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**Sustainable
Development
and Strategic
Growth**

EDITED BY

Flavia Anghel
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1

Business Ethics and CSR

SERVICE RECOVERY EFFORTS AND CUSTOMER SWITCHING INTENTIONS: INVESTIGATING THE ROLE OF POST-RECOVERY SATISFACTION

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Abstract. *As the demand for financial services has expanded, service failure has become commonplace. However, if the banking service recovery efforts are diverse and effective, it will be feasible to retain continuing contact with consumers. The research focuses on the central challenge facing bankers, which is keeping current clients who have experienced financial service failure and are doubtful of the justice they obtained throughout the service recovery procedure. In addition, it seeks to develop a methodology for measuring post-recovery satisfaction and its effect on their propensity to convert to other providers. In addition, the role of post-recovery satisfaction is in the link between service recovery efforts and consumers' switching intentions. The author verifies a measurement model using simple and multiple regression analysis in the experimental investigation (stepwise). Using a 5-point Likert scale and a web-based structured questionnaire, answers were collected from 285 Egyptian banking clients who had experienced banking service failure. The results indicate that banking service recovery efforts (distributive, procedural, and interactional justice) positively impacted post-recovery satisfaction. Moreover, the banking service recovery efforts (distributive, procedural, and interactional) had a negative impact on consumers' switching intentions. Thirdly, post-recovery satisfaction negatively impacted the consumers' switching intentions and post-recovery satisfaction has no role in the relationship between service recovery efforts and switching intentions. Distributive and procedural justice was the most influential predictor of the variance in customers switching intentions. The investigation's findings imply that the three elements of the service recovery justice model are acceptable tools for establishing service recovery satisfaction criteria for banks and reducing customers' intentions to change banks. Therefore, bank officials may use this model to evaluate service recovery efforts. They should work to improve the sense of justice felt by consumers who have suffered a service failure. This study contributes to prior research and theory by constructing a nomological framework of factors in service encounters, including service recipients' perceptions of justice, post-recovery contentment, and switching intentions.*

Keywords: *service recovery justice, post-recovery satisfaction, switching intentions, banking service, service failure, Egyptian banks.*

Introduction

Corporate social responsibility is one of the concepts that has received significant attention in the modern era as it occupies an essential space in the lives of communities and individuals, it represents the relationship between the company and customers. social responsibility shows the extent to which companies care about the desires and

needs of customers and work to provide services according to these desires and needs, without any errors or problems. When problems and errors appear in the service provided, companies must exercise their role and social responsibility to address these errors and problems because of their impact on customer satisfaction, loyalty, and conversions. The customers need to feel that the company is playing its role towards them and is interested in providing the service with the best possible quality without any errors or problems (Klein & Dawar, 2004).

In cases of service breakdown, CSR may be a recovery-initiating business strategy (Grewal et al., 2009; Siu et al., 2014) for sustainable enterprise (Kolk & van Tulder, 2010). Accordingly, Fatma et al., (2016b) have noted that in times of service failure or unsustainable business CSR can serve as "insurance protection" for organizations, which can influence stakeholders' (or customers') perceptions, trust, and loyalty (Albus & Ro, 2017; Grewal et al., 2009). Choi & La, (2013) argue that the reciprocal advantages of CSR techniques may lead to "brand love," which they define as "loyalty, satisfaction, and affection on the part of consumers toward a brand (He & Li, 2011; Nan & Heo, 2007).

Globally, banks are crucial financial organizations for the economic growth of nations, particularly Egypt. Banking industries are quickly developing to meet the varied financial demands of customers. Given that banks are essential to the economy, they aim to offer a diversified, extensive, and flawless array of services. Customer happiness is the primary objective of the service industry in highly competitive, modern technology contexts (Agolla et al., 2018; Hollebeek & Rather, 2019). The first step in designing new marketing efforts is to comprehend the wants and aspirations of customers in the target markets. However, it is possible for goods and services to produce several consumer complaints. Although banks should ultimately avoid customer complaints, service failures occur through excellent customer service, eventually leading to the departure of existing customers. These service failures occur when many services are related to employee interactions and provide psychological and human outcomes (Hocutt et al., 1997) or are not immediate or unfair to employees. It happens when the service quality fails not satisfy the customer's expectations for service delivery, such as failing to treat or react to a particular customer's wants or behavior or failing to provide a fundamental service. (Swanson & Kelley, 2001). Bell & Zemke, 1987) Users are more likely to be dissatisfied with the response of firms and employees to the failure rather than the service failure itself (Hoffman et al., 1995).

Customers who experience problems in dealing with problems receiving services become dissatisfied with how the problems are resolved. The company's service failure and inappropriate recovery efforts will exacerbate the failure situation and drive customers away. It is the leading cause of deviance (Collier et al., 2015). However, since consumers have the characteristics of negativity bias, they are more interested in negative information than positive information and are more influenced by it. As a result, consumers become more interested in unsatisfied or failed services than in satisfactory ones, thereby promoting a solid word-of-mouth effect and expanding or reproducing customer dissatisfaction (Jun & Palacios, 2016). Therefore, in in-service failure, banks must convert dissatisfied customers into satisfied customers through active responses and appropriate complaint handling and effectively deal with customer complaints to block negative word of mouth in advance and provide positive feedback should be induced (Thaichon et al., 2017; Harun et al., 2019).

Considering bad repercussions caused by service failure, the key is effectively managing service failure that can affect business activities. As a result of the result that most customers who have experienced bad luck do not feel that corporate service recovery is an appropriate recovery procedure, the problem that many companies are ineffectively implementing service recovery procedures for customers was suggested (Hart et al., 1990). Therefore, a company needs to prevent service failure in advance. Still, it is also essential to establish a system that can adequately recover from service failure that has occurred. However, suppose a company's recovery efforts following a service failure are perceived as unfair by the customers. In that case, it aggravates the service failure and becomes a major cause of customer conversion (Van Vaerenbergh et al., 2019).

However, this importance is increasingly being emphasized at large banks, when it becomes more challenging to maintain current clients and acquire new ones due to rising competition. When it is challenging to create new customers, and the churn of existing customers is accelerating (Lee et al., 2010), service recovery efforts following service failure are also important decision-making factors. While a bank's success is based on its ability to constantly delight customers Sundaram et al., (1998) and thereby build consumer loyalty Komunda & Osarenkhoe, (2012), Even companies with great plans and quality assurance processes cannot prevent process errors or service breakdowns in their daily encounters with consumers (Maxham III, 2001). In Popularity has increased for the idea of justice as a means of comprehending the method and mechanism of workers' responses to efforts to combat service failure. Perceived recovery justice consists of various facets, including "distributive justice (DJ), interactional justice (IJ), and procedural justice (PJ)". We used the idea of fairness as the underlying theory to assist us in comprehending and identifying gaps in the dynamics of service providers and consumer relationships. The perceived recovery justice variable has been the subject of several investigations (Asgar Ali et al., 2021; Cai & Qu, 2018; La & Choi, 2019; La & Choi, 2019). For instance, several research have shown that perceived recovery justice has both direct and indirect effects on consumer behavior via recovery satisfaction, relationship quality, emotions, perceived value, and trust (Muhammad & Gul-E-Rana, 2020; Cai & Qu, 2018; Chi et al., 2020; Kwon Choi et al., 2014; Kim et al., 2009; Marcos & Coelho, 2017).

Although earlier research indicates that service recovery justice increases consumers' positive behavioral intentions, such as WOM and repurchase intentions, the present study does not find such an association (Ha & Jang, 2009; Ok et al., 2005; Kim et al., 2009; Blodgett et al., 1997). As far as we know, no research examines the links among perceived justice, recovery satisfaction, and switching intentions. Despite the importance of monitoring WOM and repurchase intentions, organizations must also understand why consumers transfer to develop a culture of zero defects (Reichheld & Sasser, 1990). Besides, Keaveney, (1995) Noted that there is an imbalance between factors that result in positive outcomes and factors that determine negative outcomes, it is vital to investigate switching as a distinct phenomenon to acquire a greater understanding of its occurrence. Numerous previous researchers have investigated the effect of the fairness of service recovery on customer satisfaction (Kelley & Davis, 1994; Maxham & Netemeyer, 2002). The causal relationship in which customer satisfaction affects conversion intentions has also been discussed (Han & Back, 2007). However, there is research on the impact of the fairness of service recovery on the intention to change. Also, there is a lack of investigation on the parameters mediating between service recovery fairness and switching intentions. In this study, we intend to

investigate how the fairness of service recovery affects customers' conversion intentions by expanding several scholars' research on how service recovery efforts affect customer satisfaction.

Also, regarding fairness and conversion of service recovery, if satisfaction will play a role as a parameter in the causal link between recovery fairness and conversion intentions, we intend to investigate the effect relationship on this through empirical research. The current research examines the Egyptian banking system through the lens of justice's three dimensions as a higher-order concept (procedural, distributive, and interactional). The objective was to determine if a customer's decision to transfer banks might be affected by the bank's performance in the case of a service breakdown recovery after a registered complaint. Consequently, this research aims to establish if bank customers' perceptions of complaint handling impact consumer satisfaction and, subsequently, induce a negative inclination to move banks. The study attempts to provide banks with a look at what happens to customer satisfaction levels when a complaint about a service failure is handled in a fair manner. In addition, it aims to demonstrate to financial organizations the significance of resolving complaints from their existing committed consumers, making them viable and competitive in the Egyptian financial system. To our knowledge, however, no published research examines the link between perceived fairness with service recovery and switching intentions. In addition, this report gives insight into the Egyptian banking business.

A theoretical review and hypothesis development

There are 40 different banks in Egypt, split between the commercial, non-commercial public, and private sectors, as reported by the Central Bank of Egypt (CBE). Most retail establishments and all bank offices now provide ATM services. While some of these institutions are dedicated to serving certain industries (such as agriculture or real estate), the vast majority function as commercial banks. Major public-sector banks in Egypt include the National Bank of Egypt, Bank Misr, and Banque Du Caire, which account for 40 percent of the country's banking industry. The CBE is responsible for overseeing all Egyptian financial institutions. Egyptian Banking institutions have created mechanisms for consumers to lodge complaints due to the inherent risk of service failures in the banking service sector. The Central Bank of Egypt (CBE) has a formalized complaint mechanism in place to address concerns raised by its clientele. In addition, consumers may voice their complaints in various ways, including in-branch, over the phone, or through the bank's website. Customers who feel their bank ignored their complaints can take their case to the Central Bank of Egypt. While Egypt is still a developing economy, its retail banking sector is highly developed, technologically advanced, and competitive. Retail banks in Egypt seem dedicated and motivated to deliver services that meet and surpass clients' expectations and bounce back quickly after service failures. But it's unclear how Egyptian retail banking customers' perceptions of justice in reaction to a retail bank's service recovery attempt impact their recovery satisfaction levels and propensity to transfer banks.

Failures in the field of service delivery are almost inevitable. (Sarkar Sengupta et al., 2015; Mattison Thompson & Tuzovic, 2020), In order to recover from these failures, businesses must identify the most common customer complaints, handle issues, and provide effective remedies (Alhouti et al., 2019). Financial institutions must implement an efficient service recovery plan while providing banking services, since failures threaten their competitiveness due to the potential loss of consumers (Contiero et al.,

2016). Regarding banking services, the client is vulnerable and so requires a considerable lot of contact and engagement. In such situations, frontline and bank workers are vital for providing information and suggestions (Guenzi & Georges, 2010). Therefore, the connection's beginning and continuation depend on customer trust and satisfaction with front-line personnel and workers.

On the other hand, because service failure is unavoidable, banks should swiftly handle it to limit harm. Suppose, however, that the bank disregards client concerns. In such cases, consumers may assert their rights in different ways, such as submitting grievances to outside parties and taking legal action (Fatma et al., 2016), it might result in negative impacts on the bank. Service recovery is a service company's action and process to compensate for service failure (Kelley & Davis, 1994). Several theories explain service satisfaction, like fairness theory, influence control theory, and cognitive evaluation theory. It is used because customers perceive injustice in service failure even if there is a difference in degree (Maxham III, 2001). Fairness perception is vital in studying individual reactions when conflict is inherent (Konovsky, 2000).

Since a failure situation is typically a conflict between a service company and its customer, it is necessary to understand whether explaining customer behavior toward service recovery is fair. There is a belief that the current study contributes to service failure and restoration research. First, the goal of this study is different from that of previous studies on service failure and recovery is to use post-recovery satisfaction as a mediating variable. In other words, past research has looked at how customers' feelings of justice during service recovery affect their propensity to recommend and repurchase the service (Kim et al., 2009; (Blodgett et al., 1997; Ok et al., 2005; Harun et al., 2019). So this research investigates customers' views of justice (Assefa, 2014; Carrillo et al., 2019; De Meyer et al., 2013; Wen & Geng-qing Chi, 2013; Harun et al., 2019) as a precondition for satisfaction in instances of service failure (Assefa, 2014; Wallace et al., 2004), growing research on the issue inside the banking industry. Consideration of the role of post-recovery satisfaction in this connection (perceived fairness and switching intentions) was the fundamental theoretical basis for this study.

This research intends to construct a model to empirically investigate the effect of service recovery attempts and post-recovery satisfaction on switching intentions in the Egyptian banking market. The majority of consumer behavior research depends on Western-developed theoretical frameworks (Aaker & Maheswaran, 1997) Few research has explored service justice in the context of Arabic culture. Egypt's vast Arabic variety makes it an ideal location for this sort of research that examines these elements from an eastern viewpoint. Consequently, this research investigates the connection between perceived fairness in service recovery and switching intentions with the role of post-recovery satisfaction among Egyptian bank customers.

Service recovery efforts and switching intentions

The reciprocity norm's theoretical justification demonstrates the link between post-recovery satisfaction and behavioral intentions (Gouldner, 1960). According to the standard, consumers are disposed to assist people who have assisted them. Previous research indicates that consumers feel responsible for repaying a corporation when service recovery accomplishes justice (Van Vaerenbergh et al., 2012). According to the standard, it's human nature for consumers to return the favor to people who have

assisted them. A previous study reveals that when service recovery achieves justice, customers feel obligated to reimburse a company (Van Vaerenbergh et al., 2012). In the study (Schoefer & Ennew, 2005), low fairness perception raises the level of negative emotions of customers in the service recovery phase, and conversely, high fairness perception raises the level of positive emotions. It can be assumed that the decision will be made whether to continue. And the customer's feelings toward the company will influence the intention to switch to whether to maintain a lasting business relationship with that company or to switch to another company. Ndubisi & Ling, (2006) defined switching intentions as "customers quitting one product or service for another."

Based on Liu, (2006), customer defection is an active and damaging response to dissatisfaction, shown by a disruption in the connection between the consumer and the item. For instance, brand, product, store, or manufacturer. In addition, Ranaweera & Prabhu, (2003) customer exit (or switching) is the customer's decision to discontinue purchasing a particular service or patronizing the service provider because of an issue or difficulties addressed gradually over time. In addition, Duffy et al., (2006), investigation of client defection in the banking industry, described defection (switching) as the termination of the client's relationship to the service provider. One of the primary concerns of service providers is consumer switching intentions. According to Grace & O'Cass, (2001) companies in the service industry are more concerned about customers who have decided to leave and take their business elsewhere because of the negative effect switching intentions have on market share loss and bottom-line profitability. Thus, organizations must comprehend why consumers switch to establish a zero-defect culture Sasser & Reichheld, (1990).

However, CEOs who don't track customer defections or understand their reasons sometimes lack insight into the factors that prompt their consumers to switch brands (ScAnLAn & McPHAIL, 2000). Several studies have analyzed what factors can lead clients to change service providers (Poon & Lock-Teng Low, 2005; Grace & O'Cass, 2001; Keaveney, 1995; McCole, 2004). The most common cause of client churn seems to be service failure. For example, Keaveney, (1995) identified eight reasons customers leave a business. Of these eight, five are directly connected to aspects of the company's core service delivery, customer interactions, problem resolution, and pricing (A company's lack of a service recovery plan, which would allow it to reimburse affected customers). The research by Roos, (1999) service failures coupled with unpleasant feelings, such as the kind a customer could feel if treated unfairly, are more likely to lead to a final decision to transfer providers.

Existing literature connects service recovery activities to switching in several ways (Patterson & Smith, 2001; Wirtz & Mattila, 2004; Boshoff, 1997; McCole, 2004). For instance, based on Patterson & Smith, (2001) businesses might adopt strategies that discourage or prohibit consumers from switching service providers. This indicates that service recovery activities are possible hurdles or deterrents to transferring. Keaveney, (1995) discovered that over sixty percent of all service-switching incidents were due to fundamental service failures and poor staff responses to service problems. In addition, Wirtz & Mattila, (2004) discovered that recovery steps such as empowerment and rewards might decrease the chance of changing service providers. Boshoff & Leong, (1998) highlighted prompt response as an additional recovery measure that might reduce customer plans to move service providers. Similarly, McCole, (2004) showed that recovery activities may considerably change a customer's view of moving to a new

service provider. Lower switching intentions are a key indicator of service recovery's effectiveness.

Previous studies have made several possible connections between fairness and switching (Seiders & Berry, 1998) claimed that a lack of justice in service delivery would lead to a loss of customers and related fairness to customer retention, service providers are unable to engender the degree of client trust required to win their loyalty. In the retail industry Bies, (1987) argues that a more robust bond may be formed between customers and stores if they believe they are being treated fairly by shopkeepers. However, when customers feel they have been treated unfairly by businesses, they may get morally offended and show negative feelings such as anger and resentment (Bies, 1987), this may undermine confidence and lead to the termination of the exchange process (W. G. Kim et al., 2006). In the same way, Seiders & Berry, (1998) argues organizations that fail to project an image of fairness fail to inspire the level of client trust necessary to develop loyalty among their clientele (i.e. repeat patronage). In addition, Nikbin et al., (2012) also found that distributive, procedural, and interactional fairness were negatively correlated with switching intent in-service failure and recovery settings.

The low procedural justice felt in problem-solving causes customers to have negative emotions (Schoefer & Ennew, 2005). In the study of Chebat & Slusarczyk, (2005), even if the service recovery process was achieved quickly, customers did not show positive emotions, while recovery in this case, negative emotions are displayed. The emotions formed in the service restoration procedures are thought to greatly impact the decision to keep dealing with the existing service company. There are few cases where empirical studies have been conducted on the impact of perceived justice on conversion intentions. However, in the studies of (Chebat & Slusarczyk, 2005) and (Schoefer & Ennew, 2005), customers' emotions were shown to be significantly affected by interactional fairness. Also, in the research of (Folkes et al., 1987), service failure It is said that the level of negative emotions of customers differs depending on who is the source of the failure cause.

Perceived justice includes all three components of justice (distributive justice, procedural justice, and interactional justice) as described by the justice theory. Like other comparable studies, the present research employed service recovery analysis based mostly on the justice theory. Therefore, based on the preceding investigations, it is expected that the three forms of service recovery fairness would have a negative impact on consumers' propensity to convert. Therefore, based on the above studies, it is assumed that the three types of fairness of service recovery will have a negative effect on customers' conversion intention, Hypothesis 1 was set as follows.

H1.1: "Distributive fairness of service recovery will negatively affect customer switching intentions."

H1.2: Procedural justice of service recovery will negatively affect customer switching intentions."

H1.3 Interactional justice of service recovery will negatively affect customer switching intentions."

Service recovery efforts and post-recovery satisfaction

Earlier research has shown that justice expectations strongly predict consumer satisfaction (Chiu et al., 2013; Chiu et al., 2013). According to Parasuraman,

(Parasuraman et al., 1991), efficient service recovery may increase consumers' perception quality of purchased goods or services, the enterprise's capability, the organization's image, and ultimately post-recovery satisfaction. The research is founded on the well-known theory of justice (Homans & Merton, 1961), a framework often utilized in service recovery studies (del Río-Lanza et al., 2009; Chebat & Slusarczyk, 2005; Tax et al., 1998; Smith et al., 1999). Failure to offer financial services may elicit several client responses, including adverse emotional responses, discontent, complaints, and abandonment (Petzer et al., 2017). Consequently, It is important to find out how happy clients are with financial services (Andaleeb et al., 2016) aspects include service restoration attempts (Alhouti et al., 2019; Chao & Cheng, 2019; Harrison-Walker, 2019), a feeling of apparent fairness (Petzer et al., 2017) plus service quality (Ozatac et al., 2016) are often studied as indicators of satisfaction in this sector, particularly instances of service rehabilitation after failure. According to Chiu et al., (2013), When a failure strikes, it's a chance for a business to prove its dedication to its consumers by showing them that it cares about them and will do everything it takes to put things right again. When a service goes down, customers form views based on the actions taken to fix the problem and the outcomes. (Cambra-Fierro et al., 2015).

Consequently, consumers determine if the fault has been rectified equitably, which influences their satisfaction or dissatisfaction ratings. A previous study has studied the link between perceived justice and post-recovery satisfaction. for various industries and nations (Maxham III, 2001; Schoefer, 2008; Tax et al., 1998; Smith et al., 1999; McCollough et al., 2000; Mattila, 2001). In most of this research, it is acknowledged that consumers who perceive a fair recovery procedure have high levels of satisfaction and repurchase inclinations. For instance, research conducted within the banking and finance industries (Ozkan-Tektas & Basgoze, 2017; Maxham & Netemeyer, 2002;) focuses more on the direct link between the dimensions of felt fairness regarding recovery and post-recovery satisfaction. In addition, perceived fairness characteristics have also been researched separately concerning their effect on long-term satisfaction after recovery (Ghalandari, 2013; Sarkar Sengupta et al., 2015). different types of perceived fairness have different impacts on customers' happiness with the resolution of their complaints as described by Davidow & Leigh, (1998) . It thinks the notion of distributive justice is more essential than the others since it focuses directly on the outcome from the customer's point of view. Nonetheless, procedural fairness may be more important than distributive justice when evaluating personal outcomes such as post-recovery contentment. Furthermore, even if procedural and interactional justices positively affect satisfaction, these advantages are less significant than those of distributional justice.

Considering the consensus in the literature that the three aspects of perceived justice might have varying consequences, the following hypotheses were formulated for this study based on previous research examining this topic. Distributive justice is the extent to which a company offers consumers apparent compensation who experience failure in service delivery and that is perceived by customers who have experienced failure (Karatepe, 2006). Many studies, (Karatepe, 2006; Patterson et al., 2006; Tax et al., 1998) reported that distribution justice increases recovery satisfaction (Maxham III & Netemeyer, 2002). procedural justice It can be said to be the degree of fairness perceived by customers who have experienced failure about the process and method of problem-solving provided by the service firm to consumers at the stage of service recovery Chebat & Slusarczyk, (2005), In the complaint procedure, procedural fairness has a

beneficial influence on consumer satisfaction. Although there are many studies (Karatepe, 2006; Tax et al., 1998), that examined the degree to which procedural fairness affects post-recovery satisfaction show different results depending on the studies.

Maxham III & Netemeyer, (2002) study on Banking and Housing construction services in this study, there was no substantial relationship between procedural fairness and satisfaction with service recovery, but a study of the same researchers in the field of online electronic product purchase in 2003 revealed a positive influence relationship between the two variables. interactional justice can be said to be the degree of fairness in the way and attitudes of service company employees towards customers who have experienced failure throughout the process of service breakdown, and it pertains to the equity of the relationship. Many existing studies have revealed that the perception of interactional fairness among front-line staff in resolving complaints positively affects post-recovery satisfaction (Karatepe, 2006; Homburg & Fürst, 2005). In some cases, it was argued that interactional justice has no significant link with post-recovery satisfaction.

According to the findings of previous studies that dealt with the relationship between service recovery justice and post-recovery satisfaction, which found a positive link between recovery justice dimensions and post-recovery satisfaction. The degree of fairness perceived by customers in the service recovery process affects post-recovery satisfaction, and satisfaction, which is a perceived positive response, is thought to reduce the negative thoughts that customers want to move to other service companies. Therefore, it is assumed that the three types of fairness of service recovery will have a positive effect on post-recovery satisfaction, Hypothesis 2 was set as follows.

H2.1: “Distributive justice of service recovery will positively affect post-recovery satisfaction.”

H2.2: Procedural justice of service recovery will positively affect post-recovery satisfaction.”

H2.3 Interactional justice of service recovery will positively affect post-recovery satisfaction.”

Post-recovery satisfaction and Switching intentions:

The behavioral consequences for customers are highly influenced by customers' perceptions of how well the service was restored method chosen. Satisfied consumers may share good remarks about the business and its products and services and suggest the business to others. Satisfied customers may be significantly influenced if they spread pleasant word-of-mouth and sometimes attract new diners and not switch to deal with another firm (Bearden & Teel, 1983). Customer satisfaction indicates post-sale appraisal. It's common knowledge that happy customers are less likely to complain, switch brands, or spread the word about a bad experience (Anderson & Sullivan, 1993; Chih et al., 2012; Jones & Sasser, 1995; M.-K. Kim et al., 2004; Szymanski & Henard, 2001). Satisfied customers are likelier to repurchase, participate in positive word-of-mouth advertising, and become loyal customers. In contrast, dissatisfied customers are likelier to participate in poor word-of-mouth advertising, complain to others or third parties, and move to competitors.

consumers' propensities to move to compete with businesses are known as switching/exit intents (Ping, 1993). Notably, even if a customer has a high switching intention, you still can't be sure they'll switch anytime soon (Antón et al., 2007). Repurchase intent is directly related to brand switching and switching intentions (Bansal & Taylor, 1999). Brand switching and the inclination to switch brands are undesirable results (Oliver Richard, 1997), and the link between customer satisfaction, client loyalty, and conversion intentions is quite tight. In general, if all other factors remain constant, pleased consumers are anticipated to demonstrate more loyalty, decreasing their propensity to transfer to a competitor (Picón et al., 2014). However, the connection between recovery satisfaction and conversion is not as straightforward as it may seem. The link between customer satisfaction and loyalty is not always sufficient to keep consumers from transferring to a competitor (Kumar et al., 2013). In many instances, satisfied consumers may migrate to a competing company (Walsh et al., 2006; Sánchez-García et al., 2012), However, disgruntled clients may remain loyal to the company (Bonifield & Cole, 2007; Burnham et al., 2003).

Despite this, several prior research has established a strong negative correlation between recovery satisfaction and switching intentions (Antón et al., 2007; Bansal & Taylor, 1999; Hennig-Thurau et al., 2002; Wang et al., 2014; McDougall & Levesque, 2000; Mittal & Lassar, 1998). Scholars have shown that customer satisfaction is a major factor in many MTMs' customers' propensity to transfer providers (Chuang et al., 2012; M.-K. Kim et al., 2004; (Santouridis & Trivellas, 2010). Additionally, consumer satisfaction indicates switching intentions (M. A. Jones et al., 2000; Ping, 1993). Client satisfaction increases customer retention percentage (Ranaweera & Prabhu, 2003a; Trasorras et al., 2009) but adversely affects switching intentions (Ganesh et al., 2000). After suffering a service failure, it is anticipated that unhappy consumers would have greater switching intentions than satisfied customers.

Previous studies have shown that consumer satisfaction directly influences the likelihood of making a switch or making a repeat purchase. For instance, using the expectation-disconfirmation theory, Chiu et al., (2013) investigated the links between switching cost, satisfaction, trust, and repurchase intent. In contrast, Shukla, (2004) discovered a clear and substantial link between satisfaction and brand-switching intent inside these five types of merchandise (vehicles, television, soap, hair oil, and ice cream). Li et al. (2007) also discovered that student satisfaction is the most influential factor in their decision to move to alternative websites. According to the above, and to previous studies that studied the effect of post-recovery satisfaction on the customers switching intentions. It is assumed that perceived satisfaction after service recovery will have a negative effect on conversion intention. The above H3 hypothesis will be formulated as follows:

H3: Post-recovery satisfaction will negatively affect customers switching intentions."

Service recovery efforts, post-recovery satisfaction, Switching intentions

Several studies have indicated that satisfied consumers are willing to demonstrate behavioral responses such as switching intention, WOM, repurchase intentions, and loyalty in the marketing literature (Van Vaerenbergh et al., 2012; Tanner-Smith et al., 2018; Y. Wang et al., 2017; Kau & Wan-Yiun Loh, 2006; Petzer et al., 2017) Post-recovery satisfaction is influenced by procedural, distributive, and interactional fairness as an element of service recovery. The effect of fairness of recovery on recovery satisfaction

in the environment of service failure has been revealed through a number of studies, and there have been studies that customer satisfaction has a negative effect on conversion intention (Han & Back, 2007). In this study, it is assumed that the fairness of the service recovery process will affect the conversion intention through the parameter of satisfaction after recovery.

In contrast, fairness theory is mostly recognized for its ability to explain recovery satisfaction and negative effects following service interruption (Smith et al., 1999; Ha & Jang, 2009; Chebat & Slusarczyk, 2005; Cheung & To, 2017). Post-recovery satisfaction is the key predictor of customer loyalty and positive or negative customer intentions (Jung & Seock, 2017). However, Bouranta et al. (2019) demonstrate that a high service recovery rate corresponds with increased customer loyalty and a decreased propensity for consumers to switch to another organization. Consumers' behavioral intentions in response to perceived injustice seem contingent upon their recovery satisfaction level. Numerous previous studies (Wirtz & Mattila, 2004; Lin et al., 2011; Ellyawati et al., 2012; Kuo & Wu, 2012; Nikbin et al., 2015) have examined the direct links between service recovery and post-recovery satisfaction, revealing that dissatisfied customers will spread unfavorable word-of-mouth and choose alternative options and the intent to switch to a different company. The impression of consumer fairness towards the company's efforts for service failure recovery adds to high customer satisfaction.

Other research (Cambra-Fierro et al., 2011; Augusto de Matos et al., 2013; Crisafulli & Singh, 2016) demonstrates positive correlations between post-recovery satisfaction and future behavioral intentions. Based on the above, post-recovery customer satisfaction is expected to play a role in the link between service recovery efforts and customer switching intents. Therefore, Hypothesis 4 was established as follows.

H4: "The service recovery efforts will indirectly affect customer switching intentions through post-recovery satisfaction."

In order to establish a hypothesis through theoretical consideration and to explain the causal relationship between the variables under study, Figure 1 depicts a suggested model for examining the link among post-recovery satisfaction, the service recovery efforts construct (which has three dimensions: procedural, distributive, and interactional), and the switching intentions. The role effects of post-recovery satisfaction on service recovery efforts with switching intentions were also tested. And this is all happening while the banking sector faces mounting complaints about its inability to meet customers' needs. the research model was established in this study as follows:

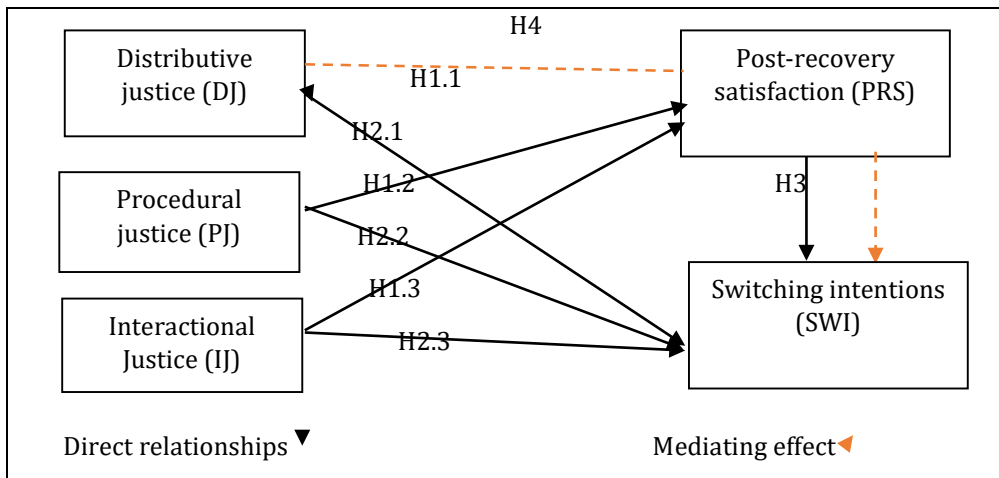


Figure 1. Model of the study

Research Design and Methods

To verify the link among the elements of perceived justice, post-recovery satisfaction, and switching intentions, in addition to verifying the role effect of post-recovery satisfaction in this relationship, we carried out quantitative research. Customers of Egyptian banks who had suffered a service failure or filed at least one complaint of inadequate service provision were the study's primary focus because of the importance of claims management in the service sector, which includes banking. Consequently, the banking industry was selected for two reasons. First, customer retention is a key driver of bank survival and expansion in this industry.

Second, even though the financial service business is one of the most significant and expanding sectors within service firms (K.-Y. Wang et al., 2014), Consumers often report problems and mistakes in the supply of financial services to the Consumer Arbitration Committee (Lewis & Spyropoulos, 2001). Consequently, the primary population of the research consisted of clients who experienced banking service failures. This industry was selected due to the significance of client retention in the banking industry. It is general knowledge that there is a high degree of rivalry among banks, who spent enormous sums on marketing to get new clients (del Río-Lanza et al., 2009). For data gathering, we employed the technique of purposive sampling. The author chose respondents who met the inclusion requirements for this research. Residents of Egypt who have filed service interruption complaints and gone through the service recovery procedure. Egypt's bank customers were surveyed using web-based questionnaires to acquire data. This study's questionnaire was mostly derived from earlier research. Modifications have been made to accommodate the present investigation. Because it is based on real marketing transactions, this survey is selected since it has a better general ability and higher external dependability (Churchill & Iacobucci, 2006), it also allows us to evaluate important factors (Fresco et al., 2007). Moreover, it is a handy, quick, and cost-effective method for obtaining respondent replies.

A questionnaire with 28 questions was used to gather data from 285 participants from bank customers through electronic methods. Through questions 4 and 5,6, respondents indicated if they connected with a bank and whether they had previously encountered a service failure in banking or lodged a complaint against that bank, guaranteeing that they belonged to the research's intended audience. These introductory questions aided in recalling service failures and recovery occurrences, and responses to the remaining questions within this framework. The survey asked respondents to identify the kind of bank they do business with (public or private), the nature of their account (individual, business, or joint), and the last one about complaints. The respondent could not finish the questionnaire if each question was answered negatively. In addition to questions on the respondent's gender, age, level of education, and annual income. All variables were assessed using a web-based questionnaire form with interval scales except for the demographic questions.

All variables use literature-based scales, which are briefly discussed below. Regarding the perception of service recovery's fairness, most measuring items for the dimensions of felt justice were taken or altered from other research. Overall, 13 questions were utilized to measure the perception of justice. From (Blodgett et al., 1997; Maxham & Netemeyer, 2002) we adopted five items to measure distributive justice and four more to measure procedural justice, and Four items used to measure interactional justice were adopted from (Blodgett et al., 1997) and (Homburg & Fürst, 2005). All perceived justice items were measured using a five-point Likert scale. Moreover, 4 items were used to measure post-recovery satisfaction adapted from (Lin et al., 2011; del Río-Lanza et al., 2009). Moreover, three items for measuring switching intentions were adapted from (Shin & Kim, 2008).

As a stage in testing the hypothesis, each question utilized a scale ranging from "5" for strongly agree to "1" for strong disagreement, the survey was divided into two sections. The first section featured remarks about service restoration attempts, post-recovery customer happiness, and consumer switching intentions. The five-point Likert scale was used to assess the items (5 = strongly agree, 1 = strongly disagree). The responder's profile implies that they are young and well-educated. Before distributing the instrument to the respondents, it was crucial to analyze its validity and reliability, even though the researcher developed the study variables based on objective and rigorous measurements to evaluate the scale's reliability and validity. Cronbach's alpha, an exceptional measure of the questionnaire validity and reliability, was used, and as the scale approaches +1, it becomes more precise. Descriptive statistical methodologies were used to characterize the characteristics of the samples, the research hypotheses were evaluated using simple regression analysis and multiple linear regression analysis (stepwise) using (SPSS v25). Tests of the questionnaire's validity and reliability are shown in Table 1.

Table 1. The validity and reliability of the questionnaire

Research instrument	Cronbach's alpha	Mean	Std. Deviation	References
Distributive justice (DJ): Reflective construct with 5 items	0.912	3.9193	0.88672	(Blodgett et al., 1997; Maxham & Netemeyer, 2002; Smith, Bolton and Wagner, 1999)
DJ1: When there was a problem with the bank's service provided, I was fairly compensated by the bank.				
DJ2: The outcome I received from the bank in response to the bank's service failure problem has been adequate.				
DJ3: The bank dealt with my complaint and problem in the right way from my point of view.				
DJ4: I got results and a solution to my problem in proportion to the size of the failure or problem that occurred in the banking service provided.				
DJ5: The bank provided me with everything I needed to resolve the issue using their services.				
Procedural justice (PJ): Reflective construct with 4 items	0.843	3.9807	0.79919	(Blodgett, Hill and Tax, 1997; Maxham & Netemeyer, 2002 Smith, Bolton and Wagner, 1999)
PJ1: I believe the bank offers adequate methods (such as FAQs, help pages, frontline employees, and a customer support hotline) to address banking services' faults and errors.				
PJ2: According to the bank's processes, the problem has been resolved quickly.				
PJ3: In accordance with its procedures and processes, the bank treats the situation fairly.				

Research instrument	Cronbach's alpha	Mean	Std. Deviation	References
PJ4: The methods and procedures demonstrate the bank's flexibility in resolving the service failure.				
Interactional justice (IJ): Reflective construct with 4 items	0.770	4.1105	0.68309	(Blodgett, Hill and Tax, 1997; Lin, Wang and Chang, 2011).
IJ1: The bank's employees are always kind to me throughout service restoration.				
IJ2: The interactions with the bank were suitable for addressing the fault in the given banking service.				
IJ3: The bank detailed the reason and context of the faults and issues that occurred with the banking service offered.				
IJ4: The bank staff always shows me their honesty.				
Post-recovery satisfaction (PRS): Reflective construct with 4 items	0.909	3.9640	0.89195	(del Río-Lanza, Vázquez-Casielles and Díaz-Martín, 2009; Lin et al., 2011).
PRS1: I am pleased with the bank's responsiveness to the issue I faced with their banking service.				
PRS2: I believe that the bank's options and procedures for managing issues with banking service failure are excellent.				
PRS3: I am pleased with what I got after the service recovery.				
PRS4: The bank's responsiveness to the service issues exceeds my expectations.				
Customer switching intentions: (SWI): Reflective construct with 3 items	0.903	2.0994	1.06363	(Shin & Kim, 2008).
SWI1: I intend to change my service in this bank, and I will deal with another bank.				
SWI2: In the future, I will need the services of other banks.				
SWI3: I would no longer use the services of my existing bank.				

Source: Authors' research results

The survey's reliability was evaluated using composite reliability, which should be greater than 0.70, as shown in Table 1 (Wasko & Faraj, 2005). The rate is more than 0.70, showing internal consistency, Cronbach's alpha was used to evaluate internal consistency. As the value surpasses 0.70, these data support the reliability of the study. All components exhibit appropriate Cronbach's alpha reliability values ranging from 0.770 to 0.912 percent, as observed. These findings indicate the validity and reliability of the measurement tool and its statistical validity for collecting field study data. Moreover, Table 1 describes the indicators of the variables included in the study, which are the mean measured on the Likert five scale, and their standard deviations. There is a clear convergence between the means of all study variables based on the total sample values, the majority of these averages were greater than the hypothetical mean of (3), and this indicates a clear awareness of the sample for most of the study variables, and the values of the standard deviation for the variables that are less from the (1), there is a great deal of agreement between the of the study sample in their perception of those variables.

Results and discussion

Sample profile

The demographic data showed the general makeup and characteristics of the participants in the study and (53.3%) of respondents were male, while (46.7%) were female. Most respondents were between the ages of 21 and 30 (58.2. percent), followed by those between the ages of 31 and 40 (25.3%), 15 to 20 (11.2%), and those older than 40 (5.3%). Regarding the education level, the majority (51,6%) had a bachelor's degree, while 39.3% held a postgraduate degree, 7.7% held a high school diploma, and 1.4% held other credentials. Most responders were well-educated, and each participant in this survey qualified for the research. Table 2 provides descriptive information on respondent characteristics.

Table 2. Demographic statistics

Gender	frequency	percentage
Male	152	53.3
Female	133	46.7
Age		
15-20	32	11.2
21-30	166	58.2
31-40	72	25.3
More than 40	15	5.3
Education		
High school	22	7.7
Undergraduate	147	51.6
Postgraduate	112	39.3
Other	4	1.4

Source: Authors' research result

Data analysis

This part provides the outcomes of validating and testing the hypotheses and statistical methodologies. Hypothesis H1 about the effect of distributive justice on customers' switching intentions is examined using simple regression analysis. The hypothesis was tested using simple regression analysis, as shown in Table 3:

Table 3. Simple regression analysis for distributive justice and customers' switching intentions

Model Summary						
Model	R	R Square	Adj R ²	Std. Error		
1	0.544 ^a	0.296	0.293	0.89405		

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	95.083	1	95.083	118.953	.000 ^b
	Residual	226.211	283	.799		
	Total	321.294	284			

a. Dependent Variable: Customers switching intentions
b. Predictors: (Constant), Distributive justice

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.657	.240		19.372	.000
	DJ	-.653-	.060	-.544-	-10.907-	.000

a. Dependent Variable: Customers switching intentions

Source: Results of the author's study

Table 3 presents an overview of the simple regression analysis findings conducted to investigate the impact of distributive justice on customers switching intentions, showing that the prediction model was statistically significant ($F = 118.953$, $p\text{-value} < 0.05$), with 0.296 % of consumers' switching intentions variability ($R\text{ Square} = 0.296$) explained by the negative effect of distributive justice ($Beta = -0.544$; $T = -10.907$). The negative effect of distributive justice on customers' switching intentions is expected. This indicates that H1.1 is supported. The H1.2 hypothesis states that procedural justice has a negative effect on customers switching intentions. Using simple regression analysis, this hypothesis was tested. Table 4 presents the results of the analysis:

Table 4. Simple regression analysis for procedural justice and customers' switching intentions

Model Summary						
Model	R	R Square	Adj R ²	Std. Error		
1	0.552 ^a	0.305	0.303	0.88815		

a. Predictors: (Constant), Procedural justice

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	98.060	1	98.060	124.314	.000 ^b
	Residual	223.234	283	0.789		
	Total	321.294	284			

a. Dependent Variable: Customers switching intentions
 b. Predictors: (Constant), Procedural justice

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.026	0.268		18.774	.000
	PJ	-.735-	0.066	-.552-	-11.150-	.000

a. Dependent Variable: Customers switching intentions

Source: Results of the author's study

Table 4 presents an overview of the simple regression analysis findings conducted to examine the impact of procedural justice on customers switching intentions, showing that the prediction model was statistically significant ($F = 124.314$, $p\text{-value} < 0.05$), with 0.305% of consumers' switching intentions variability ($R\text{ Square} = 0.305$) explained by the negative effect of procedural justice ($Beta = -.552$; $T = -11.150$). The negative influence of procedural justice on customers' switching intentions is expected. This indicates that H1.2 is supported. The H1.3 hypothesis states that interactional justice has a negative effect on customers switching intentions. Using simple regression analysis, this hypothesis was tested. Table 5 presents the findings of the analysis

Table 5. Simple regression analysis for interactional justice and switching intentions

Model Summary						
Model	R	R Square	Adj R ²		Std. Error	
1	0.492 ^a	0.242	0.239		.92779	
a. Predictors: (Constant), Interactional justice						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.688	1	77.688	90.251	.000 ^b
	Residual	243.606	283	0.861		
	Total	321.294	284			
a. Dependent Variable: Customers switching intentions						
b. Predictors: (Constant), Interactional justice						
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.247	0.336		15.624	.000
	IJ	-.766-	0.081	-.492-	-9.500-	.000
a. Dependent Variable: Customers switching intentions						

Source: Results of the author's study

Table 5 presents an overview of the simple regression analysis findings conducted to investigate the influence of interactional justice on customers switching intentions, showing that the prediction model was statistically significant (F = 90.251, p-value < 0.05), with 0.242% of consumers' switching intentions variability (R Square = 0.242) explained by the negative effect of interactional justice (Beta = -.492; T= -9.500). The negative effect of interactional justice on customers' switching intentions is expected. This indicates that H1.3 is supported. Regarding the H2.1 hypothesis the examine the influence of distributive justice on post-recovery satisfaction. Simple regression analysis was used to test this hypothesis Table 6 presents the results of the analysis:

Table 6. Simple regression analysis for distributive justice and post-recovery satisfaction

Model Summary						
Model	R	R Square	Adj R ²	Std. Error		
1	0.882 ^a	0.778	0.777	0.42101		

a. Predictors: (Constant), Distributive justice

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	175.781	1	175.781	991.698	.000 ^b
	Residual	50.163	283	0.177		
	Total	225.944	284			

a. Dependent Variable: Post-recovery satisfaction
 b. Predictors: (Constant), Distributive justice

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.487	0.113		4.299	.000
	DJ	0.887	0.028	0.882	31.491	.000

a. Dependent Variable: Post-recovery satisfaction

Source: Results of the author's study

Table 6 presents an overview of the simple regression analysis findings conducted to investigate the influence of distributive justice on post-recovery satisfaction, showing that the prediction model was statistically significant (F = 991.698, p-value < 0.05), with 0.778% of post-recovery satisfaction variability (R Square = 0.778) explained by the positive effect of distributive justice (Beta = .882; T= 31.491). The positive influence of distributive justice on post-recovery satisfaction is expected. This indicates that H2.1 is supported. Simple regression analysis was used to test the H2.2 hypothesis which examines the influence of procedural justice on post-recovery satisfaction. The findings of the simple regression analysis are shown in table 7:

Table 7. Simple regression analysis for procedural justice and post-recovery satisfaction

Model Summary						
Model	R	R Square	Adj R ²	Std. Error		
1	0.887 ^a	0.783	0.781	0.43112		
a. Predictors: (Constant), Procedural justice						
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	175.755	1	175.755	996.031	.000 ^b
	Residual	50.189	283	0.177		
	Total	225.944	284			
a. Dependent Variable: Post-recovery satisfaction						
b. Predictors: (Constant), Procedural justice						
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.046	0.127		.360	.719
	PJ	0.984	0.031	0.887	31.681	.000
a. Dependent Variable: Post-recovery satisfaction						

Source: Results of the author's study

Table 7 presents an overview of the simple regression analysis findings conducted to investigate the influence of procedural justice on post-recovery satisfaction, showing that the prediction model was statistically significant ($F = 996.031$, $p\text{-value} < 0.05$), with 0.783% of post-recovery satisfaction variability ($R\text{ Square} = 0.783$) explained by the positive effect of distributive justice ($Beta = .887$; $T = 31.691$). The positive influence of distributive justice on post-recovery satisfaction is expected. This indicates that H2.2 is supported. Simple regression analysis was used to test the H2.3 hypothesis which examines the influence of interactional justice on post-recovery satisfaction. The findings of the simple regression analysis are shown in table 8:

Table 8. Simple regression analysis for interactional justice and post-recovery satisfaction

Model Summary						
Model	R	R Square	Adj R ²	Std. Error		
1	0.792 ^a	0.627	0.626	0.54535		

a. Predictors: (Constant), IJ

ANOVA ^a						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	141.779	1	141.779	476.722	.000 ^b
	Residual	84.165	283	0.297		
	Total	225.944	284			

a. Dependent Variable: PRS
 b. Predictors: (Constant), IJ

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.288-	0.197		-1.457-	.146
	IJ	1.034	0.047	0.792	21.834	.000

a. Dependent Variable: PRS

Source: Results of the author's study

Table 8 presents an overview of the simple regression analysis findings conducted to investigate the influence of interactional justice on post-recovery satisfaction, showing that the prediction model was statistically significant ($F = 476.722$, $p\text{-value} < 0.05$), with 0.627% of post-recovery satisfaction variability ($R\text{ Square} = 0.627$) explained by the positive effect of interactional justice ($Beta = 792$; $T = 21.834$). The positive influence of interactional justice on post-recovery satisfaction is expected. This indicates that H2.3 is supported. Simple regression analysis was used to test the H3 hypothesis which examines the influence of post-recovery satisfaction on customers switching intentions. The findings of the simple regression analysis are shown in table 9:

Table 9. Simple regression analysis for post-recovery satisfaction and switching intentions

Model Summary						
Model	R	R Square	Adj R ²	Std. Error		
1	0.519 ^a	0.270	0.267	0.91062		

a. Predictors: (Constant), PRS

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	86.620	1	86.620	104.458	.000 ^b
	Residual	234.674	283	0.829		
	Total	321.294	284			

a. Dependent Variable: SWI
b. Predictors: (Constant), PRS

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.554	0.246		18.502	.000
	PRS	-.619	0.061	-.519	-10.220	.000

c. Dependent Variable: SWI

Source: Results of the author's study

Table 9 presents an overview of the simple regression analysis findings conducted to investigate the influence of post-recovery satisfaction on customers switching intentions, showing that the prediction model was statistically significant ($F = 104.458$, p -value < 0.05), with 0.270 % of consumers' switching intentions variability (R Square = 0.270) explained by the negative influence of post-recovery satisfaction (Beta = -0.519; $T = -10.220$). The negative influence of post-recovery satisfaction on customers' switching intentions is expected. This indicates that H3 is supported. Regarding the H4 hypothesis we used multiple regression (stepwise) to test the role of post-recovery satisfaction in the link between service recovery efforts and customers' switching intentions, Table 10 presents the results of the analysis:

Table 10. Findings of multiple regression analysis for the effect of the role of post-recovery satisfaction

Model Summary						
Model	R	R Square	Adj R ²		Std. Error	
1	0.552 ^a	0.305	0.303		0.88815	
2	0.568 ^b	0.323	0.318		0.87835	

a. Predictors: (Constant), PJ
 b. Predictors: (Constant), PJ, DJ

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	98.060	1	98.060	124.314	.000 ^b
	Residual	223.234	283	0.789		
	Total	321.294	284			
2	Regression	103.732	2	51.866	67.228	.000 ^c
	Residual	217.562	282	0.771		
	Total	321.294	284			

a. Dependent Variable: SWI
 b. Predictors: (Constant), PJ, DJ

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.026	0.268		18.774	.000
	PJ	-.735-	0.066	-.552-	11.150-	.000
2	(Constant)	5.060	0.265		19.089	.000
	PJ	-.433-	0.129	-.325-	-3.348-	.001
	DJ	-.316-	0.116	-.263-	-2.711-	.007

a. Dependent Variable: SWI

Excluded Variables						
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	PRS	-.144- ^b	-1.372-	0.171	-.081-	0.222
	DJ	-.263- ^b	-2.711-	.007	-.159-	0.255
	IJ	-.082- ^b	-.877-	.381	-.052-	0.280

2	PRS	-.001 ^{-c}	-.011-	0.991	-.001-	0.165
	IJ	-.049 ^{-c}	-.529-	0.597	-.032-	0.275
a. Dependent Variable: SWI						
b. Predictors in the Model: (Constant), PJ						
c. Predictors in the Model: (Constant), PJ, DJ						

Source: Results of the author's study

Table 10 offers an overview of the multiple regression analysis findings (Stepwise) conducted to the role of post-recovery satisfaction in the link among recovery efforts dimensions (distributive, procedural, interactional) and customers switching intentions. As shown in model 2 the prediction model was statistically significant ($F=67.228$, $p\text{-value} < 0.05$), with 0.323% of consumers' switching intentions variability ($R\text{ Square}= 0.323\%$) explained by the negative influence of two service recovery efforts dimensions together (distributive justice, procedural justice) on customers switching intentions ($\text{Beta} = \text{PJ} (-.325)$, $\text{DJ} (-.263)$, $T = \text{PJ} (-3.348)$, $\text{DJ} (-2.711)$). The correlation coefficient (R) shows a significant relationship between two variables correlation between both (distributive and procedural justice) as one of the dimensions of service recovery efforts and customer switching intentions, its value is (0.568), and this result indicates that any change that occurs in one of the variables must be followed by a change in the other variable. As shown in model 2 the post-recovery satisfaction variable and interactional justice has been removed from the regression analysis according to the standardized Coefficients (Beta) equal to (-.001, -.049) that is mean the post-recovery satisfaction has no role in the link among service recovery efforts and customers switching intentions. As shown in model 1 procedural justice is the most significant predictor of customer's switching intentions variance. Procedural justice remained the most influential on the dependent variable according to the standardized Coefficients (Beta) equal to (-.552 and $T=-11.150$). Where ($F= 124.314$, $P\text{-value} < 0.05$), with ($R\text{ Square} 0.305$), indicates that the procedural justice dimension explains 30.5% of the variance in customers' switching intentions and the correlation coefficient (R) shows a significant link among procedural justice as one of the dimensions of service recovery efforts and customer switching intentions, its value is (0.552), and this result indicates that any change that occurs in one of the variables must be followed by a change in the other variable. As result, the fourth ($H4$) hypothesis is not supported, and post-recovery satisfaction has no role in the link between service recovery efforts and customers' switching intentions.

Discussions

Due to the growth of financial services, service breakdowns are unavoidable. Financial service failures often include improperly handled consumer requests, inadequate disclosure of vital transaction information, technological problems caused by financial professionals, etc. (K.-Y. Wang et al., 2014). Service managers must comprehend how to recover from defunct financial services to establish efficient recovery methods. There is a dearth of understanding surrounding how banks may provide service recovery attempts and how this impacts customer perceptions, post-recovery behavior, and switching intentions. Because of this vacuum in the literature, this study examined how procedural, distributive, and interactional recovery methods enhance recovery satisfaction and reduce consumers' switching intentions. This research is based on the previous study that the perception of fairness perceived by customers in the service

recovery influences post-recovery satisfaction, how will the same types of fairness affect switching intention. This study determined whether post-recovery satisfaction mediates service recovery efforts and switching intention.

The author has put forward four hypotheses in this research to shed light on the causal connections between our study variables (service recovery efforts, post-recovery satisfaction, and customer switching intents). Hypothesis H1.1, H1.2, and H1.3 was supported, testing the effect of service recovery efforts (distributive, procedural, interactional) on customers switching intentions, according to the findings of this research, distributive fairness, procedural fairness, and interactional fairness were negatively inversely linked with switching intentions. These results are connected with the earlier studies (Keaveney, 1995; Wirtz & Mattila, 2004; Boshoff & Leong, 1998; McCole, 2004). Since all aspects of fairness were associated with switching intents, banks should identify the range of consumer-acceptable compensations and service pricing, as well as their processes, and provide timely service. Employees should always treat clients with decency and respect and strive to achieve positive results throughout service delivery. These outcomes may be explained by the customers' recognition that the bank engages with them with respect and appreciation via banking interactions, rapid response, user-friendly technologies, and the accompanying civility and respect, offering an apology and explanation for the service failure. All is negatively reflected in the customer's intention to switch to another bank.

Besides, H2.1, H2.2, and H2.3 have been supported, testing the effect of service recovery efforts (distributive, procedural, interactional) on post-recovery satisfaction. According to the findings of this research, distributive fairness, procedural fairness, and interactional fairness were positively associated with post-recovery satisfaction, and the level of perception of fairness perceived by customers in the recovery process was found to have a positive effect on post-recovery satisfaction. These findings are consistent with the previous studies that service recovery initiatives (perceived justice) will increase post-recovery satisfaction in the future (Maxham & Netemeyer, 2002; Chao & Cheng, 2019; Ahmad, 2002; Smith et al., 1999; Tax et al., 1998; Crisafulli & Singh, 2016; Migacz et al., 2018; Lastner et al., 2016; Vázquez-Casielles et al., 2017). Retail banks may utilize service recovery strategies to differentiate the service they deliver from their competitors (Lewis & Spyropoulos, 2001).

Previous studies on the banking business's distributive and procedural justice features provide more evidence for this statement (Duffy et al., 2006; Ghalandari, 2013; Sarkar Sengupta et al., 2015). According to Duffy et al., (2006), for the banking industry in the United States, what seems to be critical to post-recovery satisfaction initiatives is not 'who' replies but rather 'how quick' and 'how correct' the reaction to the service failure. Therefore, banks should apply an effective method of interactional justice. They may accomplish this by being customer-friendly, offering equitable treatment to all clients, and focusing on delivering excellent service. Therefore, it can be said that the fairness of the service recovery process, which has an essential role in retaining customers, is fundamental to service companies in a business environment where it is increasingly difficult to attract new customers.

The research also supported hypothesis H3 that post-recovery satisfaction will negatively influence customers' switching intention. These findings agree with the findings of prior studies (Mittal & Lassar, 1998; McDougall & Levesque, 2000; Antón et

al., 2007; Bansal & Taylor, 1999; Hennig-Thurau et al., 2002; Wang et al., 2014). This outcome is rational and compatible with planned behavior and action control theories. These two theories link attitudes and trends on one side with behavior on the other, implying that behavior must be preceded by attitudes or trends, whether positive or negative. When customer satisfaction with the bank increases due to effective service recovery, their intentions to switch to do business with a different bank will decrease. Through the research results, the level of fairness perceived by customers in the environment of service recovery positively influences satisfaction after recovery and a negative on conversion at the same time. It was confirmed that the intention was negatively affected.

This hypothesis has not been supported regarding the H4 hypothesis, which states that post-recovery satisfaction has a role in the link between service recovery efforts and customer switching intentions. It has been proven from the statistical analysis that there is no role for post-recovery satisfaction in the link between the two variables, and it is not necessary for the customer to be satisfied or not to feel the intention of switching to deal with other banks, but the customers' sense of the justice of service recovery efforts has the effect and is more important to customers than their feeling of satisfaction or not. This result is logical, given that the customer can continue to deal with the bank even if he is not satisfied with the service due to the high switching costs or the difficulty of conversion. But the justice of recovery procedures, systems, and strategies used to service recovery has the greatest impact on customer switching intentions. Overall, our findings suggest that when banks provide service recovery, they should keep an eye on three aspects of recovery justice: the amount of money given to unhappy customers (DJ), the banking industry's plan for service restoration after failure, and recovery procedures (i.e. PJ) (Tax et al., 1998), and the quality of the explanations given to customers (IJ). This study highlighted the significance of recovery efforts in three justice aspects, indicating that banks should create service recovery plans.

Conclusions and implications

Corporate social responsibility activities centered on satisfying stakeholders' expectations are a fundamental aspect of stakeholder orientation and may be crucial for guaranteeing stakeholders' continuous support, loyalty, and attractiveness (Fatma et al., 2016b). Examples of this planning and action include safeguarding people's rights and the environment while expanding people's workplace opportunities. As Nan & Heo, (2007) argue, following a breakdown in service, these actions might be seen as "prosocial compensations" for issues of equity, fairness, and ethical, charitable duty.

Therefore, accusations of fakery, unethical business practices, and corporate irresponsibility would be leveled at companies that did not react adequately via acceptable CSR strategies. Given the lack of integration between CSR and organizational strategies when services fail, which may be crucial to recovery (Choi & La, 2013), and the social justice of organizational strategies, these banks are generally seen as engaging in unethical practices (Kuo & Wu, 2012).

In Egypt's financial services business, competition is fierce with more financial institutions offering the same services. The market is becoming so saturated that if clients are unsatisfied with their current service provider, they have several options to swiftly transfer to another. Therefore, all Egyptian banks must see their clients as

significant assets and avoid customer defection (Keaveney, 1995). According to the findings of this research, this may be avoided by emphasizing service recovery as a means of keeping valuable customers after a disruption in service. This research indicates that service recovery administration is a significant factor in customer happiness; thus, bank managers must implement wellness programs to recognize service failures and manage recoveries swiftly and effectively. When customers see full-service restoration, they will feel more confident in the bank, increasing their happiness and decreasing the likelihood that they would move banks. However, this research analyzed how post-recovery contentment played a role in the impact of distributive justice, procedural justice, and interactional justice on participants' intent to switch. So, the researcher set out to see how different conceptions of justice (distributive, procedural, and interactional) influenced customers' intentions to change their banks.

According to the replies of 285 respondents, procedural justice, distributive justice, and interactional justice show a negative correlation with switching intentions. As a result, contract transparency and mutual communication become even more important in the bank-customer relationship in financial transactions, where the customer is likely to feel confused and find it difficult to make decisions when confronted with unfamiliar and complex financial services. Increasing the consumer-centric behaviors of salespeople to identify possible customer issues and give appropriate answers will increase customer trust, satisfaction, and loyalty. Bank management might potentially create a more prosperous future by learning and implementing these strategies. Much work has been done on the effects of distributive justice, procedural justice, and interactional justice on repurchase intentions and word of mouth in the context of service recovery. Relationship marketing seeks to retain consumers and enhance customer-business ties to increase profitability (Holloway & Wang, 2015). In increasingly aggressive corporate environments, bank management spends a great deal of money on physical amenities such as adopting innovative technical systems, integrating databases, and decorating the branch.

Investment in CSR ensures that banks engage in more work to decrease service failure and consider the stakeholders' interests as their priority. In this way, they connect emotionally with the customers through identification, eventually leading to customer satisfaction and decreasing customer switching intentions. However, maintaining client satisfaction with the bank must also be a priority. To combat the strong competition, bank executives may modify their approach from systems-centric to customer-centric. This research builds a model to better comprehend the nexus among service recovery, post-recovery satisfaction, and customers switching intentions financial institutions and it then uses an empirical approach to deduce the secrets of successful marketing, which prioritizes service recovery and post-recovery satisfaction, which can lead to negative switching behavior. The increasing number of consumer complaints and difficulties in the nation's banking industry show that banks must pay greater attention to customer service. Before contemplating a complaints system, adequate service implementation should be examined. Customers with more ties to the financial industry have even more concerns. This issue suggests that banks have difficulty delivering service to consumers, even loyal ones. Consequently, they require actions, informatics systems, and motivational programs for making a complaint to handle and evaluate their concerns systematically.

Although Egyptian banks have built and extended avenues for complaints, visiting a branch office is the most effective method for resolving complaints. As a result, it's essential to think about ways to improve the customer service expertise of managers, executives, and other staff, as well as to set up a system for receiving and responding to complaints, as well as for collecting data on customers and the nature of their failures for later analysis and improvement. They need a reliable system for listening to client complaints and enhanced contact centers to be aware of consumer issues and deliver suitable, prompt replies, resolving them.

This research offers the following techniques that bank managers may adopt to achieve the goals: To reduce consumer complaints, it is prudent to adopt proactive measures instead of reactive ones. Specifically, it is conceivable to develop mechanisms to gather frequent consumer feedback and to take steps to prevent the same issue from occurring again (Paul et al., 2016). These approaches would shorten the time required to settle the complaint and enhance the connection between the bank and the consumer. Alternatively, when service failure is unavoidable, financial institutions should prioritize service recovery by quickly responding to customer concerns, developing efficient solutions to problems, scheduling appointments that work with customers' schedules, and providing customers with up-to-date information when solving problems.

By providing these enhanced consumer experiences, confidence and contentment may be increased. consumers who experience service inadequacies and get appropriate reparation will have good behavioral intentions (Lastner et al., 2016; Sciarelli, 2017). Banking institutions may benefit from this research by learning about the most important factors that can increase customer satisfaction after a bad service experience. It is also crucial to mention that this study provides banks with a means to lessen the effect of the detriment to preserve their client portfolio with as little defection as possible and protect their market reputation. Moreover, the report discloses to banks' strategic areas the consequences of the intent of consumers who have lodged complaints about service problems, adding one important component for the banking industry (post-recovery happiness) that subsidizes the creation of retention strategies for these consumers in these industries.

Limitations and directions for future research

The current study has limitations, hence offering significant paths for further research. First, we deployed a single nation and environment (Egypt) (banks). Consequently, future research will be able to adapt our model to many contexts (e.g., cultures, nations, and industries) and reproduce our study approach, thereby verifying our results, This may limit the applicability of the findings to all sectors, since the complaint problems, solutions, and perceptions of justice may vary across service kinds (Mattila, 2001). second, using convenience sampling might impede the generalization of research outcomes (Malhotra, 2006). To further our understanding of the literature on service recovery, future studies should also examine the linear and moderating effects of emotional and rational customer commitment on other fundamental ideas (e.g., recovery strategies, compliant subjects, and methods). Even if the findings indicated no variations in post-recovery satisfaction based on age, gender, education level, or transaction type, the research may be replicated with a more representative sample. Future research may want to examine the predicted correlations regarding e-banking vs conventional banking, since mobile banking use grows with both education level and

age. Finally, it is advised that this study be extended to the e-commerce industry utilizing the notions of loyalty and security so that Internet sales organizations may utilize the findings to understand this new customer profile and how to make them even more loyal to their online purchases.

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TEAM EFFECTIVENESS AND TMS IN RELATIONSHIP WITH ORGANIZATIONAL VALUES

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Abstract. *The paper reports the results of a qualitative study investigating the adoption of remote work in Romanian companies. It focuses on remote workers' perceptions regarding their efficiency, creativity, ability to cooperate, coordinate with others and integrate their expertise with the working group to fulfill their daily tasks or deliver the projects. The study analyses the role of organizational values and internal communication in supporting individuals to face difficulties and keeping the work teams united. It shows that shared organizational values and good internal communication help organizations harness the expertise of remote workers, supporting them to collaborate and perform well.*

Keywords: *internal communication; organizational culture; organizational values; Romania; TMS; team performance.*

Introduction

The work-from-home practice remained present in KIBS' workers' routine as a legacy of the COVID-19 pandemic. According to the ILO report (ILO, 2021b), the share of employees working from home grew significantly from 3% (before the COVID-19 pandemic) to 20-30% (during the pandemic), varying by country and industry. At the EU level, Eurofound (2020a) reports that 48% of the employees worked at home, at least some of the time during the COVID-19 pandemic, while 34% worked exclusively from home. As for the knowledge-intensive business services (KIBS), the ILO reports (ILO 2021a, 2021b) and the European Commission (2020) estimated an increase from 8-14% (before the pandemic) to 90% (during the pandemic) in the share of remote workers, with variations by country.

In this context, this paper focuses on KIBS' workers and presents the result of a qualitative study exploring their work-from-home (WFH) experiences during the COVID-19 crisis.

Literature Review

Traditionally, working from home (WFH) has been positively associated with flexible working arrangements for employees (Felstead & Henseke, 2017) and with the benefits for employers through higher productivity of their employees. (Senz, 2019; Bloom et al., 2015) and cost cuts for working space (Ipsen et al., 2021; Senz, 2019; Felstead & Henseke, 2017).

The studies conducted during the COVID-19 pandemic show that the perceptions of employers and employees of remote work have remained positive: more than half of

workers still prefer working from home or the hybrid model (PwC, 2021; Eurofound, 2020b; Eurofound, 2021), and 83% of employers say the shift to remote work has been beneficial for their company (PwC, 2021).

Studies mention several advantages perceived by remote workers, such as saving commuting time, greater time flexibility, increased productivity, less stress, and a better work–life balance (Ipsen et al., 2021; Felstead & Henseke, 2017), as well as diminishing the risk of getting COVID-19 virus (Ipsen et al., 2021; Radulescu et al., 2021).

Still, working from home during the COVID-19 outbreak has been a different experience compared to what it meant before the pandemic: the office was moved to a home environment quite suddenly by governmental measures and not due to an arrangement made with the employer; the house was turned overnight both into the office of several companies (depending on the number of family members forced to work from home), and into a classroom for children connected to online schooling (Eurofound, 2020a; Grose, 2020); the Internet connection was overloaded, imposing negotiations, additional extensions and costs (Eurofound, 2020b); lockdowns and the extended state of alert depriving the parents working from home from the help of baby sitters, relatives and aides for childcare and housework (Feng & Savani, 2020); ending with more house tasks as family members had to work, play and eat under the same roof (Arntz, Ben Yahmed, & Berlingieri, 2020; Boca et al., 2020; Grose, 2020). The COVID-19 pandemic brought a higher level of stress induced by threats to health and life, long isolation, the severity of restrictions and health protection rules, and worries related to economic and social security (Eurofound, 2021; Pieh et al., 2021).

Their own efficiency, creativity, and ability to communicate well, cooperate, and coordinate with others to integrate their expertise with the working group and fulfill their daily tasks or deliver projects are the challenges that remote workers cope with using the support of their companies. In their ongoing analysis of employee-written reviews on Glassdoor, Sull & Sull (2020) discovered that the top quality of team communication, leaders' honesty, and transparency are the themes that stand out in the pandemic months, being mentioned twice more often than in the previous year, and containing more positive employee-written reviews. When employees think, speak, and act through screens, effective communication that integrates transparency is essential for maintaining trust, engagement, and social connectedness (Nadkarni et al., 2021).

Rawlins (2008, p. 6) defines the three important characteristics of transparency: "information that is truthful, substantial and useful; participation of stakeholders in identifying the information they need; and objective, balanced reporting of an organization's activities and policies that hold the organization accountable". Even without agreeing on how transparency in communication is defined and measured (Hopp & Fisher, 2021), the studies carried out during the COVID-19 pandemic bring evidence that informational transparency, participative transparency, and accountable transparency are internal communication dimensions that influence how employees cope with organizational change (Lee et al., 2020), play the role of means strengthening workplace culture (Nadkarni et al., 2021), are the key elements in managing employee morale, as well as fear and uncertainty (Spalluto et al., 2020), function as levers enhancing employee motivation, job engagement and knowledge-sharing behavior (Mani & Mishra, 2020; Lee et al., 2020), increase employee potential and performance

in various industries (Kim et al., 2021; Sizemore et al., 2021), and are also related to the perceived quality of employee-employer relationship (Lee & Li, 2020). Communication and organizational culture are symbiotic (Schein, 2000; White et al., 2010; Stein, 2006), depending on and influencing one another. According to Schein (2017), organizational culture consists of three interrelated layers: (1) basic underlying assumptions and beliefs (defining what to pay attention to, how to determine behavior, perception, thought, and feeling), (2) exposed beliefs and values (about appropriate attitudes and behaviors with subtle differentiations between beliefs and values which are congruent with the underlying assumptions, those that are part of the ideology or philosophy of the organization, and those that are rationalizations or only aspirations for the future), and (3) the artifacts (visible and feelable phenomena - e.g., architecture; language; technology and products; artistic creations; style, as embodied in clothing, manners of address, and emotional displays; myths and stories; published lists of values; observable rituals and ceremonies).

At the beginning of March of 2020, the COVID-19 outbreak imposed a sudden and non-negotiated relocation of the working space from the organizational architecture into a home space of a kitchen, a living room, a balcony, or a bedroom. Once this sudden change of location occurred, social rituals and ceremonies changed, such as coffee breaks or water-cooler conversations (Howard-Grenville, 2020), which were replaced by the domestic routines related to children or pets.

Also, the language changed (i.e. the body language became highly limited through screen mediation), as well as the office attire (i.e. the images of employees wearing pajamas and upper body suits during office hours), while the artistic creations had been left behind in the empty spaces of former offices etc. In fact, the artifacts layer of organizational culture vanished or changed dramatically over a short period. The leaders' communication faced the challenge of finding new artifacts, new vehicles for interactions or adjusted cultural tool kit (Howard-Grenville, 2020 ; Schein, 2017) that would perpetuate the shared beliefs and values as something people experience, in congruence with the basic underlying assumptions and beliefs, so that the culture could become an organizational antidote for COVID-19 crisis (Saran, 2021).

Empirical Investigation

The empirical investigation used a qualitative study based on semi-structured in-depth interviews to reveal participants' job-related experiences generated by the mandatory work-from-home (WFH) imposed by the COVID-19 crisis.

The interviews were conducted in the spring of 2021 from middle of March to the end of May via on-screen meetings held on Google Meet or Zoom platforms that lasted 25 to 30 minutes.

The participant's sample comprised 18 participants (aged between 28 and 51 years old, 11 males and 7 females, Romanian nationality) with more than 3 years of work experience at the actual job and holding full-time positions in knowledge-intensive business services (KIBS) operating in Romania. Participants were recruited from either professional services or information technology (IT) companies.

The interviews discussed the impact of the first year of massive adoption of remote work imposed by the COVID-19 crisis, focusing on remote workers' perceptions regarding their efficiency, creativity, and ability to cooperate with others and integrate their expertise within the working group to fulfill the daily tasks and deliver the projects. It also discussed the role of organizational values and transparent communication in supporting individuals and keeping the work teams united.

The applied interviews sought to provoke free expression and allow the examination of the participants' answers. Thematic analysis was used to identify and develop the main concepts into common themes.

The analysis of the interviews indicated that the ad-hoc transition from office to WFH was made without technical difficulties by the investigated companies because the online communication and remote working tools were already used since pre-pandemic period, so the changes were merely associated to the space of working and the adjustments of working processes ("the change I felt was related only to the environment" – FI, 51 years old, 3 children).

In this context, the interviewees mentioned that the mandatory WFH enabled them to manage both professional duties and family life during the pandemic, and this was very important because it allowed them to feel secure, to "stay safe, away from the danger of getting ill" (GA, 37 years old, 1 children) to take care of their jobs, children and homes in the same time, while saving time and money. "Home-to-office (and back) travels were no longer necessary, saving certain amounts of time and money. Also, the lunch break became a healthy meal, cooked at home during WFH, which is a far better option than the not so healthy and more expensive catering meals at the office" (EG, 35 years old, 2 children)".

However, the interviewees have reported that the advantages of WFH "have come with various challenges at the personal and professional level" (RF, 28 years old, no children), so they have described mandatory WFH as "full of predicted and unpredictably difficulties" (EP, 38 years old, 1 children).

The first mentioned difficulty discussed was that they "have to balance the work and personal life in the same space" (FI, 51 years old, 3 children); all study participants indicated the disadvantages related to the blurred boundaries between professional and personal life. In this regard, almost all participants have indicated increased stress and exhaustion associated with "the conversion of personal space into working space" (ZA, 38 years old, 1 child) because childcare, online schooling, and house kipping are all melted with job tasks.

Moreover, 66.33% of participants also discussed exhaustion and extra working hours due to the increase in organizations' expectations about employee's availability for daily job tasks "there is no delimitation between personal and professional life, there is no longer a limit of working time, the work schedule is continuous" - PP, 44 years, no children).

While one interviewee has reported a subtle rise in work efficiency, explaining that WFH "reduced a part of the work interruptions [...] occurring more frequently in the office" (LA, 29 years old, no children), most study participants have indicated that results were

kept during mandatory WFH at a very similar level to that reached before the pandemic. However, these results obtained during WFH consumed higher amounts of time spent on working. As PC (44 years old, 2 children) reported, remote workers “managed to overcome the limitations of WFH [...] but activity lasted longer than normal”, or “the projects are delivered as usual, rather the deadlines are no longer met (DD, 35, years old, 1 child). Moreover, if you need to grow your team, you face a situation that is very hard to handle. The integration of the new-comers and the assignment of new tasks is highly complicated because they cannot benefit from the presence of a mentor to guide them (PC, 44 years old, 2 children).

Although only 33.3% of participants reported a consistent drop in performance after one year of intensive WFH practice, all participants have indicated more or less severe issues related to communication and synchronization of teammates within their work teams and companies.

As CC (44 years old, 2 children) indicated “If you need someone's help with an unplanned 5 minutes task, you usually ask for help at coffee break or lunch. Now you need to set up a MS TEAMS appointment - and it's very hard to find availability on the calendar. And this is only one of the many types of timing problems when teams work only in the remote mode.”

Among the usual communication problems that were reported we noticed the mentions about the fact that the absence of on-site collaboration, the lack of face-to-face contact, and informal debates with teammates have induced “the monotony and the sensation of working alone” (GB, 45 years old, 2 children), blurring the creativity and the generation of fresh ideas within working teams. A kind of “never-ending solitary work feeling” (LC, 31 years old, no children) replaced the team spirit used to inspire WFH workers in normal times. As EG (35 years old, 2 children) declared “It was a short period at the beginning of the pandemic, when everyone was somehow ‘waiting’ and did not know what to expect. In the meantime, we got used to the situation and adapted well. Collaboration between colleagues remained good. Innovation has declined during this period, as face-to-face communication and coffee-break-inspired discussions are missing.”

The most serious communication problems have been described by interviewees reporting important gaps between declared values and the cultural reality of the organization, and/or the lack of communication transparency since pre-pandemic times: “In terms of communication and transparency, there were difficulties even before the pandemic. During WFH they got worse. Probably because of the size of the company and outdated mentalities. Although communication and transparency are declared priorities at the company level, it matters more if people (colleagues and managers) understand and apply these values. But everyone works from home now, so values are harder to nurture” (GE, 34 years old, 2 children). Similarly, critical communication issues have been reported in cases where the work team was less cohesive: “there are many moments when it seems like working alone on the project because it happens to ask something on the discussion channel but no one responds” (LL, 30 years old, no children).

Therefore, an important issue associated with remote work and related communication deficiencies was linked to organizational culture. One of the interviewees expressed:

“The exclusive use of technology-mediated communication at work has had a negative impact. Confusion multiplied in the absence of face-to-face interaction, making collaboration more impersonal. The organizational culture received a shock in the pandemic. Although sustained efforts are being made to return to the nominal, finding the right approach is complicated” (CD, 37, years old, 1 child).

Not surprisingly, some of the interviewees reported that team leaders or/and company management have started to address the aforementioned issues, so the frequency of communication has increased: “a higher number of meetings are needed in the team, from 3 meeting sessions monthly we increased to 3 sessions weekly” (MM, 45, no children). Also, they have started to communicate more openly, and pay more attention to the needs and interests of their subordinates: “Weekly video meetings are organized to keep the team spirit alive. We have informal discussions on topics other than the work itself - for example: personal life, movie and book recommendations, hobbies, fun things to do, discussions about children, pets, garden, cooking sessions, etc.” (IO, 32 years old, no children).

All study participants who reported that the results were maintained during mandatory WFH at a level similar to that achieved before the pandemic also provided examples of efforts made during this period to fill communication gaps and increase transparency.

Conclusions

In line with the results of other studies (PwC, 2021; Eurofound, 2020b; Eurofound, 2021), WFH has been positively associated with multitasking, schedule flexibility, and savings. The participants in our study pointed out that WFH allowed them to manage both professional and family tasks during the pandemic, to feel secure, to take care of jobs, children, and homes at the same time, while they enjoyed healthier homemade food and saved the time and money that would otherwise have been wasted on commuting and catering meals.

Still, the results of our study indicate that KIBS' employees perceive various difficulties associated with WFH, if it is the only option available, which makes them prefer a hybrid solution.

The most prominent issues mentioned by our study participants were related to the blurred boundaries between professional and personal life, extra working hours, the increase of organizations' expectations regarding employee's availability for daily job tasks, difficult integration of new-comers, problems with meeting the deadlines, increased difficulty of synchronization and coordination between teammates, and communication problems.

The analysis of the interviewees' statements indicated most problems revolve around technology-mediated communication. The lack of on-site collaboration and face-to-face contact with teammates damaged team spirit and organizational culture.

Therefore, organizational culture has been a critical issue associated with remote work and communication deficiencies. Our study indicates that some team leaders and managers have started to address this problem, making efforts to increase transparency, communicate more openly, and pay more attention to the needs and interests of the

employees. In this regard, we remind that all study participants who reported they were able to maintain the results at a level similar to that achieved before the pandemic, have also provided examples of managerial efforts made during this period to fill communication gaps and increase transparency. In a similar manner, the study of Sull & Sull (2020) has indicated the importance of leaders' honesty and transparency during the pandemic months. When employees think, speak, and act through screens, effective communication that integrates transparency is essential for maintaining trust, engagement, and social connectedness (Nadkarni et al., 2021). Honest and transparent communication is related to the community-building process (Stein, 2006), as well as to the habitual practices of the community. Communication and organizational culture are symbiotic (White et al., 2010; Stein, 2006), depending on and influencing one another.

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CIRCULAR BUSINESS MODELS IN THE ROMANIAN SOCIAL ECONOMY: AN EXPLORATORY CLUSTERING EXERCISE

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Abstract. *During the last few years, the role of social enterprises in developing a circular economy has increased constantly, even if it is a great challenge for social enterprises to compete with for-profit companies. Regulation and governmental support are crucial in this context. In terms of Romanian regulations, the potential of the social economy domain was officially recognized by law in 2015, while the circular economy was in 2022. These acts, directly and indirectly, influence the private organizations operating in the social economy, respectively circular economy. The research focuses mainly on the potential of the social economy domain to support the circular economy toward a green sustainable transition. Two main lines of investigation are followed: (1) the mapping of the circular social enterprises in Romania and (2) clustering the Romanian circular social enterprises considering their business models. Regarding research design, an online questionnaire was distributed to the 50 identified entities for self-application. In terms of results, this updated mapping exercise emphasized an increase of the specific entities especially set up mainly as companies active in urban areas. It also reveals that from the four main types of business models (Reduce, Recycle, Repurpose, and Share), the most common one the Romanian investigated organization considers is Reduce. The paper brings a fresh, original contribution towards understanding an emergent sub-sector of the social and solidarity economy in Romania: circular social economy. It also represents a step forward in conducting further research in the field.*

Keywords: *circular economy; social economy; social enterprise; Romania.*

Introduction

We face a recent and increasingly visible concern among international and national policymakers, practitioners, academia, and researchers, about how to leverage the potential of the social economy to support the circular transition. As stated in the new Social Economy Action Plan (European Commission, 2021, p.18), “*the contribution of the social economy is particularly remarkable for the development of a circular economy*

where it is pioneering activities and business models that retain the value of products and materials for as long as possible, reduce waste, provide cost-saving opportunities to citizens and create local jobs, especially in repair, reuse, sharing and recycling activities. This potential can be further promoted by raising awareness of the scope for greater uptake of these practices and reinforcing partnerships with mainstream businesses along value chains and public-private partnerships involving public authorities, research institutes, industry and social economy entities". On the other hand, the OECD together with European Commission has recently launched the report "Policy brief on making the most of the social economy's contribution to the circular economy" (2022), explaining how can social economy contribute to the circular economy: the social economy has a long-term demonstrated experience in developing circular activities, the social economy makes the transition to the circular economy more inclusive, the social economy can inspire business models and practices based on collaboration at local level, the social economy furthers stakeholder engagement and improves social acceptance of circular products and green technologies, and the social economy promotes more circular and sustainable behaviors (OECD/European Commission, 2022). In this favorable global context for putting together the two new paradigms of socio-economic development (social and solidarity economy and circular economy), we can say that a new important sub-sector of the social economy is arising: circular social economy, which becomes to be slightly visible also in Romania. Therefore, we will explore in our paper the potential of the Romanian social economy sector in supporting circular activities and related business models.

The context of the research

The main objective of this paper is to discern the most representative types of circular business models for the Romanian social economy sector. This paper represents the continuation of previous research conducted by the authors in 2021 to elaborate a first exploratory mapping of the social economy organizations active in the circular economy in Romania. The previous research output was an initial mapping of the social economy organizations active in the area of circular economy in Romania, covering 37 organizations, acting in various fields, grouped in the 3 Rs (Reduce, Reuse, and Recycle) general models of the circular economy (Barna, Zbucnea, & Stanescu, 2021).

The current research-specific aims: (1) To do a deep theoretical dive into the circular business models, in general, to better discern and analyze the main circular business model types that can be observed in the activities of the social economy organizations included in the previous mapping exercise; (2) To define the most representative clusters of social economy organizations active in circular economy in the base of existing frameworks for circular economy models adapted by the authors to the context of an emergent social economy sector; (3) To update and develop the mapping of the social economy organizations active in the circular economy in Romania, released in 2021.

Approach and structure of the paper

The present paper includes a brief analysis of the role of the social economy in the development of the circular economy in Romania. The following section defines the frameworks related to the business models in the circular economy, aiming to cluster the possible approaches. The next section is dedicated to presenting the methodology,

followed by the associated findings and discussions. We reviewed the social economy initiatives in Romania's circular social economy field, updating the previous research (Barna, Zbucea, & Stanescu, 2021), using secondary research methods (online research). We identified 50 circular social economy organizations that follow a circular business model and observe the principles of social and solidarity economy, representing an increase of almost 40% in the number of organizations. The last section includes conclusions and further implications.

The present research advances the previous one with an exploratory clustering exercise to define the most representative clusters of social economy organizations active in the circular economy.

State of the art: the contribution of the Romanian emergent social economy sector to the circular economy

The role of social enterprises and organizations in developing the circular economy is constantly developing. Increasingly more social enterprises worldwide are getting involved in the circular economy. Recycling has been replaced by the redistribution of products and services, and even for social organizations, it is a significant challenge to compete with business-oriented organizations (Lane & Gamley, 2018). Therefore, social organizations should assume more business-like approaches. A significant benefit for society if social economy organizations get more involved in the (circular) economy would be the social and economic impact on certain disadvantaged segments. With this in mind, more government support is not only expected from the sector (Lane & Gamley, 2018) but also desired for the countries and economies.

The Romanian social economy sector is still emerging compared to other European countries, also facing many challenges. However, recently there have been some improvements to the legislative framework concerning the social economy. In March 2022, in the context of the reform of the social economy foreseen in Romania's National Recovery and Resilience Plan, the Romanian Government approved the Government Emergency Ordinance amending and supplementing Law 219/2015 on the social economy. This ordinance brought several conceptual and terminological clarifications and introduced some provisions intending to create a favorable environment for the development of the social economy sector in Romania. We mention as a key point for our topic of research the fact that now article 5 d) of Law 219/2015 on the social economy recognizes the contribution of the social economy to the transition to the circular economy: "*Art.5 - (1) The social economy contributes to a) development of local communities; b) job creation; c) development of social inclusion and cohesion; d) transition to the circular economy and social innovation; e) involvement of people from the vulnerable group in social and/or economic activities; f) access of people from the vulnerable group to community resources and services*". By broadening the contribution of the social economy to the transition to the circular economy, the recent reform of the legislative frameworks opens up new opportunities for the social economy sector. This is the most important as Romania is currently working on the National Strategy on the Circular Economy, and in August 2022, the Ministry of Environment, together with the Sustainable Development Department within the Government's General Secretary, released the project strategy. On the 21st of September, 2022, the National Strategy on Circular Economy was formally adopted through the standard juridical procedure (DpDD, 2022). According to the Governmental Decision on the approval of the National

Strategy on Circular Economy launched on the 27th of September 2022, the sector can be defined by three main principles:

- Phasing out non-recoverable waste and reducing pollution,
- Keeping products and materials at their highest use value for as long as possible,
- Regeneration of natural systems, biodiversity, and ecosystems (Official Monitor, 2022, p. 9).

The most recent macro data on the social economy sector remains those provided by CIRIEC Intl. report 2017: the Romanian social economy provides under 2% of the working population (136.385 paid employment); the associations, foundations, and other similar accepted forms count 99.774 jobs, 42.707 entities, and the cooperatives and other similar accepted forms sum up 31.573 jobs, 4.934 enterprises and 3.032.000 members (including credit unions) (Monzón & Chaves, 2017). Actual data exists only for the sub-sector of certified social enterprises in the Single Register of Social Enterprises, which provides official data on social enterprises and social integration enterprises certified by Law 219/2015. In August 2022, the Single Register of Social Enterprises managed by the National Agency of Employment subordinated to the Ministry of Labor and Social Solidarity includes 2681 certified social enterprises, including 183work integration social enterprises. We notice a significant increase in interest in social enterprise certification from 2020 onwards, mainly because of the conditions imposed by the Human Capital Operational Program, which requires mandatory certification.

As mentioned in our previous research (Barna, Zbucnea, & Stănescu, 2021), even if not specifically dedicated to the circular social economy, the implementation of the European Structural Funds grants financed under the social economy calls Human Resources Development and Human Capital Operational Programs also created sustainable premises for pioneering the circular social economy in Romania. However, besides the good practice project examples identified in our previous research, many questions arise after the data provided by the recent Retrospective Evaluation Report POSDRU 2007-2013, Major Intervention Direction (DMI) 6.1 Social Economy Development (MIPE, 2022). According to this report, with regard to the sustainability of the social economy structures after the completion of the financing of the DMI 6.1, the evaluators' analyses based on official data on tax returns and the number of employees indicate that only 55% of them are still in operation today. Of course, this evolution is correlated with the most important difficulty faced by the social economy structures set up under DMI 6.1, which was the lack of facilities offered to social economy enterprises by the legal framework. But moreover, the evaluation report also shows that less than half of the social economy structures set up (40%) continue to serve a social mission, which is worrying in terms of real social impact.

As highlighted in our previous research, we identified in the Romanian social economy landscape initiatives related to various dimensions of the circular economy model: Reduce (less packaging), Reuse (Refill and Repurpose), and Recycle – a vital component of the circular economy (Barna, Zbucnea & Stănescu, 2021). By way of example, we mentioned in the 2021 paper some well-known circular social economy initiatives in Romania, such as Recicleta (developed by Visitor Plus Association), Remesh, and Educlick (developed by Atelier Fără Frontiere Association) or Redu (developed by Mai Bine Association). We are glad to see international public recognition of one of these initiatives. In 2021, the Civil Society Prize Competition organized by the European Economic and Social Committee selected Atelier Sans Frontieres for the work carried

out in the Educlick workshop, ranked third in the European Union for involvement in climate action. Also, the Educlick workshop's project "Dăm Click pe România/ We click Romania" won second prize in the Shaping a Circular Industrial Ecosystem and Supporting Life-Cycle Thinking category in the first edition of the New European Bauhaus festival in 2022. Last but not least, we mention the award received by the circular social initiative e-Natura, an online shop, which gained the Start-up prize at GPeC 2022, the most important competition awarding e-commerce and digital marketing. Additionally, e-Natura received among the best results at the GPeC Proficiency Program (GPeC, 2022). This award shows that the professionalism of such initiatives can match the companies, considered more business-wise.

Defining the circular social economy clusters

To define the most appropriate circular social economy clusters for the Romanian social economy sector, we have first analyzed various frameworks and approaches concerning mainstream circular business models available in the literature. For example, OECD (2018) proposed a very sound framework and highlighted five headline business models for a more circular economy, also mentioning that the distinction between different circular business models is clear in theory but maybe less so in reality because, in many cases, firms adopt combinations of business models. These models are: 1) Circular supply models; 2) Resource recovery models; 3) Product life extension models, 4) Sharing models, and 5) Product service system models.

Some authors stress the difficulties of complying with both requirements – of social economy and circular economy. Some models were developed to stress the interconnected components and the vital role of stakeholders, segmented into power bodies, the local population, the business community, and strategic partners (Smitskikh, Titova, & Shumik, 2020). This framework stresses the importance of governmental support, which was also highlighted by other studies (Lane & Gamley, 2018). More attention has been given to circular business models in general, with no specific social dimension (Bocken et al., 2016; Centobelli et al., 2020; Geissdoerfer et al., 2020; Lüdeke-Freund, Gold, & Bocken, 2019; Nußholz, 2017). Also, researchers point out the difficulties in understanding how these models are set and evolve (Centobelli et al., 2020), highlighting the difficulties in identifying an encompassing clustering set of criteria. A review by Rosa, Sassanelli, and Terzi (2019) revealed that at the time that 5 archetypes, 9 classification methods, 5 adoption-oriented challenges, 4 decision-support tools, and 3 additional research areas were used by researchers, with the most common approach of 3R model (Reuse, Remanufacturing, and Recycling).

Geissdoerfer et al. (2020) identified that in the previous literature, the most frequent strategies presented were: (1) recycling (*"materials and energy are recycled within the system, through reuse, remanufacturing, refurbishing, and recycling"*); (2) extending (*"the use phase of the product is extended through long-lasting design, marketing, maintenance, and repair"*); (3) intensifying (*"the use phase of the product is intensified through sharing economy solutions or public transport"*); and (4) dematerializing (*"product utility is provided without hardware through substitution with service and software solutions"*). Each approach has specific implications on value proposition, value creation, delivery, and value capture.

Besides the OECD model, there are numerous other approaches. Nußholz (2017), observing an emerging field, identified 16 business models considering only the resources efficiency strategies. They are grouped according to five life-cycle stages (material extraction, processing, production, use phase, and end-of-life treatment). Most of them, 11 models, are associated with the to-use phase (Nußholz, 2017, p. 9). The researcher concludes that *“understanding what a circular business model remains heterogeneous, there appears to be agreement that circular business models lend themselves to:*

- *substituting primary material input with secondary production;*
- *extending the useful lifetime of products through design for longer average lifespans and enabling second life (e.g., repair or remanufacturing); and*
- *material recycling”.* (Nußholz, 2017, p. 9)

Another review, considering the 6 major reverse cycles of the circular economy (repair & maintenance; reuse & redistribution; refurbishment & remanufacturing; recycling; cascading & repurposing; biochemical feedstock extraction) identified 19 models (Lüdeke-Freund, Gold, & Bocken, 2019, p.47). Each has dozens of design options, considering value proposition, value delivery, value creation, and value capture.

Finally, based on the experience in our previous research on the topic (Barna, Zbucnea & Stănescu, 2021), we have decided it is the most appropriate for the realities of the Romanian social economy sector to apply the theoretical framework provided by the European Parliamentary Research Service (EPRS) concerning the circular economy. We explain below the main issues considered in this framework used in the questionnaire survey and mapping circular social economy clusters. According to EPRS, the circular economy is a production and consumption model which involves reusing, repairing, refurbishing, and recycling existing materials and products to keep materials within the economy wherever possible. A circular economy implies that waste will become a resource, consequently minimizing the amount of waste. It is generally opposed to a traditional, linear economic model based on a 'take-make-consume-throw away' pattern.

EPRS circular economy framework considers five important areas of circular economy:

1. Recycle: products such as metals, paper, glass, or plastics can be recycled as a source of secondary raw materials.
2. Remanufacture: products such as electronic goods can be rebuilt to the original manufacturer's specifications using reused, repaired, and new parts.
3. Reuse: products such as glass bottles can be reused many times before being discarded.
4. Repair: Products are generally less durable and repairable than in the past. Enabling and promoting repair, for instance, by making spare parts and information more easily available, can bring old products back to life.
5. Share: with a shift from ownership of products to their accessibility, more efficient consumption is possible. Sharing goods (e.g., car-sharing or car-pooling) makes their use more efficient and reduces their environmental impact.

We have deeply analyzed the areas of circular economy from the above framework and considered ***four circular operational models*** in our exploratory clustering exercise:

1. **REDUCE.** Consumption reduction corresponds to the following specific approaches: reduction of raw material consumption, reducing energy consumption, reduction of emissions (CO₂); and reduction of waste from your organization's processes.
2. **RECYCLE.** Considering the following situations: metal, paper, glass, or plastic products are recycled as a source for raw materials; recycled products are creatively transformed into new, higher quality, and higher value products (upcycling); recycled products are of lower quality and functionality than recycled products (downcycling).
3. **REPURPOSE.** The following situations are considered to extend the life of products:
 - ✓ **Remanufacturing:** products (such as electronic products) can be rebuilt to the manufacturer's original specifications using a combination of reused, repaired, and new parts.
 - ✓ **Reuse:** products (such as bottles) can be reused many times before being discarded.
 - ✓ **Repair:** carrying out repairs, e.g., using spare parts and other operations to bring old products back to life.
 - ✓ **Return:** the organization has a system for returning products sold to customers, e.g., through buy-back.
4. **SHARE.** This approach involves moving from ownership of products to accessibility through sharing, leading to more efficient consumption. The following situations are considered to facilitate access to products: sharing infrastructure with other organizations, including co-working spaces, offering products or services on a sharing/rental basis, and funding projects through crowdfunding campaigns.

Research objectives and methodology

The main focus of this paper is to discern the most representative types of circular business models for the Romanian social economy. This paper is the continuation of previous research by the authors in 2021 (Barna, Zbucea, & Stănescu, 2021), which resulted in the first exploratory mapping of the social economy organizations active in the circular economy in Romania. The present investigation aims to update the map considering several dimensions: geographical spread, legal status, and business model approach.

Step 1: To update the map with new social and circular enterprises, we scanned the latest 2022 publically available version of the Unique National Register of Social Enterprises (2022) as well as the Romanian Circular Economy Platform, previous research outputs as well as other direct recommendations following the so-called „snow bowl” research method. We also used a referral technique to identify other organizations since some enterprises support and operate, considering the value of social enterprises, but are not registered as such. We stress that the map does not include exclusively organizations certified as social enterprises but all organizations which consider themselves as such based on the principles of social economy. All identified organizations have been vetted online, first considering their websites, social media platforms, but also other sources of information. This process aimed to ensure they are still operating and comply with the two criteria associated with their business model: comply with social values associated with social economy organizations and adopt some form of circularity in their operational processes.

Step 2: The investigation has started from a deep theoretical dive into the circular business models, in general, to better discern and analyze the main circular business

model types that can be observed in the activities of the social economy organizations included in the previous mapping exercise. Based on this research, starting from existing frameworks, such as the European Parliamentary Research Service's circular economy framework (EPRS) or OECD's policy perspectives (OECD, 2018), we proposed a 4-dimensions model: Reduce, Recycle, Repurpose, and Share. Each approach, include several main aspects, as presented in Table 1.

Table 1. Items associated with the main circular business models (author's elaboration)

Business model	Main dimensions considered
Reduce	consumption of raw materials energy consumption emissions consumption (CO2) waste
Recycle	recycling upcycling downcycling
Repurpose	remanufacturing reuse repair return
Share	sharing infrastructure sharing/rental products/services crowdfunding

Step 3: Quantitative research aiming to survey all identified organizations to map their business models. The secondary objectives of the survey have been profiling the circular social economy organizations and observing their perspectives concerning their legal status as social enterprises, as well as their intentions as circular organizations.

An online self-administrated questionnaire was distributed in June-August 2022. 26 out of the 50 organizations fulfilling the two criteria identified in Romania responded, most of them after repeated email and phone invitations.

Findings and discussions

The previous database of circular social economy organizations active in Romania increased from 36 to 50. Most are established as companies (36), mainly active in urban areas (28). We observed that there are two years, 2015 and 2021, when most of them have been set up. Data also shows an increased interest in combining the two forms of business models (see Figure 1).

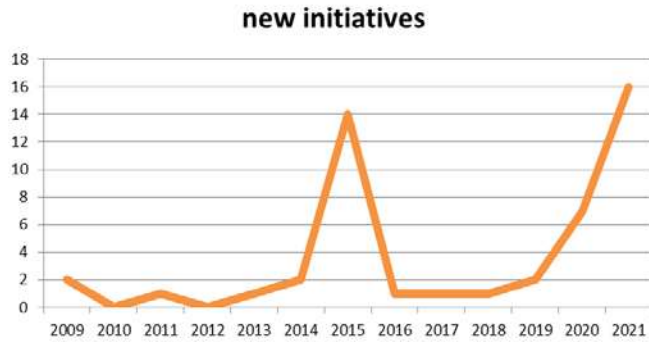


Figure 1. The evolution of newly established social and circular organizations are still in operation (authors' elaboration)

The two peaks of the rate of newly established circular social economy organizations can be explained in correlation with European funding (POSDRU and POCU Operational Programs) dedicated to social enterprise start-up financing. Therefore, we can discuss a supply-driven development of this new sub-sector of the social economy, as it is also the case of the whole emergent social enterprises sub-sector.

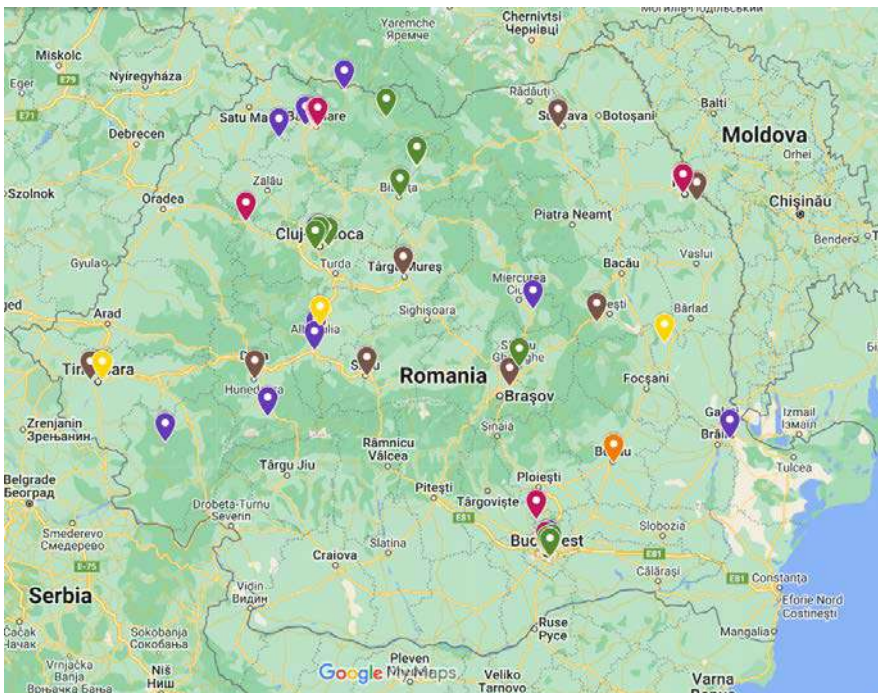


Figure 2: Map of the circular social economy organizations in Romania (June 2022) (authors' elaboration)

Figure 2 shows that most organizations are placed in Transylvania and Banat. Being close to Central Europe might explain this phenomenon, but this is also correlated with the high absorption rate of European funds in these regions. In terms of urban

concentration, Bucharest and Cluj are the first two cities to consider, therefore, Figures 2a and 2b present these cities in detail.

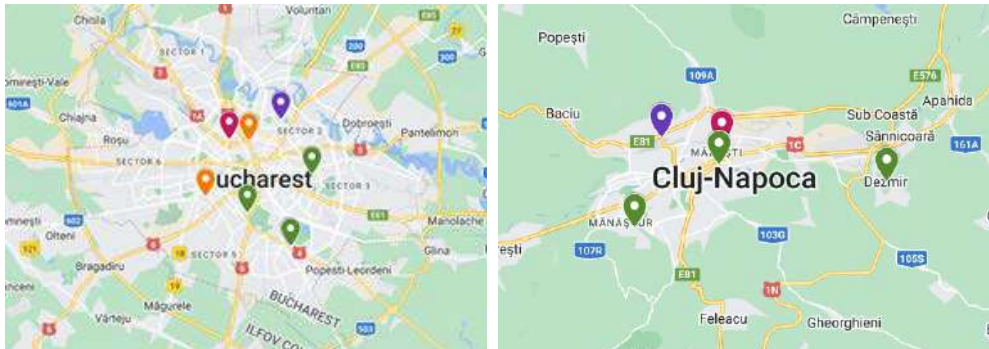


Figure 2: Map of the circular social economy organizations in Bucharest (2a) and Cluj (2b) (authors' elaboration)

There are some differences between the national distribution of registered social enterprises and the distribution of circular social economy organizations, as depicted in Figure 3. The samples we have are small, but we observe that the social enterprises in Transylvania and Banat prefer circular models compared to the rest of the country.

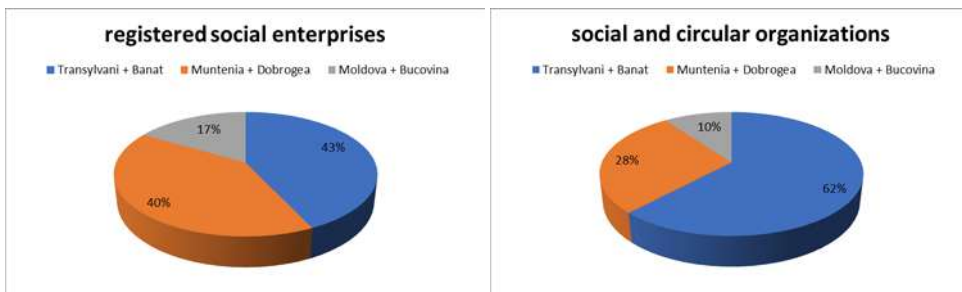


Figure 3. The regional distribution of social enterprises in Romania (authors' elaboration)

In terms of object of activity, the most numerous are those collecting materials. 10 companies are collecting and recycling DEEE (presented with brown on the map), 4 organizations are collecting and recycling oil (in yellow on the map), and 11 companies are collecting and recycling various other materials (in blue on the map). Another large group is that of companies involved in food and catering, formed by 7 organizations (in red on the map).

Profile of the Romanian circular social economy organizations

In the following section, we will concentrate on the responses received from the self-administered survey; as specified, 26 out of 50 identified organizations have answered. Most respondents (14) are the initiators of the circular social economy organizations and their managers. Five of the respondents are acting managers, while the remaining 7 are initiators. Therefore, the respondents know and understand the situation of their organizations very well.

Seventeen of the organizations have been established in the past three years. Only 4 organizations that responded have more than 10 years of experience. The following tables present the structure of the sample from a juridical perspective (Table 2), demographical characteristics (Table 3), and financing (Table 5).

Table 2. The characteristics of the respondents and their organizations considering their juridical status (author's elaboration)

Dimension	Number
Juridical status	Company (SRL – limited liability company): 18 Nongovernmental organization (NGO): 7 Individual enterprise: 1
Social enterprise accreditation	The organization is accredited: 16 The organization started the accreditation process: 1 The organization intends to obtain the accreditation: 6 The organization is not interested in being accredited: 3
Social insertion enterprise accreditation	The organization is accredited: 7 the organization started the accreditation process: 1 the organization intends to obtain the accreditation: 5 The organization is not interested in being accredited: 13

Most organizations represented are operating as companies and are or will be accredited as social enterprises. The interest in being a social insertion enterprise is much lower among the representatives in the sample. This could seem surprising considering that 9 out of the 26 respondents consider that the social enterprise status does not offer any facilities from the state. Only 2 organizations have evaluated at the maximum that the status of an accredited social (insertion) enterprise would provide access to facilities, mechanisms, and support measures from the state. The average evaluation is 2.3, where 1 is the minimum (no facilities) and 5 is the maximum (at the widest degree). Therefore, the certification of circular social organizations is mainly correlated with the requirement of the POCU Operational Program in this sense, in the lack of dedicated national funding, insufficient private funding, or insufficient support measures such as socially responsible public procurement.

Table 3. The characteristics of the respondents and their organizations considering demographical and operational elements (author's elaboration)

Dimension	Number
Location of the social headquarters	Rural area: 7 Urban area: 19
The geographical location (development regions)	Bucharest and Ilfov County: 4 South-East: 2 North-East: 4 North-West: 11 Center: 2

Dimension	Number
	West: 3
Number of years of operation	Less than three years (since 2019): 17 Between 3 and 10 years: 5 More than 10 years: 4
Number of employees	10 employees at most: 22 11-25 employees: 2 More than 25 employees: 2
Operating area	in more than 5 localities: 9 in 3-5 localities: 4 in two localities: 4 one locality: 9
Mother-organization	Without a "mother organization": 18 A Romanian NGO: 5 An international NGO: 1 Part of a group of companies: 1 Affiliated to the Catholic Church: 1
Core operating domain	HoReCa: 4 Production/Manufacturing: 6 Collection and recycling of waste or various products: 6 Other: 10

As noticed in the Table above, the organizations are extremely diverse. Some are local organizations with a short operational history, others are well-established organizations, and others are operating in a wide area. Most of them (15) are independent companies, either having or being interested in obtaining the accreditation of social enterprises. It comes as no surprise that protecting the environment and educating people to seem to be important focuses for the respondents.

We also observe that the organizations are small (with less than 10 employees), even if half operate in at least three locations. This might be associated with limited social and economic impact. It is also worth remembering that around half of the organizations declare they developed significantly in the past years, and the turnover also increased. These evolutions are associated with a decrease in the number of employees. See Table 4 for details.

Table 4. Development of the organizations in the past years (author's elaboration)

Dimension	Average evaluation
The turnover increased.	3.8
The number of employees has increased.	2.7
The enterprise has developed a lot.	3.3

*A 5-point Likert scale has been used (1 – totally disagree, 5 – totally agree)

Nevertheless, we mention that most organizations are young ones, being established or operating almost exclusively during the COVID-19 pandemic. Therefore, it is hard to critically investigate the economic dynamics of this specific sector of circular social organizations.

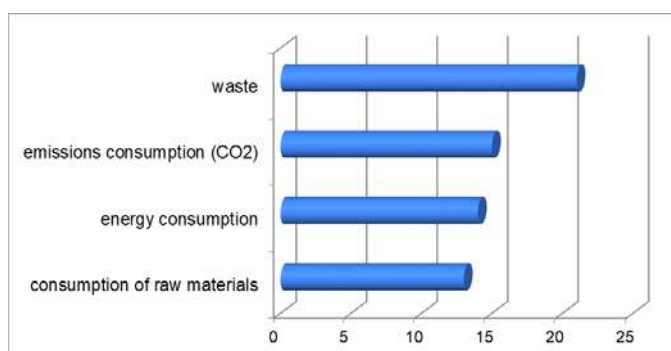
Table 5. Financing mechanisms (author's elaboration)

Dimension	Number
Established through European funding	Yes: 14 No: 12
Accessed European funding while operating	Yes: 8 No: 18
Initiated crowdfunding campaigns	5 out of 26

More than half of the represented organizations have been established using European funding (see Table 5). Four of the EU-funded organizations continued to access European funds. Four organizations that have not been established using European funding accessed later, while operating, EU programs. Therefore, access to the funds provided by the EU is an important factor of development for these organizations especially since they do not perceive too many facilities offered by the Government, as mentioned above.

The business models of the Romanian circular social economy organizations

Among the four investigated business models, **REDUCE** is the most common approach. Only two organizations do not assume any type of usage reduction. Figure 4 illustrates the frequency of the investigated approaches associated with this model.

*Figure 4. The frequency of reducing strategies (author's elaboration)*

21 out of the 24 organizations with a business model assuming a reduction of consumption are adopting waste management. Seven organizations declare that they take into consideration all 4 reduction approaches. Figure 5 presents the number of organizations combining different approaches. Most organizations implement at least two reduction strategies simultaneously.

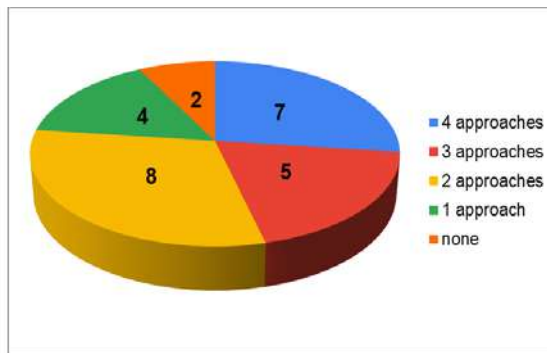


Figure 5. The number of Reduce approaches assumed by respondent organizations (author's elaboration)

RECYCLE-based business models are second-popular. Nevertheless, seven organizations out of the 26 do not have recycling approaches. The most popular approach is upcycling, as illustrated in Figure 6.

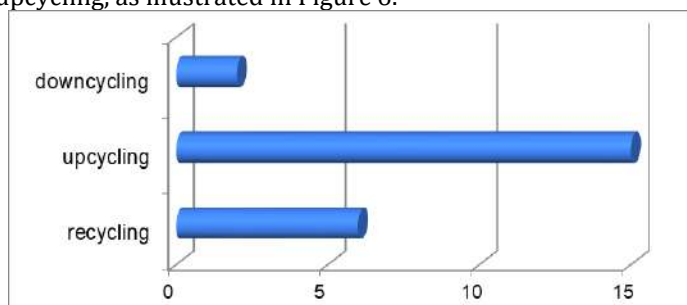


Figure 6. The frequency of recycling strategies (author's elaboration)

Only one organization is assuming all three approaches, while two others are doing recycling & upcycling, respectively upcycling & downcycling.

The business models associated with the **REPURPOSE** strategy are: remanufacturing, reuse, repair, and return. Nine of the investigated organizations do not adopt this model. The reuse model, assumed by 14 organizations, is the most frequent, as presented in Figure 7.

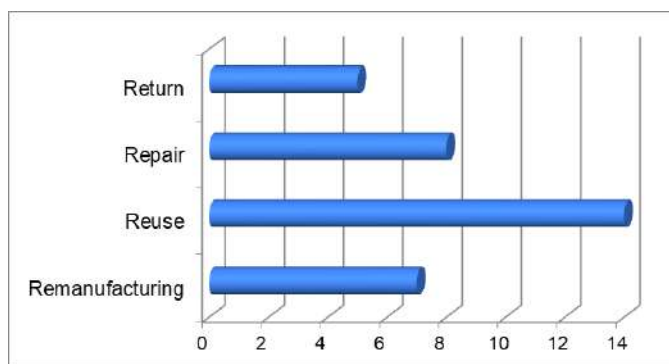


Figure 7. The frequency of Repurpose strategies (author's elaboration)

Five organizations have more complex approaches, assuming at least three repurposing models, as presented in Figure 8.

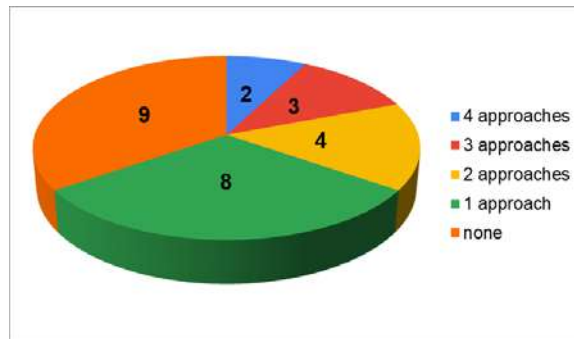


Figure 8. The number of the Repurpose approaches assumed by respondent organizations (author's elaboration)

14 out of the 26 organizations in the sample have a **SHARE**-based business model, as illustrated by Figure 9. One organization approached all three strategies, while three others – two of the strategies.

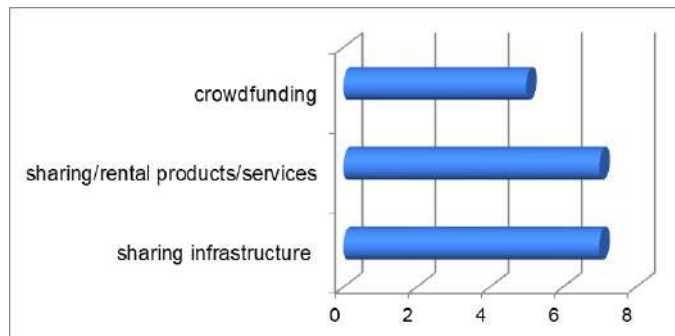


Figure 9. The frequency of sharing strategies (author's elaboration)

This model might be less popular because it needs more assets and might be more expensive or difficult to handle. Maybe it is also less known or understood. Qualitative research might highlight additional light on this aspect.

We detect a tendency for some organizations to assume complex approaches. For example, one company is assuming all tested models without sharing the infrastructure – this organization has been operating since 2020 only in Bucharest. The activity is the fields of ecology and responsible consumption, and for the moment is not accredited as social (inclusion) enterprise but intends to ask for both certificates. Another complex approach is assumed by an NGO from Bucharest, which was established in 2018 and at the present, operates in more than 5 localities, with no accreditation as a social enterprise and no intention of obtaining this status.

We also observe the most frequent combination of business models is the Reduce one with the Repurpose one. This is business-wise since the more complex repurposes

approach, the more waste and material consumption – therefore, these organizations might be interested more in reducing waste and consumption.

The last aspect investigated is that most organizations intend to develop the circularity dimension in the next period. 20 out of 26 declared that they intended it to a large or very large extent. The average score is 4.2, where 1 represents not at all and 5 to a large extent.

Conclusions

Our research paper contributes to understanding an emergent sub-sector of the social and solidarity economy in Romania: circular social economy. We have chosen to investigate this topic because we have identified a gap in Romanian academic research. Moreover, our research also has an applicative dimension if we consider the imperative to highlight the existence of the social circular economy sub-sector in the light of the new opportunities that could arise in the development of the social and solidarity economy sector in the near future in connection with the new strategies and priorities at the EU level, such as the EU Action Plan for the Circular Economy or the Fair Transition Mechanism of the European Green Deal.

First, our paper revealed that we can discuss an emerging sub-sector of circular social economy in Romania: we have identified and analyzed 50 social circular economy organizations, including them in an exploratory mapping exercise. The map of circular social organizations is available online as the main research output. We have defined the most appropriate circular business models and areas for circular social economy in Romania based on existing mainstream frameworks and approaches: Reduce, Reuse, Repurpose, and Share. Finally, based on a self-administrated survey of 26 organizations (out of the total of 50), we realized the profile of circular social organizations: most of the organizations have been established in the last 3 years (supply-driven development by European funding), most of them are certified social enterprises (because of the specific requirement in POCU Operational program), most of them are SRL (limited liability company), most of them act locally in an urban area, most of them have 10 employees at most, and REDUCE is the most embraced circular business model, with a prevalence of WASTE component.

The findings should be interpreted considering some limits of the study that could not be overcome at this research stage: insufficient sample size because only 26 out of the 50 organizations responded to the questionnaire, and the inherent limitations of an exploratory research stage.

Our paper paves the way for future research directions concerning the topic of circular social economy, such as periodically updating the map of circular social organizations, determining the value added by this subsector to the sector of social and solidarity economy, defining a social and environmental impact measurement framework for such enterprises, or further in-depth analysis of specific management models.

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NON-FUNGIBLE TOKENS (NFTS): SUSTAINABLE GROWTH OR DESTINED TO DISAPPEAR?

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Abstract. *The paper aims to analyze the new technology of non-fungible tokens (NFTs) to understand whether there is a basis for sustainable growth or whether these tokens will disappear over time. The key issues analyzed include economic, environmental, legal, and accessibility aspects. NFTs are an innovation that has emerged in recent years and have attracted huge and growing interest worldwide. They represent a type of cryptographic token that serves as a deed and certificate of authenticity for a single asset on the Blockchain. In order to do so, the methodology consists of analyses of existing literature and various information sources. What emerged is that NFT technology is to be considered as the future of online property and is destined to revolutionize, to some extent, the way the internet is used. In addition, it is an important product and process innovation for many companies, regardless of their industry. However, sustainable growth will only be possible if several environmental, legal, and economic changes occur. It must therefore be in everyone's interest to preserve and exploit the potential of non-fungible tokens, and to invest in and commit to making them environmentally sustainable and secure.*

Keywords: *Blockchain; Environmental impact; Non-fungible tokens; Sustainable growth; Technology.*

Introduction

Non-fungible tokens (NFTs) are a type of cryptographic token representing a unique asset's deed and authenticity certificate written on the Blockchain (Chohan, 2021; Kugler, 2021). Non-fungible tokens are distinguished by the fact that they are not interchangeable with one another. NFTs are an innovation that has emerged in recent years and have attracted huge and growing interest worldwide.

The motivation behind developing this topic, both on a practical and academic level, is the incredible innovation power that NFT technology is proposing. NFT can be applied to new companies and products and to the transformation or improvement of existing

products and processes. Attention to environmental impact and possible applications to safeguard the environment is also closely linked to technology.

This paper aims to study the longevity of the NFT technology, observing its pros and cons and all its possible applications (Wilson, Karg, & Ghaderi, 2021). In particular, the focus will be on understanding whether NFTs can have sustainable growth or are destined to disappear. The key issues analyzed include economic, environmental, legal, and accessibility aspects. Sustainable growth is therefore understood as a form of development that safeguards the environment first and foremost, but also the economic and legal security of users.

The approach used in this paper is a compilation approach, implemented by collecting information from many sources and studies.

The paper is structured as follows: the first paragraph will deal specifically with NFTs, starting with the blockchain technology underpinning these tokens and ending with the various non-fungible tokens. The second paragraph will focus on market analysis, value, trends, and fluctuations. The third paragraph is the heart of the study, highlighting all aspects of whether NFTs will have sustainable growth or fade away in the future. As mentioned above, the paragraph will deal with the controversy surrounding the speculative bubble status of the market, the environmental impact of NFTs, legal and regulatory aspects, and the current accessibility issues of non-fungible tokens.

Blockchain and NFT: a literature review

There is a category of blockchain-based virtual assets known as non-fungible tokens (NFTs), which have garnered incredible investor interest in a very recent and short period (Bao, & Roubaud, 2022; Dowling, 2022a). To adequately deal with the world of NFTs, it is, therefore, necessary to take a step back and tackle the topic of blockchain technology (Chevet, 2018; Karandikar et al., 2021).

Blockchain technology (Di Pierro, 2017) is defined as a decentralized, distributed ledger that records the provenance of a digital asset (Nofer et al., 2017). The data on a blockchain cannot be changed by design, making it a real disruptor in industries like payments, cybersecurity, and healthcare. The blockchain, derived from the phrases block and chain, is a decentralized distributed database structured as a chain of blocks holding transactions. Those are chronologically correlated, and a system assures the integrity of cryptographic methods and rules. Once the data has been inserted into the blocks, it can no longer be updated retroactively without invalidating all subsequent operations, which would suggest that most of the system agrees. Every record is saved to include a portion of the information they refer to previously; this relationship makes it very hard to make changes without them being immediately accessible to the whole network. The blocks to be added to the chain are then submitted to a validation procedure based on the idea of distributed consent, which assures the chain's legitimacy by making the figure of a superfluous. The blockchain is a decentralized ledger based on the distributed trust concept that, according to its unique configuration, does not require the intervention of a third party to ensure its incorruptibility because it is designed to do so.

Blockchain can be classified into three kinds based on how the ledger is maintained: public blockchain (Bitcoin and Ethereum), consortium blockchain (The Hyperledger Fabric consortium blockchain), and private blockchain, respectively.

Blockchain (Belotti et al., 2019) has some general components. Generally, blockchain architecture can be organized into five tiers: data layer, network layer, consensus layer, incentive layer, and application layer.

A token is a digital asset that may be transferred between two parties on a blockchain platform without an intermediary. In other words, it represents a value related to an item, service, or property right (Bamakan et al., 2022). Tokens have the following characteristics:

1. liquidity: it can be easily transformed into current currency or cryptocurrency
2. divisibility: allows the subdivision of the value into even minimal units
3. exchangeability: allows you to make trades
4. immutability: once digital information is entered on the blockchain it will no longer be changed.

The tokenization (Li et al., 2019; Freni et al., 2020) process entails converting a good/rights service into a digital token registered on the blockchain, with the real good and the token linked by a smart contract. Tokenizing is the process of generating and tying a token to a tangible object through a smart contract on a blockchain network. The smart contract converts a contract into code that can automatically verify the fulfillment of conditions and perform actions or make provisions in this regard. Technically, it is based on scripts that read the various provisions of the contract as well as the operating conditions under which they must be maintained. It is self-activated when the data referring to real-life situations match the data relating to the established contractual requirements.

A non-fungible token can be seen as a unit of digital information (token) stored on a blockchain and is not inherently interchangeable with other digital assets (non-fungible). The term “fungible” derives from the economic and accounting literature and is defined as anything that is interchangeable with an identical or similar object. Traditional forms of currency, whether equivalent sums of paper money or identical units of precious metals, are fungible objects, which helps them serve as mediums of exchange, because they are understood to be of equal value. According to Nash (2017): “Fungibility is, essentially, a characteristic of an asset or a token in this case, that determines whether items or quantities of the same or similar type can be completely interchangeable during exchange or utility”.

Value, Trends, and fluctuations of NFTs

At the end of November 2021, the total US dollars spent on completed sales for NFT amounted to approximately 20 billion. The comparison with the previous quarter (with an amount of approximately 1.8 billion) shows a difference of 18.2 billion dollars. Statista, in a study updated in October 2021, reports the market size of NFTs. Specifically, the data highlighted cover many topics, starting from the general market to the various sectors of application of non-fungible tokens. The market capitalization of transactions globally involving a non-fungible token shows strong growth, with 40.96 million US dollars in 2018, and with 141.56 in 2019, reaching 338.04 in 2020. The

exponential growth is demonstrated by the percentages, with an increase of 245.61% between the first and second year and 725.29% between 2018 and 2020. The sharp rise in interest in NFTs is also demonstrated by the world's most expensive non-fungible token sale in March 2021. "Beeple Everyday: The First 5000 Days" sold on March 11 for \$ 69.3 million, followed by "CryptoPunk 3100" (7.58 M) and "CryptoPunk 7804" (7.57 M) sold on the same date. Currently, the top 15 most valuable sales were made in 2021.

Non-fungible tokens are often traded in a marketplace within the platforms that issue the NFT. However, there are external sites where the users can sell and buy tokens. OpenSea is an NFT marketplace founded in New York in 2017 by Devin Finzer and Alex Atallah. On the platform users can generate NFTs for free and offer them for direct purchase or auction. OpenSea is based on the Ethereum ERC-721 standard. A crypto wallet such as B. Bitski or MetaMask needed. OpenSea has a total volume of \$ 10.39 billion, with 639,121 traders and an average of \$ 873.04 per transaction. The second in terms of volumes is Axie Infinity.

The data collected highlights the exorbitant value that some single NFTs are reaching. This type of token is therefore inaccessible to the wallets of most users and therefore one of the directions that the NFT world is taking is that of fractionalized NFTs. This type of NFT allows individual investors to spend a small amount by purchasing fractional ownership of a high-value asset.

The market we see evolving today is a market that is growing at an exponential rate, with unprecedented liquidity but also it is even more of a speculative and volatile market than ever before. One of the first indicators that has caught our attention is that of the resale rate being sold at a loss. Several collections are starting to show significant resale rates at a loss.

If this trend is confirmed, it could reflect the beginning of the deflation of the speculative bubble around certain types of NFT (notably Collectibles). In any case, the current growth context requires all investors and NFT stakeholders to pay extra attention. Triple digit growth necessarily goes hand in hand with market instability, unrealistic expectations, and potential disappointments.

The topic highlighted by NonFungible fully represents the fluctuations mentioned above. In fact, although in the previous paragraphs the data collected told of an unprecedented unstoppable expansion, the reality may be thornier to face. The fact that many collectors are making losses after the sale of their collections shows that the value of NFTs is strongly linked to risk. In fact, having the possibility of varying strongly (both increasing and decreasing) in value, these are assets that require particular attention in the purchase and sale. Since the interest is currently huge and NFTs are accessible even to fundamentally inexperienced or uninformed users, the necessary attention is very often absent. One of the terms used by NonFungible in its conclusions on the third quarter of 2021 is the speculative bubble.

NFTs: a sustainable growth?

The previous paragraph collected and analysed economic data relating to NFTs and their fluctuations in value. To understand whether NFTs are destined to disappear or have the scope for sustainable growth, it is not enough to simply observe the data collected.

What is, therefore, necessary is to start by taking into consideration the disputes that exist on this topic. This also allows us to observe the negative sides of this world, detaching ourselves from the glitter of the phenomenal economic data described, to understand, with a critical eye, the potential, and the future of NFTs.

The first useful source to study the presence of a bubble state is the study carried out by Maouchi, Charfeddine and El Montasser (2022). Within their paper, done in collaboration between the College of Business and Economics (Qatar University) and the ESCT school of Tunis (University of Manouba), the scholars used a sample of 9 DeFi tokens, 3 NFT, Bitcoin and Ethereum, trying to detect different bubbles that can overlap the cryptocurrencies examined. Specifically, the nine DeFi considered are Chainlink [LINK], Maker [MKR], 0x [ZRX], Ren [REN], Terra [LUNA], Synthetix [SNX], Fantom [FTM], Reserve Rights [RSR], THORChain [RUNE]. The three NFTs are THETA [THETA], Enjin Coin [ENJ] and Decentraland [MANA]. Finally, they consider Bitcoin [BTC] and Ethereum [ETH], as they are the two cryptocurrencies with the largest market. The inclusion of the two cryptocurrencies is prompted by Bitcoin's dominance of the cryptoassets markets and its status as one of their primary drivers, as well as Ethereum's role as the backbone of DeFi and NFTs protocols.

The starting concept of the study is that the rate and extent of capital flows to DeFi and NFT are reminiscent of cryptocurrencies and the creation of bubbles observed in these markets in the study by Kyriazisa et al. (2020). The study method applied is the "real-time bubble detection method" proposed by Phillips and Shi, which has the advantage of circumventing the problems of unconditional heteroscedasticity and multiplicity that other bubble identification methods have. They looked at potential bubble predictions by considering both internal and external aspects in cryptocurrencies markets (Dowling, 2022b). They employed four univariate models: logit, probit, tobit, and linear regression. While the last three models are used for the robustness of the results, logit is the most relevant for the study. The dependent variable in logit and probit models is a dichotomous variable that takes the value 1 (Bubble = 1) if the estimated PSt statistic is greater than the bootstrap critical value, and 0 otherwise. Inside, the logit model considers the variables: traded volume, TVL, COVID-19 pandemic proxied by the global number of total cases, VIX, gold, Google Trend searches, EPU index, and Brent prices. The result of the bubble detection is described by a graph for each of the three NFT, which shows in the highlighted parts the presence of speculative bubbles detected by the PS algorithm.

Taking into consideration the entire year 2021 and comparing it with previous years, one conclusion that can be made is that the entire year can be considered a single bubble. However, given its possible applications, NFT technology is only at the beginning of its rise and 2021 could be just the beginning of an even more disproportionate increase in sales, operations, and users.

The technology of non-fungible tokens is at the centre of debates concerning not only the economic aspect analysed in the previous section. The impact that the creation and exchange of NFTs has on the environment is another topic of controversy (Truby et al., 2022). In order to study this counter-bias we need to start from the study by Valeonti et al., (2021), which aims to understand whether NFTs provide a fundraising opportunity for galleries, libraries, archives and museums (GLAM) by selling ownership of digital copies of their collections. To understand this, the paper examines the environmental

issue, giving a clear view of the current situation. Academics introduce the topic by explaining how the most contentious issue concerning non-fungible tokens is the significant energy consumption connected with the Ethereum blockchain, which is where most NFTs are traded. Ethereum's annual energy consumption is anticipated to be 48.7 Tera-Watt Hours (TWh) as of May 2021, the same as Malta's annual energy consumption. As a result, environmentalists have been harsh in their criticism of NFTs. Precisely for this reason, many newspapers have moved to address the environmental impact of NFTs and their future sustainability.

Energy-efficient NFTs, in parallel to Ethereum, already exist and are traded on a regular basis. One of them is Whitworth Gallery NFT is registered and sold on the low-energy Tezos network. Many other blockchains, such as Cardano and Algorand, use the Proof-of-Stake mechanism for transaction verification, with energy costs comparable to operating traditional servers in a centralized application. Furthermore, Cardano, a project based on academic research, is fully operational by the end of summer 2021. Due to its pioneering, peer-reviewed Proof-of-Stake implementation, Cardano promises to be "The Most Environmentally Sustainable Blockchain Protocol," while its scalability, interoperability, and sustainability characteristics make it a contender to challenge Ethereum's dominance.

Although the mechanism guarantees significantly lower energy consumption than Ethereum's one, the Proof-of-Stake technology has nevertheless received criticism from environmentalists. PoS blockchains have been accused of "granting power to the already powerful" (the more coins a node operator holds, the more transactions they are allowed to verify with their coins held as collateral) and "that [this] is also a climate issue," because "climate justice is social justice". Regarding this criticism in the study, the academics take a clear position, explaining that the current subsidies (referring to museums, but it's applicable to other contexts) coming from the banking system consume much more than if NFT were used.

Lastly, aside from PoS adoption, other measures are being used to reduce the carbon footprint of NFTs, albeit with a lesser impact. These measures include so-called Layer 2 solutions (in which the number of transactions that must be registered on the blockchain is reduced to a minimum) and the use of renewable energy for mining.

The conclusion on the environmental issue from the study by Valeonti et al. (2021) is that, despite the various criticisms, the financial potential of non-fungible tokens is substantial. The problem they identified is attributable to the Ethereum blockchain, on which NFTs were first built, which consumes a lot of energy, and this is the most serious criticism made against them. Most NFTs are still traded on the Ethereum blockchain, which consumes a lot of energy, even though energy efficient NFTs already exist. The expectation is therefore that the world of NFTs will increasingly turn (as does Ethereum) towards sustainability and ever lower consumption.

Non-fungible tokens, due to the energy consumption required by the blockchain to validate the transaction, have been and still are objectively harmful to the environment. Moreover, the cause of this immense energy consumption is mainly due to Ethereum and the fact that most of the transactions take place on its blockchain. What has emerged, however, is that there is hope for NFTs and that a process is already underway to solve this problem. In fact, the channels that have been activated to reduce energy

consumption and make NFTs more environmentally friendly are mainly two: the first concerns the blockchain technology itself and the second the origin of the energy consumed to bring operations to life.

The change in blockchain is also divided into two possibilities. The first is to move away from Ethereum (based on the Proof-of-Work method of transaction validation) and make room for blockchains based on the Proof-of-Stake method. This option has already entered the mainstream, thanks to blockchains such as Cardano and Algorand, which use the Proof-of-Stake mechanism for transaction verification, with energy costs comparable to running traditional servers in a centralised application. The second possibility is to apply the project to improve Ethereum's technology, without therefore having to radically change the reference blockchain. In this case the innovation would be brought about by using the single blockchain to contain multiple NFTs. In the case of the approach launched by StarkWare a single block would be able to contain millions of NFTs, but the project of the two Israeli founders Eli Ben-Sasson and Uri Kolodny is not the only one already in place to have as its objective to increase the efficiency of the Ethereum blockchain. It is also necessary to remember that Ethereum itself has for years declared its commitment to making its technology more sustainable. The second channel concerns the use of renewable energy sources to power the NFT world. On the positive side, NFT and cryptocurrencies go hand in hand, as they are both based on the same technology. This means that both are interested in making progress about energy consumption. Again, the journey has already begun (currently renewable energy sources account for around 39% of bitcoin mining) and projects such as CurrencyWorks (there are many in the pipeline), which turns rubbish into energy, are one of the keys to the future survival of NFTs.

Despite the important steps being taken towards environmental protection, there is still a long way to go. The rise in interest in NFTs also represents an increase in energy consumption, which makes it more important to move quickly in the direction of environmental protection. Precisely for this reason, projects that aim to make the reality of NFTs less polluting are in clear growth, thanks also to the awareness that non-fungible tokens can represent the future of online ownership and that the enormous media visibility that the problem of environmental impact it has received could cause its disappearance.

Non-fungible tokens are still a novelty and as such not all the necessary steps have been taken to regulate the market (Fairfield, 2022). This means that legal and regulatory aspects are still to be defined or in the process of being defined. Currently, as legal regimes differ from country to country, the creation of a global standard for NFTs must consider local legislation. According to Jordanoska (2021), most NFTs would fall into the category of unregulated tokens, and hence outside of the regulatory perimeter, unless they exhibit features of e-money or security tokens in terms of providing additional rights. Investing in unregulated tokens, such as NFTs, is exempt from the standards for fair, unambiguous, and non-misleading advertisements. Moreover, regulatory protections are likewise unlikely to be available to investors.

A clear example of consideration of the regulation of NFTs came from the UK's Financial Conduct (FCA). The consultation acknowledged that NFTs might be used as a medium of trade or for speculative and high-risk purchases. It decided, however, that they are not easily replaceable and hence do not constitute a significant enough risk to consumers to warrant regulatory intervention. The FCA's abilities to interfere in the NFT market for

consumer protection would be restricted in this regard, consisting primarily of consumer education and warnings about crypto investment scams. The FCA is already working in this direction, for example, by launching a £11 million digital marketing effort to raise awareness of the risks of cryptocurrencies. The outcome of the consultation is still awaiting, however due to the fast-paced innovation in the sector and the continual creation of new ways to integrate NFT features, the stance may need to be reconsidered in the future. As in the UK, other states will move to issue their own NFT regulations, seeking to clarify the “rules of the game”.

Conclusions

The paper began by asking whether non-fungible tokens can have sustainable growth or are destined to disappear over time. Sustainable growth means that technology can be oriented towards both profit and economic return, as well as social and environmental development. The prerequisite was therefore to find out whether in the future there is room and feasibility for an environmentally friendly, user-safe, and clearly regulated use of NFTs.

All aspects that determine whether sustainable growth is possible were analysed. First, the NFT market and the possibility that it is in a state of speculative bubble were considered. Observing this aspect was useful to understand whether the market is driven by hype, by irrational and unjustified drives, and therefore destined to collapse, or whether it is reliable and developing. Since this is a rapidly changing reality, and since it is difficult to realise that you are in a speculative bubble when you are in one, it is impossible to establish with certainty the reliability of the market. The values recorded and the studies considered suggest that there may be a general bubble state, although it cannot be ruled out that it may have already burst. As a result, NFTs are a reality that should be approached with caution and vigilance by both potential investors (especially those who are inexperienced) and regulators (Chohan, & Paschen, 2021). The section on the possible applications of NFT technology was useful to show that, although there is still some uncertainty about the reliability of the market, the potential of non-fungible tokens is vast. This means that, as a means of product and process innovation for many companies, NFTs can in effect become a constantly used medium, thereby stabilising the market. As time progresses and NFTs move beyond the stage where they are a novelty, the occasional users who are only attracted by easy profit (even in a fraudulent way) could be displaced and the correct uses of these virtual assets could be increasingly implemented.

A further aspect observed to understand the future growth of NFTs is the legal and regulatory one, establishing that currently there are still some uncertainties, in regulation, hovering around this world. Nonetheless, the conclusion is that NFTs, like any other breakthrough that generates a lot of hype, will take some time to become established. The regulation is, in fact, temporary adaptations of current rules that may or may not apply to non-fungible tokens. As a result, individual states and higher institutions will progressively regulate the market and NFTs themselves, both legally and fiscally. Furthermore, the presence of intermediaries (as banks have historically been for money management) cannot be ruled out, albeit this would go against the blockchain's core principle of decentralization.

Accessibility is another factor influencing the future growth of NFTs. There are currently barriers to entry, represented by the lack of information on non-fungible tokens and the

myth that, being based on the blockchain, they are considered cryptocurrencies. Another barrier to entry is the high fees associated with transactions on the blockchain. It follows that for NFTs to grow effectively, platforms and states themselves must move to provide more information to users, combined with a reduction in the fees to be paid for each transaction. As most transactions are still carried out on the Ethereum blockchain, which currently has very high fees, one solution could be to use alternative blockchains.

Once outlined the economic, legal, regulatory and accessibility factors, and established that although there are some aspects to change, improve or overcome, NFTs can have an important path of growth, it's necessary to get to the environmental factor. In this way the picture is complete, and it is possible to establish whether sustainable growth is possible. The conclusion about the environmental impact of NFTs that emerges is consistent across all the sources examined. The first realization, which should be obvious to everyone, is that non-fungible tokens have been and continue to be objectively destructive to the environment due to the energy consumption required by the blockchain to validate the transaction. Furthermore, Ethereum and the fact that most transactions take place on its blockchain are the primary causes of this massive energy use. What has emerged, however, is that there is hope for NFTs, and that a process to fix the problem is currently starting. Indeed, there are primarily two channels that have been triggered to cut energy consumption and make NFTs more environmentally friendly: the first concerns blockchain technology itself, and the second concerns the source of the energy used to bring activities to life. Change in blockchain can also be separated into two categories. The first is to abandon Ethereum (which uses the Proof-of-Work technique of transaction validation) in favor of blockchains that use the Proof-of-Stake method of transaction validation. The second option is to use the project to improve Ethereum's technology without having to update the reference blockchain drastically.

Despite the important achievements gained in the direction of environmental conservation, there is still much work to be done. Increased interest in NFTs also means increased energy consumption, making it even more critical to act fast in the direction of environmental preservation. Precisely because of this, projects aimed at making the reality of non-fungible tokens less polluting are on the rise, owing to a growing awareness that non-fungible tokens can represent the future of online ownership, and that the enormous media attention that the issue of environmental impact has received could lead to their extinction. Another important aspect observed is that it should not be overlooked that some types of NFT can be beneficial to the environment, either by preserving it directly or by helping it in other ways.

The result that is reached by combining all the assumptions concerning the factors considered is that NFT can have sustainable growth, but only with a major evolution in many aspects. NFT technology has proven to be very flexible and applicable in a wide range of contexts, making it a candidate for future introduction in many companies. Although this innovation may revolutionize both the product offered and the process of offering it, the world of non-fungible tokens is still immature and needs to take steps forward to survive. First, the environmental aspect must be resolved, as the world environmental situation is so delicate nowadays and it is not acceptable that a new technology, even if revolutionary, is so polluting. NFT is a technology that many people are interested in preserving and in fact the results show that progress is being made to

solve the problem of environmental impact. The premise of sustainable growth therefore lies in how quickly blockchain, and consequently non-fungible tokens, become an environmentally sustainable technology.

The economics are equally important for growth (Borri, Liu, & Tsyvinski, 2022), and while the limitation of this paper is that it is not possible to determine with certainty whether the NFT market is in a state of speculative bubble, the path that non-fungible tokens are taking does not seem to have a stop in sight. Another conclusion to be drawn from the study of the market is that it will have to be constantly observed carefully, especially by regulators. Legal and regulatory aspects are essential for sustainable growth, both to guarantee security for users and to establish guidelines and penalties for environmental protection. Finally, simplified access to NFTs and correct information from institutions will also be essential to remove barriers to entry for this promising technology, both for users and companies.

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THE IMPORTANCE OF SUSTAINABILITY IN THE MARKETING AND MERCHANDISING STRATEGIES FOR ITALIAN STUDENTS: THE CASE OF THE UNIVERSITY OF INSUBRIA

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Abstract.

The importance of sustainability is an overall aspect of everyday life, even at an academic level. It is no longer just a research topic, but it can be found at a practical, theoretical, social, and promotional level in our society. Knowledge of the sustainability issues should be considered by all the actors involved, especially in the younger age groups.

This paper aims to understand the importance of numerous facets of sustainability and the circular economy in the academic field through a questionnaire distributed to students at the University of Insubria. After a brief theoretical framework related to the link between university, sustainability, and merchandising, the core part of the paper is focused on a survey. Administered in the summer of 2022, the survey aims to understand the major occurrences of these issues for respondents, checking their propensity for sustainability, knowledge of the circular economy, and the role of sustainable merchandising. To conclude, a statistical analysis of these elements is carried out to understand the overall level of importance and knowledge and to verify if there are gender differences.

Keywords. *Green Marketing, Merchandising, New Generations, Sustainability, University.*

Introduction

The growing attention to sustainability issues that initially involved institutions and businesses (Porter & Kramer, 2002) is also recently affecting the world of education,

where countless initiatives and projects have been launched in primary and secondary schools and universities.

In particular, Italian universities have recently captured the ability to influence information on sustainability issues. They have increased their awareness of the importance of educating the new generations about sustainability. For these reasons, they are committed to achieving the objectives defined by the UN, "Sustainable Development Goals", to regulate the agenda of the main actions until 2030 and become sustainable universities. Each university has different internal rules, but all aim at the common goal of promoting an approach to sustainability within the individual universities, which includes projects and initiatives; for example, many universities have joined the "Stop Single Use Plastic" campaign, established by the agreement of the Conference of Rectors of Italian Universities (CRUI). This agreement provides for the abandonment of single-use plastics and embracing eco-friendly alternatives; on the other hand, it starts from the establishment of specific bodies to implement the "sustainability plan" and plan educational activities; still, other universities provide for the inclusion of the topic of sustainability within the study programs. The importance of the role of universities on issues related to sustainability is identified for the first time in article 3 of the "Magna Charta Universitatum Europaeum", signed in Bologna in 1998, which states that the university must ensure future generations' education and training that makes it possible to contribute to respect for the balance of the natural environment and life. In this regard, in order to influence the new generations on the concepts and value of sustainability, in 2015, the Conference of Rectors of Italian Universities established the RUS - Network of Universities for Sustainable Development - the first experience of coordination and sharing between all Italian universities engaged in the issues of environmental sustainability and social responsibility. It was meant to direct their institutional activities toward sustainability objectives and actively participate in achieving the institutional objectives of the network (Sannella, 2020). There are many tools that universities are using to guide students' sustainability choices; in this work, we will focus on green marketing and sustainable merchandising, on which many universities are building original sustainable strategies.

Green Marketing and Sustainable Merchandising: A General Framework

The growing attention to sustainability, has led to the development of so-called green marketing, a marketing approach aimed at developing and producing eco-sustainable products and services, able to meet the needs of consumers without negative repercussions on the environment. The American Marketing Association argues that "Green marketing refers to the development and marketing of products that are presumed to be environmentally safe (i.e., designed to minimize negative effects on the physical environment or to improve its quality). This term may also be used to describe efforts to produce, promote, package, and reclaim products in a manner that is sensitive or responsive to ecological concerns".

Awareness of environmental issues is not the only objective of green marketing, as it includes several evolutionary phases, effectively described by Grant (2009): the first it was that of ecological green marketing, where all market activities aimed at highlighting environmental problems by providing possible remedies; in a second phase, environmental green marketing was developed, aimed at the creation of new innovative products that facilitate the disposal of waste. We are currently in the phase of sustainable green marketing, which manifests through an intent to promote products

and services that generate a reduced environmental impact. This new sales strategy implies the active involvement of the customer, who works with the company to create ideas, events, and virtual communities by spreading correct habits and lifestyles to follow (Fraai et al., 2011; Peattie, 2001). To be effective, an action linked to this new marketing approach must have precise characteristics, the so-called five "I's" of green marketing (Bhalerao & Deshmukh, 2015):

- Intuitive
- Integral
- Innovative
- Inviting
- Informed

The approach that is emerging from this innovative marketing model is focused precisely on moving away from excessive consumption, favoring aspects such as authenticity, product transparency, the active participation of customers also through word of mouth and virtual communities (Grant, 2009). Consumers, especially the new generations, are much more informed and involved, thanks to the development of information technologies, in which the customer has greater purchasing power by accessing information and comparing his alternatives directly. Protecting the environment has become a marketing lever since it is no longer enough for companies to know how to sell a product well. However, it is important to share and communicate values, explaining the deep meaning behind each of them (the controlled supply chain, the origin, substances used, packaging); for companies, it has become almost an "obligation" to propose sustainable alternatives and look for new strategies to sell. With this approach, we do not focus exclusively on promotion. Nevertheless, marketing covers a broader area that concerns the entire product life cycle, from product/service design to final consumer satisfaction. The marketing and ecological objectives must move homogeneously, hand in hand, as the customer must perceive the experience as something normal and not exceptional (one of the many objectives of green marketing). Therefore, "green" must be an integral part of the brand itself. From this point of view, merchandising activities assume increasing importance which, from a strategic point of view, become a strategic tool in order to strengthen two fundamental components of a brand and of a company as a whole: brand identity and brand awareness (Roggeveen et al., 2021).

It is possible to identify five ways in which sellers can convey solid brand identity through the merchandise they offer: focus on unique and original merchandise, take advantage of the local merchandise, reflect the characteristics of their area, include art in their merchandise, offer sustainable products and include high fashion products in their assortment; and five innovative merchandising methods to facilitate the communication of the brand identity to consumers: create themes, reflect the history of the brand, be "playful", exclusive reporting and virtual merchandising (Bilgin, 2018). It is imperative to find a correspondence between brand identity and consumer identity: this correspondence increases the probability of establishing a meaningful relationship with the customer, assuming that their involvement - establishes a strong customer-brand relationship - and leads to greater brand loyalty and an increase in their willingness to pay. This correspondence must be maintained, so the seller must continually create and integrate consumer experiences. To date, sellers have technology available, a tool capable of amplifying the brand identity and influencing the consumer's identity. Customers are easily linked to a brand if it shares values with which they

identify; Furthermore, the presence of new and exciting experiences is significant, which can expand the consumer's identity, possibly leading him to consider new perspectives. From this point of view, a company's attention to the values of sustainability is a powerful tool to bind consumers to a brand. This is especially true for the new generations, who are particularly sensitive to these issues, as many studies show (Barroso et al., 2020; Berkup, 2014).

Companies oriented toward a sustainable approach have understood the importance of including sustainability in merchandising activities, including eco-friendly materials in production processes, and inspired by the principles of the circular economy (Ghisellini et al., 2016; Gazzola et al., 2020a). For example, it is preferable to customize objects by choosing eco-compatible materials or those deriving from recycling; or, if you want to brand an item of clothing, we should make sure that the items are eco-friendly: sustainable clothing rejects polluting practices, such as the use of toxic or non-biodegradable substances. Sustainable merchandising is a growing trend, given the greater awareness acquired by both consumers and companies. Sustainable merchandising is characterized by merchandise purchased, produced, and shipped sustainably, including disposal, recycling, or reuse. Given the importance of these issues, many sellers market sustainable offers, adapting to the growing demand for this type of product, to attract eco-conscious consumers, which currently, as underlined, appears to be a preference above all of the new generations, with some gender differences that some studies are showing (Gazzola et al., 2020b; Bloodhart & Swim, 2020; Bhaduri & Ha-Brookshire, 2015). Offering sustainable products allows sellers to convey their values and principles, and to establish a strong bond between brand and consumer.

The role of sustainability in the Z-Generation

To promote awareness and sustainability-oriented behaviors, it is essential to develop personalized communication strategies with the final consumer (Dabija, 2019). This is important because on one hand the consumer is exposed to a huge amount of information and persuasive pressures, linked to the development of digital and multichannel communication and, on the other hand, he feels more and more free from conditioning in terms of methods, times and sources. To summarize, as sustained by Francis and Sarangi, (2022), the consumer wants to be the main decision maker of their choices, rather than the object of persuasion (Trudel, 2019).

By shifting the focus on the target of our work, it is possible to affirm that generation Z is most sensitive to sustainability. Sustainability is a problem that affects all generations, but nowadays it is a central discussion point especially for young people. According to research (Dabija et. al, 2019), people born between 1995 and 2010 belong to the generation most attentive to the issue of sustainability, in comparison to other generations. It is the generation Z who has realized an effective difference in poverty levels regarding the poorest world countries, also from the point of view of the distribution of resources and necessities. They are devoted to issues such as immigration and pay particular attention to these topics. Furthermore, the very young, from an early age understand very well the concept of food and water waste, reiterating it through a modification of what can be considered wrong or incorrect habits (Kamenidou et al., 2019). In fact, they are people adopt a lifestyle considered eco-friendly and pay high attention not only to the food sector but also considering a huge number of topics (Guzel, 2020). For example, generation z encourages separate

collection and pay attention to behaviors both inside and outside their home life (Goh & Jie, 2019). Moreover, in order to preserve resources, they have adapted to the use of electric vehicles in both large and small cities. The use of electric scooters and bikes is thus encouraged in line with the dictates of global legislation (Wawer et al., 2022).

Due to the theoretical framework, two research questions will be proposed:

DRQ1: Through descriptive statistical techniques the paper will provide an in-depth analysis of the sample, trying to provide an overview of the respondents regarding the issues of awareness of being a sustainable consumer, knowledge of SGDS and circular economy and importance of the university sustainable merchandising.

RQ1: Considering the literature on individuals' propensity for sustainability, we want to understand if there is a gender difference for the topics.

Methodology

Considering the aim of the paper, a survey, as previously mentioned was spread in the period June-august 2022 obtaining 173 answers to the entire population of the students, current enrolled at University of Insubria.

The questionnaire, administered via institutional e-mail, tried to understand, after the personal data section, the respondent's knowledge, and their propensity on environmental and sustainability issues. In fact, before the analysis concerning the role of University Merchandising, some specific questions were asked about the attitude towards sustainability (from a general perspective), the relevance of sustainability in the activities carried out by the University and the relevance of these activities for the respondent. Subsequently, the entire set of respondents have expressed their degree of knowledge and relevance on the concept of circular economy with its three principles. Subsequently the questionnaire focused on the role of merchandising, examining three aspects: the general interest, the propensity to buy and the sustainability of the products.

The data analysis process is based on two known methodologies:

Descriptive statistics, or descriptive analysis, is the part of statistics that deals with collecting, synthesizing, and interpreting the data of a population or sample using indicators and graphs (Zenga, 2014).

To verify the hypothesis three kind of hypothesis testing techniques are used (For a detailed description of these test, please see Good, 1981 and Weakliem, 2016):

- Two sample Z test of proportions is the test to determine whether the two populations differ in a significant way on specific characteristics.
- Two-sample Z-test for means is a technique that is used to determine if the difference between the two-population means is not statistically significant.
- The Mann-Whitney U test is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed (it is important to punctuate that, for the hypothesis related to merchandising the data are not normally distributed).

Data Analysis

Before testing RQ1 it is necessary to provide an adequate description of the sample (DRQ1). The 173 respondents are 105 females and 64 males, while four individuals preferred not to specify their gender, with an average age of 24.38 years.

It is important to point out that, first of all the analysis considers the entire dataset, and subsequently, for answering to the research questions we will split the data for genders. Considering the declared level of education (as in the following graph Figure 1) we find that most of the respondents are represented by current three-year degree students at the university, the 76% of the respondents declared that they have a high school diploma, with a slight preponderance (39% of the total) with a Lyceum Diploma.

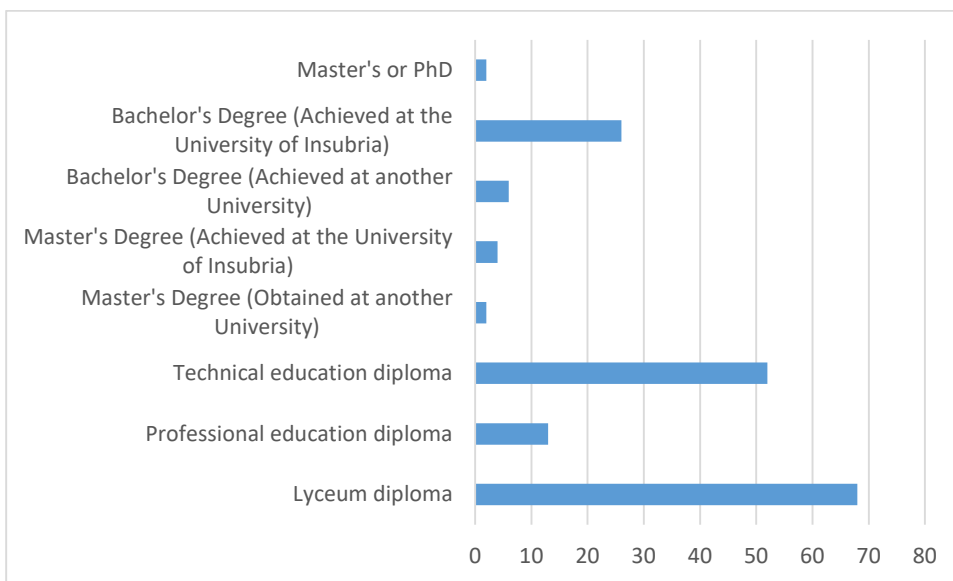


Figure 1 Educational qualification (Author's Own Source)

Considering the breakdown by the various departments of the University, it can be said that the percentages are representative of the distribution of students in the related degree courses.

As previously mentioned, before moving on to the actual relevance of some facets concerning the University Merchandising, some questions, related to Sustainability-Territory and Circular Economy were asked to the sample respondents. The first issue addressed is related to the Sustainable Development Goals (SDGs), and the first data that emerges is quite surprising as 55 respondents admitted that they do not know the Sustainable Development Goals. The remaining 68% (with varying degrees of knowledge) know the concept, its peculiarities, and what it represents.

Subsequently, we focused on a series of issues related to sustainability and asked for the student's personal evaluation through a scale (from 1 to 5) to understand the importance attributed to a series of actions and initiatives.

The same question was subsequently asked about how the same activities are implemented in the University and how the student in this area perceives them.

We focused on 12 aspects, and the average values are represented in the following table (Table 1).

Table 1 Sustainability Relevance and Importance (Author's Own Source)

Aspects	Personal relevance	Perceived relevance of the University's attention to the issue	Delta
Actions aimed at the sustainability of the environment and the territory	4.58	3.51	1.08
Fighting food waste	4.58	3.18	1.40
Initiatives for sustainable mobility	4.29	3.32	0.97
Sustainability initiatives developed with local actors	4.27	3.50	0.77
Gender equality	4.20	3.49	0.71
Specific initiatives promoted by the University (for example: Openday, Researchers' Night)	3.90	3.51	0.38
Sustainable university merchandising	3.64	3.71	-0.07
Educational offer (international)	4.29	3.62	0.66
Post-university educational offer (for example: Masters, Higher Education Courses)	4.20	3.39	0.82
Energy efficiency processes of university structures	4.54	3.22	1.32
Waste management	4.66	3.64	1.02
Scientific research	4.54	3.84	0.71

There is a relatively unambiguous answer, in fact in 11 cases out of 12¹, the importance attributed to the voice by the student is higher than the activities carried out and what the University can perceive externally. These results are a signal to be considered; in fact, the values related to these activities are pretty essential and, at the same time, are giving a message to the university that it is not be able to demonstrate, as it would be desired, the actual commitment to these rumors/actions. A possible conclusion in this regard is represented by a more significant future commitment from the University to understand the students' necessities in a more concrete and tangible way. The only item with a higher score between the student's relevance and the activity carried out by the University is the merchandising (low difference).

Subsequently, the questionnaire focused on the circular economy concept and its principles. The results, in terms of student knowledge, are relatively modest:

- 17 respondents defined themselves as citizens not attentive to sustainability and circular economy issues;
- 66 respondents affirmed that they were unaware of the principles of the Circular Economy.

Therefore, the remaining 90 were asked to rate, on a scale of 1 to 5, the importance of the three principles of the Circular Economy. Therefore, the remaining 90 were asked to rate, on a scale of 1 to 5, the importance of the three principles of the Circular Economy, obtaining similar results (more than 4.3, on average for the three principles). Finally, with reference to this section dedicated to sustainability and SDGS, we investigated, through two questions closed to multiple alternatives, the attention to sustainability and the reason that drive a consumer to choose a "sustainable product". The most selected alternatives are linked to purchasing eco-sustainable products and / or with some sustainability certificates. Secondly, respondents selected the purchase of products that comply with circular economy principles. On the other hand, considering the sustainability of a product, the majority of respondents, 62%, believe that a product, must be made with recycled raw materials, while another trendy alternative refers to the durability of the good, that it can replace disposable or shorter-lasting products. Considering Merchandising, only 134 respondents were able to answer to this section. The remaining 39 were unaware of sustainable merchandising at the University of Insubria and, for this reason, were excluded from the following analyses. To understand the propensity to buy and the importance placed by the respondent towards the new merchandising line, some statements were made and asked to evaluate the degree of agreement, likert scale from 1 to 5. In the following graph (Figure 2) there are the average values.

¹ All these aspects have been analyzed with a scale from 1 (minimum value) to 5 (maximum value)



Figure 2 Importance of Merchandising (Author's Own Source)

It is possible to understand a medium interest in the merchandising products, there is a clear relevance on sustainability. Considering the first two statements, it is possible to note that the degree of agreement is opposite, consequently the respondent provided, on average, a clear and favorable opinion towards the sustainability of the products.

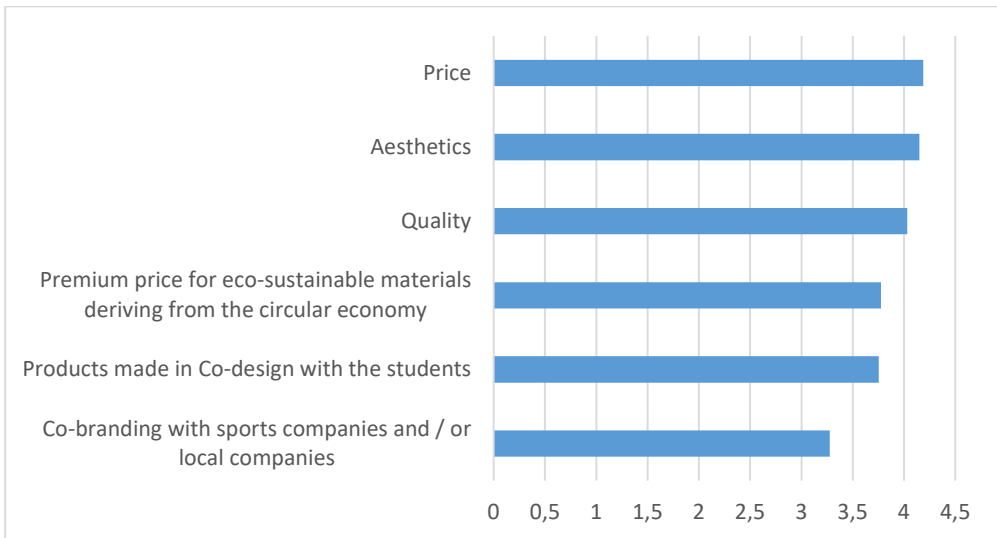


Figure 3 Features of merchandising (Author's Own Source)

Observing the previous graph (Figure 3), it is possible to note that the price is the characteristic deemed most important by the respondents. Furthermore, other interesting elements are represented by co-design and co-branding are evaluated with lower importance than the other items. After having outlined the sample from a descriptive point of view, the paper analyzed, through hypothesis testing techniques, if there is a different perception of these characteristics between women and men.

Results and discussion

As previously mentioned, the role of Gender and sustainability is widely discussed in the literature, for this reason, to solve our RQ1, different techniques of Hypothesis testing are used to analyze the data collected.

First of all, the level of knowledge of the SDGS defined by the UN 2030 Agenda is tested, in order to verify if there are any gender differences (as in table 2)

Table 2 Knowledge of SDGS (Author's Own Source)

Variable	Sample	Average level of Knowledge	Variance
Male	64	46.82	1497.86
Female	105	44.76	1329.71
Test Value	0.34		
P-Value	The P-Value is 0.73		

Due to the data (that are approximatively normal distributed) a Two-sample Z-test for means is used and there is no statistically significant difference between the two parts of the sample. For this reason, it is possible to affirm that, the knowledge of SDGS is similar for men and women.

Subsequently, using a Two-sample Z-test for means, we wanted to verify whether the importance of a series of aspects widely treated in universities has a different level of importance at the gender level (See table 3).

Table 3 Differences between importance and perceived value from university activities (Male sample=64; Female Sample=105) (Author's Own Source)

Variables	Mean Female	Variance Female	Mean Male	Variance Male	Z-Test	P-Value
Actions aimed at the sustainability of the environment and the territory	1.05	1.19	1.11	1.72	-0.32	0.74
Fighting food waste	1.45	1.5	1.33	1.53	0.61	0.54
Initiatives for sustainable mobility	0.95	1.57	0.98	2.14	-0.15	0.88

Variables	Mean Female	Variance Female	Mean Male	Variance Male	Z-Test	P-Value
Sustainability initiatives developed with local actors	0.8	1.06	0.75	1.31	0.29	0.78
Gender equality	0.95	1.4	0.3	2.43	2.9	0.004
Specific initiatives promoted by the University (for example: Openday, Researchers' Night)	0.43	1.29	0.27	0.98	0.98	0.33
Sustainable university merchandising	0.06	1.2	-0.27	1.7	1.66	0.09
Educational offer (international)	0.68	1.1	0.61	1.24	0.39	0.69
Post-university educational offer (for example: Masters, Higher Education Courses)	0.9	1.13	0.64	1.45	1.44	0.15
Energy efficiency processes of university structures	1.33	1.69	1.27	2.07	0.31	0.76
Waste management	0.99	1.34	1.08	1.32	-0.48	0.63
Scientific research	0.74	0.9	0.64	1.29	0.6	0.55

In this case it is denoted that, at the gender level, there are two aspects that are considered in a different and statistically significant way: the role of the sustainability of merchandising and the phenomenon of gender equality.

Table 4 Evaluation of behavior: attention to sustainability and circular economy. (Author's Own Source)

Variable	Sample	Percentage of sustainable behaviour in the day life
Male	64	0.85
Female	105	0.92
Test Value	1.4	
P-Value	The P-Value is 0.161.	

In the previous table (Table 4), using a Two sample Z-test of proportions (data are approximately normally distributed), the degree of attention declared by the respondents was assessed relative to the level of attention to the circular economy and the principles of sustainability in their day-life.

From a gender perspective, the percentage of sustainable behaviors is similar and not statistically significant.

In Table 5 the level of knowledge of the circular economy principles is analyzed using a Two sample Z-test of proportions (data are approximately normally distributed).

Table 5 Knowledge of the Circular Economy Principles (Author's Own Source)

Variable	Sample	Percentage of knowledge
Male	64	0.68
Female	105	0.42
Test Value	-9.18	
P-Value	P-Value is < .00001	

Considering the results of the test there is a higher statistical significance, which demonstrates a very different level of knowledge between men and women. Specifically, the average knowledge value of the men in the sample is 40% higher than the average value declared by the women.

Finally, as a final aspect of the analysis, we focus on university merchandising. Due to the Non-normality of the data, in this case, the Mann-U Whitney test is used.

Concerning this topic three characteristics are evaluated: General Interests, the propensity to purchase items, and the importance of sustainability in the products.

Table 6 Merchandising: aspects analysis (Author's Own Source)

Merchandising	
Interest	The Z-score is 1.78447. The p-value is .07508. The result is significant at $p < .10$.
Purchase Propensity	The Z-score is 0.77903. The p-value is .4354. The result is not significant at $p < .05$.
Sustainability of the products	The Z-score is 1.58728. The p-value is .11184. The result is not significant at $p < .05$.

Based on the results, it is possible to affirm that there is a general interest for female than male. While, for the other two characteristics, the level is similar.

For this reason, due to the tests' results, RQ1 is partially accepted, in fact, for some aspects, there are gender differences which cannot be generalized to all areas.

Conclusion

In this paper, the role of knowledge of a huge number of items linked with sustainability and circular economy is considered from the point of view of Uninsubria students. In addition, considering the actual renewal of the merchandising products, we have tried to analyse these elements' impact and relevance for this sample with a general overview and a gender perspective.

We want to understand their level of knowledge and the perceived importance of numerous activities and aspects of daily university life, as for the sample, how sustainability is perceived within the academic world. The role of sustainability, as emerged from the results, is strategic considering several points of view (teaching, research, third mission, socio-political activities) and is considered quite important by the sample of respondents. There is a general interest in sustainability with difficulties related to the topics of the circular economy, where knowledge is higher for the male respondents than the female side. Moreover, there is a huge interest in the female subsample but there are no statistically significant elements concerning propensity to purchase and sustainability. Considering the results and the response rate the role of merchandising seems quite relevant, but it is necessary to improve the communication to increase the importance of the products and, consequently, their diffusion and the sense of belonging to the university. The main limitation of the paper derives from the sample numerosity; In fact, to carry out statistical analyses the data is sufficient, but it cannot be considered a perfect proxy of this reality. Furthermore, considering a policy point of view, it will be necessary to understand more clearly the reasons that led a limited number of students (3% of the total) to provide their opinions.

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THE EFFECTS OF UNCERTAINTY LEVEL ON SCHEDULE DELAYS IN CONSTRUCTION PROJECTS

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Abstract. *A changing reality has become an everyday reality we must adjust to.*

Construction projects constitute an economic growth engine worldwide. There are many conditions affecting their success. The project manager must synchronize several work factors; the project’s workforce, necessary materials and timely delivery of work demand and availability, and site conditions. Project managers fulfill a significant role in driving the success of industry-oriented projects, such as construction. The project's ability to follow schedules, adhere to budget limits, and ensure project quality are all project success indicators.

In an ever-changing reality, traditional construction projects are challenging to manage while implementing methodologies that are neither change-sensitive nor flexible as they progress.

This study will focus on construction project management with frequent changes. The paper presents the findings of a study that examined the effects of various factors on project uncertainty and delays in project schedules. A few variables examined were the project manager’s seniority, the assimilation of new systems, and changes that occurred while the project was running. Though construction projects are run worldwide daily, each project is unique due to specific aspects of the construction site and the circumstances of construction activity.

The above is supported by the notion that construction requires coordination of the involved parties and the necessary materials. Other unexpected factors, such as last-minute changes or unreliable vendors, may also lead to difficulties in ensuring that construction projects are completed on schedule.

The construction industry is expected to adapt to global changes and challenges and render construction projects swifter, more efficient, and flexible to change operations while learning about the generation of project managers growing in the industry.

This article addresses the effects of the changing reality on construction and delays in construction projects, emphasizing project management methodologies.

Keywords: *business management; project management; construction industry; changing reality; organizations change.*

Introduction

Across the globe, trillions of dollars are invested in public and private construction projects. The volume of construction activities is often directly related to a given

country's development. A construction project is a combination of activities carried out during a project's life cycle. One of the main objectives of the project is to ensure its success. The project's success factors are affected by the changing construction environment as the project is in the process (Naderpour, Asgari, & Kheyroddin, 2018). Quantitative results from this study may interest public construction clients, developers, project managers, planners, and contractors, as they shed light on the factors that significantly affect the project's success. The causes of schedule deviations are the focus of the research, aiming at expanding the knowledge relating to reducing variations. Understanding the root causes of the deviation may promote narrowing the extent of schedule deviations in construction projects.

The World Economic Forum figures published indicate that the world's population in urban areas has grown by two hundred thousand (200,000) per day. The construction industry is the number one supplier of raw materials and air pollution. However, the future design of construction has attained a breakthrough in thinking and technology (The Boston Consulting Group, 2016).

Given the small number of publications relating to schedule deviations, delays and the integration of more flexible project management techniques in the management of construction projects, the publication of the findings may enhance the understanding of the construction project delays phenomenon toward the reduction thereof. Also, this study's findings may affect the international setting, where similar issues to those experienced in the Israeli construction setting are observed in the local projects.

Due to frequent changes, significant decision-making dynamics have formed, resulting in rapidly changing global transformations. With the Covid-19 pandemic, problems arose in the worldwide supply chain that led to a rise in prices and delays in the delivery of raw materials. All those, affected project management processes and caused scheduling delays.

Consequently, all parties involved in the project encounter unnecessary conflicts, inconsistent work methods and norms, and inefficient use of valuable time and resources. The literature review characterized construction projects by several significant milestones: characterizing needs, initial planning, detailed planning, tender writing, contractor selection, agreement preparation, initial construction, and delivery (Ahmed et al., 2003)

In April 2022, the World Bank publication indicated that the Ukraine conflict had triggered the biggest commodities price shock in nearly 50 years, and the impact on food and energy is going to last until 2024 (The World Bank, 2022)

In addition, raw material delivery times are still affected by COVID-19. Furthermore, with the developments occurring globally, the sizes of construction projects have grown in scale, often with more complex interfaces, longer life cycles, and the involvement of more construction practitioners. Thus, traditional project management methods may no longer be suitable for managing these more complicated construction projects. The challenges stemming from global developments have rendered the implementation of construction projects even more complex; thus, successful management of construction projects is more difficult to attain (Chou & Yang, 2012).

Literature review

Many studies have been conducted about the factors that cause delays in construction projects in schedules and budgets worldwide.

This review summarizes the main causes of deviations in construction projects schedules and budgets in some articles and research.

In their paper, Sadi A. Assaf & Sadiq Al-Hejji (2006) identified 73 causes of delay through a field survey. Three parties participated in it. The common causes of delay arose from all parties were [1] change order by the owners during construction to avoid delay, [2] delay in progress payment, [3] ineffective planning and scheduling, [4] shortage of labor, [5] difficulties in financing on the part of the contractor.

The Project Management Body of Knowledge (PMBOK) was established to provide project management guidelines and set standard terminology for project management. The most current PMBOK® Guide outlines ten Project Management Knowledge Areas. Studies in China have indicated that adherence to the PMBOK® Guide may significantly affect the overall performance of international construction projects (Ling, Low, Wang, & Egbelakin, 2008; Chou & Yang, 2012). As one of the ten Project Management Knowledge Areas, Project Schedule Management affects performance, which is also the key to a project's successful and timely completion, largely dependent on effective schedule management.

Towhid Pourroostam and Amiruddin Ismail (2012) surveyed to identify the causes of delays in construction projects. A questionnaire with 28 causes and six effects for delays is investigated. It highlighted the ten major factors that reduce client, consultant, and contractor delays. In the published paper of Narayanan, Chidambaram Ramanathan & Idrus (2012), the authors conducted a worldwide survey addressing delay factors and classified. The survey identified 113 causes of delay, and they are grouped into 18 different categories. The causes are analyzed and investigated through Importance Weight, Weighted average, Mean Standard Deviation, and Variance. The first five ranks in different studies are concluded from this paper.

Owolabi, Olusanya et al. (2014) indicated that in the project they surveyed, the causes and effects of delay on delivery time were investigated. A random sampling method was used in this study. The sample taken for this project is a population sample of 150, and a total sample of 93 was deployed. A questionnaire structured in the Linkert scale was used in the data analysis. From this investigation, the client has the highest value, 51.1%, with contractors having 35.5%, and the consultants having 13.3% of causes of delay in construction projects. The 15 factors are identified and ranked according to the mean index score. A factor includes lack of funds, adequate information from consultants, slow decision-making, and insolvency of contractors.

Most construction industry organizations cannot conduct the project in each period. It represents the factors that affect the project in both civil engineering and construction project. It has also been seen that the construction industry's management staff takes more time than the state before starting the project. It is one of the big issues in the corporate sector. Harris, McCaffer, and Edum-Fotwe (2013) stated that completing the project within time is an efficient project in the construction industry.

Methodology

A quantitative research approach is implemented in this study to examine the compliance of projects to the schedule set for the project and the effect of incorporating changes during the planning and execution of the construction project to the project schedule.

This study aims to identify changes that have taken place throughout the management of construction projects and their influence on the project's success in meeting the schedule.

The research objectives are to discover the effect of uncertainty during the project on the number of changes and delays in the schedule set at the beginning and to identify the effect of uncertainty during the project when new systems, materials, or teams are involved.

Considering the above, this study's hypothesis is as follows:

1. Identify if the worker's seniority is strongly related to the project characteristics and schedule.
2. To understand the differences in the assessment project, uncertainty degrees will be identified between males and females.
3. To identify the differences between the various positions and roles in assessing the level of uncertainty degree.

The target population was given questionnaire surveys comprising several sets of well-recognized delay causes in order to gather primary data for the research. The questionnaires evaluated the relative importance of the various factors causing delays. In the field survey, the respondents were asked to indicate each cause's degree of contribution to the delay using the Likert five-point scale ranging from 1 (Very Low) to 5 (Very High).

The project's uncertainty degree will be examined using a translated questionnaire from research by Lederer & Prasad (1998). This questionnaire consists of 17 items and addresses the following two variables:

1. System characteristics (questions 1-10).
2. Project staff characteristics (questions 11-17).

The above variable consists of a five-point ordinal scale, with 1 indicating 'not true and 5 points indicating 'very true, addressing the project's uncertainty degree based upon the degree of truth. The variable's research-related reliability is 0.79.

The questionnaires were distributed to 45 experts in the construction industry and were answered by 41 participants, 91%.

51% of the participants were men, and the rest (49%) were women.

Participants in the survey are architects, contractors, and consultants with significant experience in Israel's public, commercial, industrial, and private construction.

Of eighteen participants, 43.9% were architects, 15 participants, 36.5% were contractors, and 8, 19.6% were project managers.

The age range for the participants is 24 to 65, where age 65 is the most frequent (mode of distribution).

The average age of the sampled population is 44.6 years. The seniority is between 1 and 24 years. The average seniority is 11.3 years.

The study assumes that integrating new materials or teams into the project causes intensified uncertainty in the project.

The significant uncertainty affects the schedule delays. The data collected were analyzed using graphs, charts, and tables.

The dependent variable is the uncertainty degree in the project and is composed of system and project team characteristics.

The independent variables are gender, job title, and work seniority.

Table 1 Outlines the variables (Author's Own Source):

Variable type	Variable name	average	Standard deviation	range	reliability
Dependent	System characteristics	3.35	0.56	2.5-4.25	0.69
Dependent	Project team characteristics	3.2	1.06	1.83-4.83	0.72
Dependent	Uncertainty level	3.25	0.59	2.14-4.14	0.7
Independent	Seniority	11.3	3.6	1-24	
Independent	Job title	Categorical variables			
independent	gender				

The average uncertainty degree within the project, which consists of staff and system characteristics, is 3.25 points on a five-point scale. This value implies a relatively high uncertainty degree and a greater, more significant impact of changes on the project. System characteristics are more uncertain than staff characteristics (a 3.35-point average, compared to 3.2 points). Table 2 indicates a high reliability of parameters (0.69-0.72 based upon Cronbach alpha). Hence, this data item indicates that the questions comprising the parameter were derived from the same content area, thus providing a reliable and sufficient indication of the tested parameter. There are positively correlated variables.

Seniority is positively correlated with project uncertainty/the different characteristics have a medium to strong significant correlation with project uncertainty.

The strength of the effect (characteristics on uncertainty) grows with the participant's belief regarding the characteristic's importance.

To test hypothesis number 1, that there is a significant relationship between seniority and project characteristics, we performed Pearson's correlation analysis. We found a positive strong correlation ($p=0.00$, $r=0.3$), a positive significant correlation between

seniority and project team characteristics ($p=0.01$, $r=0.29$), and the general level of project uncertainty ($p=0.01$, $r=0.3$).

To test hypothesis 2, that there will be a significant difference between the number of males and females regarding the evaluation of project uncertainty, we performed a t-test for the independent samples.

To test hypothesis number 3, that there will be found significant differences in the valuation of different variables on project uncertainty based on job title, we performed one-way ANOVA statistical tests.

To test the predictive capacity of variables regarding the uncertainty level of the project, we performed multiple regression analysis and present the results in table 2:

Table 2 Regression analysis (Author's Own Source)

Variable	B	β	t
Cons.	0.40		4.72
System characteristics	0.23-	0.20	3.30
Human resource characteristics	0.35-	0.36	3.39
seniority	0.51	0.17	3.15
Gender (male=1)	0.02	0.01	0.34
Architect (Dummy variable)	0.66	0.46	3.22
Project manager (Dummy variable)	0.09	0.20	3.08
	0.12	0.31	3.08

In table 2, the results of multiple regression are displayed. As a part of the analysis, sociodemographic and professional variables known to affect uncertainty levels were controlled (job title, system characteristics, seniority, and gender). The model was statistically significant ($p=0.04$) and explains a large fraction of the data variability ($R^2=0.428$).

Results and Discussion

In the construction industry, delayed performance means exceeding the performance time fixed by the contract or the project delivery date. Delay results in fiscal implications (Lo et al., 2006). Prominent arguments concerning time are, in fact, the contractor's demand to extend the course of the project or a specific activity relating thereof exceeding the agreed time, defining the deviation during the project and its costs. Project schedule delays directly affect the project's budget. If a public project is concerned, the issue may become political.

This study is part of doctoral research exploring the key factors affecting schedule delays in construction projects within an ever-changing reality.

This part of the research shall notify entrepreneurs and project managers of factors bearing the most significant effects on schedule deviations in construction projects.

Considering the few publications addressing his subject matter, this research will also bear implications on the construction set by the international arena. The publication of results may enhance the understanding of the schedule delay phenomenon and enlighten the public construction customers, entrepreneurs, project managers, planners, and contractors as to the delays' source, thereby reducing the construction schedule deviation scope.

This article presents the results of the quantitative research, which was conducted by means of a questionnaire that was filled out by 41 professionals in the construction area, architects, project managers, contractors, and entrepreneurs, who were asked about the factors contributing to uncertainty in construction projects.

Some of the questions addressed the influence of new, inexperienced project managers on the uncertainty of the project and its success, assimilation of new electro-mechanical systems or changes throughout the course of the project, etc.

There is great importance to the availability of raw materials, as 70% of the respondents indicated that factor as having a high effect on the project's uncertainty degree. These days, with the war in Ukraine and COVID-19 waves from Asia, we witness major delays of raw materials to the delivery construction branch worldwide, which greatly delays project completion. Additionally, those delays cause higher costs in the construction branch and the world economy in general.

63% mentioned that when a project is based on an electromechanical system, the workers don't have enough experience, which is a significant factor affecting project uncertainty. In cases where the project relies upon an electro-mechanic system or other systems with which the workers have no experience, the project's uncertainty and schedule delays are greatly affected.

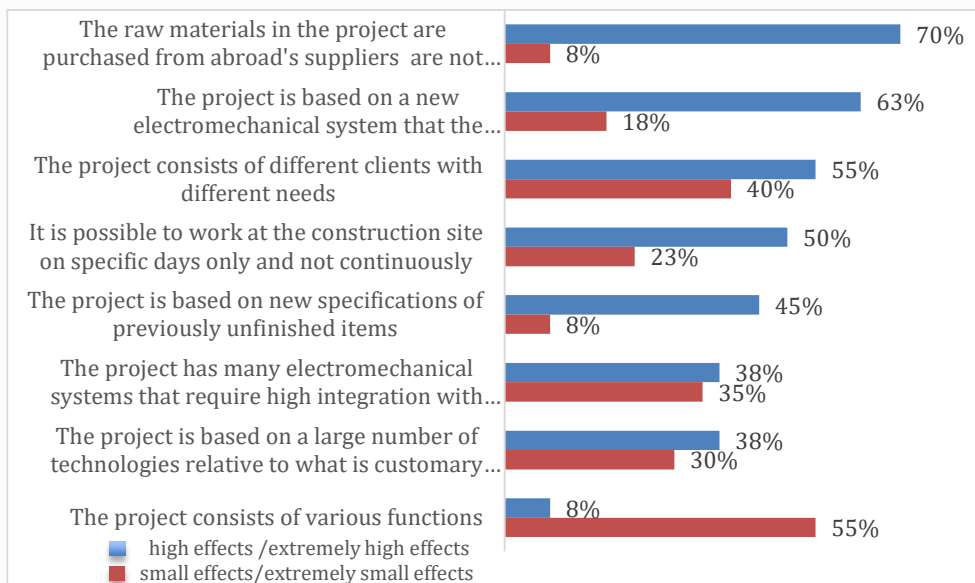


Figure 1 The distribution of extreme answers to the effects of the electro-mechanical system (Author's Own Source)

There is currently a lack of around 33 thousand foreign and Palestinian workers, and there is a significant saving in Israeli labor in the "wet" professions - out of 206 Israelis, only about 18 Israelis work in these professions. Israelis are reluctant to work in the field mainly because of the low image that has been "infected," lack of clarity about the work horizon, erosion, and awareness of reward and promotion options. According to the ISRAEL BUILDERS' ASSOCIATION and based on the International Economy and Business findings, we are witnessing a scarcity of employees in the construction field (<https://en.acb.org.il>).

In this study, 75% of the respondents indicated that the availability of manpower is of a great effect on a project's uncertainty, while 80% indicated the staff's lack of experience as a key resource affects the project's uncertainty degree.

The greater the employee's seniority, apparently the various characteristics are of greater affect the project's uncertainty degree. The various characteristics have a significant, medium, to strong positive effect on the project's general uncertainty degree. The greater the value attributed by the respondent to those characteristics, the greater their effect on the project's uncertainty degree.

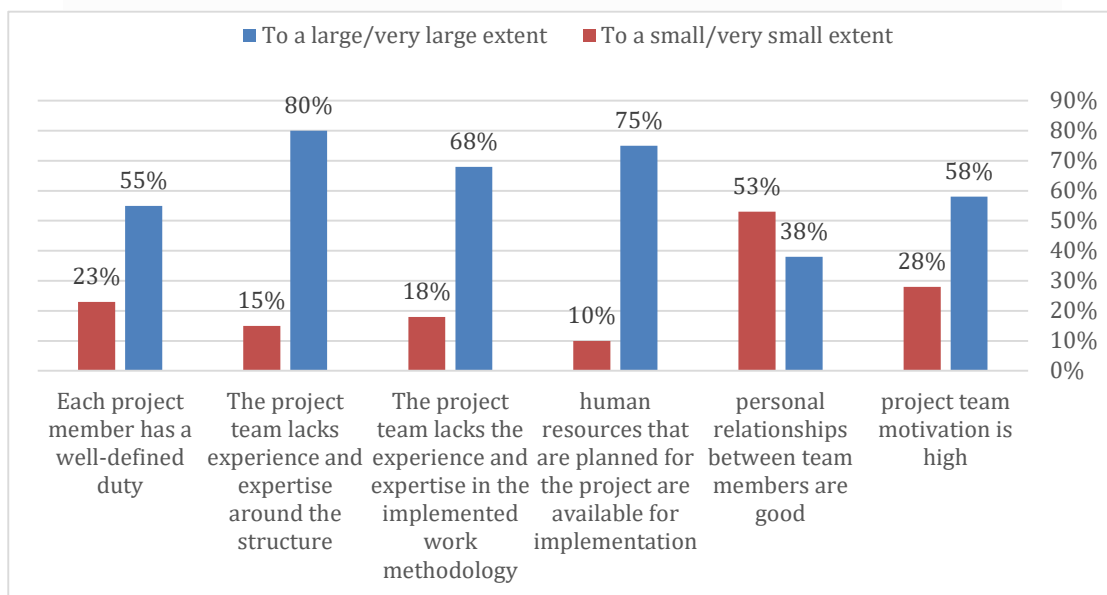


Figure 2 The distribution of extreme answers effects of human resources (Author's Own Source)

According to the study's hypotheses, this research, too, suggests issues relating to skills, professionalism, and availability of personnel in the branch, affecting the project's uncertainty, which, in turn, affects the meeting of the project's deadlines.

1. The worker's seniority is strongly related to the project characteristics.
2. Differences in the assessment project's uncertainty degree will be identified between males and females.
3. Differences between the various positions in project uncertainty degree will be identified.

Table 3 Pearson correlations between the study variables (Author's Own Source)

variable	1	2	3	4	M	SD	N
seniority		**0.3	**0.29	**0.3	11.3	3.6	41
System characteristics			*0.17	**0.34	3.35	0.56	41
Team characteristics				**0.29	3.2	1.06	41
Uncertainty level					3.25	0.59	41

*p<0.05 **p<0.01

Based on table 3, there are positively correlated variables.

Seniority is positively correlated with project uncertainty/the different characteristics have a medium to strong significant correlation with project uncertainty.

The strength of the effect (characteristics on uncertainty) grows with the participant's belief regarding the characteristic's importance.

Hypothesis 1 was reinforced, meaning that as the worker has more seniority, he will put more weight on system and project team characteristics having more influence on project uncertainty.

Table 4 shows the average effect of system characteristics as slightly higher for males (3.37 vs 3.34), but the difference is not significant (p=0.25). meaning males and females, on average, valued similarly the influence of system characteristics on project uncertainty.

Table 4 The average effect of system characteristics (Author's Own Source)

Table 4	The influence of system parameters among males N=21	The influence of system parameters among males N=20	t(39)=0.36, p=0.25
Average M	3.37	3.34	
Standard deviation SD	0.6	0.5	

In table 5, the average perceived influence of project team characteristics is slightly higher for males vs. females (3.25 vs. 3.16), but the difference is not statistically significant (p=0.38), meaning males and females on average values similarly the effect of project team characteristics on the uncertainty level in a project.

Table 5 The average perceived influence of project team characteristics (Author's Own Source)

Table 5	The influence of project team parameters among males N=21	The influence of project team parameters among males N=20	t(39)=0.17, p=0.38
Average M	3.25	3.16	
Standard deviation SD	1.07	1.02	

In table 6, the average perceived level of project uncertainty is slightly higher for males (3.3 vs. 3.2), but the difference is not statistically significant (p=0.15), meaning males and females, on average valued similarly the effects on project uncertainty. Based on the displayed results, the hypothesis was rejected at the alpha=0.05 level regarding the effect of gender on the valuation of the effects of different variables on project uncertainty.

Table 6 The average perceived influence of project team characteristics (Author's Own Source)

Table 6	The influence of uncertainty among males N=21	The influence of uncertainty among males N=20	t(39)=0.44, p=0.15
Average M	3.3	3.2	
Standard deviation SD	0.57	0.6	

Based on table 7, the influence of system characteristics among architects is higher than the average of contractors and project managers (3.38 vs. 3.34/3.3), but the difference is not statistically significant (p=0.13), meaning on average, there is no influence of job title on the perceived effect of system characteristics on project uncertainty.

Table 7 The average perceived influence of project team characteristics (Author's Own Source)

Table 7	Sample size N	Average system characteristics M	Standard deviation SD
Project manager	8	3.30	0.60
architect	18	3.38	0.56
contractor	15	3.34	0.58

*p>0.05

Based on table 8, there is a slight difference for project managers regarding the effect of the perceived project team characteristics on project uncertainty (3.26 vs. 3.16/3.2 for contractors and architects), but the difference is not significant ($p=0.17$), meaning there is on average no effect of job title on the perceived influence of project team characteristics on project uncertainty level.

Table 8 The average perceived influence of project team characteristics (Author's Own Source)

Table 8	Sample size N	Average system characteristics M	Standard deviation SD
Project manager	8	3.26	0.90
architect	18	3.20	1.05
contractor	15	3.16	1.09

Based on table 9, the average perceived level of architects on the effect of overall variables on the uncertainty level in a project is higher than in other professions (3.3 vs. 3.2/3.28 for contractors and project managers) this effect is not statistically significant ($p=0.15$), meaning on average there is no effect of job title on the perceived influence of different variables on project uncertainty

Table 9 The average perceived influence of project team characteristics (Author's Own Source)

Table 9	Sample size N	Average system characteristics M	Standard deviation SD
Project manager	8	3.28	0.63
architect	18	3.30	0.60
contractor	15	3.20	0.62

Based on the analysis displayed, we reject hypothesis 3 and conclude that there is no influence of job title on the perceived effect of different factors contributing to project uncertainty level.

According to the Ministry of Construction and Housing of Israel, the 2019–20 coronavirus crisis created a wide range of social, economic, health, educational, and more implications. In doing so, the State of Israel faces many issues that the decision-making of the matter will throw at the State of Israel in the short and long term. These issues include the issue of employment in the construction industry, while the Ministry of construction and Housing seeks to bring additional foreign workers into the industry to increase the volume of activity in the industry—a step that has many meanings, including answering the demand for housing units and the potential to generate growth throughout the economy, and the need for housing units and the development of the economy. The Ministry of Finance opposes the fear of reducing the employment of Israeli workers in the industry.

This study will call the attention of developers and project managers to factors that have the most significant impact on schedule deviations in construction projects in Israel. Given the small number of publications on this topic, the study's findings will also have implications for the construction set in the international arena. The publication of the

results can contribute to a deeper understanding of the phenomenon of schedule delays, to draw the attention of public construction clients, developers, project managers, planners, and contractors to the root causes of delays, thus leading to a reduction in the extent of schedule deviations in construction.

To sum up, in a dynamic world, which undergoes daily changes, and is characterized by scarce professional, experienced manpower, also experiencing issues of raw material supply at construction sites, as well as global changes affecting large organizations, agile methodologies are necessary to manage traditional construction projects, which will facilitate the project managers in reducing construction projects' uncertainty and risks, while increasing the likelihood of timely project completion.

Even though construction projects are still traditional, carrying out changes throughout the work is difficult, and even though construction projects are managed by means of traditional project management methods, such as the waterfall, flexible management methods such as AGILE and others are to be integrated into the work, so as to facilitate project managers' coping with the frequent changes brought by the construction branch.

The lack of construction workers, along with schedule exceptions in construction projects due to the impact of raw materials on the construction industry, as shown in the research literature review outlined in the study shown in this article, presents significant problems with delays in building schedules.

In a dynamic world, which undergoes daily changes and is characterized by a rare professional and experienced force, also experiencing issues of providing raw materials on construction sites, as well as global changes affecting large organizations, there is a need for quick methodologies to manage traditional building projects, which will allow project managers to reduce the uncertainty and risks of building projects, and to provide new building projects. Increasing the likelihood of completing the project in time.

Even though building projects are still traditional, it is difficult to make changes during work, and even though building projects are managed through traditional project management methods such as the fall of the water, flexible management methods such as AGILE and others in the work should be combined to make it easier for project managers to cope with the frequent changes that bring the construction industry.

This study will turn the attention of entrepreneurs and project managers to the most significant impact factors on schedule deviations in building projects in Israel. Given the limited number of publications on this issue, the research findings will also have implications for the construction set on the international stage. Publishing the results can contribute to a deeper understanding of the delays in the schedule, bringing attention to public construction customers, entrepreneurs, project managers, planners, and contractors to the root of delays, thus reducing the number of exceptions in the construction schedule.

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THE POOR IMAGE OF THE X-RAY TECHNICIAN PROFESSION AND HOW IT AFFECTS SUPPLY

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Abstract.

X-Rays technicians are the link chain between medical knowledge and the inner world of the human body. These operate as any physician's vision tool for investigating the human body in diagnosing illnesses. Due to global technological advancement, diagnostic investigations have developed tremendously in the last 15 years. Today, there are several complex diagnostic tests and procedures, such as computerized tomography (CT), magnetic resonance imaging (MRI), mammography, ultrasound, heart catheterization, blood vessels catheterization etc. All these changes have created a high demand for qualified hi-tech healthcare workers, the X-Rays technicians being the third largest group among healthcare professions. Still, the general public is less familiar with or unaware of the profession, its work areas, and the options it could provide. Except for a few countries, the supply of X-Rays technicians to the labor market is quite low. This study investigates the relationship between the professional image and the low supply of X-Rays technicians. It also explores the perceptions of research participants regarding X-Rays technician profession. The study uses a qualitative research methodology by applying semi-structured interviews in which ten participants – people interested in pursuing academic studies - discussed potential career paths and future professional subjects. Specifically, the interviewees revealed two main issues: lack of knowledge of the X-Rays technician profession and misconception about a profession that deals with ionizing radiation. The interview findings indicate a poor image of X-Rays technician profession. Study indicates that professional image is poor due to misconception regarding the profession and of a profession conducted in an ionizing radiation work environment. Moreover, it shows that professional image is essential in people's decision not to choose or learn about this profession, compromising the supply of professionals in the field.

Introduction

Supply is a term in economics that defines a relationship between the product's price and quantity. It illustrates an inaccurate estimate of the number of products and services produced and offered for sale on the market (Arrow, 1974; Ministry of Education, 2020). According to The International Committee for Medical Imaging, there is a lack of imaging equipment and X-Rays technicians in countries with low-to-medium income (Frija et al., 2021).

McNulti (Rouger, 2018), president of the European Federation of Radiographer Societies, states that 50% of European countries produce too many X-Rays technicians, and the other 50% experience lack of workers in this profession. In the United States, Radiology departments reported an 8.5% understaffing of X-Rays technicians (American Society of Radiologic Technologists, 2019). In Israel, there is no updated database with the number of X-Rays technicians (State Comptroller, 2015),

As a result of the technological progress in medical imaging systems, the increased use of imaging equipment due to the higher frequency of chronic diseases, and the rise in the population's age, advanced imaging technologies are required for driving the market growth in innovation and the demand for more professionals (Report Linker, 2022).

The low supply of X-Rays technicians on the market entails severe problems in the economy's way of conduct. For example, the Israeli Ministry of Health authorized five imaging machines to diagnose diseases and tumors in hospitals. However, in practice, there is a severe lack of X-Rays technicians to operate the machine and radiologists to analyze the tests. One has to wait a long time for scheduled appointments, and the diagnosis of the patient's tumors is delayed (Blumenfeld, 2018).

Given the severe data about the low supply of X-Rays technicians, it is imperative to conduct a study to identify the components that affect the supply. Hence, this study investigates the reasons for the low supply, based on the assumption that the X-Rays technician profession has image problems that compromise the supply.

Literature review

Choice of a profession

Choosing a profession is, in fact, a process of making a difficult decision, and it involves an element of uncertainty. People who have to decide which profession to choose must deliberate between various options and compare the various professions. The choice involves information collection and processing, together with a whole set of considerations.

In Israel, there is a unique feature for choosing a profession, namely military service, that discontinues the sequence between high school and academic studies. People start their studies later, and the choice is perceived as more meaningful (Gati, 2016). One factor that affects the choice of profession is the availability of information sources. Receiving counseling, orientation, and intervention program already at high school can assist individuals in their choice of profession.

X-Rays technicians – Worldwide training pathway and regulation

The term X-Rays technician encompasses X-Rays imaging, MRI, CT, nuclear medicine, and ultrasound. Hospital departments that perform these procedures are called imaging institutes or radiology departments. The imaging system might considerably differ, and not all imaging machines use ionizing radiation (U.S. News & World Report, 2021). Several training pathways in Israel award a B.A. or B.Sc. degrees, and the studies last 3-3.5 years (Ministry of Health, 2021). Moreover, this profession is not regulated by law (State Comptroller, 2015).

European countries have no regulation of the X-Rays technician profession, and various national rules exist. As a result, the degrees change, and some countries have more than one degree for various specializations. Most European institutions grant a B.A. with

various specializations, and the duration of the programs ranges between 3 to 5 years (Couto et al., 2017).

In the United States, there is an educational program on X-Rays technology. Those who wish to be qualified as registered technologists, should complete an X-Rays technician training in a program accredited by the Joint Review Committee on Education in Radiologic Technology. The X-Rays Certification Programs are available for a certificate, associate technician, and graduate studies. In most American states, the programs last between 1-4 years. According to the American Society of Radiologic Technologists, 11 states have no laws regarding X-Rays technicians' license (Best Colleges Organization, 2021). The legal regulation of the X-Rays technician profession in the various training pathways, might result in numerous and different perceptions of this profession among the global public and, thus, undermine its professional image.

The professional image of X-Rays technicians

X-Rays technicians are perceived as workers who just "press the button". They do not enjoy the occupational prestige of other healthcare professionals. A study conducted by a group of physical therapists and occupational therapists showed that the physical therapists had classified the X-Rays technicians in the last place. In contrast, occupational therapists classified them in the 12th place among healthcare professionals (Collins & Nolen, 2002). In 2021, X-Rays technicians were ranked 71 out of the 100 best positions around the globe (U.S. News & World Report, 2021).

Misconceptions of the X-Rays technician profession

Mankind is continuously exposed to natural radiation, referred to as background radiation. In most areas, natural radioactivity is slightly different, and the annual average is mSv2.4. This radiation in Israel and Romania is within the range of the annual average. However, in certain places around the world, there are high deviations from the normal levels, and they are known as areas with high background radiation, up to 100 times higher than the annual average, such as Ramsar, a city in northern Iran with an mSv 260 (Silveiraa et al., 2012). Cytogenetic studies and epidemiological monitoring of this issue do not show meaningful differences between people living in areas with high background radiation compared to those living in areas with average background radiation (Israel Atomic Energy Commission, 2011; Jolyon, 2009; Krishnan, 1990).

X-Rays technicians operate radiation-emitting equipment and, during their work, are at risk of exposure to ionizing radiation at different levels. (Romano, 2012). The annual average exposure of workers in an ionizing radiation environment is less than one millisievert. (Haruz-Waschitz, 2004).

**Table 1. Risks of working in a work environment with ionizing radiation
(Author's Own Source)**

	From the 1940s to 2010	From 2010 to the present
Studies of work environment with ionizing radiation and cancer	There is a relation between work in an ionizing radiation environment and an increased risk of various types of cancer (Steven, 2006; Shinji, 2004; Wakeford, 2009).	It cannot be proven that the low radiation to which X-Rays technicians are exposed during their work constitutes a considerable risk factor and increases the risk of cancer (Kitahara, 2018; Preston, 2016; Terrence, 2015).
The reasons for the change in the findings.	Higher exposure and being unaware of protection against radiation (Shinji, 2004).	Technological development of equipment that reduced exposure to radiation, and deeper epidemiological understanding of the way studies are conducted. (Waldermar, 2012).

Table 1 illustrates the differences in studies that have examined the relation between X-Rays technicians' exposure to radiation during their work and a higher risk of getting sick with various cancer types between the early years (1940-2010) and later years from 2010 until these present days.

The public's level of knowledge about ionizing radiation

Studies conducted among the wide population, exploring its knowledge and perception of ionizing radiation and its risks, found that a large part of the public does not have the necessary knowledge about this topic. A study conducted in Jeddah (Nasr et al., 2019) indicated that only 3% out of 244 research participants had knowledge about ionizing radiation, and they had misconceptions of the actual risks of exposure to it. In another study conducted in Vermont, the participants with a higher education level than the average were asked about the real risks of radiation exposure. The results showed that they had many misconceptions of the actual risks of ionizing radiation, particularly when imaging tests were performed (Evans et al., 2015).

A study conducted by Sesen and Ince (2010) hypothesized that there was erroneous information about radiation and radioactivity on the Internet and that erroneous information led to misconceptions. The research findings illustrated that the search engine preferred by students was Google, offering quite a high number of websites with wrong and insufficient information about radiation and radioactivity.

Hence, this study is important, since it aims to find solutions for improving the supply of X-Rays technicians, by exploring the perceptions about this profession and the factors involved in the formation of misconceptions about the X-Rays technician profession.

Methodology

Research method and research population

This study was conducted according to qualitative research paradigm. The participants were individuals who were interested in academic studies and did not know which profession to choose. The interviewees were chosen according to the "snowball" method. That is, moving from one interview to another by contacting friends who had children over the age of 18 who did not know what to study and which profession for life to choose. All the interviewees signed an informed consent form, demonstrating their agreement to participate in this study. They were guaranteed that their anonymity and confidentiality of their details would be maintained.

Research instruments

At the beginning of the interviews, the participants received an explanation regarding the research aim: "To examine the factors involved in the image of the X-Rays technicians". The interviews were conducted face-to-face, they lasted 20-30 minutes, and were recorded (after receiving the approval of all the participants). The interviews were conducted in three stages.

The first stage comprised general questions about the following topics: acquaintance with the X-Rays technician profession; knowledge of ionizing radiation; considerations for choosing a profession.

At the second stage, the same ten interviewees received true and relevant information about the X-Rays technician profession: pertinent information about ionizing radiation and risks thereof. The information was taken from the empirical literature on this field. In the third stage, after receiving and complementing the lacking knowledge, those ten interviewees were asked general questions related to their level of interest in the profession; level of apprehension from working with ionizing radiation; perceptions of the profession; and so on.

For due diligence purposes, it should be indicated that the researcher herself is an X-Rays technician who manages the imaging setup of Assuta Medical Centers in Israel. She has previous acquaintance with some of the interviewees but is not familiar with others. This attests to involvement and the ability to understand the interviewees' experience deeply. Patton cited in (Shkedi, 2003) argues that to understand the investigated topic, one should be part of it and remain distinct from it. Consequently, researchers should be aware of their positions. This study's researcher invested efforts to remain loyal to the interviewees' words.

Data analysis method

After every interview, the recorded interview was transcribed, and its content was analyzed. The transcribed material was read, and initial ideas for categories were marked next to the transcription. Then, the text units were divided into categories and consolidating and arranging the themes began. A citation was inserted in each theme, clearly manifesting the interviewee's position. This stage helped the researcher note and analyze the results that constituted part of the data analysis. When writing the results, the findings were described in relation to the chosen themes (Shkedi, 2003).

Results

First theme: Misconceptions of a profession that involves ionizing radiation, before and after information delivery.

Category 1: Lack of knowledge about ionizing radiation.

The content analysis showed that most interviewees did not know ionizing radiation. This was attested by the interviewees' words when they answered questions related to ionizing radiation. Before delivering the information, eight out of ten interviewees knew nothing about ionizing radiation and, some of them, gave wrong answers. Two interviewees had just a little knowledge. For example: "I do not know exactly what ionizing radiation is"; "ionizing radiation that is above ultraviolet wavelength, how many wavelengths that means, I cannot say".

Evidence of little knowledge about ionizing radiation: "I don't know how the sensor absorbs the radiation back... what you see on the final picture"; "radiation emitted naturally from planet earth has a scale... this is about 2".

After receiving the information, the interviewees were surprised to find out and learn new information about radiation, a topic about which they knew nothing before. For example: "I received new information also about background radiation that varies in different countries"; "I am constantly exposed to radiation, around the globe, and in Brazil, it's much higher".

To sum up, delivering information about radiation can change the misconceptions of the imaging profession and favorably affect its choice as a career. Eight of the ten interviewees pointed out they had misconceptions about radiation before receiving the information, while two stated no such misconceptions.

Category 2: Apprehension of ionizing radiation.

The content analysis illustrated that people had very little information about ionizing radiation, and part was wrong. Hence, they were apprehensive of and concerned about radiation. Before receiving the information, the interviewees mentioned that they thought that people working in an ionizing radiation environment had higher chances of becoming sick with cancer. Nine out of the ten interviewees responded that radiation workers were more likely to get cancer, compared to those who were not radiation workers. For example: "I know that people can at least protect themselves"; "Yes, radiation can cause damage"; "Of course, it is risky".

Individuals who had to choose a profession, obtained knowledge from personal experiences that left an impression about radiation. For example: "In the past, I underwent an imaging procedure near some machine. They placed me in a really big machine, but I do not remember it precisely because I was very young and they argued whether this involved radiation or whether to have radiography".

After delivery of the information, the interviewees were asked about their apprehension of radiation. They stated that they were apprehensive, but their apprehension level was decreased. Eight out of the ten interviewees indicated that their apprehension was reduced, while two said they had no apprehension even before the delivery of the information. The interviewee's answers evidenced this: "Immediately after hearing about the radiation, which is cancerous, this is frightening and discouraging. Now, after the explanation, I am much less apprehensive"; "This renewed many things for me and reduced many apprehensions regarding the radiation environment".

To sum up, apprehension of radiation can lead people to avoid choosing this profession.

Category 3: Apprehension of working with ionizing radiation.

Before delivering the information, the interviewees were asked whether they would consider working in a profession that involved an ionizing radiation environment. Those unfamiliar with the working environment, the way X-Rays technicians protected themselves, and the machines they operated would not have chosen to work in this environment. Six out of ten interviewees said they would not, and four said they were not apprehensive since they had little knowledge about the working environment. One interviewee was willing to work in an ionizing radiation environment because he thought the wages were higher. For example: "Sometimes, there are leaks, and this is not under control"; "This is only because of the radiation... it damages the body when people work daily in such an environment. I would not choose this kind of work".

Following the delivery of information, the interviewees understood that radiation workers were usually not exposed to radiation, that their annual exposure was low, and that everyone around the world was living with background radiation daily. This information considerably reduced the apprehension of working in an ionizing radiation environment. Nine out of ten interviewees stated they would work in an ionizing radiation environment. Six of them had changed their mind. For example: "they are in a protected place"; "I have just realized there is no radiation in MRI"; "It surprised me to know that there is not as much radiation as I have thought".

To sum up, the interviewees received information about radiation levels and ways of protection. Moreover, they learned that X-Rays technicians were hardly exposed to ionizing radiation and that some machines that they operated did not emit ionizing radiation, such as ultrasound (sound waves) and MRI (magnetic resonance). This greatly reduced the apprehension of working in an ionizing radiation environment. Lack of knowledge and apprehension of working in an ionizing radiation environment result in misconceptions that affect the professional image of this profession and, thus, people will not consider learning it.

Second theme: Lack of knowledge about X-Rays technician profession.

Category 1: Level of knowledge about the profession.

The decision about studies and profession for life is highly important and one should collect as much information as possible in order to make the right decision. Analysis of the content related to knowledge about X-Rays technician profession showed that the level of knowledge was low and most interviewees were not familiar with the essence of this profession, the training pathways, the machines operated by the X-Rays technicians, the advantages and disadvantages of the profession, and so on. This was due to the fact that they have never heard about the profession, nor have they inquired about it.

Prior to the delivery of information, eight out of ten interviewees knew nothing at all about the profession and two of them had low-level and insufficient knowledge. The data collected from the interviews showed that the knowledge about the profession came mainly from personal acquaintance, while the interviewees themselves experienced the imaging procedure, or from someone close to them who was familiar with the profession. For example: "I have heard about this profession in general, but I have never known what it does"; "I don't really know what X-Rays technicians do. My mother, who has an X-Rays technician at work, told me many stories about the work"; "My mother talked to me about this X-Rays technician profession".

After the delivery of information, the interviewees' knowledge was improved, and they realized it could interest them and match their expectations. Some of them even changed their mind after being exposed to the information that was new to them: "I found out

that it was diversified"; "I understood what X-Rays meant and how it was done"; "There are various directions of development and it seems interesting... I can diagnose and that is something I was unaware of and it sounds fascinating".

Analysis of the content related to misconception of this profession indicated that eight out of ten interviewees attested that they had a misconception of the profession, while two of them said they did not have such a misconception. A misconception can undermine the professional image of this profession and it might harm the supply.

To sum up, misconceptions about the X-Rays technician profession stem from lack of knowledge that causes individuals to avoid choosing this profession as a career for life.

Category 2: Knowledge about the profession increases the interest in it.

The content analysis gave rise to this category as associated with the theme 'misconceptions of the X-Rays technician profession'.

Before delivery of the information, nine out of ten interviewees attested that they had no wish nor interest to study the X-Rays technician profession, while only one interviewee, who works in a hospital, stated that he considered this profession as an option of studies. For example: "I know nothing about it and I have never shown any interest in it"; "I am not connected and don't like it. This is not the field in which I see myself in future".

Following the delivery of information, some of the interviewees started accumulating knowledge about the profession with which they were not familiar at all. They showed interest in it and some of them even said they would consider studying it. Several misconceptions were manifested due to lack of information in this field. Moreover, the data illustrated that the information they received, helped the interviewees in changing their mind as to the choice of X-Rays technician profession as a career for life. Once they realized that they were interested in the field of medicine, and that this profession has also a component of initial diagnosis of the findings, it increased their inner wish and the chances of choosing this profession. "I might have engaged in it as this profession is also part of medicine, diagnoses..."; "You opened to me a whole new world now, and I will consider learning this profession".

To sum up, information regarding the X-Rays technician profession can change the misconceptions of this field, resulting in a chance of choosing to study this profession as a career for life.

Category 3: Lack in knowledge.

In order to identify the lacking knowledge necessary for deciding whether to learn this profession, the interviewees were asked what additional information they needed for making this decision. The findings showed that an explanation campaign about the profession was very important, i.e., someone who would inform and explain more about the profession itself. Moreover, practical experience in the field, inquiry, and learning are the factors that individuals lack in order to decide whether to learn this profession. For example: "I would be pleased to come and see in practice how they work, what they do, there is nothing like seeing it with your own eyes".

To sum up, complementing the lacking knowledge about the X-Rays technician profession, practical experience in the field to see what these technicians actually do, can help in choosing the field of imaging as a career for life.

Discussion and conclusions

Choosing a profession is a process of decision-making that is being consolidated by data collection (Gati, 2016). X-Rays technicians work in an ionizing radiation environment, but their exposure to annual average radiation is low (Haruz-Waschitz, 2004). Hence, they have no risk of getting cancer because of their work in this environment (Kitahara, 2018; Preston, 2016; Terrence, 2015). Nevertheless, studies (Nasr et al., 2019) show that most of the public does not have the necessary knowledge about ionizing radiation and the risks thereof. Consequently, the public has misconceptions of these issues. The X-Rays technician profession has a low professional image (Collins & Nolen, 2002). Furthermore, many countries around the globe experience lack of X-Rays technicians on the labor market (The International Committee for Medical, 2021). The findings obtained from the content analysis are in line with the empirical literature on this issue (Keynan, 1996). They illustrate that the low professional image stems from misconceptions of ionizing radiation and lack of knowledge about the profession, affecting the supply of technicians. Figure 1 presents the relation between the components that affect the low professional image and, thus, undermines the supply.

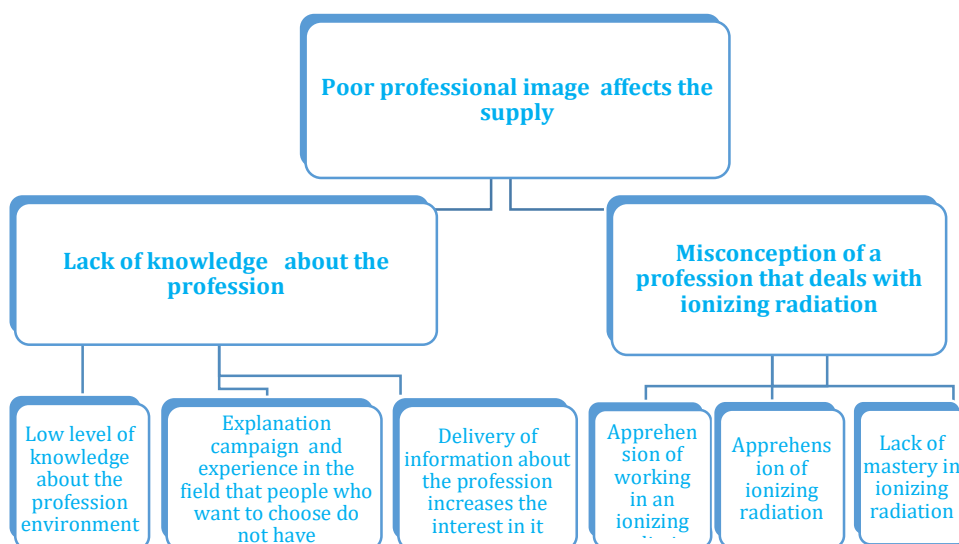


Figure 1. The relation between the components affecting the poor professional image that undermines the supply (Author's Own Source)

Figure 1 indicates misconceptions of the profession, resulting from a considerable lack of knowledge about the essence of the profession and the optional variations it enables, study pathways, promotion pathways, and workplaces. The lack of these elements directly impacts the professional image that the choosing individuals have of the profession. Moreover, the lack of knowledge leads to a negative professional image that affects the supply. Providing knowledge about the profession increased the individuals'

interest of choosing it as a profession for life. An explanation campaign about the profession, as well as an option of practical experience in this field, would have considerably improved the public's lacking information about the profession.

There are components that inhibit the choice of this profession. They are associated with a misconception of a profession that is conducted in an ionizing radiation environment. This misconception stems from the public's lack of knowledge regarding the professional nature of the profession's working environment, apprehension of radiation in general and working in an ionizing radiation environment in particular. Reducing the apprehension by learning about ionizing radiation, its risks, ways of protection against it, which machines do not emit ionizing radiation at all, and so on, will mitigate the existing apprehension and will offer a real opportunity for learning and engaging in this interesting profession as a career for life.

To sum up, the content analysis of the interviews showed that the poor professional image of X-ray technicians made this profession unattractive and reduced the supply of human resources in the field. It can be inferred that a balance between the demand and supply of human resources in the X-Rays field of activity can only be achieved if the professional image of X-Rays technicians is restored. The results of this study indicated the increased need to find solutions for improving the image of the X-Rays technician profession. The research suggested that misconceptions and the poor image of this profession should be addressed to bridge the gap between the low supply and high demand of staff in the X-Rays field.

Research limitations

The data obtained in this study are drawn from interview-based research conducted with ten Israeli interviewees who do not necessarily reflect the attitudes of the worldwide population. Moreover, the interviewees in this study are Israeli participants with limited knowledge about the X-Rays technician profession and ionizing radiation, or people who have not made an extensive inquiry of this field. Consequently, we caution about this research limitation.

In spite of these limitations, this small-scale research can transmit an important message to the Israeli Ministry of Health, the Israeli population, and the world at large. This message highlights the imperative need for dispelling misconceptions and cultivating the professional image of X-Rays technicians. The joint efforts of researchers, professionals in the field, educators, and regulatory bodies are needed for improving the image and, thus, the attractiveness of the X-Rays technician profession. As this study has shown, only an improved image of the profession will allow the necessary growth of human capital in this extremely important field, whose service supply is vital for the entire population.

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REPUTATION AND ITS IMPACT ON THE MARITIME TRANSPORT

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Abstract. *Maritime transport has been around and an important part of the world economy, since the most ancient of times. We can trace its beginnings to the earliest form of water transport in the ancient Egypt period, around 3200 BCE, and has remained until modern days the backbone of global trade. As the world has begun to broaden its horizons and has developed a more sophisticated taste, the maritime transport needed to evolve and respond to people's requests and needs. Thus, it has evolved and expanded into what it is nowadays. Even though transit times in maritime transport are higher than in any other means of moving goods, it facilitates the buyer to purchase larger quantities, or voluminous ones, at a more convenient price. However, as in any other area, the shipping companies, forwarders, and any other party involved in this transport branch are prone to reputation damage. In this sector especially, a good reputation is essential as it is the business card of the parties involved. The literature has been highly interesting on the topic, as the subject has governed our lives since even before all other means of transport have begun taking form. It supports a large percentage of the overall global transportation of goods. The research is based on analyzing the domain of maritime transport and highlighting the importance for companies in this sector to maintain their good reputation as is the prime way in which they can obtain and most importantly, maintain the clients in their portfolios. During the present times, the vast evolution of globalization as the motor of the economic field has been possible due to very fast and efficient maritime transport.*

Keywords: *forwarders; ocean freight; reputation; shipping companies; transport*

Introduction

The field of maritime transport is a highly active one and the linchpin of the global economy. Thus, it has always been present in international discussion forums. Major shipping companies and freight forwarders have always been striving to deliver the best quality to their customers, keeping them loyal to their services. The subject of reputation is very important in this field, as clients are very attentive to their privacy, and keeping them loyal is always a challenge for shipping companies and freight forwarders. For the good existence of companies in various countries and regions, ethics in the business field is of key importance.

Large companies, with high volumes of goods that need transportation via waterways, are highly attractive. Logistics suppliers are interested in capturing their attention and offering the best options, values, and transport solutions. Thus, these major logistics suppliers must always be careful about their code of conduct, as any company that is working with them, would foremost be interested in having discretion regarding the kind of business conducted and they need to be certain that one can count on their business partners.

Ocean freight, even to expedite their goods easier form of transportation, is the most attractive, as the importer can purchase high volumes of merchandise, and the costs would be much lower than expediting goods via airplane or truck. Also, another advantage of ocean freight is that it can easily connect ports between them, and transform many cities into major shipping hubs. Also, space is not as restrictive as using an airplane or truck, as container ships nowadays can easily accommodate hundreds of containers, meaning a large volume of goods.

When talking about cost-effectiveness, we should note that having the possibility of transporting large quantities at a reasonable price is an important factor for keeping the end price competitive towards the end consumers. Undoubtedly, it is in the companies' best interest to increase sales, rather than just to supply the right quantities but at much higher costs. We have the advantage that you can carry heavier goods by ocean freight. Airplanes can be more restrictive towards the weight and quantity of the merchandise, as their warehouses are not as big as the facilities at different ports within the world. Also, if some structural pieces do not have a standard form, transporting them via vessels can help the buyer obtain the much-needed pieces. This is the prime reason ocean freight is an essential transport branch, a very reliable one, and why companies expect a certain level of confidence that they put in their business partners.

Looking back at the beginning of maritime transport, we can point out that any major technological or infrastructure evolution greatly impacted the field. It is worth noting that the development of the steam engine, which happened around the mid-19th century, meant that now vessels weren't bound by the movements of the currents and of the wind, and they took a step towards independence in this field. Then, we can, of course, mention the construction of the Suez and Panama Canals, which resulted in transit times that would be highly reduced, thus making this form of transport even more attractive and sought after.

The research results are anticipated by the big shipping and forwarder companies, and clients interested in transporting goods. All major players in this field are awarding special attention to their reputation and are taking important steps to maintain it. If maintained, the customers would be satisfied with their services, which would mean more business for them. I have analyzed the first three major players both in the shipping lines and in the freight forwarder business and assessed the level of importance that they put into consolidating their reputation. Understanding which premises reputation is based on is very important for companies in the shipping field.

Literature review

The specialty literature has been highly interesting in this field. We can point out that there have been from university courses, to articles and international discussion forums on the issue. Even though the extant literature offers valuable insights into the issues related to reputation and its risks, several aspects remain undeciphered. When talking about the ethical decisions of entrepreneurs, very little is known about this context. Trading routes weren't as evolved and spread as they are nowadays, and with any new progress and invention that occurred as time passed, we saw blooming in this sector, and today we can speak of many trading routes, with no area on this globe that you can't ship goods from or towards. The invention of the steam engine in the 19th century,

allowed ships to become independent from wind patterns. The construction of the Suez Canal made the connection between the Mediterranean Sea and the Red Sea easier and shortened the distance between Europe and Asia. Until then, vessels were forced to go via the Cape of Good Hope, meaning a longer distance, higher costs, and in the end, higher priced products.

Also, through reviewing what the literature mentions, the fact that maritime routes are well established, taking into consideration the strategic placement of the port, the marine currents, the possibility of development for the respective port, and the interest that the global market is showing to the goods in the respective country. However, even by considering these aspects and maintaining the before-established routes, there can be unforeseen events, which can lead to major accidents with effects even after their happening, which happen due to the massification of the transport sector. There were in modern history some unfortunate events like Amoco Cadiz and Exxon Valdez, which were ecological disasters involving oil tankers, due to the regular flows of ships that are constantly happening. Even more recently, in 2021, one of the largest container ships, owned by Evergreen Marine Corporation, based in Taiwan, the Ever Given, remained grounded while passing through the Suez Canal. The scandal at that moment brought a serious reputation blow to the shipping company and the Suez Canal Authority, which was accused of not taking care of the Canal properly.

In 2018, trade via sea accounted for more than 80% of the total global trade in volume and 70% when discussing value. This kind of growth started after World War II and has reached this impressive percentage these days. Also, maritime shipping is one of the most globalized in ownership and operations. We are discussing ships registered exclusively in offshore paradises, due to more permissive taxes and regulations than in their home countries. However, this kind of practice does not affect their reputation as it is widespread.

When talking about “reputation”, the literature points out that is a concept linked to, but not the same as, image, and it consists of an outsider’s subjective opinion on a company’s qualities in aspect with its past performances. As is already shown in all specialty literature, reputation is mostly built over time. It represents how consistent the company has been with its openness and ability to accomplish its clients’ requests at the highest level over time. Starting some five-ten years ago, corporate image and reputation have become very important in the competitiveness of the companies. The thought that a company’s financial status can be highly impacted and affected by the firm’s overall reputation on the market, has influenced how most corporations view this subject. This definition is easily observed in the maritime transport sector in the first three largest shipping companies, i.e., A.P. Moller-Maersk Group, owners of the Maersk Line; Mediterranean Shipping Company, most commonly known as MSC; COSCO Group, owners of the COSCO Shipping Co., Ltd.

These three shipping companies are the largest in cargo freight worldwide; they also cover almost every corner of the world through their shipping routes and impressive fleet of vessels. There isn’t a destination to which they don’t go, and their attention to their customer’s needs is their business card and why clients return exclusively to them.

Apart from shipping companies, this business has freight forwarders as a solution for clients to expedite their goods. In the regular relationship between a client and a

shipping company, the exporting or importing company must do all the heavy lifting. But, if you work with a freight forwarder, they are experienced people who can take the heavy lifting off the exporter or importer's shoulders and manage all the problems that may appear. They organize expediting the container to the client's premises and its return in the container yard. Working with a freight forwarder has its benefits due to the reasons as mentioned above, but the costs of exporting or importing the goods might slightly increase, as the forwarders are also charging a fee for their stepping into the problem.

The international forwarder field is dominated by some of the biggest names in the logistics department, which offer their clients highly specialized packages and offers in order to transport their goods. The first three places are occupied by DHL, Kuehne + Nagel, and DB Schenker, resonating names in the industry that have a reputation and a name made through the hard work of thousands of people, as the companies are spread worldwide and through their network are easily meeting the client's needs and hopes to fast and highly profitable movement of goods.

The companies have embedded core values in their internal policies, to which they pledge to perform at the highest level. I have reviewed them and will proceed to analyze them and offer some results. These values will be impressive, and what's even more remarkable is that they abide by the values until the last person working for those companies. An instrument that can both help and damage a company's reputation is the internet, as all people have access to it. It is a good way of finding out more about a partner you are willing to enter into business with.

Methodology

For half a year, I have been analyzing the information available on the internet regarding the three major shipping companies and two of the largest freight forwarders. I have extracted and would like to further present their background and the results in their conquest to domination in the maritime sector.

Table 1. Top 10 shipping lines, based on no. of containers transported (Source: Mover Focus – Top 30 International Shipping Companies) (Author's Own Source)

Shipping company	No. of containers transported
A.P. Moller-Maersk Group	4.176.517
Mediterranean Shipping Company S.A. (MSC)	3.657.272
China COSCO	2.966.582
CMA CGM Group	2.696.710
Hapag-Lloyd	1.688.396
ONE (Ocean Network Express)	1.579.868
Evergreen Marine Corporation	1.303.420
Yang Ming Marine Transport Corporation	644.185

Shipping company	No. of containers transported
PIL (Pacific International Lines)	393.498
Hyundai Merchant Marine	392.314

In table no.1, it is more expressively shown the number of containers transported by each of the top 10 shipping lines. The first three are leading the top by far with the most, all due to the attention that they offer to the client's needs, their commitment to offering the best of service, to their core values which are leading them into transforming in the global shipping companies which they are at the moment.

A.P. Moller-Maersk Group, owners of the Maersk Shipping Line, is by far the most renowned, and the oldest one from the top. They have a long history of high performances, exclusive offers and services bound to satisfy even the most demanding clients. Their long-lasting legacy is the motor that encourages them to continue in this business, and their values are what guides them into doing business every day and what ensure they will last tomorrow.

They have five principal core values, constant care, the company is "actively preparing for tomorrow", as they are solving issues that arise in the present, but also, they are taking care of the possibility of what the next day offers, and how they can improve day by day their business. Through *humbleness*, they strive to remain open-minded to new opportunities, to new challenges given by the customers and always looking for a way of solving them. *The employees*, Maersk is committed in offering their employees the perfect environment in which they can grow professionally, develop themselves and through this helping the brand into further thriving and developing their reputation and image. *Uprightness*, "our word is our bound"; which is the most important value that Maersk has and the driving one, as they work each day to maintain the trust their clients and partners have put into their vision. They adhere to the principle of speaking honestly and openly, acting with integrity in respect to a client.

Least but not last, is "*our name*"; Maersk has a heritage and a burden, as their name is their business card. Through their name, they promise and commit to customers that they offer trust and excellence at the highest levels. Every employee at Maersk are ambassadors who represent and safeguard the Maersk name, working every day for a more sustainable and integrated world.

These values maintain Maersk in all important tops and are the main reason they have passed through a scandal without a scratch. Some five years ago, in 2017, the A.P. Moller-Maersk Group were the victims of a cyberattack, with the hackers at that moment keeping their systems down and for ransom. The attack has paralyzed all their systems, with many information being vulnerable to the hackers; we are talking here about classified information regarding vessel schedules, client's information and cargo, prices and finances of the group. Only due to their beforehand name and reputation, they managed to avoid a serious loss in business and client trust. They have recovered quickly, even though their system had problems for some months to come, but they have maintained almost 120 years of reputation intact. Leading through a set of values and acts of leadership differentiates companies, and the Maersk Group is one of the ones who apply ethics in their daily activities.

The Mediterranean Shipping Company is counting on four values in order to attract new customers and keep the already existing ones. They put a great effect on the fact that they are a *“family company”*; the commitment that the founding family has on each of the employee is inspiring and pushes them always forward into evolving to the best of their possibilities. *“We have passion”* as they are always looking for the best solution and they inspire their clients to thrive by their side. *“We are in continuous evolution”*, talking about always trying to expand their business and conquer new routes striving to deliver the perfect package offers to the clients in order for them to be competitive, whilst maintaining their commitment to the environment and the safety measures. *“We care for people”*, through their belief that as each person is different, they must adapt and embrace this diversity and forge authentic relationships built on ethics, respect and team spirit.

The aspect of the shipping companies has been highly insightful, as tradition is vital, the clients appreciate commitment and values orientated towards the customer. It has not been surprising the fact that on the first places in tops are companies with a strong legacy and history in the business. There are companies with insight into the business and a strong wish to maintain their reputation by keeping also their principles. In the end, the clients appreciate the existing of those principles and are always looking for partners who share the same thinking as them.

In the study there has also been approached the part of freight forwarders. Whilst they do not have directly containers and vessels, they intermediate the export and/or import for their clients. They are appreciated by the companies due to the fact that they take some of the risks upon them; they organize all the aspects of the transport and facilitate the solving of different issues that may arise during the transports.

Table 2. Top 25 Global Freight Forwarders (Source: Armstrong & Associates - 2021 Top 25 Global Freight Forwarders List) (Author's Own Source)

Service Provider	Gross Revenue (US \$ Millions)	No. of containers shipped	2021 Rank
DHL Supply Chain & Global Forwarding	28.453	2.862.000	1
Kuehne + Nagel	25.787	4.529.000	1
DB Schenker	20.761	2.052.000	2
DSV Panalpina	18.269	2.204.902	2
Sinotrans	12.174	3.750.000	3
Expeditors	10.116	1.091.380	4
Nippon Express	19.347	660.152	5
CEVA Logistics	7.416	1.081.100	6
C.H. Robinson	15.490	1.200.000	7
Kerry Logistics	6.867	1.019.924	8
UPS Supply Chain Solutions	11.048	620.000	8
GEODIS	9.135	866.631	9
Bolloré Logistics	5.265	761.000	10
Hellman Worldwide Logistics	2.972	905.100	11

Service Provider	Gross Revenue (US \$ Millions)	No. of containers shipped	2021 Rank
Kintetsu World Express	5.750	640.063	12
Agility	4.018	771.000	13
Yusen Logistics	4.248	764.000	14
CTS International Logistics	2.160	1.021.007	15
Hitachi Transport System	6.346	662.000	16
DACHSER	6.591	492.440	17
Toll Group	7.260	523.300	18
Maersk Logistics (DAMCO)	6.369	401.369	19
Apex Logistics International	2.274	190.000	20
Logwin	1.292	698.000	21
Mainfreight	2.467	347.638	22

The above information has been gathered with the help of the data provided by Armstrong & Associates, who put together a highly documented top, with the most powerful freight forwarders in the world. The classification is dominated once again and without any doubt, by DHL and Kuehne + Nagel, on the first place, followed closely by DB Schenker and DSV Panalpina. These freight forwarding companies are known worldwide and well respected, mainly because they have a strong history, and a brand name that offers confidence, and the clients are sure that they can expect high-quality services from these firms.

Kuehne + Nagel International AG is the prime logistic company, based out of Switzerland, and spread worldwide with offices, from where goods are controlled and exported and imported, however the need require. They strongly accentuate maintaining their clients through well-established values that motivate and drive their employees to offer only high-quality services. Their values are divided into three categories: *people*, *customers*, and *society*. The people with whom they connect and interact inspire them always to perform and deliver the promptest offers and services that can satisfy and solve the issues of even the most pretentious customers. The bottom line is that for Kuehne + Nagel's values are interconnected between them and cannot exist one without the other, as they sketch basically the core existence of a company.

Possibly that this interconnectivity helps them to perform at such a high standard and remain, for years to come, the first and most important logistics specialist. Even though they are battling with DHL for supremacy, an advantage that DHL does not have is that Kuehne + Nagel has always been specialized on these matters and not have evolved from international courier to more logistics solutions.

For the runner-up, the DB Schenker Group, their six core values motivate them to succeed in this business field in which they activate and be able to pass some of their competitors at the top. The group's six values are: *play fair*; *be honest*; *be one team with one goal*; *walk the talk*; *win together*; *push limits*; *take customers further*. All these six values talk about respecting the clients first and foremost, then respecting their employees,. Without each person involved in the company, their success won't be possible, and the top management is fully aware of this. The company has understood very well the fact that without their employees they won't be able to succeed in such a

demanding and fast-moving sector, and have managed to establish a system of rewarding their employees, for those to do their jobs better, be satisfied with the working environment, and thus managing the clients better.

Well-treating their employees is the key secret to having such a successful business. Suppose the employees are well taken care of, then they will offer the best of service to the clients, and their reputation will remain without a spot on it, as they will be rewarded with the clients' full trust and business to manage and offer them solutions to any issue that may arise during the transport of goods.

Results and discussions

The main purpose of the article has been analyzing the biggest shipping companies and freight forwarders regarding their approach to reputation and ethics. I have started from the premises that all major companies which conduct businesses worldwide and have offices located almost in every major country should have guidelines regarding reputation and ethics, which they can follow and abide by in search of global success.

Through analyzing statistical information provided in specialty literature, it has been shown that each company's core values are their guiding star, prime and sole motive, which drives each employee, and each person who enters into contact with them.

These companies are putting great effort and interest into providing their clients the best of services and packages. They count on the customer's satisfaction and loyalty to provide them with the best transport solutions. Basically, the interested firms should rest assure that these companies are the best in their field, and they are set on a singular goal, *customer satisfaction*.

What is astonishing is the fact that we are talking about companies with a long history. We are talking about family-owned firms, which also put another principle at play, their honor; and in the period in which they started, the honor was the most important aspect of someone's life. They have transported it in the modern days, and whenever these firms are brought into the discussion, their honor and name are what is of impact first and foremost. Some clients may even start doing business with them solely due to their good name and morality, and after to appreciate their values, which can also become theirs with time.

The international community well receives the subject, firms are going to great lengths to be sure that they follow into this pattern of core values and reputation. They also put interest in sustainability, and on their internet pages. The market nowadays is of this nature; it would be impossible for a company to achieve global recognition and a good name without investing in social causes, in the environment, or principles meant to coordinate their whole activity.

Conclusions

The present paper aimed to study why the most powerful companies in the shipping industry and freight forwarding have such success and what differentiates them from the rest of the competition. From the start, we can establish the fact that they are renowned companies, which are always striving to maintain their name, to keep the

trust of their customers, and always develop and transform to be all the time at the current with the trends and innovations which are done in the transport sector. Companies are all investing in maintaining their corporate reputation, and the same happens with firms in the transport field.

For example, they are continuously interested in the environment and through their involvement, they seek to form campaigns which support this topic. In these terms, the DB Schenker Group have introduced in the Island of Gotland, the first electrical trucks from their fleet, which will distribute the goods to customers. The international community is applauding this initiative, and the company is on track of impressing more and more business partners. This could mean more business to come their way and also maintaining the existing ones.

Then, the shipping lines have invested also in environmentally friendly equipment, using recyclable materials, or using floors in their containers from bamboo. This change and improvement come from a series of pledges that companies are doing towards improving the way of transporting goods, especially as a vessel uses a high quantity of fuel and other materials which produce fumes, damaging the environment. The problem is sensitive, as the vessels travel all around the globe, thus their influence on the atmosphere is even greater.

The most powerful shipping companies and freight forwarders have learned that everything could be possible through a good example and hard work. This is why yearly tops done by statistical companies don't often vary too much, and the same companies are present for a very long time.

Even though other companies may enter the top, it would be almost impossible to pass the already familiar and potent names in the industry. All in all, by putting their core values and clients in the center of the business, they have successfully managed to maintain their reputation, and moreover to expand it and develop into the new era of maritime transport; where the focus is aimed to studying changes and their involvement in the subject.

Ultimately, the most important aspect of this paper, which should remain in our memory, is that large and powerful companies have always had a strict and well-established code of conduct. This is why they all have strong reputations that are not easily forgotten by their clients and the whole business world.

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THE IMPACT OF INTERACTING WITH VIRTUAL ASSISTANTS ON THE OVERALL SATISFACTION

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Abstract. *The article aims to assess how interaction with automated information systems such as virtual assistants - chatbots- can influence overall customer satisfaction with banks. The article reports the results of research focused on Romanian banking customers. It uses an online questionnaire to collect participants' evaluations regarding the quality of client experience when interacting with their bank's virtual assistant. The research results indicate that the overall satisfaction expressed by the banks' clients was significantly influenced by the accessibility to the chatbot's functions and the aspects regarding the privacy and security provided by the interaction with the chatbot. Consistent with the ethical approach to data privacy and protection, the paper concludes that companies must increase customer awareness regarding their high data protection standards. The paper recommends that organizations ensure that their customer is confident that the service provided by the bank's virtual assistant offers high data privacy and protection.*

Keywords: *virtual assistants; chatbots, technology; ethics; data protection; satisfaction.*

Introduction

To have a better user experience, companies invest in developments aimed at ensuring that each Chatbot has the capacity for understanding and intelligence; for this, it is necessary to have professionals who can incorporate elements of Artificial Intelligence as support.

Chatbots are very useful when it comes to business for any need, which is reflected in the customer service part. They mark a beginning to reaching a natural language between a machine and a human being with the help of all the algorithms that were used in their development and that today the most advanced robots have it. Chatbots are more complex than they seem because of their ability to store new questions and associate answers.

These conversation agents act as customer service representatives, giving answers in natural language and offering more focused information for conversation with a user. The Chatbot must have the same tone, sensitivity, and behavior as a human service agent, but it is also required to process information faster than a human.

Literature review

Digital transformation has made and continues to make huge changes in the customer service sector (Setia et al., 2013). Thus, organizations have started introducing different kinds of technologies to improve processes, scalability, and expenditure to simultaneously contribute to a more positive customer experience (Przegalinska et al., 2019; Sahu et al., 2018). These new technologies can lead to improved customer understanding through detailed data analytics and testing. Not only that, but a digital transformation can also lead to faster customer service resolution through multi-channel communication possibilities and via “self-service” tools (Westerman et al., 2014).

Businesses in various industries (including banking) face challenges in meeting customers' wants and needs (Morgeson et al., 2020). There has been an increase in the adoption of digital technologies in business activities (Andrei et al., 2021; Przegalinska et al., 2019; Sahu et al., 2018; Stanescu et al., 2020; Vatamanescu et al., 2016). As a result, customers can buy products or services through different types of online channels that organizations offer (Sun et al., 2020). Online communication channels have exposed new opportunities for businesses to build long-term customer relationships (Rose et al., 2011; Andrei & Zait, 2014).

Managing online mediums for business could be complex. For example, Ozuem et al. (2021) investigated consumers' responses to online service failure during the COVID-19 pandemic. This investigation found that customers have moved their preferences toward online methods due to the impact of the pandemic on societies. As a result, companies have been facing a huge demand for online services and through that, customers have experienced service failures (Ozuem et al., 2021). Also, this examination found that online services have created barriers between organizations and their customers. Thus, this could influence the customer and might form service failures. It is proven that service failures have a negative effect on customer loyalty (Mattila, 2004; Sousa & Voss, 2009). The negative effect on customer loyalty reduces profits and creates a negative online word of mouth (Hedrick et al., 2007; Wilson et al., 2016). Also, Mattila (2004, p. 135) also stated that customers might feel “betrayed” because of service failure. Customers can respond to service failures in different ways but focusing on online communication channels could create certain challenges for businesses as it influences customers' trust and loyalty (Adam et al., 2020; Chari et al., 2016; Kim et al., 2021).

Morgeson et al. (2020) investigated how to turn complaining customers into loyal ones to gain their trust. The investigators found that the increase in technology users might be a reason behind the increase in complaints for any business. For instance, Chari et al. (2016) found that increased user-generated content on online websites has become a new communication channel with customers. Thus, it highlights that certain brands might use such websites to support and promote a specific product or service. Customers might believe that this type of advertisement promotes false information. As a result, it could affect customers' trust in a brand (Chari et al., 2016). Also, regarding social media, Wilson et al. (2016, p. 89) reflected that “consumers are likely to avoid a service provider with too many negative comments and choose a provider with positive comments.” For instance, Facebook has two billion active users, and it is one of the most

used social media platforms (Mei et al., 2018). Hence, it reflects that customers are influenced by their family or friends' perception of online websites (Chari et al., 2016;).

Sun et al. (2020) stated that recently there has been an increase in adapting live chat options to improve customer service. This investigation illustrated that 42% of the customers prefer to use live chat compared to other online communication channels due to the online satisfaction they experience. Customers use live chat services when they need support or cannot find an answer to their questions about a specific product or service. Thus, live chat services are handled by human interactions, and the literature suggests that businesses should invest in training together with employing skilled staff. As a result, this investigation argues that in the long run, customers will become more satisfied with the service and could turn into loyal customers for the brand. However, this investigation creates an argument about whether live chat services are recognized as a servant for existing call centers.

Considering the previous section and the arguments from Sun et al. (2020) and Adam et al. (2020) discussing the customer preferences for live chats, versus high levels of unsatisfactory service quality from conversational software agents (CAs) several advantages and disadvantages for businesses as well as for customers can be assumed. First, for businesses, a main advantage can be the cost savings that a chatbot can offer, on average labor costs are the largest expenses for call center operation (Agarwal et al., 2020; Manno et al., 2021; Przegalinska et al., 2019). Not only that, as noted in previous chapters, call centers notoriously have issues with employee turnover, due to employee dissatisfaction and high operation costs (Ormezi et al., 2014). Considering the costs of recruiting, selecting, onboarding, and training, this can become costly (Valle et al., 2017). Moreover, chatbots can help save time at call centers, as they are always available and able to help customers with basic and simple questions, and when questions or requests are more complex, users can be connected with an agent to follow up (Chung et al., 2020). Using chatbots and further digitalizing such processes through data analytics can contribute to improved business insights. Thus, businesses can better understand questions and requests that are put forward by customers and eventually adjust and adapt communications and marketing based on these analyses, therefore contributing to an improved customer experience (Agarwal et al., 2020; Chung et al., 2020).

Chatbots can be advantageous for customers as they can primarily decrease barriers to communication, being available 24/7 and easily accessible (Atiyah et al., 2018; Jenneboer et al., 2022). Chatbots can also provide highly personalized content and information to the customer, which could be one of the main reasons for influencing trust in AI technology (Jenneboer et al., 2022). Additionally, as mentioned earlier, a decrease in expenses for a business can usually translate to a stable continuation or decrease in price for the consumer (Agarwal et al., 2020; Manno et al., 2021; Przegalinska et al., 2019). Thus, the concept of the chatbot can prove to be an advantageous tool for businesses and consumers; however, the development of the chatbot must be able to meet consumer expectations to aid in building trust and loyalty.

While interacting with a virtual assistant is a rather new phenomenon, users might be more aware of the direct requests, inducing more privacy concerns. Online services collect personal information to make recommendations. Jenneboer, Herrando, and Constantinides (2022) briefly discuss the topic of privacy with chatbot technology and mention that privacy is mainly an issue for consumers due to a lack of trust. The authors

continue to explain that a human-like interaction with a chatbot aids in easing worries about privacy and can increase customer trust. Previous research by Følstad et al. (2018) showed that customers have a concern for privacy and security when it comes to interactions with chatbots and they have a need to be provided with a secure online service.

Customer satisfaction is a significant determinant of customer retention and aids in shaping customer trust in a business (Jenneboer et al., 2022). However, some researchers argue that mere satisfaction is insufficient to retain customers (Deming, 1986; Jones & Sasser, 1995; Nath, 2007). Deming (1986) and Nath (2007) explain that satisfied customers are still likely to switch to alternatives fundamentally because they may not have much to lose or because a higher perceived level of trust can be found elsewhere.

Methodology

The aim of the paper is to assess how the interaction with a chatbot can influence the respondents' overall satisfaction with the banks' performance.

H1: A client's overall satisfaction with the bank positively correlates with the general satisfaction of interacting with the chatbot.

H2: A positive interaction with the chatbot increases overall satisfaction with the bank.

The data are collected using an online questionnaire, which is applied to 164 eligible respondents. The respondents are asked to evaluate, on a scale from 1 (Strongly disagree) to 7 (Strongly agree), the overall satisfaction toward the bank and the quality of interactions they had with the virtual assistant chatbot. Several dimensions are followed when evaluating the quality of the experience when interacting with the chatbot, as presented in Table 1.

Table 1. Dimensions and sub-dimensions of users' experience when interacting with a chatbot (Author's Own Source)

Dimensions of users' experience in interacting with the chatbot*	Sub-dimension
Accessibility to the chatbot's functions (Accessibility)	Ease in conversation with the chatbot Ease in accessing the chatbot
Quality of the chatbot's functions (Functions_quality)	Clear expectation regarding the chatbot's capability Capacity of maintaining a topical discussion Quality of guiding to relevant service Quality of answers in unexpected situations Clear answers Reliable answers
Quality of conversation and information provided by the chatbot (Conversation_quality)	Effort in communicating with the chatbot Acknowledging and facilitating reaching the user's goal Relevance of provided information Appropriate amount of information provided Social presence of the chatbot
Privacy and security provided by the interaction with the chatbot (Privacy_security)	Privacy and security
Speed in interacting with the chatbot (Speed)	Speed

* Variables' names in brackets

To assess the influence that the experience when interacting with the chatbot has on the overall bank satisfaction, a linear regression model is estimated. The functional form of the model is:

$$Y = \beta_0 + \beta_i X_i + \gamma_i Z_i + \varepsilon$$

where X_i is the independent variable, the five dimensions through which the experience when interacting with the chatbot is measured; Z_i is the control variable – respondent’s gender (1-male, 0-female) and level of education (1-tertiary education, 0-otherwise); ε is the residual term, normally distributed, with zero mean and constant variance.

Results and discussion

For each dimension evaluating the experience of interacting with a chatbot, an internal consistency of the questionnaire’s items that compose a dimension is employed, calculating Cronbach’s Alpha reliability coefficient, as presented in Table 2.

Table 2. Cronbach’s alpha for each sub-dimension (Author’s Own Source)

Sub-dimension	Cronbach’s Alpha coefficient
Accessibility to the chatbot’s functions	0.978
Quality of the chatbot’s functions	0.984
Quality of conversation and information provided by the chatbot	0.961
Privacy and security provided by the interaction with the chatbot	0.939
Speed in interacting with the chatbot	0.945

The scale reliability is very good and consistent across the items of each dimension (the coefficient is over 0,7 and positive in all cases).

Summary statistics are provided in order to evaluate the distributions of responses for all of the interest variables. The results are presented in Table 3.

Table 3. Descriptive indicators (Author’s Own Source)

	Overall bank satisfaction	Accessibility	Functions_ quality	Conversati on_ quality	Privacy_ security	Speed	
Mean	5.13	4.8926	4.5898	4.5475	4.6768	4.8455	
Median	5.00	5.0000	4.7500	4.7333	5.0000	5.0000	
Std. Deviation	1.579	1.72281	1.53931	1.47042	1.74027	1.69380	
Skewness	-.520	-.468	-.436	-.491	-.444	-.444	
Kurtosis	-.472	-.811	-.535	-.430	-.866	-.795	
Percentiles	25	4.00	3.8333	3.7917	3.6167	3.3333	3.6667
	50	5.00	5.0000	4.7500	4.7333	5.0000	5.0000
	75	7.00	6.5000	5.8750	5.6000	6.0000	6.3333

The average score for the overall bank satisfaction is higher than the satisfaction when interacting with the chatbot, for all dimensions, at least 25% of respondents giving the maximum satisfaction score for the bank performance. The means are over 4.5, with respondents declaring, on average, a moderately satisfactory experience when interacting with the chatbot.

A correlation matrix is presented in Table 4, to evaluate whether a client's overall satisfaction with the bank is positively correlated with the general satisfaction of interacting with the chatbot.

Table 4. Correlation matrix for the interest variables (Author's Own Source)

	Overall bank satisfaction	Accesibility	Functions_quality	Conversation_quality	Privacy_security	Speed
Overall bank satisfaction	1	,437**	,465**	,442**	,460**	,412**
Accesibility	,437**	1	,832**	,802**	,732**	,750**
Functions_quality	,465**	,832**	1	,958**	,870**	,853**
Conversation_quality_rec	,442**	,802**	,958**	1	,871**	,854**
Privacy_security	,460**	,732**	,870**	,871**	1	,761**
Speed	,412**	,750**	,853**	,854**	,761**	1

** . Correlation is significant at the 0.01 level (2-tailed).

When interacting with the chatbot, respondents moderately associate a positive experience of this interaction with good overall satisfaction with the bank. The Pearson correlation coefficient is close to 0.5 and has a significant positive value, showing a moderate correlation between the level of satisfaction when engaging in interaction with the chatbot and the overall satisfaction with the bank.

The results for the estimated regression model are presented in Table 6. These results help assess the impact that different dimensions of interacting with the chatbot have on the overall bank satisfaction expressed by respondents.

The backward method for selecting the independent variables is applied, where all independents are entered into the model's equation and then serially removed when the criteria for elimination are satisfied. The variables are considered for elimination according to their partial correlation with the dependent. The extensive results of applying the backward method are presented in Table 5. After identifying the significant factors, the model is re-estimated with these factors and the controls (Table 6).

Table 5. Regression model results after applying the backward method of estimation (Author's Own Source)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.664	.457		5.829	.000		
	Accesibility	.141	.118	.154	1.200	.232	.302	3.311
	Privacy_security	.238	.135	.262	1.769	.079	.226	4.425
	Speed	.073	.132	.078	.550	.583	.250	3.993
	Gender	.367	.255	.104	1.443	.151	.954	1.049
	Education	.029	.272	.008	.108	.914	.971	1.030
	Functions_quality	.271	.283	.263	.958	.340	.066	15.099
	Conversation_quality	-.235	.282	-.217	-.834	.405	.074	13.565
2	(Constant)	2.690	.389		6.918	.000		
	Accesibility	.142	.117	.155	1.215	.226	.304	3.292
	Privacy_security	.239	.134	.263	1.779	.077	.226	4.421
	Speed	.072	.131	.077	.547	.585	.251	3.979
	Gender	.367	.254	.104	1.447	.150	.954	1.049

	Functions_quality	.267	.280	.259	.955	.341	.067	14.850
	Conversation_quality	-.232	.280	-.214	-.831	.407	.074	13.453
3	(Constant)	2.720	.384		7.082	.000		
	Accesibility	.151	.116	.164	1.302	.195	.309	3.235
	Privacy_security	.238	.134	.262	1.779	.077	.226	4.421
	Gender	.345	.250	.098	1.381	.169	.978	1.022
	Functions_quality	.292	.276	.283	1.059	.291	.069	14.464
	Conversation_quality	-.195	.270	-.179	-.720	.473	.079	12.632
4	(Constant)	2.660	.374		7.108	.000		
	Accesibility	.148	.115	.162	1.286	.200	.309	3.233
	Privacy_security	.212	.129	.234	1.648	.101	.244	4.096
	Gender	.334	.249	.095	1.339	.183	.982	1.018
	Functions_quality	.142	.180	.138	.788	.432	.161	6.207
5	(Constant)	2.725	.364		7.477	.000		
	Accesibility	.202	.094	.220	2.157	.033	.470	2.127
	Privacy_security	.282	.093	.311	3.035	.003	.467	2.143
	Gender	.331	.249	.094	1.332	.185	.983	1.018
6	(Constant)	2.871	.349		8.236	.000		
	Accesibility	.201	.094	.219	2.143	.034	.470	2.127
	Privacy_security	.272	.093	.299	2.924	.004	.470	2.127

a. Dependent Variable: Overall bank satisfaction

Table 6. Regression model estimation (Author's Own Source)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.742	.431		6.369	.000		
	Accesibility	.202	.094	.220	2.149	.033	.470	2.127
	Privacy_security	.282	.093	.310	3.020	.003	.466	2.146
	Gender	.332	.250	.094	1.329	.186	.982	1.018
	Education	-.021	.268	-.005	-.077	.939	.995	1.005

a. Dependent Variable: Overall bank satisfaction

The only dimensions that significantly impact the overall bank satisfaction expressed by the banks' clients are the accessibility to the chatbot's functions and the privacy and security that the interaction with the chatbot provided. Both dimensions have a positive impact, an increase of one point in the score given for the experience with the chatbot determines an average increase of 0.202 and 0.282 points, respectively, in the overall bank satisfaction, for the same gender and education level of respondents.

The collinearity statistics indicators show that the independent variables in the model are not linear functions of the other independents, so do not introduce collinearity problems when estimating the regression coefficients - the Tolerance indicator is above 0.1 and VIF is well below 10.

The average score for overall bank satisfaction is higher than the satisfaction when interacting with the chatbot, for all dimensions. When interacting with the chatbot, respondents moderately associate a positive experience of this interaction with good overall satisfaction with the bank.

Conclusions

The research results indicate that dimensions that significantly impact the overall bank satisfaction expressed by the banks' clients are the accessibility to the chatbot's functions and the privacy and security that the interaction with the chatbot provided.

Of course, study limitations may influence the interpretation and application of presented results - even though surveys presented descriptions for each dimension, it is not clear how respondents interpreted the descriptions and the survey items.

However, we can conclude it is recommended that organizations should ensure that their customer is realizing that the provided service is secured, and the risks of service failure are minimized. Consistent with the ethical approach of data privacy protection, this aspect is essential for customer satisfaction and loyalty.

The idea of communicating with automated information systems is not entirely integrated into our society, considering that AI technology has always been controversial. Moreover, chatbots are very often linked to social network platforms, so customers' personal data can easily be accessed by the platform's administrators. Therefore, companies must ensure that their customers' data is well protected, even more so when financial transactions or any confidential information about financial accounts are involved. It is recommended that organizations should ensure that their customer is realizing that the provided service is secured.

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CORPORATE SOCIAL RESPONSIBILITY IN ROMANIAN SMALL AND MEDIUM-SIZED ENTERPRISES – ARE WE THERE YET?

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Abstract. *Sustainability has become an important aspect of any company, regardless of industry or size. The endeavors of the European Commission to implement sustainability principles across the entire business environment have intensified, especially for small and medium-sized enterprises (SMEs). The SME sector significantly impacts environmental degradation, causing the depletion of natural resources. Therefore, these firms need to implement corporate social responsibility (CSR) actions. Because the concept of sustainable development has not achieved its full potential in the SME landscape in Romania, further insights into internal green perceptions and behaviors are needed. Thus, the main goal of the current paper is to understand how Romanian SMEs perceive corporate social responsibility. The paper looks at the most common actions taken to protect the environment and limit resource usage, investment level, future plans regarding carbon emissions reduction, and the barriers to being more eco-friendly. It also offers an updated outlook on firms selling green products and services. The data used for analysis comes from Flash Eurobarometer 498, a European Union survey conducted by the European Commission in 2021. The main findings revealed that, at the declarative level, national SMEs are taking measures to limit their environmental footprint. However, considering investment level and future plans, a gap between talk and action is also evident. The main barriers identified are the complexity of legal policies, the inappropriateness of environmental legislation, and the lack of skills and financial resources. Furthermore, data analysis confirmed that the green market is still developing compared to other European countries. This paper focuses on Romanian firms as more knowledge is needed on this topic locally. The results presented offer relevant insights regarding the ecological behavior of SMEs, with significant implications for the business environment. This paper is the first step in encouraging the transition to sustainable business models for Romania's companies of all shapes and sizes.*

Keywords: *corporate social responsibility; environmental protection; green market; small and medium-sized enterprises; sustainability.*

Introduction

Sustainable marketing has become a popular marketing and management research agenda topic. The shift from green marketing to sustainable marketing represents an important step for society, because it symbolizes the transition from minimal measures, that only reduce environmental degradation, to radical changes in the behavior of consumers and companies (Peattie, 2001). When it comes to the business environment, more and more companies are starting to include sustainability principles in their operational strategies, taking real action to protect the environment and reduce their carbon footprint. As a result, for organizations to be successful and profitable in today's world, doing good has become mandatory.

While customers are changing their shopping behavior and consumption routines, companies are making responsible decisions considering the current ecological and social issues. By doing so, companies and firms realize that profit matters and protect future generations. Paying attention to environmental protection can bring multiple benefits: from gaining respect from customers and other stakeholders to achieving competitive advantage, attracting top talent, reducing costs in the long term, and increasing brand reputation in the market (Pujar et al., 2003; Luo & Bhattacharya, 2006).

Compared to multinational corporations, it seems that small and medium-sized enterprises (SMEs) are one step behind when it comes to corporate social responsibility (CSR) adoption. To add more, the literature on this topic is rather scarce compared to big firms. Because there are so many SMEs worldwide, their impact can be perceived as both an asset and a liability. On the one hand, these businesses offer multiple economic and social advantages regarding local development. Nevertheless, on the other hand, they also use an excessive volume of natural resources, putting a strain on the environment. For this reason, they are expected to become more responsible for resource management across all business stages, from product planning to final disposal.

Considering both the limited research on the topic and the significant environmental impact, this paper aims to address the lack of insights regarding CSR implementation for Romanian SMEs. The data analyzed is part of the Flash Eurobarometer 498 survey conducted in 2021 across all European Union member states. The main variables discussed are actions taken to protect the environment and limit resource depletion, level of investment so far and plans for the future to reduce carbon emissions, and barriers to being more eco-friendly. The current study also offers an updated outlook on the green market in Romania, with a section dedicated to enterprises selling green products and services.

The research is structured in the following way. It starts with a literature review of local and international studies concerning sustainable development and the business environment, focusing on SMEs. Following that, the methodology and data collection process are summarised. Next, key results are presented and discussed in line with findings from other studies. The paper concludes with a summary of findings, highlighting areas for future research, study limitations, and policy implications.

Literature review

Nowadays, any type of development that is not sustainable will do more harm than good. The concept of sustainable development concentrates on three main pillars: economic, environmental, and social (De Grosbois, 2012). This translates into caring for the planet, profits, and people. Attention to current environmental and social problems has become a key differentiator for business organizations. Citizens appreciate firms that care for others and do not focus solely on increasing their revenues.

Just like the concept of sustainable development, the term corporate social responsibility (CSR) has received much attention recently from researchers and marketing specialists. According to Carroll (1991), CSR consists of four fundamental elements: economic, legal, ethical, and philanthropic. The economic component represents the core of the business, more specifically, making profit by producing products and services that cater to customers' needs. The legal component is about respecting the business climate laws and regulations implied at local and international levels. The ethical component refers to doing the right thing at a societal level. Furthermore, based on the philanthropic element, companies are expected to be "good corporate citizens" by improving the well-being of communities (Carroll, 1991, p. 42).

The pressure on companies to adopt sustainability principles has intensified, mainly due to the alarming rate of socio-environmental degradation, concerning climate change, loss of natural resources, unfair trade, and human rights challenges. The literature review search revealed some positive findings, highlighting that "a growing number of companies are implementing CSR initiatives and are improving their efforts to become more sustainable" (De Grosbois, 2012, p. 896). However, the main research limitation of studies concerning CSR implementation is that most focus on multinational corporations. Therefore, papers on small and medium organizations and sustainable development are neglected at both local and international levels. Clemens's (2006) literature search found only two studies on the link between green behavior and small firms. A similar finding resulted from Leonidou and Leonidou's (2011) biographical analysis. Investigating more than 500 articles from 119 academic journals published between 1969 and 2008, the authors concluded that most of these studies focus on medium and large-sized organizations. Surprisingly, 11 years later, Martins, Branco, Melo and Machado (2022) confirmed that the number of available studies on small firms continues to be very low.

On the one hand, CSR implementation can benefit society and organizations, impacting both micro and macro levels. According to Cronin, Smith, Gleim, Ramirez, and Martinez (2011), companies that adopt green marketing strategies are "likely to achieve greater financial gains and market share, high levels of employee commitment, increased firm performance and increased capabilities" (p. 163). Other specialists confirmed that pro-environmental practices could help with resource management, thus "increasing productivity and reducing costs" (Fraj, Martínez, & Matute, 2011, p. 349). Concerning small firms, a study on the steel industry highlighted a positive correlation between green involvement and financial performance (Clemens, 2006). This result encourages small and medium-sized firms, as they could benefit from introducing green actions into their business plans. A more recent study on all European Union member states added some further benefits of implementing resource efficiency measures across SMEs:

competitive advantages, respecting the law, increased sales, and better opportunities in the market (Zamfir et al., 2017).

On the other hand, the main barriers to CSR adoption discussed in the literature are “limited resources in terms of staff, money, and time, lack of interest and need, and no requests by customers or management” (Sheldon & Park, 2011, p. 402). Regarding SMEs, the key inhibitors to pro-environmental actions are “the absence of an institutional environment, the absence of perceived business benefits deriving from sustainability practices, and the unavailability of framework and guidelines to support firms, specifically in terms of planning, monitoring and evaluating” (Martins et al., 2022, p. 3). Another issue identified by researchers is that, although firms have a favorable attitude towards CSR, acting, measuring, and reporting are very difficult (De Grosbois, 2012). According to De Grosbois’s (2012) research on the global hotel industry, reporting responsible actions is challenging because of “different methodologies applied, different measures used and lack of clarity concerning the scope of reporting” (p. 896). Other specialists have highlighted that the main problem associated with CSR is difficulty in tracking and measurement (Sheldon & Park, 2011). Therefore, it could be argued that more clarity and guidelines are needed to evaluate the green performance of business organizations.

Evidence provides some opposing results concerning the link between the company’s size and CSR participation. On the one hand, specialists argue that bigger firms are more likely to be pioneers in the CSR domain (Martins et al., 2022). On the other hand, some researchers have concluded that small firms implement more CSR activities than bigger organizations (Carey et al., 1997). However, most studies have confirmed that SMEs are one step behind in incorporating CSR actions (Zamfir et al., 2017). According to Katz-Gerro and López Sintas (2019), although SMEs understand the advantages of CSR measures, many of them “are still failing to implement change actively” (p. 486). One possible explanation could be that most of these firms are preoccupied with their daily activities and surviving in the market; therefore, they may find it discouraging to prioritize sustainability. Moreover,, this process takes a lot of time, resources, commitment, and knowledge.

Undoubtedly, SMEs play a major role in social and economic development. For this reason, The European Commission (2022) describes Europe’s 23 million SMEs as “the backbone of the European Union economy” (p. 1). Firms of small and medium sizes can hold a central transformational role in the local society. Their development is essential for increasing prosperity and competitiveness by creating jobs and social stability. Nevertheless, SMEs can also have a huge environmental impact because of their substantial presence worldwide. European SMEs are estimated to cause more than two-thirds of industrial pollution in the continent (OECD, 2018). Therefore, addressing current environmental and social issues is no longer an option, becoming mandatory for SMEs. The new “SME Strategy for a sustainable and digital Europe” developed by the European Commission further highlights the need for action.

Like everywhere in Europe, most of the businesses in Romania are SMEs. They amount to 12% of the total turnover of Romanian companies, creating more than 880.000 jobs (Vasiliu, 2021). In 2019, their total number was around 670.000, representing more than 90% of the total business market in Romania (Vasiliu, 2021). According to the National Trade Register Office (ONRC), the number of new companies established in

2020 has dropped by around 18% compared to the previous year, probably driven by the pandemic context (Vasiliu, 2021). These firms are a great source of innovation, contributing to the country's socio-economic development.

The "White Paper of Romanian SMEs", launched in 2021 by the National Council of Romanian Small and Medium-Sized Private Enterprises (CNIPMMR, 2021), revealed that almost half of all national SMEs reduced their activity last year. Figure 1 below presents the complete activity status of Romanian SMEs during 2021.

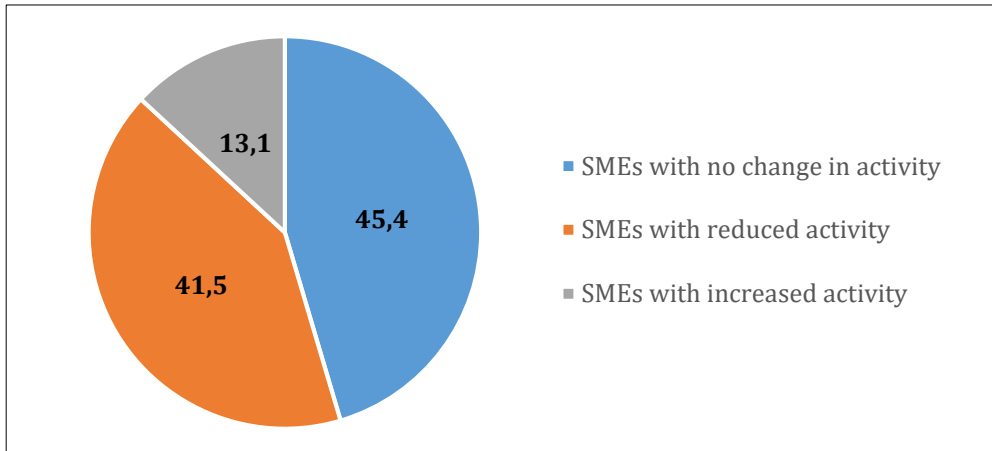


Figure 1. The activity status of SMEs during 2021 (CNIPMMR, 2021, p. 7)

The same report highlighted that the behaviors and achievements of Romanian SMEs are impacted negatively by the uncertain future (51%), decreasing local demand (47%), limited staff resources (44%), bureaucracy (42%), unfair competition (41%), rising expenditures (36%) and taxes (31%) (CNIPMMR, 2021).

According to Marchis (2016), the entrepreneurial climate in Romania is still developing, being defined by "greater caution, reduced liquidity, reduced flows of foreign capital, and more stringent regulations and actions that minimize risk, but reduce capital" (p. 88). Similarly, Zamfir et al.'s (2017) cross-cultural study mentioned that Romania is one of the few countries with a very discouraging framework for adopting circular economy activities. The authors added that "the participation of SMEs from Bulgaria, Hungary, Poland, Romania, and Slovakia with regard to circular economy is the weakest in Europe, regardless of the sector of activity, size or turnover of the company" (Zamfir et al., 2017, p. 12).

The literature review search on CSR and SMEs has revealed a significant knowledge gap. Little is known at a local level about how small firms perceive sustainability and their attitudes and expertise on ecological behavior. Therefore, it can be concluded that conducting a study on this topic is relevant and necessary. It is vital to foster public debate on this subject, considering the economic grants offered by the Government and the pressure from stakeholders. Additionally, environmental damage in the country is on the rise, and a rich biodiversity area is at stake.

Data analysis and findings:

As mentioned previously, this study focuses on SMEs because these firms play a major role at a local level, in terms of both economic and social development, as well as current ecological problems. For an entity to be considered a small or medium-sized enterprise, a few conditions must be achieved regarding turnover and number of employees. For the current research, the definition provided by the European Commission is taken into account; therefore, SMEs are firms that have “less than 250 employees and that do not exceed 50 million euros of annual turnover or 43 million euros of total annual balance” (Bassi & Dias, 2020, p. 2530). Although definitions may vary slightly locally, most are based on the number of employees and the organization’s financial results.

The data analyzed is part of the Flash Eurobarometer 498 survey called “SMEs, green markets & resource efficiency” (European Commission, 2022). The fieldwork occurred between November and December 2021; the report was published in March 2022. The main research themes are related to resource efficiency actions and the market of green products and services. The survey was implemented across all 27 Member States of the European Union, including Romania. 13,343 telephone interviews were recorded with respondents from all countries in their native language. In Romania, 584 SMEs from various industries were interviewed.

Although European Commission reports provide beneficial and updated information regarding the opinions of citizens, households, and companies, they are not very popular across marketing and management studies. Regarding the specific Flash Eurobarometer editions, only three studies were identified in the literature (Zamfir et al., 2017; Katz-Gerro & López Sintas, 2019; Bassi & Dias, 2020). These studies offer a full view on environmental practices across all European Union countries, making relevant comparisons between states. However, the current study is country-specific to dive deep into Romanian SMEs’ climate. The transition towards a sustainable society will smoothen if local SMEs receive the necessary attention and resources. To add more, the interest of citizens is increasing when it comes to eco-friendly companies.

Thus, the main objective of the current paper is to offer an updated perspective on how Romanian SMEs perceive corporate social responsibility. The main topics analyzed are actions taken for resource efficiency, level of investment so far, and future measures to reduce environmental footprint, as well as impediments to sustainable development. The study also offers a dedicated section on the green market in Romania. In order to achieve the aforementioned goal, the data sets are analyzed and interpreted with the help of SPSS software.

The first section looks at the actions taken by the companies to limit natural resources usage and become more eco-conscious. The related question is a multiple-choice one, therefore, the respondents can select all options that apply from a list of 9 actions. Data analysis revealed that, when it comes to Romanian SMEs, the most mentioned activities are waste minimization (75.3%), saving materials (72.3%), and energy conservation (69.9%). At the other extreme, the least mentioned activities are using mainly renewable energy sources (11.0%), changes in product design (35.1%), waste and residue selling (43.7%), and internal recycling (44.3%). Therefore, almost 7 times more respondents are minimizing waste than those who predominantly function on renewable energy. First of all, Romanian SMEs seem more likely to take part in actions that do not require

drastic changes in their operational structure or do not significantly impact the environment. Minimizing waste or materials usage can be perceived as rather superficial compared to changes in product design or energy sources. Second of all, it comes as no surprise that the least number of Romanian SMEs are using renewable energy, considering that Romania is one of the few countries in Europe without a clear decarbonization strategy regarding the transition from traditional and polluting energy sources, like coal, to green energy (Greenpeace Romania, 2021).

In order to quantify the number of actions taken, responses were grouped into four categories: “many activities” (9-7 actions picked), “some activities” (6-4 actions picked), “few activities” (1-3 actions picked) and “no activities” (0 actions picked). The results are presented in Table 1 below.

Table 1. The number of actions taken by Romanian SMEs (Source: Authors' own research results/contribution) (Author's Own Source)

Number of activities	Percentage
Many	57.5
Some	22.4
Few	11.5
None	8.6

As highlighted above, less than 10% of companies (50 respondents) did not participate in any type of behaviour related to environmental protection and resource conservation. Overall, it seems that most of the SMEs interviewed have taken many or some actions; therefore, it could be argued that they are actively participating in saving the planet. Another promising result is that the number of those who did not pick any action decreased compared to the previous survey edition.

The next question concerns the average level of investment in pro-environmental measures over the past 24 months. The response options are related to annual turnover: “less than 1%”, “1%-5%”, “6%-10%”, “11%-30%”, “more than 30%”, and “no investment”. Compared to the previous question, which highlighted some positive findings, actual investment in resource efficiency actions remains quite low. For example, around a third of all respondents have not invested anything in the past 2 years (30.5%), while the majority invested less than 5% of their yearly revenues (58.4%). Only 12 companies mentioned investing more than 30% of their annual revenues in pro-environmental activities.

These differences could portray a potential gap between attitudes, perceptions, and real green behavior. This imbalance is further highlighted when analyzing the responses concerning plans and strategies for the future to reduce carbon footprint and gain climate neutrality. Data analysis revealed that the number of Romanian SMEs that do not have a green strategy, but are planning to act, is almost equal to the number of those which do not have a green strategy and are not planning to invest any resources in this direction (around 35% of all SMEs questioned). Around 5% of all respondents declared they were already carbon neutral.

Because of this gap between talk and action, it might feel that companies give society “mixed signals” (Elving et al., 2015, p. 118). Therefore, if firms present themselves as eco-conscious and socially responsible, this does not automatically mean they are doing anything to save the planet and achieve sustainable development (Elving et al., 2015). Multiple studies on green consumption have confirmed that this gap is not only present in the behavior of companies, but also in customers or households. According to Aertsens, Verbeke, Mondelaers, and Van Huylenbroeck (2009), „the gap between intention and behavior is larger in the Southern countries, due to a higher degree of uncertainty and the lower availability of organic food in these countries” (p. 1153).

The next part of the paper is about the barriers respondents perceived in implementing resource efficiency actions. Like the first question, respondents could choose from a list of 9 impediments. Most mentioned answers are the complicated administrative and legislative policies (53.0%), the inappropriateness of environmental legislation with regards to SMEs (37.4%), outdated technical details (36.8%), lack of expertise (35.9%) and limited financial resources (35.7%). Respondents often mention these barriers from CSR studies, especially the issue of limited time, money, and staff resources (Coles et al., 2013).

And finally, the last section of results is dedicated to the Romanian green market, specifically SMEs selling ecological products and services. The main findings are summarised in Figure 2 below.

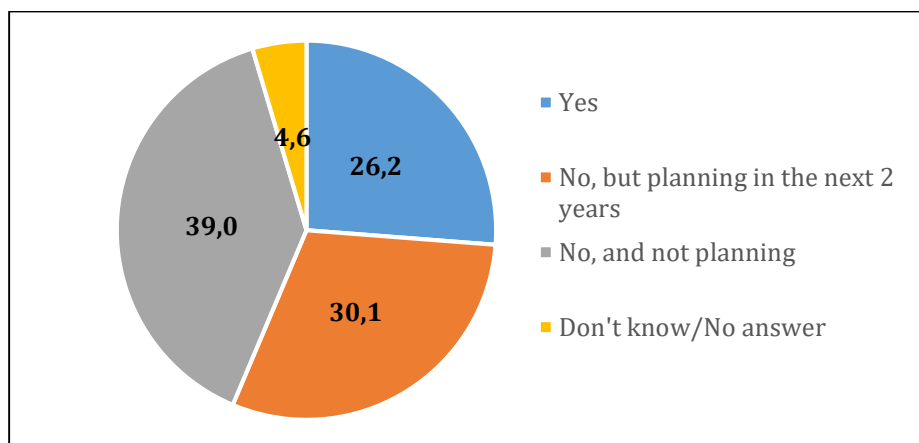


Figure 2. Responses to the question “Do you offer green products and services?”
(Source: Authors’ own research results/contribution)

As illustrated in the figure above, a total of 228 respondents (39.0%) have mentioned that they do not plan to sell green products or services. From the total sample, 26.2% declared they are already part of the green market, while around a third are planning to join this segment in the next 24 months. Compared with other European countries, Romania is among the last 5 countries in terms of SMEs already in the green market. Almost two times more companies in the Netherlands or Austria sell green products and services than in Romania. In these countries, the organic sector is far more developed. Therefore, the proportion of SMEs not offering green products and services is quite high compared to other countries. By domain, the food industry is the most developed in green presence.

To add more, Romania is also ranked first in the EU regarding the number of companies not offering eco-friendly goods but want to join this market in the next 2 years. Future investigation is required to understand how this transition can become a reality faster.

Conclusions

The current research examined how small and midsize firms perceive sustainability-related topics in Romania. This study represents a good starting point, being one of the earliest attempts to understand this research topic at a local level. Findings revealed that most Romanian SMEs are trying to take better care of natural resources by participating in environmental activities. At the same time, a gap between talk and action was identified when considering plans for the future and the level of investment. To add more, a few barriers to CSR adoption were highlighted by respondents. In order to find the right solutions internally, qualitative and quantitative data are required shortly. The link between sustainability and SMEs must be better understood to support the transition toward a sustainable country. Most importantly, the inhibitors mentioned by the SMEs interviewed need to be transformed into challenges to overcome.

Although the present paper offers relevant insights regarding the ecological behavior of Romanian SMEs, some important limitations are worth mentioning. For instance, the current study relies on secondary data analysis. Future studies should implement primary data collection to compare findings with Flash Eurobarometer reports. To add more, there are some knowledge gaps, for example, the main drivers of sustainability were not investigated. This topic should be included in future research to understand what drives companies to be more socially responsible. Also, this study does not analyze differences in industry type, region, or number of employees. Therefore, other papers could focus on specific comparisons because CSR implementation may vary based on country, culture, or industry, other papers could focus on specific comparisons. The truth is there are many topics left to be discovered to achieve sustainable development at a business level and further on at a national level, therefore protecting the environment and the wellbeing of society.

We hope the presented findings are useful for those interested in stimulating green behaviors in markets where public eco-consciousness is not that developed, including Romania. As mentioned by Marchis (2016), “the framework under Romanian entrepreneurs operates is still very unsafe and unpredictable” (p. 94). However, although sustainability is harder to achieve in practice than the theory prescribes, in the end, it offers a valuable and safe development for businesses of all types and sizes, together with securing the prosperity of future generations.

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ANALYSIS OF SOCIAL MEDIA PLATFORMS TO BUILD A POSITIVE, ETHICAL, AND SUSTAINABLE ASSOCIATION FOR THE BRAND IN THE FOOD INDUSTRY

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Abstract. *The world of marketing has changed dramatically and social media has played a crucial role in this transition. New web technologies and online media constantly challenge traditional media that stimulate participation, conversation, and a sense of community (Castronovo & Huang, 2012).*

Specifically, social media has become a pretty cool branding tool. It allows companies of all sizes to establish a communication channel with their customers, market their products, communicate an ethical approach, and increase customer loyalty. However, being a two-way channel, it requires commitment and care to manage this communication. Consumer purchasing criteria for food are increasingly health and sustainability-oriented and the internet and social media play an important role. As in other areas outside the food sphere, the Internet and social media are increasingly important in providing this information as this output is increasingly reliable. To avoid the risk of damaging the brand image rather than improving it, companies should choose a profile of people that matches their target segment and communicate with them accordingly, Saravanakumar and Sugantha Lakshmi (2012). Social media comes in many forms and one of them is social networks. The Metaverse is the evolution of these communities thanks to the possibility of organizing events with friends, virtual or otherwise. The crypto community has become passionate about food and its supply chain and through the blockchain, the food sector could be pushed towards choices aimed at ethics, transparency, and autonomy. Consequently, our research question is how the dietary content of social media performance and its economic value are influenced by ethical and sustainable choices. An application in the food sector will be analyzed through its impact report: Too good To go which deals with the reduction of food waste and the reduction of CO2.

Keywords: *social media; Instagram; communication channel; brand loyalty; food; Metaverse; Too Good to Go.*

Introduction

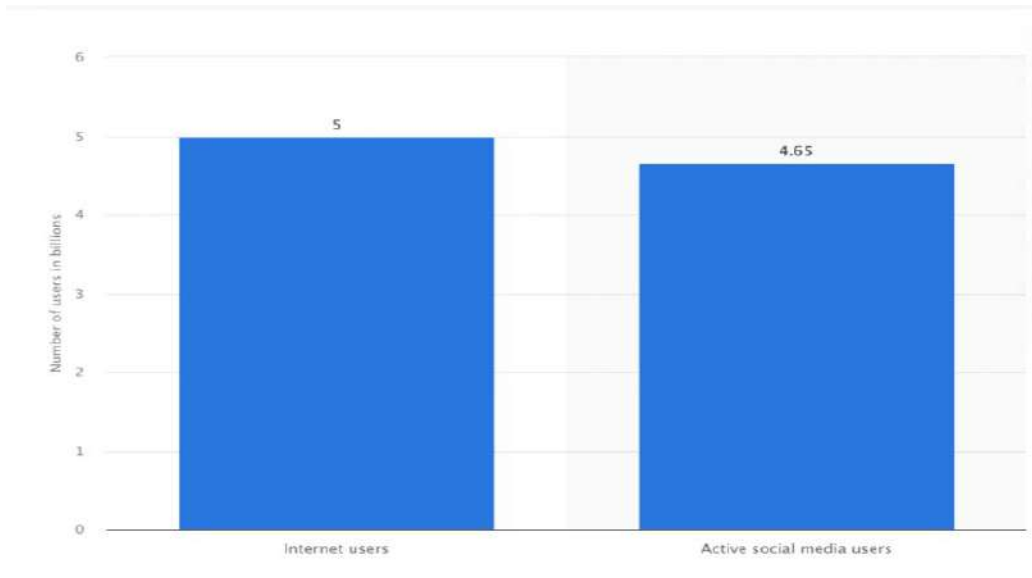
Traditional media such as television, newspapers, radio, and magazines are, in the new era, technologies for static shows and are constantly challenged by new web

technologies and online media that stimulate participation, conversation, and a sense of community. The increasingly customer-centric perspective has given rise to new tools, marketing methodologies, and strategies that have led to the development and affirmation of new tools, giving enormous space to the potential of the Network. These tools are functional to develop your own network, commercial, analyze the market, and create offers based on a target to be reached that thanks to these tools it was possible to define and profile in a targeted way, in detail. The marketing world has deeply changed and social media has played a crucial role in such a transition. New web technologies and online media constantly challenge traditional media that stimulate participation, conversation, and a sense of community (Castronovo & Huang, 2012). It is evident, therefore, that the Internet inevitably expands the opportunities and horizons of human communication, contributing to the redefinition of part of the geography of our planet. The network is not only the result of a long series of scientific research and technological inventions: it is the cornerstone of the network society in which we live and permeates with its peculiarities of our cultural development.

Social networks connect people and brands directly, without the filters of the past and this is the great step that identifies social media marketing. Building a world of relationships on various social networks is the mission of the brands and the use of these tools allows entrepreneurs to have immediate feedback on the business and products, creating a sense of belonging in the user and stimulating him to get closer and then invite him to perform precise actions (sharing, interactions, evaluations, purchases). The possibilities of human communication have been expanded by the Internet. With the natural evolution of social media, there will be a fusion between social media and virtual reality. Through the Metaverse, there is an even more immersive development of the social world. A world parallels to the real one that flows daily and that will become a unique experience with an economy and customs of its own. Social media, websites, virtual reality, search engines, emails, and smartphones will be integrated and interconnected with each other with the connection between the physical and virtual worlds. John Smart (2007) defines this encounter through the Metaverse: "The Metaverse is the convergence of 1) virtually- enhanced physical reality and 2) physically persistent virtual space. It is a fusion of both, while allowing users to experience it as either".

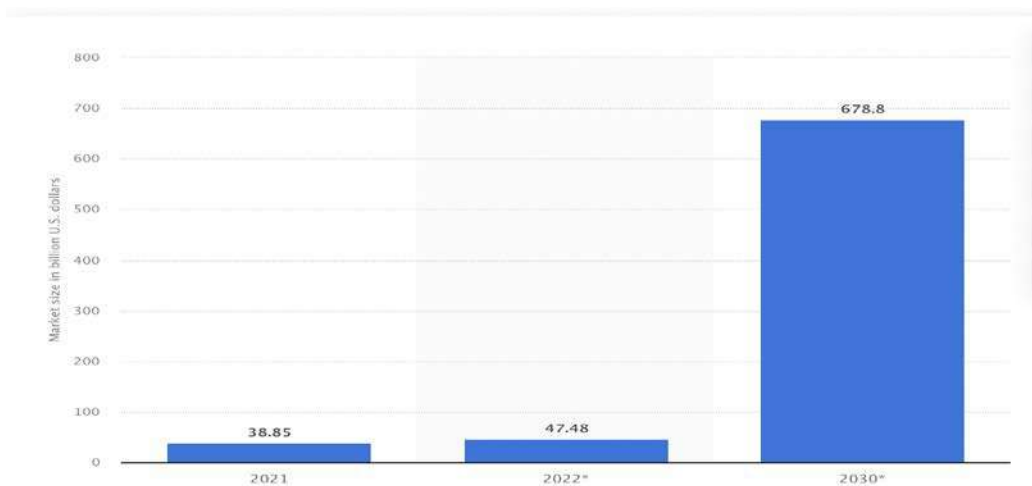
Social Media Marketing concerns those activities for promoting products, services, and brands through social networks that allow direct interaction between the user and the company. Social channels can become a powerful user engagement machine that directs them to your website. However, as it is a two-way channel, it requires effort and care to manage this communication. In order to avoid the risk of damaging the brand's image rather than improving it, businesses should choose a profile of people that matches their target segment and communicate with them accordingly (Saravanakumar & Sugantha, 2012).

From the analysis of Statista (2022), it is highlighted that in April 2022 there were five billion users with an Internet connection equal to 63% of the world population and 4.65 billion of this total were social media users, fig. 1.

Figure 1. Global digital population as of April 2022

Source: Statista (2022)

Also important are the estimates of the numbers of users in the Metaverse who moved the global market in 2021 for 38.85 billion U.S. dollars, with forecasts in 2022 of 47.48 billion U.S. dollars rising to 678.8 billion U.S. dollars by 2030, fig.2.

Figure 2. Metaverse market revenue worldwide from 2021 to 2030 (in billion U.S. dollars)

Source: Statista (2022)

Through the analysis of the literature and of the characteristics of social platforms, we will try to answer the question of whether they support the choices made by companies in the food sector to build a positive, ethical and sustainable association.

Literature Review

Over the last decades, branding critics have demonstrated how brands rely not only on the data but also on the content that consumer participation generates on social media platforms (Banet-Weiser, 2012; Hearn, 2008; Zwick et al., 2008).

The practice of branding is typically understood as a complex economic tool, a method of attaching a social or cultural meaning to a commodity, as a means to make the commodity more personally resonant to the consumer. In this era, brands are about culture as much as economics. Brands are nothing more than a story told to consumers. When this story is successful, it goes beyond the simple identification with the product or the service and becomes familiar, intimate, and personal (Banet-Weiser, 2012). The spread of social marketing, the engagement of consumers through user-generated content online, and the coproduction of brands by consumers have created a new relationship between the buyer and the seller.

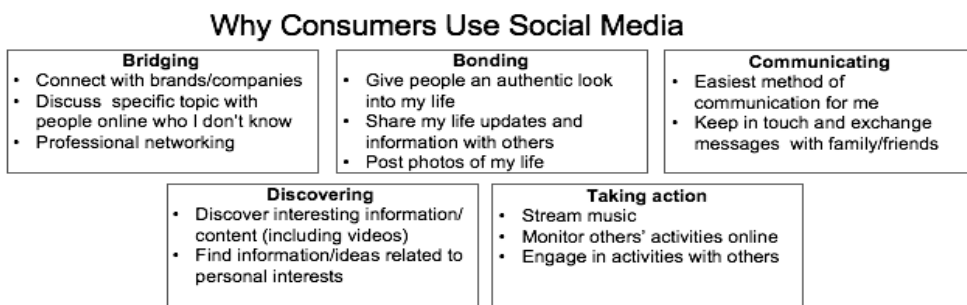
In an effort to more effectively manage such a peculiar relationship, businesses' use of social media has increased, resulting in several companies having started a personal Facebook or Instagram page.

Pursuing social media strategies, a brand aims at (a) building a sense of membership, (b) building greater awareness of the brand to audiences it has not yet reached, (c) building positive brand associations, (d) encouraging the acceptance and communication of brand values, and (e) encouraging the audience to engage in dialogue and eventually promote the brand. This dialogue can in more strategic terms, (f) help the business to find and maintain a competitive advantage, (g) act as a check to understand whether the brand is properly communicated and understood by the target audiences, and finally (h) inform the vision behind the brand and build differentiation for it (Yan, 2011).

The first rule for brands to survive and eventually succeed within the context of social networks is to be genuine. Brands that are fake or sketchy are soon uncovered. The second rule is that brands should not bet on a single social network, instead, they should build a truly integrated social media ecosystem. Needless to say, the most successful brands are those that create the right content for the right channel, as audience expectations vary from platform to platform. This means that what evokes engagement on Facebook does not necessarily generate the same response on other social media platforms, like Instagram.

Research conducted in 2018 by Nicole Votolato Montgomery, a professor at the University of Virginia, aimed at understanding why consumers use social media and how businesses can choose social channels in alignment with their goals. From such research, consumers' motivations for using social media channels fall into five distinct categories: bridging, bonding, communicating, discovering, and taking action (Montgomery, 2018), as summarised in table 1.

Table 1.: Social Media Platform Use Motivations



Source: Montgomery, (2018)

Among these reasons, the ones with a psychological root play a crucial role. People feel the need to be socially connected (Sarason, 1974) and joining social media and connecting with others satisfies their need for belongingness (Gangadharbhatla, 2008). As a matter of fact, social interaction is defined as one of the main motivations for consumers to engage in content generating activities on online platforms (Hennig-Thurau et al., 2004).

The analysis conducted by Montgomery also revealed different kinds of behaviors consumers might take in response to brand content (Table 2), which fall into three different categories:

1. Brand investigation ,i.e. behaviours related to learning about a brand
2. Brand advocacy, i.e. behaviours related to deepening a relationship with a brand
3. Blocking content, i.e. a voiding any brand content

Table 2.: Consumer Behavioural Responses to Brand Content

Behaviour Category	Description and list of behaviors
Brand investigation	<p>To learn about a brand</p> <ol style="list-style-type: none"> 1. Do a web search to find additional nformation about the brand 2. Visit the brand/company website 3. Click/swipe on the content 4. Follow the brand/company on the platform 5. «Like» or «Favorite» the content 6. Subscribe to a brand channel or podcast 7. Follow the brand on another social media 8. Purchase a product/service from the brand
Brand advocacy	<p>To deepen a relationship with a brand</p> <ol style="list-style-type: none"> 1. Share the content on the platform 2. Share the content on another social media platform 3. Tell one or more friends about the content 4. Take a screenshot/save the content 5. Write a review for the brand or its products 6. Use hashtags related to the company in your own posts 7. Geotag own content with the company's location 8. Interact with the company via a chat or a messaging site/app 9. Tag people 10. Subscribe to receive emails from the company
Blocking content	<p>To avoid content from the brand</p> <ol style="list-style-type: none"> 1. Block content from the company

Source: Montgomery, (2018)

As a series of regression analyses showed, the motivation dimensions drive the varying behaviour towards brand content. For instance, when consumers' use of the platform is based on connecting with other users or brands (Bridging) and discovering new information (Discovering), it is more likely that they will respond to brand content. Additionally, businesses have to consider the type of content to create for any given channel. The research conducted by Montgomery identified eight different categories of content (Table 3), which fall into three macro categories: Identity content, Info/Utility content and Emotional content.

Table 3: Content Categories

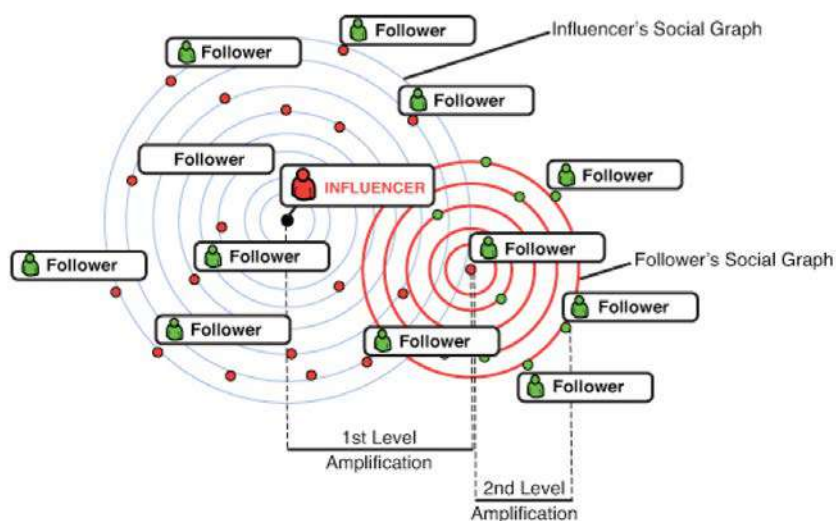
Identity	Info/ Utility	Emotional
Reflects who I see myself as	Educational	Humorous
Reflects who I want to be	Informs about news/current events	Warm and fuzzy
Relates to my hobbies/personal interests		Sympathetic

Source: Montgomery, (2018)

Social media platforms and brand in the food industry

Online consumer reviews are a major source of information that drives purchasing decisions. Potential consumers are more likely to rely on other real consumers' recommendations rather than a marketing message. Before the era of social networks, unsatisfied consumers were less likely to complain as the costs of complaining were seen as exceeding the benefits (Gafni & Golan, 2016). However, online sharing platforms have made complaining much easier (Gregorie et al, 2015). Van Noort and Willemsen (2012) stated that, through social networks, complaints and dissatisfied experiences can be communicated and distributed almost instantly and this can cause substantial damage to the company and the brand. The two scholars also found that negative electronic Word of Mouth (eWoM) (Kirby & Marsden, 2006) may have strong effects on consumer behavior, on all phases of their decision-making process, including brand evaluation, brand choice, purchase behavior, and brand loyalty. The current paradigm of influence marketing places the influencer at the center of the marketing strategy, which requires marketers to identify people with a wide/ deep reach within communities, understand the nature of communities and the role of the influencer within the community (Brown & Fiorella, 2013), fig.3.

Figure 3: Fisherman's Influence Marketing Model



Source: Brown, D. & Fiorella, S. (2013)

Nowadays, social media has become an important source of information for all types of consumers, (Gazzola et al., 2017). The role of social media, in fact, is more relevant for those businesses in which word of mouth plays a central role, such as food and catering. According to Leung et al. (2013), social media can overcome the “problem” of intangibility as it is linked to the fact that the quality and the potentially favorable outcomes of a food product cannot be evaluated ex-ante but only ex-post, that is, once consumed. Consequently, to avoid making and regretting a wrong choice, consumers tend to gather information in advance from various sources - not just friends and family but also other internet users around the world - and often make a decision based on this. ... that others suggest. User-generated content on social media, which can take the form of messages, videos, images, and so on, is an important source of information in decision-making. Burgess et al. (2009) suggested that user-generated content is reliable because it is a “real experience shared by real individuals”. However, Leung et al. (2013) stated that this type of content is not always reliable as it may be posted by someone with a business interest.

Social media can be a powerful and often inexpensive marketing tool, especially in the food sector. Positive comments on social media platforms can favorably improve the image of a food product and attract more consumers. Mhlanga and Tichaawa (2017), for example, report that 44% of first-time restaurant consumers are motivated to try a restaurant by the positive comments they read on social media. Given the greater number of people that can be reached on social media, the echo that specific comments received on that platform is quite intense. If consumer feedback is positive, this mechanism creates a clear advantage for companies operating in the food sector, improving their reputation and attractiveness in the eyes of other consumers. However, if the comments are negative, the results can be detrimental. Out of 100 dissatisfied consumers, only 4 express their dissatisfaction and in three out of four cases it is possible to recover these consumers. The remaining 96 consumers will not only go

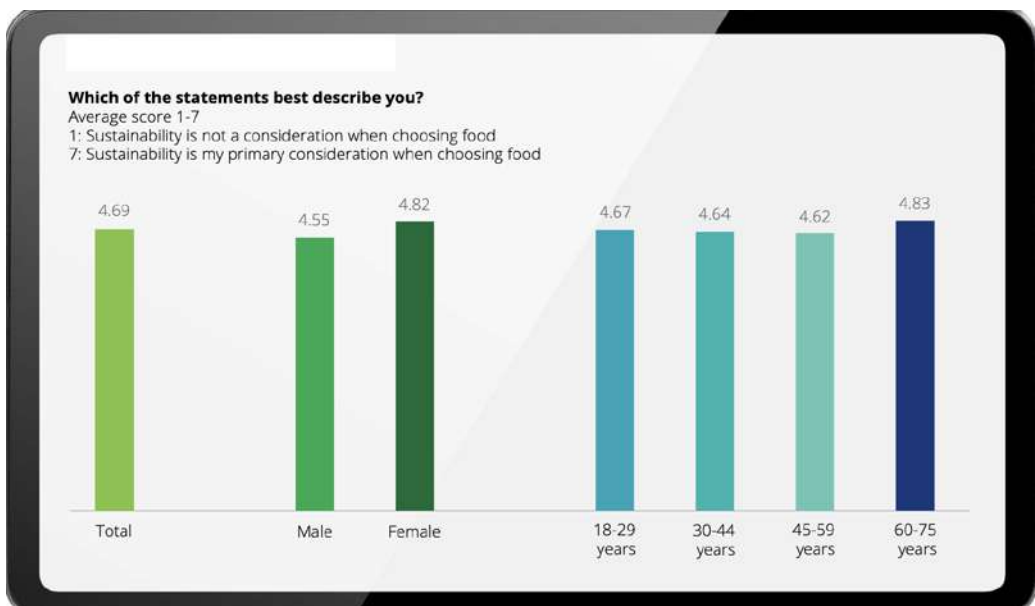
elsewhere but may also spread negative comments and suggest other potential consumers make different choices. According to Buscall (2015), "one bad tweet or negative comment on social media can cause up to thirty customers to lose your business." in the restaurant business

Social media and sustainable choices in the food sector

The criteria for the purchase of food by consumers are increasingly oriented towards health and sustainability and the internet and social media play an important role. As in other areas outside the food sphere, the internet, and social media are increasingly important in providing this information considering this output increasingly reliable. Deloitte (2021) launched a survey on consumers regarding sustainability and health and their choices in purchasing food products in 15 European countries. From Figure 4. research reveals the extent of consumers' sustainability choice when purchasing food. The mean score is 4.69 with a range of 1 to 7.

Figure 4. Consideration of sustainability

Source: Deloitte (2021)



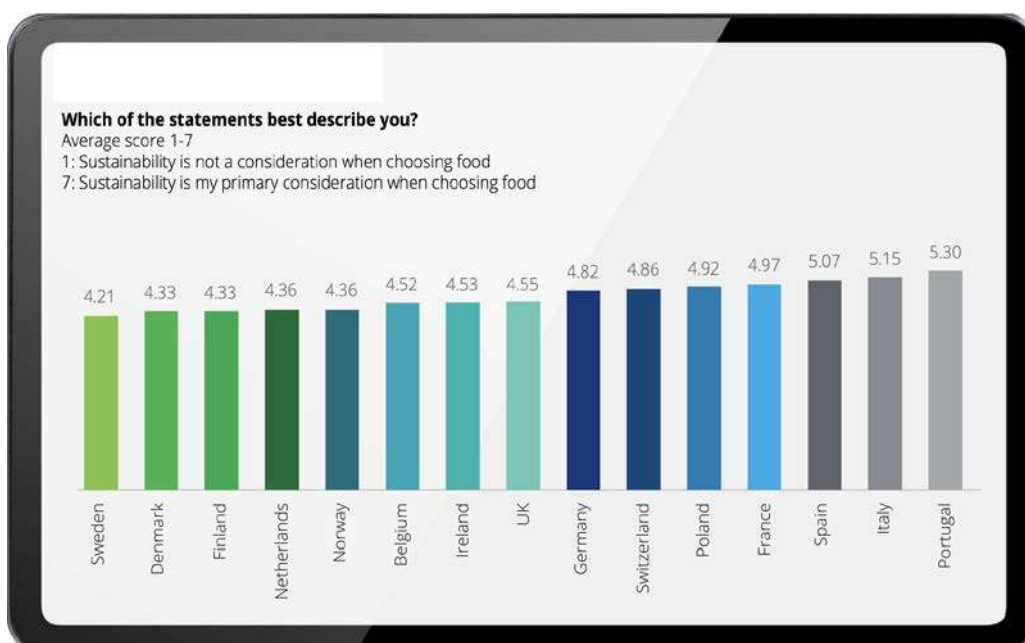
Ethical and sustainable purchases are derived from the environmental propensity that consumers have towards protection and social.

The willingness to consume foods with a lower environmental impact also depends on the price, generally chosen from the lowest even if the relationship between this and foodstuffs is not always negative, since a price higher is assumed to have a higher quality and a better product image. Consumers associate two types of attributes to food products: one defined as selfish, linked to the economic aspect e therefore to the price, and the other, defined as green, associated with the propensity to purchase ecological

products. The valuation analysis of each product attribute will depend on the decision to consume it or not and then proceed with the trade-off.

If the consumer attributes positive characteristics to the food under investigation, the green aspect will prevail and the phase will end with the purchase of the product, if instead, he considers the food not suitable to satisfy his needs and requirements, then it will not proceed to purchase it despite the fact that it has the ethical, social and characteristics environmental, (McCluskey & Loureiro, 2003). To the question of how sustainability affects food purchasing decisions, it is highlighted that southern European, (Italy Spain, and Portugal), countries are more careful, with choices aimed at the use of reusable bags, avoiding too much waste, and favoring recyclable packaging and the use of local products, Fig.5.

Figure 5. Consideration of sustainability



Source: Deloitte (2021)

Consumers are informed in the food sector, through information shared on social media. Interacting with an active online company encourages their involvement by being able to express interests and emotions, interacting and contributing to the formulation of products through active participation (Stefanidis et al., 2013). For companies, careful use of social media in promoting their products facilitates the development of the company's reputation. Consumers choose and give preference to companies and brands that respect environmental sustainability. There are variables whose correlation creates a positive and direct effect on environmental sustainability as consumers in the choice phase favor companies that respect environmental sustainability, (Mendleson et al. 1995). Therefore, to achieve environmental sustainability objectives through social media, companies, must analyze several variables: perceived value, future prospects,

trust, and satisfaction, (Chen et al. 2015). A satisfied customer is an economic asset to the company with high returns and low risk, (Fornell et al., 2006).

Fight against food waste: Too Good to Go

An application of the food sector born in Europe and active in many countries of the world has as its mission the sustainability and the achievement of some UN 2030 targets with social media interaction.

The Too Good To Go app project is based on four entrepreneurial pillars: consumption, correct use of resources, respect for the environment, and awareness of food waste, in order to contribute to the achievement of goal number 12 "Sustainable production and consumption" of SDGs 2030. TCTG declares "Our mission is to inspire and involve everyone in the fight against food waste. To achieve our goal, we want to translate our words into concrete actions and help at different levels to build a movement against waste", (Too Good To Go UK). App is certified "B Corporation" which measures a company's social and environmental impact (Grimes et al., 2018).

Too Good to Go is an app with a long-term project aimed, through its marketplace, to sensitize companies and public institutions to change in the fight against food waste to protect the planet. The App's mission is: "Our mission is to inspire and empower everyone to take action against food waste. We know that to live and breathe this daily, we need to turn our words into actions. With this in mind, we have set out a new ambition - to contribute in every way we can to build the global food waste movement. Only when we all come together to fight food waste will we be able to generate a positive change in society."

The Magic Box is a bag containing food products and fresh dishes left unsold at the end of the day and which cannot be put back on the market or served the next day. The box is considered magical because the end user doesn't know what's inside until the purchase process is complete. The purchase process is simple and takes place via the downloaded App on your phone once geolocation is activated, the users can view participating stores and select a retailer in them nearby and buy a Magic Box which costs only a third of the full price. Once the store and the Magic box have been identified, payment via the App and the pick-up time is communicated. At the end of the purchase cycle, our planet has benefited from it since for each magic box purchased, it is avoided on average the emission of about 2.5 kg of CO₂, Fig.6.

Figure 6. Average emission CO2



Source: Too Good To Go, Impact Report 2021

There are many brands and stores that have joined the Too Good to Go project in the world, in figure 7 we see some of them.

Figure 7. Brands that have joined the Too Good to Go project

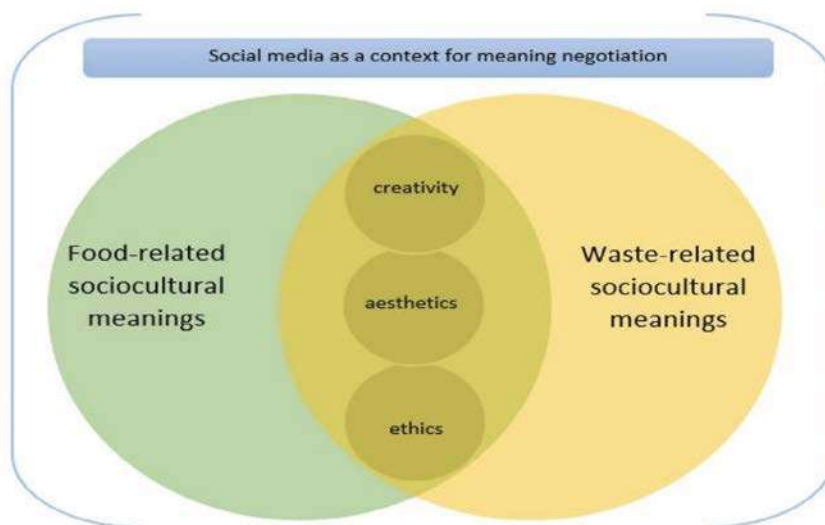


Source: Too Good-To Go, Impact Report 2021

The Too good to Go platform was initially the solution for some partners dealing with food waste, such as large retail brands. The work done to expand the number of member companies has brought together small retailers and large food industries. For the big food brands, the advantages are many, from managing the warehouse and their surpluses to increasing their reputation by adhering to good practices for reducing food waste. So we have Brands like Ikea that come together to create magic boxes with the famous meatballs, Danone, and Nestlè, without neglecting the catering sector where an analysis conducted on 114 out of 12 restaurants showed that almost every business records a positive return, with an average of \$ 7 saved per \$ 1 invested in reducing food waste in the kitchen, Clowes et al (2019). For restaurateurs who join Too Good To there are sustainable solutions to reduce waste due to the unpredictability of demand, to recover the costs incurred for the production of dishes and to increase their visibility by customers increasingly sensitive to this type of choice, and using smartphones and digital services to search and order meals.

Too good to go, it communicates with users through its presence on social networks: Facebook, Instagram, tweeter, LinkedIn, and YouTube, but also on the spontaneous aggregation to form groups of buyers on Facebook. who post photos of the contents of the Magic box and related comments. The app's function is also informative on good practices related to food and its recycling with downloadable ebooks, insights, interviews, blogs etc. According to Närvänen et al. (2018), social media is an increasingly important platform where consumers share information, interact and create new meanings. As shown in fig. 8. creativity generates new ideas and solutions. Aesthetics denote meanings related to multi-sensory knowledge and emotions. Aesthetics plays an important role in social media platforms. Visual aesthetics have become an important aspect of food, the presentations on social media platforms such as cooking blogs and "food porn", and online food images on social media have made food and eating public and shared collectively.

Figure 8. Framework depicting the interrelations of food, waste, and social media



Source: Närvänen et al., (2018)

Ethics relates to the practical behavior of a man with respect to what is the true good and what are means to achieve it. Ethical concerns in the area of sustainable consumption and therefore also waste-related practices help to create virtuous circles of management of the same.

Conclusions

The creation of business value has changed through social media, as have the structural forms of transfer of bargaining power and the reduction of the information asymmetry in favor of consumers. With the interaction of three factors: social media, community, and purpose (the value proposition), communities will share the brand and purpose through photos, videos, and little snippets of the company's personality. Consumers ask companies to consider the environment as corporate stakeholders. This can be achieved by integrating corporate goals with the United Nations Sustainable Development Goals and addressing climate change. Given the complexity of contributing and achieving these goals, embracing a collaborative mindset that opens up to a start-up, individuals, civil society, and competitors are essential to creating a more sustainable and equitable future. According to Kotler and Sarkar. (2017) companies must achieve a purpose superior to the simple pursuit of profit by proposing themselves as promoters of new ideas and interests in environmental protection. The use of social media and the Internet, in general, can help brand purpose to work for the common good and the duty of companies to make a positive contribution to people's lives. Therefore, companies must be aware that consumers interact with each other and the companies themselves, interacting and contributing to creating the products and services offered (Romero & Molina, (2011). Word of mouth of experience leads to increase notoriety, knowledge, and promotion of the brand. Word of mouth is more credible than traditional communication carried out by businesses, as it is generated by people, from people (Rakic & Rakic, 2018). From word-of-mouth marketing to word-of-mouth in traditional and digital media. Through the eWOM, everything is communicated quickly and instantly and a real community is created between consumers-consumers and consumers-businesses, where businesses do not have the ability to control the contents and the frequency with which dialogues take place between users, Vollmer, Precourt, (2008).

Consumer purchasing criteria for food are increasingly health and sustainability-oriented. In the food sector, the internet and social media are increasingly important for providing information, and the con is Too good to go, it communicates with users through its presence on social networks: Facebook, Instagram, tweeter, LinkedIn e YouTube, but also on the spontaneous aggregation to formed groups of buyers on Facebook. Who posts photos of the contents of the Magic box and related comments? Sustainability affects food purchasing decisions together at using reusable bags, avoiding too much waste, and favoring recyclable packaging and the use of local products. Joining Too Good Togo affects the impact report and the social balance sheet.

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RESPONSIBLE BANKING STRATEGIES DURING COVID-19 PANDEMIC: EVIDENCE FROM ROMANIA

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Abstract. *The COVID-19 pandemic has forced clients to use digital channels in order to access banking services, creating the premises for a challenging banking environment, more resilient to complex crises. The literature review based on the Romanian banking sector emphasizes a good capacity for shock absorption, suggesting the importance of digital banking as a response to the vulnerabilities generated by the health crisis. The paper's first section is dedicated to identifying the banks' responsible measures towards employees, clients, and the community during the COVID-19 pandemic, based on a content analysis of official websites, and annual or sustainability reports of the banks included in the sample. The present paper presents the most frequent responsible measures of the banks during the pandemic, stressing the employees' strategic role during the health crisis as a link between banks, on the one hand, and community or clients, on the other hand. In the paper's final section, the coding process using the MAXQDA software has revealed a strong identification of digital banking, as a way to obtain organizational resilience during the COVID-19 pandemic, with the People, Planet, and Profit dimensions. The data provided by the banks suggest an interesting perception of digital banking as a measure of corporate social responsibility related to the triple bottom line approach. The results have multiple managerial implications, focusing on digital transformation as a strategy to improve the organizational resilience of the banking institutions in Romania.*

Keywords: *banks; corporate social responsibility; COVID-19 pandemic; digital banking; People.*

Introduction

The present paper focus on defining the current state of corporate social responsibility practices of the Romanian banking sector in the context of the COVID-19 pandemic, emphasizing the relation with digital transformation. We have identified the best practices during the crisis, outlining the role of CSR actions in the organizational resilience of the banks. At the end of September 2021, the banking sector recorded increases in net profit up to lei 6.4 billion (an increase of 42% compared to the same period of the previous year) and an ROE indicator of 13.6%, above the European average values (7.4% in the EU27), but lower compared to the average of the sector of non-financial companies in Romania (18.9%, December 2020). The median ROE value of large banks, which concentrate 85.7% of the aggregate positive financial result, has

returned to growth, at a higher level compared to European developments, while the market share of loss-making banks remains low (0.7%).

Starting from the main research hypothesis that responsible practices towards clients have influenced organizational resilience through digital banking development, we organized the CSR sections of the bank's websites and reports to classify and structure the data. The coding process revealed a Code Theory Model focused on digital banking which is in line with the *triple bottom line* approach (Elkington, 1997), with a special emphasis on the *People* dimension.

Literature review

Crystallised as a distinct concept from the 60-the 70s, the notion of corporate social responsibility has been the subject of numerous scientific research efforts, without reaching a consensus regarding the definition and the approach to measuring the actions circumscribed by this concept.

From the multitude of approaches to corporate social responsibility, we consider that the most representative and frequently used in research are the stakeholder theory (Freeman, 1984), the "triple bottom line" approach (Elkington, 1997), and Carroll's pyramid (1979) which comes to strengthen the approach "triple bottom line". In every approach to corporate social responsibility, the starting point is the so-called moral culpability of corporations synthetically addressed on three representative levels (economic, social, and environmental). Carroll (1979) increased the complexity of Elkington's approach by constructing a multidimensional pyramid: economic responsibility, legal responsibility, ethical responsibility, and discretionary responsibility. In the last 30 years, in an attempt to reproduce, as accurately as possible, the way in which corporations give something back to society/community, other studies showed a multitude of new approaches which have brought changes to the dimensions of Carroll's theory (Schwartz and Carroll, 2003; García de los Salmones et al., 2005; Wood, 1991).

After the 2000s, greater importance began to be given to the ethical dimension of corporate social responsibility, especially when the economic-financial crises (for example, the one from 2008-2011) showed that different categories of clients and employees are affected to a greater extent. On the other hand, as Hongwei and Harris(2020) showed, the COVID-19 pandemic "offers great opportunities for firms to actively engage in various CSR initiatives during the crisis, and potentially catalyze a new era of CSR development in the long run. For consumers, the ethical dimension of consumer decision has become salient during the pandemic, which is also likely to shift consumers towards more responsible and prosocial consumption"(Hongwei and Harris, 2020, p.180-181).

Among different types of corporations, when we discuss CSR actions, banks are approached with the presumption that their only purpose is to obtain profit. That's why, especially in periods of crisis (economic, political, health), expectations regarding CSR actions of banks are increasing as the economies and societies are facing strong imbalances such as rising unemployment, and bankruptcies, especially at the level of small and medium-sized companies (Aivaz et al., 2022, p.3-5), the growth of the degree of indebtedness of the individuals and the ratio of non-performing loans. But such a

crisis comes with significant challenges for banks as well: systemic and specific risks, financial losses, reduction of investments, changes in the personnel structure and personnel expectations as several studies proved (Korzeb and Niedziółka 2020; Wu and Olson 2020, Wilkins 2020).

The behavior of banks in terms of corporate social responsibility actions during the COVID-19 pandemic aroused the interest of researchers who have analyzed especially the aspects that concern employees, customers, and the community (referring, first of all, to the People dimension from the "triple bottom line " approach) but also how they contribute to maintaining/increasing the entity's reputation on the one hand and customer loyalty and retention, on the other.

Ordonez-Ponce, Dordi, Talbot, and Weber (2022) developed research to determine how Canadian banks responded to the COVID-19 pandemic based on sentiment analysis and to evaluate the crisis management strategies implemented. The conclusion of their study was that banks have not addressed stakeholders positively throughout the pandemic, but the community has been found to achieve the highest positive sentiment score.

Baicu, Gârdan , Gârdan, and Jiroveanu(2020) made an analysis of CSR measures taken by banks in Romania and came to the conclusion that "similar to banks in many countries, banks in Romania took measures to stimulate digital channels"(Baicu et al., 2020, p155) but draw attention that such measures must take into account the risk of excluding customers without digital skills and make the recommendation that "more actions in the field of financial education for individual customers are needed" (Aivaz, 2021a, p. 15; Aivaz, 2021b, p.18). Another research based on the opinion of customers, shows that in the conditions of the COVID-19 pandemic, banks have taken measures that some of the customers perceived as CSR actions, and it comes to the conclusion that a direction in which the banking system will go with speed is the digitization of banking services, drawing attention to "the increased risks regarding the security of data and the IT systems used "(Druga, 2020, p. 42).

The studies carried out in Romania regarding the CSR actions of banks are few and most of them are realized in the first months of the pandemic, which justifies our approach to carry out an analysis focused primarily on the social dimension - the People pillar of the TBL approach, in the period 2020-2021, in order to obtain an overview of the CSR actions with a focus on the digitization of banking services.

Methodology

The research analysis focused on the first five banks by total assets in Romania with international activity to extend the analysis at the group level. The content analysis based on CSR sections of the banks' websites, annual reports, or sustainability reports was completed by a conventional thematic analysis through a Computer Assisted Qualitative Data Analysis Software, MAXQDA. The research investigation involves examining the data, coding, classifying, and reclassifying the codes to create patterns and themes. The main research hypothesis that responsible practices towards clients have influenced organizational resilience through digital banking development was tested and validated. Several codes rely on all three dimensions of the triple bottom line approach.

The MAXQDA software allowed us to easily explore the data, building hyperlinks between segments of data and unifying the codes in three main themes: environmental protection (*Planet*), economic performance (*Profit*), and support for stakeholders (*People*). The coding process supports a systematic qualitative analysis approach, structuring categories from In-vivo and open codes to sustain the theoretical construct. The paper's main findings resulted from juxtaposing meaningful data units after two complete coding cycles. The emerging coding system corresponding to the first coding cycle led to identifying the thematic unit of *digital banking* as the basic strategic item of organizational resilience in Romanian banks during the COVID-19 pandemic.

Results and discussions

According to the National Bank of Romania data, the Romanian banking sector was seriously affected in 2020 by a set of vulnerabilities generated by the COVID-19 pandemic. However, liquidity or solvency ratios remained similar to the EU average, or even better. The Romanian banking sector demonstrates a strong resilience to intense macroeconomic shocks during the health crisis, ensuring a good capacity for shock absorption due to the banks' adequate portfolio and the authorities' measures to support the Romanian economic activity. According to Table no. 1, the structure of the Romanian banking sector did not significantly change in 2021 compared with 2020. The share of credit institutions with the majority of domestic capital increased by 2.37 pps at 31.84% in 2021 due to the change in the same direction of the market share of Transilvania Bank (Banca Transilvania).

Table 1. The Romanian banking sector structure by net assets
(Source: <https://www.bnr.ro/Publicatii-periodice-204.aspx>)

	Net assets (%)	
	2020	2021
Credit institutions with majority domestic capital, <i>of which</i> :	29.47	31.84
State-owned credit institutions	10.64	11.46
Credit institutions with majority private capital	18.83	20.38
Credit institutions with majority foreign capital	57.96	56.01
TOTAL CREDIT INSTITUTIONS, ROMANIAN LEGAL ENTITIES	87.43	87.85
BRANCHES OF FOREIGN CREDIT INSTITUTIONS	12.57	12.15
Total credit institutions	100	100

In order to identify the influences of the parent group strategies in terms of corporate social responsibility and to extend the analysis to the international financial groups, there were included in the sample the first five banks by total assets (2020) from the Romanian banking sector which is part of the international financial groups. According to the Top 100 SEE - Southeast Europe's Biggest Companies, the banks included in the analysis were: Banca Comercială Română SA - BCR (16334 mil. euro), BRD – Groupe Société Générale SA (12658 mil. euro), ING Bank N.V. Amsterdam Branch Bucharest

(10984 mil. euro), Raiffeisen Bank SA (10532 mil. euro) and UniCredit Bank SA (9333 mil. euro).

The mentioned banks totalized more than 50% of the Romanian banking sector, according to the data provided by the National Bank of Romania (2020): Banca Comercială Română SA – BCR (14.20%), BRD – Groupe Société Générale SA (11.01%), ING Bank N.V. Amsterdam Branch Bucharest (9.55%), Raiffeisen Bank SA (9.16%) and UniCredit Bank SA (8.11%).

All banks included in the analysis have considered the stakeholder theory in reporting CSR information during the COVID-19 pandemic. Banks must adopt a strategy to maintain a well-calculated balance between their services' economic and social aspects, satisfying the digital banking demand determined by social restrictions. Even if the set of actions focused on the digital transformation of the credit institutions was primarily a measure to fight against the COVID-19 pandemic and to protect both employees and clients, it gradually became a strategy to improve organizational resilience. Thus, digital banking can be perceived as a CSR measure that mirrors *People, Profit* and *Planet* dimensions of the triple bottom line approach. The CSR options of the credit institutions must be correctly sized to the stakeholders' expectations and permanently adapted according to their reactions.

Table 2. Banks' responsible measures towards employees during the COVID-19 pandemic (Source: authors' processing)

Stakeholders	Responsible measures adopted by banks
<i>Employees</i>	<ul style="list-style-type: none"> ● Online training programs ● E-learning platforms (for training and assessment) ● Online courses focused on customer service in the Covid-19 context ● Remote working ● A flexible work schedule ● Protective equipment and disinfectants for offices ● Info-signs on keeping the minimum required distance ● Limiting the number of clients that could be simultaneously in an agency ● Reduced work schedule with the public

Most of the analyzed banks reported responsible measures towards employees during the COVID-19 pandemic (Table 2), providing complex solutions focused on keeping their employees safe at the workplace. According to the official data of the websites and sustainability reports, banks have efficiently implemented sanitary protection measures, such as limiting the number of clients that could be simultaneously in an agency, providing protective equipment and disinfectants for offices, etc, and info-signs on keeping the minimum required distance. But the most cited measures relate to the flexible work schedule and remote working opportunities. The CSR feature of such actions is emphasized by additional actions like offering individual psychotherapy sessions and online training programs adapted to the health crisis, with a special focus on the emotional well-being of employees.

Table 3. Banks' responsible measures towards clients during the COVID-19 pandemic (Source: authors' processing)

Stakeholders	Responsible measures adopted by banks
<i>Clients</i>	<ul style="list-style-type: none"> ● SMEs financing through IMM Invest Program, Agro IMM Invest, SME Grants ● Instant credit with repayment in installments for SMEs, without material guarantees ● Development of digital banking ● Financial education programs ● Postponement of installment payments ● Financing granted to companies, in order to limit the negative effect of the pandemic ● Renewed cards sent by courier ● Reduced interest on personal loans granted ● 6 months of free Microsoft Office 365 for SME customers ● Online SMEs lending platform

All the banks included in the sample reported consistent measures towards clients during the COVID-19 pandemic, revealing a huge step forward the digitalization process (Table 3). The main challenge of the period was the urgent development of digital banking, a measure that contributed to reducing the spread of the virus, supporting at the same time the revival of economic activity after the lockdown period. On the other hand, it can be perceived as a necessary measure for banks' survival and an organizational resilience strategy adjustment tool. According to the data provided by BCR, the intelligent George banking ecosystem exceeded 1 million active users in 2020, up 43% compared to 2019, while for 2021 there was an increase of 33% compared to 2020. Approximately 56% of new personal loans in 2021 were granted through a fully digital operational flow – George. Private and public moratorium solutions were dedicated to corporate customers, while financing opportunities remained a critical issue, especially for the SME segment long after the emergency period.

Table 4. Banks' responsible measures towards community during the COVID-19 pandemic (Source: authors' processing)

Stakeholders	Responsible measures adopted by banks
<i>Community</i>	<ul style="list-style-type: none"> ● Community support for vulnerable people in the COVID-19 context ● Purchase of equipments for children who do not have access to online school ● Online therapies with children with disabilities ● Protective equipment for the medical staff ● Psychological counseling for people in difficulty ● Intubation equipment for the ATI Department ● Medical education campaigns with informative content for the general public ● Support for the independent cultural sector ● Online mentoring and meditations for the benefit of disadvantaged children

	<ul style="list-style-type: none"> ● Support for start-ups who have been affected by the pandemic ● Sponsorships to hospitals, ambulance services and emergency inspectorates
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There was a major shift in the CSR attitude of banking institutions towards community (Table 4): even if the healthcare was not one of the priorities in the strategic community investments plan before the COVID-19 crisis, the banks implemented sponsorships programs for hospitals, ambulance services and emergency inspectorates in order to purchase protective equipment for the medical staff or intubation systems for the ATI Department. Going ahead with the actions in the traditional CSR fields, some banking institutions have proved to diversify community investments portfolio in the COVID-19 context: medical institutions, children, start-ups, the independent cultural sector, vulnerable people, etc. We also stress the volunteering actions, most of the analyzed banks encouraging the employees' contributions, especially in educational projects (online mentoring and meditations for the benefit of disadvantaged children). Thus, the employees' strategic role during the pandemic is twofold: (1) strengthening the bank–community relationship through the volunteering actions of the employees and (2) strengthening the bank–client relationship through dedicated customer service in the COVID-19 context.

In the context of the COVID-19 pandemic, BCR dedicates a set of responsible measures toward employees, such as: training sessions for new employees in a virtual format, training topics related to the performance of the employees which were redesigned for the online delivery, using interactive and attractive techniques for participants, alongside with the e-learning platform development. Employees were considered a key actor in the pandemic period and a link between clients and banks, supporting the clients' needs in a proactive way. In 2021, BCR continued the transformation process in line with the global digitization trends and changing customer expectations, organizing events and workshops with relevant topics such as new work models, design thinking, and agile methodologies.

The bank reduced the impact of the Bank's core activity on the environment through digital banking, customer assistance, and increased efforts to reduce the carbon footprint for investments. BCR's assets on December 31, 2021 totaled RON 89.090 mil., up 12% compared to December 31, 2020. Regarding the Group, total assets increased by 10.1%, from RON 81.986 mil. on December 31, 2020 to RON 90.255 mil. on December 31, 2021. The resilience strategy of BCR against the COVID-19 pandemic is closely related to the triple bottom line approach, with a special focus on digital transformation, as a way to protect the environment (Planet), to satisfy the client's needs (People), and maintain/increase the Profit.

BRD – Groupe Société Générale SA followed its traditional CSR fields during the pandemic period, adjusting in the same the product portfolio in accordance with the social restrictions imposed by the spread of the virus and the digital sophistication of the clients. In 2020, the bank was involved in over 50 music concerts in all regions of the country. In the educational field, a dedicated journalistic project, MINDCRAFT Stories, had over 1.4 million visitors, while the central theme of the platform was predominantly related to the evolution of COVID, the scientific discoveries related to the pandemic, its

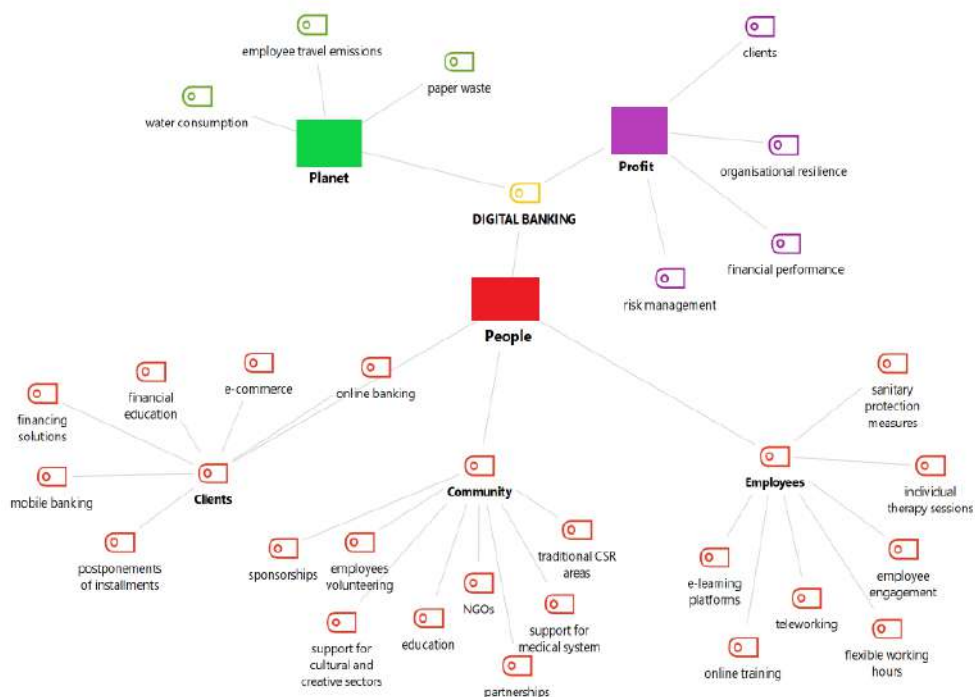
evolution in Romania and in the world. Sports and environment were the other two pillars of CSR involvement, which continued despite the negative effects of the pandemic.

The same approach focused on the traditional lines of CSR actions was sustained by ING Bank N.V. Amsterdam Branch Bucharest. Unlike BRD – Groupe Société Générale SA, where the CSR actions towards employees are not clearly mentioned, ING Bank N.V. Amsterdam Branch Bucharest outlines the employees' volunteering, which was transformed during the pandemic into a digital volunteering process. In 2021, over 100 ING employees donated more than 1600 hours of their time to digital volunteering, from mentoring and online meditations with rural high school students, consulting for startups, "remote" fundraising, or programming digital solutions for NGOs. Banks tend to involve their employees in volunteer activities, to strengthen their identification with the organizational values and culture. Employees are considered key tools in CSR development, and banking institutions influence external stakeholders with the aid of internal stakeholders.

Since the beginning of the COVID-19 pandemic, Raiffeisen Bank SA has constantly communicated with its clients, providing them with dedicated communication channels to find tailored solutions to their challenging situations. During the critical health crisis, the bank has taken preventive measures for employees and clients, distributing protective materials for the public and staff and reducing their activity through digitalization. In 2020, approx. 40% of the total employees worked from home in the COVID-19 context, while flexible hours work schedule (with different start and end working hours) was implemented to address the issue of congestion in public/private transport.

There were 54,054 private individual customers who benefited from installment postponement: 31,766 through a public moratorium and 23,288 through a private moratorium. In 2020, Raiffeisen Bank provided consistent support to legal entities in the COVID-19 framework, through seven open financing programs, with a total volume of funding of EUR 341.5 million. The use of online tools during the pandemic has become extremely important for the safety of employees and customers. In the first half of 2020, Raiffeisen Bank registered an 80% increase in electronic payments. The POS transactions with debit cards performed by individual clients increased by 22% at the end of 2020, compared to 2019. To minimize the negative impact of the COVID-19 pandemic, Raiffeisen Bank directed lei 1,589,967 through sponsorships to medical institutions in 2020, while the cultural and other creative sectors were also sustained, along with sports events, education, or urban ecology.

In the context of the emergency state caused by the Covid-19 pandemic in Romania, UniCredit Bank has taken decisive measures to guarantee national coverage for its banking services, while protecting the health of the bank's customers and employees. UniCredit has adopted a flexible work policy to help employees, while guaranteeing business continuity for its clients. The bank has encouraged all employees to use alternative work solutions such as remote work, where possible, for those who carry out their activity in the headquarters. In the context of the national state of emergency generated by the COVID-19 pandemic, the donation of EUR 120,000 for purchasing two high-performance mechanical ventilation devices and other necessary materials was an additional measure that completes the regional efforts made at the Group level, in Italy.



**Figure 1. Code Theory Model
(authors' processing, MAXQDA)**

Figure 1 outlines the Code Theory Model after processing the data from official websites and sustainability reports using the MAXQDA software. The main outputs suggest a strong identification of digital banking, as a way to obtain organizational resilience during the COVID-19 pandemic, with the CSR development according to the “triple bottom line” (Elkington, 1997) paradigm: *People*, *Planet* and *Profit*. First, the *Profit* dimension confirms the importance of perception and reputational value in contemporary corporate responsibility.

According to their frequencies, four primary codes are identified: clients, risk management, organizational resilience, and financial performance. While the last two codes refer to maintaining a superior level of financial performance in the face of challenging business conditions, the first ones are more connected to the *People* dimension: clients (obtaining better economic performance as a result of satisfying their digital needs, creating strong relationships with the bank through customer engagement and the strong influence of clients' perceptions on *Profit*) and risk management, with a special focus on reputational risk.

Second, digital banking is directly linked to the *Planet* dimension, mainly in saving natural resources: reducing employee travel emissions, water consumption, and paper waste. Finally, placing the *People* dimension at the center of digital banking strategy during the COVID-19 pandemic is also based on the “triple bottom line” theory and the approaches that consider this theory in CSR reporting. Three main stakeholders were

considered according to the Code Theory Model developed in this section: clients, community, and employees. During the COVID-19 pandemic, banks have changed their CSR vision related to these actors, restructuring their activities to adapt them to digital banking services.

Customer expectations during the COVID-19 pandemic have significantly influenced both portfolios of services offered by the banks, through a rapid adjustment to digital banking, and banking resilience during the pandemic. The most sensitive issues related to the client's category were online banking, mobile banking, e-commerce, and complex financial solutions for the economic recovery of business agents. Another responsible measure related to retail and corporate clients was the postponement of installments, identified in the entire sample. The connection between clients and digital banking was secured through financial education, the analyzed banks provided educational support to clients by developing financial education programs designed to accelerate the adoption of digital channels, more appropriate to their financial and transactional needs. Responsible practices towards employees were mainly used to strengthen the employee's engagement with the bank during the health crisis. The focus has been on keeping the employees safe, both physically and mentally, by maintaining a proper work-life balance. The investments in protective equipment were completed by offering psychoeducational resources that address the emotional well-being of the employees: online training, e-learning platforms, teleworking, flexible working hours or individual therapy sessions.

Community was not neglected in the COVID-19 framework, even if some credit institutions remained attached to the traditional CSR areas. However, support was offered to the Romanian medical system (sponsorships), cultural and creative sectors affected by the pandemic (partnerships), or education (computer donations for disadvantaged children). Digital banking was used as a tool through which the clients could support social causes right from Online/Mobile Apps. An interesting point is the bank's ability to rely on volunteer employees and NGOs partnerships for responsible actions targeted to the community sector.

Conclusions

The resilience of the Romanian banking sector during the COVID-19 crisis suggests a strong correlation with the stakeholder theory through responsible practices towards clients, employees, and the community. The content analysis reveals sustained efforts to maintain a well-calculated balance between the economic and social aspects of the banking process, completed by the environmental concern through digital banking. Banks' digital transformation was perceived as a CSR measure aligned with the triple bottom line approach, outlining the dimensions of People, Profit, and Planet. All banks included in the analysis have implemented complex solutions to address the employees' needs, such as: providing protective equipment, offering individual psychotherapy sessions, developing e-learning platforms, remote working, flexible work schedules, or reducing the work schedule with the public. All mentioned CSR practices were at the same time strategic measures to improve organizational resilience, with a strong focus on the digital transition.

Digital banking also represents a huge step forward in the clients' sophistication in digital competencies, digital needs, and services redesign, ensuring the banks' survival during the COVID-19 pandemic. A large set of digital products amplified the digital ecosystem of the Romanian banking sector, significantly contributing to both clients' safety and the organizational resilience of banks. While the community remained a

critical factor for the CSR strategy of the banks included in the sample, there was a major shift in the CSR attitude of banking institutions towards the community, from traditional responsible practices to strategic investments in healthcare, such as sponsorships programs for hospitals, ambulance services or emergency inspectorates.

Mapping the digital banking influence using the MAXQDA software, we have confirmed the research hypothesis that suggests a strong identification of digital banking with the “triple bottom line” paradigm: People, Planet and Profit. The same stakeholders were identified according to the Code Theory Model: clients, community, and employees. Customer expectations during the COVID-19 pandemic have significantly influenced the portfolio of services offered by the banks, alongside the employee’ volunteering that has amplified the bank–community relationship in a more strategic perspective. While the main limitation of the paper is that the results only apply to the Romanian banking sector, future research will address this issue by extending the analysis to international financial groups.

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THE CLAIMS OF THE 21ST CENTURY ROMANIAN CONSUMER

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Abstract

Modern times have massively changed how 21st-century consumers act, think, make decisions & even purchase services or goods. This paper examines the changes that have occurred in the claims of modern consumers, especially for generation X and generation Y, as they greatly differ from the claims they had as consumers before 1989 – when the communist regime fell in Romania. Because of that, this writing outlines the significant differences between the two generations mentioned earlier in terms of consumer claims. This study aims to analyze 21st-century consumer claims and compare the present and future expectations of generation X and generation Y consumers. Therefore, it presents the results of an online survey with 274 respondents from the North-East part of Romania: people from generation Y and generation X. Also, the research answered three questions: Which are the top 6 “labels” which claim to be important for the 21st-century consumers of X and Y generations?, Which are the differences between the claims of the X and Y generations consumers? and What are the claims which changed the most from the 20th century to the 21st century for generation X consumers? The article is divided into three parts: the first part presents the context and outlines the literature in the field, the second part explains the methodology and the interpretation of results, and the last part includes the conclusions.

Keywords: *consumer behavior; generation X; generation Y; Romanian consumer’s behavior claims; the 21st Romanian consumer.*

Introduction: Context and literature

Consumer behavior emerged when the researchers focused more on the individual customer than on the market itself. As behavioral sciences proved to be more effective in explaining the individual’s behavior and preferences than the social sciences, there was a shift towards focusing on the consumers as individuals, rather than on a mass of people. Many theories have appeared today which are trying to determine and measure

the forces influencing the consumer to choose a brand, product, or service while trying to frame the place, price, and time, but there is one single focus in the whole process: the consumer.

The 21st-century consumers have changed massively and undoubtedly their habits, lifestyle, preferences, and so on have been massively shifting over the last years. This subject regarding these new consumer claims has a significant role in the market. Its impact will continue to grow more and more, from generation to generation, as the complexity of consumer has been rising rapidly.

In order to be able to develop this topic regarding these claims, a clear definition of what is important for the consumer and how these claims could vary depending on the generation and point in time. To understand and identify the claims, various studies and publications have been explored and the most important ones to the mind of the current consumers are about: time poverty (Solomon et al, 2006), diversity (Kapoor, 2011), promotion (Sandu, 2014), the complexity of the consumer (Zinkhan and Braunsberger, 2004), social media (Duangruthai et al., 2018), innovation (Awan & Zuriat-ul-Zahra, 2014), brand status (Robbins, 2019), ecology (Brandabur, 2011) and many more. These labels and many more have been studied through the research presented below in which generation X and Y could express whether they identify with the proposed claim.

With an increasing rate of 65 million per year, city dwellers will experience a growth in size, making the urban consumer the majority of the consumers. This leads to a predicted explosion of the middle class, which will certainly affect their lifestyle, thus their consumption, which is forecasted to be characterized by an increase in convenience. Moreover, regarding technological advancement, consumers will have a more social-media-driven consumption, which will take place because of the mobile industry's development and the connectivity and ease of access to the internet. Both generation X and Y are predicted to be more motivated by various digital platforms to buy from certain brands due to their connection to the virtual world.

Moreover, the consumers are predicted to change in terms of presence in the workplace and will translate according to this research in a higher number of women in the workplace, meaning that consumption among this category will increase (Bell, 2018). Also, new patterns in terms of personal consumption will be adopted. An increase in convenience will stand out for the consumers and a more specific focus on health and wellness will emerge. Also, the consumer already started to demand more products or services closer to their needs. In the future tense, high satisfaction among buyers and users will be more complex and difficult to attain. Therefore, a study regarding all these claims is necessary and can have a great impact on marketing professionals, managers, entrepreneurs, researchers, and many more.

Methodology

This study aims to investigate which claims are considered to be relevant for generation X, regarding past, present and future times, and also, for generation Y, regarding present and future times. Another objective was to identify expected future changes in consumer behavior by both generations X and Y. Moreover, according to an article published in Emerald, there are differences between generations X and Y in many dimensions (Glass, 2007). We will analyze the "claims" presented and conclude if the two generations are

distinct in what they claim as consumers. So, the following assumption regarding the two generations addressed in this research will be tested:

H0: There are no differences between the X and Y generations regarding what they claim as consumers.

H1: There are differences among the X and Y generations regarding what they claim as consumers.

To that end, the study was based on a quantitative study, in which we applied an online survey for 46 days during the months of April, May, and June 2019 to 274 respondents from north-east Romania. The population of interest was composed of individuals over the age of 18 and over the age of 40 in order to be able to make the comparison between generation Y (who summed up 186 respondents) and generation X (who had a total of 88 respondents), in order to contrast the past and present consumers and their preferences.

The online questionnaire was divided into 3 main parts: the first one had 32 statements that described the present consumer's claims, while the second part was addressed only to generation X, who experiences the communist regime and could compare these 32 statements to the past tense. Every statement had a "label" considered a claim of the present consumer, and this was built based on literature review and studies. In the survey, in order to have accurate results, a Likert scale was used in order to quantify, analyze, and compare the data and its relevance to 21st-century consumers.

The average time to complete the online survey was 10-15 minutes for people from generation Y. The average time to complete was different for the respondents born before 1979 (generation X). The estimated was 25 minutes, as they had an additional 32 questions to fill in regarding their consumer behavior before the communist regime fell.

The online survey was made through Google Forms and shared on social media platforms groups and pages, and via other devices by text message or other instant messaging apps. Approximately 15% of the sample regarding people above 40 were completing the survey assisted, on a device, as some individuals were unfamiliar with the online environment or had low technical skills. In order to reach more people, the snowball sampling method was used to apply the questionnaire.

This is defined as a non-probability sampling technique in which the selected respondents (appointed by the researcher) are asked to identify others to be part of the sample, thus gathering more responses by sharing the survey with them, consequently expanding the sample gradually.

This method was used to reach more people and access the X generation, as it was difficult in the application phase of the survey to gather responses from them. In other words, the sample size increases and expands like a snowball which is rolling (Ahmadzadehasl & Sepehr, 2010). It had a massive advantage as it facilitated in many ways the speed of the data collection. On the other hand, one disadvantage of this survey is that individuals may have similar preferences, attitudes, and behaviors, which may not be beneficial to our research. This happened because people may sometimes recommend individuals who are in many aspects much the same.

Data was collected between the 25th of April 2019 and the 10th of June 2019; the programs used to analyze the data were Microsoft Excel 2019 and IBM SPSS Statistics 20.

Results and discussions

The analysis of the responses gathered through the online survey was used to identify the differences between the present claims of generations X and Y consumers and future expectations as a 21st-century consumer. So, to have an overview of the survey results, the table presented will highlight the claims and their importance to the 21st-century consumer. The most relevant ones have a high score, while those considered less relevant or least important have a mean average lower than 5.

Table 1. Present and past claims of generations X and Y (Author's Own Source)

Claim	Mean generations X & Y	Mean generation X (before 1989)	Mean generation X (present times)	Mean Generation Y
1	4.5	4.49	4.72	4.41
2	4.54	4.74	4.44	4.59
3	6.73	7.10	6.63	6.77
4	6.78	5.61	6.68	6.82
5	5.28	5.75	4.95	5.41
6	5.39	5.57	5.53	5.34
7	6.97	6.29	6.48	7.17
8	6.91	6.94	6.73	6.98
9	5.51	6.26	5.60	5.47
10	5.15	5.51	5.28	5.10
11	8.72	7.10	8.79	8.69
12	7.95	6.06	7.80	8.02
13	7.87	2.87	7.89	7.87
14	6.63	2.34	6.04	6.87
15	5.75	4.22	6.05	5.63
16	5.54	2.26	5.96	5.38
17	6.27	6.03	6.60	6.13
18	8.14	8.79	8.21	8.11
19	7.11	6.79	7.21	7.07
20	8.15	5.96	8.89	7.84
21	9.03	6.62	9.31	8.92
22	5.52	3.13	5.55	5.51

Claim	Mean generations X & Y	Mean generation X (before 1989)	Mean generation X (present times)	Mean Generation Y
23	7.7	5.75	8.36	7.44
24	5.79	4.00	5.13	6.06
25	5.61	6.14	6.11	5.41
26	6.33	2.05	6.45	6.28
27	7.24	8.14	7.81	7.01
28	5.85	2.74	5.8	5.88
29	6.69	4.09	7.28	6.46
30	4.07	6.65	3.99	4.10
31	5.87	7.51	7.03	5.40
32	6.5	4.62	6.60	6.46

This table presents the most important aspects of this research by presenting the overall results for present claims of the X and Y generation and highlights the significant or insignificant differences among these two categories of respondents.

Generation X in Romania has been through different political regimes that massively influenced them as consumers. Their behavior has changed dramatically from the 20th century to the 21st, reflected in the significant variation in various claims. The survey asked respondents from this generation to offer a score according to the identification "level" for the same statement: one formulated to emphasize the present behavior and another one which had the same statement, but formulated in the past tense, one regarding what took place before 1989 (before communism in Romania fell).

The statement which had the most significant difference in the level of identification in past and present terms was the one regarding the companies which guarantee the protection of personal data. Generation X claimed that this was not relevant in the communism dimension (or the 20th century) as the survey's result assigned an average of 2.87 for this statement, meaning that they strongly pointed out the fact that personal data protection was important for them back then. Nowadays, the same group of respondents assigned a higher score for the same statement in present terms, meaning that they would tend to choose companies that guarantee their personal data, thus highlighting its importance with an average of 7.89 out of 10. This highly scored statement in the present term labels this claim as important today. The striking difference underlines the fact that in the past, the same consumer, was not interested at all in whether the companies protected their data or not, while today this factor can play a detrimental role in consumers' minds. This variation emphasizes the fact that the claims of the consumers are extremely volatile and change accordingly to the environment they live in.

The statement "*It matters to me if companies address every type of consumer from the society*" was considered irrelevant to the communism scenario and for their consumers. The mean average suggested a low interest in this affirmation for past tense, which

emphasizes the fact that generation X back then did not place importance on how products or services address minorities. Moreover, the fact that the availability and variety of the product were minimal, cause consumers to be more individualistic in terms of covering their needs rather than having empathy towards other classes of people from society. Additionally, communism tried to hide any kind of minority which did not match the “frame” of a typical Romanian. Because of this, many X-ers were not aware of the needs of the various social classes. Consequently, the fact that the products were not inclusive was irrelevant to them.

Another expected change from the 20th to the 21st century in terms of consumption is the claim highlighting the frequency at which individuals need products to go or with home delivery. The statement described this: *“It happens quite often to me to need products or services to-go or with home delivery.”* Framed in the communism tense, this claim was considered to be false. Therefore, respondents substantially rejected it. The variation of this claim from past to present only highlights the fact that before 1989 delivery services did not exist on the market and people were used to picking up what they purchased by themselves. On the other hand, in the present tense, generation X claimed that what they need is on the opposite side, therefore in the 21st century, they need often to buy products or services to-go or with home delivery.

After analyzing the data, the label which came in the first place of importance to the consumers was the one regarding the level of quality. The statement *“I appreciate firms who make a constant effort to improve the level of quality from all points of view”* had a percent of 50 who totally identified with the affirmation, meaning that quality is important and significant for them. Therefore, we can say that the consumer of the 21st century prefers companies who allocate resources to improve the quality of their products or services. Consequently, quality is perceived to be important. Generally speaking, people nowadays tend to orient themselves to businesses that go “the extra mile” for their customers to address their needs through this quality axiom in a holistic, comprehensive way. The average grade given to the importance of quality improvement is 9.03 on a scale from 1 to 10, which indicates the massive importance associated with the level of quality to the consumers. By interpreting the survey results, we can conclude that generation X compared with generation Y, places a higher emphasis on this quality and effort dimension.

Both generation X and Y think about themselves as being complex human beings, thus complex consumers. From X-ers, 36 individuals identified with the statement *“I appreciate the offers which do not treat me superficially.”* by assigning a 10, while in the millennials, 43 individuals who assigned a score corresponding with the maximum level of identification. The average mean was 8.15 out of 10. Additionally, by analyzing this data, we could conclude that consumers today claim that they want products or services with a real holistic value and present “honest” information regarding benefits offering. Moreover, by running statistical tests, there was shown that there is a difference in the means of the answers given by the X generation and Y generation. Therefore, the 21st consumer claims that he has complex needs which should be addressed and covered in a real, comprehensive way.

The 21st-century consumer claims that businesses should address their needs and update their products or services accordingly in a customized manner. In contrast with the other claim mentioned, this one emphasizes more on the speed of reactions of the

businesses in terms of addressing needs. Trends, fads, and other factors influencing individuals leave a mark on the market, thus impacting people's needs and behavior. This was seen also in the survey research as most respondents identified with the statement *"For me is important that products are updated fast and according to my needs"*.

As expected, for millennials, the average level of identification with this affirmation is higher than the mean of the X-ers as instantaneity, and high speed in the reaction are associated more with the needs of the younger generations. Millennials, as mentioned in chapter 2 are advanced technology users, and this places them as being more pretentious towards the brand's speed of reaction. Additionally, they claim that it is important for them to be as quick as possible in addressing their needs. The level of identification associated with the statement mentioned is, on average, 7.95 out of 10, placing this claim in 4th place as important to 21st-century consumers. Lastly, there is no significant difference between the average level of identification among generation X and generation Y to the statement mentioned above.

Additionally, it should be mentioned that X generation suggests it is very relevant for them to test the product in the store. If we take this group of people independently, we can conclude that this is the fourth most important claim for them as most of the X-ers have identified with the statement *"I have more trust in a product I can test in a store"*. Since generation X is also called generation Why as they question everything, this claim does not come as a surprise in the research.

The next table will present the mean expected changes of characteristics in consumer behavior for both generation X and Y, which stand out in literature and theories in consumer behavior.

**Table 2. Changing characteristics of the consumer in future claims
(Author's Own Source)**

Expected changes	Mean Generation X	Mean Generation Y	Sample mean
Expectations	3.00	2.78	2.85
Attitudes	3.05	2.82	2.89
Experiences	2.73	2.26	2.41
Habits	2.75	2.56	2.62
Lifestyle	2.80	2.47	2.57
Shopping behavior	2.94	2.87	2.89
Consumption	2.70	2.62	2.65

There are significant changes in the consumer behavior lately. Technology and other factors will continue to have a strong impact on them. Many changes in demographics, trends, economic pressure, political shifts, and so on will affect the massive transformation which will take place from second to second in the next 10 years. Every generation predicts its own changes and forecasts specific adjustments and modifications according to their needs and the environment in which it will live.

According to the research, the future will strongly shape the experiences, and this is seen in how the respondents answered the question regarding prediction on future changes. The one which are considered to modify in the next 10 years totally or significantly are the experiences. More than 60% of respondents from both generation X and Y believe in this change. On the other hand, if we contrast the two categories of respondents, we can affirm after analyzing the data. that more individuals from generation X consider experiences as being less changed in the next ten years than generation Y predicts.

Secondly, the lifestyle is predicted to be modified in the 10 ten years among the sample's respondents. This claim is considered to be totally or significantly changed by 50% of the respondents.

Generation X, in predicting future changes in the survey, has given higher grades and as those were associated with a less changed behavior, we could conclude that this group of respondents are more anchored in their perception and their behavior as consumers is less predicted to change or variate in the next 10 years. The most impacted in the future is the consumption according to the individuals above the age of 40, and the slightest change in the next 10 years is associated with the attitudes.

In contrast, generation Y is more flexible and believes in a higher transformation of the characteristics such as attitudes, consumption, habits and so on in the upcoming future according to the research made. The minimal change is believed to happen in their shopping behavior, while the most significant transformation is going to target millennial's experiences.

Conclusions

Therefore, after carrying out an online survey study that aimed to understand the way generation X identifies the claims in comparison with how the generation Y identifies the claims, we may conclude that there should be highlighted that through the data collected there have been identified the claims which are relevant for generation X consumers for the past, present, and future axis. Additionally, for generation Y, there have been identified the most important claims have been identified similarly, but only for the present and future tense as these individuals have not been consumers before 1989, when the political regime in Romania has changed, significantly affecting the consumer.

In the 21st century, the most important claims of both X and Y generations are regarding quality, adaptation of products to their needs, personal data protection and lifespan of a product. Moreover, consumers want to be treated through their complexity and claim that brands should update their products or services fast, thus their speed of reaction to address the needs and the demands of the market should be extremely high. Additionally, it is expected that their data is protected, thus, the brands which consider

themselves as being responsible, should make sure that their policies comply with the law regarding this aspect. The only claim which came in top 4 for X generation, but not at all in top 6 for Y generation is the one which describes the importance of testing a product in stores.

The hypotheses mentioned in the first part regarding the differences among the X and Y generations in the 21st century claims were tested. In 8 cases out of 32, a significant difference between the two groups of responses has been found. Thus, there was enough statistical evidence to accept the alternative hypothesis in 25% of the cases. The most significant differences among the generations were in the claims regarding the level of quality, the proximity of a store to the consumer and the level of trust of store testing.

On top of that, variation among the means of the two respondents were found in the way they perceive offers which approach consumers in their complexity, in the frequency of needs regarding to-go or with home delivery products and in the preferences for online and offline shops. The optimism factor and the stability one have also been claims representing a significant difference between generation X and Y. To conclude, it's vital to understand that we are in 2022 and this means that the 21st century consumer has been present for 23 years already. It will become increasingly prevalent as the time passes. Managerial implications could suggest that retailers should keep up and be proactive with the claims and challenges of the consumers, and unless they do this, they won't be able to survive and thrive in the 21st century for a long time. Adapting the business model in order to become more compliant with the consumers claims has become a responsibility of the firms for the current market.

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2

Economics

REGIONAL DISPARITIES IN ROMANIA AFTER THE EUROPEAN UNION ACCESSION

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Abstract. *One of the most expected benefits after the integration of Romania into the European Union was the improvement of living standards in the country's poorer regions. In 2007, regional disparities in Romania were at a high level, and the expectation was that economic performance due to accession to the union and the European funds would reduce these inequalities. This paper investigates the evolution of regional disparities in Romania at the county and regional levels between 2007 and 2019. The investigation tool used to analyze inequalities variation is sigma convergence, based on the catch-up effect hypothesis, that poorer regions have higher growth rates than richer regions. Excepting Bucharest Municipality, the results suggest overall regional divergence in GDP/capita in Romania in the studied period and territorial convergence in the same period if.*

Keywords: *catch-up effect; European Union; regional disparities; sigma convergence.*

Introduction

European Union even since its formal establishment, has adopted a cohesion policy that plays an important role in promoting the 'overall harmonious development of its member states and regions. Cohesion policy is clearly visible and offers benefits that could not be implemented only on a national, regional, or local level. The expectations were high in 2007 after Romanian accession to the European Union, especially on economic development and reducing the gaps that we had behind senior EU members. In the first year after the integration of Romania into the European Union, our country had all the NUTS2 regions below the EU-27 average in terms of GDP/capita, with the NE region as the poorest region in the EU. Things were not too bright inside the country; there were old gaps between the East and the West, and about 45% of the population lived in rural areas. Regional disparities in Romania, increased shortly after the transition to the market economy; in 1990 there were low territorial inequalities, the result of an active policy of the precursory communist regime, that followed evenly economic development inside the country (Goschin, 2014).

In 2010, the European Union launched a document entitled Europe2020, which is the European strategy for smart, sustainable and socio-economic growth. Regional policy is the EU's main investment policy. In 2014-2020, € 355.1 billion, about a third of the EU total budget, was allocated to cohesion policy to reduce disparities and meet the various needs of all EU regions (ec.europa.eu). Romania was allocated 30, 882 billion euros in structural and investment EU funds.

Literature review

Socioeconomic inequalities are a major concern and attracted the attention of both specialized studies conducted by different institutions in Romania and Europe, as well as researchers affiliated with universities and research institutes, aiming for social and policy measures. National economic studies offer an explanation for territorial inequalities, based on the dissimilarity between regions in terms of endowments with infrastructure, natural resources, factors of production, and technological development (Ailenei & Dachin, 2007; Goschin, et al., 2008; Constantinescu & Constantin, 2010; Boboc et al., 2012).

Considering the analysis of the factors that affect economic evolution and regional inequalities in Romania, we have recognized several articles that use different research methodologies: using the SSA methodology studied regional growth in Romania after the EU ascension (Goschin, 2014). Territorial disparities in the Romanian counties regarding the urban population's access to waste collection services and to examine environmental issues were highlighted by Mihai, F.C. et al. (2012); the endogenous determinants and processes of underlying economic evolution at the national and county level, were the subject of a 2015 study (Zaman et al., 2015); the determinants of GDP (Anghelache et al., 2015); a study on international trade was presented in 2012 Anghelache and Manole (2012); Anghelache et al. (2014), Bardsen et al. (2005), Dobrescu (2013) presents a macro model for the Romanian economy; Davies, Waddell, and Naughton (2007) perform a spatial analysis of FDI on GDP; Ludoșean (Stoiciu) (2012) also studied the correlation between FDI and economic development; a similar topic is found in the studies of Stancu and Constantin (2011) and Pecican (2007).

Several other relevant studies that treat the topic of regional inequalities in Romania and Europe are mentioned below: providing a classification of countries by the degree of convergence, Shankar, R., Shah, A. (2001) find also Romania among the countries experiencing regional income divergence: Vietnam, China, Indonesia, Russia, Philippines, Brazil, Sri Lanka, and India. Herz, B. and Vogel, L. (2003) investigate the regional development in Central and Eastern Europe, by analyzing a sample of 31 Central and East European regions. They conclude that structural variables like the labor participation rate and the economy's sectoral structure matter for regional growth. Meliciani, V., Peracchi F. (2004) study convergence in per-capita GDP across European regions over the period 1980—2000 and find significant evidence of correlation of growth rates across neighbor regions and regions belonging to the same country by estimating convergence equations. Paas, T. and Vahi, T. (2012) notice that regional innovations tend to increase inter-regional differences, at least during the short-run period. Covering the period between 1985 and 2000, Niebuhr, A. (2006) investigates the significance of market access for regional wages and the geographic extent of demand linkages for a cross-section of European regions, also taking into account the effects of national borders. LópezBazo, E. (2021) brings evidence of regional

disparities in public attitudes toward the EU and finds that the impact of regional growth on attitudes towards the EU is not the same in all regions. The effect of support and trust is more intense in regions with per capita income above the EU average. Hadjinikolov, D. (2020) finds that intra-regional differences in Bulgaria have increased in the post-accession period and intra-regional disparities have resulted in the depopulation of the lagging regions.

Major events also attracted the interest of authors in this field, the evolution of regional inequalities in the context of the great economic crisis of 2008 (Chirila & Chirila, 2014) was studied using a series of indices that defines the difference between the territorial structure and its evolution in time (Zaman et al., 2013). The more recent context of the global pandemic caused by the COVID-19 virus also may change the course of regional disparities evolution due to region resilience, a topic studied in European countries by Roberta Capello and Andrea Caragiu (2021).

Methodology

Economic conditional convergence or the “catch-up” effect is the hypothesis that countries with lower GDP/capita tend to have a higher growth rate than more developed countries. This theory first appeared in the economic literature in 1956 when Solow as Swan, independently developed a long-run economic growth model. In their models, these two new classical economists estimate that different economic development levels would look stable, considering the capital marginal production decrease. In my paper, I will measure regional disparities, with a standard method proposed by Barro, R. and Sala-i-Martin in 1995, σ -convergence, which measures the decreases or increases of disparities between regions over time. The mathematical notation of the sigma convergence is as follows:

$$\sigma = \frac{\sqrt{\frac{\sum_{i=1}^n (y_i - \underline{y})^2}{n}}}{\underline{y}} \quad (1)$$

where:

- $\sqrt{\frac{\sum_{i=1}^n (y_i - \underline{y})^2}{n}}$, represents the standard deviation, the measure of the dispersion where n is an indicator of the number of observations (counties or regions) within the sample,
- σ represents the ratio between the weighted standard deviation of regional or counties GDP per capita (y_i) and national GDP per capita (\underline{y}).

$$\sigma_{t_0+T} < \sigma_{t_0} \quad (2)$$

If the coefficient of variation decreases over time, we have the “catch-up” effect or economic conditional convergence or sigma convergence meaning that regional disparities decreased over time.

$$\sigma_{t_0+T} > \sigma_{t_0} \quad (3)$$

In the case that the coefficient of variation increases over time, we have sigma divergence. In this case, the regional disparities increased over the period studied.

Tendencies of the sigma variation over time are calculated using the trend equation below:

$$\sigma_t = a + bt + \varepsilon_t \quad (4)$$

where:

- σ_t is the time series of sigma annual values
- bt is the corresponding trend line. If the trend variable t holds a positive significant coefficient, indicates a divergence process, if it is negative then we have a convergence process.

In the above regression equation, may be inserted an autoregressive process AR (1), resulting following:

$$\sigma_t = a + bt + \rho\sigma_{t-1} + \varepsilon_t \quad (5)$$

AR (1) can be used to test non-stationarity (autoregressive process AR (1) with $\rho = 1$ indicating unit root) of σ time series based on Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1981). A more powerful variant of the ADF test is Dickey-Fuller Generalized Least Squares (DF-GLS) test (Elliott et al., 1996), which will reinforce the results. ADF test involves estimating the following equation that results by subtracting σ_{t-1} from both parts of the previous relation:

$$\Delta\sigma_t = a + bt + c\sigma_{t-1} + \varepsilon_t \quad (6)$$

Where:

- $\Delta\sigma_t$ is the first-order difference in sigma time series,
- bt stands the corresponding trend line,
- $c = \rho - 1$ represents unit root

Null hypothesis in ADF tests is the presence of unit root (Drennan, 2004):

$H_0: c = 0 \Rightarrow \rho = 1$, sigma convergence

$H_A: c < 0$, indicates sigma divergence

Cohesion funds from European Union are a powerful tool for territorial convergence, and Romania has benefited since its accession to the union. The evolution of regional disparities in Romania between 2007 and 2019 also influenced other factors like the Great Recession from 2008-2010 (Goschin, 2014), the supply and demand generated by mass migration, technological evolution, or preferences of household consumers. I will put this hypothesis and the 'catch-up' effect for the Romanian counties and regions in the 2007-2019 period to investigate the evolution of regional disparities in Romania since its accession to the European Union.

Results and discussion

To test the degree of economic convergence or divergence in Romania, I used data from the National Institute of Statistics (TEMPO online database). To ensure comparability of data in the time series, the statistics on GDP were transformed in 2008 by constant prices using GDP deflator formula. Territorial inequalities and sigma convergence/divergence of GDP/capita have been measured inside the region, between the regions and counties.

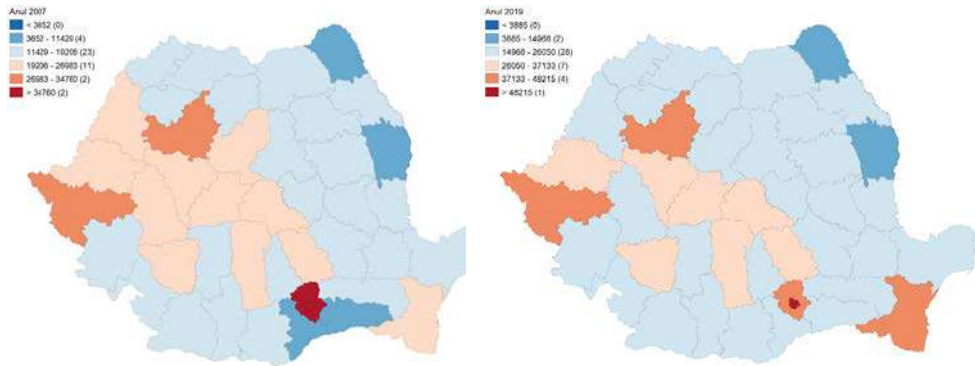


Figure 1. Standard deviation of GDP per capita in 2007 and 2019

Figure 1 represents the standard deviation map in 2007, at the beginning of the period studied and in 2019, the end of the period studied, and shows us how dispersed the county's GDP per capita in relation to national GDP per capita. The regression results are divided into 6 parts: with the blue pallet of colors we have the counties with annual GDP per capita lower than the annual national GDP per capita, and with the red pallet of colors we have the counties with higher GDP per capita than the national average. We can visualize how disparities evolved in this period the figure 2.

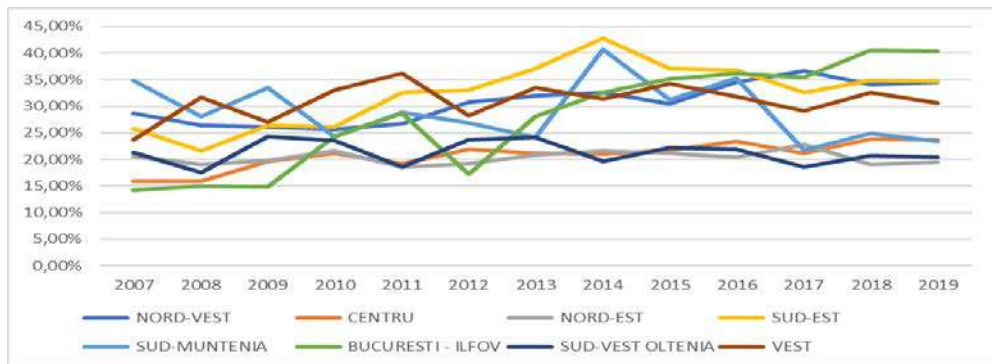


Figure 2. The convergence coefficient (sigma) for GDP/capita within each development region, 2007-2019 (%).

Table 1. The Sigma convergence for GDP/capita within each development region, 2007-2019 (%).

YEAR	NORD VEST	CENTRU	NORD-EST	SUD-EST	SUD-MUNTENIA	BUCURESTI - ILFOV	SUD-VEST OLTENIA	VEST
2007	28,73%	15,81%	20,47%	25,75%	34,83%	14,24%	21,22%	23,66%
2008	26,34%	15,94%	19,06%	21,63%	28,08%	14,94%	17,60%	31,70%
2009	26,15%	19,58%	19,85%	26,47%	33,52%	14,86%	24,30%	26,96%
2010	25,72%	21,21%	21,59%	26,09%	24,33%	24,27%	23,56%	32,98%

2011	26,75%	19,21%	18,53%	32,55%	28,83%	28,73%	18,54%	36,14%
2012	30,77%	21,85%	19,14%	32,98%	26,79%	17,25%	23,72%	28,15%
2013	31,96%	21,09%	20,86%	37,12%	24,21%	28,01%	24,16%	33,41%
2014	32,61%	21,03%	21,64%	42,83%	40,77%	32,56%	19,56%	31,37%
2015	30,42%	21,74%	21,09%	37,15%	31,21%	35,19%	22,15%	34,25%
2016	34,51%	23,35%	20,37%	36,73%	35,28%	36,26%	21,94%	31,82%
2017	36,59%	21,15%	22,77%	32,61%	21,73%	35,47%	18,53%	29,06%
2018	34,05%	23,88%	19,09%	34,76%	24,87%	40,59%	20,69%	32,59%
2019	34,58%	23,73%	19,51%	34,62%	23,43%	40,47%	20,36%	30,56%

These results suggest that we have more than one situation: extreme divergence, divergence, stable/unstable and even convergence among country development regions. We identify extreme divergence in Bucuresti - Ilfov region. This extreme divergence came from the uneven economic growth between Bucharest the national capital and the surrounding county Ilfov.

Divergence is present in the next regions: North West, Centre, South-Est, and West. In North East and South West Oltenia, the evolution of economic convergence is unstable, indicating that regional disparities within these regions are constant. We can see that the trend is convergent meaning a is a slight trend in reducing inequalities. South Muntenia is the only region in the country where disparities are, meaning that since its accession to the EU, this region manage to deal with inequalities. The economic convergence came from the spill-over effect due to the vicinity of Bucharest Municipality, the core of economic development in Romania.

Table 2. Sigma divergence in GDP/capita across counties and across regions, 2007-2019

Year	Counties	Counties except for Bucharest Municipality	Regions	Regions except for Bucharest Municipalities
2007	40,49%	33,46%	47,96%	17,89%
2008	43,49%	34,20%	54,57%	17,83%
2009	41,10%	33,62%	49,11%	17,20%
2010	40,74%	31,78%	50,36%	18,03%
2011	43,18%	32,92%	53,75%	18,53%
2012	44,86%	35,63%	54,44%	17,61%
2013	44,66%	33,91%	55,08%	17,06%
2014	46,19%	35,83%	54,17%	17,18%
2015	46,93%	34,40%	57,87%	18,18%
2016	46,47%	35,16%	55,54%	19,30%
2017	44,23%	32,51%	54,97%	18,35%

2018	43,45%	32,30%	52,48%	18,70%
2019	42,54%	31,73%	51,26%	18,37%

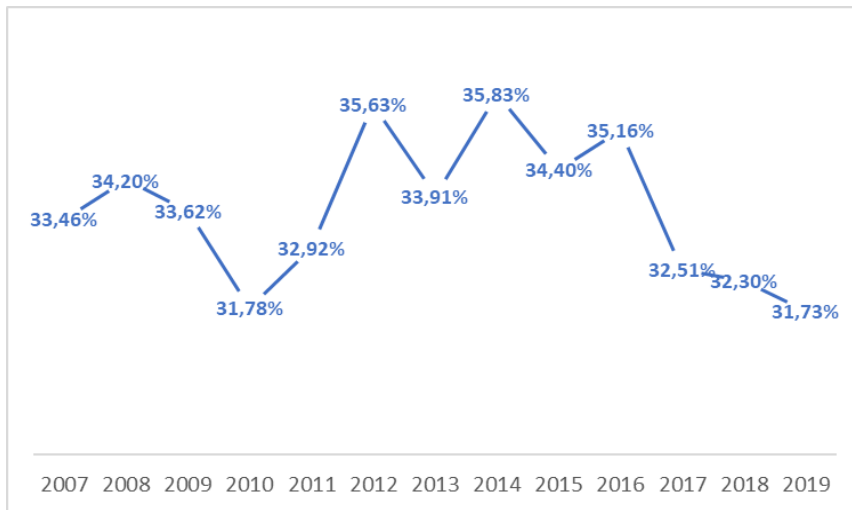


Figure 3. Sigma divergence in GDP/capita across counties, except Bucharest Municipality

If we except the Bucharest Municipality coefficient of variation decreases over time, and we have the “catch-up” effect or economic conditional convergence or sigma convergence meaning that regional disparities decreased over time. In figure 4 case, the coefficient of variation increases over time and we have sigma divergence. In this case, the regional disparities increased over the period studied.

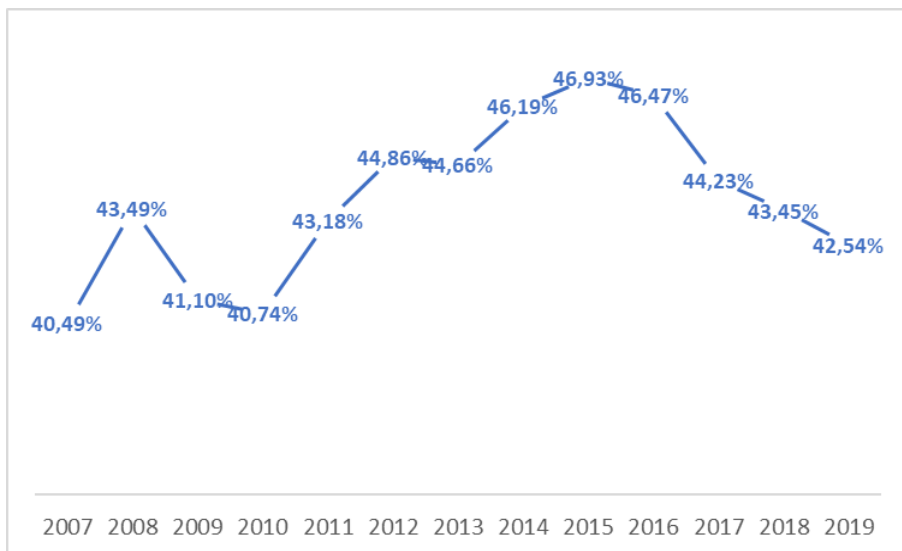


Figure 4. Sigma convergence in GDP/capita across counties

**Table 3. Trend estimation results for sigma series, 2007–2019
(Author's Own Source)**

Counties			
Variable/statistic	Coefficient	Std. Error	Probability
Constant	41.7665	1.1263	0.000***
trend	0.2786	0.1419	0.07533
R-squared		0.2595	
F statistic		3.8563	0.075331
Regions			
Variable/statistic	Coefficient	Std. Error	Probability
Constant	51,0293	1,56313	0.000***
trend	0,3097	0,196936	0,14404
R-squared		0,183616	
F statistic		2,47406	0,14404

In Table 3 are the results from sigma trend estimation in accordance with equation (5) that take into consideration an autoregressive process AR (1) for both, county and regional level. The results for sigma trend estimation at the county level is not statistically significant, the probability is 0.07533, below the benchmark of 0.05, meaning that the null hypothesis cannot be rejected (Drennan, 2004). The results for sigma convergence at the regional level are also not statistically significant, with p value 0.14404.

**Table 4. Results for the ADF test equation (dependent variable $\Delta\sigma$)
(Author's Own Source)**

Counties			
Variable/statistic	Coefficient	Std. Error	Probability
Sigma -1	-.3310474	.3021734	0.302
Trend	-.0006492	.0018388	0.732
Constant	.1509778	.1247871	0.257
Regions			
Variable/statistic	Coefficient	Std. Error	Probability
Sigma -1	-.822245	.3398513	0.039*
Trend	.0007065	.002712	0.800
Constant	.4368975	1714301	0.031*

For both estimations, the sigma variable with unit lag is negative, which indicates a divergent process, but not a statistically significant coefficient for trend. At the county level, the result suggests that disparities had a steady evolution. At a regional level, results indicate that disparities had divergent evolution since the accession of Romania to the European Union.

Table 5. Results for the ADF and DF-GLS tests (Author's Own Source)

Test critical values		t-statistic (Prob.)	
		Counties	Regions
Augmented Dickey-Fuller Test		p-value for $Z(t) = 0.9298$	p-value for $Z(t) = 0.3693$
		-1.096	-2.419
1% level	-4.380		
5% level	-3.600		
10% level	-3.240		
Elliott-Rothenberg-Stock DF-GLS Test		-1.377	-1.180
1% level	-3.770		
5% level	-3.190		
10% level	-2.890		

In Table 4 are presented the results from the Augmented Dickey-Fuller and DF-GLS unit root tests for sigma series from 2007 to 2019, and shows that we cannot reject the unit root hypothesis.

Conclusions

In our study, we employed different methods for estimating the economic divergence/convergence process in Romania's regions and counties after the accession to the European Union. Our results indicate that both at the county and regional levels had a weak increase in economic disparities in the long run, but with some important deviation in the sub-periods.

Immediately after the accession of Romania to the European Union, in the first two years, regional inequalities were widening, influenced by previous trends (Goschin, 2010) and the accommodation process to the norms and rigors of the EU, which, the wealthier region was more prepared. The trend overlaps in 2009 in the global economy influenced by the Great Recession. The financial crisis created a non-desired convergence process in Romania, economic differences between regions and counties were reduced, not because of the catch-up effect but because more developed, yet more integrated counties and regions were more affected by crises than less developed ones. The period after the Great Recession was followed again by a divergent process of regional inequality mostly caused by the more rapidly recover of more developed yet resilient counties and regions in Romania.

The expected benefit of economic growth and reducing economic disparities are visible in Romania eight years after its integration into the European Union. In the sub-period 2015-2019, the "catch-up effect" occurs at every level, county, and region, and the economic gap is on a steady descendent trend. We can attribute this favorable evolution to the benefits of EU integration – technological spill-over, FDI funds, EU funds, and regional EU investment policy in the sustainable development of all regions.

To our knowledge, this paper is the first to investigate the evolution of regional disparities in Romania after the EU accession and offers a deeper understanding of the socio-economic evolution in the context of European Union membership. Our results provide valuable information for policymakers regarding Euroscepticism and withdrawal parties. In the end, our study also has limitations. We focus on the evolution of regional disparities measured as GDP/capita; therefore, future research should focus on other indicators of regional inequalities.

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POVERTY: A DIMENSION OF ECONOMIC SECURITY IN ROMANIA

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Abstract

Economic security addresses the level of welfare a country achieves as a result of a convergent economic policy, on the one hand, but also following a degree of rational, efficient, and timely use of national resources, by attracting the most efficient means of production. The paper reviews economic security objectives for a nation like Romania and focuses on a particular dimension of economic security: the welfare disparities recorded among individuals and genders.

Keywords

Welfare; economic security; poverty; income inequality; and gender disparity.

Introduction

Many discussions about economic security are conducted in terms of national competition and comparisons: which economies are the largest, most productive, and most innovative? Who controls the importance of economic assets? Which companies are dominant in certain markets? This emphasis on competition and comparisons are useful in identifying at least some policies that will enhance a country's economic security (Mureșan, 2010).

A country will seek to be closer, from an economic point of view, to the most developed nations, through the power of example, on the one hand, but also through the need to expand markets, to pursue the placement of specific national products, on competitive markets, with the purpose of increasing incomes and economic welfare respectively. Naturally, nations with large economies enjoy greater influence in setting the norms governing international economic relations. For example, the US, dominant in almost every dimension of economic activity since the beginning of the postwar era, has played a key role in establishing international economic institutions and arrangements that still shape international economic activity. Therefore, the US is an effective provider of international economic norms (Katzenstein, 1996), creating, through NATO, the premises of a generator of stability through the constant pursuit of security and, implicitly, economic security, at the global level, as a whole, but also at the regional level, specifically. Thus, international cooperation in economic issues has become particularly active nowadays, as a result of the proliferation of economic crises, the deepening of gaps between countries, the concentration of wealth in certain areas, and the accentuation of poverty. In recent years, investment as a share of total output has been lower in countries like Romania than in most industrialized countries. If this pattern persists, Romania's economic growth will almost certainly lag behind the more developed countries in the region, on the one hand, and Western countries, on the other. The relative size of Romania's economy - and with it Romania's influence in regional economic issues - will decrease. The effective pursuit of Romania's economic security will require economic policies that restrict consumption, encourage saving, and provide incentives for investment.

However, as a NATO member, Romania enjoys a position of strength in the region but also has economic growth responsibilities to face military expenses to guarantee security. At the same time, any effort regarding compliance with NATO standards means more economic development and, *in extenso*, the prerequisites for ensuring economic well-being for the population.

Beyond measures to increase the general level of investment in Romania, interest is growing in direct government support for certain "strategic" or "critical" industries. It is assumed that such support will enhance Romania's economic security by promoting the growth of industries that will contribute to Romania's economic well-being by generating well-paid jobs, higher-than-usual profits, or beneficial "spinoffs" for other industries. Furthermore, such support can prove an effective counter to foreign governments' efforts to stimulate their own domestic activity in the same industries.

According to the Permanent Delegation of Romania to NATO (2019), "The NATO Security Investment Program (NSIP) is a long-term program financed by all NATO member states. Based on the requirements identified in the NATO Defense Planning Process (NDPP), the NSIP aims to ensure peace, security, and stability by consolidating and maintaining a strong transatlantic link that demonstrates the solidarity of allies, but also by continuing the practices of accepting and assuming roles, the risks, responsibilities, costs, and benefits arising from membership in the North Atlantic Alliance".

The most recent NATO investment, approved for Romania, amounts to 130.5 million dollars and consists of the modernization of an Air Base in "what would be the largest American investment in an American military project in Europe for 2021" (Lupițu, 2020).

As a theoretical principle, the possibility that direct government support of certain industries can increase overall national welfare must necessarily favor certain industries or interests (subsidies paid to a favored industry, for example, must be financed by someone), in which to identify the potential benefits of such support. There is also considerable doubt about the ability of governments to identify opportunities for welfare-enhancing industrial support in order to provide such support effectively. We can have little confidence that increased government efforts to support certain industries will prove beneficial. In some cases, external industrial policies identify consumer gains against producer losses. Even when it seems clear that foreign actions are detrimental to a country's interests, the best response is to support those industries that will drive growth rates across the economy, measured in increased welfare for citizens. As in military affairs, capitalizing on one's strengths or exploiting an adversary's weaknesses can prove a more effective counter than attempting to meet an adversary's challenge.

Military power requires an economic base, and part of economic security is maintaining an overall economic output that allows adequate resources to be diverted to military uses. At a micro level, economic security will also require maintaining the industrial capacity to design and produce successive generations of technologically sophisticated weapons. Only in recent years, as defense spending has been drastically reduced, has much attention been paid to understanding the essential industrial capabilities of this task and what will be required to maintain those capabilities. Efforts to date to identify certain technologies as "critical" for defense purposes have not stood much in the way of operational policies for managing the defense industrial base. General policies aimed at closing the gap between military and commercial technology development efforts and attracting additional firms to supply military needs are more productive than efforts to preserve particular enterprises or advance particular technologies.

For the most part, the fears related to foreign direct investment in countries like Romania, both for the military and the economy as a whole, relate to the convergence of economic policies and the trust the state has through its institutions gives back to the investors. The problem in Romania is not the investors and the supply of economic goods produced: most of the goods produced are not very competitive, with little added value, which will cause low revenues, with a minimal effect in terms of the economic welfare of the citizens as a whole. Another problem in Romania is the fragmentation of society into poles of wealth and poles of poverty, with effects on the proliferation of poverty for disadvantaged groups that are increasing in intensity: the population receiving a minimum guaranteed income, the population that receives from work only the equivalent of the minimum wage, the population in chronic or voluntary unemployment. In these conditions, the lack of economic policies to stimulate and support entrepreneurship cannot solve the stability problem of Romania's economy.

Although foreign interests can gain control of significant commercial or industrial assets in Romania through direct investment, it is far from obvious who gains effective leverage due to such transactions. Rather than being dangerous, foreign investments can bring real benefits to Romania's economy. To the extent that foreign investment results in new fixed assets or the introduction of superior foreign methods or processes, employment opportunities, and worker productivity will increase.

True economic security will require more than ensuring that the economy is larger, more robust, or growing faster than other economies; more than ensuring that national firms are

dominant in important regional or world markets; more than maintaining military forces that are superior to those of any potential challengers (Tadjbakhsh and Chenoy, 2009). In addition to trying to keep the economy growing and doing everything possible to limit negative external developments, ways should also be identified to minimize international instability that will generate undesirable developments in the first place (avoidance of global financial crises). Economic security can be strengthened by strengthening international economic security. Thus, economic security should aim to achieve the following objectives:

- *Maintaining access to external markets*

The population's economic welfare depends largely on their access, both as buyers and sellers, to international goods and financial markets (Smith, 1962). The growing integration of the economy into the larger global economy creates susceptibilities to shocks emanating elsewhere. But withdrawal or isolation from foreign markets would do more harm to national interests than either of these shocks. A country's economic security policy should therefore not aim at trying to reduce a country's "dependence" on external sources of supply. Rather, the goal should be to make continued access to foreign markets more secure.

A country should seek to strengthen international trade cooperation, make continuous and tangible progress toward expanding world trade, and ensure that international trade is governed by easy-to-understand and predictable rules rather than the changing whims of national governments.

- *Creating a stable international financial environment*

There is no consensus on the most effective approaches to controlling these types of instability, but there is a growing recognition that exchange rate stability, and international financial stability in general, will only be achieved through cooperation increased among policymakers in the world's developed economies (Kregel, 2004). Such cooperation will necessarily involve losing national freedom of action in economic matters. Ironically, however, relinquishing some national sovereignty in this regard is likely to be essential to the pursuit of international financial stability and thus to the pursuit of national economic welfare.

- *Promoting market-oriented economic policies*

National economies are interested in promoting market-oriented economic policies in other countries (World Bank, 2002). Although international private capital markets have expanded greatly over the past thirty years, these private markets are inadequate to meet the needs of countries that are trying, after years of state-dominated economic failure (in the case of former socialist economies, for example), to establish new market-oriented approaches to economic activity. At least for the immediate future, security will require the continued support of institutions such as the World Bank and the International Monetary Fund, which seek to plug gaps in private credit markets and encourage market-oriented solutions to economic problems in developing economies. but which implements economic reform measures to increase the level of competitiveness of the economy. In addition, ongoing efforts to reform these institutions and improve their operations should be pursued aggressively. For some purposes, creating new multilateral channels for financing development and reform efforts may also be necessary.

- *Maintaining a functional international and commercial infrastructure*

The economic welfare of a country's population depends on the smooth and efficient functioning of what might be considered a commercial and financial infrastructure. A country's policy must promote the traditional requirements of international trade and finance, economic freedom, and property. In recent years, there has been a political interest focused on eliminating gaps in the regulation of international

banking, reducing the vulnerability of agreements concluded exclusively by electronic means, strengthening the protection of intellectual property rights, implementing functional mechanisms to ensure compliance with international trade legislation and developing a framework for an effective international competition policy (anti-trust policies).

- *A fair distribution of internal income*

True national security — whether of the military or the economic variety — requires a unified population with a common understanding of national interests and able to stand together in the face of foreign challenges. This type of unity will be promoted by an internal distribution of income and economic welfare that is perceived as broadly fair. Although economic integration must contain in the international economy to benefit arguably the best auspices for the promotion of a country's domestic supply, the lower-skilled workers in an economy must understand that they find themselves increasingly in competition with an enormous pool of low-skilled and low-paid labor in the rest of the world. If these workers are left out of the general prosperity, the economic security of a country will be undermined (Cingano, 2014). Efforts to raise the skill level and therefore the productivity of these workers should be a main objective of economic security policies in a country in identifying opportunities for sustainable growth and development. Unfortunately, as far as Romania's economy is concerned, few efforts to increase the productivity of adult workers have proven successful, and modernizing the Romanian education system to produce a new generation of highly productive workers, even if one could perform such a transformation - it will only produce results in the future. While waiting for such efforts to bear fruit, we might want to rethink that economic security is advanced by promoting "high-tech" industries. A wiser strategy might be to work to raise productivity, and thus wages, in industries that can provide jobs. Employees in "low-tech" industries should be motivated by the certainty of receiving low wages, and foreigners to accept continuous training internships for the development of specific skills, in those fields with a high incidence on the labor market from the perspective of the future economy: green economy, recycling, digitization, energy production from renewable sources, etc.

Analysis of welfare and economic security in Romania

Ensuring economic security for Romania has been a continuous desire, since the 1990s, following the political regime change, the establishment of democracy, and access to the principles of the free market. The rise of capitalism in Romania has been difficult, the market being marked by vulnerabilities even now, especially in terms of the labor market and other markets, such as the land market or the market of agricultural products. This fact is all the more harmful to economic welfare as welfare losses occur in rural areas, among disadvantaged people due to exclusion from the labor market, which accentuates poverty over time.

During the analysis, we considered a series of indicators that seemed relevant to us, both in terms of intensity, scope, and the need for measures that are required to be taken to reduce the short-, medium- and long-term effects on the affected population.

The first analyzed indicator, *Gender Wage Disparity*, refers to the most sensitive vulnerability, the gender relationship from the labor market perspective. The relationship between the gender gap and economic development has been emphasized in many studies, such as by Doepke and Tertilt (2019) and Hsieh et al. (2019).

There is an unfavorable difference between the way of remuneration for the work performed between men and women, on the one hand, determined by the limited access of women to management positions, to the number of hours performed, to the incidence of the work performed on free time, from the perspective of the active role and predominance of women in children's lives and education. This indicator is important because of the relationship between the gender gap and economic development

The graph shows a general tendency to reduce the level of gender wage disparity, for the analyzed data, period 2006-2020; these values, higher in the years 2007, 2010, and 2011, show moments in the economy that had a major impact on the labor market: Romania's accession to the European Union, the rise of the construction sector, the relaunch of the construction market in Romania, with an impact on salary increases in fields generally occupied by male labor.

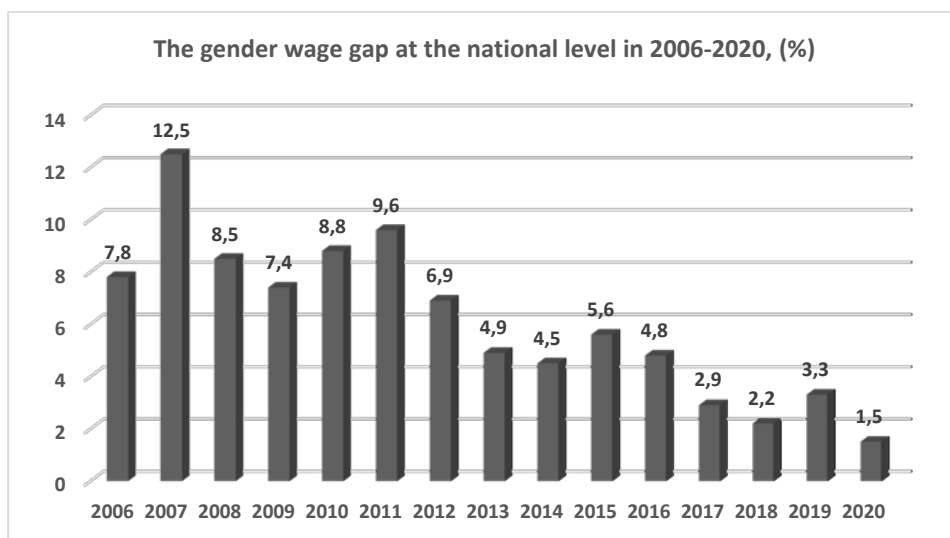


Figure 1. The gender wage gap at the national level in 2006-2020

For a settlement of the economy and a projection of welfare at the family level, there is a need to balance wage earnings at the gender level. In this way, a series of difficulties affecting the family can be avoided, and the contribution of income to the growth and education of the children will be higher. Also, this gender balance will have a positive impact on the motivation of the workforce.

Another analyzed indicator is the *Relative Poverty Rate* or *Poverty Risk Rate*. According to the National Institute of Statistics, the relative poverty rate shows the share of poor people in the total population. At the same time, according to the Institutul Național de Statistică (2022): "people from households are considered poor if they have an adult-equivalent disposable income (including or exclusively the value of consumption from own resources), lower than the poverty threshold". INS appreciates that this indicator "is determined for the threshold of 60% of the median available income per adult-equivalent".

The effect of social disparities, starting from gender disparity, and the lack of effectiveness of educational and investment policies in rural and disadvantaged areas, has a particular impact on the state of poverty.

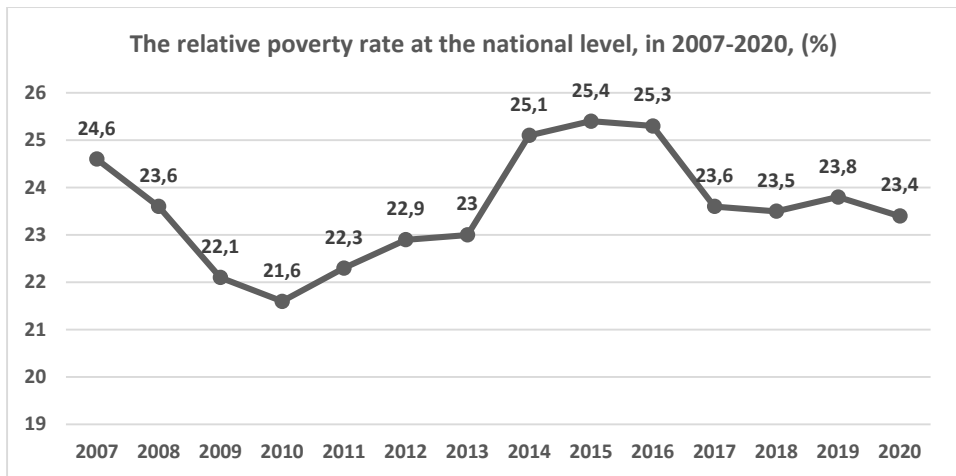


Figure 2. The relative poverty rate at the level of Romania in 2007-2020

From the values presented, it can be seen that the relative poverty rate in Romania has remained in the range of 21-25%, which shows a setback in the economic policies that lead to economic welfare. The most reasons that accentuate the state of poverty are the lack of education, the lack of jobs, the lack of demand for work for people with low educational levels and skills, and the lack of effectiveness of government programs to reduce poverty. Another factor is school dropout for primary and secondary school populations, with reduced possibilities for further insertion and a particularly high marginal effect on the increase in poverty. At the same time, another element is the relatively low child support allowances that are not directly attributed to the children's education. A direct effect of awarding the allowance would be through the school, which would generate more welfare for the child, either in the direct allocation of school supplies, access to education support programs, or food provision in extreme poverty cases.

We consider the relative poverty rate by age group for a broader analysis. Thus, according to the INS classification, we considered the age groups 0-17 years, 18-64 years, and 65 and over. From the data presented in the graph below, it can be seen that the highest level of relative poverty is found among children, with values between 30-35%, decreasing from 2017 to 32%, and in 2020 recorded a level of 30.1%. Juvenile poverty defines all forms of failure of social and economic policies, losses of well-being, and deprivations reflected in the quality of family life and implicitly of children.

Measures regarding raising the level of education and assistance in education for disadvantaged and economically disadvantaged families must be a goal of any economy. The basis of the economy consists mainly of what skills and motivational baggage children have for developing the skills and motivation to become the tools of the economic gear. As long as the assistance programs are global, without identifying the need and acting personalized, through the convergent and consistent involvement of the local authorities, the level of education and keeping interested in education will be low.

The school must remain the stronghold of families, which supervises the course of a child, both from the point of view of accumulated knowledge, but also emotionally, psychosocially, and economically. This fact is possible by transforming the school from an

educational unit into a school community, so that integrated educational activities are carried out in the school, from the provision of education itself, to the provision of activities specific to the degree of interest of young people.

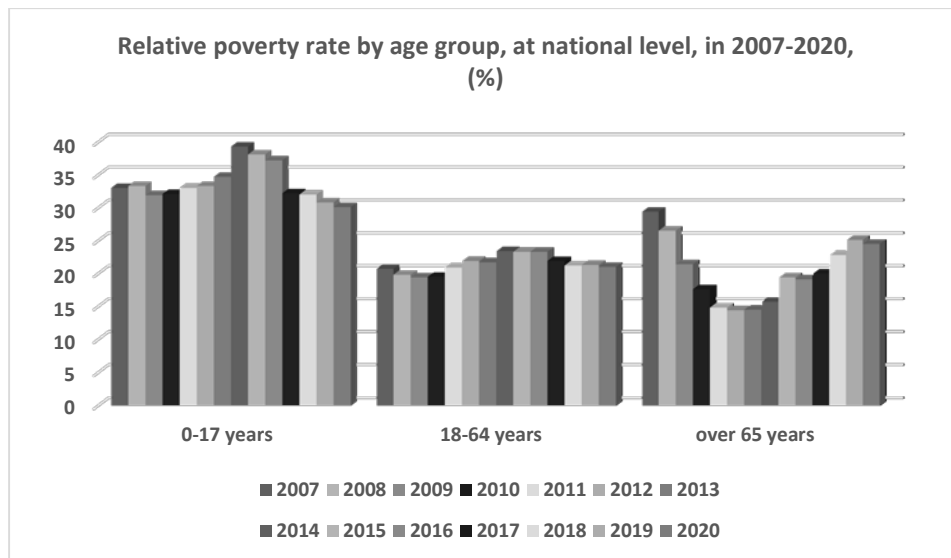


Figure 3. Relative poverty rate by age group, at a national level, in 2007-2020

At the same time, there is a consistency in the relative poverty rate among the adult population, the primary segment of the working population, which registers an average poverty level of 20%. This fact is a determination of poverty registered at the level of those who work, for the most part, knowing that the minimum wage level in Romania brings most workers to the threshold of extreme poverty.

At this point, the discussion leads to economic welfare: while the structure of the Romanian economy is primary, producing mostly goods with low added value, sub-assemblies, or raw materials, the salary level is low, as a result of a low gain in competitiveness from the capitalization on the market of those economic goods produced. The poverty level recorded by this social category is around 25%, but the conditions are favorable for growth, following the increase in the deficit of the pension fund, and the registration of particularly modest salary incomes of most contributors to the pension fund. At the same time, there is an increase in relative poverty in the category of people over 65, the effect of a deficient pension system that does not allow the minimum coverage of living needs.

In essence, the population of Romania is on a rising background in terms of the level of poverty, with a driving effect on the level of other social aspects, such as violence, delinquency, and criminality. From a larger perspective, reducing poverty is important because one cannot pursue national security without aiming for human security (Hudgins, 1021).

Another indicator analyzed is the rate of material deprivation from an economic point of view. This indicator, according to the INS, presents "the share of people in the total population who cannot afford one or more of the following elements: paying utilities and other current obligations on time, without arrears; payment of one week's annual holiday away from home; eating meat, chicken, fish (or other protein equivalent), at least once

every two days; ensuring the payment of adequate home heating; the possibility to face, with one's own resources, unforeseen expenses (equivalent to 1/12 of the value of the national poverty threshold)".

From the data presented in the figure below, we identify the accentuation of the gap between the rich population and those with prospects of wealth, identified in the variable "People without economic problems", with increasing values, since 2007, from 17.8% to 34, 7% in 2019, and the population in extreme poverty, identified in the variable "People with 5 problems", with increasing values, from 2018 - level of 2.4% to 2.9% in 2020, although this indicator decreased from 7% in 2012, when it recorded the highest level in the analyzed period, 2007-2020.

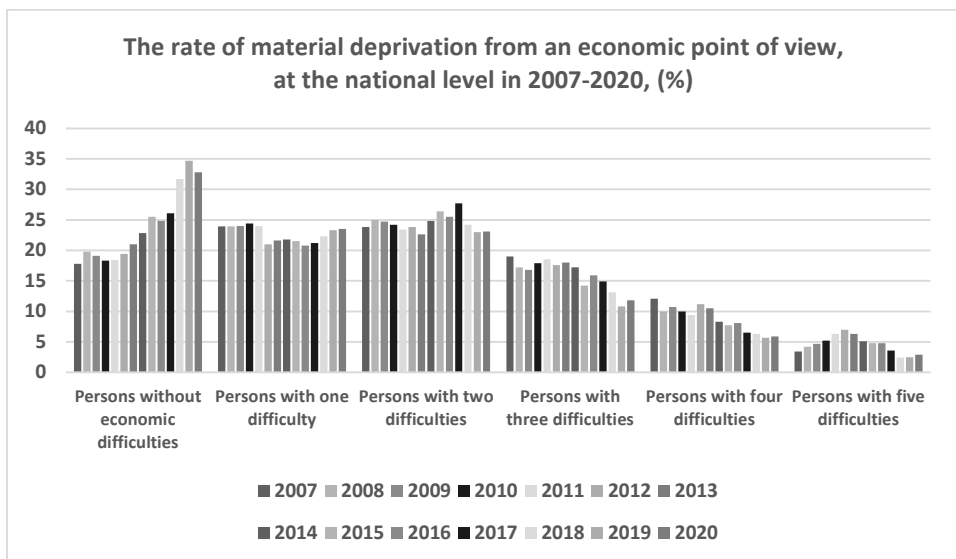


Figure 4. The rate of material deprivation from an economic point of view, at the national level, in 2007-2020, %

Even if, starting from 2017, the variable "People without economic problems" has surpassed all other variables in the rise, it is observed, in the analyzed period, the downgrading of this variable from the one entitled "People with 2 problems", a situation that shows the fact that the level of deprivation is quite sensitive for the population of Romania. The balance of forces between these variables essentially depends on the degree of maturity of the implementation of economic and social policies to lift a large part of the population out of poverty, through social programs, access to appropriate forms of education, inclusion in the labor market through programs adapted to their level of skills.

From the indicator *Index of income inequality by age*, a high level of inequality can be observed among adults who are able to work, which also includes the segment of the population affected by unemployment or the one remunerated at the minimum level wage in the economy. At the same time, the values recorded for people over 65 show a preponderance among them of particularly low income from pensions, it is known that in Romania most pensioners have pensions below 1500 lei, respectively 2.7 million pensioners.

The values recorded by "all persons" an average of 6.6% in 2020 with a downward trend, located below the values recorded by "persons between 0-64 years" with an average of 7.2% in 2020, with a tendency of decline, shows the inequality between the income levels achieved by the rich at the expense of the poor. At the same time, we notice the very large gap between active people and retired people, which is determined in particular by the inefficiency of the contributory system to ensure retirement income.

It is not very clear whether the current pension system is inefficient or not, but from the existing data, we realize that this system will collapse in a very few years with a very low possibility of determining a minimum standard of living and an element of sustainable welfare for people now in active life and who will become pensioners.

According to the INS, "the index of income inequality estimates how many times the available income per adult-equivalent (including or exclusively the value of consumption from own resources) obtained by all people from quintile 5 (the richest) is higher than the income obtained by people from quintile 1 (the poorest), of the distribution of the population according to disposable income per adult-equivalent"

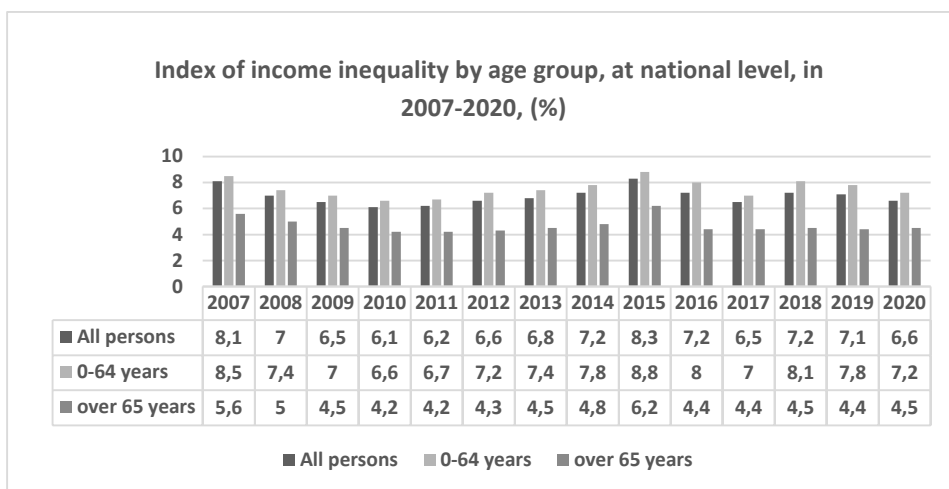


Figure 5. Index of income inequality by age group, at a national level, In 2007-2020

In order to generate economic welfare, inflationary social programs based on direct payments in the form of allowances or welfare income are not relevant, but investments in the real economy generate a competitive offer of economic goods, jobs paid according to the evolution of the index labor productivity.

In order to reduce the poverty gap, scenarios can be considered that aim at the urban-rural relationship, growth poles in the region that generate or export well-being and to poor communities, not through direct payments but by facilitating corrections at the level of economic acts: the achievement of economic goods based on orders, by identifying those needs that can be covered by the work of those excluded from the legal market systems of the labor market. In this way, they also act on the gray and black labor market.

Another indicator, *The Rate of Severe Material Deprivation* is decreasing throughout the analyzed period, from 2007 to 2020, from 38% to 15.2%. This fact is the exclusive effect of the operation of the black labor market, of work in the bonus system for the work done,

and less of the effect of social policies and support for employability and employment in visible economic sectors.

Moreover, finding a job at the minimum wage level in the economy does not lead someone into extreme poverty, but it does not take someone out of poverty either. Thus, the values recorded by this indicator consist of the human need to find survival resources in a market system. This does not emphasize the sustainability of quality-of-life policies, with direct repercussions regarding economic welfare.

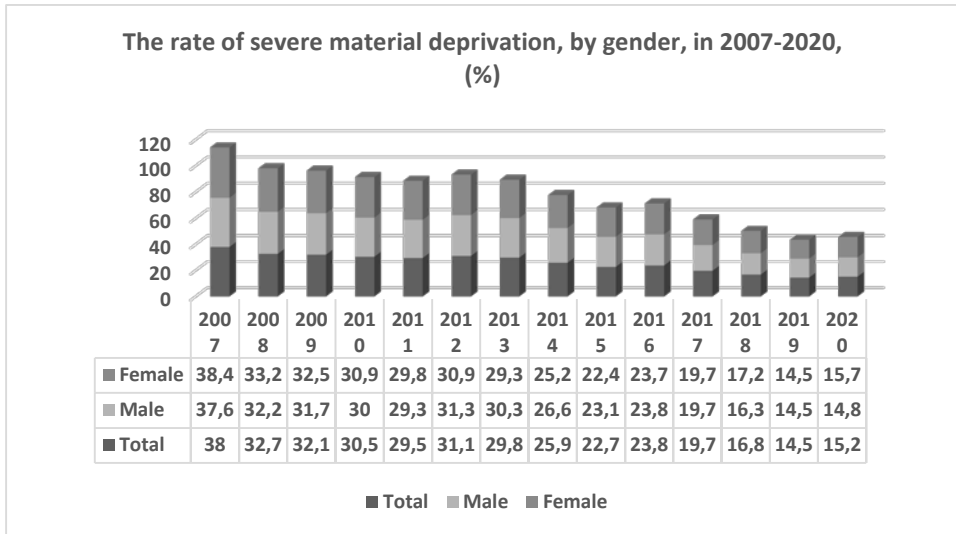


Figure 6. The rate of severe material deprivation, by gender, in 2007-2020, %

Regarding the rate of severe material deprivation, by age group, 2007-2020, we note that the most vulnerable are children, with a decreasing level from 38.8% in 2012 to 17.7% in 2019, which is quite close to the other age groups.

As we have shown in the other explanations of the values of specific poverty indicators, children and young people are especially affected due to the lack of material means of their families and whose use is directed towards food and utilities, and less towards meeting specific needs, such as educational needs, leisure time, gadget use, etc.

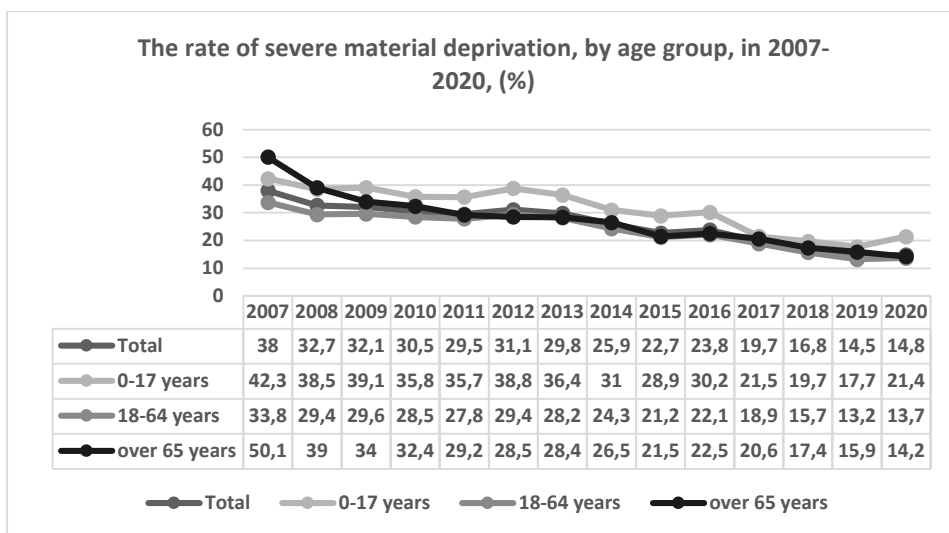


Figure 7. The rate of severe material deprivation, by age group, in 2007-2019, %

In order to ensure and increase welfare for young people, but in general, for the whole population, there is a need, first of all, to improve the process of economic governance, by identifying solutions to the most pressing problems of our economy, by covering with economic, market and competitive measures, of the vulnerabilities and deficiencies of the economy. In this sense, we consider the rural environment, the area of rural education and other disadvantaged areas, the agricultural market, and agricultural products, by creating support measures for peasants, in the sense of capitalizing on the land and producing goods for the local market, for markets in the surroundings, in order to facilitate the entry of income for the welfare of rural communities.

Conclusions

In our opinion, economic security is ensured by providing the means to propel economic welfare. Providing the means to stimulate the economy to produce goods that are in demand, to cover the demand by capitalizing on internal resources or those attracted, but with a lot of skill and motivation are the seeds that lead to economic development.

The increase of GDP through monetary means is not the only essential factor. Rather, developing the supply of economic goods to ensure the domestic supply. In this respect, we use the concept of economic security, a concept that determines the direct link between protecting the national economy and labor resources, in general, by valuing the motivation and skill of each member of the community.

Romania's economy can be in the phase of increasing economic welfare, by ensuring economic security, as long as it effectively capitalizes on internal resources, identifies the development potential of some communities, and directs it toward covering global demand.

Romania must go in the direction of the timely capitalization of the growth possibilities offered by the regional and world context, the complex circumstances, and the advantage of being a member of a common market.

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ESTIMATION AND PREDICTION OF DAILY NATURAL GAS PRICES BY APPLYING THE AUTOREGRESSIVE INTEGRATED MOVING AVERAGE (ARIMA) MODELS

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Abstract. *Natural gas continues to represent the main source of traditional energy that is increasingly essential and vital to all mankind. From this perspective, increasing dependence on this energy source and investigating the price movements and dynamics mechanism by developing statistical and econometric models become relevant topics of discussion in current empirical studies. Thus, we proposed to carry out/perform an estimation and forecasting analysis of daily natural gas prices over 1997-2022 using Henry Hub as benchmarks for the entire North American natural gas market and parts of the global liquid natural gas (LNG) market. Applying ARIMA Integrated Autoregressive Models and following the specifications of Box-Jenkins methodology, we could provide an up-to-date picture of the behavior of natural gas prices time series, highlighting its most relevant co-movements and fluctuations. Our results showed that AR(1) MA(2) MA(4) Adjusted ARIMA Model is the most robust and suitable/appropriate model, after which the forecast analysis of daily natural gas prices could be performed. Moreover, it was shown that the natural gas prices persist in fluctuating and oscillating in the analyzed period, generating a high level of volatility (the predicted value of this volatility is approximately 13%) especially during the last two years: 2020-2022. Certainly, we can confirm that the investigation of the time series of natural gas prices will represent an actual and important point of interest in international financial markets, investments, and risk management.*

Keywords: *autoregressive models; ARIMA models; Box-Jenkins methodology; Henry Hub Natural Gas prices; predicted volatility; risk management.*

Introduction

Actually, natural gas represents an important and vital energy resource for mankind. The indispensable character of this globally strategic resource generates a series of effects and implications both on a social and political level, and above all on an economic and financial level.

For example, natural gas is an important commodity in most international transactions between consuming and net importing countries (especially in the case of developing and developed countries) and the producing and exporting ones (i.e. the Caspian countries, Arab countries, etc.).

Nowadays, new opportunities to diversify these energy resources are being sought, as well as the construction of pipelines and new access routes to them with an eye/in order to cover the energy needs or requirements in the medium and long term in the case of importing countries/importers. From this perspective, many researchers and academics are increasingly concerned with finding those methods and techniques for estimating and forecasting the consumption and production of natural gas, as well as predicting and estimating the time series of natural gas prices. For these reasons, the main objective of our study is to perform a forecasting analysis of the time series of natural gas prices to measure the degree of volatility associated with this asset and understand fluctuating movements and co-movements that are more and more pronounced and persistent.

Moreover, the practical value of our study is to determine and provide an appropriate framework for the dynamic trend/evolution of natural gas prices for various participants such as: financial and energy companies, financial investors, government authorities, or policymakers. Therefore, we use the time series of daily global natural gas prices in 1997-2022, which are obtained by applying the first difference. Also, we consider the Henry Hub Natural Gas Spot Prices as the benchmark, where the data source is U.S. Energy Information Administration.

From a methodological point of view, we employ the Box-Jenkins method in six steps according to the autoregressive ARIMA models: (1) descriptive statistics of the natural gas prices time series; (2) assessment of the time series stationarity using unit root tests verification; (3) identification the tentative ARIMA models based on visualization of the correlogram, ACF and PACF; (4) estimation the coefficients of each ARIMA model; (5) selection to the appropriate and approximate ARIMA model based on the application of robustness tests, and (6) forecasting analysis in our sample based on the most suitable ARIMA Model.

Our study is organized in the following order: Section 2 presents the most relevant literature review; Section 3 describes the Research Methodology, Data, Preliminary Analysis of natural gas price series, and the applied ARIMA Models; Section 4 discusses the main results and interpretation of these results and Section 5 presents the conclusion.

Literature review

In this section, we will present the main theoretical and empirical studies to investigate and forecast the dynamic behavior of the global natural gas prices time series by applying the Autoregressive Integrated Moving Average (ARIMA) Models.

From this perspective, we can say that more and more researchers are interested in finding these econometric models that provide the most faithful and appropriate prediction regarding the price dynamics of this globally traded asset. Thus, using forecasting models becomes an important and relevant condition, especially in the case of the investment process, risk management, international trade, and international financial and natural gas markets.

We believe that our study is practical and helpful to investors increasingly interested in understanding the fluctuating and dynamic behavior of the prices of financial and non-financial assets in their portfolios (in our case, the global prices of natural gas) by applying the ARIMA models.

Hosseiniipoor and Hajirezaie's (2016) study applies the autoregressive ARIMA and GARCH models to determine a forecasting analysis of Henry Hub Natural Gas prices in the case of the U.S. natural gas market in the long-term period. The results showed that natural gas prices are fluctuating extremely volatile in the analyzed period 1996-2016, generating a high risk for consumers, producers, and investors in the U.S. natural gas market.

Moreover, the authors showed that the ARIMA (5,1,9) and GARCH(1,1) are appropriate models to forecast the time series of natural gas prices, both of them suggesting a slight increase in the global price of natural gas in the future, up to 3.20 USD/Million Btu (value expected in September 2016). Similarly, Mishra (2012) proposes a non-parametric approach to forecast the time series of natural gas, oil, and gold from 1975-2010. The results obtained have highlighted that the three applied univariate and non-parametric models, i.e. ARIMA (1,2,1), GARCH (1,1), Alternating Conditional Estimation (ACE model) provide extremely rigorous and adequate foresight in the case of the analyzed time series, being among the first studies that have developed a new, sophisticated and innovative forecasting approach.

More recently, many forecasting models are used to ensure a good prediction of the natural gas price, as well as the estimation of the production and consumption of this commodity. In this sense, the study by Manigandan et al. (2021) uses complex and advanced autoregressive models (i.e. SARIMA and SARIMAX models) to forecast and measure the consumption and production of natural gas in the USA. Using monthly time series, the results showed that both consumption and natural gas production tends to increase until 2025.

Last but not least, the study has practical implications for the future decision-making mechanism of the US natural gas market. Guan et al. (2022) use advanced machine learning techniques to develop an appropriate forecasting model that captures the fluctuating movements of natural gas prices, political events, and news from 2012-2021. This study's main contribution and novelty is the new technique (BiLSTM) used to extract price information related to news features. The robustness of the model is over

79%, explaining that the future trend of the natural gas price is dependent and influenced by various news and events, and the performance is better than most traditional machine learning algorithms.

The two probabilistic models, The Day-Ahead and The Month-Ahead Models developed by Berrisch and Ziel (2021), were used to estimate the future natural gas prices from 2011 to 2020. The main evidence showed a strong nexus between the natural gas market and the electricity market at the European level, and also the conditional volatility or variance of the price of natural gas (estimated by the TGARCH model) tends to increase up to 34%. Moreover, according to these forecasting models, the authors found that the highly significant pattern in the data estimating a total price reduction of 0.35 per month these risk premiums should decrease over time because the uncertainty decreases as time gets closer to delivery.

In another approach, the study by Göncü et al (2013) investigates the interdependence relationship between residential and commercial consumption of natural gas and the temperature level/degree in the case of Istanbul (Turkey) in the period 2004-2011 by applying the panel data methodology. In this new dynamic model, the authors have performed the Monte Carlo simulation and checked the accuracy of forecasting analysis using the most relevant diagnostic tests. The main results showed that the sudden increases in the temperature have directly influenced natural gas consumption, which generates a significant increase in domestic demand and the price level of natural gas.

Moreover, the necessity of establishing the natural gas futures market in Turkey is observed in the near future where those participants can probably hedge against these climate and environmental risks. The main purpose of the study by Nyangarika and Tang (2018) is represented by forecasting analysis of the global price of oil and natural gas time series from 1991 to 2016. The authors applied the modified autoregressive integrated moving average models in this regard.

In the same study, a linear regression was applied to explain the interdependence relationships between the global oil price, the global natural gas price, and six other dummy variables (i.e. World financial crisis, The Military company in Iran, Syria, and Iraq, Afghanistan, and the U.S.Terror). The obtained results suggested that the global oil price is directly influenced by the global natural gas price level and by the armed conflict/military company that broke out in Iraq in 2004. Also, the Modified ARIMA model suggested a better forecast for global oil and natural gas prices so investors can better understand the increasing and persistent volatile movements.

On the other hand, the study by Tamba et al. (2018) highlights the most important empirical and theoretical studies to determine and investigate the forecasting analysis of natural gas prices. From this perspective, these authors emphasized the series of methods and tools used, the specifics and characteristics of the data used, and the possible future implications in natural gas forecasting.

Within this study, a series of published articles were presented in a chronological way/manner regarding the estimation and forecasting of natural gas time series in the interval 1949-2015.

At the same time, a diversity of estimation and forecasting methods was suggested, such as: ARIMA and GARCH autoregressive models, time series models, regression models, panel regression models, non-parametric models, advanced machine learning techniques, combined models (SARIMAX, SARIMA, ARX), etc. Also, each model was tested and verified based on robustness indicators (Root Mean Square Error, Mean Absolute Error, Mean Absolute Percent Error, R-Squared, Sigma) depending on the expected and analyzed time horizon. The value of this study is impressive given the rigorous, logical, and detailed presentation of the published studies in the field of forecasting natural gas time series, generating new research directions, and resolution of possible methodological inconveniences.

Another empirical research (Siddiqui, 2019) proposes an Autoregressive Neural Network (ARN) Model to ensure a better and more accurate forecasting analysis of the time series of natural gas prices. Using the Henry Hub daily natural gas Spot prices in 1997-2018, the results suggested that the ARN model generates a considerable improvement over the ARIMA models used by over 30%. This study employed ARIMA (3,1,3) and ARIMA (2,1,2). The same study emphasizes that the Autoregressive Neural Network Model represents an actual model for basing spot gas purchase decisions.

Similarly, Viacaba et al (2012) use an innovative data mining model to forecast the time series of natural gas prices. According to the Selective Support Vector Regression (SVR model), the authors could measure the specific volatility of natural gas in the U.S. natural gas market from 2003-2009. They confirmed that the volatility measured by the SVR models is approximately the same as that provided by the U.S. Energy Information Administration by their Short Term Energy Outlook (STEO) forecast, having a value of 9.90%. In the same direction, it also applies to the study by Hosseinipoor (2016).

To forecast the U.S. natural gas prices time series, the author used three modern techniques based on the Artificial Neural Networks (i.e. simple Artificial Neural Network Model, three-layer Artificial Neural Network Model with 6 hidden neurons, and NARX network model with 6 neurons). All these models captured the price spikes, offering a simulation as close as possible to the reality of the present natural gas prices time series. The study by Wong-Parodi et al. (2006) presents a comparative analysis of U.S. natural gas price forecasting from 1998-2003. Taking into account the forecasting models provided by Short Term Energy Outlook-STEO (U.S. Energy Information Administration) and Henry Hub Forward Prices, the authors concluded that in most cases the futures market is a more accurate predictor of natural gas prices than STEO for a 24-month forecast period.

Busse et al. (2012) highlight a dynamic approach to forecasting the natural gas price fluctuations in the market area of NetConnect Germany. In order to capture the interdependence relationships between natural gas prices and other independent variables they used the NARX neural network model and sensitivity analysis. The results illustrated that the most important factors that directly influenced the future trend of natural gas prices are: temperature, the exchange rate between USD and EUR, the exchange rate between GBP and EUR, and the settlements of the gas hubs. At the same time, the authors conclude that autoregressive econometric models, in particular, ARIMA and GARCH are user-friendly in forecasting analysis compared to the complex methodology proposed by Artificial Neural Network Models, providing a high level of

accuracy and robustness. Nevertheless, data mining techniques represent an important and up-to-date step in the case of forecasting non-parametric models.

In another approach, Zhao et al. (2018) use the autoregressive ARIMA to implement an adequate forecasting model for fuel cost in the case of Texas in 2013-2016. The ARIMA (2,1,1) and ARIMA (2,0,1) models are those models on which the forecast analysis for Henry Hub Natural Gas spot prices was employed. The results show the proposed forecasting algorithm performs better than the method that uses the three-month delayed data.

Considering that the state of Iran represents an important producer and exporter of energy products, especially natural gas, and oil, Farrokhi and Hassanzadeh (2017) use ARIMA models to forecast and estimate the monthly and annual domestic consumption of natural gas. The results of the study following the application of the Box-Jenkins J methodology, showed that the best model for forecasting the annual consumption of natural gas in Iran is ARIMA (0,1,0), while SARIMA (1,0,0) (1,1,0) is suitable to forecast the monthly domestic consumption.

Methodology

The main objective of our study is to estimate and forecast the daily natural gas prices time series in the period 1997-2022. From this perspective, the research questions are as follows: (1) How can we estimate the daily natural gas prices in the most appropriate way? and (2) How we can forecast the natural gas price time series by applying the autoregressive models?

According to the U.S. Energy Information Administration (EIA, 2021), natural gas prices are a market supply and demand function. Increases in natural gas supply generally result in lower prices, and decreases in supply tend to lead to higher prices. Increases in demand generally lead to higher prices, and decreases in demand tend to lead to lower prices.

Another aspect that is offered by the EIA is that the strength of the economy influences natural gas markets. For example, during economic growth, increased demand for goods and services from the commercial and industrial sectors may increase natural gas consumption. Also, because of natural gas supply infrastructure constraints and limitations in the ability of many natural gas consumers to switch fuels quickly, short-term increases in demand and/or reductions in supply may cause large changes in natural gas prices, especially during the wintertime.

Moreover, when competing fuels' prices rise relative to natural gas prices, switching from those fuels to natural gas may increase demand and prices. Nevertheless, natural gas prices on the spot market may increase sharply during high-demand periods if natural gas supply sources are relatively low or constrained.

On the other hand, European Union (ECB, 2022) considered that natural gas is the second most important primary energy resource in the euro area, after petroleum-based products, and also acts as the key marginal energy resource in electricity generation, given the flexibility of gas-fired power plants and the overall gas infrastructure in responding to fluctuations in electricity demand.

We will then use/apply autoregressive integrated moving average models (ARIMA models) for estimating and forecasting the dynamic and volatile behavior of natural gas prices from 1997-2022.

An ARIMA model can be considered a special type of regression model in which the dependent variable has been rationalized and the independent variables are all lags of the dependent variable and/or lags of the errors, so it is straightforward in principle to extend an ARIMA model to incorporate information provided by leading indicators and other exogenous variables: you simply add one or more regressors to the forecasting equation.

The ARIMA model is thought to provide more accurate predictions by removing these difficulties. ARIMA models have demonstrated their efficient ability to produce short-term predictions. In terms of short-term prediction, it consistently outperformed complicated structural models (Mashadihasanli, 2022).

In general, the ARIMA model is based on AR and MA models. While the AR model is used to show that the current observation is dependent on previous observations, the MA model is used to show that the current and previous residuals compose a linear function. ARIMA, as a time series forecasting method, can be employed to understand the data through time series analysis and study the sequence formed by the state of the variables at different times (Mashadihasanli, 2022).

It can also be used to fit the data and make forecasts, quantitatively describing the pattern of variables in the time series and future trends. The advantage of the ARIMA model over other forecasting models is that it only requires forecasting based on endogenous variables, without the need to acquire other relevant exogenous variables, and focuses more on the patterns and trends of the variables to be studied. As an effective time series analysis tool, an ARIMA model is implemented to forecast price signals. ARIMA models have been analyzed and evaluated to forecast natural gas prices (Zhao et al. 2018).

In our case, we used the ARIMA (p,d,q) models, where: p = number of lags of the dependent variable; q = number of lags of the error term; d = how many times the variables is differenced to become stationary. Because engaging an ARIMA model is to forecast a series, the Box- Jenkins methodology (Figure 1) comes in handy in answering the predicting question.

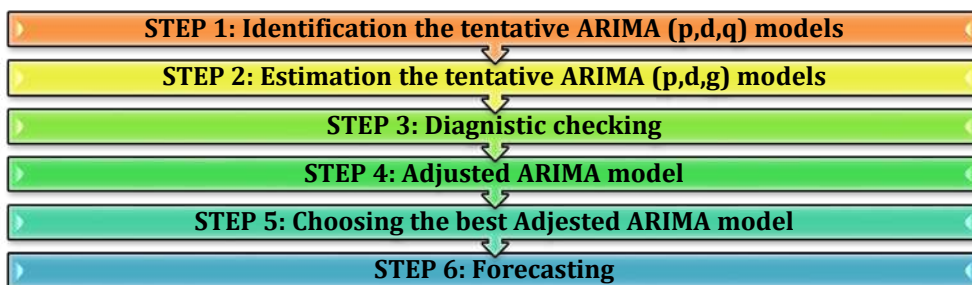


Figure 1. The Box-Jenkins methodology
Source: Authors' own research contribution

In step 1, identification, the question is “How can the appropriate model be identified?”. We used the correlogram and the partial autocorrelation function (PACF) to answer. These tools measure the correlation between observations that are k times after controlling for correlations at intermediate lags. In other words, PACF is the correlation between $d(\text{natural gas prices})_t$ and $d(\text{natural gas prices})_{t-1}$ after removing the effect of the intermediate $d(\text{natural gas prices})$'s. In this step, the identification procedure consists in: plot the series to visualize if stationary, or not; from the correlogram, calculate the ACF and PACF; check whether the series is stationary or not; take the first difference of the raw data and calculate ACF and PACF again, and visualize the graphs of the ACF and PACF and determine which models would be good. In step 2, we estimated the tentative models, using the Least Square and ARIMA Procedures. Moreover, in this step, we selected the appropriate model, which the significant coefficients, the less volatility (Sigma^2), the lowest Akaike Info Criterion (AIC) and Schwarz criterion (SC), and the highest R-Squared (R^2).

In step 3, we investigated the appropriate model, performing the diagnostic tests and/or re-estimating the adjusted ARIMA Models. Next, we performed the forecast analysis by plotting the forecast graphs and verifying the success of the forecast to predict the future values of the daily natural gas prices time series. Indeed, the fundamental idea of Box-Jenkin's methodology is that of parsimony.

Descriptive statistics of the natural gas prices time series used

The analyzed time series is that of natural gas prices globally, in 1997- 2022. The data source is U.S. Energy Information Administration (EIA), which provides the level of benchmark prices, namely Henry Hub Natural Gas Spot Prices. In our case, we used the daily natural gas prices time series in the period 1997-2022 and the dynamic trend of these prices is shown in the Figure 2.

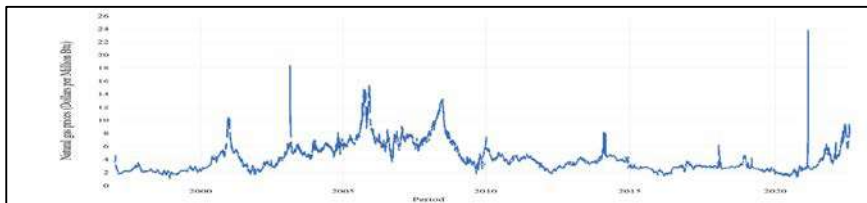


Figure 2. The plot of daily natural gas prices in the period of 1997-2022

Source: Authors' own research contribution

According to this figure, the evolution and fluctuating movements of natural gas prices over time can be observed. Also, we certainly say that natural gas is an important and strategic asset, highly traded in the international financial markets. Thus, we identify the main spikes and jumps since 2005, where the average level of natural gas price is about \$18 / Million BTU. Also, the negative effects of the Global Financial Crisis have been observed since 2008, when natural gas prices fell by 56%. Mostly, price fluctuations have continued until now, with 2020 recording an extremely high level of natural gas price of approximately \$24/Million BTU, mainly caused by the outbreak of the Coronavirus pandemic. We are also aware that fluctuating movements persist in the unpredictable and uncertain near future following the outbreak of the war between Russia and Ukraine (February 24, 2022), where the average natural gas price is approximately \$18/Million BTU.

Table 1. Descriptive statistics of the natural gas prices time series

Mean	4.1976
Median	3.5600
Maximum	23.8600
Minimum	1.0500
Standard Deviation	2.1827
Skewness	1.6516
Kurtosis	7.0142
Jarque-Bera/Prob.	7241.843 /0.0000
Observations	6431

Source: Authors' own research contribution

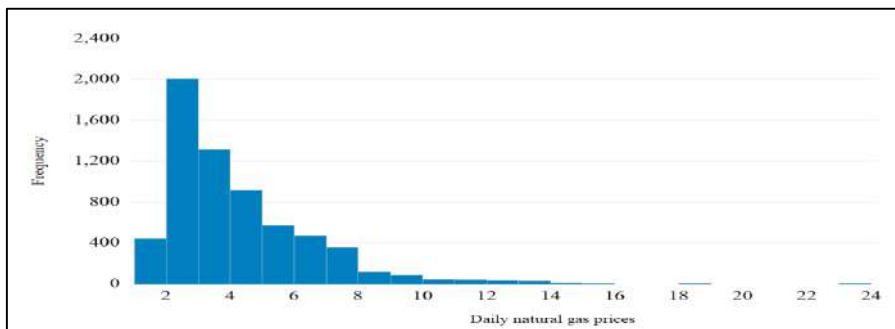


Figure 3. Histogram of daily natural gas prices in the 1997-2022 Source: Authors' research contribution

Table 1 presents a brief statistical description of the daily natural gas prices time series in our analyzed period. The time series contains 6431 observations, where the maximum value of the price is approximately \$24/Million BTU, while the minimum value of the natural gas price is about \$1 /Million BTU. In this period, the average value of the natural gas price is \$4.20/Million BTU, approximately \$3.60 representing the median value of the analyzed time series.

From a statistical point of view, we observe that the natural gas price deviates in average with \$2.18/Million BTU, which confirms a high risk associated with this globally traded asset. Regarding the distribution of natural gas price time series (Figure 3), the positive values of the Skewness (1.65) and Kurtosis (7.01) states highly present stylized fact in the analysis, namely the fat-tail property of distribution or the presence of a leptokurtic and asymmetric to the right distribution. At the same time, based on the histogram, the natural gas prices do not match and do not tend towards a normal or Gaussian distribution $N(0,1)$ and this fact is visible from the extremely high value of the Jarque-Bera test.

On the other hand, our series is non-stationary according to the data provided by Figure 2 and Figure 3. This must be corrected before applying the ARIMA models. In this sense, the Augmented Dickey-Fuller (Dickey and Fuller, 1979) and Phillips Perron (Phillips and

Perron, 1988) tests were done to check for stationary of the natural gas prices time series. The results obtained can be seen in Table 2.

Table 2. The results of unit root tests

ADF Test	t-Statistic	Prob.	Test critical value at 1% level
None	-41.7636	0.0000	-2.5653
Intercept	-41.7612	0.0000	-3.4311
Trend and Intercept	-41.7602	0.0000	-3.9594
PP Test			
None	-105.2211	0.0001	-2.5653
Intercept	-105.2240	0.0001	-3.4311
Trend and Intercept	-105.2300	0.0001	-3.9594

Source: Authors' own research contribution

In our case, ADF and PP have the statistical test values approximately equal to -100.00 and the associated p-value at 0.0001. As the test values are lower than the critical values by choosing the 1% confidence level, it can be certainly confirmed that the null hypothesis is rejected. The results showed that the natural gas price series is stationary at the first difference, with an extremely high probability level (p-value is less than 1%). Therefore, the specific analysis of the autoregressive methodology continued on the new series, obtained by applying the first difference. In our case, the series is called *d(natural gas prices)*, which indicates that our time series is I(1). For this reason, we will apply the ARIMA models.

ARIMA Models

Using autoregressive (AR) and moving average (MA) processes to analyze and forecast the time series can be improved. Thus, by combining the two processes, a generalized model is obtained, called the Autoregressive Integrated Moving Average (ARIMA) Model. The ARIMA model combines the dependent variable's autoregressive lags and moving average process errors. ARIMA Model is popularly known as the Box-Jenkins (1976) methodology. It is a method among several used in forecasting variables and uses the information obtained from the variables themselves to forecast its trend.

The variable is regressed on its own past values, and from this perspective, the ARIMA model is based on univariate analysis. Also, it is designed to forecast future movements, knowing and analyzing the probabilities, or stochastic, properties of variables. ARIMA Model uses the following philosophy: "let the variable speak for itself".

ARIMA Model helps investors, government regulators, policymakers, and relevant stakeholders make informed decisions. For example, an investor before buying a financial asset will want to know if it is really worth buying and holding on to it. In the same way, policymakers and regulators will want to forecast the future trend of some economic series and formulate policies based on the previous realizations of such variables. The underlying assumptions of the ARIMA Model are: (i) stationarity (use unit root test), and (ii) invertibility (implicitly assumes that the series can be approximated by an autoregressive model).

The ARIMA Model specification are: (i) the BJ-type time series models allow the variable to be explained by past, or lagged values of the variable itself and stochastic error terms; (ii) ARIMA Models are sometimes called theoretical models because they are not derived from any economic or specialized theory; (iii) the series is simply explaining itself using its historical data; (iv) ARIMA is composed of two distinct models which explain the behavior of a series from two different perspectives: the autoregressive models (AR), and respectively, the moving average (MA) models.

The AR(p) model can be generalized to include more series lags, such that the values in brackets() indicate the number of lagged values of the regressand included in the model.

The formula of the Generalised AR(p) model is presented in the equation 1.

$d(\text{natural gas price})_t = a + \sum_{i=1}^p b_i d(\text{natural gas price})_{t-i} + u_t$ (1), where: a = intercept; b_i = coefficients; $d(\text{natural gas price})_{t-i}$ = the past value of the natural gas price; and u_t = the error term; t =time; p = lags

The moving average (MA) model gas the following formula that is presented in Equation 2. Moreover, the generalized formula of the ARMA Model is illustrated in Equation 3.

$d(\text{natural gas price})_t = \gamma + d_0 u_t + \sum_{j=1}^q d_j u_{t-j}$ (2), where: $d(\text{natural gas price})_t$ is explained by the value of the error term and the intermediate past error known at time t .

$ARMA(p,q) \Rightarrow d(\text{natural gas price})_t = a + \sum_{i=1}^p b_i d(\text{natural gas price})_{t-i} + d_0 u_t + \sum_{j=1}^q d_j u_{t-j}$ (3)

Distinction between ARMA and ARIMA models is the integration component which brings us back to the subject of stationarity.

The key to ARIMA modeling is employing the iterative identification, estimation, and diagnostic checking process. Thus, it is advisable not to choose the model a priori. Furthermore, ARIMA informs the researcher or reader that the series in question has been integrated before being used for any analysis. The main advantage of ARIMA forecasting is that it requires data on the time series in question. First, this feature is advantageous if one is forecasting many time series. Second, this avoids a problem sometimes with multivariate models (Castaneda et al., 2021; Mouchtaris et al., 2021). Owing to purely statistical approaches, ARIMA models only need the historical data of a time series to generalize the forecast and increase prediction accuracy while keeping the model parsimonious. Potential cons of using ARIMA models are: difficult to predict turning points, there is quite a bit of subjectivity involved in determining (p,d,q) order of the model; computationally expensive; poorer performance for long-term forecasts, or cannot be used for seasonal time series (Castaneda et al., 2021; Mouchtaris et al., 2021; Bakar, Rosbi & Uzaki, 2018).

The entire methodological approach and the results obtained from estimating the ARIMA models were developed using the econometric software EViews12.

Results and discussions

In this section, we present and discuss the main results obtained from the analysis of the natural gas prices by applying the autoregressive integrated moving average (ARIMA) models. Specifically, the results will be presented according to the specific ARIMA autoregressive methodology, namely the Box-Jenkins method.

From this perspective, in the first part, we present how we identified and selected the tentative ARIMA models. We focus on the main results obtained from the estimation analysis of these tentative ARIMA models.

In the last part, we investigate and diagnose the applied autoregressive ARIMA models and choose the most suitable/reliable model to estimate the natural gas prices time series. Moreover, we present and discuss the main implications obtained from the forecast natural gas prices analysis in the period of 1997-2022.

The main results from the identification of the tentative ARIMA models

In order to use ARIMA models, the first step is to identify the tentative and experimental ARIMA models that explain and capture the dynamic evolution of the natural gas prices time series. Therefore, we applied the econometric method known as the correlogram.

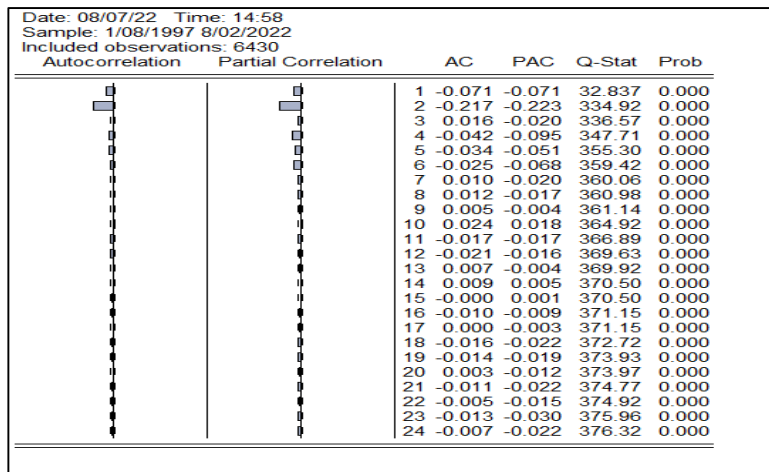


Figure 4. ACF and PACF to determine the tentative ARIMA Models

Source: Authors' own research contribution

The obtained results that are illustrated in Figure 4 show that both autocorrelation function (ACF) and partial autocorrelation function (PACF) present the same pattern and namely: the both of them decrease progressively. This means the estimation analysis will be done by applying the autoregressive integrated moving average (ARIMA) models. By visualising the correlogram, we observe that the most significant lags in which information can be obtained are Lag 1, Lag 2, Lag 4, Lag 5, and Lag 6. From this perspective, we construct and identify the ARIMA models formed from the random combination of these lags.

Table 3. The tentative ARIMA models

ARIMA (1,1,1)
ARIMA (2,1,2)
ARIMA (4,1,4)
ARIMA (5,1,5)
ARIMA (6,1,6)

ARIMA (1,1,2)
ARIMA (2,1,1)
ARIMA (2,1,4)
ARIMA (4,1,2)
ARIMA (1,1,4)
ARIMA (2,1,5)
ARIMA (2,1,6)
ARIMA (6,1,2)
ARIMA (5,1,2)
ARIMA (1,1,6)
ARIMA (1,1,5)
ARIMA (6,1,5)
ARIMA (6,1,4)

Source: Authors' own research contribution

In our case, 18 ARIMA models were created for estimation and forecasting analysis of the daily natural gas prices time series in the period 1997-2022. These models are shown in Table 3.

The main results from the estimation analysis of the tentative ARIMA models

The second section presents the specific results for the 18 tentative autoregressive integrated moving average (ARIMA) models. Starting from the specific hypotheses in using the ARIMA models, many conditions are proposed in the literature that need to be fulfilled by each model applied.

In this regard, to select the most suitable ARIMA model, these models should have the least number of parameters, significant autoregressive (AR) and moving average (MA) parameters/coefficients, the lowest predicted value of volatility (Sigma^2), the highest R-Squared (R^2), lowest Schwarz Information Criteria (SC), lowest Akaike Information Criteria (AIC), and also no heteroskedasticity and no autocorrelation in the residual or errors terms series. In this sense, we resorted to creating a ranking/top regarding choosing the most suitable ARIMA model. These results can be viewed in Table 4 down below.

Table 4. The ranking of ARIMA tentative Models

MODEL	Significant coefficients	Sigma^2	R^2	AIC	SC	DW	Rank
ARIMA (1,1,2)	2	0.131625	0.064581	0.811344	0.815555	1.999902	1
ARIMA (2,1,2)	2	0.132556	0.057962	0.818394	0.822605	2.202283	2
ARIMA (4,1,2)	2	0.132645	0.057328	0.819066	0.823277	2.200469	3
ARIMA (2,1,4)	2	0.132656	0.057251	0.819148	0.823359	2.200313	4
ARIMA (5,1,2)	2	0.132755	0.056551	0.819891	0.824101	2.204511	5

MODEL	Significant coefficients	Sigma ²	R ²	AIC	SC	DW	Rank
ARIMA (6,1,2)	2	0.132791	0.056292	0.820165	0.824376	2.199942	6
ARIMA (2,1,1)	2	0.132932	0.055292	0.821218	0.822676	1.988970	7
ARIMA (2,1,6)	2	0.133939	0.048135	0.828765	0.832976	2.184811	8
ARIMA (2,1,5)	2	0.133975	0.047877	0.829035	0.833246	2.190658	9
ARIMA (1,1,1)	2	0.134093	0.047037	0.829921	0.831378	1.939554	10
ARIMA (1,1,4)	2	0.139736	0.006934	0.871124	0.875335	2.033281	11
ARIMA (1,1,5)	2	0.139784	0.006598	0.871463	0.875674	2.033088	12
ARIMA (1,1,6)	2	0.139884	0.005883	0.872182	0.876393	2.032088	13
ARIMA (6,1,4)	2	0.140306	0.002883	0.875197	0.879407	2.147425	14
ARIMA (6,1,5)	2	0.140440	0.001935	0.876146	0.880357	2.148023	15
ARIMA (4,1,4)	0	0.140438	0.001944	0.876137	0.880347	2.145394	16
ARIMA (5,1,5)	0	0.140486	0.001607	0.876474	0.880685	2.147409	17
ARIMA (6,1,6)	0	0.140547	0.001172	0.876910	0.881121	2.145343	18

Note: Significant coefficients = p-value is less than 5%; Sigma²= volatility; R²=R-Squared; AIC= Akaike info criterion; SC= Schwarz criterion; DW= Durbin-Waston stat

Source: Authors' own research contribution

From the start, we notice that the best ARIMA model in estimating analysis of the daily natural gas prices time series is ARIMA (1,1,2). Compared to the rest of the identified models, the selected ARIMA (1,1,2) model has the most high level of the R-Squared (R²), which is approximately 6.5%. Also, this model has the lowest value of the predicted volatility (Sigma²), respectively 13.65%.

Moreover, the lowest values of robustness indicators (Schwarz Information Criteria and Akaike Information Criteria) confirm that the ARIMA (1,1,2) model is the most suitable and appropriate for measuring natural gas prices. Also, the value of the Durbin-Waston test is extremely close to the value 2.00, which concludes that the errors are not autocorrelated, successfully validating this assumption.

It was interesting that in the majority of tentative ARIMA models, at least two coefficients were statistically significant at the 5% level of p-value. This aspect was not encountered in the case of the following ARIMA models: ARIMA (4,1,4); ARIMA (5,1,5), and ARIMA (6,1,6) models. Also, these three models have the highest values of predicted volatility, as well as the lowest values of the R-Squared.

In a comparative approach, we can state that the first 10 tentative ARIMA models are extremely close according to the conditions that should be met, respectively the values of the Schwarz Information Criteria (the values are between 0.82 to 0.83), Akaike

Information Criteria (these values are between 0.81 to 0.82), R-Squared (these values vary between 4,7% to 5,8%, and predicted variance (the values between 13,10% to 13,45%). On the other hand, the econometric analysis continued by performing diagnostic tests for the ARIMA (1, 1, 2) model, in our case being the best autoregressive model.

The main results from the diagnostic and forecasting analysis of the daily natural gas prices

As we have seen previously, the ARIMA (1,1,2) model is the most suitable to estimate the natural gas prices time series in the mentioned period. But to confirm this aspect and see if our model captures all the necessary information regarding the behavior of the natural gas prices time series, we performed several diagnostic tests based on the visualization of the correlogram, the autocorrelation function (ACF), and the partial autocorrelation function (PACF).

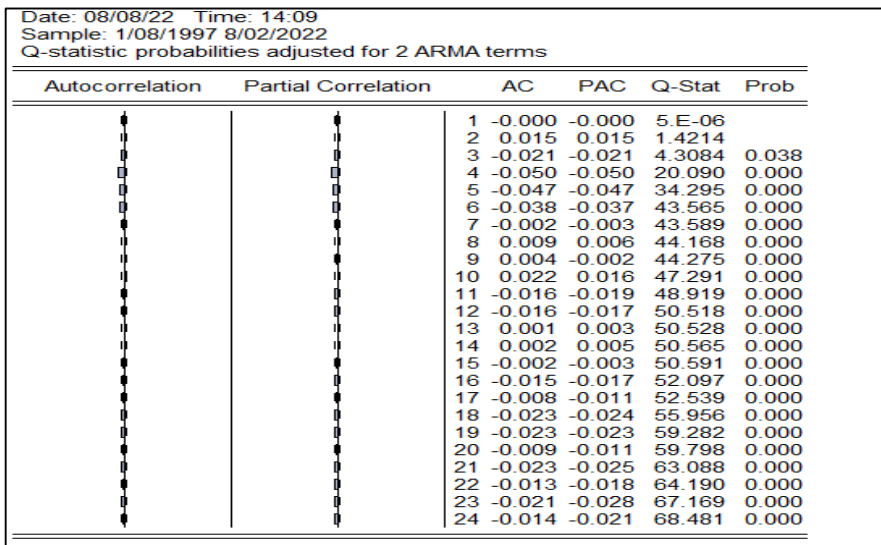


Figure 5. The correlogram of ARIMA (1,1,2) Model

Source: Authors' own research contribution

From Figure 5, it appears that this ARIMA (1,1,2) model does not capture all the desired information, the correlogram is not flat and, consequently, we have to find other new ARIMA models.

Therefore, we will re-estimate other ARIMA models to contain the significant lags: Lag 4, Lag 5, and respectively, Lag 6. These are the Adjusted ARIMA models and they are illustrated in Table 5 down below.

Tale 5. Ranking and selection the most appropriate Adjusted ARIMA Model

ADJ. ARIMA MODELS	Significant coefficients	Sigma ²	R ²	AIC	SC	DW	Rank
AR(1) MA(2) MA(4)	3	0.131193	0.067650	0.808371	0.813635	2.000983	1
AR(1) AR(4) MA(2)	3	0.131343	0.066582	0.809516	0.814779	2.004283	2
AR(1) MA(2) MA(5)	3	0.131349	0.066540	0.809561	0.814824	2.001003	3
AR(1) AR(5) MA(2)	3	0.131379	0.066328	0.809787	0.815051	2.003944	4
AR(1) AR(6) MA(2)	3	0.131439	0.065903	0.810242	0.815506	2.000703	5
AR(1) MA(2) MA(6)	3	0.131475	0.065647	0.810516	0.815780	2.000115	6
<i>ARIMA (1,1,2)</i>	2	0.131625	0.064581	0.811344	0.815555	1.999902	7

Note: Significant coefficients = p-value is less than 5%; Sigma²= volatility; R²=R-Squared; AIC= Akaike info criterion; SC= Schwarz criterion; DW= Durbin-Waston stat

Source: Authors' own research contribution

From the 6 adjusted ARIMA models, we will select the one that meets the conditions of robustness and accuracy, respectively: least number of parameters, significant autoregressive (AR) and moving average (MA) parameters/coefficients, the lowest predicted value of volatility (Sigma²), the highest R-Squared (R²), lowest Schwarz Information Criteria (SC), lowest Akaike Information Criteria (AIC), and also no heteroskedasticity and no autocorrelation in the residual or errors terms series.

Certainly, the AR (1) MA (2) MA (4) model represents the model that provides the better estimation, which captures any significant information about the natural gas prices time series.

Also, we can conclude that this adjusted ARIMA model and the correlogram of the residual is flat which indicates that all the information has been captured. The correlogram of AR (1) MA(2) MA(4) adjusted model is presented in Figure 6.

Date: 08/08/22 Time: 14:57
 Sample: 1/08/1997 8/02/2022
 Q-statistic probabilities adjusted for 3 ARMA terms

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	-0.001	-0.001	0.0021	
		2	0.001	0.001	0.0044	
		3	-0.021	-0.021	2.9397	
		4	0.004	0.004	3.0275	0.082
		5	-0.047	-0.047	17.400	0.000
		6	-0.023	-0.024	20.937	0.000
		7	-0.003	-0.003	21.015	0.000
		8	0.013	0.011	22.027	0.001
		9	0.002	0.001	22.043	0.001
		10	0.021	0.019	24.965	0.001
		11	-0.017	-0.019	26.890	0.001
		12	-0.017	-0.018	28.710	0.001
		13	0.000	0.002	28.711	0.001
		14	0.003	0.002	28.754	0.002
		15	-0.005	-0.003	28.887	0.004
		16	-0.016	-0.017	30.623	0.004
		17	-0.010	-0.012	31.248	0.005
		18	-0.024	-0.025	34.905	0.003
		19	-0.024	-0.024	38.637	0.001
		20	-0.010	-0.011	39.325	0.002
		21	-0.023	-0.025	42.808	0.001
		22	-0.015	-0.018	44.220	0.001
		23	-0.023	-0.028	47.730	0.000
		24	-0.015	-0.020	49.155	0.000

Figure 6. The correlogram of AR(1) MA(2) MA(4) Adjusted ARIMA Model

Source: Authors' own research contribution

Inverse Roots of AR/MA Polynomial(s)
 Specification: D_NATURAL_GAS_PRICES_C AR(1)
 MA(2) MA(4)
 Date: 08/13/22 Time: 15:56
 Sample: 1/08/1997 8/02/2022
 Included observations: 6430

AR Root(s)	Modulus	Cycle
-0.102317	0.102317	
No root lies outside the unit circle. ARMA model is stationary.		
MA Root(s)	Modulus	Cycle
-0.630206	0.630206	
0.630206	0.630206	
4.16e-17 ± 0.375309i	0.375309	4.000000
No root lies outside the unit circle. ARMA model is invertible.		

Figure 7. The stability of AR(1) MA(2) MA(4) Model Equation

Source: Authors' own research contribution

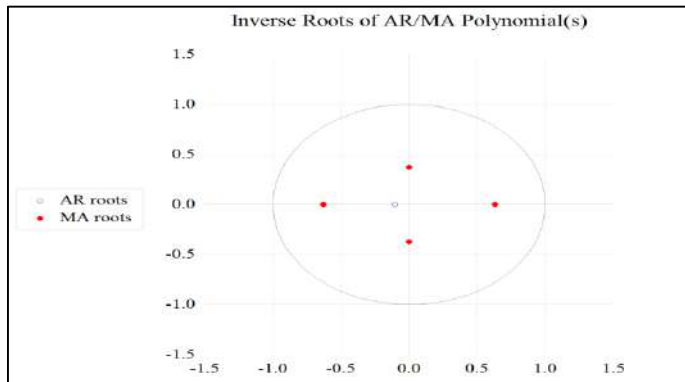


Figure 8. The representation of AR(1) MA(2) MA(4) equation stability

Source: Authors' own research contribution

Moreover, the forecast will be based on this adjusted ARIMA model. At the same time, according to the statistical results presented in Figure 7 and Figure 8, the modulus of the roots of the characteristic polynomial is less than 1, and therefore the equation of our selected adjusted ARIMA model is stable.

In our selected model, all the estimated coefficients are statistically significant at the 5% p-value, the predicted volatility is 13.11%, the R-Squared (6.75%) is the highest and the values, approximately equal to 2.00 of the Durbin- Waston Test confirmed the non-existence of the autocorrelation or serial correlations on the residual series.

A final aspect of our research consisted of performing the forecast analysis of the daily natural gas prices time series from 1997-2022. This step assumes the main essence of autoregressive integrated moving average models to provide a good prediction of future observations explained by past observations or historical data. In our case, the forecast was based on the AR(1) MA(2) MA(4) adjusted ARIMA model, and the results are presented in Figure 9.

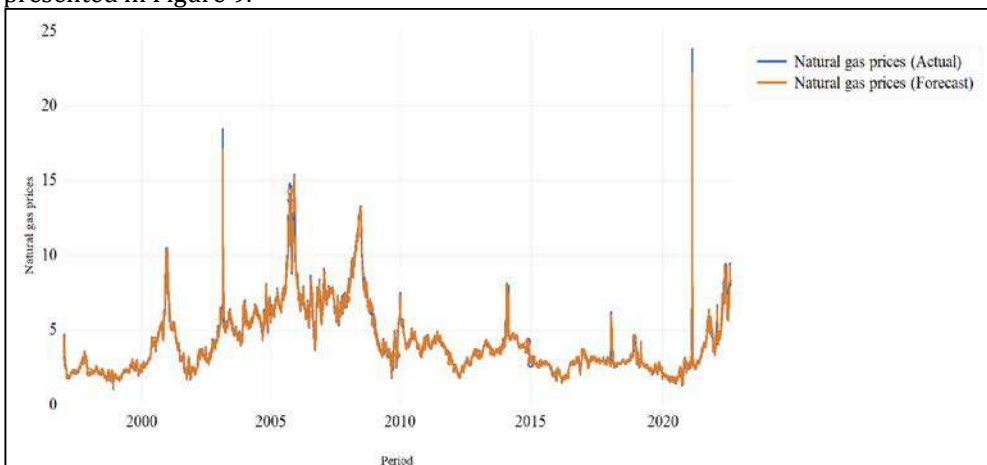


Figure 9. The forecast of natural gas prices in the period 1997-2022

Source: Authors' own research contribution

In general, we can state that this model provides a good prediction, and this model has the ability to capture any significant detail that influences the future value of natural gas prices. By visualizing Figure 9, we observe that the prediction from 2000 to 2018 is almost exact, but we notice a slight deviation in predicting the next period: 2019 to 2022. Overall, we can say that the forecast is good and appropriate (Bakar, Rosbi & Uzaki, 2018; Zhao et al., 2018).

At the same time, our model can capture the slight and predictable fluctuations in natural gas prices in the short and medium term. We must not omit the fact that there are other more advanced econometric methods, i.e. machine learning methods, and data mining techniques that are able to provide a more accurate forecasting analysis, especially in capturing the fluctuating movements in the long term of the time series.

Conclusions

The central aim of our study was to perform an estimation and forecasting analysis of the daily natural gas prices between 1997- 2022 by applying the ARIMA models.

In this sense, 18 ARIMA models were created in order to capture and determine the most statistically significant lags. In our case, these lags were: lag 1, lag 2, lag 4, lag 5, and lag 6. In the first phase/way, it was observed that the ARIMA (1,1,2) model is the most appropriate model regarding the fulfillment of robustness tests and diagnostics (i.e the significant number of coefficients, the highest value of the R-Squared, the lowest predicted volatility, and the lowest values of Akaike info criterion and Schwarz criterion). But, after performing other diagnostic tests of the selected ARIMA (1,1,2) model, we concluded that this model does not capture all the specific information from the lags, and consequently, the resulting correlogram was not flat and consistent.

Therefore, we resorted to the re-estimation analysis of another 6 Adjusted ARIMA Models, after which we could certainly say that the AR(1) MA(2) MA(4) Adjusted ARIMA Model is most appropriate in forecasting the daily natural gas prices time series. Moreover, this final model could ensure a good forecast, producing better results than over-parameterized models. Also, we confirm that the price of natural gas continues to be volatile and fluctuating in the near future, with the predicted volatility (Sigma^2) reaching the value of approx. 13%.

Our results are almost similar to the studies of Busse et al.(2012); Farrokhi and Hassanzadeh (2017); Mishra (2012); Zhao et al. (2018) or Mashadihasanli (2022).

Also, according to the latest information provided by the U.S. Energy Information Administration, the Henry Hub price is expected to average \$7.54/MMBtu in the second half of 2022 and then fall to an average of \$5.10/MMBtu in 2023 amid rising natural gas production.

Consequently, our study provides an up-to-date picture of natural gas prices, having an informative and decision-making role in the case of financial investors, energy and financial companies, or other participants in the global financial markets and international trade.

Moreover, our study shows that autoregressive integrated moving average models prove efficient in estimating and measuring the future price of natural gas based on historical data.

The study results can set an example for researchers and practitioners working in the financial, equity, and stock market and can guide economic decision units and investors in these financial and economic areas. In modern financial markets, traders and practitioners have had trouble predicting the stock market price index, in our case the historical natural gas prices.

We are aware that there are other innovative and advanced econometric methods and models to offer a more precise and consistent forecasting analysis, such as: machine learning (for example: Neural Artificial Models, data mining techniques, etc.)

Another limitation of our study derives from the fact that ARIMA models do not have the capacity to capture those sudden and sharp natural gas price movements (i.e. spikes or jumps), being especially suitable for short-term forecast analysis. In further research, we aim to solve this aspect by applying machine learning tools, as well more sophisticated methodologies may be employed.

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NATURAL RESOURCES AND NATIONAL SECURITY: A STRATEGIC PERSPECTIVE OF THE EU MEMBER STATES

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Abstract. *This article analyzes the natural resources from the perspective of the national security of the European Union member states. In general, the national security strategies of each country contain the objectives of protecting its national interests. At the same time, one of the objectives consists of the interdependent relationship between national security and other strategic areas that ensure the maintenance of strategic goods and services within normal parameters. In this context, natural resources are key and indispensable elements for economic and technological development, which must be protected and used sustainably. Several specialized studies present specific analyzes of natural resources from the perspective of environmental protection and combating climate change, and the shortage of natural resources, especially non-renewable resources, represents a top priority in the national security strategy of every country. The aim of this article is to present the approach to natural resources from the perspective of national security through an exploratory analysis of the security strategies of 15 member states and the influence of sustainable use of natural resources on environmental security. Thus, the phrase "natural resources" is mentioned 43 times demonstrating the national interest in natural resources and their protection against various threats. At the same time, the three types of natural resources: energy, water, and food are highlighted in a very high percentage as resources of strategic importance for the analyzed countries, and their security represents a basic element of national security. Moreover, the fierce competition for possessing or exploiting natural resources can turn into tense situations, retaliatory violence, or armed conflict. This article highlights a multidimensional relationship between natural resources and national security. Moreover, the results of certain studies in this respective field regarding the influence of natural resources on environmental security are confirmed.*

Keywords: *climate change; conflict; EU Member States; natural resources; national security strategies; sustainability.*

Introduction

Over the years, natural resources have been a topic of interest for state and non-state actors, generating crisis situations or conflicts at the local, state, regional, and global levels. Most of these resources are vital for the population, and the process of transforming natural resources into consumable or usable goods and services is ensured by economic, industrial, energy, transport infrastructures, etc. Some public and private infrastructures have been designated by several states as national critical infrastructures, according to a number of sectoral criteria established by normative acts.

A state's natural resources represent its economic stability and national security coordinates. Regarding economic stability, exploited resources can influence society's economic growth and well-being. Considering that resources can be exhausted, their rationing or limitation represents a factor of progress and their exploitation and processing should be more efficient by using appropriate and innovative technologies. At the same time, the scarcity of natural resources represents a major problem with a negative impact on the economy and society, and implicitly on national safety and security. From the national security perspective, natural resources support the defense industry and contribute to ensuring a state of normality, and therefore the hybrid threats targeting natural resources and critical infrastructures must be mitigated by the national security organizational structures.

In this article, natural resources are analyzed from the perspective of the national security of the member states of the European Union. Thus, for that purpose, this research is based on the analysis of the national security strategies of the EU member states, in accordance with the literature review.

Literature review

The functioning of society and the economy depends on natural resources. They represent the basis of most production processes and supply much energy for transport, light, and heat worldwide. (Andersen, Marin & Simensen, 2018). At the same time, society's resources depend on technological development. Along with technological innovation comes the possibility of exploiting new resources, which reinforces the idea that the stock of natural resources may be limited at certain times. The exploitation of natural resources represents, on the one hand, a problem of social choice based on a specific analysis of social benefits and costs. On the other hand a problem of political deliberation (Pichler et al., 2017). The more today's society exploits natural resources, the more political decision-makers must not ignore the distant future, which may come with much higher costs as a result of long-term effects on the physical environment (Lampert, 2019).

In the literature, the shortage of natural resources is analyzed from several perspectives, which interfere with each other and provide an interdisciplinary framework: environmental management and climate change, economy and social welfare, sustainable development, digitalization, and, last but not least, national security. Drăcea et al. (2020) emphasize that environmental specialists have been trying for years to find sustainable methods of natural resource conservation to ensure environmental protection and generate income. Most countries have integrated climate change measures into national policies, strategies, and planning. The study by Oláh et al. (2020), shows that sustainability is very important for economic growth in the context of the shortage of natural resources. Thus, the conservation and protection of natural resources is a sustainable solution for the economy, and the possibility for natural resources to regenerate and be used responsibly in the production process is an ideal situation. Several studies highlight the effects of digitalization on natural resources (Mai et al., 2022; Barteková & Börkey, 2022; Santarius et al., 2020). These studies show the beneficial effects of information and communications technology (ICT), modern equipment, and artificial intelligence-based technologies on economic growth, energy reduction, and environmental impact reduction in sustainable development. At the same time, Eerola et al. (2021) point out that digitalization requires an infrastructure that

supports the hardware and software needed to store a high volume of information, which leads to increased requests for raw materials. In this context, mineral resources have become a crucial issue for sustainable development. At the same time, from an economic perspective, there is a direct relationship between digitalization and sustainability by the fact that "digitalization influences sustainability practices, and the factors that lead to the adoption of sustainability, internal and external, influence the digital transformation of companies" (Pânzaru et al., 2022, p. 38).

In recent years, individuals pay greater attention to the over-exploitation of natural resources and environmental protection. Kang et al. (2022) consider natural resources to be essential for human long-term survival and development. The lack or deficit of natural resources determines the states to solve these problems through sustainable development methods and resource security which occupies an important position in national security. In the future, people will face several ecological crises, including crises specific to sustainable development. So, in this context effective coordination between natural resource security, environmental stability, and sustainable development is necessary. Constantinescu (2015) states that a country's dependence on exploiting its own natural resources does not affect security, but national security may become vulnerable in the longer term. The depletion of non-renewable resources without a sustainable alternative can seriously affect a country's economic and social development. Thus, the competition over natural resource access, especially mineral ones, represents an economic and security problem for developed states and a factor of instability for resource-exporting countries. One of the concerns of many countries worldwide is ensuring energy independence. Dźwigoł et al. (2019) state that energy independence has become a component of energy security playing a key role in national security. The authors highlight the interdependence between energy, economic development, and national security. This approach is also found in Mara et al., (2022). Moreover, these authors argue that energy security should not cause deep tensions between countries.

Natural resources can be an important source of funding for conflicting parties. With this support, the duration of a conflict can be prolonged, infrastructure for global supply chains can be affected, and the environment can suffer significant damage. The European Union's approach to conflict prevention and crisis management is deployed in a full range of policy tools to reduce trade in natural resources necessary for conflicting parties (Vlaskamp, 2019). One of the restrictive policies is based on the application of economic sanctions. The best example is the application of several progressive EU economic sanctions against Russia in response to Russia's invasion of Ukraine on February 24, 2022 and subsequent military actions on Ukrainian territory. Even from the first months of the conflict, a strong response was given to Russia's aggression through economic pressures. Once the conflict continued, the United States was the first to impose economic sanctions that banned the import of oil, liquefied gas, and coal. At first, the European Union was reluctant to such measures due to the dependence of certain European states on Russian supplies, but after the atrocities progressed, it imposed economic sanctions (Chachko & Heath, 2022). According to the Council of the EU (2022), economic sanctions were taken by the EU on Russia on finance, energy, technology, dual-use goods, industry, transport, and luxury goods. Moreover, these sanctions have been extended from July 26, 2022 to January 31, 2023.

Research methodology

In this study, it is carried out an exploratory quantitative analysis of the national security strategies of certain EU member states regarding the approach to the concept of natural resources. This study highlights the strategic relationship between natural resources and national security, starting from two hypotheses based on the literature. The first hypothesis (H_1) refers to the approach to natural resources from the perspective of interests, values, and national security objectives: the phrase natural resources is specified in the content of security strategies. The second hypothesis (H_2) refers to current security issues in the context of climate change: the shortage of natural resources and limited access to them with a strong impact on the security environment.

The strategic documents in this research are the official documents of the EU member states (Table 1), represented by the National Security Strategy (NSS), the National Security Concept (NSC), the National Defense Strategy (NDS), the National Security and Defense Strategy (NDSS), Foreign and Security Policy (FSP), National Defense Strategic Concept (NDSC) and White Paper (WP). Moreover, each country approaches the national security strategy differently and these legal provides a conceptual basis for the policies, principles, directions of action, and mechanisms necessary to ensure security (Lipinsky et al., 2019).

Table 1. National security strategies validated for study by the author

Country	Year	Type	Issuer	National	English
Austria	2013	NSS	Ministry of the Interior	-	<input type="checkbox"/>
Bulgaria	2018	NSS	Government	<input type="checkbox"/>	-
Croatia	2017	NSS	Ministry of Defence	-	<input type="checkbox"/>
					<input type="checkbox"/>
Czech R.	2015	NSS	Ministry of Foreign Affairs	-	<input type="checkbox"/>
					<input type="checkbox"/>
Denmark	2022	FSPS	Ministry of Foreign Affairs	-	<input type="checkbox"/>
					<input type="checkbox"/>
Finland	2017	NSS	Government	-	<input type="checkbox"/>
					<input type="checkbox"/>

France	2017	NDSS	Ministry of Defence	-	<input type="checkbox"/>
					<input type="checkbox"/>
Germany	2016	WP	Government	-	<input type="checkbox"/>
					<input type="checkbox"/>
Hungary	2020	NSS	Government	-	<input type="checkbox"/>
					<input type="checkbox"/>
Italy	2015	WP	Ministry of Defence	-	<input type="checkbox"/>
					<input type="checkbox"/>
Lithuania	2021	NSC	Ministry of Defence	-	<input type="checkbox"/>
					<input type="checkbox"/>
Portugal	2013	NDSC	Government	-	<input type="checkbox"/>
					<input type="checkbox"/>
Romania	2020	NDS	Presidential Administration	-	<input type="checkbox"/>
					<input type="checkbox"/>
Slovakia	2021	NDS	Ministry of Defence	-	<input type="checkbox"/>
					<input type="checkbox"/>
Slovenia	2020	NSS	Ministry of Defence	-	<input type="checkbox"/>
					<input type="checkbox"/>

Therefore, the first step of this methodology consists in excluding states that have not developed or present public official documents, because it might impose research limitations. This way, 4 countries are not the subject of this study: Cyprus, Greece, Ireland, and Malta. Furthermore, the official documents of the 23 member states, except Bulgaria's national strategy, were found in English on the websites of the institutions in charge by using the Google search engine. However, this was not an impediment and represented the second step of this study. The third step consists of searching and finding the phrase natural resources in the national strategies of 15 member states, representing the documents validated for this research. Accordingly, Belgium, Estonia, Latvia, Luxembourg, the Netherlands, Poland, Spain, and Sweden that do not mention the phrase natural resources in the documents are excluded from this study, even if there are some general references regarding natural resources or certain types of natural resources.

Research results

The national security strategies of the EU member states highlight the importance of natural resources and the national interests regarding their possession, exploitation, management, and security. In the content of the analyzed documents of all 15 national strategies, the phrase natural resources are mentioned 43 times. Figure no.1 shows the number of mentions of the phrase natural resources corresponding to each member state. Next, the main aspects associated with natural resources, resulting from the research, are presented for each member state.

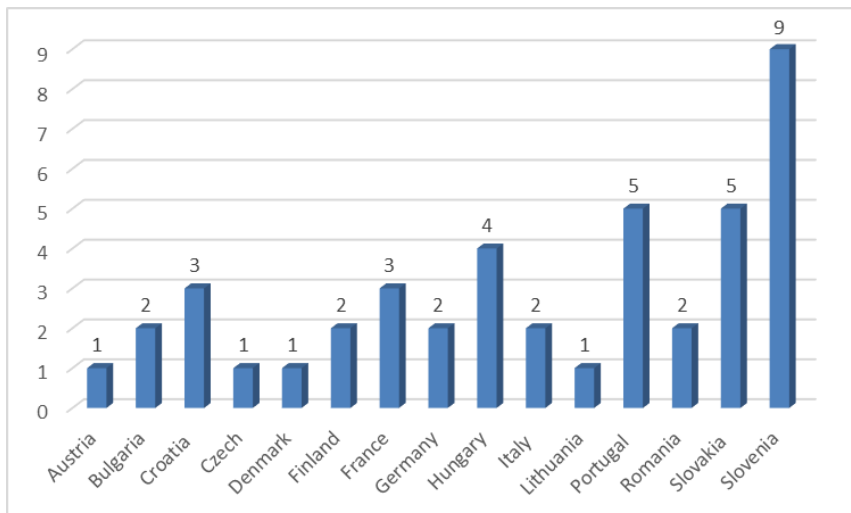


Figure 1. The number of occurrences of the terms "natural resources" (data processed by the authors)

Thus, the phrase natural resources is mentioned 9 times in Slovenia's national security strategy. One of Slovenia's strategic interests is conserving the environment and natural resources. Therefore, limited natural resources are considered risks and threats in the international security environment. The protection of natural resources and the environment is ensured by European frameworks for policy and national strategies on the environment and sustainable development. Restricted access to natural resources,

especially energy, and water, as an indirect consequence of climate change, leads to political, social, and economic instability. Moreover, competition for water resources or scarcity causes conflict situations or armed conflict. After Slovenia, the phrase natural resources is mentioned 5 times in Portugal's national security strategy. The Strategic Concept of National Defense is heavily debated on natural resources. Thus, the dispute over exploiting and controlling limited natural resources (hydrocarbons, water, and mineral resources) can generate violent competition, and natural resource scarcity (water and energy) can generate armed conflict. In addition, the document emphasizes the role of human resources in Portugal's economic and social development, which requires a simultaneous improvement of human and natural resources. There are 5 mentions of natural resources in Slovakia's national security strategy. The problems with natural resources are analyzed from two perspectives. The first highlights the influence of natural resource consumption on climate change and the environment, which can generate conflict and forced migration. The second perspective presents the influence of economic growth on natural resources and the transition to a circular and sustainable economy, through creating and protecting specific stocks of strategic raw materials. In Hungary's national security strategy, the phrase natural resources are mentioned 4 times. The introduction presents that the evolution of climate and demographic changes in accordance with the depletion of natural resources and illegal migration represent global challenges. Within the framework of the strategy, Hungary recognizes that its natural resources are limited, and the lack of vital resources can generate interstate and intrastate conflicts. Therefore, protecting natural resources, especially water reserves, drinking water supply, and arable land, are key elements of national security. In Croatia's national security strategy, where there are 3 mentions of the phrase natural resources, there are presented on the one hand, the necessity of protection natural resources against natural or man-made disasters, and on the other hand, the conservation of natural resources and protection of the environment for a very long time in various areas of the country, as well as the achievement of a sustainable economy that is necessary to safeguard the prosperity and well-being of individuals. There are also 3 mentions of the phrase natural resources in France's national security strategy. The national security and defense strategy presents a series of national security challenges upon the territorial integrity, some of them coming from Overseas territories, where monitoring, supervision and intervention by certain public administrations and military structures are required to counter the looting of natural resources, drug trafficking, illegal migration and uncontrolled urbanization. There are 2 mentions associated with the phrase natural resources in the national security strategies of Bulgaria, Finland, Germany, Italy and Romania. Thus, in its national security strategy, Bulgaria frames the rational use of natural resources as an important objective of national interest. Also, natural resources are listed as one of the factors that create tensions and generate conflicts. Finland deals with the topic of natural resources from the perspective of environmental protection and climate change, mentioning in the document two national agencies responsible with the preservation of the environment and natural resources: The Finnish Environment Institute and The Natural Resources Institute Finland. Furthermore, Germany, in the White Paper, estimates an exacerbation of hostilities affecting the international security, due to the depletion of natural resources and accelerated population growth. In addition, climate change in combination with these two factors affects water access to people and amplifies the deficit of basic resources, emerging into real threats for states. Similarly, Italy in the White Paper highlights the fact that the scarcity of natural resources can lead to tensions and armed conflicts. Also, in the content of this document it is mentioned the necessity

of trade in primary natural resources necessary for the economic development of the countries. In the same vein, Romania emphasizes that the intense and unsustainable exploitation of natural resources, followed by the slow restoration of certain renewable resources, can even lead to military conflicts. Also, the correct and responsible exploitation of natural resources represents a direction of action related to the environmental security. In the national security strategies of Austria, Denmark, the Czech Republic and Lithuania there is only one mention of the phrase natural resources. In Austria's national security strategy, more specifically in the chapter on security values, interests and objectives, it is mentioned that all citizens must benefit from equal opportunities and support the sustainable conservation of natural resources. Incidentally, among the challenges, risks and threats to Austria's and the EU's security are generated by the lack of resources (energy, water, food). In contrast, Denmark, in the context of climate change, makes huge efforts for the conservations of the limited natural resources in order to avoid the tensions that might emerge in the environmental security and gets involved, alongside the EU, in strengthening resilience and security of the supply of natural resources and limited raw materials in situations where global competition increases. The Czech Republic highlights the competition for access to energy sources and raw materials due to the increased dependence on available natural resources and underlines the importance of protecting critical infrastructures, especially those intended for the transport of strategic raw materials. Lithuania's strategy specifies several stand-alone goals to be pursued to strengthen the resilience of the society and states. Therefore, one of these objectives consists in the application of projects on climate change adaptation for the management of crises and emergency situations caused by migration and conflicts over natural resources.

Research hypothesis H_1 is confirmed by the number of 43 mentions of the phrase natural resources in the 15 analyzed national security strategies out of 23, which represents more than 65% and is reinforced by the main types of natural resources identified in the analyzed documents: energy resources, water, and food. Figure 2 shows the percentage of their posting in the strategy plans, namely 100% for energy resources (15 strategy plans), 87% for water (13 strategy plans), and 73% for food (11 strategy plans). Moreover, natural resources and the three types stated previously are categorized in several security strategy plans as strategic resources (Czech Republic, Denmark, Hungary, Slovakia, Slovenia), vital resources (Austria, Bulgaria, Finland, Italy, Romania), rare resources (Portugal) or basic resources (Germany). Therefore, these results confirm the study of Schellens & Gisladottir (2018) that natural resources are strategic resources from the perspective of national defense.

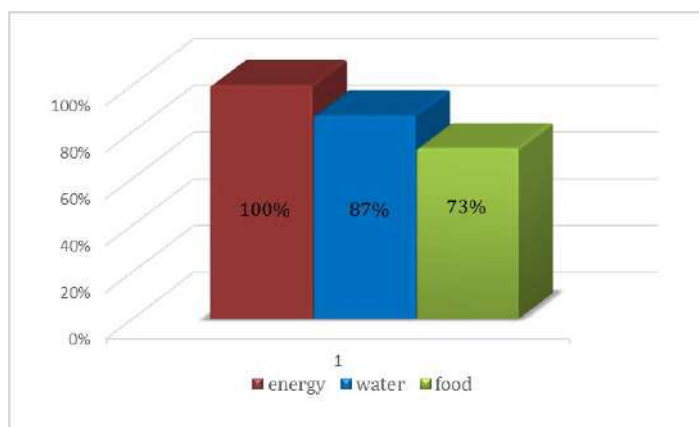


Figure 2. The main types of natural resources identified (data processed by the authors)

Next, the shortage of natural resources is mentioned directly in two-thirds of the national security strategies of the analyzed countries (Table 2). Indirectly, other countries, such as Croatia and the Czech Republic, emphasize that the dependence on certain natural resources can represent a threat to environmental security, France presents the looting of natural resources as a major problem for the national territory and for the entire European Union, Finland encourages the use of renewable natural resources and Lithuania focuses on crisis management in case of conflicts over natural resources. Also, in this table are illustrated the most used key terms in the context of natural resources. At the same time, most countries approach the limited natural resources and the three specified types (energy, water, food) in association with the climate change. Overall, climate change affects social well-being, population health, and critical infrastructures. As a result, restricted access to these resources represents real threats from the perspective of national security strategies (Austria, Czech Republic, Germany) and can generate global and strategic competitions (Denmark, France), international tensions (Bulgaria), conflicts (Lithuania, Hungary, Slovakia), or armed conflicts (Italy, Portugal, Romania). The depletion of the world's natural resources is an issue of global concern and is not limited only to the EU member states. This situation refers to trade in and transports of natural resources, foreign investments, suppliers, transit countries, financial resources, etc. Also, the dependence on a single supplier or exporting country of natural resources can bring significant revenues to support defense spending or even pre-conflict spending, as confirmed by Russia's invasion of Ukraine.

Table 2. The key terms from strategies that appear in the context of natural resources

Country	Energy	Water	Food	Scarcity	Climate change	Conflict
Austria	☐	☐	☐	☐	☐	-
Bulgaria	☐	☐	-	☐	☐	☐

Country	Energy	Water	Food	Scarcity	Climate change	Conflict
Croatia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		-
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Czech R.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		<input type="checkbox"/>
					-	
					<input type="checkbox"/>	
Denmark	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Finland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		-
					<input type="checkbox"/>	
					<input type="checkbox"/>	
France	<input type="checkbox"/>	-	-	-		<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Germany	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>		<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Hungary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Italy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Lithuania	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-		<input type="checkbox"/>
					<input type="checkbox"/>	

Country	Energy	Water	Food	Scarcity	Climate change	Conflict
					<input type="checkbox"/>	
Portugal	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Romania	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Slovakia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	
Slovenia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	
					<input type="checkbox"/>	

The results that were presented previously also confirm the second research hypothesis. Almost all the analyzed states have taken into account that the scarcity of the world's natural resources and climate change is an issue of global concern that can generate global and strategic competition, leading to crises, rivalries between countries, and various conflicts that threaten to undermine international peace and security.

Conclusions

Natural resources continue to be a subject of great interest, from the individual level to the global level. The population, communities of people, and states benefits engage a complex and dynamic system that requires efficient exploitation technologies, investments, critical infrastructures, and, last but not least, specialists in the field. Following the literature review, the research's main limitation was the lack of a solid and comprehensive base of articles specific to natural resources from the perspective of national security strategies. Therefore, this limitation of contribution to the further development of this approach. The analysis of the 15 national security strategies confirms the elements highlighted in the literature review and highlights their position in relation to economic growth, sustainable development, climate change, new technologies, and national security. Also, in most strategies analyzed, natural resources are considered strategic and human, technological, and financial resources. In this study, along with the analysis of the phrase natural resources in the context of national security strategies, the most relevant types of natural resources were analyzed: energy, water, and food. In this context, countries have taken different views as regards the prioritization of one of the three types of natural resources, but overall, energy security, food security, and protection of water resources are important components for national

security. This aspect confirms the study of Mara et al. (2022) in which it is mentioned that the national security strategies and existing national security indices do not prioritize energy security. At the same time, analyzing the scarcity of natural resources is a problem presented in most national security strategies, in accordance with climate change and with possible retaliatory violence or armed conflicts. This paper also validates the existing situation regarding the EU's dependence on natural resources in other countries and confirms recent studies (Baqae et al., 2022; Di Bella et al., 2022) showing dependence on Russia for oil and natural gas, varying from country to country. Future studies have the possibility to analyze, on the one hand, the strategies of other countries outside the EU and on the other hand to carry out more comparative studies. Thus, there is the opportunity to continue the approach by analyzing the effects of Ukraine's conflict on the member states' natural resources.

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THE ROMANIAN ENTREPRENEURIAL ECOSYSTEM AND REGIONAL DEVELOPMENT. A CASE STUDY OF THE NORTHEAST REGION

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Abstract. *Generating wealth through the trailing of specific opportunities is the essence of entrepreneurship. Understanding the entrepreneurial ecosystem provides insights into the interconnections between many variables and how their synergy operates in order to boost economic growth on a continent, in a country, or on a regional scale. The foundation of entrepreneurship involves years of academic research in various scientific fields, such as politics, sociology, psychology, and public administration. At the current stage of global entrepreneurship research, the extensive literature on entrepreneurship is divided into eight pillars, which offer a detailed framework for how the economy functions: accessible markets; human capital; financing; support systems; regulatory framework and infrastructure; education and training; universities as catalysts and cultural support. Given those ecosystems like Silicon Valley experience elevated levels of well-being as a result of the practical application of the pillars that support entrepreneurship, and ecosystems like Romania experience low levels of entrepreneurship and a low well-being index as a result of ineffective pillar implementation, we acknowledge the significance of entrepreneurship for society because it is a primary driver in both economic development and growth. Our research aimed to quantify the pillars of Romania's entrepreneurial environment. We used a personalized questionnaire as the methodology, allowing us to conduct a demographic analysis of the respondents and a theoretical triangulation-based content analysis approach for the cities' ranking. Following the application of the questionnaire among the ninety-two respondents, five out of eight hypotheses have been validated, the context in which the findings indicate that the pillars are the core of a sustainable entrepreneurial ecosystem and few cities are major drivers in the expansion of the entrepreneurial ecosphere. Our research illustrates the assertion that an all-encompassing strategy for encouraging entrepreneurship is based on the interconnectedness of the entrepreneurial pillars, hence enhancing economic growth.*

Keywords: *economy; entrepreneurship; entrepreneurial ecosystem pillars; development; growth.*

Introduction

Most economic, psychological, and sociological research indicates that entrepreneurship is a dynamic rather than a static phenomenon. The link between entrepreneurship and economic development is highlighted when entrepreneurs act on profit opportunities and make the economy more productive in the process. At the regional level, studying the relationship between the structural characteristics of regions and growth is not considered entrepreneurial research until the quantity and/or quality of new economic activity in regions is introduced as a mechanism for such a relationship (Kano et al., 2020).

Despite being in a permanent state of adaptation and transition, the Romanian SME sector has made a sizable quantitative and qualitative national leap. The growth of the SME sector is influenced by a variety of local characteristics, which identify and emphasize its significance and serve as a foundation for the creation of development strategies or programs. With the exception of the Bucharest-Ilfov region, which lags behind the other regions, particularly in terms of performance, regional differences in the development of the SME sector are generally marginal.

Theoretical consideration

Perception of entrepreneurs

The following points are some pertinent findings on how entrepreneurs perceive the current business environment that are drawn from the classification of economic units by development regions:

1. Businesses in the South West have the highest proportions of organizations that believe the economic environment is/will be neutral to doing business, and the lowest proportions of respondents believe the environment will be beneficial to business in both 2020 and 2021;
2. Enterprises, where the environment was found to be/will be a hindrance to business development, are more common in the South-East in the current situation (70.25%), the North-West in terms of developments in 2020 (53.97%), and the Northeast in terms of 2021 (28.15%);
3. The Bucharest-Ilfov region has more SMEs, with favorable ratings across all time periods researched.

Business opportunities

When the intensity of business opportunity manifestation is considered, the distribution of firms by development region draws attention to the subsequent aspects:

1. Enterprises in the Center region reported using new technology, incorporating new commodities, and expanding into new markets at higher rates;
2. The Northeast region's economic units showed bigger shares of the domestic demand growth and the digital transformation (82.27% and 47.52%, respectively);
3. Western enterprises confronted a smaller percentage of domestic demand expansion, modern technology usage, organizational digitalization, and export growth;
4. Business partnerships are more prevalent in the Bucharest-Ilfov region (60.26%) than in the Northeast (37.59%).

Difficulties in the SME activity

The study sample of company owners mentioned challenges including uncertainty about future developments, declining domestic demand, temporary business stoppage owing to the Covid-19 outbreak, red tape, taxes, or increased wage expenses. Since these difficulties are analyzed at the regional level, it is clear that:

1. A greater proportion of respondents who operated for Western region enterprises indicated uncertainty about future developments (78.72%), excessive taxes (57.45%), unstable national currencies (44.68%), competition from imported products (38.30%), and raw material/product supply (38.30%);
2. The Covid-19 pandemic temporarily suspended entrepreneurial activities (69.64%), wage bill levels increased (53.57%), delays in collecting invoices from private operators (46.43%), corruption (41.07%), poor infrastructure quality (39.29%), decreased export demand (33.93%), getting necessary advice (35.71%), and non-payment of invoices by state entities (35.71%), were all allegations made more widely by entrepreneurs in the Central region;
3. Enterprises in the Northeast exhibit significant issues brought on by diminishing domestic demand (68.09%), excessive bureaucracy (56.03%), and 43.26% of excessive controls;
4. According to economic actors, the South-West has the lowest proportions of enterprises that emphasize staff training and retention (26.42%), increasing income expenses (24.53%), and availability to consultancy services (15.09%);
5. Companies in the South area report a smaller percentage of decision-makers who identified shortages in the supply of raw materials/products (14.29%), while Bucharest-Ilfov region businesses reported the lowest key challenges encountered by SMEs.

Pillars of the entrepreneurial ecosystem in Romania. Research objectives

Entrepreneurship is shaped by a distinct set of factors known as pillars, the interaction of which results in entrepreneurial dynamics and economic growth (Martin & Romero, 2019). The state of these pillars has a direct impact on the existence of entrepreneurial opportunities, entrepreneurial capacity, and entrepreneurial preferences, all of which determine a healthy entrepreneurial ecosystem, as follows:

1. Accessible markets – market entry regulation, market dynamics, and openness, access to internal and external customers.
2. Human capital / workforce pillar – managerial and technical skills, entrepreneurial experience in the company, availability of outsourcing.
3. The financing pillar – access to loans, private capital, business angels, and support from friends or family.
4. Support systems/mentors – mentors/advisors, professional services, incubators, accelerators, and network of entrepreneurs.
5. Government and regulatory framework – ease of starting a business, tax incentives, business-friendly legislation/policies, and access to basic infrastructure.
6. Education and training – available workforce with pre-university/university education, training specific to the entrepreneurial environment.
7. Universities with a catalytic role – promoting a culture of respect for entrepreneurship, role in identifying ideas for new companies, providing graduates for the entrepreneurial environment.

8. Cultural support – risk and failure tolerance, preference for independent work, success stories/role models, research culture, a positive image of entrepreneurship, and promotion of innovation.

In order to further understand disparities in entrepreneurship development and the entrepreneurial pillars that support the entrepreneurial ecosystem in each region, the research attempts to identify the regional poles of entrepreneurial development in Romania. The objectives derived from the central goal are as follows:

1. Illustrating how entrepreneurship affects the growth of the country's economy;
2. Identifying the variables influencing entrepreneurship at the regional level and assessing the variances in entrepreneurship levels between regions;
3. Suggesting policy changes that could magnify variations in entrepreneurial development among the eight development areas.

As a strategy for conducting the case study, we selected data analysis using tabular computations. Using data provided by research organizations, we generated tables from which we identified regions with particular indicators and categorized them according to their respective development region. There are two stages to the regional analysis for 2021. The first step consists of an analysis based on information from Forbes magazine edition no. 227, published in May 2021. This study helped us categorize the regions and identify the Romanian business district that is most favored by investors. The distribution of a questionnaire to business owners in Romania's Northeast region follows this classification, with the aim of evaluating the entrepreneurial ecosystem by identifying the pillars that support the local entrepreneurial environment and those that are challenging to access or implement. This survey is the outcome of pilot testing for broader research that attempts to demonstrate that entrepreneurship is a successful model for economic growth.

Data and methodology

Entrepreneurial activity is shaped by a distinct set of factors defined as the pillars of the entrepreneurial ecosystem. The state of these pillars directly impacts the existence of entrepreneurial opportunities, entrepreneurial capacity, and entrepreneurial interests, which in turn affect the business dynamics.

Regional entrepreneurship policies are currently transitioning from increasing the quantity of entrepreneurship to increasing the quality of entrepreneurship (Prelipean et al., 2021). The transition from entrepreneurship policy to policy for an entrepreneurial economy will be the next step. The entrepreneurial ecosystem approach is a new framework that accommodates these transitions; it initiates with the entrepreneurial actor but concentrates on the context of productive entrepreneurship. Entrepreneurship is not plainly an outcome of the system; entrepreneurs play a significant role in shaping and maintaining the ecosystem.

The 18th edition of the White Book of SMEs in Romania, which comprises the yearly research report of the Romanian entrepreneurial ecosystem, was the resource I selected for evaluation in order to write this article. A number of 826 SMEs from the eight development regions were interviewed in the first half of 2020 to describe the national economic-social condition, which had been affected by the Covid-19 epidemic. The following indications can be used to determine the size and structure of the sample considered representative for the study objective:

1. Companies that were established within the last five years have the highest percentage (59.08%), followed by businesses older than 15 years (21.07%), businesses between five and ten years old (10.41%), and businesses between ten and fifteen years old (9.44%).
2. Developing regions: Bucharest-Ilfov (18.89%), South East (19.61%), North East (17.07%), North West (15.38%), South (10.17%), Center (6.78%), and South West (6.42%).
3. Company size: Of the total investigated, micro-enterprises accounted for 76.88%, small businesses for 15.62%, and medium-sized businesses for 7.51%.
4. Branches of activity: construction (4.24%), trade (7.14%), industry (59.32%), and transportation (1.94%).

Purpose and structure of the questionnaire

The major attribute is its potential to provide information for a reliable comparison of regions while also identifying pillars that support an adequate level of entrepreneurship. The most straightforward and efficient way to collect the data required to demonstrate the hypotheses and achieve the objectives was to apply the standardized questionnaire to entrepreneurs in the specified area. Furthermore, it encouraged the collection of quantitative data on the eight entrepreneurial pillars, opportunities, and regional entrepreneurial capacity. The results of the questionnaire enabled us to compare the results with the outcomes of the analysis, which increased the study's degree of accuracy.

At the same time, it provides the opportunity to gather information on the traits of the regional entrepreneurial ecosystem and the aspirations and attitudes of entrepreneurs, allowing the study to respond to the environmental factors at the national and regional levels at both the framework and individual levels.

Survey results in the Northeast region

Prior to the questions specific to each pillar, the questionnaire includes a section that seeks background information, items tracking demographic data, and details on the nature of professional training. Since 92 of the 145 responders are from the Northeast region, we took the decision to conduct our pilot analysis locally.

Following the application of the questionnaire among the entrepreneurial respondents, we found that the median age of female entrepreneurs is 36.61 years, compared to the median age of male entrepreneurs, which is 39.24 years. We also found out that the average number of years in business is 4.96 years for women and 9.81 years for men.

Regarding education, 46% of respondents have a university degree, 51% have a postgraduate degree, and only 3% have a high school diploma. Services comprise the majority of the activity field (49%), followed by 17% of other fields, 13% of trade, 8% of transport, 7% of construction, 5% of manufacturing, and 1% of health.

Using the percentage findings of the survey on the pillar analysis, as shown in the interpretation of the table beneath, we validated and disproved the proposed hypotheses, the results indicating that the pillars act as the core of a strong entrepreneurship ecosystem.

**Table 1. Confirmation of research hypotheses
(Own processing based on the results of the questionnaire)**

Pillar	Hypothesis	True	False	DK	Not applicable	Result
Accessible markets pillar	The greater the access to affordable markets, the higher the access to entrepreneurial activity.	51%	30%	15%	4%	Confirmed
Human capital/ labor pillar	The greater the access to human capital, the higher the access to entrepreneurial activity.	39%	47%	12%	2%	Refuted
Financing pillar	The greater the access to finance, the higher the access to entrepreneurial activity.	39%	41%	17%	3%	Refuted
Support systems/ mentors pillar	The greater the access to support systems, the higher the access to entrepreneurial activity.	46%	39%	12%	3%	Confirmed
Government and regulatory framework pillar	The greater the access to government and regulatory framework, the higher the access to entrepreneurial activity.	24%	60%	14%	2%	Refuted
Education and training pillar	The greater the access to education and training, the higher the access to entrepreneurial activity.	57%	29%	8%	6%	Confirmed
Universities as catalyst pillar	The greater the access to catalytic universities, the higher the access to entrepreneurial activity.	46%	32%	16%	6%	Confirmed
Cultural support pillar	The greater the access to cultural support, the higher the access to entrepreneurial activity.	50%	33%	15%	2%	Confirmed

Top Best Business Areas

The most significant macroeconomic and socioeconomic variables were used to establish the top-ranking business regions. Factors including GDP, average net salary, unemployment rate, number of active enterprises, turnover, and average net profit were all properly considered. Each indication was associated to the county's population size, and certain advantages were given to regions with one or more airports nearby as well as those with several smart-city initiatives under progress. The National Institute of Statistics, the National Strategy and Forecasting Commission, the National Trade Registry Office, the Ministry of Public Finance, and the website www.confidas.ro are the sources for the statistical information.

Beyond the evolutions or involutions at the top, the ranking's objective remains the same: to highlight economic disparities between Romania's metropolitan areas, the benefits they provide to prospective investors, and ultimately, to uncover the potential of each region. According to the indicators analyzed, the top cities are listed in the table below, with blue denoting the city with the highest indicator level and red suggesting the city with the lowest indicator level:

*Table 2. Top of the best business areas in Romania
(Source: Forbes Romania, no. 227, May 2021, pages 70 - 87, own processing)*

Rank	City	Region	GDP (billion RON)	FDI/1000 capita (thousand euro)	Average net monthly wage 2020 (RON)	Unemployment at the end of 2020 (%)	Turnover (billion RON)	Net profit (billion RON)	Smart projects
1	Bucharest	B. - Ilfov	251,9	11.893,5	4.289	1,3	602,69	49,23	34
2	Cluj - Napoca	N - W	54,2	1.084,6	3.728	1,7	69,44	6,55	54
3	Timisoara	W	47,1	2.248,8	3.490	1,3	78,34	5,76	26
4	Alba - Iulia	Center	18	1.598,5	3.180	3,8	27,89	1,77	106
5	Arad	W	21,8	1.062,7	2.725	2,3	32,33	2,06	19
6	Sibiu	Center	23,5	1.357,1	3.169	2,8	40,22	3,85	16
7	Brasov	Center	35,8	2.077,8	3.059	2,7	54,71	3,73	29
8	Constanta	S - E	41,9	1.245,8	2.812	3,0	55,38	4,69	11
9	Oradea	N - W	23,5	2.258,1	2.542	2,3	37,65	3,3	17
10	Resita	W	10,7	388,5	2.622	3,5	6,74	0,54	6
11	Hunedoara	W	16,2	537,0	2.546	3,4	13,59	1,05	20
12	Arges	S	27,5	1.262,5	3.103	3,8	69,64	3,82	5
13	Iasi	N - E	35,1	472,8	3.374	3,2	31,75	3,29	19
14	Gorj	S - W	16,5	31,6	2.794	4,0	9,08	0,62	0
15	Olt	S - W	13,4	1.928,8	2.893	6,0	16,8	1,07	7
16	Mures	Center	23,4	2.018,0	2.902	2,9	35,03	2,36	7

17	Ialomita	S	8,9	597,2	2.588	5,0	9,04	0,65	5
18	Harghita	Center	11,7	301,9	2.512	4,6	12,23	1,04	6
19	Giurgiu	S	8,6	458,2	2.883	2,7	7,58	0,83	9
20	Bistrita Nasaud	N - W	10,1	366,6	2.566	3,4	12,96	0,97	0
21	Calarasi	S	8,2	1.015,3	2.739	4,3	9,29	0,74	0
22	Mehedinti	S - W	8,8	181,2	2.642	6,5	3,3	0,42	5
23	Buzau	S - E	15,5	1.228,4	2.596	7,9	18,62	1,26	5
24	Tulcea	S - E	8,2	368,8	2.756	3,1	8,85	0,72	0
25	Satu - Mare	N - W	12,3	500,3	2.716	3,7	19,21	1,29	7
26	Dolj	S - W	25,7	1.037,9	2.932	7,2	35,12	2,5	6
27	Prahova	S	39,8	1.592,4	3.029	3,1	58,97	4,16	0
28	Covasna	Center	7,7	612,1	2.483	5,2	7,21	0,53	6
29	Salaj	N - W	9,1	515,8	2.709	5,3	9,08	0,88	0
30	Valcea	S - W	15,3	270,2	2.606	3,7	13,33	1,01	6
31	Maramures	N - W	17,3	467,7	2.613	2,7	19,69	1,53	11
32	Teleorman	South	10,2	209,9	2.518	6,6	7,02	0,61	0
33	Braila	S - E	35,8	150,1	2.588	4,4	9,57	0,89	3
34	Suceava	N - E	19,2	452,0	2.652	5,1	21,77	1,98	4
35	Galati	S - E	18,8	938,8	2.785	6,5	26,64	1,65	13
36	Vrancea	S - E	10,4	217,2	2.570	4,2	9,32	0,77	8
37	Dambovita	South	17	425,9	2.666	3,4	15,82	1,39	0
38	Bacau	N - E	20,7	934,6	2.805	5,4	28,45	3,26	4
39	Botosani	N - E	10,2	117,6	2.690	3,0	7,95	0,58	10
40	Vaslui	N - E	9,3	78,5	2.672	7,4	7,29	0,58	0
41	Neamt	N - E	14,8	211,8	2.571	5,0	12,7	1,22	15

Analysis of regional indicators

To perform the proposed research, we divided the indicators by regions and calculated the regional average of each (GDP billion lei), with the following outcomes:

1. Iasi, which scored the highest on six out of the seven variables analysed in the Northeast region, was found to be the most developed city in the area. The city of Vaslui has six minimal signs and is at the opposite pole position;
2. The examination of indicators in the South-East region showed that Constanta, which had 6 out of the maximum 7 indicators examined, was the most developed city in the area. In terms of the region's weakest city, Buzău, Tulcea, Brăila, Galați, and Vrancea all had minimum indications, but Tulcea achieved three minimum indicators.
3. The examination of the indicators in the Southern region indicated that Prahova, which scored the highest out of the seven evaluated indicators, is the region's most developed city, followed by Arges. The city of Teleorman in the region has the lowest minimum indicators, reaching five minimum indicators, ranking it the weakest city in the region.
4. Dolj, which scored the best on four of the seven variables examined in the South-West area, was found to have the highest level of development while also holding the highest unemployment rate at 7.2%. The lowest indications, which reached 4 minimal criteria, were characteristic of Mehedinți, the poorest city in the region.
5. The Western region's indicator research found that Timisoara, with 7 maximum indications out of the 7 examined, is the region's most developed city. The city of Resita,

which obtained 5 minimum indicators, represented the city at the other polarity in terms of its minimal indicators.

6. The North-West region's indicator research demonstrates that Cluj-Napoca has the highest level of development in the area, with 5 out of the 7 indicators reaching their maximum value. The minimal indications reached 4 minimum indicators and were typical of Salaj, the city at the opposite pole.

7. According to the examination of the indicators in the Center region, Brasov has the highest level of development in the area with 4 out of the 7 indicators that were evaluated. Regarding the city at the opposite position, Covasna, which scored 5 minimal indicators, exhibited the minimum indications.

8. Examining indicators in the Bucharest-Ilfov region showed that Bucharest, with seven of the seven indicators scoring the maximum, is the most developed city in the area and the most developed city in Romania overall, with the most stable economic ecosystem.

The examination of the regional average of the indicators at the level of the eight development areas enabled us in establishing the poles of the business development regions, underlining the fact that Bucharest-Ilfov is the region with the highest average of indicators and is also the most developed city in the country with the most stable business environment, setting the standard for the other cities in Romania. On the other hand, the South-West region is the region with the lowest average of indicators which is the most unfavourable. In order to make the overall picture easier to comprehend, we have included the data in a table, which is as follows:

Table 3. Poles of development regions
(own processing based on table no. 2: Top of the best business areas in Romania)

Ra nk	Region	GDP (billio n RON)	FDI/ 1000 capita (thousan d euro)	Average net monthly wage 2020 (RON)	Unemploy ment at the end of 2020 (%)	Turno ver (billio n RON)	Net profit (billio n RON)	Smart projects
6	N - E	18,21	327,88	2.794	4,85	18,31	1,81	52
3	S - E	21,76	691,51	2.684,5	4,85	21,39	1,7	40
7	S	17,17	794,48	2.798,42	4,12	25,33	1,74	19
8	S - W	15,94	689,94	2.773,4	5,48	15,52	1,12	24
2	W	23,29	1.059,25	2.845,75	2,62	32,75	2,35	71
4	N - W	21,08	865,51	2.812,3	3,18	28	2,42	89
5	Center	20,01	1.327,56	2.884,16	3,66	29,5	2,21	170
1	B - Ilf.	251,9	11.893,5	4.289	1,3	602,6 9	49,23	34

Results and discussions

Regional entrepreneurship environments vary significantly from one another. The metrics collected for the eight regions reveal that Romania's economic indicators are subject to considerable disparities and limitations. In order to understand how entrepreneurs perceive the growth of the economic environment, our research carefully evaluates which ecosystem pillars are most significant. After conducting the thorough analysis outlined in the article's first section, we identified the regions with the greatest

potential for business growth, with Bucharest-Ilfov rating as the highest and the South-West region as the most detrimental.

According to the pillar analysis questionnaire results, a successful entrepreneurial environment gravitates around the pillars of the entrepreneurial ecosystem. The proposed hypotheses were validated and discarded, with 3 being rejected and 5 being confirmed. Despite the fact that entrepreneurs do not operate in a bubble, it is essential to consider these pillars as a set of interconnected policies since they influence whether and how entrepreneurs will use their initiative and expertise to convert their plans into profitable ventures. Furthermore, entrepreneurial activity may be perpetually impacted by economic actors' entrepreneurial tendencies, skills, and incentives. Experience has shown that when these inclinations start manifesting, unfavorable framework conditions cannot completely suppress them.

Conclusions, limitations, and future research directions

The examination of the national entrepreneurial environment in this research was followed by a regional analysis, which resulted in identifying the poles of the best entrepreneurial development regions, having Bucharest-Ilfov the most favorable and the South-West being the least advantageous. Regional entrepreneurship ecosystems differ tremendously from one another, and based on the metrics estimated for the eight regions, Romania is facing large inequalities and limitations in the development of its economic indicators. A limited number of cities sustain the dynamic and growing economy, and Romanian enterprises face more similar issues than different ones. These ubiquitous problems, which impact the entrepreneurial process, emerge in all the development regions.

In accordance with the methodology chosen, this paper argues that an all-encompassing strategy for promoting entrepreneurship is based on the interdependence of the eight pillars of entrepreneurship, which strengthens entrepreneurial skills and enhances the conditions of the entrepreneurial environment.

Entrepreneurial activity is the interaction between an individual's awareness of an opportunity and capacity to seize it, as well as the unique circumstances of the environment they are part of. The pillars of the entrepreneurial ecosystem constitute one of the most critical aspects because are linked to circumstances that encourage or inhibit the development of new enterprises. The condition of these pillars directly impacts the availability of entrepreneurial prospects, as well as their preferences and capabilities, which in turn affect business dynamics and development.

Taking into account all of the preceding factors, future research directions concentrate on the comparative analysis of the entrepreneurial pillars that can influence the sustainable growth of Romania's regions, providing the framework for the third objective intended but not achieved inside this research: the proposal of policies that can increase the level of entrepreneurial activity at the national scale.

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3

Finance and Banking

THE EFFECTS OF THE ROMANIAN MARKET RECLASSIFICATION BY FTSE RUSSELL

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Abstract. *This paper analyses the effects of the Romanian market reclassification from the frontier market status to the secondary emerging status, realized by FTSE RUSSELL, one of the biggest three global index providers, in September 2020. The effects of the reclassification of a market by one of the three major global index providers have not been systematically studied, most of the studies focused only on the effects of stock market inclusion in different indexes. Our research concluded that the topic of this paper was not sufficiently studied as we only came across two other academic studies regarding the effects of market reclassification. However, the importance and influence of global index providers on capital allocation are the focus of recent research. Using Python – Jupyter Notebook we applied neural networks algorithms (long short-term memory) and evaluated the impact of the FTSE's announcement on reclassification and the actual reclassification of the two most important Bucharest Stock Exchange indexes. The results show that these events generate a significant impact on the Bucharest Stock Exchange indexes we analyzed: the FTSE announcement about reclassification (which took place 1 year before actual reclassification) didn't have a positive impact on them; however, the results also indicate that the actual reclassification had a positive impact on these indexes, in terms of returns and volatility. These findings are in contrast with the ones we found in the other two studies, a possible reason is that in the period of time that we analyzed the Romanian market there were two events with significant impact on returns and volatility: a significant change in Romanian regulations and the Covid-19 crisis.*

Keywords: *FTSE; global index providers; market reclassification; neural networks; Romania.*

Introduction

The most important global index providers – MSCI, FTSE RUSSELL, and S&P DOW JONES INDICES - classify countries/markets in different categories, depending on their stage of development: frontier markets, emerging markets, and developed markets. MSCI utilizes an extra classification – standalone market – and FTSE RUSSELL differentiates between secondary and advanced emerging markets.

For a country to be classified in one of the mentioned categories it must fulfill a series of quantitative and/or qualitative criteria (and receive positive feedback during the investors' consultation process). The criteria mentioned are: economic development, size, and liquidity, market accessibility criteria - used by MSCI, World Bank GNI per

capita rating, credit worthiness, market, and regulatory environment, foreign exchange market status, equity market status, clearing, settlement, and custody - used by FTSE RUSSELL, full domestic market capitalization size, annual turnover value, market development ratio (used by S&P DOW JONES INDICES for the initial eligibility analysis, to which other criteria are added in order to obtain emerging or developed market status).

The reclassification of a market – upgrading it to next market status - is a major event because it represents the result of the reforms undertaken by the stock exchange and the public authorities of a country, in order to comply with the criteria set by the global index providers and can lead to augmented capital inflows from international investors and to increased liquidity. A downgrade can also determine the authorities to engage in reforms consistent with the aforementioned criteria.

The investors also benefit from the results of the classification process by adapting their investment strategies depending on the market status changes operated by the global index providers.

This study aims to reveal and analyze the effects which the reclassification of the Romanian market by FTSE RUSSELL in September 2020 had on the Bucharest Stock Exchange (BSE) indexes – BET (Bucharest Exchange Trading) and BET –XT (Bucharest Exchange Trading Extended Index).

Literature review

Miziolek (2018, p.144-145) argues that the relevance of global index providers has incrementally increased, under the impact of six factors: ‘the dynamic development of various forms and methods of investing in the financial market (...), the emergence of new financial instruments (...) a growing interest in new classes of assets (...), the development of electronic trading platforms (...), a growing specialization in financial markets (...), the development of research on financial markets’. The growing importance of global index providers in capital allocation is also highlighted and analyzed by Petry, Fichtner, and Heemskerk (2019, p.19) who concluded that MSCI, FTSE RUSSELL, and S&P DOW JONES INDICES are “actors that exercise growing private authority in capital markets as they steer investments through the indices they create and maintain”.

Furthermore, Petry and al. (2019, p.17) affirm that the power of the global index providers is also increasing in relation to states, the classification decisions having ‘enormous consequences for states and their national stock markets’ given the amounts of foreign capital that can be unlocked for investments in the case of a market status upgrade, or the disruption in investments flows that can be generated in a case of a market downgrade (as a consequence of lack of compliance with the recommendations made by the global index providers). Miziolek (2018) highlights this relation, including in the case of countries whose economies are significantly important globally, such as China.

Moreover, Petry (2020, p.13) claims that the global index providers ‘have become more powerful with the continuing shift from active towards passive investment where ETFs/index funds simply track or reproduce stock market indices’. Similarly, Miziolek (2018, p.145) affirms that the “huge increase in the popularity of index financial

products, assuming the form of investment portfolios” was due to the institutional investors - mainly ETFs - that started to largely resort to passive investing, considering the advantages of this type of investing.

In addition to the global influence on capital allocation, the reclassification process carried out by the global index providers can boost reforms regarding legislation and the market infrastructure. Hence, it can take several years for a country to be upgraded and attract more capital. This is why since 1997 MSCI has performed only 16 country upgrades (out of which 8 from standalone status to frontier/emerging) and why, starting from 2008 FTSE RUSSELL operated only 22 country upgrades (out of which 7 inclusions in frontier market status from previously “unclassified”).

The importance of market classifications for investors is also stated by Mendes and Martins (2017, p.1), who indicate that the classifications delivered, among others, by global index providers ‘have an influence on how the market is perceived by the financial world’.

However, the effects of market reclassification have not been largely addressed in academic articles, the most closely related to our own being the studies of Saidi et al.(2012) and Burnham et al. (2018).

Saidi et al. (2012) studied the capital markets reclassification of Egypt and Morocco by the MSCI Barra in 2001, from the frontier to emerging market status, analyzing how these markets performed in relation to three moments: the date of the announcement regarding the intention to upgrade the markets, the date of the actual market upgrade and one year after the upgrade. The results of this study show that the announcement of a market reclassification can generate an overshooting effect, but after the actual reclassification, the markets tend to follow a downward trend.

On the other hand, Burnham et al. (2018, p.77), who also observed the lack of a ‘systematic study of what happens around reclassification events’ conducted a larger study, analyzing 17 country reclassifications (9 upgrades and 8 downgrades) made by MSCI from 2000 to 2015, taking into consideration the same three moments, but also supply, demand, and index inclusion effects. The importance of these events is also stated by the authors, who affirm that the investors who are benchmarked to the MSCI indexes (with assets under management of nearly \$10 trillion) have to rapidly recalibrate their portfolios, which can lead to a large ‘collective action (...) the actual flows driven by reclassification being difficult to track’ (Burnham et al. 2018, p. 80). Their findings suggest, approximately in line with the conclusions of Said et al., that in the case of market upgrades, between the announcement date and the actual reclassification, the markets experience a positive trend (their MSCI country index gains, on average 23,2%), which is reversed one year after the actual reclassification (with a loss, on average, of 12,4%). In the case of downgrades, the markets face an opposite trend.

A general assessment of upgrades and downgrades in market status is made by Miziolek (2018, p.150), who states that in the case of upgrades, the capital reallocations are ‘usually positive (even though the weight of the country in a new index is lower than in the previous one)’, whereas in the case of downgrades are ‘usually negative (although the weight of the weight of the country in a new index is higher than in the previous

one)'. However, Miziolek does not focus on studying a specific case, only listing the examples of Greece (upgraded by FTSE RUSSELL in 2001, and downgraded in 2016), Israel, and South Korea (upgraded by FTSE RUSSELL in 2008, respectively 2009).

The effects of the Romanian market reclassification by FTSE RUSSELL, from frontier market to secondary emerging, have not been addressed so far, the subject only being referred to as a step in the evolution of the Bucharest Stock Exchange by Pop (2022), or in the context of how the Covid-19 crisis affected the performance listed companies on the BSE, by Vasiu and Ilie (2021).

Romania was included by FTSE RUSSELL on the watch list in September 2016, with the actual reclassification from frontier market to secondary emerging market taking place 4 years later, in September 2020 (with an announcement of reclassification in September 2019). The reclassification followed a series of reforms and actions both from BSE and the Romanian authorities, as pinpointed by Anghel and Mihalcea (2018, p.175): in 2014 ASF developed *STEAM project – Set of Actions Toward Establishing and Acknowledgement of the Emerging Market Status* and continued to improve the legislation and BSE started to develop and consolidate the market infrastructure.

Pop (2022, p.101) also pinpoints that the reclassification did not generate the expected effects, in particular an increase in foreign investors numbers at BSE, but without any analysis of how the market performed between the key dates regarding the upgrade (announcement, actual upgrade, the year after the upgrade).

Vasiu and Ilie (2021, p.117) only stated that after the upgrade decided by FTSE RUSSELL, the liquidity on BSE increased '3.5 times in September 2020, compared to the values of August 2020 or September 2019'.

However, Romania is still classified as a frontier market both by MSCI and S&P, further reforms and fulfilling a series of quantitative and qualitative criteria being required in order to obtain the emerging market status also from these global index providers.

Methodology

The purpose of this research was to analyze the impact of both FTSE announcement about the reclassification of the Romanian Capital Market to Secondary Emerging (September 2019) and the actual reclassification (one year later) on two of the main index of the Bucharest Stock Exchange (BET and BET – XT). To do so, we applied an event study (the events being the announcement and the actual reclassification) using state of art algorithms from the field of neural networks.

We collected from BSE webpage (<https://bvb.ro>) BET and BET – XT daily data from 09/25/2015 to 09/24/2021. The total number of observations was 3000. Descriptive statistics about collected data are presented in *Table 1* and *Table 2*.

BET is the main index of the Bucharest Stock Exchange (BSE), reflecting the performance of the companies listed on the regulated market with the highest liquidity (except financial investing companies - FIC). BET includes 20 companies: FONDUL PROPRIETATEA S.A., BANCA TRANSILVANIA S.A., OMV PETROM S.A., S.N.G.N. ROMGAZ S.A., BRD – GROUPE SOCIETE GENERALE S.A., S.N. NUCLEARELECTRICA S.A., MEDLIFE

S.A., DIGI COMMUNICATIONS N.V., S.N.T.G.N. TRANSGAZ S.A., SOCIETATEA ENERGETICA ELECTRICA S.A., ONE UNITED PROPERTIES S.A., TERAPLAST S.A., C.N.T.E.E. TRANSELECTRICA S.A., TRANSPORT TRADE SERVICES S.A., AQUILLA PART PROD COM S.A., PURCARI WINERIES COMPANY LIMITED, BURSA DE VALORI BUCUREȘTI S.A., CONPET S.A., and SPHERA FRANCHISE GROUP S.A.

BET – XT reflects the price evolution of the most traded thirty companies listed on the regulated market of Bucharest Stock Exchange (BSE), including the fifth FIC. BET-XT includes: the 20 companies included in BET and 10 more (SIF BANAT CRIȘANA S.A., EVERGENT INVESTMENTS S.A., TRANSILVANIA INVESTMENTS S.A., SIF MUNTENIA S.A., SIF OLTENIA S.A., IMPACT DEVELOPER & CONTRACTOR S.A., BITTNET SYSTEMS S.A., COMPA S.A., SSIF BRK FINANCIAL GROUP S.A., and ROMCARBON S.A.).

Table 1. Descriptive statistics BET

Mean	Standard Error	Standard Deviation	Skewness	Kurtosis
8477.34	36.8527	1427.3	0.8170	0.3695

Table 2. Descriptive statistics BET - XT

Mean	Standard Error	Standard Deviation	Skewness	Kurtosis
770.3801	3.1616	122.4492	0.6065	0.0947

Firstly, we computed mean, standard deviation, skewness and kurtosis of the BET and the BET – XT returns registered in the following intervals: 09/26/2018 – 09/25/2019 (one year before the FTSE’s announcement about the reclassification of the Romanian Capital Market to Secondary Emerging); 09/26/2019 – 09/25/2020 (the interval between the FTSE’s announcement and the actual reclassification) and 09/28/2020 – 09/24/2021 (one year after the actual reclassification).

Next, using *Python – Jupyter Notebook*, we applied neural network algorithms in order to evaluate the impact of the FTSE’s announcement about reclassification and the actual reclassification on BET and BET-XT. According to Vonko (2022), neural networks are, in essence, algorithms that simulate the function of the human brain. Neural networks have some characteristics, such as self-training capacity, and data classification. In addition, probably the most important usage of neural networks is to make predictions based on historical data. The algorithm we applied in this study, developed by Bee Guan (2021), is part of the Long Short-Term Memory (LSTM) category. LSTM is a type of neural network algorithm, first developed by Hochreiter & Schmidhuber (1997), which is better than recurrent neural networks regarding the transmission/ storage of information in the process of doing predictions.

To apply Bee Guan’s algorithm we used for data training the daily value of BET and BET – XT for a period of 4 years (the equivalent of 1000 observations for each index). Then, using the characteristics of neural networks, the algorithm made predictions regarding the evolution of BET and BET – XT in the fifth year. Because of the fact that the purpose of this research is to evaluate the impact of the FTSE announcement and the actual reclassification, the analyzed intervals, both in the case of BET and BET-XT, were

between 2015 – 2020, respectively between 2016 – 2021. After we applied the algorithm, we computed the mean of prediction and the mean of BET and BET – XT values in the fifth year. We did that in order to evaluate if BET and BET – XT overperformed or underperformed compared to the predictions made by the algorithm. Finally, we analyzed the relevance of the results using the paired sample t-test (*t-test*).

Finally, we analyzed the impact of the analyzed events (the FTSE announcement and the actual reclassification) on the volatility of BET and BET-XT. To do so, we evaluated the jumps' dynamic and dimension in BET and BET – XT values. The analyzed interval was 09/26/2018 – 09/24/2021 (one year before the FTSE announcement and one year after the actual reclassification). Jumps were first introduced by Robert Merton, who adjusted the Black-Scholes model (1973) for option evaluation in a way that considers jumps. According to Merton (1976, pp.126-127), jumps are atypical events that produce a high dimension change in the asset price in a very short time between two observations. To identify jumps on BET and BET-XT, we applied, in *Python – Jupyter Notebook*, the Lee and Mykland (2008) test, adjusted by Lee, Naranjo, and Velioglu (2018). The Lee and Mykland test identifies jumps using the properties of Gumbel distribution. In addition, Lee and Mykland test compute the dimension of jumps (L_i) as a ratio between returns and standard deviation. Lee, Naranjo, and Velioglu adjusted Lee and Mykland by proving that the value of K (which in the Lee and Mykland test is 10) is 16 for daily data.

Results

As shown in *Table 1*, the results don't indicate a positive impact of the FTSE announcement about the reclassification of the Romanian Capital Market on returns and volatility of BET and BET-XT. So, after the FTSE announcement, the mean of the BET returns had dropped from 0.0585 to – 0.0118, while, in the case of BET-XT, the drop was from 0.367 to -0.211. Also, the standard deviation had increased from 1.2753 to 1.5267 (BET), respectively from 8.6512 to 11.2893 (BET-XT). However, the results indicate that the actual reclassification of the Romanian Capital Market positively impacted BSE. The mean of BET and BET – XT returns after the actual reclassification was 0.133 (BET) and 1.1834 (BET XT), values significantly higher than the ones registered before. Similarly, after the actual reclassification, BET and BET- XT returns' volatility (reflected by standard deviation) dropped. The dynamics of skewness and kurtosis confirm the previous statements about the evolution of volatility and returns.

Table 3. Mean, Standard deviation, skewness and kurtosis

	BET			BET-XT		
	Before ¹	Between ²	After ³	Before	Between	After
Mean	0.0585	-0.0118	0.1337	0.367	-0.211	1.1834
Standard deviation	1.2753	1.5267	0.7187	8.6512	11.2893	6.1998
Skewness	-2.3634	-1.3972	-0.0432	-3.198	-1.7278	-0.3041

¹ One year Before FTSE announcement.

² Between FTSE announcement and effective reclassification

³ One year after effective reclassification.

Kurtosis	28.4225	10.5488	2.9266	39.4158	9.9276	2.0279
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The findings from *Table 3* regarding the impact of the two analyzed events on BET and BET-XT are, also, confirmed by the results obtained when applying the neural networks algorithm. Thus, the FTSE announcement didn't positively impact BET and BET-XT. Although, after the actual reclassification, BET and BET - XT had a higher than estimated growth, as you can observe in *Figure 1* and *Figure 2*.

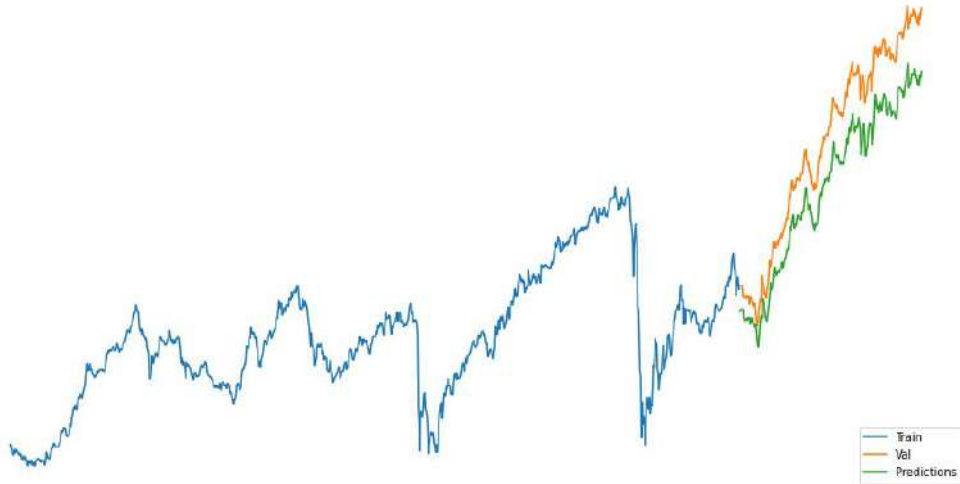


Figure 1. BET



Figure 2. BET - XT

As shown in *Table 4*, the one-year mean of the BET and BET - XT values were higher after the actual reclassification than the predictions made by the algorithm. In the case of BET, the mean of the values was 10765.4851, while the mean of the estimated values

was 10225.959. Similarly, in the case of BET – XT, the mean of values was 954.4428, while the mean of estimated values was 949.23111. In addition, the differences between means (mean of the values and mean of the estimated values) have statistical significance (p-value is much lower than 5%), both in the case of BET and BET – XT.

However, regarding the period between the FTSE announcement and the actual reclassification, the mean of the BET and BET – XT values were lower than the estimated values (computed by applying the neural networks algorithm). The mean of BET values was 9052.4551, while the mean of the estimated values was 9070.9202. Moreover, the mean of BET – XT values was 826.6134, while the mean of the estimated values was 832.2301. Because the results didn't indicate a positive effect of the FTSE announcement on the BET and BET – XT values, we didn't apply a t-test for this interval (*Table 4*).

Table 4. BET&BET-XT vs. Predictions

	BET		BET - XT	
	Between	After	Between	After
Values (mean)	9052.4551	10765.4851	826.6134	954.44428
Predictions (mean)	9070.9202	10225.959	832.2301	949.2310
T-test (p-value)	-	2.5236E-127	-	2.1487E-28

Regarding the jumps on BET and BET – XT, the results indicate a decrease in the number and the dimension of them in the period after the actual reclassification of the Romanian Capital Market. According to the results in *Table 5*, both in the one-year period before the FTSE announcement and in the period between the FTSE announcement and actual reclassification there were 4 jumps in BET. The number of jumps had decreased to 2 in the one-year period after the actual reclassification. Moreover, the mean of the dimensions of jumps (absolute values) had decreased after the actual reclassification, which (re)confirmed the positive impact of the events on reducing the volatility.

Table 5. Jumps on BET (09/26/2018 – 09/24/2021)

<i>Before</i>				
Date	18.12.2018	21.12.2018	30.07.2019	26.08.2019
Dimension	5.6751	-4.9991	-6.1521	-12.4883
<i>Between</i>				
Date	30.10.2019	11.06.2020	12.06.2020	18.09.2020
Dimension	5.8595	-5.4188	5.1499	5.7783
<i>After</i>				
Date	03.04.2021	30.08.2021		
Dimension	-4.8286	4.9555		

Referring to BET – XT, the impact of the actual reclassification was even higher, taking into consideration that there was no jump on this index in the one-year interval after the event. In the other two analyzed intervals, there were 4, respectively 5 jumps on BET – XT (*Table 6*).

Table 6. Jumps on BET - XT (09/26/2018 – 09/24/2021)

<i>Before</i>					
Date	18.12.2018	21.12.2018	30.07.2019	26.08.2019	
Dimension	5.8829	-5.1945	-5.5438	-15.6437	
<i>Between</i>					
Date	30.10.2019	10.06.2019	11.06.2020	12.06.2020	18.09.2020
Dimension	5.4588	4.9261	-4.8740	4.8749	5.8087
<i>After</i>					
Date					
Dimension					

Conclusions

The FTSE reclassification of the Romanian Capital Market to Secondary Emerging is an extremely important event, which generates significant effects on BSE. The results indicate, in contrast with the ones found by Saidi et al. and Burnham et al., that the FTSE announcement about reclassification (which took place 1 year before actual reclassification) didn't have a positive impact on the main indexes of BSE. However, the results also indicate that the actual reclassification positively impacted BET and BET-XT regarding the returns and volatility. Thus, after the actual reclassification, the mean of BET and BET-XT returns was higher. In addition, the mean of the BET and BET-XT values were higher (with statistical significance) than the mean of the BET and BET-XT predicted values. These facts prove that BET and BET-XT overperformed after the actual reclassification. Moreover, the standard deviation of BET and BET-XT returns and the number of jumps on these indexes were lower than in the years before the actual reclassification, which indicates that the actual reclassification generated a decrease in the indexes' volatility.

This research has some limitations, one of the most important being the incapacity to quantify the extent in which BET and BET-XT dynamics were influenced by other factors (such as COVID-19, or the impact of the Emergency Government Ordinance 114/2018, which led to significant stocks' price drops, etc.) rather than the FTSE announcement or the actual reclassification.

However, given the growing influence of the global index providers, the shift in the investment industry, from active to passive, and with trillions of US dollars benchmarked against the indexes provided by MSCI, FTSE RUSSELL, and S&P DOW JONES INDICES, we consider that the effects of market reclassifications should be extensively studied.

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THE ESG IMPACT ON FINANCIAL PERFORMANCE AT THE COMPANY LEVEL

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Abstract. *The object of this article is to present a concise study of the state of scientific literature regarding the relation between the Environmental, Social and Corporate Governance (ESG) factors and the financial performance at a company based level. According to scientific literature, we expect that the more socially responsible companies have an interest in the well-being of the stakeholders (customers, employees, members of the supply chain, and the community) as much as in that of their shareholders.*

Keywords: *sustainable finance; credit risk management; ESG; policy*

Introduction

In today's economy, commercial banks play a very important role in national financial systems. The profitability of commercial banks depends on how they manage their loans and assets. Thus, credit risk management is crucial in the banking system, representing the main activity of any commercial bank. But in this developing world, where climate and social factors are starting to play an increasing role in the business sector, environmental, social, and governance (ESG) criteria have become part of the crucial factors considered a consideration when designing the risk framework that will be applied to a particular client. Institutions and their management must adapt their sustainable environmental policies and procedures in the context of their objectives strategy and general sustainable finance policy. Institutions must set qualitative and, where appropriate, quantitative objectives. High-profile ESG programs tend to be launched and developed primarily by organizations that integrate them into evolving business models and strategies, thereby gradually translating into sustainable strategic management frameworks.

The present paper explores the current challenges of sustainable strategic management in the banking sector in parallel with regulatory requirements, investigating the relationship with available practices considering two major challenges currently reshaping the sector: digitalization and sustainability requirements. It is proposed to determine the relationship between ESG, strategic management initiatives, and organizational performance considering regulatory requirements and determine if there is any significant correlation between the variables. This paper contributes to the literature in the field by researching and analyzing ESG and its purpose is to show that if the number of companies that adopt ESG norms increases, this will lead to an increase

in the financial position of the companies and make a potential better client from these companies for financial institutions as well as their partners.

From a theoretical and applied point of view, this paper addresses a new topic and aims to understand the correlation between financial indicators and (ESG) performance in banking and companies. Another important aspect is the analysis of long-term economic growth potential for possible customers, which can be done by easily comparing different business sectors. At the same time, this study offers a new perspective to approach how environmental, social, and corporate governance factors influence the creditworthiness of a potential customer or business partner.

In essence, corporate social responsibility (CSR) acts as a self-regulating business model that raises awareness of a company's social responsibility to all stakeholders (itself, stakeholders, and the public). By applying the principles of corporate social responsibility, companies can be aware of their impact on the society in which they operate, including economic, social, and environmental factors. Applying (CSR) principles is defined as practicing in the ordinary course of business, ways that increase the development and responsibility of society and awareness related to the state of the environment, instead of having a negative impact on their state. CSR recommendations are considered by most specialists to be the forerunners of environmental, social, and governance (ESG) recommendations, but the two are far from interchangeable. While (CSR) aims to increase business responsibility, (ESG) criteria measure the company's efforts to comply. If in the case of (CSR), related activities vary massively between businesses and sectors and there is a lack of comparable indicators available, in the case of (ESG) activity, it is considered that they are easier to quantify and define. ESG policies are driven by strict criteria and require them to be embedded at the core of a business's strategy, rather than marginalized. The strength of (ESG) is that its requirements must be integrated into the company's business model and that its momentum is driven by asset managers, consumers, and employees demanding transparent business, and business practices oriented towards a purpose that aligns with business priorities. Furthermore, given today's changes in strategic management, all organizational strategic initiatives must be considered so that they work toward the same goals of improving the entity's organizational performance.

Starting from the fact that many American companies listed on the American stock exchange have adopted this ESG strategy, I chose as a subject the qualitative research of ESGs, namely the impact that (ESG) scores have on the financial performance of the following 23 American companies: *Microsoft (MSFT)*, *Linde (LIN)*, *Accenture (ACN)*, *J.B. Hunt (JBHT)*, *Xylem (XYL)*, *Texas Instruments (TXN)*, *Salesforce. Com (CRM)*, *Metropolitan Bank (MCB)*, *Nvidia (NVDA)*, *Oracle (ORCL)*, *Motorola Solutions (MSI)*, *Crown Holdings (CCK)*, *Nike (NKE)*, *Qiagen (QGEN)*, *ASGN(ASGN)*, *Dover (DOV)*, *Lam Research (LRCX)*, *Apple (AAPL)*, *Owens Corning (OC)*, *Adobe (ADBE)*, *Mohawk Industries (MHK)*, *Goldman Sachs (GS)* and *Cadence Design Systems (CDNS)*.

In the future, since the subject is an interesting one, I want to analyze in other works the European market with the new regulations promoted by the European Banking Authority and especially the financial market in our country where it is recommended to emphasize the role of the previously mentioned ideas regarding environmental,

social, and corporate governance in a clear and practical way to apply banking institutions.

In their credit risk policies and procedures, banks should develop specific tests on environmentally sustainable credit policies and procedures covering the provision and monitoring of such credit facilities. This approach involves expanding the analysis tools with which the traditional bank operates, which are starting points for risk anticipation and performance simulation, modifying them while providing a dynamic picture of the bank's financial performance.

The analysis of the twenty American companies from various sectors of activity was carried out based on the research tools presented in the specialized literature, starting from the profitability indicators of the companies analyzed and calculated such as: EBITDA and ROE. Later I will show the degree of influence that the ESG score has on ROE and EBITDA, and in this way, the companies analyzed will be able to be compared and conclusions will be drawn related to how these regulations and (ESG) factors, lead to the financial performance of a company.

Literature review

The role of business in society has been discussed and expanded over the 50 years since Milton Friedman's landmark 1970 essay, "The social responsibility of business is to increase its profits" (Friedman, 2007), first published given in the New York Times and then re-published with other articles in the "Corporate Ethics and Corporate Governance" collection. Since then, and with exponential speed over the past two years, there has been a shift toward a broader understanding of how corporate decisions affect all stakeholder groups—not just shareholders. As a relatively new field that has found its way into academic topics, the relationship between corporate social responsibility and a firm's corporate financial performance is a phenomenon being explored in various research studies conducted around the world. These research studies (Cho et al, 2019) show a positive relationship between a firm's corporate social responsibility policies and corporate financial performance. To investigate this relationship, the researchers constructed a regression and preceded the analysis by providing several measures that they used to serve as proxies for key financial performance indicators (ie, return on assets serves as an indicator of profitability). Most of the studies that have been done on (ESG) for the banking sectors are recent, and in recent years (ESG) has increased its visibility due to how it can help predict the economic performance of a particular client (Klettner et al., 2013). The pressure to regulate (ESG) has become one of the most important factors in adopting regulations at the banking level. Since the universal and legal adoption of the Paris Agreement on climate change in December 2015, studies that attempt to focus on (ESG) performance (ESGP) and corporate financial performance (CFP) in the banking sector have begun to become commonplace in the scientific field. The Paris Agreement on Climate Change defined how financial market participants and business advisors should integrate (ESG) risks and opportunities into their processes to act in their client's best interests. A growing number of articles in the academic economic community have teams referring to banking business models that have begun to focus on environmental, social, and corporate governance issues as promising new paradigms for business management (Galbreath, 2016).

The strategy and the increasing interest of stakeholders in adopting socially responsible practices, together with the application of appropriate governance practices (Widyawati, 2019) have made the field of (ESG) regulation and the assessment of potential clients by their environmental, social, and corporate, governance practices an interesting field.

The inclusion of social objectives in internal processes can allow an increase in efficiency recoveries and the reduction of all costs, in addition, according to some articles (Serafim, 2020), banks' attention to (ESG) issues helps them reduce their cost of capital and expand their possible shareholder base due to the good publicity that is sometimes associated with compliance with ESG principles. Other studies that analyze the relationship between (ESGP) and corporate financial performance (CFP), such as those published after 2018 (Finger et al., 2018), this is because banks have certain unique characteristics compared to other legal entities. Specific circumstances, common only to banks, and the way processes are designed, lead to the exclusion of banking sectors from environmental, social, and governance performance studies that contain a multi-sector sample (Mirallas-Quirós et al., 2019).

Another article that seems to capture the relationship between financial performance and environmental, social, and governance actions in the case of banks is the one published by (La Torre et al., 2021).

Socially responsible investment (SRI) strategies that should be considered for the transition to sustainable development: the importance of integrating and communicating (ESG) parameters is the subject of the article written by (Sciarelli et al., 2021). The results obtained demonstrated that the companies studied for the article integrated (ESG) norms in (SRI) in a different way; thus, while some of them appear quite close to full integration, others have demonstrated less than total commitment to (ESG) norms.

More recent research has highlighted that investing in socially responsible funds can benefit from communicating the company's progress in implementing (ESG) regulatory outcomes (Renneboog et al., 2008). The previously mentioned factors have led several companies to increase their focus on screening the main criteria that are part of (ESG): transparency, ethics, impact, environment, society, and governance and the related allocation of assets and strategies that are considered by the company as possible future policies that must be taken as they appear (Przychodzen et al., 2016) In the specialized literature, there are numerous articles that deal with this problem using different methodologies, including the one written by Tarmuji et al (2016) in which the economic performances at the level nationally are correlated with the (ESG) score, concluding that they lead to economic growth for Singapore and Malaysia. An article that provides an example of calculating a score for (ESG) factors is the one written by Giannarakis et al (2014). In the specialized literature, an article that serves as an example of the approach related to the application and results of the questionnaires is the one written by Arli et al (2010) which shows that the public perception in emerging markets of a product of a company that complies with (ESG) rules, it is favorable only if the price and quality are the same as other products on the market.

Worth mentioning is the innovative works in the managerial field written by Stanescu Zbucea and Panzaru (2020) which explores the relationship between transformational

leadership and innovative work behavior of employees, the study based on structured questionnaires: Multifactor Leadership Questionnaire, IWB, and psychological empowerment tool and shows a positive and significant relationship between them and Zbucea, Ivan, and Mocanu (2021) which underlines the importance of the human dimension in the practice of sharing knowledge of non-profit organizations.

Methodology

The paper starts with the question "*In what way does the adoption of (ESG) requirements influence financial performance?*" through the methodology used I want to show the correlation between the adoption of regulations and requirements in the field of environmental and social governance and the financial and economic performance of companies.

The methodology used to calculate the influence of the adoption of environmental and social governance factors on financial performance indicators is carried out by using a sample of 23 American companies, namely: Microsoft (MSFT), Linde (LIN), Accenture (ACN), J.B. Hunt (JBHT), Xylem (XYL), Texas Instruments (TXN), Salesforce. Com (CRM), Metropolitan Bank (MCB), Nvidia (NVDA), Oracle (ORCL), Motorola Solutions (MSI), Crown Holdings (CCK), Nike (NKE), Qiagen (QGEN), ASGN(ASGN), Dover (DOV), Lam Research (LRCX), Apple (AAPL), Owens Corning (OC), Adobe (ADBE), Mohawk Industries (MHK), Goldman Sachs (GS) and Cadence Design Systems (CDNS), calculated and analyzed during the year 2021, aiming for other works to be noticed at the European level and especially in our country. In the present paper, an analysis at the company level will be attempted because, I believe that the effect of these regulations has as its main purpose the way in which companies carry out their activity, and at the same time, the direct effect of the requirements on the financial situation through performance indicators (ROE and EBITDA).

The main indicator for companies used in this paper EBITDA, represents the profit before the installation policy (interest), the fiscal policy (taxes), and the amortization policy (depreciation and amortization) and is a measure often used in measuring the profitability of a company. Some prefer EBITDA to net income because it can provide a more accurate representation of operating efficiency and is a good measure for comparisons with other companies. As a representative formula, EBITDA is calculated as follows:

$$EBITDA = \text{Net Income} + \text{Taxes} + \text{Interest Expense} \\ + \text{Depreciation \& Amortization}$$

ROE, the second indicator used in this paper, represents the return on equity and is characterized by the formula:

$$ROE = \frac{\text{Net income}}{\text{Equity}}$$

The return on capital is expressed in percentages, and the BAA condition for this indicator to be calculated is that the net income and equity have positive values. Investors suggest companies set as an objective a return on capital equal to or slightly higher than the average return on capital of other companies in the same sector of activity.

ROA, the third and last indicator on which I will perform the analysis, represents the profitability of the asset, and is characterized by the formula:

$$ROA = \frac{\text{Net income}}{\text{Total assets}}$$

Return on assets is an important indicator at the level of companies because it measures the efficiency of the capital allocated in fixed assets and in the current assets of the enterprise. Financial analysts recommend that this indicator register positive values as high as possible. To be able to see the level of efficiency of the company, the managers must also analyze other market factors such as: the inflation rate, the average rate of return on the activity sector, the interest rate on deposits, etc.

The way to see if a series is stationary or not is by performing the Augmented Dickey-Fuller test, which is characterized by the following formula:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

To be able to see if two or more variables influence each other, we test the Granger causality which is characterized by:

$$P[Y(t+1) \in A | L(t)] \neq P[Y(t+1) \in A | L_{-x}(t)]$$

where the hypotheses of the model are: H_0 : the cause occurs before its effect and H_1 : the cause has unique information about the future values of its effect.

Results and discussions

In carrying out this work, I chose to analyze 23 companies listed on the American stock exchange from different sectors of activity according to table 1:

Table 1. Illustration of the companies used (Source: Yahoo Finance)

Rank	Company	Symbol	Industry
1	Microsoft	MSFT	Computer Software-Desktop
2	Linde	LIN	Chemicals-Specialty
3	Accenture	ACN	Computer-Tech Services
4	J.B. Hunt	JBHT	Transportation-Trucking
5	Xylem	XYL	Machinery-Tools & Resources
6	Texas Instruments	TXN	Electronics-Semiconductor Mfg
7	Salesforce.com	CRM	Computer Software-Enterprise
8	Metropolitan Bank	MCB	Banks-Northeast
9	Nvidia	NVDA	Electronics-Semiconductor Fabless Mfg
10	Adobe	ADBE	Computer Software-Desktop
11	Oracle	ORCL	Computer Software-Database
12	Motorola Solutions	MSI	Telecom Services-Integrated
13	Crown Holdings	CCK	Containers/Packaging

14	Nike	NKE	Apparel-Shoes & Related Mfg
15	Qiagen	QGEN	Medical-Products
16	ASGN	ASGN	Commercial Services-Staffing
17	Dover	DOV	Machinery-General Industrial
18	Lam Research	LRCX	Electronics-Semiconductor Equipment
19	Apple	AAPL	Telecommunications-Consumer Products
20	Owens Corning	OC	Building-Construction Products/Misc.
21	Mohawk Industries	MHK	Building-Construction Products/Misc.
22	Goldman Sachs	GS	Banks-Money Center
23	Cadence Design Systems	CDNS	Computer Software-Design

The data in table 2 reflects the evolution of the companies for the year 2021, where we have performed a classification of the 23 companies in descending order according to the (ESG) score, the company rating, the superior sales growth rates, profit margins and return on equity (SMR rtg), return on capital ROE and EBITDA.

Table 2. Classification of companies (Source: Yahoo Finance)

Rank	Company	ESG Score	Comp Rtg	SMR Rtg	ROE	EBITDA (thousands)
1	Microsoft	76.3	99	A	47%	100,239,000
2	Linde	76	94	B	9%	9,512,000
3	Accenture	75.95	97	A	33%	10,956,029
4	J.B. Hunt	74.14	89	B	21%	1,870,713
5	Xylem	73.89	87	B	13%	791,000
6	Texas Instruments	73.14	88	A	58%	11,060,000
7	Salesforce.com	72.92	94	A	12%	3,782,000
8	Metropolitan Bank	72.68	96	A	12%	77,312.00
9	Nvidia	72.19	99	A	43%	9,357,000
10	Adobe	70.06	98	A	41%	6,917,000
11	Oracle	71.14	93	A	163%	13,292,000
12	Motorola Solutions	70.81	89	na	0%	2,113,000
13	Crown Holdings	68.66	89	A	41%	397,000
14	Nike	67.34	90	A	55%	7,515,000
15	Qiagen	66.73	92	A	19%	889,777
16	ASGN	66.73	90	B	17%	492,300
17	Dover	66.65	96	A	26%	1,804,759
18	Lam Research	66.47	90	A	71%	5,711,612
19	Apple	66.15	97	A	74%	131,698,000
20	Owens Corning	65.36	89	B	13%	2,172,000

21	Mohawk Industries	63.59	91	B	8%	1,876,033
22	Goldman Sachs	62.93	93	A	13%	16,179,000
23	Cadence Design Systems	62.69	95	A	34%	1,112,969

According to public information, in 2022 the companies with the highest ESG are: Nvidia from the semiconductor industry; Microsoft from the software and infrastructure industry; Software Industry Cadence; Lam Research from the semiconductor equipment and materials industry and Adobe from the software and infrastructure industry.

After grouping the companies according to the activity sector, I averaged the ESG scores according to the industries in which the companies collected by me operate and I could observe that the highest ESG score for the year 2021 was at the level of the Computer Software-Desktop sector (71.51) closely followed by the transport sector (71.40) and then by the medical and specialty chemicals sector (71.36).

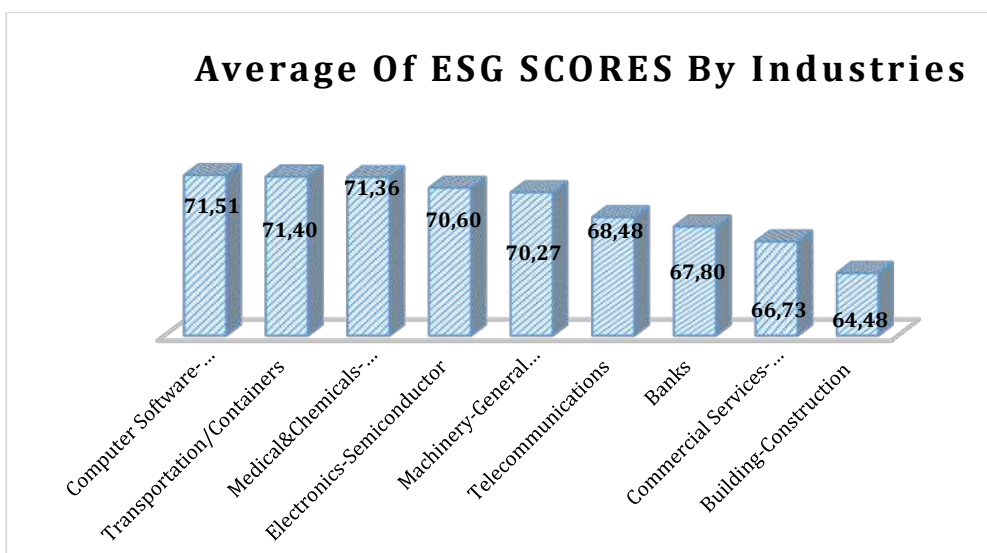


Figure 1. Classification of companies according to the sector of activity for the year 2021

From figure 2 we can see that from the point of view of the return on equity indicator, the sector with the highest percentage is the Electronics-Semiconductor sector (57.3%), closely followed by the Computer Software-Desktop sector (55%). What we can conclude is that the ESG score related to the Electronics-Semiconductor industry recorded a high value of (70.60), therefore there is a direct relationship between the ESG score and ROE.

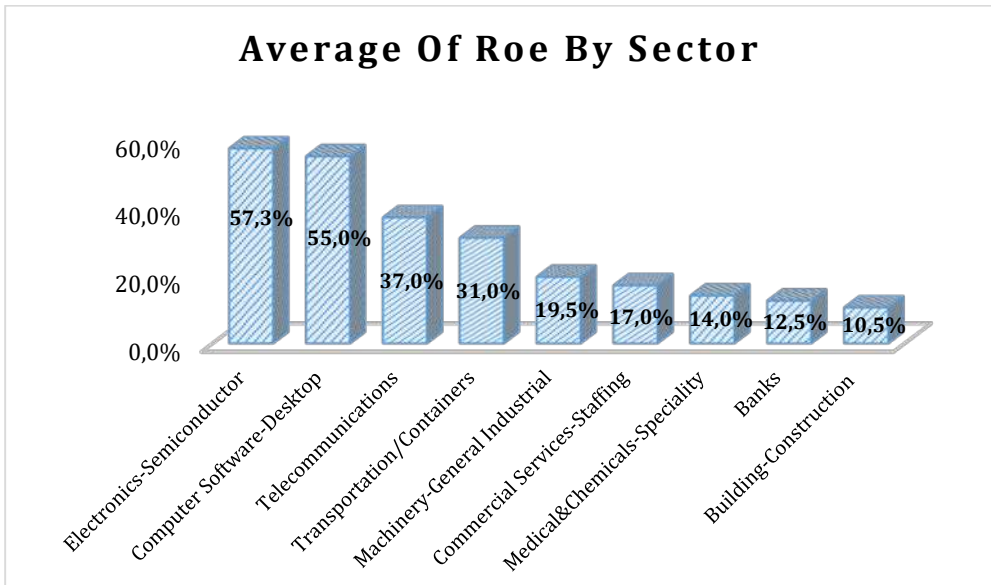


Figure 2. Average of ROE by each industry

To be able to answer the question "In what way does the adoption of E.S.G. requirements influence financial performance?" the collected data will be entered into the panel and then with the help of the EViews software we will check with the help of Granger causality if there is an influence in the data.

First, we test the data series to be stationary and then we will test if there is a causal relationship between the ESG score and EBITDA, and the results will be tested for lags 2-6. To observe whether or not the series is stationary, we will use the well-known Augmented Dickey-Fuller stationarity test on the 3 variables used in this work: ESG score, EBITDA, and ROE.

The results in the table below show that the data series are stationary, registering probabilities lower than 0.05.

Table 3. ADF test (Source:Own representation EViews10)

NULL HYPOTHESIS: ESG_SCORE HAS A UNIT ROOT		T-STATISTIC	PROB.*
AUGMENTED DICKEY-FULLER TEST STATISTIC		-4.867272	0.0009
TEST CRITICAL VALUES:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	
NULL HYPOTHESIS: EBITDA HAS A UNIT ROOT			0.0001
AUGMENTED DICKEY-FULLER TEST STATISTIC		-5.798559	
TEST CRITICAL VALUES:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	
NULL HYPOTHESIS: ROE HAS A UNIT ROOT		-4.989025	0.0006
AUGMENTED DICKEY-FULLER TEST STATISTIC		-3.769597	
TEST CRITICAL VALUES:	1% level	-3.004861	
	5% level	-3.004861	
	10% level	-2.642242	

As can be seen, there is no causal relationship between EBITDA and the ESG score. There would have been a possible influence from EBITDA to the ESG score if the probability from lag 4 and lag 6 had not exceeded the threshold of 0.05.

Table 4. Granger Causality Test EBITDA-ESG
(Source: Own representation EViews10)

PAIRWISE GRANGER CAUSALITY TESTS		F-STATISTIC	PROB.
LAGS: 2	EBITDA does not Granger Cause ESG_SCORE	1.95191	0.1744
	ESG_SCORE does not Granger Cause EBITDA	0.38595	0.6860
LAGS: 3	EBITDA does not Granger Cause ESG_SCORE	1.08411	0.3903
	ESG_SCORE does not Granger Cause EBITDA	0.30702	0.8199
LAGS: 4	EBITDA does not Granger Cause ESG_SCORE	2.76412	0.0876
	ESG_SCORE does not Granger Cause EBITDA	0.58923	0.6781
LAGS: 5	EBITDA does not Granger Cause ESG_SCORE	3.04126	0.0897
	ESG_SCORE does not Granger Cause EBITDA	2.76783	0.1085
LAGS: 6	EBITDA does not Granger Cause ESG_SCORE	2.48940	0.1983
	ESG_SCORE does not Granger Cause EBITDA	1.60333	0.3372

Table 5. Granger Causality Test ROE-ESG
(Source: Own representation EViews10)

PAIRWISE GRANGER CAUSALITY TESTS		F-STATISTIC	PROB.
LAGS: 2	ROE does not Granger Cause ESG_SCORE	0.27326	0.7644
	ESG_SCORE does not Granger Cause ROE	1.25160	0.3126
LAGS: 3	ROE does not Granger Cause ESG_SCORE	1.56465	0.2454
	ESG_SCORE does not Granger Cause ROE	1.02686	0.4128
LAGS: 4	ROE does not Granger Cause ESG_SCORE	3.60883	0.0454
	ESG_SCORE does not Granger Cause ROE	1.05606	0.4267
LAGS: 5	ROE does not Granger Cause ESG_SCORE	14.6082	0.0014
	ESG_SCORE does not Granger Cause ROE	2.95921	0.0949
LAGS: 6	ROE does not Granger Cause ESG_SCORE	9.62904	0.0230
	ESG_SCORE does not Granger Cause ROE	1.80989	0.2945

According to the results obtained after the Granger causality test, it can be seen that starting from Lag 4 and up to Lag 6, the hypothesis that ROE does not influence the ESG score ("ROE does not Granger Cause ESG_SCORE") is rejected because the probabilities do not exceed the threshold of 0.05. Therefore, it can be concluded that the Granger causality test shows an influence from ROE to ESG scores and not vice versa.

From the results obtained, we can say that they are in accordance with expectations because we can see that from a certain Lag, there is a causal relationship between ROE to ESG scores, which once again denotes that between the two variables, there is a relationship of positive and direct influence as we could see right from figure 2. Therefore, the answer to the question from which we started in this paper, namely "In what way does the adoption of ESG requirements influence financial performance?" is that

indeed the adoption of these requirements is beneficial to companies, especially when the ROE has a high percentage and the ESG score is high, fact demonstrated by the Granger Causality test.

Conclusions

From a theoretical and applied point of view, the paper addresses a new topic and leads to a more accurate understanding of the correlation between financial indicators and ESG performance in the banking system and companies

The article contributes to the literature in the field by further researching ESGs, but also by observing the fact that the number of companies that adopt ESG norms have an increase in their financial position, a fact that makes them a better potential client for financial institutions (banks in particular), as well as for their partners.

It also offers a new perspective to approach how environmental, social, and corporate governance factors influence the creditworthiness of a potential client or business partner.

The correlation between certain company indicators and ESG performance in the banking system leads me to study and analyze them in the future in Romania as well.

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CLOUD-BASED ACCOUNTING SERVICES-MARKET ANALYSIS AND PROSPECTS FOR THE FUTURE IN ROMANIA

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Abstract. *The purpose of this paper is to briefly clarify notions such as “cloud computing” and “cloud accounting”, stressing the pros and cons of these technologies, based on the state of the art on the topic, as reflected by the scientific literature, and to analyze the present state of such kind of services in Romania. The research method is the literature analysis, focusing on current issues related to online accounting services based on cloud technology, followed by local market analysis and a survey in which accountants and managers activating in Romania have expressed their views on cloud accounting. The study reveals that, although most companies in Romania keep accounting in the classic system, especially by using specialized software licenses installed on computers, managers and accountants would like to adopt cloud accounting. Respondents consider that the new technology certainly has big pros: accounting data can be accessed from anywhere (32%), it is more advantageous from an economic point of view (23%), cloud clients benefit from the emerging technologies integrated by the cloud services provider, such as artificial intelligence, chat robots, blockchain and Internet of Things (19%). Respondents also have some fears, especially related to: data security risk (38%), monthly subscription costs (24%), risk of disappearance or bankruptcy of the provider (21%), and others. Most respondents are certain of the fact that particularly small companies will change the way they work, because they have better chances related to data security by contracting cloud accounting-based services, due to the fact that they offer at a convenient price, as a rule, access control, user authentication, and strong data encryption. Respondents stressed that cloud accounting supports remote work, which is gaining more followers, and favors outsourcing accounting services. Furthermore, the investment to purchase licenses, servers, and other equipment for the IT infrastructure can be very expensive, and choosing a solution based on “cloud” technology can reduce these costs. The adoption of cloud-type technology represents an element of novelty in the local market, but there are already specialized companies accredited by CECCAR (The Body of Expert and Licensed Accountants of Romania) that offer such kinds of services. The transition to cloud accounting requires not only a different organization of the financial accounting function, but also a different mentality, which favors remote work. For many managers, cloud accounting means reliability, scalability, and better control of financial data. For others, data security risks are a matter of concern. Romania has allocated funds through the National Recovery and Resilience Plan of Romania, for the digital transformation component worth 1.8 billion euros, which mostly targets the digitization of large public services, but also investments in the digitization of the business environment.*

Keywords: *cloud computing; cloud accounting; SaaS; PaaS; artificial intelligence; digitization.*

Introduction

The fourth industrial revolution, with which we are contemporaneous, is driven by four factors, namely the rise in the amount of data, computing power, and connectivity. Today's economic environment is characterized by the development of business analytics, capacity, and level of intelligence, new correlations between machines and people emerging, and the rise of digital transfer instructions to the physical world, such as three-dimensional printing and robotics (Mujiono, 2021).

In the past, accounting was done with pencil on paper, then with the help of a computer and accounting software installed on the workstation. Today technology offers much more efficient ways of management by automating many processes. There are primary accounting programs for preparing invoices, receipts, statements, cash registers, etc. These supporting documents are usually issued internally and then registered, according to the law, in the financial and management accounting by the employed accountant (full-time or part-time) or by the accounting firm accredited by a professional body (in the case of Romania, by to the Corps of Certified Accountants and Certified Accountants, according to Government Ordinance No. 65/1994 on the organization of accounting expertise and certified accountants, republished, with subsequent amendments and additions).

Companies are increasingly turning to online accounting services based on cloud technology, which offer solutions that fundamentally change the dynamics of the accountant-entrepreneur relationship.

Cloud computing is the most fashionable term in the IT world today. Its definition is not unanimous, but several versions exist in the new age of information technologies. Cloud computing is a computer organization system that enables on-demand, ubiquitous, convenient network access to a shared pool of configurable computing resources (eg, networks, servers, storage, applications, and services) that can be quickly provisioned with minimal management effort or interaction with the service provider. Cloud computing can be likened to an electric grid to which people connect and pay according to their electricity consumption.

In 1997, Chellappa first coined the term "Cloud Computing" (CC) in his speech at the INFORMS annual meeting (Chellappa, 2017).

The challenges associated with CC are currently diverse, such as: reliability, service and data availability, security, complexity, limited customization, and cost of service.

The traditional model involves purchasing hardware solutions, applications, and software licenses. They are protected by their own firewall, and the company gains control over the intellectual property (IP). On the other hand, the cloud model implies access rights only for the software application, the technology solutions being protected by the cloud service provider's firewall, which also retains control over the IP. Therefore, traditional applications, including accounting software, are difficult to manage and expensive for small businesses. They need servers, physical spaces, networks, bandwidth, storage capacities, security services, and specialized personnel to install and configure them. With "cloud computing", managing a business becomes

much easier, because entrepreneurs can log in to a data center where these applications are stored and benefit from automatic, high-performance upgrading.

Cloud technology facilitates entrepreneurs' access to an online accounting platform based on a subscription. The services are available 24/7 from any device connected to the Internet (laptop, smartphone, tablet, PC, etc.).

Architecture of Cloud Computing is complex, and it can be classified as follows:

1. The Service Models-Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS)

2. The Deployment Models- Public Cloud, Private cloud, Community Cloud, and Hybrid Cloud (Darwish, Yafi, Almasri, Zuhairi, 2018).

SaaS - "software as a service" contracts are used for accounting services. Specific to these types of contracts is that the company concludes contracts for services and does not intend to purchase or lease software assets. This is because, in a cloud-based environment, the SaaS contract provides the right to receive access to the cloud service provider's application software, rather than a license of IP (e.g. source code control).

Common examples of Cloud Accounting Software include: Cloud Elements, IBM App Connect, IFTTT, and Zapier (Byron, Kelly, 2020).

Despite the many advantages associated with cloud computing, many vulnerabilities and challenges are associated with security and privacy in the cloud—data breaches, loss of control, unauthorized uses, etc. Therefore, one of the main reasons cloud accounting software is not yet widely used is users' fear of the threat to data security.

A cloud provider's customer management interfaces are usually accessible via the Internet, representing a high-security risk, especially when combined with remote access technologies or policies, in addition to the typical vulnerabilities of the web browsers.

Unauthorized access, when someone gains logical or physical access without permission to a network, system, application, data, or other resource is a risk arising from allowing third-party organizations to manage an individual's data and the user is not in full control. Legal complexity impacts cloud computing where data is stored. The advantages of cloud computing—its ability to scale rapidly, store data remotely and share services in a dynamic environment—can become disadvantages in maintaining a level of assurance sufficient to sustain confidence in potential customers (Pearson, 2013).

Stipic and Vicic researched why many accountants are still reluctant to adopt cloud accounting. The research results showed a significant correlation between resistance to cloud accounting and fear of new technologies, as well as resistance to cloud accounting and fear of a lack of complete control over accounting data. While resistance to cloud accounting is not significantly related to the age structure of accountants (Stipic & Vicic, 2022).

Cloud technology is also characterized by scalability (the property that shows the ability of an application to correctly support a larger volume of data)-for an application running on the company's servers, the increase in the volume of activity above a certain level can cause significant additional investments in equipment hardware and software. This technology allows the management of a larger volume of data by supplementing the demand for cloud services with a minimal additional cost, as clients only pay for what they use.

The current business environment is an extremely dynamic one. Therefore, access to information, the speed of their transmission, the speed of decision-making, and mobility, are extremely important in order to be able to remain competitive. Since information technology has evolved extremely fast, the decision to change accounting software is important and can have a major impact on the business. The solution of replacing accounting software with cloud accounting services can be taken if:

- the company uses several non-integrated software applications, or the current software is outdated, because there is a high risk of errors and additional costs;
- the manager does not have access to information directly from the application, these being received late, with the risk of making erroneous decisions;
- the manager is always on the move and mainly uses a smartphone or a tablet, since a cloud accounting application can be accessed online from anywhere, whereas with classic accounting applications, this is impossible;
- the business is carried out in several geographical areas or includes various fields of activity.

Accountants can also have clear advantages in the "cloud accounting" system. In the classic system, customers use an online or installed invoicing program, send the invoices by e-mail, or deliver them personally, printed on paper. In the "cloud accounting" system, the client issues invoices directly in the online application, and the accountant views all their documents in real-time and can make accounting records per the law. Also, the client can attach scanned documents to the system, which the accountant can view and record in the General Ledger. This way, time can be saved, and the accountant can fill out the tax returns and the month's closing more relaxedly, without fear of exceeding the deadlines.

The existing mainstream accounting cloud service network density is very low, which significantly impacts the integration of accounting cloud services. Accounting cloud services should make every effort to optimize the network density, have greater density and shorter path length, and improve integration and reliability (Chen, Guang, Hua, 2021).

Resistance to change, organizational culture, price, cyber security, and data protection related to accounting data are the main barriers to digital transformation in accounting. Automating routine tasks and reducing errors frees up time for accountants to provide higher value-added services and eliminate paper (Gonçalves, Silva, Ferreira, 2022). Although the security of data stored in the "cloud" is often presented as a weak point of this technology, in reality, things are different, the companies that offer "cloud" services have implemented strict procedures and rules for data security, but in practice, it can happen interruptions or unauthorized access. The advantages are great, especially for small and medium-sized companies. For large companies, the decision to change the

current software or ERP solution with cloud technology must be well considered, because it involves both benefits and risks that can be largely mitigated.

Regarding cloud computing in auditing, the studies show that firms often opt for hybrid or private solutions instead of the cloud, even though cloud computing technology is perceived as a strong support point, because privacy must come first to information security. Cloud security could be better than traditional IT systems, especially for providers audited by companies with a good reputation (Yigitbasioglu, 2015).

The EU prioritizes digitization through the Digital Europe Program, which, until 2027, will finance projects in five areas, each with its own indicative budget:

-high performance computing: EUR 2,226,914,000;

-artificial intelligence: EUR 2,061,956,000;

-cyber security and trust: EUR 1 649 566 000;

-advanced digital skills: EUR 577,347,000;

-implementation, optimal use of digital capabilities and interoperability: EUR 1 072 217 000 (EU Council Press Release, 2021).

Market Analysis Of Cloud-Based Accounting Services in Romania

In 2021, 42% of EU enterprises used cloud computing. This is a 6-percentage point (pp) increase since 2020 (36%), and more than double the share in 2016 (19%). Cloud computing most commonly is used in the Nordic Member States, the highest shares were reported in Sweden, Finland (both at 75%), and Denmark (65%) in 2021. Of the companies that chose such services, 79% opted for a cloud solution for hosting email systems, 68% used the cloud for data storage, 61% used it for office software (such as word processors and spreadsheets) and 59% to host their database.

In addition, these businesses also used the cloud to access more advanced software applications such as financial management or accounting (48%). So, less than half of the companies currently use cloud technology for accounting purposes (Eurostat, 2021).

Romania has the second lowest percentage of companies using, at 14%, down from last year and well below the EU average (42%).

Notwithstanding high-speed internet at reasonable prices, the percentage of companies in Romania that chose to host resources on rented servers (cloud), instead of using their own IT infrastructure, decreased to 14% from 16% last year.

The pandemic has contributed to accelerating the digital transformation in the business environment in the EU and Romania, an aspect that presupposed the creation of an IT infrastructure that allows the integration of the various software solutions that companies adopt, aimed at amplifying their strategic plans. Digital transformation, including in the field of bookkeeping, is necessary, which requires investment budgets in this regard and partnership with experts to help in the implementation process.

Until recently, in Romania, the accounting software market remained in the 90s, dominated by classic accounting programs, intended to be installed in a computer's memory. Online accounting services have become more popular lately, because they are based on cloud technology. The relationship between the accountant and the entrepreneur becomes a prompter and more well-organized one. End users just take a picture or scan supporting documents and upload them to the platform. Further, they will be processed and recorded in accounting.

Saga accounting program is one of the most used in Romania (almost half of the users of accounting softs have a Saga license running on their computers) and is particularly useful for medium and small companies with several employees that operate with lei, but also with other currencies. The Saga program has several important advantages: good quality/price ratio, intuitive interface, easy to learn, real-time updating of legislative changes, can be used to keep the accounting records of several companies and by several users, allows simultaneous access to the same program options.

Another popular choice of Romanian accountants is Winmentor accounting software, compatible with the Windows operating system. The programs offered are customized according to the specific needs of each field. This accounting program can be adapted to the specifics of the activity carried out by the company, it contains the necessary modules to have control over the growth attributes: management, salaries, production, and cash registers, it allows simultaneous access to the database of a large number of users, regardless of location, provided you have an internet connection, even of low speed. Also, the program ensures the interconnectivity of the modules and the application's connectivity with management peripherals (cash registers, barcode readers, electronic scales, data collection terminals, etc.)

Ciel was among the first companies that started to sell accounting software produced in Romania, 30 years ago, so, it still has many clients. It has two product variants, the standard for small and medium-sized companies, and the professional for accounting firms or large companies. The applications can be customized and the company provides consultancy in this regard.

SAP is one of the most complex ERP programs, integrating accounting, logistics, and personnel. It is not an easy program to use, so prior training is needed.

Other software products Romanian accountants use are: Nexus, D-Soft, Tigris, SmartBill Conta, Charisma, Neomanager, Asis, Navision, Omikont, Softpro, Contaflux, Wizcount, Iscala, Dynamics AX, Freeform Contab, Diel, ContabSQL, Clarvision, Softimel, etc.

Most software developers prefer older technologies, but they are preparing new versions, which will likely use cloud accounting, as users begin to trust this new way of keeping accounts.

Not only private entities need digital transformation, but also public entities need it, especially because a priority of the public sector is the managerial internal control based on a set of policies in order to provide reasonable assurance for: achieving the objectives of the public entity in an economical, efficient and effective way. The quality of accounting documents and the timely production of reliable information, related to the financial and management segment are crucial for any public entity.

The implementation of a cloud-type infrastructure in the public sector is a priority assumed by the Government of Romania determined by the COVID-19 pandemic, and by the need to exchange data in electronic format in the public sector, absolutely necessary for the improvement of public services dedicated to citizens and for the efficiency of related expenses computer systems and networks.

Romania has allocated funds through the National Recovery and Resilience Plan of Romania, for the digital transformation component worth 1.8 billion euros, which

mostly targets the digitization of large public services, but also investments in the digitization of the business environment.

The Romanian Government has recently concluded that cloud technology is increasingly used by authorities and public institutions in the member states of the European Union, as a result of the technical and economic advantages regarding data processing and storage, as well as the availability of services, advantages that result in the generation of substantial savings in terms of investments and operational expenses. That is why the Government of Romania adopted Emergency Ordinance No. 89 of June 27, 2022 regarding the establishment, administration, and development of infrastructures and cloud IT services used by public authorities and institutions, published in the Official Gazette no. 638 of June 28, 2022.

The Romanian Government has appointed three main actors for creating, maintaining, and managing the government cloud: the Authority for the Digitization of Romania, in collaboration with the Special Telecommunications Service and the Romanian Information Service. The so-called "Government Cloud" would provide the necessary infrastructure for state institutions to digitize their activity and relationship with the public.

Research methodology

The research method is the literature analysis, focusing on current issues related to online accounting services based on cloud technology, followed by market analysis and a survey in which accountants and managers activating in Romania have expressed their views on cloud accounting matters. As such, the quantitative-qualitative method is used, by applying the questionnaire as a specific tool in the data collection process. The research includes questions with multiple choice answers, but also open-ended questions, which inquired for personal opinions on those questions. The data collection and interpretation were performed automatically and securely, the online questionnaire being applied between June 20-30, 2022, and 119 responses were collected.

Research Questions. Result and Discussions

The first interrogation of the questionnaire was: "What are the pros of adopting cloud accounting?"

The answers, and the respective percentages were the following:

- a) accounting data can be accessed from anywhere (32%);
- b) it is more advantageous from an economic point of view (23%);
- c) cloud clients benefit from the emerging technologies integrated by the cloud services provider, such as artificial intelligence, chat robots, blockchain and Internet of Things (19%);
- d) more efficient operational management, a clearer and updated vision of the business performance (15%);
- e) storage of information in the cloud offers an almost unlimited storage capacity, with the possibility of backup and recovery (11%).

The second question asked in the survey was: "What are the cons of adopting cloud accounting?"

- a) data security risk, as the client gives access to all sensitive company information to a cloud computing service provider (38%);
- b) monthly subscription costs (24%);
- c) risk of disappearance or bankruptcy of the provider (21%);
- d) lack of support, because sometimes cloud computing companies fail to provide adequate support, they depend on the frequent asked question menu or online help (11%);
- e) the risk of not being able to access one's own data in case of network and connectivity problems. (6 %).

The survey also contained open-ended questions to identify why cloud accounting is not widely adopted in Romania. Thus, in this third question, respondents indicated: the fear related to the lack of data security, the resistance to change, the recent appearance of this kind of service on the local market, and the fact that at the moment, in Romania there is no law regulating very clearly cloud computing, but only regulations in the field of personal data protection. Also, the respondents mentioned that managers are reluctant to contract cloud accounting-based services, because in Romania companies still prefer to hire their own accountants rather than outsource the service to specialized companies. In addition, many providers offer packages that require regular payments. For some packages, cloud accounting is more expensive in the long term, so doing a cost/benefit analysis before purchasing the respective services is good. Many cloud storage service providers limit their users' bandwidth usage. So, if the firm exceeds the given allowance, the additional fees could be significantly expensive.

The last question answered by the respondents was: "Do you think that in the next three years, Romanian companies will prefer the large-scale adoption of cloud accounting or will remain faithful to classic technologies?" Most respondents answered in a positive way, and argued that especially small companies will change the way they work, because they have better chances related to data security by contracting cloud accounting-based services, due to the fact that they offer at a convenient price, as a rule, access control, user authentication, and strong data encryption. Respondents stressed that cloud accounting supports remote work, which is gaining more followers and favors outsourcing accounting services. Moreover, the investment to purchase licenses, servers, and other equipment for the IT infrastructure can be very expensive, and choosing a solution based on "cloud" technology can reduce these costs. Additionally, the responsibility for the optimal functioning of the applications rests entirely with the "cloud" service provider company, therefore, entrepreneurs no longer have to allocate financial, time, and human resources for server administration, updates, upgrades, and backup. The money saved can be used for business development.

Limits of research

The research limits are related to the small number of respondents and the newness of the topic, so some of the respondents may not have enough knowledge related to cloud accounting matters.

Conclusions and recommendations

Currently, most companies in Romania keep accounting in the classic system, especially by using a specialized software license installed on the hardware. The adoption of cloud-

type technology represents an element of novelty in the local market, but there are already specialized companies accredited by CECCAR (The Body of Expert and Licensed Accountants of Romania) that offer services in the new way of working. The transition to cloud accounting requires not only a different organization of the financial accounting function, but also a different mentality, which favors remote work. For many managers, cloud accounting means reliability, scalability, and better control of financial data. For others, data security risks are a matter of concern. Romania has allocated funds through the National Recovery and Resilience Plan of Romania, for the digital transformation component worth 1.8 billion euros, which mostly targets the digitization of large public services, but also investments in the digitization of the business environment.

The future of accounting and business advisory services is, most likely, including in Romania, the "paperless" technology, through cloud accounting, a tool that entrepreneurs can access anytime and anywhere to information about their businesses. Gradually, cloud applications gain ground in favor of applications that run on their own servers. The advantages of cloud technology are numerous: it requires minimal investments in hardware equipment, short implementation time, and maintenance provided by the supplier, without additional costs. "Cloud" technology offers mobility and independence, data and applications can be accessed from anywhere there is internet access.

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THE GLOBAL EVOLUTION OF THE EXCHANGE RATE IN THE LAST DECADE

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Abstract. *During this period, the capital markets are dealing with the serious effects caused by the Coronavirus pandemic and the ongoing war between Russia and Ukraine. Against the background of these problems, the volatility of the stock market indices is also affected by unfortunate events and starting from the fact that investors want to maximize their profits as quickly as possible and obtain the highest income possible, resorting to the method of speculation on the currencies of other countries, we chose to analyze the exchange rates. Using the variations of the exchange rates in which we chose the euro as the base currency and forming pairs with the following currencies: the Romanian leu, the Swiss franc, the US dollar, and the pound sterling, we followed the influence between these currency pairs, as well as the impact of a stock market index on them, using different statistical and econometric tests. The tests of stationarity, multicollinearity, and homoscedasticity, preceding and applied to multiple regressions, show that the data series used are statistically significant, do not suspect the presence of multicollinearity, and do not respect the presence of the hypothesis of homoscedasticity. The multiple regressions performed on the analyzed exchange rates indicate the existence of direct influence relationships in certain cases and indirect relationships, and from the results of the econometric tests applied to these regressions, we concluded that the quality of the regression model was not damaged. Considering the recent fluctuations of the euro and the US dollar, we made a forecast of this currency pair through the various econometric methodologies using the autoregressive integrated moving average model, trying to estimate, and forecast the evolution of this pair in the next period.*

Keywords: *currency pairs; homoscedasticity; multiple regression; multicollinearity; stationarity*

Introduction

In recent years, the global economy has been facing unprecedented situations, considering the Coronavirus pandemic and Russia's shocking invasion of Ukraine, resulting in a sudden increase in world prices for key commodities, especially fuel, and food, which have accelerated concerns about the security of energy and food supplies around the world. In these conditions, Russia's military aggression against Ukraine, which occurred at a time when the Coronavirus pandemic still had an impact on the economy, became an obstacle that will slow down the growth of the global economy and increase inflation, which, from a macroeconomic point of view, it's already largely seen in commodity markets. The European Union, thanks to the common agricultural policy, is largely self-sufficient, with a single market that demonstrates its role in absorbing shocks and ensuring food security for its citizens, guaranteeing income support for farmers. However, the reduction in imports of corn, wheat, oil, rapeseed, and sunflower from Ukraine strongly impacts feed prices and the food industry, with higher food prices and inflationary trends. The growth of the global economy, the GDP, is linked to the sudden increase in energy prices, prices that have increased since the middle of last year, culminating with the increase in fuel prices and with Russia's decision to suspend deliveries and cut off gas supplies to several member states of the European Union after Russia's unprovoked and unjustified aggression against Ukraine.

The present paper wants to reflect on the economic impact produced by the ongoing Coronavirus pandemic and the armed conflict between the two countries, which led to areas of currency volatility. The Russian ruble is hitting all-time highs, even if the Russian stock market was closed for almost a month after February 25, 2022, while Eurozone currencies have become more exposed to risk, as the euro against other foreign exchange reserves have become more exposed to volatility, given the eurozone's dependence on Russian energy sources. The paper aims to show the role and performance in the current conditions of three currencies: the Romanian RON, the Swiss franc, the American dollar, and the British pound, chosen to quote with the same base currency, the euro. The American dollar, the reserve currency of the world, used in most international transactions, has seen a spectacular increase lately in conditions where inflation fears are growing, and the economy is showing signs of slowing down, just like the Swiss franc, whose value is increasing, unlike the euro currency which feels the pressure on the European economies due to the armed conflict between Russia and Ukraine, a conflict which pushes the currencies of the eurozone down. However, currency markets are extremely difficult to predict, so it is difficult to say whether these currencies will continue to rise or fall soon. The exchange rates for the analysis carried out in this paper were: EUR/RON, EUR/CHF, EUR/USD, and EUR/GBP, which were made following the daily observations (5 days/week) from 02 January 2012 – 30 August 2022, with a total number of 2782 observations.

Literature review

Following the vast specialized literature in the field, one of the important papers used for this study was that of Edwards (2006), which shows the differences between the countries that are controlling their economy mostly through monetary policies compared to those that have an inflation targeting plan. The paper aimed to illustrate that the exchange rate plays an important role in the inflation targeting mechanism.

Hacker et al. (2010) started from what Fisher demonstrated in his work from 1930, namely that there is a positive relationship between the interest rate and inflation. The authors aimed to find a relationship between the exchange rate and the difference between the domestic interest rate and the foreign interest rate and concluded that there is a negative relationship in the short term. Numerous papers deal with the same topic, as the paper by Abdurehman and Hacilar (2016), shows a strong relationship between the exchange rate and inflation. Using models such as GARCH, the authors concluded that there is a strong relationship between the two elements and that the purchasing power parity in Turkey is non-existent due to laws and transaction costs. Leiva-Leon et al. (2020) show the importance of the exchange rate (mainly the EUR and USD), which turns into a price that reacts to every news or new information on the market. The authors demonstrated that, in countries that are guided by certain monetary policies for controlling interest rates, the governments have a high influence on the yield of the financial asset of an economy, but also a risk from the point of view of sudden changes in the exchange rate that are very difficult to predict. Olamide et al. (2022) observed, mainly in countries with economies that are still developing, that the fluctuation of the exchange rate and of the GDP represents an impediment in the development of the economy. The authors concluded that there is a direct relationship between inflation and the exchange rate.

Bruno et al. (2022) showed the influence of the exchange rate variation on the existing financial conditions in a certain country. Thus, in their paper, the authors investigate, taking into account the weighted index of the American dollar according to trade, how the returns of the stock market produce changes at the level of exchange rates. The authors' results showed that introducing a new indicator that represents the ratio between the shares with values expressed in USD and the returns on shares expressed in a certain country's currency will exceed the value of 1. The weighted index of the dollar becomes an important factor in determining stock returns. The sensitivity of stock returns to variations in the weighted dollar index shows that investors are determined to bear the risk from the exchange rate because they expect high stock returns.

Liao et al. (2019) developed a network of exchange rate correlations, i.e. the "Spanning Tree" method, which promotes communication, cooperation, and commercial exchange at the global level. In their paper, it is specified that there are both favorable and unfavorable effects from the depreciation of the exchange rate, considering that, on the one hand, it can lead to an improvement in exports, but, at the same time, it can also cause an increase in import prices, which leads to an increase in inflation. The authors came to the conclusion that certain countries, mainly those from the Eastern region of Europe, play an important role in propagating exchange rate risks.

Zhu et al. (2022) illustrated, in parallel, the evolution and influence between exports and exchange rates from Asian countries over a period of 35 years. The authors presented the relationship between exports of goods and services and exchange rates. The results showed that the more undervalued a country's currency is, the more exports are stimulated, resulting in a favorable impact that leads to economic growth. The authors mentioned that a balanced policy can improve the connection between exchange rates, exports, and economic growth.

Long Vo and Hong Vo (2022) illustrate the major importance of exchange rate variations on the imports and exports of the studied countries. The authors concluded that

arbitrageurs have a very strong effect on the correlation between the exchange rate and price by redistributing resources, which eliminates distortions created by long-term variations in exchange values.

Cuestas et al. (2022) contributed through their study to determine the real exchange rate by using models with structural and non-linear breaks. Their paper concluded that the models were different before and after the 2008 crisis, affecting the results of the long-term equations for countries like Cyprus and Malta, while the estimated coefficients for Central and Eastern Europe were different. Gründler et al. (2022) studied the nominal exchange rate of US monetary policy. The authors pointed out that, in the case of a monetary policy shock, the exchange rate appreciates much faster and stronger than in the case of an impact of new information appearing on the market about interest rates and share prices. In conclusion, they've shown that, although the short-term effects on the exchange rate are primarily due to monetary policy shocks, it is determined by informational effects in the medium term. Yilmazkuday (2022), by using a VAR (vector autoregressive) model applied to the exchange rates of the monetary policy, studied the spillover effects of US monetary policy on some emerging markets and some advanced economies in the pre-pandemic period and in the pandemic. The study's results suggested that the propagation effects were effective before the pandemic, but during the pandemic, they had an effect only for certain countries. Lilley et al. (2022) studied the impact of exchange rates over a series of economic variables, before and after the financial crisis from 2008. The authors concluded that, after 2008's financial crisis, the role of the US dollar as an international and safe-haven currency has surged.

Methodology

Following the specialized literature and observing that the financial markets are influenced by the exchange rates, as the price of the exchange rate reacts to any new information from the market, we wanted to show the role of the currency pairs collected and analyzed in the paper in regard to the economy. We've tested the hypotheses formulated on the linear regression model through a series of tests. Stationarity testing was performed using the Augmented Dickey-Fuller test characterized by the formula:

$$\Delta y_t = \alpha + \beta_t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t \quad 1)$$

The hypotheses of this test are: the null hypothesis (H_0), in which the series is not stationary and the alternative hypothesis (H_1), in which the series is stationary.

Testing the hypotheses formulated on the linear regression model involved testing the normality of errors (Jarque-Bera Test), testing the hypothesis of non-correlation of errors, testing the hypothesis of homoscedasticity, and testing the hypothesis regarding the lack of multicollinearity (Klein Criterion).

The Jarque-Bera test is characterized by the formula:

$$JB = \frac{n}{6} \left[S^2 + \frac{(k-3)^2}{4} \right] \quad 2)$$

having as hypotheses: (H_0): the series of residuals come from a normal distribution ($S = 0, K = 3$), where S is the coefficient for skewness, K for kurtosis and the alternative hypotheses (H_1): the series of residuals does not come from a normal distribution.

We've tested the hypothesis of non-correlation of errors using the Breusch-Godfrey test, whose equation is:

$$\hat{\varepsilon}_t = b_0 + b_1 \cdot t + \rho_1 \cdot \varepsilon_{t-1} + \rho_2 \cdot \varepsilon_{t-2} + u_t \quad 3)$$

with the hypotheses of the model being the null hypothesis (H_0): $\rho_1 = \rho_2 = 0$ (no autocorrelation exists) and the alternative hypothesis (H_1): $\rho_1 \neq 0$ or $\rho_2 \neq 0$ (autocorrelation exists).

We tested the hypothesis of homoscedasticity using the White test whose characteristic formula is:

$$\varepsilon_i^2 = b_0 + b_1 \cdot x_1 + b_2 \cdot x_1^2 + b_3 \cdot x_1 \cdot x_2 + b_4 \cdot x_2 + b_5 \cdot x_2^2 + u_i \quad 4)$$

and the hypotheses of this model are the null hypothesis (H_0) that attests the existence of homoscedasticity and the alternative hypothesis (H_1) that admits that, if there is a $b_i \neq 0$, then the phenomenon of heteroscedasticity is present.

The Klein criterion is very useful when the hypothesis regarding the lack of collinearity needs to be tested because it compares the correlation coefficients with R^2 of the regression. To see if the parameters used in this work are stable, we've used the Chow test, which involves dividing the initial data into several approximately equal sub-samples relative to the parameter t we chose. The hypotheses of this test are the null hypothesis (H_0), in which the parameters are stable, and the alternative hypothesis (H_1), in which the parameters are not stable.

Results and discussions

In carrying out this work, we've chosen the currencies: the Romanian leu (RON), the American dollar (USD), the Swiss franc (CHF), and the British pound (GBP) to be quoted with the same base currency, namely the euro (EUR). The pairs of exchange rates become as follows: EUR/RON, EUR/USD, EUR/CHF, and EUR/GBP with the currencies EUR, USD, and GBP particularly important, given the economic power of their respective country. The database collected from Investing.com includes daily observations (5 days/week) over a period of approximately 10 years (02 January 2012 - 30 August 2022), summing up a total number of observations of 2782 of observations. The data series used to represent the daily percentage variation of the exchange rates was calculated by using the formula:

$$\Delta(\%) = \ln\left(\frac{P_1}{P_0}\right) * 100 \quad 5)$$

In order to be able to see the influence of the variation of the currency pairs EUR/RON, EUR/USD and EUR/CHF on the variation of the EUR/GBP exchange rate, we performed a multiple regression where the endogenous (dependent) variable is EUR/GBP and the exogenous (independent) variables are the other pairs. It should be mentioned that the data series used is stationary, a fact tested using the Augmented Dickey-Fuller (ADF) stationarity test.

Table 1. Multiple regression (Source: Investing.com; processed in Eviews10)

Dependent Variable: EUR_GBP				
Method: Least Squares				
Sample: 1/02/2012 8/30/2022				
Included observations: 2782				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR_RON	0.111541	0.045811	2.434820	0.0150
EUR_CHF	0.052527	0.019140	2.744347	0.0061
EUR_USD	0.348527	0.018197	19.15302	0.0000
C	0.004218	0.008603	0.490241	0.6240
R-squared	0.134125	Mean dependent var		0.001108
Adjusted R-squared	0.133190	S.D. dependent var		0.487127
S.E. of regression	0.453528	Akaike info criterion		1.257916
Sum squared resid	571.3997	Schwarz criterion		1.266444
Log likelihood	-1745.761	Hannan-Quinn criter.		1.260995
F-statistic	143.4379	Durbin-Watson stat		1.931376
Prob(F-statistic)	0.000000			

The obtained results show that with an increase in the variation of the EUR/RON exchange rate by 1 unit, the variation of the EUR/GBP exchange rate will increase by 0.1115 units, while with an increase in the variation of the EUR/CHF exchange rate by 1 unit, the variation of the EUR/GBP exchange rate will increase by only 0.0525 units and with the same increase in the variation of the EUR/USD exchange rate, the variation of the EUR/GBP exchange rate will increase by 0.3485 units. Thus, we can state that the most visible influence on the variation of the EUR/GBP exchange rate is that of the EUR/USD exchange rate, followed by the EUR/RON variation.

From the point of view of the significance of the parameters, it can be observed that the probabilities of the three currency pairs: EUR/RON, EUR/USD and EUR/CHF present values that are below the accepted significance threshold of 0.05, which shows that the chosen parameters are statistically significant. The constant shows a probability that exceeds the threshold of 0.05, which shows that the free term is not representative of the chosen model, as it's statistically insignificant.

We have introduced a new variable into the model, the SPX stock index (S&P500) so that the EUR/GBP variable is influenced by the SPX (the data used has been calibrated) for which we've performed the stationarity test on the return of the SPX index and we've observed that the series is stationary. Analyzing the probabilities of the variables used in Table 2, we can note that we've obtained values below the 0.05 threshold, which means that they are stationary, apart from the EUR/RON currency pair and the free term. What can be observed from the obtained results is the presence of an indirect relationship between the EUR/GBP currency pair and the SPX, more precisely, when the stock index increases by one unit, the percentage variation of the EUR/GBP exchange rate will decrease by 0.0892 percentage points.

Table 2. Multiple regression – Index SPX (Source: Investing.com; processed in Eviews10)

Dependent Variable: EUR_GBP				
Method: Least Squares				
Sample: 1/03/2012 8/30/2022				
Included observations: 2683				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR_RON	0.054130	0.046082	1.174646	0.2402
EUR_CHF	0.072649	0.019246	3.774709	0.0002
EUR_USD	0.357027	0.018135	19.68740	0.0000
SPX	-0.089203	0.008231	-10.83771	0.0000
C	0.007304	0.008689	0.840656	0.4006
R-squared	0.171191	Mean dependent var	-0.000446	
Adjusted R-squared	0.169953	S.D. dependent var	0.493174	
S.E. of regression	0.449316	Akaike info criterion	1.239679	
Sum squared resid	540.6466	Schwarz criterion	1.250665	
Log likelihood	-1658.030	Hannan-Quinn criter.	1.243653	
F-statistic	138.2855	Durbin-Watson stat	1.977989	
Prob(F-statistic)	0.000000			

The Jarque-Bera test applied to the multiple regression shows a probability lower than 0.05, which means that the series of residuals does not come from a normal distribution. From the point of view of the skewness coefficient, a positive value different from 0 is observed, which shows a positive asymmetry to the right, and from the point of view of the flattening coefficient (kurtosis), a positive value greater than 3 is observed which shows that the series of residuals come from a leptokurtic distribution.

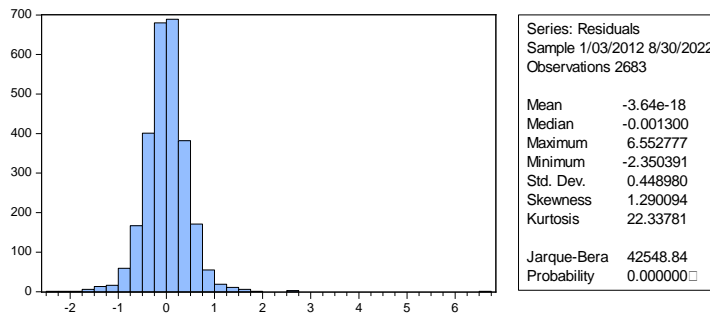


Figure 1- Testing for normality of errors (Jarque-Bera Test) (Source: processing in EViews 10)

Using the Breusch-Godfrey test we will verify the existence of autocorrelation of errors, and, after analyzing the results obtained in Table 3, explain the probabilities for

$RESID(-1)$ and $RESID(-2)$ that exceed the threshold of 0.05, we can conclude that there is no autocorrelation of order I or II in the data.

Table 3. Breusch-Godfrey Test (Source: processing in Eviews10)

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	1.446933	Prob. F (2,2676)	0.2355	
Obs*R-squared	2.898301	Prob. Chi-Square (2)	0.2348	
Test Equation:				
Dependent Variable: RESID				
Method: Least Squares				
Sample: 1/03/2012 8/30/2022				
Included observations: 2683				
Presample missing value lagged residuals set to zero.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR_RON	0.000189	0.046074	0.004108	0.9967
EUR_CHF	-0.000317	0.019246	-0.016457	0.9869
EUR_USD	-0.000977	0.018141	-0.053836	0.9571
SPX	0.000357	0.008248	0.043271	0.9655
C	-3.69E-05	0.008687	-0.004245	0.9966
RESID (-1)	0.011148	0.019370	0.575530	0.5650
RESID (-2)	-0.031078	0.019339	-1.607026	0.1082

To see if the homoscedasticity hypothesis is respected or not, we've performed the White test and, according to the results obtained in the table below, the homoscedasticity hypothesis is not respected, considering that the three probabilities: Prob. F (14.2668), Prob. Chi-Square (14) and Prob. Chi-Square (14) has a value of 0.0000, which does not exceed the allowed threshold of 0.05.

Table 4. White Test (Source: processing in Eviews10)

Heteroskedasticity Test: White				
F-statistic	32.23344	Prob. F (14,2668)	0.0000	
Obs*R-squared	388.1527	Prob. Chi-Square (14)	0.0000	
Scaled explained SS	4125.745	Prob. Chi-Square (14)	0.0000	
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Included observations: 2683				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.060533	0.019618	3.085598	0.0021
EUR_RON^2	-0.093586	0.148901	-0.628510	0.5297
EUR_RON*EUR_CHF	-0.559623	0.310448	-1.802628	0.0716
EUR_RON*EUR_USD	-1.093821	0.159059	-6.876829	0.0000
EUR_RON*SPX	-0.432385	0.098087	-4.408176	0.0000
EUR_RON	0.230593	0.089405	2.579190	0.0100
EUR_CHF^2	-0.024642	0.009066	-2.717944	0.0066
EUR_CHF*EUR_USD	0.150533	0.103457	1.455029	0.1458
EUR_CHF*SPX	0.129776	0.047384	2.738844	0.0062
EUR_CHF	-0.014495	0.059103	-0.245250	0.8063
EUR_USD^2	0.387457	0.040875	9.479018	0.0000
EUR_USD*SPX	0.189368	0.024635	7.686974	0.0000
EUR_USD	-0.150216	0.036101	-4.161040	0.0000
SPX^2	0.015699	0.003666	4.282556	0.0000
SPX	-0.016053	0.016296	-0.985092	0.3247
R-squared	0.144671	Mean dependent var	0.201508	
Adjusted R-squared	0.140183	S.D. dependent var	0.930998	
S.E. of regression	0.863280	Akaike info criterion	2.549420	
Sum squared resid	1988.334	Schwarz criterion	2.582376	
Log likelihood	-3405.047	Hannan-Quinn criter.	2.561342	
F-statistic	32.23344	Durbin-Watson stat	1.792472	
Prob(F-statistic)	0.000000			

Following the Klein Criterion, we've tested the hypothesis regarding the lack of multicollinearity and we can say, according to Table 5, that no correlation coefficient exceeds R-squared (0.134125) and, thus, the presence of multicollinearity is not suspected and the quality of the regression model is undamaged (the regression coefficients are precisely estimated).

**Table 5. Matrix of correlation coefficients for multiple regression
(Source: processing in Eviews10)**

	EUR RON	EUR CHF	EUR GBP	SPX
EUR RON	1.000000	-0.040459	0.040040	-0.119472
EUR CHF	-0.040459	1.000000	0.132204	0.1201410
EUR GBP	0.040040	0.132204	1.000000	-0.164881
SPX	-0.119472	0.120141	-0.164881	1.000000

We've applied the Chow test for parameter stabilization, which involves dividing the initial data into two or more approximately equal sub-samples with respect to the t parameter that we've chosen to be the date 13 July 2022. Considering that the three probabilities Prob. F (5.2673), Prob. Chi-Square (5) and Prob. Chi-Square (5) exceeded the 0.05 threshold, we must note that we've failed to reject the null hypothesis, so the parameters are stable.

Table 6. Chow Breakpoint Test (Source: processing in Eviews10)

Chow Breakpoint Test: 7/13/2022			
Null Hypothesis: No breaks at specified breakpoints			
Varying regressors: All equation variables			
F-statistic	0.360328	Prob. F (5,2673)	0.8758
Log likelihood ratio	1.807769	Prob. Chi-Square (5)	0.8751
Wald Statistic	1.801638	Prob. Chi-Square (5)	0.8759

The currency pair EUR/USD, with sudden changes closely related to the evolution of the war in Ukraine, brings to the financial market a massive increase of the dollar against the EURO world, the dollar exceeding the parity of the EURO currency in certain periods from August 2022. In order to be able to observe this evolution, we've collected the quarterly data of the EUR/USD exchange rate over a period of 20 years (01 January 2002 - 31 August 2022). We've studied for a longer period because we wanted to analyze the degree of the influence between the currency pairs and a forecast on the EUR/USD evolution, which will help us see its trend in the next period.

Through the Augmented Dickey-Fuller test, we noticed that the collected data series was not stationary, so we had to make it stationary by differentiating it to order I, so we've created a new series called D_EUR_USD and continued with the application of the Box-Jenkins methodology to determine the orders p and q of the process. The orders p and q are approximately determined based on the shape of the stationary series correlogram, according to Figure 2.

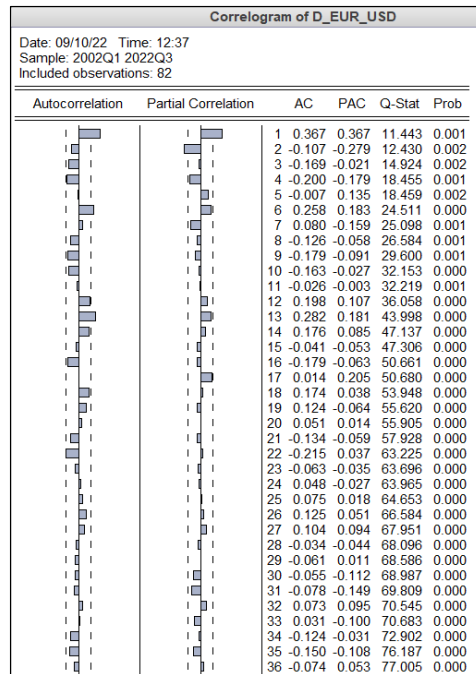


Figure 2-Correlogram D_EUR_USD
(Source: processing in EViews)

Based on the correlogram, we've identified several peaks, both for the autoregressive process and for the moving average, so we've tested $AR(p)$, $MA(q)$, and $ARIMA(p,d,q)$. After testing $AR(1)$, $MA(1)$, and $MA(4)$, we've concluded that the coefficients have lower probabilities than the accepted threshold of 0.05, which means that they are statistically significant, as we were able to deduce from the correlogram.

Table 7. ARIMA models (Source: processing in Eviews10)

Dependent Variable: D_EUR_USD						
Method: ARMA Maximum Likelihood (BFGS)						
Sample: 2002Q2 2022Q3						
Included observations: 82						
Model	variable	rob.	A IC crit.	B IC crit.	H Q crit.	R ²
ARIM A (1,1,4)	R (1)	.0008	-	-	-	.179223
ARIM A (1,1,4)	A (4)	.0464	3.213639	3.096238	3.166505	
ARIM A (1,1,2)	R (1)	.0000	-	-	-	.208445
ARIM A (1,1,2)	A (2)	.0046	3.250564	3.133163	3.203430	
ARIM A (3,1,3)	R (3)	.0001	-	-	-	.088925
ARIM A (3,1,3)	A (3)	.0196	3.108824	2.991423	3.061689	

The generation of forecasts using ARIMA processes is done to choose the best model, by comparing the criteria regarding the information contained, the most frequently used criteria being: Akaike Info Criterion (AIC), Schwarz criterion (BIC), Hannan-Quinn criterion (HQ). The results obtained in this case show that the best forecasting model is ARIMA (1,1,2).

The forecast through confidence intervals was made for the stationary series with the ARIMA process (1,1,2) respectively ARIMA (1,1,4) and we've identified a change in the exchange rate of 0.001954 respectively 0.001753 units over the entire analyzed period.

Table 8. ARIMA Forecast (Source: processing in Eviews10)

	AR1_M A2.forecast d_eur_ usdf	AR1_M A4.forecast d_eur_usdf	AR3_M A3.forecast d_eur_ usdf
eriod	Values	Values	Values
019Q3	0.0019 54	0.00175 3	0.00158 8
019Q4	0.0019 54	0.00175 3	0.00170 5
020Q1	0.0019 54	0.00175 3	0.00173 9
020Q2	0.0019 54	0.00175 3	0.00202 9
020Q3	0.0019 54	0.00175 3	0.00193 3
020Q4	0.0019 54	0.00175 3	0.00190 5
021Q1	0.0019 54	0.00175 3	0.00166 5
021Q2	0.0019 54	0.00175 3	0.00174 4
021Q3	0.0019 54	0.00175 3	0.00176 7
021Q4	0.0019 54	0.00175 3	0.00196 6
022Q1	0.0019 54	0.00175 3	0.00190 1
022Q2	0.0019 54	0.00175 3	0.00188 1
022Q3	0.0019 54	0.00175 3	0.00171 7

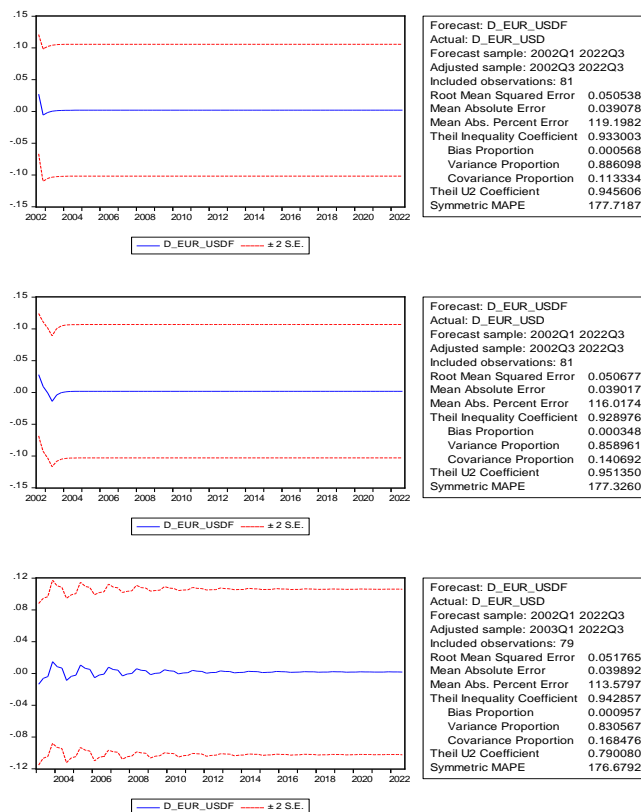


Figure 3-Forecast D_EUR_USD
(Source: processing in EViews)

The forecast was made on the stationary series with an ARIMA (3,1,3) process and we've identified a change in the exchange rate of 0.001588 units in the third quarter and 0.001705 units in the fourth quarter of 2019, 0.001739, 0.002029, 0.001933 and 0.001905 units for the four quarters of 2020. The four quarters of 2021 had changes of 0.001665, 0.001744, 0.001767, and 0.001966 units, but for 2022 we've observed a decrease in the exchange rate, as follows: a decrease of 0.001901 units in the first quarter, followed by a decrease of 0.001881 units in the second quarter and 0.001717 units for the period of July-August.

Conclusions

The multiple regression model used in this paper, which aimed to showcase the influence of the EUR/RON, EUR/CHF, and EUR/USD exchange rates on the dependent variable EUR/GBP, is valid and, from the results obtained, we can state that the most influential variation on the EUR/ GBP is that of the EUR/USD exchange rate, followed by the variation of the EUR/RON exchange rate. The only insignificant variable in the model was the free term (intercept) with a probability of 0.6240, which is normal because independent exchange rates can never be zero. After introducing an SPX stock index (S&P500 Index) into the model, we could conclude that with an increase in the SPX stock index by one unit, the percentage variation of the

EUR/GBP exchange rate would decrease by 0.089203 units. After testing the assumptions of the regression model, we've noticed that the series of residuals does not come from a normal distribution and there is no autocorrelation of errors of order I or II, the hypothesis of homoscedasticity is not respected, the presence of multicollinearity is not suspected and, thus, the quality of the regression model was not damaged.

The Chow test for parameter stabilization demonstrated no structural breaks in the model and the parameters are stable. By applying the Box-Jenkins methodology, we've estimated the coefficients through three autoregressive ARIMA models, namely: ARIMA (1,1,2), ARIMA (2,1,2), ARIMA (1,1,4) for the D_EUR_USD series and, by analyzing the three information criteria: Akaike info criterion, Schwarz criterion, and Hannan-Quinn criterion, we've concluded that the ARIMA model (1,1,2) is the model where the predicted values was the closest to the real values recorded. For the prediction and evolution of the exchange rate in the future, we can say, by observing the ARIMA (1,1,2) and ARIMA (1,1,4) models, that there is a constant increase of the rate by 0.001954 units in the case of the model ARIMA (1,1,2), respectively 0.001753 units in the case of the ARIMA (1,1,4) model, those increases perpetuating over a long period of time. We cannot say the same about the ARIMA (3,1,3) model, which shows, during the different quarters of the last years, how dynamic changes in the exchange rate occurred because of the coronavirus pandemic and the Russian invasion of Ukraine. The best example is the decrease in the change of the EUR/USD exchange rate starting with the first quarter of 2020 (where the beginning of the pandemic is reflected) and the first three quarters of 2022 (which shows the impact of the Russia-Ukraine war). According to the model and forecast, we can speculate that the EUR/USD pair will decrease with small changes followed by sudden increases, but this aspect remains to be studied in the future.

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4

Innovations and Organizational Resilience

THE IMPORTANCE OF DEVELOPING PLAYER'S PERSONAL SKILLS. A RESEARCH REGARDING THE ACTIVE BASKETBALL ORGANIZATIONS WITHIN THE ROMANIAN MEN' NATIONAL BASKETBALL LEAGUE

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Abstract. *Personal development is an aspect that has gained more and more importance in the last years in both business and sports organizations. Companies have been continuously investing in employee training programs in order to be able to further develop and reach the desired performance. In Basketball, however, we can find a lot of research about physical training and less about players' personal (soft skills) development. That is why, through this research, the author wanted to find out if the personal development of basketball players is considered by clubs that are active in the men's Romanian National Basketball League in the 2021 – 2022 season. Thus, the base of this research is a quantitative data analysis whose population consists of basketball coaches and management staff employed at basketball clubs, which were active in the men's Romanian National Basketball League in the 2021 – 2022 season. Furthermore, as a representative sample, the author chose to focus the research on the main coaches of these basketball clubs. As a strategy, the research will use non-probability purposive sampling because the sample is representative of the full population. The results confirmed that most basketball clubs from the men's Romanian National Basketball League do not invest in the soft skills development of their players. However, the results also pointed to the fact that constant investments in the development of soft skills of players would help basketball clubs reach the desired performance much faster. More so, the results showed that basketball coaches consider developing soft skills for players to be important and that these can help players become better team members. Finally, the contribution brought by the present research is to emphasize that a basketball player's personal skills need to be taken into consideration and developed by basketball clubs.*

Keywords: *Basketball; Coaching; Learning Organizations; Personal Development.*

Introduction

“Basketball, one of the most popular and most dynamic sports in the world has always been in the spotlight in local, national or international media when it comes to player transfers and how these movements affect the team.” (Branga, 2021) In today's economic environment, business and sports organizations alike need to adapt their recruitment activities in order to ensure the building of efficient and effective teams. Recruiters and scouts have also started to consider candidates' personal skills. This topic has become increasingly important in recruitment and scouting even before the covid-19 pandemic. On the one hand, various types of research such as (Crook et al., 2011; Jehanzeb & Bashir, 2013; Sung & Choi, 2014) and practices prove the fact that companies have been continuously investing in employee training programs in order to be able to further develop and reach the desired performance. In Basketball, however, the situation is different. If on the one hand, we can find a lot of research about physical training, on the other hand, the topic of basketball players' personal development has not been researched to the same extent. In this research, the author will analyze the

importance of developing players' personal skills from the coaches' point of view. The relevance of this paper will be emphasized through the results it obtained and by highlighting the need for more in-depth research on basketball players' personal development.

Literature Review

The performance of athletes can depend on various factors such as physiological, psychological, social, and emotional factors. (Lorenz et al., 2013) These factors have also been analyzed by Reilly who notes that these performance indicators include anthropometric factors (ex.: body mass, acceleration etc.), physiological factors (ex.: muscle strength and power), biomechanical factors (ex.: mechanical efficiency), and psychological factors. (Reilly, 2001) Furthermore, a study by Rogers et al identified that "a range of psychological, game intelligence, physical fitness, and movement skill indicators were considered by elite athlete coaches to be important to extremely important for the recruitment / selection of basketball players." (Rogers et al., 2022) Considering this, the author focused the research on a part that constitutes the psychological factors mainly the soft skills of basketball players. Thus, according to Klaus et al "soft skills encompass personal, social, communication, and self-management behaviors. They cover a wide spectrum of abilities and traits: being self-aware, trustworthiness, conscientiousness, adaptability, critical thinking, attitude, initiative, empathy, confidence, integrity, self-control, organizational awareness, likability, influence, risk-taking, problem-solving, leadership, time management, and then some." (Klaus et al., 2009) Soft skills can be considered fundamentally important to an individual's well-being and success. (Feraco & Meneghetti, 2022)

Constant investments in developing the soft skills of its human capital can help organizations achieve better results and performance. (Crook et al., 2011) In order to be able to develop its human capital (ex.: players, coaches, and administrative staff) basketball organizations need to evolve into so-called "learning organizations". This term describes "organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together." (Senge, 2006) Researching this aspect regarding basketball organizations active within the Romanian men's national basketball league in the 2021 – 2022 season is a novelty aspect brought by this research, as the author could not identify if this aspect was previously researched.

Furthermore, through this research, the author wanted to identify how basketball organizations active within the Romanian men's national basketball league in the 2021 – 2022 season structure and organize their induction process for new players as this can be considered a useful method that can help with integrating new players a lot faster and they would become a "team" much faster. Thus, the induction process was analyzed from the perspective of a "process of helping a new employee / player to settle quickly into their job so that they soon become an efficient and productive employee / player". (Foot et al., 2016) After searching different international databases such as ProQuest, Science Direct, or Web of Science, the author could not identify other research that analyzed such a topic regarding the basketball organizations in Romania. Thus, it can be stated that this is another aspect that emphasizes the novelty character and the importance of this research for the basketball organizations in the Romanian men's national basketball league.

Research on topics that affect basketball organizations in Romania is low. As a comparison, a search of the keywords "basketball" and "Romania" returns 253 results on the Science Direct database in contrast to a search of the keyword "NBA" which

returns 11651 results on the same database. If we would filter our search even more according to the topic of this paper “basketball player’s personal development” and “Romania”, we would get 61 results out of which very few articles analyzed topics similar to this one. Considering this, the topic of this article will serve as a new addition to the research regarding different aspects that can influence a basketball player’s development, other than hard skills training.

Methodology

Firstly, this research aimed to identify if basketball players’ personal development is considered by basketball clubs active in the men’s Romanian National Basketball League. In order to reach this objective, quantitative research on the topic was conducted during the 2021 – 2022 season of the Romanian National Basketball League. The research was conducted from a critical realism point of view, which means that an objective analysis of quantitative data on the subject at hand was undergone. More so, this research type can be categorized as being inductive and exploratory as the theory can be generated from the data collected. Also, the time horizon of this research can be categorized as cross-sectional as the data was collected at one point in time, the moment the questionnaire was answered.

In order for a better structure of the questionnaire, various concepts such as abstract (ex.: soft skills, induction process, mentorship) or objective ones (ex.: investments in basketball players’ development – time, money, and energy; performance) have been established. These concepts were further put together to form constructs such as: learning organizations (formed out of the induction process, mentorship, and performance) and personal development (formed out of soft skills and investments in players’ development). Also, the research was conducted considering variables such as dependent ones: basketball players’ personal development, independent ones: soft skills of basketball players, and moderating ones: investments in players’ personal development, which can influence the performance of the basketball organization.

Secondly, for the goal of this research, the following research questions were drafted: 1. Do soft skills complement hard skills in basketball? 2. What are the three most important soft skills for a player to have from the point of view of a coach? 3. Are basketball players viewed as resources or assets? 4. Do Basketball clubs active in the Romanian Men’s National Basketball League have the characteristics to be considered Learning Organizations? 5. Does a basketball organization need to constantly invest time, money, and energy in the development of its human capital (ex.: players, staff – coaches, and management) in order to achieve its desired performance? An answer to these questions can be given by analyzing the responses collected through the questionnaire.

Thirdly, before establishing the target group for this research, a number of three hypotheses were established. The first one is a descriptive hypothesis: *Most basketball clubs in the men’s Romanian national basketball league do not invest in the soft skills development of basketball players.* The second one is a descriptive hypothesis: *Clubs in the men’s Romanian national basketball league can not be considered Learning Organizations.* The third and last hypothesis is a causal one: *Investments in the soft skills development of basketball players would help basketball clubs reach the desired performance much faster.*

Fourthly, the sampling strategy for this research consists of a non-probability purposive (intentional) sample because the sample is representative of the full population. The population for this research consists of basketball coaches and management staff employed (approx. 48) at basketball clubs that are active in the men’s Romanian national basketball league during the 2021 – 2022 season. From this population, the author chose to focus the study on a representative sample consisting of the main

coaches employed by basketball clubs active in the men’s Romanian national basketball league during the 2021 – 2022 season. The main criteria for considering a coach for this research was that they should be active as a main coach at one of the basketball clubs in the men’s Romanian national basketball league during the 2021 – 2022 season. Finally, the data was gathered via Google Forms and exported to Microsoft Excel where it was prepared, summarized, and analyzed.

Results and discussions

Sixteen main coaches active at basketball clubs active in the men’s Romanian national basketball league during the 2021 – 2022 season participated in this research. Out of these sixteen, eight have been employed at the basketball organization for over three years as shown in figure 1. Another demographic aspect of the target group is represented by their age. Thus our target group can be organized based on four age groups as we can see in figure 2. Regarding this, the average age of a main coach employed by a basketball club that was active in the men’s Romanian national basketball league during the 2021 – 2022 season was 45,19 years.

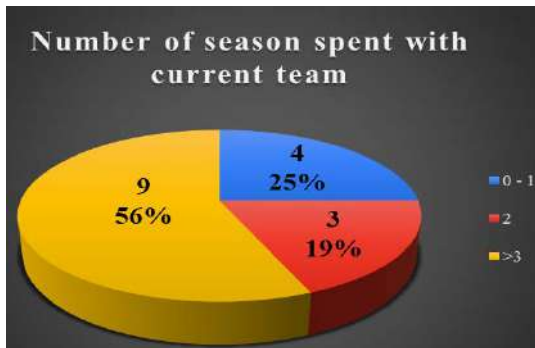


Figure 1: Number of seasons spent with current team
Source: Authors’ own research results

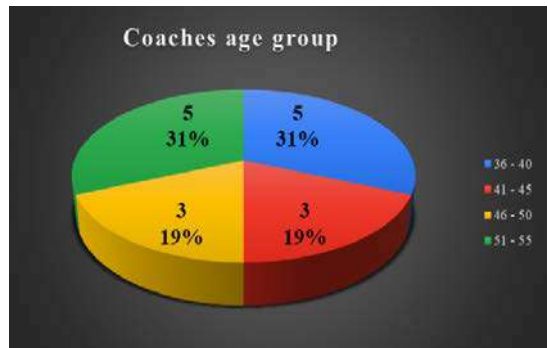


Figure 2: Coaches Age Groups
Source: Authors’ own research results

If we look at the number of coaches (9) that have spent more than 3 years in their main coach position at the current teams, we can state that the majority of basketball clubs active in the men’s Romanian national basketball league during the 2021 – 2022 season decided to focus on continuity in regard to the main coaching position.

The main findings of this research endeavor are represented by the validation of two and the invalidation of one of the hypotheses. The first hypothesis that was validated was that most basketball clubs in the men’s Romanian national basketball league do not invest in the soft skills development of basketball players. A number of 11 main coaches answered positively to the question if the basketball organization is currently actively investing in the soft skills development of its basketball players. This means that 69% of basketball clubs active in the men’s Romanian national basketball league during the 2021 – 2022 season invest also in the personal development of their players not just in the physical one. Furthermore, it is important to understand the reasons where, why 31% of basketball clubs do not invest in this area. In this regard, the three main reasons these basketball organizations do not invest in the soft skills development of their players are: lack of budget, lack of well-trained personnel regarding this area, and lack of expertise on behalf of the basketball organization regarding this matter.

The second validated hypothesis was that investments in the soft skills development of basketball players would help basketball clubs reach the desired performance much faster. Figure 3 shows that most (10) of the coaches agreed with this statement while only one disagreed.

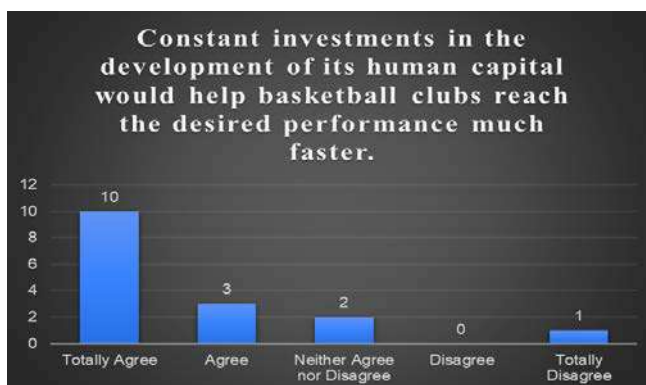


Figure 3: Level of coaches' agreement about constant investments in the development of human capital in basketball organization

Source: Authors' own research results

Although not all coaches were on the same page regarding the previous statement, almost all of them agreed that in order to obtain performance, a basketball organization needs to constantly invest time, money and energy in the development of its human capital (players, staff – coaches and management) as can be seen in the following figure.



Figure 4: Investments in the development of the human capital of basketball organizations

Source: Authors' own research results

The third hypothesis, which stated that clubs in the men's Romanian national basketball league can not be considered Learning Organizations was the one that got invalidated. In this regard, 62% of the respondents considered that the basketball organizations where they were active can actually be considered learning organizations. However, when asked about how often the basketball organization invests in developing soft skills programs for its players, the opinions of the target group were quite different, as can be seen in the following figure. An example of how basketball can invest in soft skills development can be taken from the NBA. As Martenzie Johnson wrote in an article for www.andscape.com, in 2021 the NBA decided to launch a new personal development

training program to teach young players about leadership, mental health and other civic activities that can help them better prepare for their careers in the sports industry. Taking this into consideration, basketball organizations active in Romania could benefit in three ways from the implementation: firstly, their young players would be better prepared to step up to the first team; secondly, their involvement in this area could bring positive aspects to the image of the club; thirdly, they could be able to retain players for a longer period of time.

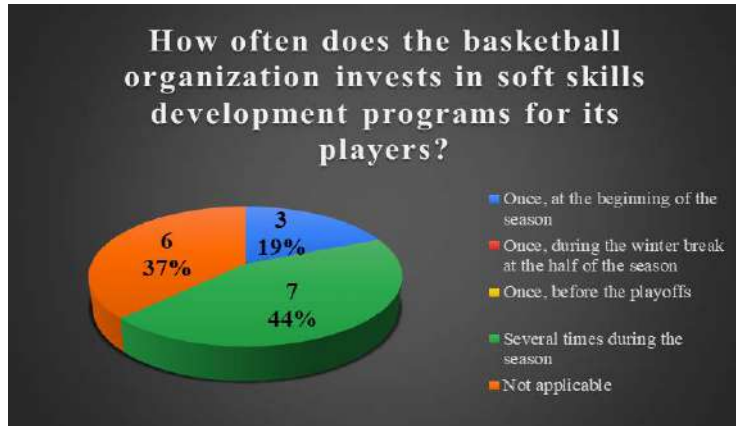


Figure 5: Frequency of investments in soft skills development programs of basketball players
 Source: Authors' own research results

Moreover, when asked if the basketball organization where they are currently active has a well-established learning system or if they have implemented an induction training phase, the majority of the responses (10) of the coaches were negative. However, when asked if they think implementing an induction training phase would benefit the basketball organization, a majority (14) of the coaches answered affirmatively. Also, when asked how they think implementing an induction training phase would benefit the basketball organization, the first two responses were that players would become „a team” faster and that the team’s performance would increase. A classification of the benefits of implementing an induction training phase can be seen in the following figure.

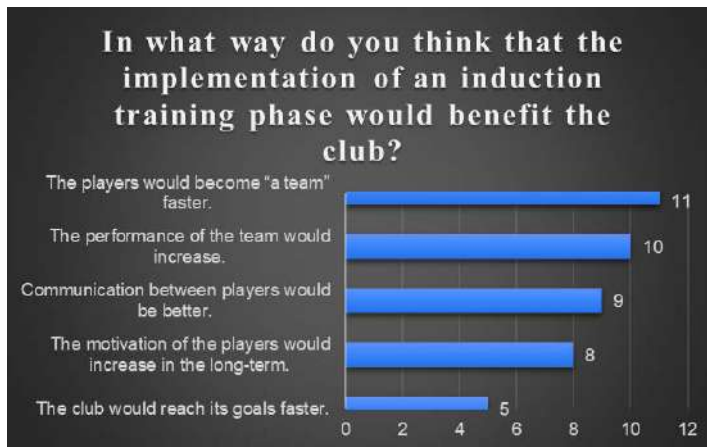


Figure 6: Benefits of implementing an induction training phase
 Source: Authors' own research results

Also in this regard, when asked if they think that implementing an induction training phase would help basketball organizations reach their desired performance much faster and easier, a majority (14) of the main coaches answered affirmatively. Regarding this induction training phase, the author wanted to better understand how such a phase can look for a basketball organization. That is why the participants in this research that formed the target group were asked what they think an optimal induction training phase should look like so that the basketball players can have a good start in the team and in the new season. Most main coaches voted for the option: Players sign a contract with the club. Upon arrival, a club delegate (friendly and helpful first contact) picks them up from the airport. They receive a welcome package from the club during the first dinner with the entire team. First initial briefing during team meeting (each new player gets assigned a “buddy” from the older players). Introduction to the workplace (physical training period begins). Feedback discussion after the first training period. Championship starts. Furthermore, because the main objective of this research was to identify if the personal development of basketball players is taken into consideration by basketball clubs that are active in the men’s Romanian National Basketball League during the 2021 – 2022 season, the research contained questions that were constructed in order to emphasize the importance of soft skills in basketball players. Thus, considering the definition of soft skills presented previously in the introduction part of this article, we found out that the majority (81%) of the main coaches consider that basketball players have and show a variety of soft skills. More so, all 16 coaches of the target group agreed that soft skills (ex.: adaptability, critical thinking, self-control etc.) should complement hard skills (ex.: shooting, passing, rebounding, defending etc.) of basketball players. However, when asked about the importance of soft skills compared to a basketball player’s hard skills, most coaches considered them to be between 51% and 71% as important. In this regard, the author wanted to determine if and in what percentage basketball organizations should divide their training between hard and soft skills. The results pointed out two ways of dividing the players’ training: 20% soft skills – 80% hard skills and 40% soft skills – 60% hard skills as seen in the following figure.



Figure 7: Division of training for basketball players

Source: Authors' own research results

Additionally the author wanted to find out which are the three most important soft skills for a basketball player to have and to develop from the point of view of the coaches. The results show that quick-decision making is at the first place in being the most important soft skill that a basketball player should have according to our target group, followed by teamwork capability and self-control. The ranking of soft skills according to the importance they have for a basketball player from the main coaches employed by

basketball clubs that were active in the men’s Romanian national basketball league during the 2021 – 2022 season can be seen in the following figure.

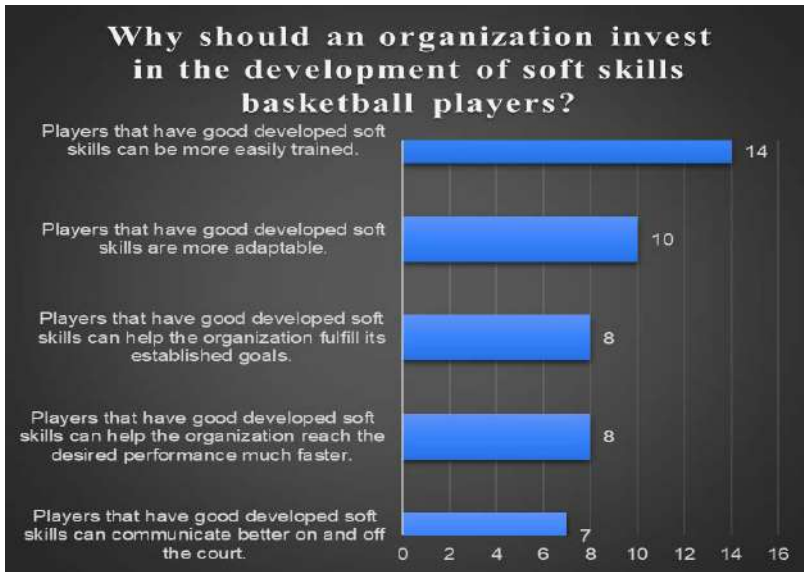


Figure 8: The three most important soft skills for a basketball player to have and develop
 Source: Authors’ own research results

Previously in this chapter we showed that almost all coaches out of the target group agreed that in order to obtain performance a basketball organization needs to constantly invest time, money and energy in the development of its human capital. While very few disagreed, all of the 16 coaches were in agreement when asked if they think that the organization should invest in developing the soft skills of its basketball players. The reasons behind this agreement can be seen in the following figure.

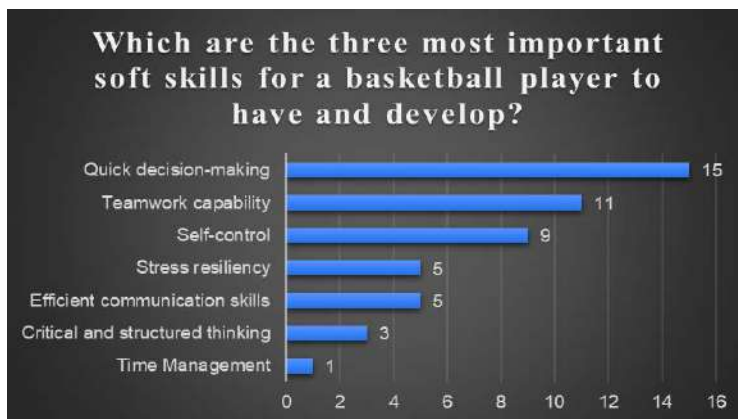


Figure 9: Reasons for investing in the development of soft skills in basketball players
 Source: Authors’ own research results

As we can see, the results show that players that have good developed soft skills can be more easily trained and are more adaptable. This means that coaches also analyze basketball players’ personal side (ex.: through soft skills) when trying to recruit them and not just on the technical / hard skill side which can be analyzed through the

statistical reports of each player. Furthermore, the author wanted to find out if the coaches out of the target group agree, or not, that if a basketball player focuses on developing his soft skills on his own he can become a better team member and implicitly a better basketball player. The results in this matter show a total agreement of the majority (12) with this statement. Also, the majority (13) of the coaches totally agreed to the statement that the development of soft skills is important for basketball players. However, the author also wanted to identify if the soft skills of basketball players have an influence on the performance of the basketball organization. Thus, the results show that most (9) of the coaches agreed with the statement that basketball players with good developed soft skills have a big influence on achieving the desired performance. One way basketball clubs in the Romanian national league can get directly involved in developing players' personal skills is by having a dedicated person in the organization responsible for this area. An example of such a position can be found at Fenerbahçe Beko Istanbul Basketball club. According to the Euroleague Basketball website, the club announced in 2021 that they hired former fan favorite player Ali Muhammed as Senior Team Development Coach and Youth Team Ambassador. Thus, as mentioned previously, Fenerbahçe Basketball club managed to retain one of its emblematic players and further benefit from his experience on and off the court.

Moreover, most (10) of the coaches agreed with the statement that basketball players with good developed soft skills can help the organization reach its desired performance much faster. Considering these results, we can clearly state that the soft skills of basketball players are a topic that coaches have begun to consider more and more when scouting or trying to help a player develop.

Lastly, as a bonus question in the questionnaire, the author wanted to identify how coaches see players, as a resource or as an asset. In this regard, the author defined a resource as a useful or valuable input that brings value to the basketball organization; and an asset as a useful or valuable input that not only brings value to the basketball organization but also has high trading value. The results were that 9 (56%) coaches see players as a resource and 7 (44%) see them as an asset.

Conclusions

In conclusion, the results of this research prove the fact that developing a basketball player's personal skills (soft skills) can have benefits not only for the player but also for the basketball organization where he is employed. Moreover, as the results of this study have shown, the soft skills of basketball players should complement their hard skills, not replace them, and should be considered to be developed individually by each player and collectively by the basketball organization through the organization of various soft skills training programs. As we could see through the results of this study, we validated two of the hypotheses and invalidated one. Regarding the invalidated hypothesis, we can see a tendency of subjectivity on behalf of the main coaches from our target group as they evaluated their employers as learning organizations only according to the definition for this term that we provided. However, the other questions on this topic show us that basketball organizations that were active in the men's Romanian National Basketball League during the 2021 – 2022 season cannot be considered learning organizations as they lack various aspects that a learning organization should have such as a well-established learning system, investments in the development of the soft skills of its employees, induction training programs and mentorship. So, the question that now arises is: can basketball clubs active in the men's Romanian National Basketball League during the 2021 – 2022 season really be considered learning organizations? An answer to this question can serve as the basis for future and perhaps more in-depth research on this topic.

Finally, there are some recommendations that the author would like to make for the basketball organizations active in the Romanian national league. The first one is the implementation of a personal skills development program that can be structured in four parts: 1. at the start of the season, 2. after the first training period, 3. in the break between the first and second part of the season, 4. at the end of the season. The second recommendation would be to hire (like in the example with Fenerbahçe Basketball club) a person responsible for the development of players' personal skills. If this isn't possible, they could contract an external company specialized in this type of development. The third recommendation is in regard to the structure of the financial budget. Romanian basketball organizations should allocate each year a specific percentage of their budget for the development of the personal skills of their players. Implementing such measures could benefit basketball organizations in areas such as: better-prepared players, retention of players, and positive benefits for the club's image.

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EDUCATION 4.0 AND SKILLS FOR TWIN TRANSITION – AN EXPLORATORY STUDY

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Abstract. *The concern for economic, social, and environmental challenges and sustainability education requires higher education systems to improve their alignment with the economic environment to ensure that graduates have the mix of skills needed to make the most of the digital society.*

Technological advancements are changing the way education systems can unlock the potential of technology for teaching and learning as a response to Industry 4.0, greatly incorporating the use of digital technologies, opening up higher education and knowledge to more students, improving access across different socio-economic groups, and provide high-quality learning material aligned with labor market needs.

The paper aims to ascertain the current views on the role of higher education in the context of digital transformation i.e. Education 4.0 and related implications on the current challenges with regard to the complex skills development of graduates.

The study emphasized the Romanian country in the pursuit of adjusting education to the future of work and deciphering several key performance indicators in coherence with the challenges faced by the higher education sector. Given the longstanding structural vulnerabilities, improving Romania's performance indicators is critical for sustainable growth potential and job creation. The pursuit of green and digital transition is expected to enable valuable interventions to develop digital skills at all levels to ensure that higher education graduates can participate in society and take advantage of the digital transition.

Finally, the study emphasizes specific interventions and actions needed to overcome major structural vulnerabilities of Romania's higher education system such as substantial interventions to facilitate digitalization, investments in digital equipment, training of teaching and academic staff, and other measures to improve teachers' and students' digital skills.

Keywords: *continuous improvement; digital and green skills; Education 4.0; sustainability education; quality education.*

Introduction

In the race for disruptive innovation and technological advancement, the transition toward more sustainable systems tackling climate and environmental-related challenges is paramount to protect, conserve and enhance the European Union's natural capital, and protect the health and well-being of citizens. In particular, this transition has to put people first, ensuring the supply of critical raw materials necessary for clean technologies, digital, space, and business applications, reducing and reusing materials before recycling, and embedding significant efforts on a new path of sustainable and inclusive growth.

The European Skills Agenda emphasized the parallel green and digital transitions that are transforming how people live, work, and interact and the significance of a change in people's skill sets to fully capitalize on the digital transformation, which is a key enabler for achieving the Green Deal objectives (European Commission, 2020). According to research, between 2005 and 2016, 40 percent of new employment was generated in sectors with high levels of digital activity, and in some job categories, over 90% of positions demand particular types of digital abilities. In addition, OECD (2019a) stressed that the deployment of digital technologies across all economic sectors, including non-tech sectors, will require a more digitally skilled workforce at all skill levels and ages.

Higher education systems must better connect themselves with the economic climate in order to provide graduates with the variety of skills demanded by the labor market, particularly those required for the twin transitions to green and digital economies. The concern for economic, social, and environmental challenges and sustainability education to deliver skills, knowledge, and values is addressed by a specific action covering a set of strategic interventions to support the acquisition of skills for the green transition and sustainable future. This action puts skills at the heart of the European policy agenda and calls on the Member States and all stakeholders to develop skills to accompany the green and digital transitions in jobs and beyond (European Commission, 2020).

In this context, the paper aims to ascertain the current views on the role of higher education in the context of digital transformation i.e. Education 4.0, and related implications on the current challenges with regard to the complex skills development of graduates. To this end, the paper commences with an updated literature review on the framework of Education 4.0 and the major challenges framed by the shift to the green economy and digital-rich workplaces. Furthermore, the study put emphasis on the Romanian country and its state of play in the attempt to adjust education to the future of work as well as deciphering several key performance indicators from the huge array of available data and measurements, in coherence with the challenges faced by the higher education sector.

Although all educational levels are extremely important for developing human capital, the study is focused only on higher education since it plays a critical role in enhancing the acquisition of workforce skills needed to thrive in the digital workplace and a greener economic era. Also, the study aims to emphasize specific interventions and actions needed to overcome major structural vulnerabilities of Romania's higher education system.

Literature review

The emergence of Industry 4.0 and the associated digital transformation, including mobile communication, social media, cloud, big data analytics, smart devices, connected things, and sensors, radically change how people live, work, and communicate. These resulted in significant structural changes in the world economy, automation, and digitalization, changing the nature of work and leading to further urgency to ensure those quality investments in people and their skills are made.

As acknowledged by the World Economic Forum (2020) in the *Future of Jobs Survey*, the companies' likelihood to adopt cloud computing, big data, and e-commerce remain high priorities, in line with the trend established in previous years. In particular, 55% of companies pinpointed their intention to transform the composition of their value chain, introduce further automation, reduce the current workforce (43%) or expand their workforce as a result of deeper technological integration (34%), and expand their use of contractors for task-specialized work (41%). Also, the survey emphasized companies' vulnerabilities in their attempt to capitalize on the growth potential of new technology adoption due to the persistence of workforce skills shortages. For tasks involving information and data processing and retrieval, administrative work, and some aspects of traditional manual labor, digitalization of the work process is anticipated, whereas humans are anticipated to retain their advantage for managing, advising, decision-making, reasoning, communicating, and interacting activities.

Furthermore, according to the revised OECD Employment Outlook 2019, up to 15 percentage of current jobs could disappear due to automation in the next 15 to 20 years, and another 32 percentage could experience significant changes as a result of the automation of some tasks that used to be performed by workers. Digital technologies will replace the workforce for those tasks that can be automated (e.g. routine tasks) and the workers will use technology (e.g. ICT tools) to perform tasks more efficiently which both have implications for the mix of skills people need (OECD, 2019b).

Digital skills and the ability to operate digital technology are yet considered the major transversal competencies needed across various jobs. As acknowledged by recent studies, digital skills are permeating societies and labor markets not only in high-tech occupations but across virtually all jobs and sectors. Thriving in the digital workplace requires both digital skills and strong cognitive and socio-emotional skills in growing occupations linked to new technologies (OECD, 2019c).

Albeit is quite impossible to predict which technologies will be developed in the long-term and their impact on the citizens' lives, some trends are clear and require reshaping the developments of workforce skills and capabilities through education, learning, and work.

These technological advancements are changing the way education systems can unlock the potential of technology for teaching and learning as a response to Industry 4.0, greatly incorporating the use of digital technologies, opening up higher education and knowledge to more students, improving access across different socio-economic groups, and provide high-quality learning material aligned with labor market needs. The conceptualization of these implications within education sectors refers to Education 4.0 which is responsible for preparing a new generation of graduates to use appropriate

physical and digital resources to provide innovative solutions to current and future societal challenges. Current studies devoted their attention to analyzing the challenges faced by the so-called Education 4.0 that are expected to smoothly incorporate new technologies that enhance learning opportunities and help develop skills for the 21st century.

In this view, Kipper et al. (2021) structured the set of competencies necessary for Industry 4.0 in terms of skills such as initiative, communication, innovation, adaptability, flexibility, and self-management, as well as pro-activity, creativity, problem-solving, interdisciplinary, teamwork, collaborative work, knowledge of contemporary fields like information and communication technology, algorithms, automation, software development and security, data analysis, general systems theory, and sustainable development theory. In particular, they highlighted the need for cooperation among companies and universities to reform curriculums, create real learning environments, and develop interdisciplinary competencies to solve problems and challenges posed by the fourth industrial revolution.

Looking at the components of Education 4.0, Miranda et al. (2021) compiled relevant concepts throughout the transition from Education 1.0 to the current educational paradigm and proposed four core components that shape the concept of Education 4.0. such as competencies, including transversal (soft) and disciplinary (hard) ones, learning methods that consider the use of technologies and pedagogical procedures that are increasingly used in higher education, information and communication technologies (ICT) that incorporate working principles of technologies and techniques to provide technology-based solutions for educational and management purposes, and infrastructure for learning and teaching practices that accommodate students' learning needs and support current educational challenges.

According to Yusuf and Jamjoom (2022), curricula emphasizing hard skills at the expense of soft skills are unsustainable. Job readiness skills like interpersonal and communication skills, teamwork, leadership, digital fluency, and creativity have emerged as essential components of achieving sustainable employability. The study also made the case that all interested parties should participate in creating projects and programs that strengthen cross-sector employability skills, with the opinion of industry leaders being particularly valuable as they frequently have first-hand knowledge.

The concern for a new era of digitalization and Education 4.0 was tackled by current studies which figured out three pillars in terms of flexible learning according to the needs and interests of each student, learning at an individual pace and at the speed of each student regardless of age and grade. In order to help students develop their abilities and skills with real projects by involving them in situations that are relevant to and related to their environment, the scholars introduced the challenge-based learning experience and courses. These courses encourage students to develop sustainable solutions in terms of the environment, society, and the economy. The outcomes can be seen in the cutting-edge instructional tactics and learning methodologies used to integrate the university curricula with the new competencies demanded by this globalized environment (Gutiérrez-Martínez et al., 2021).

By tackling a narrow approach to engineering education, other studies were focused on addressing the challenges induced by solving social problems with the help of the

integration of physical and virtual spaces i.e. so-called Industry 5.0. The researchers identified the convergence phenomenon—in which the distinctions between disciplines are blurring—and the digital transformation—which is the cross-fertilization of a wide variety of ideas. They highlighted the paradigm shifts in basic skill sets and proposed four strategies that could assist higher education institutions in redesigning their curricula in the areas of sustainability, resilience, hands-on data fluency and management courses, lifelong learning and trans-disciplinary education, and interaction between humans and machines (Gürdür Broo et al., 2022).

The concern for challenges and opportunities brought by the new paradigm of Education 4.0 was also tackled. Scholars put forward that the universities that laid the foundation for future talents or trends in society must adapt and modernize existing programs, facilities, and infrastructure. In this view, Mian et al. (2020) figured out major requirements for universities to prepare for Industry 4.0 in terms of proper financial planning, specialized staff, expanded industrial collaborations, new infrastructure, updated curricula, robust security measures, as well as awareness-raising and educational initiatives or marketing tactics. Despite certain advantages brought by digital technology such as higher productivity, greater flexibility, sustainability development, and accelerated enterprise growth, the results stressed major prerequisites that have to be fulfilled to adopt digital technology in academic practices such as training the existing staff, acquiring new talent, overcoming employees fear and concerns through proper counseling and job security, guidelines with the aid of experts in the field, allocate sufficient funds, and set down procedures to minimize security threats.

The current scientific literature also embodies the quest to implement communication technology in educational practices. Wang et al. (2021) found that the effective adoption of digital technology in education will likely depend on the teachers' pedagogical capability and determination to improve students' learning activities. In particular, when it comes to considering the effort, time spent, and resources used to prepare adequate materials, teachers tend to be hesitant about using new technology even with the many teaching and learning advantages of new technology brought by artificial intelligence (AI), virtual reality (VR), augmented reality (AR), and the Internet of Things (IoT). Worthy to mention, the scholars highlighted the critical role of teachers in successfully implementing new technology into the education environment.

The roles of teachers in the new model of Education 4.0 was also acknowledged by scholars who figured out the necessity to enrich the value-cognitive content of education by expanding the social and humanistic component to developing social, emotional, communicative, and practical intelligence skills of teachers. To this end, the improvement of the professional skills of teachers themselves, the integration of innovative processes in education around the idea and principles of sustainability education, and standardization and organizational design of the institutional framework of education for sustainable development should be considered as important improvement areas (Galtseva et al., 2020).

Several conceptual ideas were highlighted in other analyses of the Education 4.0 model, focusing on the model's contextually challenging and moderately organized character in terms of transversal and subjective direction, integration, and forward-looking features. According to this perspective, Karpan et al. (2020) highlighted the function of Education

4.0 in systematically forming people's fundamental characteristics for participating in the field of education for sustainable development – critical thinking, environmental worldview, subjective-value approach to the environment, and eco-cultural values. They stated that in order to resolve the contradiction between accelerated economic expansion and the need to preserve resources and ecosystems, digitization should be used in conjunction with an emphasis on morality and responsibility.

Although plenty of studies in the scientific literature have been dedicated to deciphering the changing paradigm of Education 4.0, further inquiries into the national educational context need to receive particular attention to better understand structural vulnerabilities and ensure that education will be aligned with labor market needs.

Methodology

In order to fulfill the aim, the study draws on data from official reports and documents from European Commission to evaluate the gap between national states of play compared to other EU member states. Although a huge array of data and performance indicators may support the analysis of quality education, a particular set of indicators were selected to be analyzed in coherence with EU 2030 education targets and the thematic focus of the study – skills for twin transition.

In this view, *table 1* showcases the framework with performance indicators used for highlighting the state of play with regard to the capabilities of the national higher education system to prepare the students for future work.

Table 1. Framework with performance indicators – structural aspects (source: Eurostat 2019, E&T database)

Indicator [unit of measure], [Eurostat main data code]	Country performance			EU-27
	Romania	Strongest performer	Weakest performer	
Public expenditure on education [% of GDP] [educ_uoe_fine06]	0.81	2.31 Denmark	0.44 Luxembourg	1.19
Public expenditure on education per students [euro] [educ_uoe_fine09]	3,533.3	42,428.8 Luxembourg	1,780.0 Greece	9,880.4
Ratio of students to teachers and academic staff [ratio] [educ_uoe_perp04]	19.4	4.9 Luxembourg	22.5 Cyprus	15.3
Tertiary educational attainment [%] [edat_lfse_03]	24.9	60.6 Luxembourg	24.9 Romania	40.9
Employment rate by educational attainment level [%] [lfsa_ergaed]	88.8	89.5 Lithuania	74.5 Greece	83.8

Percentage of the ICT sector in GDP [% of GDP] [isoc_bde15ag]	3.74	7.66 Malta	2.27 Greece	4.89
Employed ICT specialists by educational attainment level [%] [isoc_sks_itspe]	76.3	85.1 Lithuania	39.6 Italy	63.7
Employed ICT specialists – total employment [%] [isoc_sks_itspt]	2.4	7.6 Finland	2.1 Greece	4.3

To investigate the state of play, several indicators were used in the pursuit to depict the structural challenges of the higher education system such as public expenditure per student, public expenditure as a percentage of Gross Domestic Products (GDP), the ratio of students to teachers and academic staff, tertiary educational attainment, and employment rate by educational attainment level.

Furthermore, the level of development concerning the ICT sector is evaluated in connection with major indicators such as the employed ICT specialists by educational attainment level, employed ICT specialists from total employment, and the share of the ICT sector as a percentage of Gross Domestic Products (GDP).

The values of indicators were extracted from the statistical database Eurostat, the statistical office of the European Union. Considering the scope of the study, the displayed data are relevant for tertiary education level i.e. ISCED 5-8 which covers three educational layers of the Bologna process: Bachelor studies, Master studies, and PhD studies (OECD, 2015).

The analysis goes further with several contextual indicators linked to green and digital transition. As digital skills at all levels is a condition to ensure that all people can participate in society and take advantage of the digital transition, several indicators measuring the degree of digital skills were taken into account such as the degree of individuals' digital skills, degree of computer usage and cloud services, the frequency of internet access, the usage of ICT devices and software applications for working purpose.

In this regard, *Table 2* depicts the framework with performance indicators used for highlighting the state of play with regard to digital skills possessed by Romanian citizens. The values of indicators were extracted from the statistical database Eurostat including skills-related statistics.

Table 2. Framework with performance indicators – contextual aspects
(source: Eurostat 2019, Skills database)

Indicator [unit of measure], [Eurostat main data code]	Country performance			EU-27
	Romania	Strongest performer	Weakest performer	
Individuals who have an above basic overall level of digital skills [%] [isoc_sk_dskl_i]	10	62 Iceland	10 Romania	31
Individuals - computer use [%] [isoc_ci_cfp_cu]	68	98 Iceland	65 Bulgaria	80
Individuals - use of cloud services (internet storage space to save documents and other files), [%] [isoc_cicci_use]	27	68 Iceland	24 Poland	31
Digital inclusion – individuals (frequency of internet access - once a week, including everyday), [%] [isoc_bdek_di]	76	99 Iceland	69 Bulgaria	85
Individuals – use of ICT devices at work [%] [isoc_iw_ap]	17	65 Norway	17 Romania	42
Individuals – use of occupational-specific software at work [%] [isoc_iw_ap]	7	50 Norway	7 Romania	24

Results and discussions

The analysis of structural indicators for higher education systems shows that Romania country is facing significant vulnerabilities coming from an underfinanced education system suggesting low educational outcomes and hampering the quality of education. The public investment in Romania is only 0.91% of the Gross Domestic Product compared to the EU-27 average of 1,19%. Albeit, the public expenditure on higher education varies significantly between EU countries, Romania's net value of public expenditure on higher education per student has encountered a slight increase from 2015 to 2019 but is still among the lower values in the EU (3533.3 euro/student in 2019 versus 2051.3 euro/student in 2015 but lagging behind the EU-27 average of 9880.4 euro/student in 2019). Romania's education budget was somewhat higher than the EU average as a percentage of all government spending (10.1 % vs. EU-27:10%), indicating a relatively low level of public spending (European Commission, 2021).

The concern for the quality of educational outcomes needs to be addressed by the adequate ratio of students to teachers and academic staff that enable the shift from

teacher-centered learning to a student-centered learning approach. These innovative teaching and learning pedagogies promote individual accountability for the learning process and require keeping the group size small in order to address distinct learning needs, interests, aspirations, and cultural backgrounds of individuals and groups of students. The data analysis shows that in 2019, Romania has a ratio of 19.4 students to teachers and academic staff significantly below the strongest performer with a 4.8 (Luxembourg) ratio but close to the EU-27 average of 15.3 students to teachers and academic staff.

As far as educational attainment, only 24.9% of the Romanian population aged between 25 and 34 holds a tertiary education degree. Although the proportion has improved over time, it is significantly below the EU average of 40.9% and the EU-level target of 45% by 2030.

However, in 2019, more than two-fifths (40.3 %) of people in the EU-27 between the ages of 30-34 had completed a tertiary degree, meaning that the ET 2020 criterion had been met. This is significant because persons with higher levels of education generally tend to have a lower risk of being unemployed, have a larger variety of work choices, earn better incomes, and generally have higher levels of life satisfaction (Eurostat, 2020).

The ICT uptake is low in Romania since the share of the ICT sector in GDP is only 3.74% in 2019 versus 4.89% of GDP for EU-27. Interestingly, the employed ICT specialists count for 76.3%, above the EU-27 average of 63.7%, whereas the employed ICT specialists from total employment have a share of only 2.4% below the EU-27 average of 4.3%.

The analysis of contextual performance indicators reveals that the lack of basic digital skills and ICT specialists are key challenges for Romania. The country scores considerably below the EU average in all indicators, as only 10% of people aged between 16 and 74 have above the basic overall level of digital skills (31% in the EU as a whole), while 68% use computers within last 12 months (EU average: 80%). Only 27% of individuals use cloud services such as internet storage space to save documents and other files (EU average: 31%), 17% use ICT devices at work, and only 7% use occupational-specific software at work versus the EU average of 24%. These figures mark the lacking of digital skills and the shortage of ICT specialists. Finally, Romanian businesses do not fully use digital technologies such as electronic information sharing, social media, big data, and cloud services.

In sum, the workforce's skills remain insufficiently aligned with the needs of the labor market, skills shortages, and mismatches, and a weak education and training system negatively affects prospects. Likewise, the structural vulnerabilities of the higher education system and long-standing structural weaknesses of Romania's business sector hamper the twin green and digital transition and the reinforcement of economic and social resilience (European Commission, COM (2022) 624 final). Thus, Romania is still among the worst performers in the EU in meeting education and training. Further measures are needed to address serious and longstanding challenges in the country's education sector.

The findings call for significant interventions to support digitalization, investments in digital equipment, teaching, and academic personnel training, and other efforts to improve students' digital abilities in light of the challenges of Education 4.0. It is essential to make sure that the higher education system is adaptable enough to incorporate this new knowledge and realize the full potential of technology for teaching and learning in order to respond to shifting skill requirements for the green and digital transition.

Additionally, several suggestions are worth mentioning in increasing digital literacy:

- Digital skills are equally transversal, confirming the extensive penetration of tasks involving digital technologies across jobs in virtually all sectors. These call for redesigning the curricula to promote cross-fertilization among different areas and subjects. Higher education systems should support teachers in adapting to evolving curricula since excellent education is essential to developing transversal skills and capabilities.
- Universities should think about developing non-classroom learning settings in addition to more conventional ones. Interactive techniques are becoming increasingly technologically advanced, enabling the employment of cutting-edge equipment like virtual or augmented reality. Transversal skills can also be cultivated in an applied setting through study programs, internships, and placements.
- Finally, access to digital devices and connectivity, digital skills for students and teachers, and strong motivation are essential.

Conclusions

Higher education systems are facing increasing challenges posed by digital technology. The advent of Education 4.0 deals with the coherent usage of ICT technology in the teaching and learning environment and the development of the skills graduates need to make the most of the digital society.

Given the anticipated acceleration in the use of technology, there is an increased interest in adjusting higher education institutions to the future of employment. Governments confront significant hurdles in keeping their policies relevant and aimed at constantly changing demands. They must determine not only the abilities required today, but also new trends, industries, and areas where those skills will be most in-demand.

In this light, especially for the Romanian country, a coherent set of interventions and measures are critical to overcoming the long-standing structural weaknesses of the higher education system to make learning opportunities much more flexible and responsive to labor market needs through appropriate funding mechanisms, to improve equity in education and accelerating the twin green and digital transition.

The exploratory study attempts to fill in the knowledge gap in the framework of Education 4.0 and can be of value to the academic community by raising awareness and a better understanding of the challenges and threats faced by Romanian higher education in pursuing green and digital transition.

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HOW THE COVID-19 PANDEMIC HAS INFLUENCED THE DIGITAL TRANSFORMATION OF BUSINESSES

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Abstract. *The paper presents explorative research aiming to map how the COVID-19 pandemic influenced digitalization worldwide. The narrative literature review both of academic studies and most of the investigations of professional organizations have revealed that the pandemic significantly increased the pace of digitalization in all companies and organizations, but at the same time, the digital gap increased between countries and organizations. Since digital transformation has a strong impact on efficiency and profitability, the identified phenomenon might strengthen the competitive advantage of companies that already were more advanced. The results show that a new type of leadership is needed, more resilient, open to collaborative approaches, and able to integrate agile solutions into strategic planning.*

Keywords: *digital economy; digital transformation; globalization 4.0; the impact of the COVID-19 pandemic.*

Introduction

Digital revolution is a concept relatively frequently used both in the academic and professional environments since the 90s of the 20th century. Most studies are positive in documenting its impact in many fields, especially on the economy (Hearn, Mandeville, & Anthony, 1998; Morakanyane, Grace, & O'Reilly, 2017; Negroponete, 1995; Reis et al., 2018; Vial 2019; Małkowska, Urbaniec, & Kosala, 2021; Tiutiunyk et al., 2021), and healthcare (Agarwal, Gao, DesRoches, & Jha, 2010; Gopal, Suter-Crazzolara, Toldo, & Eberhardt, 2019; Herrmann et al., 2018; Iyawa, Herselman, & Botha, 2016; Kraus et al., 2021; Topol, & Hill, 2012; Tortorella et al., 2020), but it is considered even in research on arts & humanities (Gündüz, 2012; Goodman, 1990; Hutson & Olsen, 2021; Lanham, 1989; Lazzarotti, 2020; Li, 2020; Muenster, 2022; Paul, 2020; Taormina & Baraldi, 2022; Wechsler, 1998), or sports (Davenport, 2014; Savchenko, Filatova, & Vochozka, 2021; Stangl, 2020; Tan, Hedman, & Xiao, 2017). The digital seems to take control of contemporary economies and societies.

As Yuval Noah Harari (2017, pp.428-462) observes, the current society is guided by *data religion / dataism*. In this era, human knowledge and wisdom are less trustworthy than computer algorithms and data processing. All systems, including living organisms and human emotions, are now considered algorithms and this new dogma has changed

mentalities and behaviors. In this framework, the digital has become an organic part of society, and giant digital hubs (such as the stock exchange) are now ruling the world through the global economy. Harari believes that effective data processing is the only way toward the development/attaining of power and control. The depth of digital integration in most developed countries seems to validate his view. Also, Harari (2017, pp. 438-439) observes that humanity does not keep pace with technological/ digital change, at the moment. The human minds, or at least the ones of the present-day leaders, are tributary to 20th-century thinking patterns. Therefore, his question is who can understand and control the new global ecosystem.

The possible (not so far away in time) answer he pictures is already presented in science-fiction novels and films since the 60s of the 20th century. Harari (2017, pp. 443-445) predicts that the Internet of Things is the efficient all-inclusive data processing system that would lead to the disappearance of homo sapiens. The Internet of Things becomes the "*great web of life*". Harari (2017, p. 449) argues that "*the individual becomes a tiny chip inside a giant system that nobody really understands*". The COVID-19 pandemic seems to confirm de facto this vision when at least the knowledge workers have been working only digitally, longer hours than normal in many cases.

Nevertheless, let's step back and consider an exterior perspective. Many decades ago, Sterling (1997) warned that humanity puts the same weight on atomic energy which, even if changed greatly the society and economy, lost much of its significance. Maybe such hopes/expectations placed on digital will prove to be inaccurate. Still, the COVID-19 pandemic seems to have determined a great advance toward an increasingly more integrated digital world and economy. It is not the aim of the present study to investigate the future of the economy and humanity, but rather to document how the pandemic influenced digital advancement.

Based on a narrative literature review methodology, this opinion paper explores how digitization around the globe has speeded as a direct consequence of the pandemic. The authors discuss the digitally enhanced structural effects of the COVID-19 pandemic on the organizational structures, cultures, and processes, in a manifesto for a new type of leadership oriented toward resilient agility using the new digital advances as a source for efficiency and profitability.

Literature review

Digital transformation and leadership

The impact of digital on humans, societies, and economies should not be surprising, considering the effects of previous "revolutions". Culkin (1967) observed many decades ago that "*We shape our tools and then our tools shape us.*" Digital transformation implies the "*system-level restructuring of economies, institutions, and society that occurs through digital diffusion*" (Uruh & Kiron, 2017) in the framework of innovative business models based on digital platforms and tools. As already presented, digital transformation significantly impacts business organizations, considering many dimensions. For instance, in documented cases, injecting digital technologies such as analytics, AI, and digital platforms into business processes make them 40-50% more efficient (Bendor-Samuel, 2020). IBM (2020) reports for client companies up to 6% revenue growth through reimagining core business processes and 70% improved enterprise agility

through artificial intelligence-enabled automation while reducing costs and risks (with up to 40% decreases in operating costs and 20% reduced security and compliance risks). It can increase customer satisfaction and a strong competitive advantage (Lowson, 2021). Digital transformation has a significant impact on efficiency and profitability. Also, the digital transformation of business models determines an increased and diverse added value for clients and other stakeholders (Schallmo, Williams, & Boardman, 2017), influencing business outcomes. We also mention that during the pandemic, 9 in 10 organizations' business models should change (if they haven't yet) in the following few years to fit the digital challenges (McKinsey, 2021).

In these new circumstances, leaders' responsibilities and approaches have to adapt. Digital transformation is imperative, therefore, business leaders should be able to put together digital teams relevant to all functions of management/organizations, to design and continuously manage digital transformation (IBM, 2020). This is a complex task and a fast and collaborative process (Hansen, Kraemmergaard, & Mathiassen, 2011). As Tabrizi et al. (2019) argue, digital transformation is not a matter of technology but of changing organizational mindset and culture. They also recommend relying on inside employees instead of outside consultants. Stimulating the development and valorization of inside knowledge could lead to more effective transformation. They also propose agile decision-making, rapid prototyping, and flat organizational structures which are more flexible and better face uncertainties. Klein (2020) developed a review of previous studies and identified the following main characteristics necessary for leaders of digital transformation: innovative vision, networking intelligence, adaptability, motivating coach, digital intelligence, complexity master, social intelligence, democratic delegation, agility, and learning by errors.

Digital transformation also requires new leadership roles, such as chief digital officer, ensuring the collaboration between IT and business functions (Vial, 2019). At the same time, leadership style impacts the effectiveness of digital transformation (Sow, & Aborbie, 2018). A new collaborative and open organizational culture is also required (Ismail et al., 2017). This culture should embrace technological development and continuous integration rather than feel upper-down imposed (Ismail et al., 2017).

The leadership style influences digital transformation and organizational agility (AlNuaimi et al., 2022). The leaders are also responsible for guiding employees not only related to traditional responsibilities, but also for acquiring new skills and perspectives. At the same time, the IT team should be supported to be more aware of business-related processes and requirements. To capitalize on digital opportunities, employees should possess new knowledge and skills. The digital leadership style, defined as the strategic use of an organization's digital assets, proved effective in motivating employees and cross-generational communication (Lubis et al., 2019). Employees could better cope with the disruption and challenges of digital transformation if leaders provide them with vision and support (Kazim, 2019). Co-creation, co-design, and integrated stakeholders' ideas proved beneficial processes for effective leadership and successful digital transformation. Kazim (2019) concludes that "the digital era of disruptive transformation is the catalyst that has influenced leaders to better clarify and communicate ideas to achieve improved solutions that stem from increased cooperation and co-creating value, and built through increased cross-functional relationships using a leadership style that is open and authentic".

The COVID-19 pandemic and the digital transformation

The terrible disruption generated by the global COVID-19 pandemic has had a significant impact at macro-, mezzo-, and as well as individual levels. International relations and public policies have been considerably impacted. We highlight the main evolutions at the macro-level by limiting the present study only to digital-related impact. Previous challenges related to the ethical use of data, collecting and using statistics, or even implementing e-health systems have been rapidly overcome even in the first months after the start of the pandemic (Hantrais et al., 2020). Artificial intelligence was used to track and fight the virus in a global effort to control the pandemic. Innovation was high, determining rapid development and adoption of new approaches.

For instance, AI was an increasingly important concern at the EU level before the pandemic. A white paper was published in February 2020, developing a policy launched less than two years in advance, supporting ethical development in the field, cooperation, and excellence (EC, 2020). We would observe that during 2020 the EU tried to observe these pillars, despite member states' strong national egotistic interests. This white paper also stressed the support for SMEs and the encouragement of a bottom-up approach. After one year through the pandemic, in March 2021, some shifts could be observed across the EU. Trust has become a pillar of AI development in Europe, and the support for excellence is connected to capacity building for the industry overall and research centers. A horizontal regulatory proposal was planned for 2021 (EC, 2021).

At the global level, Tsekeris and Mastrogeorgiou (2020) argue that COVID-19 has a positive long-term effect, by supporting Globalization 4.0 against Globalization 3.0. The former is considered more sustainable, a more responsible path for development. In December 2018, Globalization 4.0 was announced as the key topic for Davos 2019, observing at the same time that humanity is "vastly underprepared for it" (Baldwin, 2018). Maybe the optimism placed both on Globalization 4.0 and the positive outcomes of COVID-19 are too early to validate, especially since the recent political, energetic, and economic crises are making the environment turbulent and unpredictable. We give only two examples in this context – the rich seem to have become richer in the past years, including during the pandemic times (Kelly, 2020; Neate, 2020); the decrease in pollution associated with the first months of the pandemic has been reversed in various parts of the world (Edmond, 2020; IQAir, 2021; Wilks, 2021), while the war in Ukraine has had also unforeseen impact on the energy industry and its footprint on the environment (Nerlinger & Utz, 2022; Pereira et al., 2022). Voices argue that the pandemic stressed the need for de-globalization (Thangavel et al., 2022). Nevertheless, a need for rethinking international political and economic relationships and business chains has emerged.

Governments seem to have been paying more attention to fake news and cybercrimes than ever (Europol, 2020). Significant changes in how fake news and manipulative online approaches are treated by the online industry giants have taken place (Crouch, 2021; Spring, 2020). Nevertheless, these regulations are hard to implement, they are debatable and their impact is limited by the fake news spread effectiveness. Also, larger-scale cooperation in this sense is needed (Hartley & Vu, 2020), especially since the pandemic was a fertile ground for increased propaganda and the spread of fake news (Balakrishnan et al., 2022; Bargaoanu & Nastasiu, 2022).

The global communication system and interconnectedness define the pandemic, which has been considered the first digital pandemic (Tsekeris & Mastrogeorgiou, 2020). Also, digital technologies helped governments fight the pandemic, but also various aspects of digital pandemics determined additional challenges (Wang et al., 2022). This “title” also stresses that access to quality information and the news influence the ability of individuals and organizations to overcome biases and effectively react to this new challenge.

At the business/organizational level, the impact of the COVID-19 pandemic was complex and required agile resilience and intelligent new business models/ manufacturing to rebuild operations and recover revenues (Pinzaru et al., 2020). The negative business outcomes are numerous but we will mention only some of the most impactful: facilities closing, a decline in revenues, a drop in supply chains’ performance, increased costs related to sanitary security and risk reduction, and new employee-related challenges. In this framework, the winning strategies were rethinking the organization and boosting digital transformation. We also mention that the pandemic evolutions and their impact on the business sector attracted the attention of policy-makers and practitioners and the academic environment (Tiutiunyk et al., 2021).

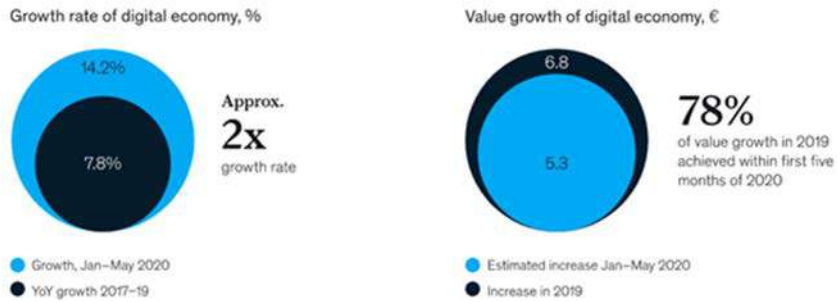
A new timeframe induced by the COVID-19 pandemic

Success of digital transformation has not been a simple process. A McKinsey study (Martin, 2018) developed before the pandemic showed that only 16% of investigated organizations reported successful digital transformation, compared to a figure twice higher for other types of organizational transformation. Even the “digital savvy industries” did not report a success rate higher than 26%. Smaller organizations performed better than very large ones. The study also reveals that management has a significant role in the success of digital transformation by influencing in several ways the processes: communicating frequently, empowering people, giving a sense of direction and urgency, and ensuring cooperation within the organization.

The advances in digital transformation are visible. Nevertheless, one might wonder how fast – if at all – the changes were compared with the organic digital transformation. A study by McKinsey (Filip et al., 2020) developed in Central and Eastern Europe shows that in the first five months of the pandemic, the digital economy increased almost double compared with the evolution in the previous two years. Also, its monetary value exceeded the previous forecast. Romania experienced one of the fastest growth in the region. Also, the number of digital service users increased significantly, with a large contribution from Romania. Interestingly, the steepest increase was registered in the 65+ cohort (McKinsey, 2020a) Nevertheless, the CEE countries continued to lag behind the Baltic States and Nordic countries, and the gap even increased. This data shows that being agile is not effective enough compared with planning and being already on a strategic development path.

The study observed that just before the pandemic, although the evolution was positive above organic development, the growth potential has been missed. The study notes that *“the region has not yet managed to fully leverage digitization of the public and private sectors, and has failed to significantly boost e-commerce and offline consumer spending on digital equipment”* (McKinsey, 2020a). Figure 1 documents the main evolutions.

In Jan–May 2020, the digital economy of CEE grew almost twice as fast as in previous years, achieving 78% of the total increase seen in 2019 in just 5 months.

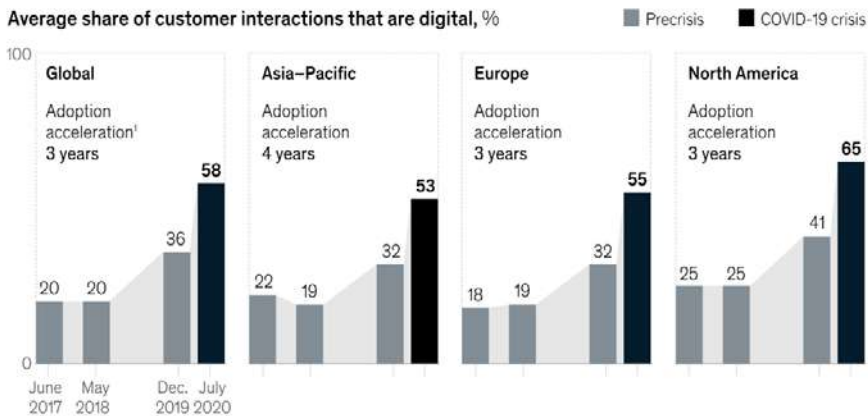


Source: Eurostat; Euromonitor; McKinsey analysis

Figure 1. The evolution of the digital economy in the CEE region (McKinsey, 2020a)

Another McKinsey study (2020b) investigating the global executives on specific evolutions shows that digitization around the globe speeded with several years. The greatest jump, of over seven years, has been documented for digitally enabled products. Disparities are also registered among regions, with Asia showing the fastest dynamics compared with the forecasted evolution, based on previous surveys. Figure 2 presents the evolution of various regions.

The COVID-19 crisis has accelerated the digitization of customer interactions by several years.



¹Years ahead of the average rate of adoption from 2017 to 2019.

Across business areas, the largest leap in digitization is the share of offerings that are digital in nature.

Average share of products and/or services that are partially or fully digitized, %

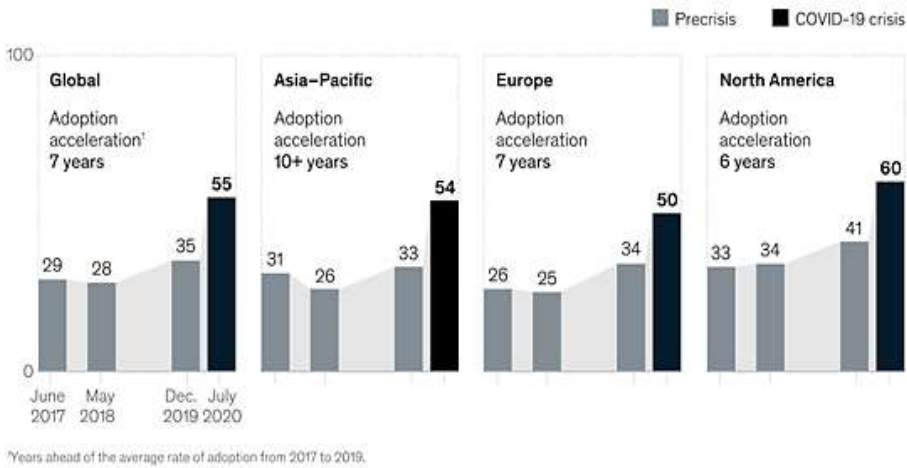


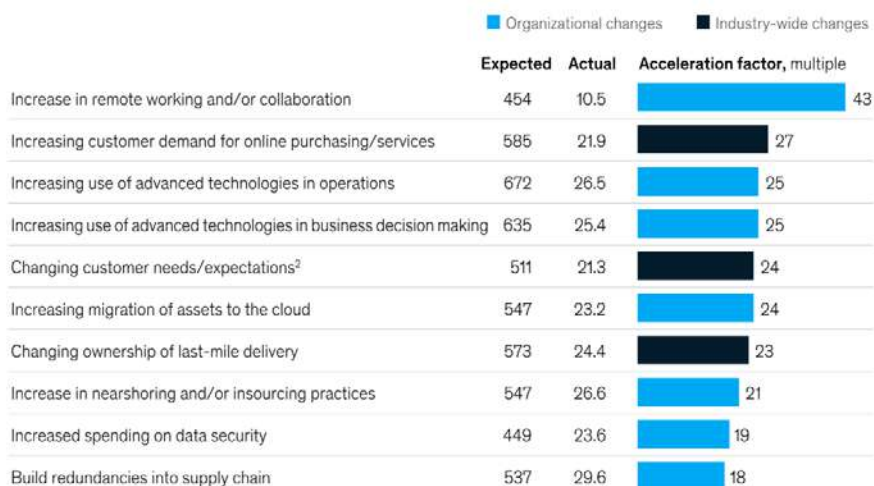
Figure 2. The digital growth due to the pandemic (McKinsey, 2020b)

One observes that customers were better adapted to the digital than companies previous to the pandemic. The need to adapt to sudden crises proved to be a much more stimulating factor than the desire to align previously the offer and the organization with its customers. Digital evolved from a tool for cost cuts to a strategic development tool. Two years ago almost half of the respondents considered digital as a means of reducing costs, while the pandemic reduced the percentage to 10% (McKinsey, 2020b).

Nevertheless, the rate of growth varied across industries. The fastest growth registered in healthcare, pharma, financial, and professional services. This evolution is not surprising and shades some concerns about the consistency of transformations in other domains. Also, the growth is related to increased budgets allocated to digital transformation. Even if in many cases budgets for various costs, especially variable ones, decreased, for 2 in 3 organizations the funding of digital initiatives increased, while for only 7% of the organizations, this funding decreased due to this specific crisis (McKinsey, 2021). The same study shows successful companies are more likely to invest in R&D, new talent, and partnerships. They are also more innovative.

Executives say their companies responded to a range of COVID-19-related changes much more quickly than they thought possible before the crisis.

Time required to respond to or implement changes,¹ expected vs actual, number of days



¹ Respondents who answered "entry of new competitors in company's market/value chain" or "exit of major competitors from company's market/value chain" are not shown; compared with the other 10 changes, respondents are much more likely to say their companies have not been able to respond.
² For instance, increased focus on health/hygiene.

Figure 3. Response to the pandemics

The pandemic proved to be a good chance to measure how prepared various countries are for digital transformation. In the case of the EU, the McKinsey study shows that the most fitted proved to be the Nordic countries, including the Baltic States (McKinsey, 2020). In the case of previous pandemics, the negative impact of the pandemic was limited and the adaptation was boosted by the existence of reliable broadband with high penetration rates (Katz, Callorda, & Jung, 2020). This relationship has not been specifically investigated for the current pandemic, but this phenomenon could justify the evolutions in Romania exceeding other CEE countries. An IMF study also suggests a country's digitalization level is another factor positively influencing the recovery (Katz et al., 2020). Of course, not only the level of digitalization and the flexibility to offer a digital response to the pandemic are factors influencing the effectiveness in these turbulent times, but also the infrastructure already existing in a country (Banga & te Velde, 2020). In this context, corporate agility is relevant, and public policies and support are vital.

A significant acceleration of digital transformation was also documented by the Dell Technologies Digital Transformation Index (Dell Technologies, 2020). The highest jump was registered by the "digital adopters" – i.e., organizations with mature digital strategies (see Figure 4).

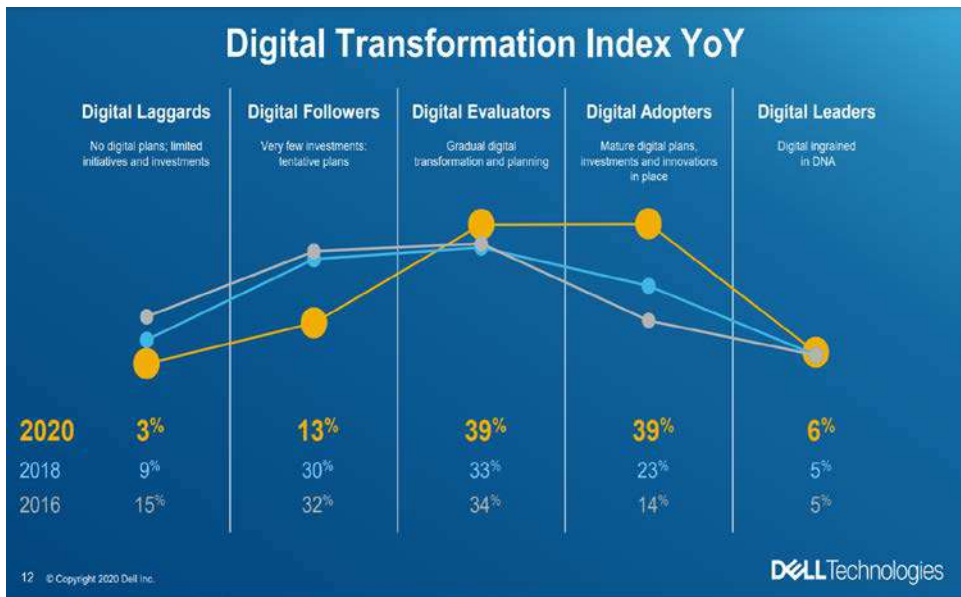


Figure 4. The evolution of the Dell Digital Transformation Index (Dell Technologies, 2020)

Despite the generally positive reaction, only 41% of companies adopted a holistic approach. The most popular acceleration programs identified in 2020 were: cybersecurity defenses; broader working-from-home/remote working capabilities; delivering digital experiences to customers & employees; using data in completely new ways; and transforming services and consumption models. Although the digital transformation was faster than ever in 2020, half of the companies worry they were not fast enough. The study also reveals that funding the necessary transformation and the adaptation to the changes in the market is lagging.

The 2021 Global Tech Outlook documents that 16% of companies are at the beginning of digital transformation with integration issues as the main barriers (Red Hat, 2021). Although the main challenges seem to be cultural and cooperation between IT and business functions, most companies invest in technical aspects, starting with IT security.

Another global study, developed by Twilio (2021), evaluates that the overall time jump for digital transformation was 6 years. Digital communication was key for the great majority of companies. Traditional bureaucratic barriers have been overcome and in many cases, funding for digital transformation increased, according to this study.

A McKinsey (2021) study showed that during the pandemic, digital transformation was positively influenced not only by technological capabilities, but also by adequate leadership (see Figure 5). The companies with enhanced learning capabilities and which allocated talents flexibly among business units were more successful. We also observe that the investments in the digital transformation during the pandemic have not led to the sought performance for most organizations (McKinsey, 2022), still companies are focusing on additional development of their digital investments.

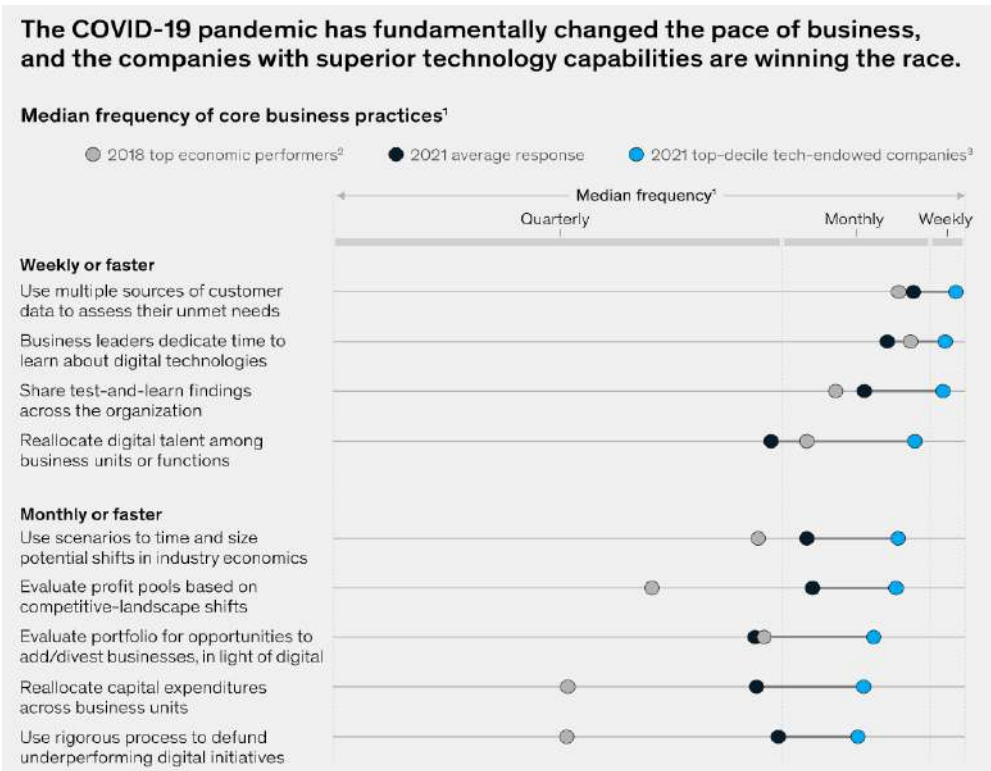


Figure 5. Successful business practices during the pandemic (McKinsey, 2021)

Also, digital leadership seems to be a successful differentiator, as illustrated in Figure 6.

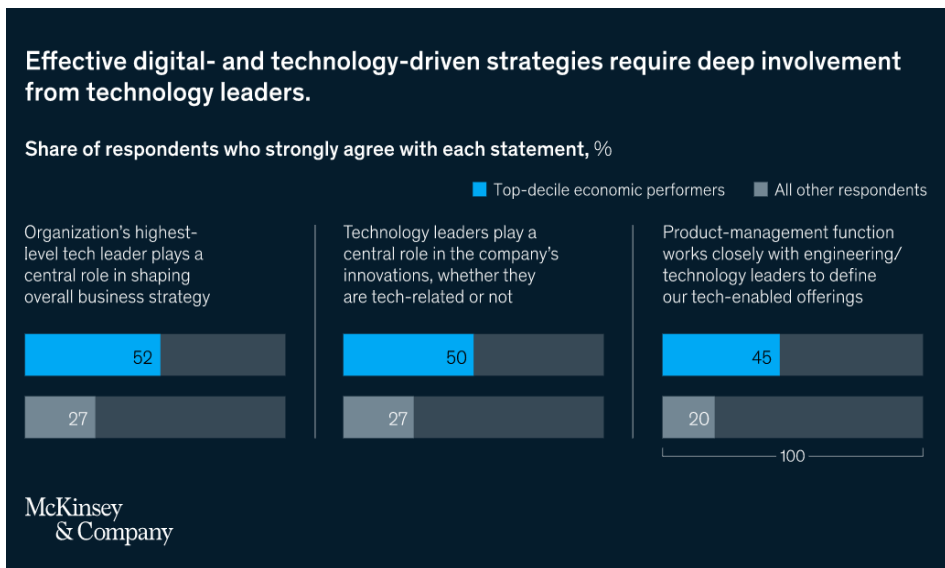


Figure 6. Success associated with tech leadership (McKinsey, 2021)

Conclusions

Since the COVID-19 pandemic was a significant disruptive factor for all businesses worldwide, no matter their characteristics, its impact, and the successful recovery strategies were important aims of academics and especially of business reports. These studies have documented that resilient and agile organizations thrived, benefiting from a significant leap forward in digital transformation. Companies already advanced in this field were the ones making more progress. Therefore, even if organizations jumped several years ahead, the digital gap actually increased.

The digital gap has widened in both considering countries and organizations. If we focus on companies, considering that digital transformation has a strong impact on efficiency and profitability, the identified phenomenon leads to a stronger competitive advantage for companies that already have been more advanced, with a leadership oriented more on digital transformation embedded in all processes.

Although the main challenges associated with accelerated digital transformation seem to be cultural and cooperation between IT and business functions, most companies concentrate on investing in technical aspects, starting with IT security. This might be a sign of weak digital leadership. Effective leaders in digital transformation should possess many skills, the technical ones being less relevant than vision, agility, and ability to change the organizational culture. Summing the necessary leadership capabilities, we would mention vision and purpose, governance, culture and engagement, workforce enablement, technology, and business. Another unique aspect is that the bottom-up solutions, accepted by inspired leaders, have offered fast and valid solutions to various complex and simultaneous challenges during the pandemic. The crises generated by the COVID-19 pandemic proved that all these factors are vital for an organization to thrive, for effective leadership.

Although existing studies did not concentrate on the quality of digital transformation, they suggest that this might be a strong differentiator for success. Companies investing more in people, partnerships, and being more innovative proved to have a more significant advantage. Digital transformation leadership is pragmatic and empowering, contributes to organizational learning, invests in talents, ensures digital talents' flexible distribution across organizations, focuses on value flows digitally enhanced, and continuously invests in further creative digital transformation.

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THE INFLUENCE OF TECHNOLOGY READINESS IN ORGANIZATIONAL LIFE. A STUDY WITH AEROSPACE INDUSTRY SPECIALISTS

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Abstract. *During the last decades, automatization gained a lot of attention in organizational studies. Usually defined as the performance done by a technological agent of a function previously done by a human agent, automatization's main aim is to increase the quality of products and services, by reducing waste to a minimum with zero errors. In the current study, we have selected technology readiness, defined as people's propensity to embrace and use new technologies to accomplish goals in home life and at work, as a specific predictor for both work performance and work engagement in the highly specialized space industry. The study was conducted in the framework of the SESAME project (Smart European Space Access through Modern Exploitation of data science - H2020-EU.2.1.6.1.) using a convenience sampling method. Because access to highly specialized employees in the aerospace industry is extremely difficult, we received responses from 30 highly specialized aerospace employees from the Guiana Space Center in Kourou. The data were collected through the following structured questionnaires: Technology Readiness Index, Work Performance, and Utrecht Work Engagement Scale. Data analyses were performed in SPSS 26.0. The analysis of the relationships between variables showed that technology readiness positively correlates with work performance and engagement. Current findings are supported by previous studies highlighting positive correlations between positive attitudes and motivation for use, actual system usage, and work performance. Practical implications of the recent study are discussed as some directions for future research in the area.*

Keywords: *technology readiness; work performance; work engagement; aerospace; SESAME.*

Introduction

Since the late 20th century, a large emphasis has been placed on automatization, defined as a process that controls a function or a task without the intervention of a human factor

(Billings, 1991). Parasuraman and Riley (1997) describe automatization as the performance of a technological agent (usually a computer) of a function previously done by a human agent. A more recent definition of the term has been provided by Lee and See (2004) who consider it the technology which selects and actively transforms data, makes decisions, or manages different operations.

One of the main benefits of automatization is its capability to perform complicated, repetitive tasks quickly and without errors (Hoff & Bashir, 2015). It enhances the quality and speed of operations, productivity, reliability, and sustainability, even under uncertain or risky conditions or for dangerous tasks (Frenc et al., 2018). Moreover, Friedmann (2006, p.144) demonstrated that automatization may increase the quality of products and services, by reducing waste to a minimum. This is because automatization may perform tasks with fewer errors than human operators or without errors, provided the automated system is correctly calibrated.

Literature review

Technology readiness

Previous empirical studies have shown that individuals have different personality traits that can influence their attitudes toward the use of technology (Rogers, 2003). According to Parasuraman (2000), technology readiness (TR) represents “people’s propensity to embrace and use new technologies to accomplish goals in home life and at work” (Parasuraman, 2000, p. 308). In Parasuraman and Colby’s (2001) opinion, this tendency to embrace and use new technologies might be explained by some personality traits such as openness to experience, dispositional optimism, innovativeness, tolerance to ambiguity (as facilitators to accept new technologies), and discomfort, risk adversity and insecurity (as inhibitors).

The four dimensions proposed by Parasuraman and Colby (2014) are:

“Optimism—a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency in their lives; Innovativeness—a tendency to be a technology pioneer and thought leader; Discomfort—a perceived lack of control over technology and a feeling of being overwhelmed by it; Insecurity—distrust of technology, stemming from skepticism about its ability to work properly and concerns about its potentially harmful consequences” (Parasuraman & Colby, 2014, p. 2).

Out of those four dimensions, optimism and innovativeness are considered to be drivers of technology readiness and are positively correlated with higher adoption rates of cutting-edge technology (Parasuraman & Colby, 2014), and, according to the well-known TAM model (Marikyan & Papagiannidis, 2021), more intense usage of technology (Lin & Chang 2011), and greater perceived ease in doing so (Massey et al., 2007). On the other hand, discomfort and insecurity, are considered to act as inhibitors of technology readiness.

According to Blut and Wang (2020), people having a high level of discomfort will consider using new technologies as being unpleasant and overwhelming, and those scoring high on the insecurity dimension will express general safety concerns and

worries about possible negative outcomes of technology usage, therefore, trying to avoid it (Blut & Wang, 2020).

Work engagement

Work engagement is usually defined as an independent, persistent, pervasive, positive, and fulfilling work-related affective–cognitive and motivational–psychological state (Schaufeli et al., 2002). This definition aligns with a series of studies that operationalize work engagement as a motivational–psychological state with three dimensions: vigor, dedication, and absorption (Schaufeli, Bakker, & Salanova, 2006; Bakker & Demerouti, 2008; Salanova & Schaufeli, 2008).

The first dimension, Vigor represents the energy levels and mental resilience of employees, together with the willingness to invest effort in the workplace and persistence when facing difficult tasks or demanding deadlines (González-Romá et al., 2006). The second dimension, Dedication, measures the employee's involvement in his/her work, and psychological identification with it, along with strong feelings of significance, enthusiasm, inspiration, pride, and challenge. The third characteristic is called Absorption, which describes an employee's immersion, high level of concentration, and engagement in work such that he/she loses track of time and has difficulties detaching from work (González-Romá et al., 2006).

The core dimensions of work engagement, namely Vigor, and Dedication (González-Romá et al., 2006), are considered to be the opposite of exhaustion and cynicism, the well-known dimensions of burnout. Moreover, a series of studies (Salanova et al., 2005; Xanthopoulou et al., 2009) have shown that work engagement correlates with task performance and contextual, extra-role performance (Bakker et al., 2004).

Engaged employees can access additional internal resources, positive emotions, and dispositional optimism and display better health, energy, and focus (Bakker & Demerouti, 2008). Also, an engaged employee manifests enthusiasm about his/her job and pursues and achieves challenging tasks, pushing themselves to extra effort (Schaufeli & Bakker, 2004; Leiter & Bakker, 2010), all of which lead to higher work performance (Bakker & Demerouti, 2008).

Work performance

According to Borman and Motowidlo (1993), workplace performance consists of two main factors. The first of the two factors identified by Borman and Motowidlo (1993) as part of the concept of work performance is the performance of the task, which describes the basic responsibilities of an employee and is reflected both in the specific results of work, but also in quality and quantity of these (Borman & Motowidlo, 1993). Also, according to Borman and Motowidlo (1993), the second factor that makes up work performance is contextual performance, which involves overcoming formal responsibilities associated with the job and is reflected in activities such as coaching and training colleagues, strengthening social networks set up at the organizational level, or making additional efforts for the organization's benefit.

Moreover, Motowidlo and Van Scooter (1994) noted that, as a rule, employees are engaged in two types of performance: in-role and extra-role. For the two authors, in-role

performance is defined as official outcomes and behaviors that directly serve organizational goals and objectives (Motowidlo & Van Scooter, 1994).

In addition to these behaviors, Bakker, Demerouti, and Verbeke (2004) also mention that "employees exhibit extra-role behaviors" (Bakker et al., 2004, p. 85). The examples proposed by Bakker, Demerouti, and Verbeke (2004) refer to the willingness to help colleagues whose workload is increased, volunteering for tasks, and defending the organization, or the behavior aimed to avoid problems in relationships with colleagues (Bakker, Demerouti, & Verbeke, 2004). As stated by Allen and Rush (1998), these behaviors are important for achieving organizational performance, especially long-term success (Allen & Rush, 1998).

Referring to the elements of job performance identified by Borman and Motowidlo (1993), Koopmans et al. (2001) identify as "prescribed in-role behavior" what Borman and Motowidlo (1993) call "task performance". The same Koopmans et al. (2011) call, in the cited article, "extra-role discretionary behavior" what Borman and Motowidlo (1993) called in their work "contextual performance".

Griffin, Neal, and Neale (2001) noted that the two distinct dimensions of workplace performance, task, and contextual performance, are likely to contribute independently to organizational effectiveness (Griffin et al., 2001). According to a series of authors (Van Scotter & Motowidlo, 1996), "task performance" refers to the core technical behaviors and activities involved in the job, and "contextual performance" refers to behaviors that support the environment which the technical core operates. In the research carried out, the authors highlighted the fact that the importance of contextual performance is special because it represents a type of behavior that is under the direct motivational control of individuals the majority of the time, emphasizing, at the same time, the small number of studies focused on how the opportunity to engage in contextual behaviors might be restricted by situational demands (Griffin et al., 2001).

Reilly and Aronson (2009), describe those activities - which are not specific to tasks or objectives, but in the presence of which individuals, teams, and organizations, as a whole, register a high level of efficiency and success - known generically as contextual performance, as including behaviors such as: cooperating with and helping others, volunteering for extra-role activities, persevering with enthusiasm and extra determination to complete assignments, defending organizational goals, and following organizational policies even when this is inconvenient (Reilly & Aronson, 2009).

Moreover, contextual performance incorporates key aspects of a series of non-job-specific constructs (Borman & Motowidlo, 1993). Constructs such as organizational citizenship behavior (Bateman & Organ, 1983), extra-role behavior (Katz & Kahn, 1966), and prosocial organizational behavior (Brief & Motowidlo, 1986), often overlap with contextual performance.

Methodology

In this study, we aim to investigate the relationship between Technology Readiness, Work Performance, and Work Engagement. The objective is to identify how the Technology Readiness of employees might influence their Work Performance and Work Engagement.

Research questions

Starting from the previous findings in similar studies having different types of respondents and/or different methodological approaches, we have developed the following research questions:

RQ1: What relations can be identified between Technology readiness dimensions and Work performance?

RQ2: What relations can be identified between Technology readiness dimensions and Work engagement?

Sample and procedure

The study was conducted in the framework of the SESAME project (Smart European Space Access through Modern Exploitation of data science - H2020-EU.2.1.6.1.) using a convenience sampling method. Because access to highly specialized employees in the aerospace industry is extremely difficult, we have responses from 30 highly specialized aerospace employees from the Guiana Space Center in Kourou. The average age of the respondents was $M=38.10$ ($SD = 10.93$) and 83.3% ($n=25$) were male. The average tenure in the organization was 14.20 years ($SD = 9.29$). The respondents belonged to various hierarchical and functional levels: management ($n=23$, 76.7%), and execution ($n=7$, 23.3%). The questionnaire was implemented in the Google Forms platform together with the informed consent. The study meets all the criteria established within the ethical guidelines of the SESAME project.

Measures

The questionnaire comprised 74 questions over four sections and was adapted from the corresponding literature. The first section covered the demography of the respondents, the second section was about technology readiness containing 36 items (Parasuraman, 2000), the third section was about self-reported work performance containing 16 items (Goodman, & Svyantek, 1999), and the last one about work engagement with 17 items (Schaufeli & Bakker, 2004).

Technology Readiness Index (TRI, 2000) consists of 36 items to be responded to on a 6-point-Likert format from (1) Strongly disagree to (6) Strongly agree. Parasuraman and Colby (2001) chunk the Technology Readiness construct into four variables: optimism, innovativeness, discomfort, and insecurity. Examples of TRI construct items: *optimism* contains items such as "Technology makes you more efficient in your occupation", *innovativeness* includes items such as "You keep up with the latest technological developments in your areas of interest", *discomfort* includes items such as "Many new technologies have health or safety risks that are not discovered until after people have used them" and *insecurity* with items such as "If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place". Reliability reported for the total score is $\alpha = .74$ and ranges from $\alpha = .68$ to $\alpha = .86$ for single scales.

Work Performance was assessed with the 16 items scale developed by Goodman and Svyantek (1999) on a scale ranging from (1) Strongly disagree to (4) Strongly agree. The questionnaire comprises two dimensions: contextual performance (7 items) and task performance (9 items). An example of a Task performance item is: "You demonstrate

expertise in all job-related tasks”, the scale having a very good reliability of $\alpha = .92$. Contextual performance was measured with items based on Smith, Organ, and Near’s (1983) organizational citizenship behavior measure. An example item is: “You help other employers with their work when they have been absent” and the scale has excellent reliability of $\alpha = .94$. The reliability obtained for the total score is $\alpha = .96$.

Work Engagement was measured using Utrecht Work Engagement Scale developed by Schaufeli and Bakker (2004), a scale that measures work engagement on three dimensions: vigor, dedication, and absorption. Example items are: “At my work, I feel bursting with energy” (vigor), “At my work, I always persevere, even when things do not go well” (dedication), and “When I am working, I forget everything else around me” (absorption). All items were scored on a seven-point rating scale ranging from 0 (‘never’) to 6 (‘always’). The reliability was very good for the composite score ($\alpha = .94$) and for individual subdimensions (Vigor $\alpha = .84$, Dedication $\alpha = .92$, Absorption $\alpha = .85$).

Results

Data analyses were performed in SPSS 26.0 (IBM Corporation, 2019). Moreover, because the present study is based on self-report questionnaires, we performed Harman’s single-factor test to detect the possible impact of common method bias (Tehseen, Ramayah, & Sajilan, 2017). As prior research (Podsakoff et al., 2003) recommended, all items corresponding to selected variables were loaded into an exploratory factor analysis to check whether one factor can explain the majority variance. The results indicated that the first factor accounted only for 22.47% of the variance and, therefore, the common method bias is not a pervasive issue in this study.

The conceptual model can be seen in Figure 1.

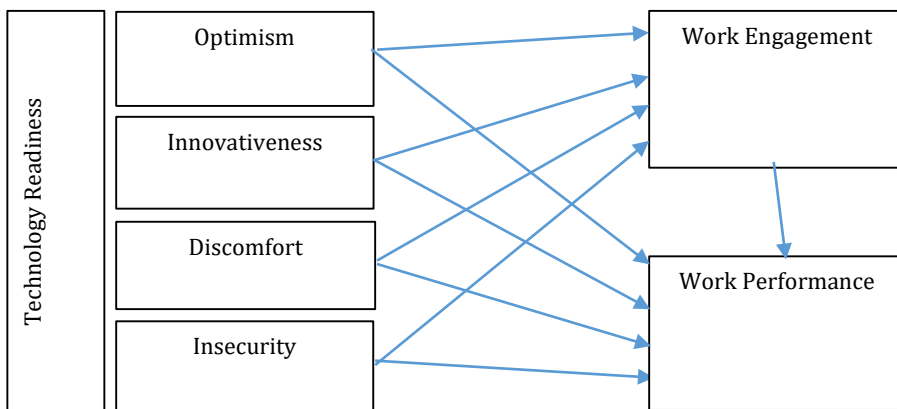


Figure 1. The proposed research model (Author’s Own Source)

Descriptive Statistics

Means, standard deviations, and bivariate correlations for all the study variables are presented below. Regarding the Technology Readiness scores, in Table 1 it can be observed that the composite score of the TRI is $M=3.39$, $SD=.33$. The highest score on the subdimensions was obtained for Optimism ($M=3.81$, $SD=.61$), followed by Innovativeness ($M=3.46$, $SD=.78$), Insecurity ($M=3.27$, $SD=.54$) and Discomfort ($M=3.01$, $SD=.45$). The analysis of the skewness and kurtosis scores reveal a normal distribution of data.

Table 1. Technology Readiness Descriptive Statistics (Author's Own Source)

	N	Mean	Std. Dev.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Optimism	30	3.8167	.61649	-.349	.427	-.769	.833
Innovativeness	30	3.4617	.78435	-.395	.427	.158	.833
Discomfort	30	3.0187	.45351	.159	.427	-.158	.833
Insecurity	30	3.2730	.54541	.307	.427	-.344	.833
TRI	30	3.3923	.33364	.924	.427	.604	.833

Moving further with the analysis, it was observed (Table 2) that self-reported job performance also got high scores both on the composite score – general performance ($M=3.96$, $SD=.44$) and the two subdimensions, namely Contextual ($M=3.78$, $SD=.82$) and Task performance ($M=3.84$, $SD=.95$). The analysis of the skewness and kurtosis scores display an abnormal (nonparametric) distribution of data. Therefore, the Spearman rho correlation will be used in the following analysis.

Table 2. Job Performance Descriptive Statistics (Author's Own Source)

	N	Mean	Std. Dev.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Contextual	30	3.7803	.82390	-1.920	.427	5.150	.833
Task	30	3.8473	.95141	-1.634	.427	3.380	.833
PERFORMANCE	30	3.9640	.44912	.132	.427	.215	.833

The last construct selected for analysis was work engagement. The scores showed (Table 3) a very good level of work engagement for the selected sample ($M=4.13$, $SD=.74$). Moreover, all three subdimensions of work engagement also indicate high levels of vigor ($M=4.15$, $SD=.70$), dedication ($M=4.18$, $SD=.96$) and absorption ($M=4.07$, $SD=.81$). The analysis of the skewness and kurtosis scores display a normal data distribution.

Table 3. Work Engagement Descriptive Statistics (Author's Own Source)

	N	Mean	Std. Dev.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Vigor	30	4.1507	.70331	.687	.427	.412	.833

Dedication	30	4.1867	.96123	-.280	.427	.475	.833
Absorption	30	4.0777	.81326	.803	.427	-.030	.833
ENGAGEMENT	30	4.1350	.74754	.672	.427	.730	.833

Inferential statistics

In order to answer the previously mentioned research questions, the Spearman and Pearson bivariate correlation was calculated, both between the composite scores of the selected variables and between the corresponding sub-dimensions of each scale.

RQ1: What relations can be identified between Technology readiness dimensions and Work performance?

As can be observed in Table 4, Task performance positively correlates with Optimism (rho=.605, p<.01) and Innovativeness (rho=.507, p<.01) dimensions of the Technology readiness scale.

The second type of performance, contextual, correlates only with the Optimism (rho=.394, p<.05) dimension of the Technology readiness scale. Similarly, the composite score of work performance positively correlates with the Optimism (rho=.460, p<.05) and Innovativeness (rho=.451, p<.05) dimensions and negatively with the Insecurity (rho=-.369, p<.05) dimension of the Technology readiness scale.

Table 4. Spearman's correlation matrix between Work Performance and Technology Readiness (Author's Own Source)

		Optimism	Innovativeness	Discomfort	Insecurity
Contextual	Correl. Coeff.	.394*	.295	-.171	-.061
	Sig. (2-tailed)	.031	.113	.366	.748
Task	Correl. Coeff.	.605**	.507**	-.180	-.354
	Sig. (2-tailed)	.000	.004	.340	.055
PERFORMANCE	Correl. Coeff.	.460*	.451*	-.326	-.369*
	Sig. (2-tailed)	.010	.012	.079	.045

RQ2: What relations can be identified between Technology readiness and Work engagement?

Similarly, the Pearson correlation coefficients (table 5) show a positive correlation between the composite score of work engagement and both positive dimensions of Technology readiness, Optimism (r=.535, p<.01), and Innovativeness (r=.540, p<.01).

Table 5. Spearman's correlation matrix between Work Performance and Work Engagement (Author's Own Source)

		Optimism	Innovativeness	Discomfort	Insecurity
Vigor	Pearson Correl.	.485**	.470**	-.253	-.353
	Sig. (2-tailed)	.007	.009	.178	.056
Dedication	Pearson Correl.	.578**	.623**	-.353	-.216
	Sig. (2-tailed)	.001	.000	.056	.253
Absorption	Pearson Correl.	.403*	.386*	-.004	-.285
	Sig. (2-tailed)	.027	.035	.983	.127
ENGAGEMENT	Pearson Correl.	.535**	.540**	-.219	-.308
	Sig. (2-tailed)	.002	.002	.245	.097

The Vigor dimension of work engagement also correlates with the two positive scales of technology readiness, namely Optimism ($r=485$, $p<.01$) and Innovativeness ($r=470$, $p<.01$). Furthermore, the Dedication dimension of work engagement shows a strong positive correlation with the same two dimensions of technology readiness, Optimism ($r=578$, $p<.01$) and Innovativeness ($r=623$, $p<.01$).

Furthermore, in an explorative approach, we have calculated the correlation matrix (table 6) between work performance and work engagement. The results showed significant correlations between the work performance composite score and work engagement composite score ($\rho=.424$, $p<.05$). The same positive correlations were observed also for the work performance composite score and Vigor ($\rho=.416$, $p<.05$) and Dedication ($\rho=.502$, $p<.01$) dimensions of work engagement.

Table 6. Spearman's correlation matrix between Work Performance and Work Engagement (Author's Own Source)

		Vigor	Dedication	Absorption	ENGAGEMENT
Contextual	Correl. Coeff.	.108	.112	.251	.206
	Sig. (2-tailed)	.569	.556	.182	.275
Task	Correl. Coeff.	.274	.265	.172	.210
	Sig. (2-tailed)	.142	.158	.362	.265

PERFORMANCE	Correl. Coeff.	.416*	.502**	.348	.424*
	Sig. (2-tailed)	.022	.005	.059	.020

Results show that the readiness of people to embrace technology could predict how much they will perform and how engaged they will be in their job. In particular optimism and innovativeness are supporting this relationship. At the same time, we notice that the composite work performance score correlates negatively with the insecurity ($\rho = -.369$, $p < .05$) dimension of the Technology readiness scale. Thus, our research shows similar results (Parasuraman & Colby, 2014) stating that optimism and innovativeness are considered drivers of technology readiness and are positively correlated with higher adoption rates of cutting-edge technology, and more intense usage of technology (Lin & Chang, 2011). However, these results don't touch upon performance, either contextual or task or any type of engagement.

Conclusions

Although the results cannot be generalized beyond the current sample, they point to the fact that companies should understand that employee performance and engagement are strongly related to their attitude toward new technologies. Being aware of that, companies should pay much more attention to attitudes and beliefs that people manifest in relation to technology (Parasuraman & Colby, 2001).

Despite the valuable findings of this study, it is not without limitations. One of this study's main weaknesses is that the questionnaires were self-reported, and the tendency is to investigate and report attitudes, rather than behaviors (Hughes et al., 2018). Another issue to be considered when evaluating the results is the small sample, which makes the results difficult to generalize. However, it is almost impossible to access in the aerospace industry, especially at Guiana Space Center.

Future research directions offer the opportunity to expand the topics addressed in this study by adding new variables in the analysis, such as Attitude Towards Technology, Trust in Automation, perceived usefulness, and perceived ease of use of specific technologies (in our case algorithms).

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THE IMPACT OF THE DIGITALIZATION PHENOMENON ON MANAGEMENT PRACTICES BEFORE AND AFTER THE COVID-19 PANDEMIC. A LITERATURE REVIEW

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Abstract. *Digital transformation is a topic that was already having a significant popularity in organizations in the last decade, with C-level managers understanding that in order to stay competitive and avoid the disruption happening in many industries they will have to adapt their businesses and have a more digital approach. The COVID-19 pandemic only accelerated this existing process, not only by forcing organizations to adopt new digital tools and technologies, but also by changing mindsets and accelerating processes that would usually take at least a couple of years to happen in an organic environment. Remote work is only an example of change that happened during the COVID-19 pandemic and is currently becoming normality for employees and organizations, although before 2020 one day of remote working each month was a benefit that only a small part of the organizations was offering. The aim of this paper is to analyze the impact of the COVID-19 pandemic on researches about digital transformation in management practices before and after the COVID-19 pandemic by using text mining and visual mapping conducted with the help of VOSviewer software. A change in research topics regarding digital transformation and its implications after the beginning of the COVID-19 pandemic was observed with the help of a bibliometric analysis conducted with the help of Web of Science libraries and VOSviewer software.*

Keywords: *COVID-19; digital transformation; digitalization; management practices; pandemic;*

Introduction

Although the digital transformation literature was already developing at a high rate before 2020, the COVID-19 pandemic produced a significant increase in the number of studies published, as one of the major impacts of the restrictions imposed by the authorities all over the world was the adoption of digital tools on all levels in organizations. Starting from the premise that in order to explore major information trends, categories and to identify existing research gaps, relevant and recent literature was reviewed by doing a literature review on materials published in the Web of Science libraries and by using VOSviewer in order to analyze and visualize the similarities and differences in materials published until 2020, after and during the COVID-19 pandemic. Literature review play a vital role during crises such as the COVID-19 pandemic, where events unfold rapidly and we find ourselves inundated with an overwhelming amount of information as research publications continue to grow.(Stanley, 2001). The Web of Science database was used in August 2022 to find materials containing “digital transformation” and/or “COVID-19” as keywords, returning 7.835 materials.

In Figure 1 is presented the number of published digital transformation materials by years, indicating that almost 38% of the materials were published in the last two years (2021 and 2020), equaling the number of materials published in 2014-2019. And although 2022 is not over, there is already a number of 2.183 materials published, almost as much as in 2020.

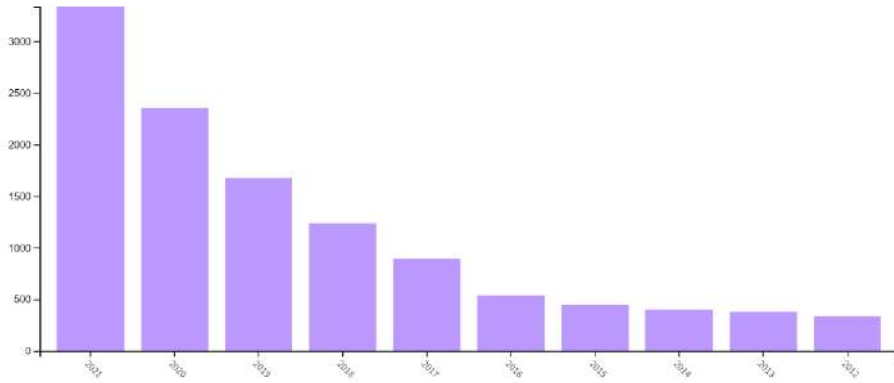


Figure 1 Number of digital transformation materials published in 2014-2021. Source: Web of Science, August 2022

The research area in which the majority of the materials were published was Engineering, with almost a quarter of the total published materials. However, the high number of materials published in research areas related to technology and computer science can be explained by the fact that digital transformation has a strong technological component as being driven and focused on digital tools. The level of interest for this subject in business is proven by the number of materials published in research areas related to management (898 materials published, 6% of the total) and business (675 materials published, 4.5% of the total).



Figure 2 Number of digital transformation materials published by categories in 2014-2021. Source: Web of Science, August 2022

However, restricting the publishing years to 2020, 2021 and first half of 2022, the percent of digital transformation materials published in management and business research areas increases significantly, to 18.5% of the total published digital transformation materials, showing high interest on this topic after the beginning and during the COVID-19 pandemic. This can be explained by the increased number of organizations and individuals that have found solutions with a significant digital component during the COVID-19 pandemic in order to cope with the new challenges imposed by the authorities all over the world.



Figure 3 Number of digital transformation materials published by categories in 2021, 2022 and first half of 2022. Source: Web of Science, August 2022

Literature review

The process of digitalization is reshaping current processes and facilitating the development of new ones, while also impacting individual behavior and requirements. It enables enhanced intra- and inter-company collaboration and paves the way for novel forms of automation. (Kerpedzhiev et al, 2021). Amidst the COVID-19 crisis, the pivotal factor for effective responses has been identified as the presence of dynamic capabilities within organizational performance. (Lin, 2014) (Linnenluecke, 2017). In response to the COVID-19 pandemic in 2020, companies have widely embraced various digital technologies as a means of adhering to social distancing measures and adapting to the "new normal." These technologies had already existed on a large scale before the pandemic but were extensively employed during this period. For instance, educational institutions worldwide had to implement online learning as the sole viable method to continue their operations during lockdowns, even though this technology had been available for a significant period of time prior to its adoption. However, recent studies have indicated that the COVID-19 pandemic has resulted in changes in student behavior. To address these changes, a combination of tangible and digital resources that can ideally be interchanged is necessary, taking into account the specific preferences observed among female and male students, as well as between bachelor's and master's level students. (Hargitai, Pînzaru, & Veres, 2021). The term employed to characterize

the creation of advantageous circumstances for an unprecedented phenomenon is "disruption" or a revolutionary transformation. (Ganichev & Koshovets, 2021). This process is underway as individuals and organizations are compelled to transition their daily activities to a new digital society. It holds significant importance as humanity must cultivate the capacity to devise solutions for the unavoidable shocks and disruptions that impact the economy and society. Numerous recent examples, such as the 2008 global financial crisis and the more recent COVID-19 pandemic, serve as compelling illustrations of the significance of this process, with these events merely scratching the surface of the larger picture. (Ra et al, 2021). Despite significant efforts made since the beginning of the new millennium to transition towards a more digital economy and embrace its implications, it was only recently that the entire world experienced an unprecedented need for this change. The outbreak of COVID-19 resulted in extensive disruptions across various industries, impacting the daily lives of people worldwide. Technology emerged as the solution, with businesses swiftly adopting digitalization of processes, online meetings, and remote work as the logical choice in response to lockdown measures. While the full extent of these changes is yet to be fully measured and analyzed, evidence indicates that the accelerated digitalization process has actually boosted productivity, reduced asset ratios, and generated an increased demand for training as employees had to acquire new technological skills. (Ra et al, 2021).

Digitization, digitalization and digital transformation

In order to have a clear definition of this term, it is important to also define digitization and digitalization. Digitization is defined as being the process of taking analog information and changing it to digital form, without adding significant changes to its essence (Gartner's IT Glossary). The best example for this definition is the process of taking handwritten text and converting it into digital form by typing it using a digital keyboard connected to another device. The main characteristic of this term is that it defines the digitization of information, not the process. That's why, according to Gartner's Glossary, digitalization is defined as „the process of moving to a digital business”, by using digital technologies to change a business model and provide new revenue and value-producing opportunities (Gartner's IT Glossary, n.d.). And although many other definitions imply that digitalization has an impact only in social interactions or in business models, according to the report *Digitalization and American Workforce* by Mark Muro, digitalization is “the process of employing digital technologies and information to transform business operations” (Muro et al, 2017). By buying and implementing “digital technologies”, organizations also have to deal with a change in people's jobs and that's the reason that automatization is a key element in the digitalization story (Tacke & Ehrhardt, 2017). Last but not least, digital transformation, unlike digitalization, it's not something that can be implemented as a project in an organization, but refers to the customer-driven strategic business transformation that requires cross-cutting organizational change as well as the implementation of digital technologies (Bloomberg, 2018). That's why the whole process of digital transformation will often include multiple digitalization projects, requiring the organizations to make changes to their core competency, becoming customer-driven end-to-end. In conclusion, digitization applies to information, digitalization to processes and roles that make up the operations of a business that can be digitally transformed together with its strategy. And while digitization and digitalization are mostly about technology, digital transformation is about customers.

COVID-19 pandemic

The Coronavirus Disease 2019 (COVID-19) initially emerged as an epidemic in mainland China in February 2020. However, it rapidly escalated into a global pandemic, officially declared by the World Health Organization on March 11th, 2020. The profound impact it had on the world was beyond our wildest expectations, transforming it in ways we could never have imagined. (World Health Organization, 2020).

An unseen adversary brought our lives to a halt, forced businesses to close, and posed risks to global economies. Presently, the world grapples with various challenges, including public health strategies, fiscal and monetary support, the pace of vaccine distribution, and the recovery of heavily impacted sectors. However, there is a glimmer of hope for the global economy as prospects begin to improve. (OECD, 2021).

The forecast suggests a 6% increase in global output in 2022, following a 3.5% contraction experienced in 2020. However, this growth will fall short of matching the pre-pandemic trajectory, leading to many OECD countries still lagging behind the expected living standards prior to the pandemic. Nevertheless, swift policy measures have resulted in significant progress. After sixteen months into the pandemic, nearly 2 billion vaccine doses have been administered, laying the groundwork for both health and economic recovery. As the world economy gradually returns to pre-pandemic levels of activity, the projected Global GDP growth stands at approximately 5.75% in 2021 and close to 4.5% in 2022. (OECD, 2021). As countries around the world have started to cautiously ease restrictions, our reliance on digital technologies remains crucial to maintaining activity levels that resemble those prior to the pandemic. Contrary to the prevailing perception that employees are eager to return to office settings, an interesting fact emerges: nearly half of the workers in the UK are willing to accept a reduction in salary to sustain long-term remote work arrangements. (OWL Labs, 2020).

Management practices

Defined as the working methods and innovations that managers use to improve the effectiveness of work systems or as an entity of instruments to support implementation of concepts and ideas at all levels of conceptualization a realization of concepts, ultimately aiming to support organizational processes, management practices are tightly related to the concept of digital transformation in organizations and are constantly adapting. Nowadays, in order to be aligned with the contemporary business environment, organizations use a plethora of different management practices in order to support their operations (Nedelko & Potočan, 2015).

With digitalization, globalization, unexpected crises and shortage of resources being more and more present in our reality, organizations have to assess their impact and prepare themselves for the future. Technology and people are the two determinant factors that are impacting the fundamentals of organizational behavior and pushing them towards changes that can maintain or extend their position in the market. But among these two factors there are others, both external and internal, that are determining the need of a complex and complete digital transformation process in organizations in order to remain competitive and adapt to the new digital economy.

With customers being more and more tech-savvy and the concept of early-adopter being an asset that can easily describe someone, organizations have to know their customers and what they do in terms of digital tools. Additionally, beyond customization, which implies a restriction in the customer's role and involves making suggestions for incremental changes to an almost complete prototype, co-creation has become the new way of developing goods or services by involving the customer as an active collaborator right from the beginning of the innovation process (Kristensson et al, 2008). Since the beginning of the COVID-19 pandemic, organizations had to deal with a large number of new requests coming from customers that were also dealing with a new reality generated by the restrictions imposed by the public authorities. Many of these requests had solutions that involved significant digital development both in terms of hardware and knowledge and changed day-to-day activities for an unlimited period of time.

With disruptive technologies creating growth through the introduction of products or services that are dramatically better, cheaper and more convenient, organizations have to deal with a new wave of technologically unsophisticated individuals or smaller organizations entering and becoming competitive in the industrial workforce, forcing them to change their operations or processes significantly. If during normal times some industries were less affected by disruptive technologies than others, during the COVID-19 pandemic almost all domains faced a new challenge and had to adapt by developing new internal virtual processes before developing user workflows in order to keep customers close to the business and assuring the level of satisfaction as high as possible during crises. For example, restaurants had to adapt and find new ways to deliver their products to the customers during lockdowns, boosting the food delivery apps and forcing other businesses to develop their own delivery services in order to stay competitive.

Reputation is another important external factor that organizations have to deal with during crisis, with corporate social responsibility (CSR) activities also being a priority for organizations and the COVID-19 pandemic leading to a sharp increase in governments' and market participants' attention to CSR considerations (Bae et al, 2021). And with the latest advances in digital technologies and the new way of doing things during crises that impose restrictions and lockdowns, the utilization of social media and other digital communication channels for marketing, promotion of products, CSR practices and stakeholder engagement gave organizations a boost in terms of reputation and allowed them to maintain the customers' satisfaction close to normal. But this involved a high level of understanding the customers' needs and how to respond in a proper way using digital tools as a leverage. Mainly this first implied an internal process of developing the employees' digital skills before they could further develop new digital strategies for customers (Troise & Camilleri, 2021).

Privacy and personal data protection of users has lately become a priority for governments and organizations. With the adoption of the new European regulation, known as GDPR on 25 May 2018, personal data was defined as any information related to a person who can be identified directly or indirectly with specific factors for personal, physical, digital, physiological, genetic, mental, economic, cultural or social identity (intersoft consulting). Organizations had therefore to walk through a new process of carefully handling customers' data and complying with the new regulations for users coming from Europe, with other resembling regulations being gradually implemented in America or Australia (Romansky, 2019). New technologies like cloud computing,

Internet of Things (IoT), Big Data Analysis creates new opportunities for collaboration, remote storing data, smart application and processing very large data but also create problems for the privacy. This domain being mostly regulated by local authorities means that organizations have little to no space to develop new processes and they have to adhere to existing regulations. During the COVID-19 pandemic everything happened faster than usual, meaning that for organizations it was harder to maintain the quality of processes while also keeping them in line with other regulations regarding privacy and data control.

As digital transformation is seen as an adaptation of business models, resulting from the dynamic pace of technological progress and innovation that trigger changes in consumer and social behaviors, it has to benefit from support of the board management and the C-suite. With information technology (IT) becoming a strategic differentiation for many established firms over the last decades (Bassellier, 2004) two new roles were gaining importance: Chief Information Officer and Chief Digital Officer. With competitive differentiation in the market through IT has become a critical C-level topic, the role of the CIO has also changed and became more and more important and associated with evolution, pressure, complexity and tension (Haffke et al, 2016). Beginning as a data processing manager (Martin, 1982) the CIO role is currently dealing with ambiguity, but is also starting to be seen as more valuable and as a business manager than a technical manager (Chun & Mooney, 2009).

Methodology

In order to assemble a general image of the digital transformation materials written, VOSviewer (version 1.6.18) was used to generate multiple maps based on bibliometric data for materials indexed in the Web of Science database. Keywords „digital transformation” and „COVID-19” were used for advanced searches, the results being refined in order to select only materials written in English that were indexed in the Business and Management categories.

Results and discussion

For a better understanding of how the COVID-19 affected management practices, an analysis based on the direct comparison of digital transformation materials published before and after the beginning of the pandemic (March 2020) was developed. Using „digital transformation” as a keyword in Web of Science and selecting only the materials published before 2020 in English, indexed in the Business and Management categories, generated 377 results. The total number of keywords was 260, with 37 of the keywords meeting the criteria of having at least 2 co-occurrences. If the condition of having minimum 3 occurrences was selected, the number of keywords meeting the criteria was significantly lower, down to 16, divided into 4 clusters. The final results had 65 links with a total length strength of 37.

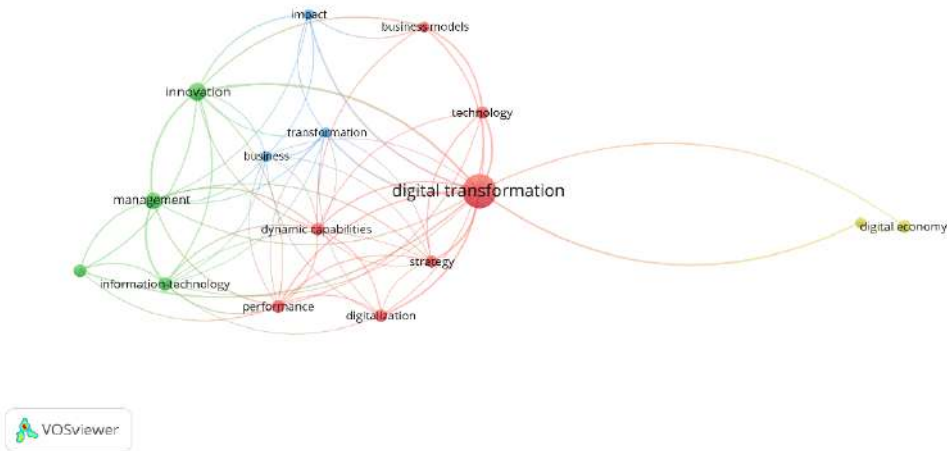


Figure 4 Map of digital transformation literature until 2020 with at least 3 co-occurrences. Author’s own research results

“Digital transformation” keyword has 15 links with other keywords. In its own cluster the strongest link is with „strategy” – 1.98. In order clusters the strongest links are with „innovation” – 2.67, „impact” – 1.33 and „industry 4.0” – 1.50.

Narrowing the results of the search using „digital transformation” as a keyword and selecting only the materials published from 2020 to 2022 (first six months) generates 451 results, 74 more than the materials published before 2020, showing an increased interest over this subject since the beginning of the COVID-19 pandemic. The total number of keywords was 293, with 46 of the keywords meeting the criteria of having at least 2 co-occurrences. If the condition of having minimum 3 occurrences was selected, the number of keywords meeting the criteria halved, to 23, divided into 4 clusters, as seen in Figure 5. The final results had 137 links with a total length strength of 72.50.

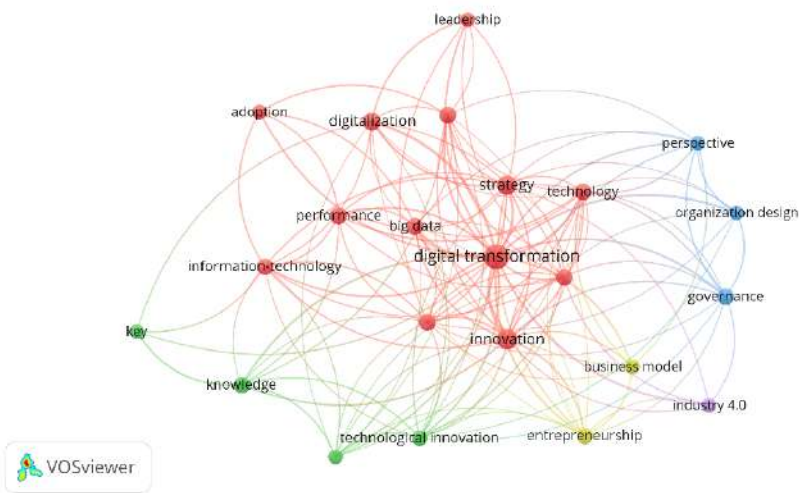


Figure 5 Map of digital transformation literature since 2020 with at least 3 co-occurrences. Author’s own research results

Reducing the number of minimum co-occurrences to 5 generates a map with 14 keywords, 4 clusters and a total link strength of 57.50. „Digital transformation” keyword has 41 occurrences, links with all the other keywords and a total link strength of 31. For digital transformation materials published after the beginning of the COVID-19 pandemic there is a strong link between „digital transformation” and „innovation” keywords – 5.07. „Strategy” is also strongly linked with „digital transformation”, having a link strength of 3.13. „Knowledge” is a keyword directly linked to „digital transformation” that has enough co-occurrences for materials written after 2020 in order to be displayed on the map. This is also in line with the literature showing that among the most successful organizations are those that can be considered as knowledge-based ones, issue addressed more and more since the beginning of the COVID-19 pandemic (Zbucnea, Ivan, Petropoulos, & Pînzaru, 2019). So is big data, knowledge, entrepreneurship, and dynamic capabilities, showing the topics that were most popular during the crisis generated by the COVID-19 pandemic and confirming what has been underlined in the chapter dedicated to the literature review.

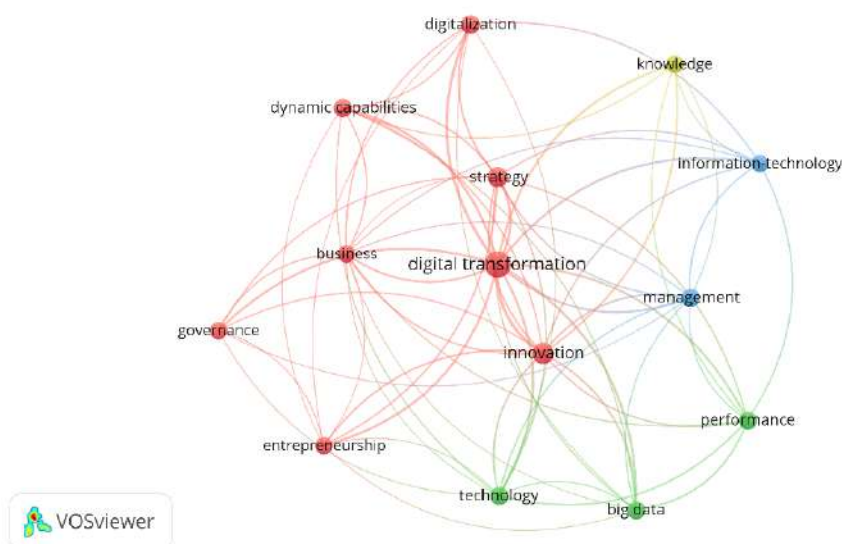


Figure 6 Map of digital transformation literature since 2020 with at least 5 co-occurrences.
Author's own research results

A search on Web of Science using „digital transformation” and „COVID-19” keywords generated 854 materials, published since 2020. The majority of the articles were published in Business and Management areas, a percent of 21% of the total.



Figure 7 Digital transformation and COVID-19 materials published by research area. Author’s own research result

In total there were 3.661 keywords from which 195 met the condition of having at least 5 co-occurrences. In order to simplify the visualization, the number of minimum co-occurrences was increased to 20, resulting 32 keywords and 6 clusters as shown in Figure 8.

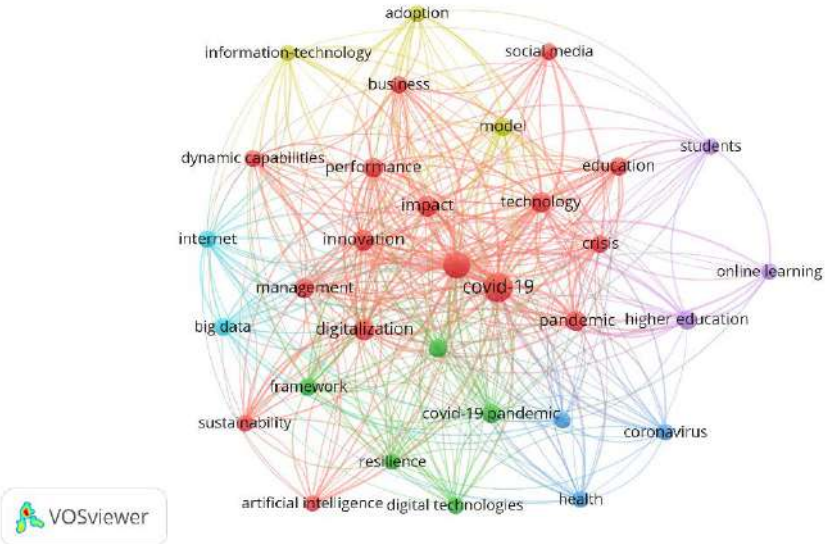


Figure 8 Map of digital transformation and COVID-19 literature since 2020 with at least 20 co-occurrences. Author’s own research results

There were 5 important areas where digital transformation and COVID-19 materials were published since the beginning of the pandemic: education, health, resilience, big data and artificial intelligence, all of them connected and generating a total link strength of 670. An important mention goes to “social media” keyword, being directly linked to “COVID-19” and “digital transformation”, as seen also in the chapter dedicated to the Literature review for being a very common solution adopted by organizations during the COVID-19 pandemic in order to keep in touch with their customers.

When looking at each cluster separately one can observe the characteristics defining that area, as following: in Cluster 2 (green) the focus is on digital technologies as a solution for generating frameworks in order to develop the resilience of an organization in order to support the transformation process during crisis. Cluster 3 (dark blue) has only 3 keywords: coronavirus, health and information, showing that the focus was on keeping individuals updated by providing relevant information regarding health issues. Cluster 4 (yellow) also has 3 keywords: adoption, information-technology and model, while Cluster 5 (purple) is related to education and online learning and Cluster 6 (light blue) focuses on big data.

Conclusions

Literature review together with the bibliometric analysis shows the change of focus in research on digital transformation materials since the beginning of the COVID-19 pandemic, with an increase of the number of materials published in Business and Management areas. Some keywords were also observed to be more recent and more popular since 2020, with big data, knowledge, entrepreneurship, and dynamic capabilities being directly linked with digital transformation. As the materials published and the research is still ongoing further research in order to assess the changes produced by the COVID-19 pandemic in the literature researching the impact of digital transformation has to be done.

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A THEORETICAL MODEL TO EVALUATE THE IMPACT OF ORGANIZATIONAL CLIMATE ON INNOVATIVE CAPABILITIES AND INNOVATION PERFORMANCE FOR COMPANIES IN THE SOFTWARE INDUSTRY

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Abstract. *Organizational climate is strongly influential for the business-creative capabilities, the degree of innovation novelty, and the innovation performance of contemporary organizations, and consequently for their long-term sustainability and profitability. Based on an extensive academic literature review, this paper provides a theoretical model and a validation research design to explain how organizational climate can influence firms' innovative capabilities and performance with a special focus on the software industry. The model combines three established organizational climate research tools: Personal Initiative, Psychological Safety, and Team Climate Inventory (with its four latent variables - Vision, Participative Safety, Task Orientation, and Support for Innovation) and two fundamental dimensions of organizations' innovative capability (innovations' degree of novelty and innovativeness), linking them ultimately to innovations' business performance to explain how climate factors should be leveraged to enhance firms' market success. The paper proposes a research design and measurement model that can be used to apply the theoretical model in the software industry.*

Keywords: *Organizational Climate; Innovativeness; Innovation Performance; Team Climate; Personal Initiative; Psychological Safety; Innovation Management.*

1. Introduction

Innovation is a means for any organization to transform change into opportunities and income, but also a solid source of long-term sustainability and profitability (Moghimi & Muenjohn, 2014), as innovations have a crucial role in a firm's market success and competitive advantage (Crossan & Apaydin, 2010). Innovation is strategically necessary in today's highly competitive economic setting, particularly in dynamic markets such as the software industry (Patterson et al., 2009). For most of organizations in knowledge-related economic sectors, one of the biggest challenges is to motivate professionals with a natural and trained brain power to think creatively and generate profitable change, be it incremental or radical (Shipton et al., 2006). To do that, organizations can develop an appropriate culture and climate for creativity and innovation by strategically focusing on creating novelty (Pallas et al., 2013). A climate for innovation is positively associated with organizational performance (Glisson, 2015; Shanker et al., 2017). To differentiate

from the competition and win the market battles, managers need to nurture creativity, create an appropriate climate, and develop appropriate structures and processes for innovation (Kandampully, 2002; Ritter et al., 2004). We approach climate factors as manifestations of the organizational culture (Martin, 2001) functioning as important predictors of innovation capabilities and outcomes at the team level (Hunter et al., 2007).

A systematic review of the literature made by Sethibe & Stein (2016) identified only seven articles investigating the causal path between organizational climate, innovation, and organizational performance, this represents the most important gap in the academic knowledge we address through this paper, given the importance of innovation in companies' long-term performance. This paper aims to describe and academically substantiate a theoretical model establishing relationships between organizational climate, a firm's innovative capabilities, and innovation's business performance, in the very specific context of the software industry. The academic background on the organizational climate factors contributing to innovativeness, novelty degree, and innovation's business performance in the software industry is still poor, immature, and fragmented (Fischer et al., 2014; Rose et al., 2016). Recent research partially covered this field, indicating that certain climate factors have a positive impact on certain dimensions of innovativeness as knowledge acquisition, dissemination, idea generation, and idea promotion (Huang & Li, 2021) on business creativity and profitability (Shahzad et al., 2017) or innovation performance (de Souza Bermejo et al., 2016).

At the same time, a solid body of academic literature has already validated Team Climate, Personal Initiative, and Psychological Safety as relevant composite factors for the organizational creative climate and has found direct and indirect correlations between these climate factors and organizational performance (Frese & Fay, 2001; Hirak et al., 2012; Soomro et al., 2016). However, the three composite climate factors have never been placed altogether in the same research, even though important research initiatives have paired TCI and PI (Fischer et al., 2014), respectively PI and PS (Baer & Frese, 2003) in studies aiming at finding correlations between organizational climate and performance in software or technology companies. We see a strong opportunity to cover this knowledge gap, by bringing together all three composite climate factors, demonstrated as highly relevant for the creative sectors of the economy, to be checked and validated in the same research model.

We see a strong opportunity to contribution to the knowledge in this field by introducing the innovative capability factors (Innovativeness and Degree of Novelty), already confirmed as relevant in the academic literature (Nirjar, 2008; Eveleens, 2010; Therrien et al., 2011), in the relationship between climate factors and firm's innovation performance to look for their correlations in the sector of digital technology (Pallas et al., 2013). We theorize that the parameters characterizing firms' innovation capabilities directly result from the organizational climate and significant premises of the innovation's business performance. Innovativeness is a composite parameter resulting from the employees' evaluation of several elements specific to the value-creating activities in the organization, while the Degree of Novelty differentiates organizations focused on incremental change from those interested in a high degree of novelty (i.e. radical and even disruptive innovations), this approach of business strategy and risk-taking imposing organizational climates adapted to each orientation (Duhamel & Santi, 2012). For the results of the organizational innovative activities specific to the software industry, we define a composite parameter called Innovation Performance, which

aggregates several items describing innovations' beneficial and measurable business impact, as assessed in management's perceptions.

Based on a wide body of literature (Amabile et al., 1996; 1999; Baer & Frese, 2003; Subramaniam & Youndt, 2005), the theoretical model we propose (presented in Figure 1) considers that the organizational climate has a direct impact on the innovative capabilities demonstrated in the value-creative activities and operational processes of the organization (Fischer et al., 2014; Sethibe & Stein, 2016). In their turn, these capabilities, through their quality and consistency, directly impact the business results generated by innovation (Subramanian, 1996; Romijn & Albaladejo, 2002; Hult et al., 2004; OECD, 2005; Gamal et al., 2011).

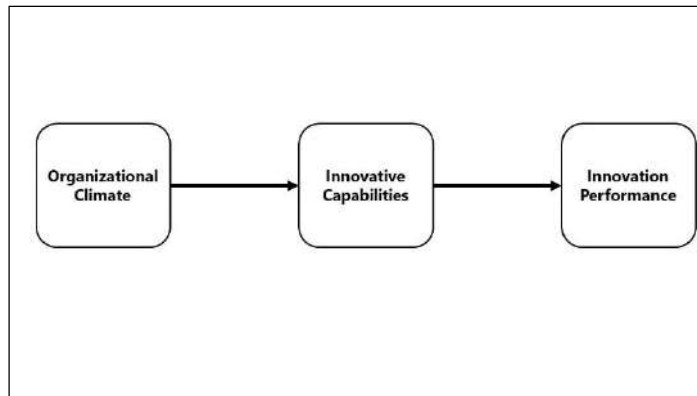


Figure 1. The Research Model - structural description

In this theoretical model, we separate three categories of factors: 1 - organizational climate factors validated by the academic literature as determinants for innovation (Team Climate, Personal Initiative, and Psychological Safety), 2 - innovation capability factors specific to the organization's value-creating processes (Innovativeness and Degree of Novelty), and 3 - innovation's outcome factors, illustrated by the novelty-related measurable results of the business (Innovation Performance).

The theoretical novelty of the research originates from (a) the definition of a new research model focused on organizational innovation, specific to the software industry as a new and highly performing sector in the knowledge economy, which correlates organizational climate, firm's innovative capabilities and innovation; (b) the introduction of two industry-relevant composite factors: innovativeness and innovation performance, consistently supported by literature but customized for the software industry, a highly-growing, insufficiently explored but economically significant business sector; (c) the introduction in the same research framework of three major climate inventory assessment instruments that have been rarely used together and never altogether, with a special attention allocated to Personal Initiative and Psychological Safety, two composite factors of organizational climate demonstrated as strategically important for innovativeness and performance in technology companies, but investigated in a very small number of studies ; and (d) the presentation of a complex

validation research methodology including customized survey instruments, aggregated and based on a solid literature body.

2. Literature review

Innovation is seen as “*the successful exploitation of new ideas*” (Adams et al., 2006, p. 22), “*the successful implementation of creative ideas within an organization*” (Amabile et al., 1996, p. 2), or “*the first commercialization of a new idea.*” (Fagerberg, 2004, p. 3). A holistic and universal framework to identify and evaluate the sources and engines of innovation performance at a firm’s level is hard to construct and coherently apply. Companies generally focus on innovation inputs and output only, ignoring the complexity of the in-between processes. A systematic literature review by Said-Metwaly et al. (2017) reveals that existing instruments of innovation assessment suffer from conceptual and psychometric shortcomings, gaps in their validity, or omissions. Quantitative measures yet prevail, whereas qualitative research still needs more development, spectrum enlargement, standards, and common approaches, while evaluation instruments cannot cover the entire spectrum of problems and a unitary system of quantification is far from realization (Said-Metwaly et al., 2017).

Organizational Culture and Structure represent one of the seven major dimensions of innovation defined by Adams et al. (2006), together with Innovation Strategy, Innovations Commercialization, and the management of Inputs, Knowledge, Portfolio, and Projects. The firm’s culture and structure act as strong differentiators for innovative organizations. Interactions, collaboration, processes, capabilities, autonomy, flexibility, resources availability, methods’ novelty, multidisciplinary and diverse teams, qualifications and communication, freedom and motivation favor successful innovative projects. Scholars propose multiple different evaluation models and inventories, but this paper will strictly focus on the elements specific to the organizational climate, indicated by Adams et al. (2006) in the Organizational Culture and Structure category, and by Crossan & Apaydin (2010) as Managerial Lever.

2.1. Organizational climate factors impacting innovation

The organizational climate concept is based on “*shared perceptions of organizational policies, practices, and procedures*”, indicating the subjective but collectively agreed interpretation of the objective reality and interactions in the work environment (Schneider, 1990; Reichers & Schneider, 1990; Anderson & West 1998, p. 236). Subramaniam & Youndt (2005) indicate work climate is the bedrock of the organization’s innovative capability, whereas different organizational climates are directly responsible for different types of innovation in companies (Hunter et al., 2007). West & Anderson (1996) prove that the overall quality of the innovation processes (in terms of radicalness, magnitude, or novelty) is primarily determined by the team’s composition, while social interactions at the team level are essential to attain a high level of innovation. Team climate provides employees the context to reach their highest levels of creativity, and individual outcomes contribute further to collective results (Pirola-Merlo & Mann, 2004).

Various theoretical models of organizational climate have been developed identifying several dimensions relevant to creativity and innovation (Hunter et al., 2007; West & Sacramento, 2012). The principal alternative to TCI, KEYS (Amabile et al., 1996; 1999) is considered comprehensive and precise, reliable, and highly useful, though criticized for being more appropriate for creativity than innovation as process outputs (Mathisen

& Einarsen, 2004), this being the reason for choosing TCI instead of KEYS in the current research model. Other climate-related factors have a much narrower academic coverage, especially in the recent years, and are criticized by scholars for certain liabilities.

Even though the software industry dominates all value rankings in the global economy and consistently contributes to business development via incremental or radical innovation, this sector has rarely been the object of studies correlating climate, creativity-related capabilities, and innovation performance. Therefore, we bring together three of the most consecrated organizational climate research instruments: The Team Climate Inventory (TCI), the Personal Initiative (PI), and the Psychological Safety (PS) inventories, which assess the climate for innovation from three different but equally important perspectives for the software industry as part of the knowledge and creativity economy. Team Climate Inventory enjoys the highest research coverage in the academic literature and benefits from a wide range of statistical validations (Houston et al., 2020; Newman et al., 2020). We add two other climate parameters that cover relevant interactions, behaviors, attitudes, contributions, and manifestations with strong personal involvement within organizations in the knowledge economy: Personal Initiative describes individuals' capacity to initiate and impose new ideas, concepts, products, and projects (Frese & Fay, 2015; Khalili, 2018; Lisbona et al., 2018; 2020), while Psychological Safety covers the extremely important area of a climate of mental comfort and intellectual balance, both at individual and group level (Edmondson & Lei, 2014; Carmeli et al., 2009; 2010).

Together with TCI, the inventories for Personal Initiative and Psychological Safety are preferred for this study because they have already been used and validated in innovation performance studies, applied together (Baer & Frese, 2003), or in combination with PI and TCI (Fischer et al., 2014) on samples of companies from software or technology sector. Baer & Frese (2003) proved that Personal Initiative and Psychological Safety positively influence organizations' business outcomes and moderate the relationship between innovation and business performance in technology companies. PI generates intensive team knowledge sharing, enhancing trust and PS, which ultimately leads to increased team creativity (Gong et al., 2012; Liu et al., 2021).

The Team Climate Inventory (TCI). An instrument initially defined by West (1990; West & Farr, 1990) and further developed and consolidated by Anderson & West (1996; 1998) assesses the specific group processes and climate creation to encourage, enhance, and structure organizational innovation. This instrument had multiple versions in time, all focused on four major dimensions of work-group innovation: **vision, participative safety, task orientation, and support for innovation** (West, 1990; Anderson & West, 1998). Vision quantifies how clear, shared, attainable, and valuable the team's objectives and vision are within the group members and has four dimensions: clarity, visionary nature, attainability, and sharedness. Participative Safety refers to the level of implication in decision-making and the safety perceived when proposing changes and engaging in novel activities. Task Orientation expresses the team's commitment to achieving the highest work standards, indicating the group's engagement for excellence. Support for Innovation evaluates the degree of declared and practically confirmed support, autonomy, authority, and resources from the organization's management structures (Anderson & West, 1994; 1996). Many studies proved that team evaluations

with TCI significantly predict practical levels of innovation in the studied teams. Hülshager et al. (2009) demonstrated that TCI predicts innovativeness, as the relationships of climate factors with team innovativeness is $r=0,30$ and higher. TCI benefits many validations in healthcare and education but was rarely used in technology-related areas. In software companies, Team Climate is proven as significantly related to superior team cognition (Açıkgöz et al., 2014), and teams' performance (Sudhakar et al., 2011), having as consequence better software and better quality (Acuña et al., 2008; 2015).

The instrument was initially built on 116 items/questions, later limited to only 44, extended to 61, and further reduced to 38 items, the most cited team climate research instrument. The number of scales varied from four to five in different interpretations. Antino et al. (2014) validated the Spanish version of TCI in both four- and five-factor versions in the software sector. The four-factor version gets the most academic credits, being validated as a team-level consensus model of team climate for innovation by Agrell & Gustafson (1994) and Mathisen et al. (2006), and as a predictor of the speed of innovation and innovation performance by Pirola-Merlo (2010). A shorter version with only 14 items addressing only the four-factor structure was also developed by Anderson & West (1998), applied and validated by studies in various sectors and countries (Kivimäki & Elovainio, 1999; Loo & Loewen, 2002; Loewen & Loo, 2004). Recently, the 14-item version of TCI was validated in Spain by Boada-Grau et al. (2011) and in Norway by Kaiser et al. (2016), confirming its validity, consistency, and reliability. This research model uses the 14 items and 4 factors version presented and validated by Strating & Nieboer (2009).

Personal Initiative. Frese et al. (1997) introduced the concept of Personal Initiative as a self-starting, goal-oriented, and proactive work behavior that overcomes barriers to achieve an objective and enables people to deal with job difficulties more actively. The construct of personal initiative (Frese et al., 1996, 1997) is built on the concept of "taking charge" (Morrison & Phelps, 1999): employees engage in proactive extra-role behavior when they feel a climate of responsibility, self-efficacy, top management openness, and support. At the personal and team levels, initiative has a bearing on key outcomes such as productivity and radical innovation (Las-Hayas et al., 2018; Lisbona et al., 2020; 2021). Lisbona et al. (2018) use the model Frese & Fay (2001) developed and confirm that Personal Initiative is an antecedent of performance and a direct result of work engagement and self-efficacy. PI leads to new ideas implementation (Binnewies & Gromer, 2012), influences both creative activities at work and the degree of creativity of the new ideas (Binnewies et al., 2007), and brings a quantitative impact, by spending additional energy at work and demonstrating perseverance in overcoming challenges (Rank et al., 2004).

Personal Initiative is recently been demonstrated as a source of innovation and business outgrowth: mediates the increase of creative approaches in business and entrepreneurial success (Glaub et al., 2014), leads to innovative results when assisted by planning and social networking (Rooks et al., 2016), whereas training focused on PI increases firm's profits by 30% (Campos et al., 2017). In its current modern format, utilized in the current study as well, the research instrument related to Personal Initiative and Psychological Safety was first developed and applied by Baer & Frese

(2003) with two separate sections and 14 items (seven for PI, seven for PS), partially inspired by a model developed by Frese et al. (1997).

Psychological Safety. Teams' psychological safety is a construct defined by Edmondson (1999) indicating a shared belief held by the team members that their working group is safe for interpersonal risk-taking. PS is a critical factor in understanding workgroup phenomena such as voice, teamwork, information sharing, interpersonal trust, mutual respect, caring about each other, and team and organizational learning which, combined with trust and confidence, are prerequisites for group creativity and team performance (Edmondson & Lei, 2014). A systematic literature review indicates that PS correlates with performance, team effectiveness, innovation, team creativity, efficiency, and positive work attitudes (engagement, commitment, and empowerment) at the dyadic level (Newman et al., 2017; 2020). A longitudinal study applied by Baer & Frese (2003) on 47 mid-sized German technology companies demonstrates the direct contribution of PS to the success of organizational innovation and firms' business results, moderating the relation between process innovations and firms' profitable growth. PS is positively associated with SMEs' innovation outcomes, and positively related to innovation capabilities related to products, activities, services, and business models (Andersson et al., 2020) and enhances the chances of success for teams at the front end of new product development, even in conditions of uncertainty in work structure or lack of clarity (Nienaber et al., 2015).

In this study, the research instrument related to the climate of Psychological Safety is applied by Baer & Frese (2003), built by using the seven items developed by Edmondson (1999).

2.2. Connecting innovative capabilities and innovation performance

Adams et al. (2006) observed that quantification of innovation results does not appear to take place routinely within management practice in organizations, but this field has received increasing attention within the last two decades and tends to be more structured (Bititci et al., 2012). Despite their importance, organizations' innovativeness and innovation performance do not yet benefit from a solid, clear, and objective evaluation method, as it is difficult to choose suitable and precise indicators (Rogers & Rogers, 1998; Romijn & Albaladejo, 2002; Bloch, 2007). Involving a complex system with multiple dimensions is recommended, to provide a meaningful, clear, and comprehensive representation of reality (Mairesse & Mohnen, 2002; Lanjouw & Schankerman, 2004; Gault, 2018).

Innovation assessment should be adapted to the specific business sector and the organizational context (Richtnér et al., 2017). The software industry is one of the best performing but also one of the most recently developed areas, so it has not yet built a comprehensive and coherent methodology to help management assess innovation capabilities and benefits. Edison et al. (2013) identified 13 existing innovation measurement frameworks reported in the literature, but only one, the index of innovativeness (Nirjar, 2008) was focused at the time on software firms, being based on six metrics adapted from the Oslo Manual (OECD, 2005), aggregated in a calculated index of innovativeness.

Literature separates inputs (resources for innovation - personnel, funds, equipment, ideas), processes (activities, time, cost, quality, and project's progress), outputs (new products, services, knowledge, or new flows), and outcomes (market results and business success: revenue, profit, market share, customer satisfaction) as major factors describing innovation (Janssen et al., 2011; Saunila, 2017). For two reasons, we separate input, process, and output factors as dimensions of the innovative capability of outcomes as innovation's tangible contribution to business growth. First, the relationship between organizational capabilities and business results is not always positive and proportional (Bengtsson et al., 2013; Pallas et al., 2013; Quandt et al., 2015). Second, we capitalize on the diversity of information sources, to get accuracy, relevance, and representativity: while business outcomes (innovation performance) can be effectively evaluated by the organization's top managers by interpreting financially-calculated factors, innovativeness, and novelty degree would be more precisely and representatively evaluated by the employees, who also provide data inputs for the climate factors (OECD, 2005; Prajogo & Suhal, 2006; Fischer et al., 2014). For both types of respondents and for the aggregated evaluation parameters, a superior level of objectivity and credibility would be reached by asking respondents to apply multiple scales of evaluation (Kraft, 1990; Prajogo & Ahmed, 2006), by looking at results in absolute numbers, by comparing their perceived outcomes to the results of their market rivals or by comparing their concrete results against the organization's objectives (Judge & Douglas, 1998; Prajogo & Sohal, 2006; De Luca & Atuahene-Gima, 2007).

Innovativeness. The variety and complexity of instruments assessing organizational innovativeness are increased by the specific differences between industries and research approaches. Hung et al. (2011) adapt concepts of previous research (Baker & Sinkula, 1999; Prajogo et al., 2004) and inspire this study by proposing 11 items relevant for innovativeness: speed of R&D; the speed of production improvement; the speed of logistic innovation; the impact of R&D in production; production customization; products innovativeness; use of latest technologies; use of modern HR practices; job design innovation; organizational structure flexibility; patent registrations). One of the most cited and structured frameworks is the "Oslo Manual", developed by OECD (2005), which includes a large part of the previously-mentioned parameters, and sets international standards for measuring innovativeness and innovation performance (Evangelista et al., 2001; Erdil et al., 2004; Roszko-Wójtowicz & Białek, 2016).

Other academic frameworks offer multiple diverse perspectives but appear unreliable, inappropriate, or irrelevant to the software industry and the context of this paper.

The six variables aggregated in the innovativeness factor are: focus on innovation (Pallas et al., 2013); the speed of R&D processes as compared against major competitors; the novelty of the used technologies and methodologies; speed to the market of new products, as compared against major competitors (Prajogo & Ahmed, 2006; Prajogo & Suhal, 2006); encouragement of initiative to implement ideas (OECD, 2005; Fischer et al., 2014); effective adoption of new ideas (Ferraresi et al., 2012; Parida et al., 2017).

Innovation's Degree of Novelty. Innovative activities and business outcomes depend on the radicalness, magnitude, and novelty of the implemented new ideas (West & Anderson, 1996), scholars separating incremental from radical innovations (Eveleens,

2010). Innovation is incremental when changes sustain or improve efficiency to existing flows for current markets and customers, whereas radical innovation is market-creating and often disruptive, activates latent needs or desires of non-consuming segments, and bring products or services new to the company, new to the market or even new to the industry (Christensen et al., 2019). Management practices differ: radical innovation asks for a totally different mindset (McDermott & O'Connor, 2002), new principles and rules (Veryzer, 1998; Hill & Rothaermel, 2003), develops a totally new organizational paradigm (McLaughlin et al., 2008), involves high-risk of failure (Duhamel & Santi, 2012) and potentially high-return.

The novelty of innovation can be expressed on a scale where change is “*associated with the creation and adaptation of ideas that are new-to-world, new to nation/region, new-to-industry or new-to-firm*” (Patterson et al., 2009, p. 5). Romijn & Albaladejo (2002) improved the model created at Cambridge by Cosh et al. (2002) affirming that the degree of novelty is strongly relevant, qualitative, and subjective, being expressed in surveys, on 5-degrees scales, as a score of the newness of the firm’s products launched within the last three years. Similar approaches are presented by other studies (Baer & Frese, 2003); Prajogo & Ahmed, 2006; Prajogo & Suhail, 2006; Carayannis & Provan, 2008). To quantify innovation’s newness, this research proposes a six-degree scale defined by Fischer et al. (2014), inspired by Romijn & Albaladejo (2002) and later validated by Lisbona et al. (2020). Six levels of radical innovation (based on consistency and market impact) specifically distinguish the degree of newness: no major innovation at all (score of 0); same or very similar innovation adopted by competitors (score of 1); similar innovation to the ones adopted by other firms in the same industry but the firm’s innovation differs in identifiable ways from innovations of other firms. (score of 2); similar innovation to the ones adopted in other industries (score of 3); innovation fundamentally new to the firm (score of 4); innovation fundamentally new to the market (score of 5).

Innovation Performance. The evaluation of innovation outcomes received high attention and coverage in the literature, with with multiple frameworks addressing the topic and generally based on top managers’ Likert scale evaluations.

Based on a rich academic background, the ten factors established in this study to assess the innovative performance of the organizations are: new products turnover in total turnover; new products turnover in total turnover, as compared against competitors (OECD, 2005; Carlsson et al., 2011; Alegre et al., 2013; Arundel et al., 2019); new products turnover in total turnover, per employee, as compared against major competitors (Kafouros et al., 2008); increase of competitive advantage in the market due to innovation (Hung et al., 2011); increase of profitability due to innovation (Pallas et al., 2013); increase of turnover due to innovation (OECD, 2005; Hung et al., 2011); achievement of market share objectives by new products; achievement of sales revenue objectives; achievement of Return On Investment objectives; achievement of profitability objectives (Baer & Frese, 2003, Pallas et al., 2013).

To resume, we propose a Research Model split into three phase-related composite factors (climate, capabilities, and performance). We expect to identify significant correlations between climate factors in software-creating organizations and firms’ innovative capabilities (innovativeness and innovations’ degree of novelty), which, in

their turn, have direct relationships with innovation-based business results. Our literature-based theory states that Personal Initiative, Psychological Safety, and Team Climate (with their four components – Vision, Participative Safety, Task Orientation, and Support & Innovation) each significantly influence software organizations' capabilities of producing valuable creative novelty.

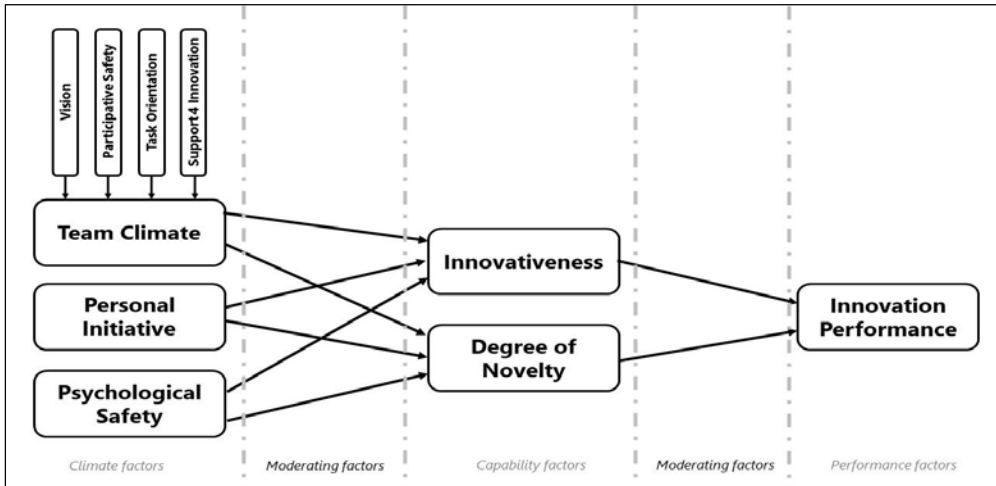


Figure 2. The Research Model – detailed description

To collect relevant and consistent organizational climate data, we combine for the first time three consecrated organizational climate research instruments: The Team Climate Inventory (TCI), the Personal Initiative (PI), and the Psychological Safety (PS) surveys. In the field of organizational innovative capability, we select Innovativeness and Degree of Novelty, already developed and validated by literature, as the most important results of an innovation-oriented climate and assume these two factors as prerequisites for the significant business outcomes generated by innovations, aggregated in a composite factor, Innovation Performance. Two new formulas of composite factors aggregated from domain-relevant variables are proposed for Innovativeness, respectively Innovation Performance.

3. Proposed research design and instruments to test the model

Based on the literature, we believe the best approach to test this research model is quantitative, based on surveys applied on a statistically relevant number of software companies of various types, sizes, market coverages, product strategies, and business models, to provide diversity and cover a sufficiently large spectrum of firms for each of the three moderating factors. A pair of surveys (one for the employees and one for the top manager of each company) should be applied. To correspond to the innovation performance criteria, only companies with at least three years of activity and already profitable should be selected in the final sample, as scholars consider that the research-relevant new products generated through innovation are those launched and sold within the last three years of activity of the firm (Judge & Douglas, 1998; Cassiman & Veugelers, 2006; Fosfuri & Tribó, 2008; Zeng et al., 2010).

The climate-related questionnaire addressed to employees includes 28 items: 14 items for the Team Climate Inventory, using the model presented and validated by Strating &

Nieboer (2009); 7 items for Personal Initiative, as defined by Baer & Frese (2003) and validated by Fischer et al. (2014) or Lisbona et al. (2018); and 7 items for Psychological Safety, as defined by Edmondson (1999), presented and validated by Baer & Frese (2003) and multiple other recent studies. All 28 items use a 5-degree Likert scale with values from 1 – Strongly disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Strongly agree. The items are presented in the following Table (star-marked manifest variables indicate negative situations or climate behaviours):

#Item formulation	Manifest variable, code	Latent variable
#1 - I completely agree with our organization's objectives.	TC11_Sharedness	TCI Vision
#2 - I believe that our team's objectives are clearly understood by the other members of the team.	TC12_Clarify	TCI Vision
#3 - I think our team's objectives can actually be achieved.	TC13_Attainability	TCI Vision
#4 - I believe these objectives are worthwhile to the organization.	TC14_PerceivedValue	TCI Vision
#5 - We have a "we are in it together" attitude in our team.	TC21_Influence	TCI Participative Safety
#6 - People keep each other informed about work-related issues in the team.	TC22_InteractionFrequency	TCI Participative Safety
#7 - People feel understood and accepted by each other, in our team.	TC23_Safety	TCI Participative Safety
#8 - There are real attempts to share information throughout the team.	TC24_InfoSharing	TCI Participative Safety
#9 - Our team members are prepared to question the basis of what the team is doing.	TC31_Ideation	TCI Task Orientation
#10 - Our team members critically appraise potential weaknesses in what we are doing, in order to achieve the best possible outcome.	TC32_Appraisal	TCI Task Orientation
#11 - The members of our team build on each other's ideas in order to achieve the best possible outcome.	TC33_Excellence	TCI Task Orientation
#12 - People in our team are always searching for fresh, new ways of looking at problems.	TC41_ArticulatedSupport	TCI Support for Innovation
#13 - In this team we take the time needed to develop new ideas.	TC42_Time4Creativity	TCI Support for Innovation
#14 - People in our team cooperate in order to help develop and apply new ideas.	TC43_EnactedSupport	TCI Support for Innovation
#15 - People in our company actively attack	PIE1_Focus	Personal Initiative

problems.		
#16 - Whenever something goes wrong, people in our company search for a solution immediately.	PIE2_Solutioning	Personal Initiative
#17 - Whenever there is a chance to get actively involved, people in our company take it.	PIE3_Involvement	Personal Initiative
#18 - People in our company take initiative immediately – more often than in other companies.	PIE4_Initiative	Personal Initiative
#19 - People in our company use opportunities quickly in order to reach our goals.	PIE5_Opportunism	Personal Initiative
#20 - People in our company usually do more than they are asked to do.	PIE6_ExtraEffort	Personal Initiative
#21 - People in our company are particularly good at practically implementing new ideas.	PIE7_Implementation	Personal Initiative
#22 - In our company some employees are rejected for being different.	PSE1_Intolerance*	Psychological Safety
#23 - When someone in our company makes a mistake, it is often held against them.	PSE2_Blame*	Psychological Safety
#24 - No one in our company would deliberately act in a way that undermines others' efforts.	PSE3_Cohesion	Psychological Safety
#25 - It is difficult to ask others for help in our company.	PSE4_Unavailability*	Psychological Safety
#26 - In our company one is free to take risks.	PSE5_RiskTaking	Psychological Safety
#27 - The people in our company value others' unique skills and talents.	PSE6_Recognition	Psychological Safety
#28 - As an employee in our company one is able to bring up problems and tough issues.	PSE7_SpeakingUp	Psychological Safety

Table 1 – The items addressing the organizational climate. Sources: Anderson & West (1996; 1998), Baer & Frese (2003), Strating & Nieboer (2009), Fischer et al. (2014)

The questionnaire addressing the evaluation of the organizational innovative capabilities is addressed to employees and includes 6 items for the composite factor Innovativeness and one item for Degree of Innovation. All 6 items related to Innovativeness use a 5-degree Likert scale with values from 1 – Strongly disagree; 2 – Disagree; 3 – Neither disagree or agree; 4 – Agree; 5 – Strongly agree. The six factors taken into consideration to evaluate the organizations' innovativeness are: focus on innovation (Pallas et al., 2013); the speed of R&D processes as compared against major competitors; the novelty of the used technologies and methodologies; speed to the

market of new products, as compared against major competitors (Prajogo & Ahmed, 2006; Prajogo & Suhail, 2006); encouragement of initiative to implement ideas (OECD, 2005; Fischer et al., 2014); effective adoption of new ideas (Ferraresi et al., 2012; Parida et al., 2017). The items are presented in the following Table:

#Item formulation	Latent variable	Academic reference
The company I work for is seriously focused on innovation	Focus on innovation;	Pallas et al., 2013
The speed of the Research & Development processes of our company is faster than our competitors	Speed of R&D compared against major competitors	Prajogo & Ahmed, 2006; Prajogo & Suhail, 2006
We use the latest technological innovations and methodologies in our new product development activities	Novelty of the technologies and methodologies used	Prajogo & Ahmed, 2006; Prajogo & Suhail, 2006
The new products and services delivered by our company arrive to the market faster than our competitors	Speed to the market of NP, as compared to competitors	Prajogo & Ahmed, 2006; Prajogo & Suhail, 2006
In our company, the initiative for implementing new ideas is actively encouraged and supported.	Encouragement of initiative for new ideas	OECD, 2005; Fischer et al., 2014
A large proportion of the new ideas generated in the company is practically implemented in our work and products.	Effective adoption of new ideas	Ferraresi et al., 2012; Parida et al., 2017

Table 2 - The items addressing the organizational innovativeness

The degree of novelty will be assessed on a six-degree scale as defined by Fischer et al. (2014) and later validated by Lisbona et al. (2020). The item formulation is: *“Please evaluate the level of innovation of your organization. Select the option that best describes the innovative value of your products and services:”*, and the answering options are: 1 - No major innovation at all; 2 - Same or very similar innovation applied by our competitors; 3 - Similar innovation to the ones applied by other firms in the same industry, but the firm’s innovation differs in identifiable ways from innovations of other firms; 4 - Similar innovation to the ones applied in other industries; 5 - The innovation we realize is fundamentally new to the firm; 6 - The innovation we generate is fundamentally new to the market.

The questionnaire targeting Innovation Performance is designated to organizations’ managers and includes 10 items. The first item (new products’ turnover in total firm’s turnover) asks *“What is the proportion of annual turnover from New Products in total annual turnover?”* and is expressed on a 5-degree Likert scale with the following options: 1 - 0%; 2 - Between 0% - 15%; 3 - Between 15% - 30%, 4 - between 30% - 50%; 5 - Over 50%. The other 9 items related to Innovation Performance use a 5-degree Likert scale (1 - Strongly disagree; 2 - Disagree; 3 - Neither disagree or agree; 4 - Agree; 5 - Strongly agree) and are: new products turnover in total turnover, as compared against competitors (OECD, 2005; Carlsson et al., 2011; Alegre et al., 2013; Arundel et al., 2019); new products turnover in total turnover, per employee, as compared against

major competitors (Kafouros et al., 2008); increase of competitive advantage in the market due to innovation (Hung et al., 2011); increase of profitability due to innovation (Pallas et al., 2013); increase of turnover due to innovation (OECD, 2005; Hung et al., 2011); achievement of market share objectives by new products (De Luca & Atuahene-Gima, 2007; Ferraresi et al., 2012); achievement of sales revenue objectives; achievement of Return On Investment objectives; achievement of profitability objectives (Baer & Frese, 2003; De Luca & Atuahene-Gima, 2007; Pallas et al., 2013). The items are presented in the following Table:

#Item formulation	Latent variable	Academic reference
What is the proportion of annual turnover from New Products in total annual turnover?	New products' turnover in total turnover	OECD, 2005; Carlsson et al., 2011;
The proportion of annual turnover of New Products in total annual turnover is higher compared to our competitors.	New products' turnover in total turnover, compared to competitors	OECD, 2005; Alegre et al., 2013; Arundel et al., 2019
The Sales revenue from New Products in total turnover, calculated per employee, is higher compared to our competitors.	New products' turnover in total turnover, per employee	Kafouros et al., 2008
During the last three years, the comparative advantage of our company in the market has significantly improved due to innovation.	Increase of competitive advantage due to innovation	Hung et al., 2011
During the last three years, our company profitability has improved due to innovation.	Increase of profitability due to innovation	Pallas et al., 2013
During the last three years, the turnover of our organization has been improved significantly due to innovation.	Increase of turnover due to innovation	OECD, 2005; Hung et al., 2011
The new products and services developed by our firm have achieved MARKET SHARE according to our previously-stated objectives.	Achievement of market share stated objectives by new products	Baer & Frese, 2003; De Luca & Atuahene-Gima, 2007; Ferraresi et al., 2012; Pallas et al., 2013
The new products and services developed by our firm have achieved SALES REVENUE according to our previously-stated objectives.	Achievement of sales revenue stated objectives	Baer & Frese, 2003; De Luca & Atuahene-Gima, 2007; Pallas et al., 2013
The new products and services developed by our firm have achieved RETURN ON INVESTMENT according to our previously-stated objectives.	Achievement of ROI stated objectives	Baer & Frese, 2003; De Luca & Atuahene-Gima, 2007; Pallas et al., 2013
The new products and services developed by our firm have achieved PROFITABILITY according to our previously-stated objectives.	Achievement of profitability stated objectives	Baer & Frese, 2003; De Luca & Atuahene-Gima, 2007; Pallas et al., 2013

Table 3 – The items addressing the Innovation Performance

After data collection, data filtering, and entries validation, a mix of statistical research tools could be applied to validate the model.

4. Conclusions, limitations and further research

Summary. Based on the literature, we presume that organizational climate directly impacts organizations' innovative capabilities, which, in their turn, are correlated with innovation-based business results. We select Personal Initiative, Psychological Safety, and Team Climate (with their four latent variables – Vision, Participative Safety, Task Orientation, and Support for Innovation) as the most significant climate factors for the software organizations' capabilities (Innovativeness and Degree of Novelty) in generating profitable impactful novelty (Innovation Performance). Three established research instruments on organizational climate (TCI, PI, and PS) are combined for the first time in the methodology. Founded in literature, two industry-adapted aggregation formulas for Innovativeness and Innovation Performance as composite factors are presented.

Relevance. This research model should provide valuable insights for academics and managers about the characteristics and principles of organizational climate in software organizations, which can generate innovative capabilities and further remarkable innovative outputs. A comprehensive set of hypotheses may be formulated based on the research model and researchers' areas of interest, to cover and explore all the relationships between the factors in the proposed structure. By testing the consistency and validity of the two newly-constructed composite factors, a better understanding of innovativeness and innovation performance, adapted to the software industry, can be reached and further expanded to other creative sectors.

Further research. Testing the proposed model in various contexts, organizations and countries is a natural future research step. Based on the model testing, an opportunity for developing optimized versions appears, by including further variables, relationships, and potential moderating factors. Further research results are expected to produce innovation- and industry-related knowledge and support practical ideas related to how to engage and manage employees and teams to continuously generate new ideas and initiatives that prove to enhance the performance of software-producing organizations, no matter if oriented towards incremental, radical or mixed product strategies.

Limitations. The novelty of the research model involves certain vulnerabilities and limitations. In this format, the factors of innovativeness and innovation performance are based on a new composition framework, supported by a wide academic literature but not yet validated by other studies. The research model could not fully represent the global software industry and should be adapted to further research contexts, as local business strategies, cultural biases, and influence of the national culture, as defined by Hofstede (1980) are able to impact research results. Further research conclusions and managerial applications could be limited to the IT software-producing industry and should be adapted for other knowledge economy sectors.

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STRATEGIC IDEAS FOR IMPROVING THE FORMAT OF FIFA AND UEFA INTERNATIONAL COMPETITIONS

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Abstract. *The most important Fédération Internationale de Football Association international competition is the World Cup and the most important Union of European Football Associations international competition is the European Championship.*

The Fédération Internationale de Football Association has 211 member countries and the next World Cup will be held in 2022 in Qatar with 32 teams. The Union of European Football Associations has 55 member countries and the next European Championship will be held in 2024 in Germany with 24 teams.

An innovative model of the qualifiers and final tournaments of the most important international football competitions will be presented. As a methodology, we will perform a SWOT and BCG analysis of the proposed new competition system and evaluate the opportunity for crowdfunding and public-private partnership financing of the final tournaments.

To counteract the fall in incomes during the possible period of moderate recession that will follow the current inflationary period, international football competitions should be held every 2 years instead of 4 years. Doubling the number of international competitions will help to increase revenues in the context of more difficult access to financing due to rising interest rates on the world market. All international matches would be grouped in May, June, and July, rather than spread throughout the year. At the European level, two divisions will be created, the first with 32 teams and the second with the remaining 23. Each year, the top 8 teams in the first division advance to the final tournaments, and 4 teams will be promoted and relegated between the two divisions.

The World Cup and the European Championship will be organized every two years with 32 and 8 teams, respectively. The total number of international matches per year will decrease by 26% compared to the current system.

Keywords: *FIFA; globalization; innovation; new trends; research; UEFA.*

Introduction

The importance of improving the format of international football competitions is given by their current chaotic organization. We have many matches spread over the competition year, with 2 matches each in March, June, September, October, and November. These are added every 2 years, either a world or a continental competition, lasting 5 weeks. In the case of Africa, and North America, they are held more often twice every 4 years. We aim to improve this system by simplifying the competition system and grouping all matches around June over 6-8 weeks.

Fédération Internationale de Football Association (FIFA) organizes international football competitions worldwide and the most important competition is the World Cup, organized every 4 years since 1930. The World Cup final tournament has evolved from a 16-team system to a 32-team system, and from 2026 it will be organized with 48 teams. The 2022 World Cup final tournament will be held in Qatar with 32 teams, with 13 teams from Europe, 5 from Africa, 6 from Asia, 0 from Oceania, 4 from North America, and 4 from South America will participate. The host country Qatar has been qualified by default and the other 31 teams have qualified following qualifying matches, in which 211 teams from 6 continental confederations participated.

Each continental confederation has its own governing body. In the following, we will study the case of Europe and consider that the proposed model will be taken up by the other FIFA confederations: Africa, Asia (with Oceania), and America (including North and South America). The Union of European Football Associations (UEFA) organizes international football competitions at the European level and the most important competition is the European Championship, which is organized every 4 years since 1960. The final tournament of the European Championship has evolved from a 4-team system to a 24-team system, and the next final tournament will take place in 2024 in Germany.

Table 1. Number of the matches in the actual UEFA and FIFA international calendar (Source: Authors' own research results/contribution)

Year	Sep	Oct	Nov	Mar	Jun	Jun	Jun	Jun	Jul	Jul	Total
One (odd)	2	2	2	2	2	-	-	-	-	-	10
Two (even)	2	2	2	2	2	7 (UEFA European Championship)					17
Three (odd)	2	2	2	2	2	-	-	-	-	-	10
Four (even)	2	2	2	2	2	7 (FIFA World Cup)					17

Over the course of a year a national team plays 10 matches in an odd year and in an even year 10 matches plus a final tournament comprising between 3 and 7 matches (Table 1). The 10 matches each year can be qualifying matches for the final tournament, friendly matches, or other competitions (Sugden & Tomlinson, 1997; Darby, 2006; Scoppa, 2013; Geeraert & Drieskens, 2015; Vonnard & Quin, 2017).

Table 2. The actual system of the FIFA World Cup (Source: Authors' own research results/contribution)

Phase	Group phase	1 st ko round	2 nd ko round	Semi-finals	Finals
Teams	32	16	8	4	2
Matches	48	8	4	2	2

The FIFA World Cup final tournament is attended by 32 teams divided into 8 groups (Table 2). Four pools are created according to the results of the last 3 years and in each group has one team from each pool after the draw. Teams from America, Asia, or Africa cannot be part of the same group, except for Europe, whose teams can be a maximum of two in the same group. In the group phase, 48 matches are played, 6 matches in each group, 3 matches for each team. The best 2 teams from each group are qualified for the next round where they play 8 knockout matches, 8 group winners against 8 second-placed teams. In the 2nd knockout round the remaining 8 teams are playing 4 matches. The 4 winners are playing 2 semi-finals, the best 2 teams are getting qualified for the final and the other 2 are playing the 3rd place final (Pielke Jr., 2013).

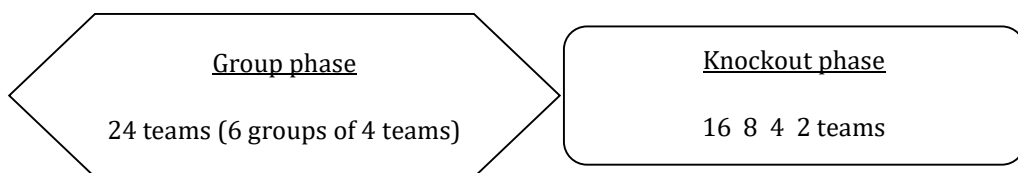


Figure 1. The actual system of the UEFA European Championship (Source: Authors' own research results/contribution)

The UEFA European Championship is attended by the best 24 teams in Europe, divided into 6 groups of 4 teams (Figure 1). In the group, each team plays the other 3 matches. The best 16 teams are getting qualified in the knockout phase, where they play each other in pairs and the winners qualify for the quarter-finals, semi-finals, and the final.

Literature review

World and continental football competition systems have continuously evolved (Darby, 2006), therefore the international calendar should be standardized between continental confederations (Vonnard & Quin, 2017). There is a need for an innovative competition system based on dynamic capabilities (Boscoianu et al., 2018) and a reduction in the number of international matches for to rest players (Scoppa, 2013). In particular, the strengths and opportunities of the proposed new competition system will be highlighted (Gürel & Akkoç, 2011).

The SWOT analysis is significant from a marketing perspective (Gürel & Akkoç, 2011) and supports the strategic development of organizations (Hill & Westbrook, 1997). The advantages and disadvantages of this strategic management tool (Helms & Nixon, 2010) are related to the complexity and diversity of the materials researched (Jackson et al.,

2003) and the degree of customer satisfaction and subjectivity (Phadermrod et al., 2019).

Although considered outdated, the BCG analysis continues to be an important strategic planning model for companies (Madsen, 2017), helping to better allocate resources from a strategic management and marketing perspective (Haradhan, 2017).

For the development of sports infrastructure, there is a need for more public-private partnerships (Akhmetshina et al., 2017), funding of new innovative technologies (Vrajitoru et al., 2021), and ensuring low risk and sustainability of investments (Prelipcean & Boscoianu, 2020). Developing countries need to get used to modern financing solutions (Prelipcean et al., 2014) since the future of sports is crowdfunding (Krupa et al., 2020).

Politics is indirectly involved in the world and European sport (Geeraert & Drieskens, 2015), FIFA can be accused of monopoly (Pielke Jr., 2013) and developed countries dominate football (Sugden & Tomlinson, 1997). If immediate reforms are not made, interest in international competitions will decrease and the future of football will be only inter-club competitions.

Methodology

The current system of international football competitions will be compared with the proposed improved system, the study being conducted between June and July 2022. A SWOT and BCG analysis of the proposed new models for the FIFA and UEFA final tournaments will be carried out to highlight their advantages (Gürel & Akkoç, 2011). It will be assessed the opportunity of crowdfunding and public-private partnership financing, the use of modern financing channels from stakeholders via the internet, targeting final tournaments to atypical markets, and the increasing involvement of private companies in the organization of final tournaments, knowing that private management is superior to government management (Prelipcean et al., 2014; Akhmetshina et al., 2017; Boscoianu et al., 2018; Krupa et al., 2020; Prelipcean & Boscoianu, 2020; Vrajitoru et al., 2021).

Results and discussions

Globally, we are expected to face a moderate economic recession because of the current inflationary period caused by the Covid-19 pandemic and the war in Ukraine. To compensate for the possible drop in revenue from FIFA and UEFA international competitions, we propose that the final tournaments be held every 2 years instead of every 4 years, in a simplified manner. The proposed system will increase FIFA and UEFA revenues and decrease the total number of international matches to increase their quality, rest footballers, and reduce the number of injuries. We will have a final tournament every year, in odd years the UEFA European Championship will be held while in even years the FIFA World Cup will be held. All these matches will no longer be spread over the whole year but will be grouped in May-June-July each year. The competitions in odd-numbered years will be spread over 6 weeks, the qualifiers over 4 weeks and the UEFA final tournament over 2 weeks. FIFA competitions in even-numbered years will run for 8 weeks, the qualifiers for 4 weeks, and the FIFA final tournament for another 4 weeks (Table 3).

Table 3. Number of the matches in the proposed UEFA and FIFA international calendar (Source: Authors' own research results/contribution)

Year	May	May	June	June	June	June	July	July	Total
One (odd)	6 (first division)				3 (UEFA final tournament)		-	-	9
					2 (relegation playoffs)		-	-	8
	8/10 (second division)					-	-	8/10	
Two (even)	6 (first division)				5 (FIFA final tournament)				11
					2 (relegation playoffs)		-	-	8
	8/10 (second division)					-	-	8/10	
Three (odd)	6 (first division)				3 (UEFA final tournament)		-	-	9
					2 (relegation playoffs)		-	-	8
	8/10 (second division)					-	-	8/10	
Four (even)	6 (first division)				5 (FIFA final tournament)				11
					2 (relegation playoffs)		-	-	8
	8/10 (second division)					-	-	8/10	

The national teams of the 55 European countries will be divided into 2 value divisions. The first division will comprise the best 32 teams, and the second will comprise the weakest 23 national teams. In the first division, 6 matches will be played over 4 weeks; in the second division, 8-10 matches will be played over 6 weeks. From the first division, the 8 group winners will qualify for the UEFA or FIFA final tournaments. The 8 teams ranked 4th will play relegation play-offs, two by two, and the 4 losing teams will be relegated for the following year. From the second division, the 4 group winners are promoted to the next year's first division (Figure 2). It is assumed that this model will be adopted by the other football confederations: Africa, Asia, and America. It is assumed that Oceania will be integrated into the Asian confederation and North America will merge with South America, the total number of teams in each newly created confederation being comparable.

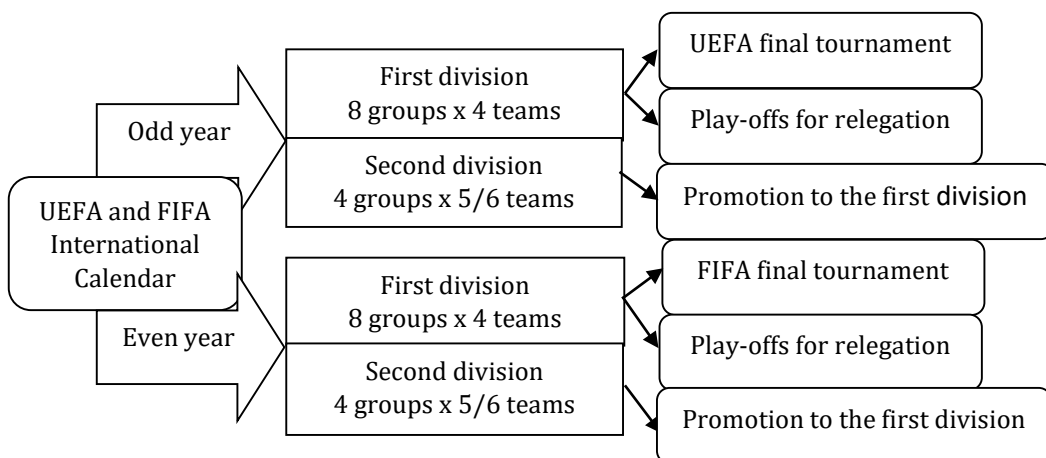


Figure 2. Proposed UEFA and FIFA competition system (Source: Authors' own research results/contribution)

The 8 winners of the groups of the first continental division will qualify each year for the UEFA or FIFA final tournaments. The tradition will be maintained that these final tournaments be organized by a host country, without that country's team qualifying directly. The UEFA final tournaments will be organized with 8 teams and direct knockout matches over 2 weeks (Table 4).

Table 4. Proposed UEFA final tournaments competition system (Source: Authors' own research results/contribution)

Phase	Quarter-finals	Semi-finals	Final
Teams	8	4	2
Knockout matches	4	2	1

The FIFA final tournaments will feature 32 teams and direct knockout matches over 4 weeks with 8 teams from Europe, 8 teams from Africa, 8 teams from Asia and 8 teams from America (Table 5). The teams from the same confederation should not meet each other in the first 2 knockout rounds.

Table 5. Proposed FIFA final tournaments competition system (Source: Authors' own research results/contribution)

Phase	1 st round	2 nd round	Quarter-finals	Semi-finals	Final
Teams	32	16	8	4	2
Knockout matches	16	8	4	2	1

If in the current system, we have a maximum total of 27 matches over two years, in the proposed system we will have a maximum of 20 matches over two years. This results in a 26% decrease in the total number of international matches, which will be seen in the increased quality of the matches, both in the reduced number of player injuries and in the freshness of the players on the pitch.

SWOT and BCG analysis of the proposed FIFA and UEFA competition system

To better describe the new competition system and the proposed new international calendar, a SWOT (Table 6) and BCG (Table 7) analysis will be carried out below.

Table 6. The SWOT analysis of the proposed FIFA and UEFA competition system (Source: Authors' own research results/contribution)

Strengths
Simplification of the international football competition system
FIFA or UEFA final tournaments every year
Doubling the number of final tournaments

Decrease the total number of matches by 26%, from maximum 27 to 20 over two years
Grouping matches in 6-8 weeks per year
Divide teams into value divisions
Shorter and more frequent final tournaments
More rest for footballers
FIFA final tournaments with equal number of participating teams from confederations
Better promotion of football worldwide
At FIFA final tournaments a team plays maximum 10 matches instead of 7 in 4 years
At final tournaments a team plays maximum 8 matches instead of 7 in 2 years
Fewer qualifying matches and more matches in final tournaments
Weaknesses
Lower interest for a final tournament held every 2 years than every 4 years
Fewer international football matches for supporters to watch
No international matches spread throughout the year
Lower revenue for teams that do not qualify for the final tournaments
At UEFA final tournaments a team plays maximum 6 matches instead of 7 in 4 years
FIFA World Cup 3 rd place final disappears
Fewer training matches
Cancellation of other smaller competitions
Opportunities
Increasing market share
Organising more frequent final tournaments
Organising final tournaments in as many countries as possible
Alternative organisation of FIFA World Cup in Europe, Africa, Asia and America
Merger of the Asian confederation with Oceania
Merger of the North and South American confederations
Increase quality by reducing the number of matches and resting footballers
Abandon continental competitions and hold the FIFA World Cup every year
Threats
Decreasing interest in international competitions at the expense of club competitions
Globalisation makes people no longer feel they belong to a particular country
Footballers may decide not to play for national teams due to busy schedule

**Table 7. The BCG analysis of the proposed FIFA and UEFA competition system
(Source: Authors' own research results/contribution)**

Stars
FIFA World Cup
UEFA European Championship
Question Marks
Frequency of organisation of final tournaments
Organisation of qualifications
Creation of value divisions in the international football system
Cash Cows
Qualifying matches for the final tournaments
Final tournaments of African, Asian and American confederations
Dogs
Friendly matches
UEFA Nations League

The evaluation of the opportunity of crowdfunding and public-private partnership financing of FIFA and UEFA final tournaments

We have chosen to explore the opportunity of crowdfunding FIFA and UEFA final tournaments, because we believe that this way we can see the interest and desire of football fans to see such competitions taking place in different parts of the world, even in regions where final tournaments have not been organised so far. Thus, we can see the market dynamics in real-time and the interest of stakeholders to be represented in areas with development potential. There is a possibility of seeing World Cups in countries with high financial power or in exotic areas where supporters often go on holidays and would like to see World Cup football matches. There is the possibility of not having host countries but only host stadiums or the strange possibility of organizing the final tournament of the European Championship on another continent, outside Europe. The advantage of crowdfunding is that the funders will decide where the competitions will take place whereas, in the current classic system, a committee always decides where the final tournaments will be held. A rule can be introduced that crowd funders cannot fund their own country. FIFA and UEFA as organizers on the one hand and the crowd funders on the other end up being mediated by technology in their decisions, with the development of the Internet making crowdfunding very popular in the future.

We also see the opportunity for public-private partnership financing of the FIFA and UEFA final tournaments as appropriate, as the role of the private system in the world economy is becoming stronger and stronger. In the future, we could see final tournaments organized by countries cooperating with private companies. Private companies will be able to build their own stadiums, accommodation, and transport alternatives, they will be able to impose several matches on their own stadiums and will be able to get more involved in the organization of the final tournaments. Private companies can innovate, provide all-inclusive services for players and supporters and gain enormously from image and publicity. In the first phase, the involvement of private companies could be limited to sponsorship or selling the name of the final tournaments

to them. In the future, private companies will take the initiative and national governments will simply help them by providing the existing infrastructure. Private companies will be able to bid for the organization of the final tournaments and then look for the country and the government that will offer them the best facilities to organize these sports competitions, with governments using the same principles for attracting foreign investment. There is unfortunately a risk of polarization, the possibility of the rich getting richer and the poor getting poorer, but the interest of companies in cheap resources can also give disadvantaged areas a chance of development.

Conclusions

The FIFA World Cup is the spectacle of world sport and the UEFA European Championship is like a miniature World Cup, taking place between two proper World Cups. There is a tradition started in 1930 to organize major competitions every 4 years, but after the celebration of the centenary of the World Cup in 2030 we believe that it will be possible to move to a modern competition system with major competitions held every 2 years.

Sport is part of children's school education, many schools have their own sports teams that motivate their pupils and students through the development of team spirit and a winning mentality. Football has proved to be the most popular sport and attracts the most followers worldwide, but it is considered a poor man's sport in many parts of the world. Unfortunately, the most important competitions are rare, organized according to the Olympic Games model, thus losing much of the market share this sport could gain worldwide.

To make this sport accessible to all, in terms of managerial implications, it is necessary to access funding through modern methods in order to create a sports infrastructure in every place in the world. We expect financing costs to fall soon due to lower future inflation with the emergence of an assumed moderate recession. Inflation could fall further, above expectations, but this is not desirable as it happens in times of severe recession. Holding the final tournaments in all parts of the world leaves an important cultural legacy for that region and the necessary infrastructure, forming the basis for future development. We have the case of the USA, South Korea, and Japan, which after organizing World Cups have grown immensely in terms of football.

Weaknesses can be turned into strengths by reducing the number of low-importance matches and sharing 50% of all FIFA revenues equally among all member countries. Better TV distribution of matches so that supporters can watch matches on TV all the time from different continents due to time zone differences. In the future, we can have world championships every year if continental competitions are dropped. To overcome the threats of declining interest in international competitions, we need a robust competition system and the long-term evolution towards intercontinental competitions. The next stage of globalization will make people feel that they belong to a continent and not to a country. Each continent will have its own representative team, so good players from weak countries will have a better chance of participating in the final tournament. There will be far fewer participating teams and therefore fewer matches.

The creation of 6 value divisions in world football, without taking confederations into account, would solve many of the dilemmas of the BCG analysis. The first 5 divisions

would contain 32 teams and the last would contain the remaining 51 teams. According to the proposed European first-division model, we would have world competitions every year. By implementing the promotion and relegation system, the group stage would also be the qualification criteria for the following year's competition. The system would be inspired by the current UEFA Nations League model and would consist of 6 weeks each year, preceded by a first week of friendly matches.

In the current competition system, a footballer must play one month for the club team, then one week for the national team, again one month for the club team, then again for the national team. They alternate competitions, which is not optimal. For the future, it is desirable that each competition be run separately, without interference. Currently, 15 weekends spread over 2 years are needed for international competitions. In the proposed system 14 weekends will be needed over 2 years, group 6 in odd years and 8 in even years. In the odd years, the qualifiers and continental final tournaments will be held and in the even years, the qualifiers and world final tournaments will be held.

Currently, in the European qualifiers, all 55 participating teams play with equal chances, practically countries with tens of millions of inhabitants are considered equal to countries with tens of thousands of inhabitants. In some situations, teams like Germany must play unknown teams like Gibraltar, the final score being known by many people beforehand.

The most important contributions of the proposed new system are simplifying the qualification system, with fewer matches, by introducing the 2 value divisions at the continental level, organizing the final tournaments every 2 years, and simplifying their format. At the continental level, the best 32 teams could be grouped in the first division, according to the results of the last 4 years, and the remaining 23 teams would remain in the second division. The promotion-relegation principle will be introduced, with 4 teams being promoted and relegated between the 2 divisions every year. The top 8 teams in the continental first division qualify each year for the final tournaments, European in odd years and the world in even years.

It is hoped that this system will be adopted by the other FIFA confederations. Africa has 54 national teams, Asia has 46, Oceania has 11, North America has 35 and South America has 10 national teams. We propose that the Asian confederation should merge with the Oceania confederation and the North American confederation should merge with the South American confederation. This will create 4 homogenous confederations which will help simplify the competition system and football development worldwide.

The final tournaments will be simplified to compensate for their number doubling. Whereas the current system involves groups of 4 teams with 3 matches in the first phase and 4 knockout matches in the second phase of the competition, in the proposed new system there will only be knockout matches in a final tournament. Whereas currently, in a four-year cycle, we have 7 matches in a European final tournament and 7 matches in a World final tournament, in the proposed new system there will be 6 matches in the European final tournaments and 10 matches in the world final tournaments in a four-year cycle, because the interest for a World Cup is higher than for a European Championship. The advantages of the proposed new system are that the total number of matches in the final tournaments would increase at the expense of qualifying matches, as the interest in the final tournaments is higher than in the qualifiers, and that the total

number of matches would decrease by 26%, which would ensure an increase in the quality of the matches by giving extra rest to the players and reducing the number of injuries.

The research is limited to proposing strategic ideas for improving the FIFA World Cup and the UEFA European Championship qualifications and final tournament systems, without considering the other international competitions organized by FIFA and UEFA for women or children and without considering the inter-club competitions organized by them. In our future research, we will also analyze the systems of other competitions organized by FIFA and UEFA, especially those organized at the club level, because in recent decades there has been an increase in interest in club competitions at the expense of international competitions.

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TOWARDS A HOLISTIC OPTIMISATION OF THE EUROPEAN INTER-CLUB FOOTBALL COMPETITION SYSTEM

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Abstract. *The European inter-club football competition system is based on the national championships of the 55 member countries of the Union of European Football Associations. The European competitions are divided into 3 levels of 32 teams: the Champions League, the Europa League, and the Conference League. They run each year in parallel with the national championships, crowding the competition calendar and reducing the efficiency of participating teams as they have to fight on more fronts than teams that do not qualify for European competitions.*

We will present an innovative model of the European inter-club football competition system, in which the current European competitions will be restructured and the divisional models of the national championships will be extended hierarchically to the European level. The methodology used is a simplified multi-criteria analysis and the tomato garden analogy, as well as highlighting the opportunity for venture capital and private equity financing of the new competition system and the small teams in the lower divisions in this inflationary period.

We would have a 1st European division with the top 20 teams, a 2nd division with another 20 teams, a 3rd division with 2 regional series, a 4th division with 6 regional series, a 5th division with 18 regional series, a 6th division represented by the national championships and a promotion and relegation system between these divisions.

In the new system, a team will only play in one official competition. A team will no longer be able to play in the national championship and, in parallel, in a European competition. In each division or series of 20 teams, there will be only 38 matches per season, one match per week, from September to May next year.

Keywords: *championship, globalization, innovation, new trends, research, UEFA.*

Introduction

The importance of optimizing the European inter-club football competition system results from the current competition system being overloaded and chaotic, with all sorts

of national and European competitions created to satisfy the needs of small interest groups. At a national level, there are championships and cups, with the best teams qualifying for the following season in European competitions organized on three hierarchical levels, with teams qualifying for European competitions playing in parallel with national competitions. Only the 1st European competition is important, the other two being organized more to satisfy the need to Europeanise football.

The current European inter-club competition system is based on the 54 national championships of the 55 member countries of the Union of European Football Associations (UEFA), the difference made by the Liechtenstein teams playing in the Swiss championship. The national championships are made up of the top divisions of each country's domestic divisional pyramid system and are made up of a maximum of 20 teams in which each team usually plays each other, both home and away. The best teams in each league qualify for the strongest European inter-club competition called the UEFA Champions League, other teams qualify for the 2nd European inter-club competition called the UEFA Europa League and the 3rd European inter-club competition called the UEFA Conference League (Table 1). The weakest teams in each championship, a maximum 3, are relegated each year to the 2nd division of the respective country. In addition to the national championships, at a national level, there are also national cups, which are knockout competitions whose winners qualify directly to the UEFA Europa League (Geeraert & Drieskens, 2015; Sugden & Tomlinson, 1997).

Table 1. The distribution of teams from national championships in European competitions (Source: Authors' own research results/contribution)

National championship ranking	Champions League		Europa League		Conference League Qualification
	Competition	Qualification	Competition	Qualification	
1 st – 4 th	4	-	2	-	1
5 th	2	1	2	-	1
6 th	2	1	1	-	2
7 th	1	1	1	-	2
8 th – 11 th	1	1	-	1	2
12 th – 15 th	-	2	-	1	2
16 th	-	1	-	1	2
17 th – 54 th	-	1	-	-	3
55 th	-	-	-	-	1

In order to better exemplify the qualification system of the national championships in the European competitions, as well as the relegation system of the weaker teams in the 2nd divisions, we will analyze the case of the strongest national championship (the English one) according to the results of the last 5 years (Table 2).

Table 2. Distribution of the teams in the highest ranked national championship (Source: Authors' own research results/contribution)

Position in the national championship	Result
1 st – 4 th position	Qualification to UEFA Champions League
5 th – 6 th position	Qualification to UEFA Europa League
7 th position	Qualification to UEFA Conference League
8 th – 17 th position	Without European presence
18 th – 20 th position	Relegated in the 2 nd national division

Following the completion of the qualification process, which takes place each year in July and August, all 32 teams qualified for the start of each European competition are determined. Each year, the system involves a group phase from September to December and a knockout phase from February, with the final in May. Next, we will look at the UEFA Champions League competition system, the strongest European inter-club competition (Figure 1).

<p><u>Group phase</u> 8 groups of 4 teams The group winners and 2nd placed teams qualify for the knockout phase</p>	<p><u>Knockout phase</u> 8 group winners against 2nd placed teams Quarter-finals with the remaining 8 teams Semi-finals with the best 4 teams Final with the best 2 teams</p>
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Figure 1. UEFA Champions League competition system (Source: Authors' own research results/contribution)

Literature review

Venture capital and private equity financing offer high returns through the relevance of proactive strategies and social media-based investment opportunities (Teten & Farmer, 2010) and is suitable for small new football clubs in emerging markets (Prelicean, Boscoianu, & Lupan, 2014). Financial and sports performance evaluation shows that short-term over-indebtedness leads to increased sporting performance at the expense of long-term financial sustainability (Galariotis et al., 2018). The investments will be recovered faster through sustainable development strategies and responsible investment (Prelicean & Boscoianu, 2020) whether football clubs are more open to investment funds through alternative diversified portfolio management strategies in dynamic emerging markets, considering the implementation of liquidity and innovation constraints (Vrajitoru et al., 2021).

The social involvement of football clubs in the organization of football competitions should be greater than UEFA's sports policy (Sugden & Tomlinson, 1997). The development of the European football competition system will attract more sponsors based on multi-criteria analysis in a market worth over €30 billion. More than €60

billion in sponsorship is attracted in world sport. The 5 biggest European football leagues (England, Spain, Germany, Italy, and France) attract over €4 billion in sponsorship. Middle East companies spend the most, €250 million. (Górecka, 2020).

Reducing the number of matches per season will increase teams' quality and sporting performance, as players need more than three days' rest between matches (Scoppa, 2013). The revenue per match will increase and financial strength will determine team performance (Arsu, 2021). In order to have a sustainable market strategy, the new system must be dynamic and innovative (Boscoianu et al., 2018) and contribute to the development of the European Union in terms of football, with implications for the homogeneity of national championships (Geeraert & Drieskens, 2015).

Methodology

A new European inter-club football competition system will be proposed, the study being conducted between July and August 2022. It will be based on a pyramid system, extending the existing national competition systems at a European level, with national championships becoming level 6 of the value pyramid. A simplified multi-criteria analysis and tomato garden analogy of the relevant features of the proposed new system will be carried out (Scoppa, 2013; Prelipcean et al., 2014; Boscoianu et al., 2018; Prelipcean & Boscoianu, 2020; Vrajitoru et al., 2021). The opportunity for venture capital and private equity financing of the new competition system will be highlighted, as we will be dealing with a new business model, but especially the importance of these financing models for small teams in the lower divisions (Teten & Farmer, 2010; Galarioti et al., 2018; Górecka, 2020; Arsu, 2021). It is a good time for reforms because financing currently has real-negative interest rates, due to the period of high inflation we are going through. It should be mentioned that this is only a temporary period, until national banks raise interest rates above the inflation rate.

Results and discussions

In the history of sports competitions there have always been reforms. It is time for the competition systems established at a national level to be extended to the European level (Table 3). The next step will be to consider the European continent as a country, where we will have a 1st division of Europe with a classic championship with 20 teams, a 2nd division also with 20 teams, and a later ramification of the competition system, which at level 6 will include the national championships as regional competitions (Figure 2).

**Table 3. A new model of European inter-club football competition system
(Source: Authors' own research results/contribution)**

Divisions	Number of teams	Promoted teams	Relegated teams
1 st division	20	European champion	2
2 nd division	20	2	2
3 rd division	40 (2 series of 20 teams)	2	6
4 th division	120 (6 series of 20 teams)	6	18
5 th division	360 (18 series of 20 teams)	18	54
6 th division	54 national championships	54	each country's decision

1 st division	20 teams																	
2 nd division	20 teams																	
3 rd division	Eastern regional series									Western regional series								
4 th division	RS1			RS2			RS3			RS4			RS5			RS6		
5 th division	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
6 th division	54 national championships																	

Figure 2. Divisions and series structure of the proposed new competition model (Source: Authors' own research results/contribution)

The 1st division would contain 20 teams. Each team would play each of the other 19 teams both home and away, totaling 38 matches in a year. The team that wins a match after 90 minutes will receive 5 points and the team that loses will receive 0 points. In case of a draw, an extra time of 30 minutes will be played, with 4 points for a win and 1 point for a loss. In case of a draw after 120 minutes, penalty kicks from 11 meters will be taken, with 3 points for a win and 2 points for a loss. At the end of the season, the team with the most points will be declared the winner and the European champion. The last 2 teams will be relegated to the 2nd division.

The 2nd division will also contain 20 teams, the 2 best teams at the end of the season will be promoted to the 1st division and the 2 weakest teams will be relegated to the 3rd division, according to the same rules as in the 1st division.

In the 3rd division, there will be 40 teams divided into 2 regional series, east, and west, of 20 teams each. The 1st place in each series will be promoted to the 2nd division, and the last 3 teams in each series will be relegated to the 4th.

In the 4th division, there will be 120 teams, divided into 6 regional series of 20 teams each. The 1st place in each series will be promoted to the 3rd division, and the last 3 teams in each series will be relegated to the 5th.

In the 5th division, there will be 360 teams, divided into 18 regional series of 20 teams each. The 1st place in each series will be promoted to the 4th division and the last 3 teams in each series will be relegated to the 6th division.

In the 6th division, there will be 54 national championships recognized by UEFA, where each country will be free to decide its own competition system. The champion teams of each national championship will be promoted to the 5th division of European football.

A simplified multi-criteria analysis and a tomato garden analogy of the proposed new system's relevant characteristics

In order to perform a simplified multi-criteria analysis, we will analyze the 6 options represented by the 6 divisions of the proposed new European inter-club football

competition system according to 7 analysis criteria: UEFA Champions League (I), UEFA Europa League (II), UEFA Conference League (III), current national league systems (IV), implications for players (V), implications for supporters (VI) and implications for investors (VII).

The criteria will be compared, giving a value of 2 for the most important criterion, 0 for the least important, and 1 for both criteria in case of a tie. The criteria will be ranked by calculating a percentage weight (Table 4). Scores from 1 to 7 will be given for each option corresponding to each criterion (Table 5). The weights are multiplied by the scores, added together, and the options are ranked (Table 6).

Table 4. Ranking of criteria (Source: Authors' own research results/contribution)

Criterion	I	II	III	IV	V	VI	VII	Total	Weight	Ranking
I	1	2	2	2	2	2	2	13	26,5 %	1
II	0	1	2	0	0	0	0	3	6,1 %	6
III	0	0	1	0	0	0	0	1	2,0 %	7
IV	0	2	2	1	2	2	2	11	22,4 %	2
V	0	2	2	0	1	0	2	7	14,3 %	4
VI	0	2	2	0	2	1	2	9	18,4 %	3
VII	0	2	2	0	0	0	1	5	10,2 %	5

Table 5. The scores of the options corresponding to each analysis criterion (Source: Authors' own research results/contribution)

Criterion Options	I	II	III	IV	V	VI	VII
1 st division	7	2	1	3	6	4	5
2 nd division	3	7	1	2	6	5	4
3 rd division	3	1	7	2	6	5	4
4 th division	4	2	1	3	5	7	6
5 th division	3	2	1	4	5	7	6
6 th division	3	2	1	7	6	5	4

Table 6. Ranking of options (Source: Authors' own research results/contribution)

Criterion Options	I	II	III	IV	V	VI	VII	Total	Ranking
1 st division	185,5	12,2	2,0	67,2	85,8	73,6	51,0	477,3	1
2 nd division	79,5	42,7	2,0	44,8	85,8	92,0	40,8	387,6	5
3 rd division	79,5	6,1	14,0	44,8	85,8	92,0	40,8	363,0	6

4 th division	106,0	12,2	2,0	67,2	71,5	128,8	61,2	448,9	3
5 th division	79,5	12,2	2,0	89,6	71,5	128,8	61,2	444,8	4
6 th division	79,5	12,2	2,0	156,8	85,8	92,0	40,8	469,1	2

As expected, the winning option is represented by the 1st division which will include the best 20 teams and the one that will be the European champion at the end of the season. Surprisingly, the 2nd place was taken by the 6th division represented by the national championships, which denotes that the stakeholders cannot change their mentality in a short period of time, keeping in their subconscious the principles on which the European inter-club football system has been built so far. The regional divisions will be closer to the supporters’ hearts than the 2nd and 3rd divisions, due to the lower expenses involved, the shorter distances to travel, and the increased probability of being closer to the favorite team.

In order to better exemplify the new European inter-club football competition system, we will make a tomato garden analogy of the 6 proposed divisions, from the investors’ perspective (Figure 3).

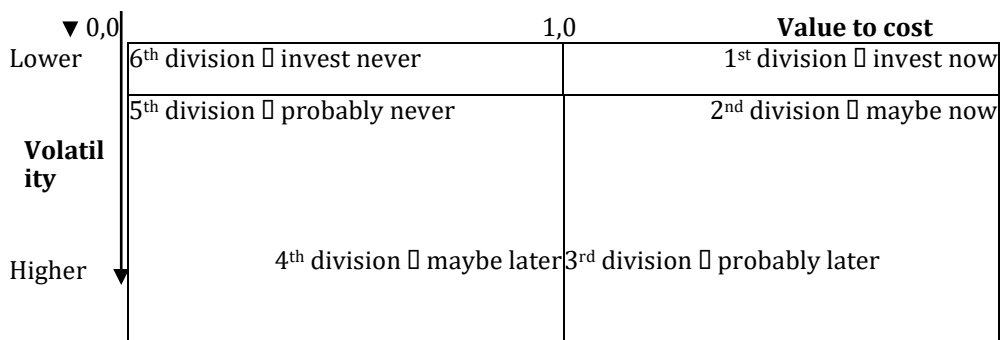


Figure 3. A tomato garden analogy applied to the new competition system (Source: Authors’ own research results/contribution)

It is obvious that investors will flock to the 1st division because the financial rewards here are the highest and they have the possibility to win the European title, which will bring them permanent image income. In the 2nd division, the investments will be smaller, taking at least a year to reach the 1st division. In the 3rd division, the investments will be even smaller because the waiting time to reach the 1st division is at least doubled. In the 4th division, the investments are already delayed, and the distance to the top is increasing. In the 5th division, we are already talking about regional investments in local teams that play football more for fun and to promote the sport among young people. In the 6th division, we will have the national championships, which will promote sport among children to educate and maintain general health.

Highlighting the opportunity for venture capital and private equity funding of the European inter-club football competition system

Being a new competition format, it will require venture capital investment, which is specific to a start-up business. Given the business’s scale, large financial institutions can only provide this funding through investment funds. These financial institutions will be

associated with UEFA and will participate in the decision-making on the long-term development of this business. In general, new businesses operate at a loss in the first few years, in this case, profit is assured from the first year due to the continuity of the previous competition systems, which ensured an accelerated growth of turnover. Venture capital funding will also be used to develop small teams in the lower regional or national divisions. These teams promote football at the level of a region or a city, they need funding to ensure better conditions for the players and to be closer to the people. Only through massive investments, these small teams can grow and then promote to the higher divisions of the European system with the prospect of bringing high profits in the future. The real reward for the investors will come when they sell these teams after promoting them to higher divisions, generating higher revenues.

UEFA and its managed competitors are not listed on the stock exchange and can easily access private equity investments. This type of business financing can be attracted through TV rights, sponsorship, or corporate social responsibility investments. Private equity investments will be more suitable for club teams participating in all levels of competition. Powerful financial institutions will mainly invest in the top division to compete at the highest level and gain image capital in addition to financial revenues, as is the case with Manchester City, Newcastle United, or Paris Saint-Germain, and the know-how gained from sports competitions in North America (NFL, NBA, NHL, and MLB). The lower divisions will enter smaller investment funds, hoping that through good management they can promote to the 1st division in the coming years, to use the football teams as locomotives of the whole business. Private equity investments in small teams in the lower divisions should not be neglected, whereby small financiers can advertise locally, gradually strengthen the club they represent and, in the long term, can promote to higher divisions while developing their own business.

It's a good time to develop new business ideas, and new competition systems and fund new teams, as we live in an inflationary period where bank interest rates are below inflation, which temporarily makes funding relatively cheap. This whole process must be rushed until national banks raise interest rates above the inflation rate to normalize the market, especially as interest rate increases also help lower inflation.

Each country will be free to determine its own competition system for the 6th division. We believe that in the case of Romania, the best option would be the championship with only 10 teams, as in Switzerland. The 10 teams will play 36 matches in a season, twice round-robin. This competition system will attract investors because the revenue per team will be double that of a 20-team league. The best team will be promoted to the 5th division of European football, having a financial power superior to teams from other countries that keep the classic system with 20 teams. Only 1 of the 10 teams would be relegated, representing 10% of the total. In the classic 20-team championship system 3 teams are relegated, representing 15% of the total. The money received by those teams during a season is lost by relegating teams. By relegating only 10% of teams instead of 15%, 5% more money is kept in the championship. The beneficial effects will be exponential in the long term and we believe this business model will be copied by as many countries as possible.

Conclusions

Society, business and sport are evolving and sports competition systems have to adapt too. As managerial implications it is proposed to replace the current competition system based on national championships with one based on European cohesion, by extending the existing pyramidal systems at national level with divisional systems at European level. In the current system 233 teams from the 54 national championships of the 55 UEFA member countries participate in the European competitions, as a superstructure of the national championships (teams from Liechtenstein participate in the Swiss championship). In the proposed new system there will be 560 teams participating in the top 5 European divisions, with the national championships representing the 6th division of European football, in which different teams than those in the top 5 divisions will participate.

The advantages of the new system are that the national championships will complete the system rather than duplicate it as at present, relaxing the competition calendar for footballers, who will play 38 matches in a single competition, rather than fighting on several fronts as at present with a maximum of 67 matches per season for teams in England. This reduces the number of injuries and increases the quality of matches by keeping players physically fit. The greatest interest will be in the 1st division and the national championships, with interest in the intermediate European divisions set to increase greatly as the national specificity fades and the European consciousness of the population grows.

Although we currently have inflation, we also have economic growth with relatively cheap financing. Amid falling inflation and rising interest rates, economic growth will moderate and financing will be harder to obtain. However, long-term modern venture capital and private equity financing systems seem to be well suited to this business model, regardless of future economic and financial fluctuations. The globalization of financial markets will mean that small football clubs in developing countries in the lower divisions of European football will have long-term competitive advantages over those in developed countries. People's need for entertainment, sport and competition has been evident since ancient times and today's physical wars will be fought through sport in the future.

The most important contributions of the proposed competition system combine qualitative and quantitative aspects. The 1st European division would have 20 teams compared to 32 in the current UEFA Champions League, a 2nd division also with 20 teams and the branching of the system from the 3rd division to link with the national championships in the 6th division. Extending the promotion and relegation system from national to the European level to ensure the cohesion of the whole system contributes to the future development of the European Union and creates the conditions for its future enlargement. It can therefore be concluded that sports can also significantly impact politics.

The research is limited to European inter-club football competitions with repercussions on national championships recognized by UEFA, without considering the FIFA Club World Cup, inter-club competition systems of other continents, and women's and children's competitions. In future articles, we will analyze the systems of the FIFA Club World Cup, the Romanian national football championship, and the women's and children's competitions at the European and world level.

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FRUGAL INNOVATIONS IN ENTERPRISES: A COMPARISON BETWEEN SERVICE AND INDUSTRY SECTORS

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Abstract. *Frugal innovations are one of the dynamically developing models of innovative activities in enterprises. As the analysis of the international literature indicates, this type of innovation is primarily aimed at optimizing the efficiency of operations – by reducing redundant functionalities and thus reducing costs. Customers/users receive the so-called “must have”, but of the highest possible quality. The foreign authors clearly indicate that frugal innovations are designed to increase the availability of innovations in less affluent societies, and are also focused on creating high-added value for the environment. The study aims to estimate the complexity of applying the assumptions of the concept of frugal innovations in innovative enterprises in the service and industry sectors, to indicate the dominant activities/factors in this area, and to compare the two indicated sectors. Eight research hypotheses have been stated in the study. In the empirical study, quantitative research techniques were used: CAWI survey and statistical data analysis. The study constructed two basic composite indicators: ICSRC – an indicator of the complexity of shaping relationships with customers, and ICSIP – an indicator of the complexity of shaping innovative processes. The indicators were developed using the method of factor analysis. The study also used the verification of normality of variables' distribution, Friedman's rank test, cluster analysis using the k-mean method, and the U Mann-Whitney test for independent samples. The CAWI survey was conducted on a random sample (N=200) of business owners or managers. On the basis of the conducted empirical research, it can be concluded that the complexity of applying the assumptions of the concept of frugal innovations in enterprises from the service and industry sectors is at a moderately high level. In addition, there are no statistically significant differences between service and industry companies in the complexity of applying the assumptions of frugal innovations. The basic contribution of the study to the theory is the focus on the analysis of the complexity of applying the assumptions of the concept of frugal innovations in enterprises, as well as the comparison of two sectors: service and industry.*

Keywords: *complexity; customers; enterprise; frugal innovations; industry sector; innovation processes; service sector.*

Introduction

Enterprises operating on the market are looking for new ways to create value for the environment/customers nowadays. One of the "paths" to create such value is the implementation of frugal innovations, which are primarily aimed at optimizing the efficiency of operations. Frugal innovations mainly help to decrease redundant functionalities and thus bring reduced costs.

Examples of frugal innovations are: (1) low-cost Swiss Swatch watches, (2) Five App for deaf-mute people to communicate with friends, (3) Oppy Mars rover, (4) IKEA furniture,

(5) Foldscope paper microscope, (6) General Electric battery-operated ECG, (7) MittiCool clay refrigerator, as well as (8) Tata Motors' Nano car (Woźniak, 2022; Markiewicz et al., 2020; Ratten, 2019, p. 44).

Such innovations can be implemented within the enterprise in different ways and to different extents. Nevertheless, it is necessary to meet certain conditions for the companies to state that the enterprise operates in accordance with the assumptions of the concept of frugal innovations. That is why the article focuses on the complexity of applying the assumptions of the concept of frugal innovations in innovative enterprises, measured on the basis of the importance/level of application of specific factors/activities reflecting the essence of the frugal approach. In addition, since the concept of frugal innovations is relatively young (also in Poland), the study will estimate the complexity of applying its assumptions in innovative enterprises.

Literature review

Frugal innovations are one of today's "challenges" for businesses worldwide, both in highly developed and underdeveloped countries. This is a "model" of creating new value for individual customers and even entire social groups (e.g. local communities). It is worth noting here that frugal operation is economical, and diligent, and reflects sustainability in the use of resources (*Merriam Webster Dictionary*, 2022), as well as is simple, uncomplicated, and low cost (*Oxford Dictionaries*, 2020). The basic attributes of frugal innovations include low costs, high financial efficiency, and meeting users' most important needs (Makowski, & Kidyba, 2018, p. 201; Hossain, 2020, p. 2). The concept of frugal innovations assumes the creation of maximum available value for specific stakeholder groups (Dadlani et al., 2022). Moreover, enterprises must ensure that value chains are aligned (Mukerjee, 2012). The basic attributes of frugal innovations are shown in Figure 1.

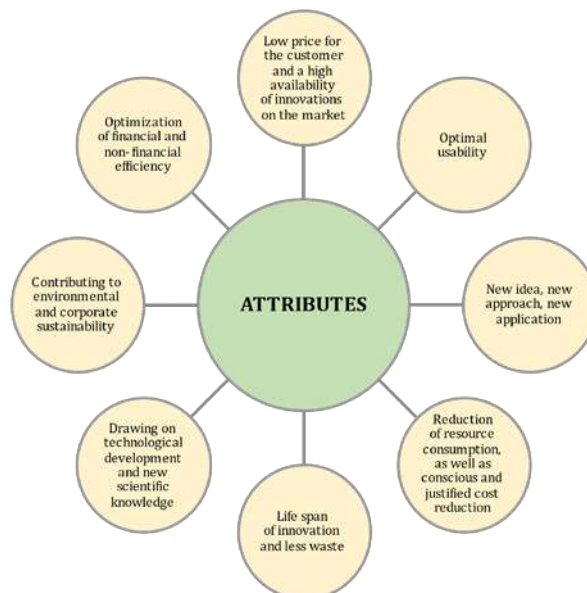


Figure 1. The basic attributes of frugal innovations
(own elaboration based on: Weyrauch, & Herstatt, 2017; Markiewicz et al., 2020; Dadlani et al., 2022)

Frugal innovations are a specific approach to serving consumers with limited resources in emerging and developing markets, as well as in low-growth Western markets (Hyvärinen, et al., 2016). Thus, frugal solutions/projects must be designed, manufactured, delivered, and maintained to meet the needs of underserved consumers in poor environments (market segments) (Bhatti, 2012). In other words, innovations of this class refer to the launch of affordable products and services that meet the needs of consumers with a modest lifestyle (see: Zeschky et al., 2011; Basu et al., 2013).

It is interesting that J.M Janiszewski (2020, p. 76) associates frugal innovations with "lean thinking", which reduces waste resources and time in innovative processes. In turn, D. Beaulin (2019, s. 8) notes that frugal innovations are a kind of "overarching philosophy that enables a true »blank sheet of paper« approach to product development". At this point, it is also worth noting that the model of frugal innovations "assumes a revision of existing solutions in order to provide social value by minimizing the consumption of resources" (Markiewicz et al., 2020, p. 24). In other words, it is a transition from the "doing more with less" model to the "doing better with less" model (Radjou & Prabhu, 2016).

At this point, it should be clearly noted that the international literature is primarily focused on the indication and description of the attributes of frugal innovations implemented in specific classes of organizations. The issue of estimating and comparing the complexity of the application of the assumptions of the concept of frugal innovations in innovative enterprises has not been explored so far which points to a significant research gap. Therefore, the obtained empirical results will be difficult to compare to the results of other Authors and to conduct discussions.

Methodology

Research objective and hypotheses

The study's objective is to estimate the complexity of applying the assumptions of frugal innovations in innovative enterprises in the service and industry sectors, to indicate the dominant activities/factors in this area, and to compare the two sectors.

The research problem is as follows: *What is the level of complexity of applying the assumptions of frugal innovations in innovative enterprises and what factors are dominant in this area in the service and industry sectors, as well as are there statistically significant differences between enterprises from the service and industry sectors in terms of the complexity of applying the assumptions of the concept of frugal innovations (in the areas of shaping relationships with customers and shaping innovative processes)?*

Eight hypotheses have been stated in the study:

- H.1. The complexity of applying the assumptions of the concept of frugal innovations in shaping relationships with customers in companies from the service and industry sectors is at a high level.
- H.2. The complexity of applying the assumptions of the concept of frugal innovations in shaping innovative processes in companies from the service and industry sectors is at a high level.

- H.3. Comparing companies from the service and industry sectors, there are statistically significant differences in the complexity of applying the assumptions of the concept of frugal innovations (shaping relationships with customers).
- H.4. Comparing companies from the service and industry sectors, there are statistically significant differences in the complexity of applying the assumptions of frugal innovations (the area of shaping innovative processes).
- H.5. The dominant factors in applying the assumptions of the concept of frugal innovations in the area of shaping relationships with customers in enterprises from the service and industry sectors related to optimizing the functionality of innovation.
- H.6. The dominant factors in applying the assumptions of the concept of frugal innovations in shaping innovative processes in enterprises from the service and industry sectors related to managing financial resources.
- H.7. In both the service and industry sectors, companies characterized by the high complexity of applying the assumptions of the concept of frugal innovations in shaping customer relationships dominate.
- H.8. Both in the service and industry sectors, companies characterized by the high complexity of applying the assumptions of the concept of frugal innovations in shaping innovative processes dominate.

Research methods

Quantitative methods and research techniques were used in the empirical study (Lisiński, & Szarucki, 2020). An inductive approach was used (see: Sułkowski, 2012; Wojciechowska, 2016). The study also used elements of a deductive approach, mainly at the stage of critical analysis of national and foreign literature sources. The study also used the analysis and synthesis methods (Hajduk, 2012). As part of the inductive approach, the following quantitative empirical research methods and techniques were used (based on: Sudoł, 2012; Apanowicz, 2005; Zaborek, 2009; Wojciechowska, 2011): CAWI survey technique, and statistical analysis of quantitative data. The basic research tools were: CAWI survey questionnaire, PS IMAGO PRO 7.0 software, and Microsoft Excel (Woźniak, 2022).

In the scope of the CAWI study, two basic composite indicators were identified, which were used for quantitative verification of research hypotheses (indicators reflect the level of complexity of enterprises' activities¹): (1) ICSRC – an indicator of the complexity of shaping relationships with customers, (2) ICSIP – an indicator of the complexity of shaping innovative processes (Woźniak, 2022).

The indicators were developed using the factor analysis method (the PCA method, the rotation method – Varimax with Kaiser's normalization), and based on detailed measures (see Figures 2 and 3) (Woźniak, 2022). Detailed measures have been identified on the basis of the literature analysis (see: Radjou et al., 2012; Radjou, & Prabhu, 2016; Beaulin, 2019; Ratten, 2019; Markiewicz et al., 2020; Bhatti et al., 2022).

In order to obtain detailed analyses for the ICSRC and ICSIP indicators, companies were divided into three basic clusters taking into account three standard levels of these

¹The higher value of the indicator, the higher complexity of actions. All factors (i.e. detailed measures) were assessed by respondents on a 5-point scale (score "1" means a very low level/importance, and score "5" means a very high level/importance).

indicators: low, moderate, and high – to identify the dominant clusters in the research sample. The cluster analysis using the *k*-mean method (including standardization of variables) was used. When analyzing the results of the CAWI study, basic descriptive statistics (e.g. median, dominant, mean, standard deviation, and skewness) for individual indicators/variables were also considered. The study also used the verification of the normality of variables' distribution, the Frieman's rank test, and the U Mann-Whitney test for independent samples (Woźniak, 2022).

Research scope and research sample

For the study, the objective, subjective, temporal, and spatial scope was established. The subject of the study was the application of the assumptions of the concept of frugal innovations in Polish enterprises implementing innovative activities in two sectors: services and industry. Companies belonging to the most innovative sectors in Poland² were qualified for the research through the CAWI survey. The study included companies in which innovative activity is dominant. The CAWI survey was conducted on a random sample (N=200) of business owners or managers responsible for risk management, innovative processes, or project management, employed in enterprises operating in Poland (one respondent from each surveyed enterprise). The study covered entities operating throughout the whole of Poland (16 voivodships). The population consisted of large enterprises. The specification of the research sample – regarding the division into service and industry sectors – is presented in Table 1 (Woźniak, 2022).

Table 1. Specification of the research sample
(Source: Author's own research results)

Enterprises' attributes	SERVICES		INDUSTRY	
	Number of entities	% (in the sector)	Number of entities	% (in the sector)
N	80	100	120	100
Activity profile				
Food & Beverage Manufacturing	-	-	20	16,6(6)
Manufacture of textile products and manufacture of clothing	-	-	20	16,6(6)
Manufacture of chemicals and chemical products	-	-	20	16,6(6)
Manufacture of basic pharmaceutical substances, as well as medicines and other pharmaceutical products	-	-	20	16,6(6)
Manufacture of computers, electronic and optical products, as well as manufacture of electrical equipment	-	-	20	16,6(6)
Manufacture of motor vehicles, trailers and semi-trailers, excluding motorcycles	-	-	20	16,6(6)
Warehousing and service activities supporting transport	20	25	-	-
Activities related to the production of films, video recordings, television programmes, sound and music recordings	20	25	-	-
Software, IT consultancy and related activities	20	25	-	-
Insurance, reinsurance and pension funds, excluding compulsory social security	20	25	-	-
Age				

² The list of the most innovative sectors in the Polish economy was developed on the basis of the following studies: (Innowacyjność Polski. Chartbook, 2020, p. 21; Innowacyjność Polski. Chartbook, 2021, p. 27).

Enterprises' attributes	SERVICES		INDUSTRY	
	Number of entities	% (in the sector)	Number of entities	% (in the sector)
1-5 years ("young")	7	8,7	19	15,9
6-10 years ("quite young")	35	43,8	40	33,3
11-15 years ("mature")	15	18,8	25	20,8
Over 15 years ("old")	23	28,7	36	30,0
Scale of operation				
Local (1 city/municipality/district)	3	3,7	1	0,8
Regional (1-8 voivodships in Poland)	7	8,8	15	12,5
National (9-16 voivodships in Poland)	47	58,8	53	44,2
European (min. 1 country in Europe outside Poland)	15	18,7	31	25,8
International (min. 1 country in the world outside Europe - including Poland)	8	10,0	20	16,7
Average annual turnovers				
PLN 0-3 million	19	23,8	35	29,2
PLN 3-6 million	40	50,0	54	45,0
PLN 6 million and more	21	26,2	31	25,8

The research concerned the activities of enterprises (in the field of innovative processes) in the period from January 2017 to December 2021, i.e. five full years of their operation on the market. Overall, the study was conducted in the period April-July 2022. The CAWI study was carried out (at the level of data collection) by the IPC Research Institute (Wroclaw, Poland) (Woźniak, 2022).

Results

Complexity of applying the assumptions of the concept of frugal innovations, and dominant factors in enterprises

The first problem considered in the study is to estimate the level of complexity of applying the assumptions of the concept of frugal innovations in the area of shaping relationships with customers and in the area of shaping innovative processes in enterprises from the service and industry sectors. For this purpose, the average values of the ICSRC and ICSIP indicators (Table 2) were used. The study adopted a simplification of four levels of the complexity - the same for both indicators: (1) low - values in range <1;2>, (2) moderate low - values in range <2;3>, (3) moderate high - values in range <3;4>, as well as (4) high - values in range <4;5> (Woźniak, 2022).

Table 2. Descriptive statistics for indicators
(Source: Author's own research results)

Sector	SERVICES		INDUSTRY	
	ICSRC	ICSIP	ICSRC	ICSIP
N	80		120	
Mean	3,7307	3,7089	3,5106	3,5060
Median	3,7273	3,8875	3,5455	3,5597
Dominance	5,00	5,00	3,36 ^a	5,00

Sector	SERVICES		INDUSTRY	
Indicator	ICSRC	ICSIP	ICSRC	ICSIP
Standard deviation	0,79469	0,78265	0,83770	0,75141
Variance	0,632	0,613	0,702	0,565
Skewness	-0,322	-0,071	-0,542	-0,512
Kurtosis	0,433	-1,013	0,534	0,995
Minimum	1,18	2,15	1,00	1,00
Maximum	5,00	5,00	5,00	5,00
Gap mark	3,82	2,85	4,00	4,00

a. There are many modal values. The lowest value is given.

The above division is conventional and is a kind of simplification of the complex socio-economic reality in which innovative enterprises operate. In order to precisely determine the level of the complexity of the application of the assumptions of the concept of frugal innovation, each enterprise must be considered individually, taking into account its potential, as well as specific development limitations. On the basis of the data contained in Table 2, partial confirmation of the H.1 and H.2 hypotheses can be made.

In order to identify the dominant factors in the application of the assumptions of the concept of frugal innovations in the areas of shaping relationships with customers and shaping innovative processes in companies from the service and industry sectors, Friedman's rank test (Figures 2 and 3) was used. Analyzing the obtained results, it can be noted that in the area of shaping relationships with customers in companies from the service sector, the following factors dominate: scaling up the distribution of innovations (greater availability), ensuring the universal and comprehensive nature of innovation for customers (applicable in different situations), ensuring the life span of innovation (long service life of innovation), as well as developing alternatives, improvisation, and practical methods to overcome a lack of resources or solve seemingly unsolvable financial, social and technological problems of customers. Concerning the enterprises from the industry sector the factors: achieving the level of the minimum expected functionality of innovation in the opinion of customers (providing only the so-called must-have for the customer), ensuring low costs for customers to acquire innovations (low price), creating innovations for the poorest social groups, as well as training of customers in the field of self-contained creation of solutions and development of acquired innovations (Figure 2). At this point, it is worth noting that the factors relating to the functionality of innovation are slightly more visible in the service sector.

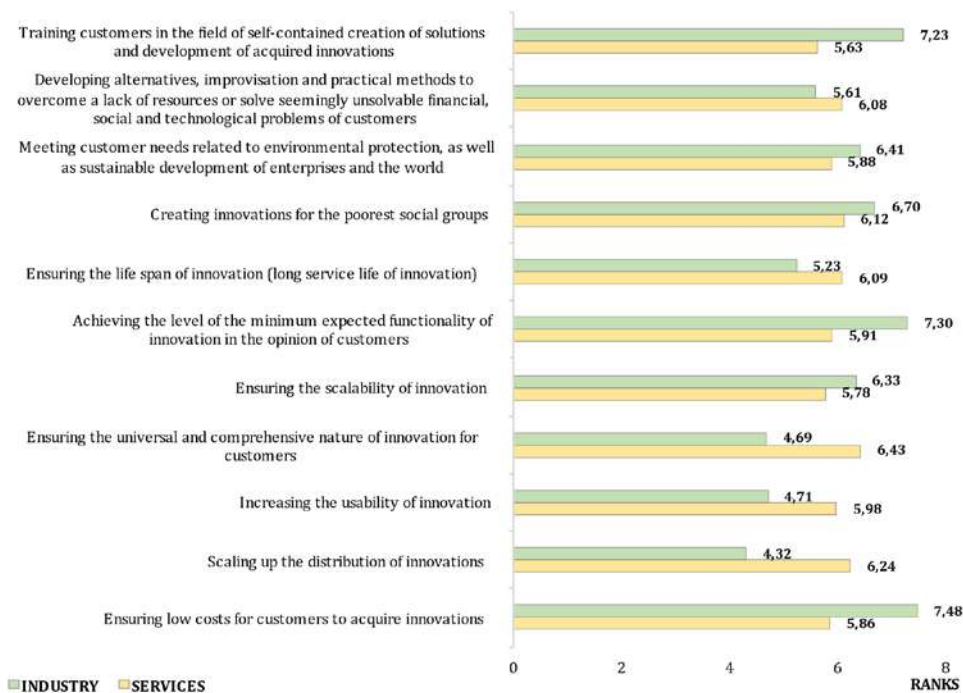


Figure 2. Dominant factors in enterprises for ICSRC indicator – Friedman's ranks (Author's own research results)

On the other hand, in the area of shaping innovative processes in enterprises from the service sector, the following factors dominate: increasing the efficiency of financing innovative processes, increasing the efficiency of knowledge management in innovative processes, recognizing basic customer needs while complexly penetrating the market, as well as social acceptance of innovative activities of enterprises, and in enterprises from the industry sector, the factors such as: reducing the costs of conceptualizing innovations, reducing the costs of imitation activities, the use of outsourcing (external business services), changes in the value system of society and in the mood of citizens, as well as the emergence of inconsistencies between market reality and the needs of customers/society (Figure 3). Interestingly, factors relating to financial resource management are more visible in enterprises representing the industry sector.

On this basis, partial confirmation of the H.5 and H.6 hypotheses can be made.



Figure 3. Dominant factors in enterprises for ICSIP indicator – Friedman's ranks (Author's own research results)

Clusters of enterprises applying the frugal innovations

Another analyzed problem is the clusters' size of enterprises characterized by low, moderate, and high values of the complexity of applying the assumptions of the concept of frugal innovations in the area of shaping relationships with customers and shaping innovative processes. For this purpose, cluster analysis using the *k*-mean method (considering the standardization of variables) was used (Tables 3 and 4).

**Table 3. Clusters of enterprises – service sector
(Source: Author's own research results)**

	Clusters		
	Enterprises with low values of indicators	Enterprises with moderate values of indicators	Enterprises with high values of indicators
N	9	46	25
Stand: ICSRC	-1,54435	-0,08833	1,23014
N	29	30	21
Stand: ICSIP	-0,97289	0,37824	1,40631

**Table 4. Clusters of enterprises – industry sector
(Source: Author's own research results)**

	Clusters		
	Enterprises with low values of indicators	Enterprises with moderate values of indicators	Enterprises with high values of indicators
N	18	56	46
Stand: ICSRC	-1,87459	-0,32190	0,84735
N	10	66	44
Stand: ICSIP	-2,13655	-0,42993	0,84261

On the basis of data contained in Tables 3 and 4, falsification of the H.7 and H.8 hypotheses can be made.

Statistical differences in the complexity of applying the assumptions of the concept of frugal innovations in chosen sectors

In order to verify whether there are statistically significant differences between service and industry companies in the complexity of applying the assumptions of the concept of frugal innovations, the normality of the distribution of variables (i.e. ICSRC and CSIP indicators) was tested first.

**Table 5. Verification of the normality of variables' distribution
(Source: Author's own research results)**

Sector Indicator		SERVICES		INDUSTRY	
		ICSRC	ICSIP	ICSRC	ICSIP
N		80		120	
Normal distribution parameters ^a	Mean	3,7307	3,7089	3,5106	3,5060
	Standard deviation	0,79469	0,78265	0,83770	0,75141
Test statistics		0,082	0,103	0,088	0,063
Asymptotic significance (bilateral) ^b		0,200^c	0,034	0,024	0,200^c
Skewness		-0,322	-0,071	-0,542	-0,512
Kurtosis		0,433	-1,013	0,534	0,995
Decision on the normality of decomposition		YES	NO	NO	YES

a. Compliance with the normal distribution is tested (Kolmogorov-Smirnov test). Calculated from data.

b. Lilliefors' correction.

c. This is the lower limit of actual significance.

**Table 6. U Mann-Whitney test for independent samples
(Source: Author's own research results)**

No.	H ₀	Significance ^a	Decision
1.	The distribution of ICSRC is the same for both categories: services and industry.	0,100	Confirm H ₀
2.	The distribution of ICSIP is the same for both categories: services and industry.	0,114	Confirm H ₀

a. The significance level is 0,050. Asymptotic significance is presented.

For companies from the service sector, the normal distribution has only the ICSRC indicator, and for companies from the industry sector – only the ICSIP indicator (Table 5). Therefore, the decision was made to conduct a non-parametric analysis using the U Mann-Whitney test for independent samples. The results of this test (Table 6) offered proof of the falsification of the H.3 and H.4 hypotheses.

Conclusions

The concept of frugal innovations is a "tool" for solving current business and social problems. It is a "new" mode of operation, that permits to increase in the efficiency of innovative processes in specific environmental circumstances. However, not every company is recommended to implement the assumptions of frugal innovations. This is due to the properties of the created innovations, the goals of the company, the peculiarity of the market/recipients of innovations, etc.

On the basis of the conducted empirical research, it can be concluded that the complexity of applying the assumptions of the concept of frugal innovations in the area of shaping relationships with customers and in the area of shaping innovative processes in enterprises from the service and industry sectors is at a moderately high level (but not very high). In addition, between enterprises from the service and industry sectors, there are no statistically significant differences in the complexity of applying the assumptions of the concept of frugal innovations in shaping relationships with customers and shaping innovative processes. The dominant factors in the application of the assumptions of the concept of frugal innovations in the area of shaping relationships with customers in enterprises from the service and industry sectors only partially relate to the optimization of the functionality of innovations. What's more, the dominant factors in applying the assumptions of the concept of frugal innovations in shaping innovative processes in enterprises from the service and industry sectors only partially relate to the management of financial resources. It is also important that the service and industry sectors are dominated by companies characterized by the moderate complexity of applying the assumptions of the concept of frugal innovations in shaping relationships with customers and in the area of shaping innovative processes.

The recommendations for companies that are willing to implement a process of developing frugal innovations are as follows: (1) frugal innovations can become the basis for shaping the security of enterprises, so their development and implementation should be integrated with the risk/hazard management system used in the enterprise; (2) the development of frugal innovations should take into account factors and activities relating both to the maintenance of customer relationships and the implementation of innovative processes; (3) shaping frugal innovations should reflect the specificity of the company's information needs and the broadly understood environment – because

frugal innovations should become a "tool" for ensuring the long-term development of the company by corresponding to the needs, capabilities, and limitations of the main classes of stakeholders (Woźniak, 2022).

In interpreting the obtained results, it is necessary to consider research limitations, which are mainly related to the fact that the subjective opinions of respondents were analyzed. It was also based on a limited list of factors constituting the basic assumptions of the concept of frugal innovations – the study detailed a total of thirty-nine factors. It is also worth noting that on the basis of the study, it is difficult to clearly indicate whether companies consciously implement the assumptions of the concept of frugal innovations, or whether this is an intuitive action. What's more, in assessing the complexity of applying the assumptions of the concept of frugal innovations, specially developed composite indicators (ICSRC and ICSIP) were used, simplifying the analyzed situation and respondents' assessments. In addition, only Polish companies were examined, so it is difficult to make an inference for innovative activities carried out in other countries (Woźniak, 2022).

Further research should focus on identifying the attributes of enterprises classified in given clusters of enterprises according to the level of the complexity of the application of the assumptions of the concept of frugal innovations, as well as the relationship between this complexity and attributes.

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5

Marketing and Consumer Behavior

DIGITAL BOOK CONSUMPTION AS A FORM OF SUSTAINABLE CONSUMPTION, BEFORE AND DURING THE PANDEMIC

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Abstract. *The present paper aims to analyze digital book consumption behavior, as a form of sustainable consumption, compared to traditional print book consumption, before and during the pandemic. After a brief theoretical presentation of the advantages and disadvantages of using the electronic book, especially from the perspective of environmental protection, the paper continues with a secondary analysis of statistical data regarding the current book market at the European and national level, as well as regarding the digital and printed book consumption behavior before and during the pandemic. The applied approach is based on qualitative research carried out through interviews with representatives of the publishers, but also with consumers, and book readers. Book consumption behavior in Romania hasn't changed significantly during the pandemic: the change was only the purchase channel that completely shifted to online, as well as increased interest in motivational and applied psychology books. People devoted more time to reading during this period due to the restrictions imposed by the pandemic. In response to being constantly connected to technology and social media, people prefer to read books in a classic way. The future of book consumption in the short to medium term is likely to split between online and offline to respond to new book consumption trends and behaviors, and online is likely to continue to grow. Considering the need to protect the environment through sustainable consumption, the future will probably belong to e-books, not that printed books will disappear altogether, but they will probably be more expensive and people will find it easier to consume e-books.*

Keywords: *book market; digital book; pandemic; printed book; sustainable consumption.*

Introduction

Although the gadget industry has exploded locally, as well as globally, e-book sales have struggled. "The Internet brought the book a *click* away from the reader, and the pandemic period gave the impression of a revival of the percentage of readers. In fact,

the percentage of those who purchased books during the pandemic did not change significantly in Romania. However, the method of payment has seen important changes in this period of time, with Romanians preferring to purchase printed books online and paying by card" (Gîju, 2021).

The present paper aims to analyze digital book consumption behavior, as a form of sustainable consumption, compared to traditional print book consumption, before and during the pandemic. The first part of the paper consists of a brief theoretical presentation of the advantages and disadvantages of electronic book consumption, especially from the perspective of environmental protection. After a secondary analysis of statistical data regarding the current book market at the European and national levels, and regarding the digital and printed book consumption behavior before and during the pandemic, our research consisted of interviews with professionals in the book industry and consumers, book readers.

Players of the worldwide publishing industry commit themselves to a new sustainable business policy. They signed a 10 points document – "The Sustainable Development and Growth Publishers Compact (SDG)" that stipulates, among other, their main concerns about the environment, policies, and targets of their activity, themes they advocate, progress they register in fulfilling the mission of their business (United Nations, 2020).

The health crisis caused by the Covid-19 virus had and still has a major influence on consumer behavior, in just a few weeks after the pandemic began, it changed the way people behaved, regardless of the type of consumption we are referring to. Social distancing and location constraints have changed the habits of individuals to consume, but also to shop: 66% of people declared the quality and price of products as essential in the purchasing process during the pandemic. Another trend observed during this period was the orientation of purchases towards local products at the expense of imported ones: 33% of the respondents who participated in the research stated that during the pandemic they preferred to order food products online (Cârstoiu, 2020).

The book market has also been impacted by the Covid-19 crisis. Our research aims to identify and compare the consumption behavior of books in the digital and printed format before and during the pandemic, from the professionals (editors, marketing managers, and other categories of professionals involved in the book market) and book readers (consumers) point of view. The general objective is detailed in specific objectives aiming at characterizing the book purchasing during the lockdown and post-pandemic period, the book market evaluation during these two periods, and defining the preferences of the Romanian readers in those periods. As final conclusion, the paper designs a few of the book market trends: printed and/or digital formats.

1. The current book market at the European and national level

When referring to books in electronic format there are both advantages and disadvantages. The advantage is preservation over time, speed, price (lower than classic books), and nature protection. "The printed book consumes paper, therefore wood, it

consumes polluting chemical products (printing inks), it consumes energy to be multiplied in the printing press. It requires huge spaces for storage in publishing houses, until the sale phase - so, again, high costs. The electronic book: it does not pollute, its circulation never runs out, it does not require transport and storage - any home, online store, or library can house any number of titles. Any reader can purchase and download, in a few tens of seconds, any number of titles. Access to the book, therefore to the content, is, if not unlimited, in any case, increased thousands of times by the electronic book" (Michailov, 2014).

The weakness of the electronic format is the reduced sense of satisfaction of classic book lovers. Electronic books should not be perceived as a minus for the book market; they are not a replacement for printed books, but rather an adaptation to modern society's new trends and needs. Moreover, "individuals who already have habits of intensive reading on paper will also be those who will read digitally, and vice versa" (Gîju, 2021, p. 39).

During the lockdown, individuals were forced to buy more online, and these habits have persisted into the present and will somehow define the immediate future. Before the pandemic, brands focused on the core target, communicating in an emotional way, and people arrived at the point of sale and purchased the respective brands. The pandemic fundamentally changed the initial process: "It's about every click that buyers and consumers make on the Internet. It is increasingly difficult to follow the sequence of decisions, of interaction points from the moment a consumer hears about a brand to the moment he ends up consuming it at home" (Iordăchescu, 2021).

The pandemic also fundamentally changed how people searched for information about the brands they wanted to buy: they turned more to advise and word-of-mouth recommendations, becoming the main sources of influence in the purchase process. Influencer marketing substantially grew during this period: "Many of the influencers now have millions of followers. The impact of digital technology, in general, and social media, in particular, on consumer behavior is massive and omnipresent in their daily lives" (Sheth, 2020, pp. 280-283). One of the essential factors influencing the purchase process is social interaction; being permanently connected to social networks, people interact with each other to exchange opinions, recommendations, or information that can help them make a purchase decision (Yang, 2021).

The last years have marked, globally, an era of digitization of books, archives, and manuscripts existing in libraries around the world, a huge amount of information, with the aim of being accessed online by as many people as possible (Gîju, 2021). With this digitization process, printed books are converted into electronic books to be accessible to the public online. With this transformation, a new audience is emerging that prefers to read online and that we can define as an individual who uses certain gadgets or devices specially designed for reading, to satisfy the pleasure of reading (Gîju, 2021). In the antithesis is the traditional reader who still prefers to read classic books, purchasing printed books from specialized stores or online from websites that sell books.

With the release of the first e-book and the evolution of social media, it was predicted that the world would stop reading classic books, but this did not happen, and studies show that people prefer classic print books more than ever. In a survey conducted between January and February, 2021 by Pew Research, 65% of respondents said they had read classic printed books in the past year, with print remaining the most popular book format for those who read (Perrin, 2022).

Even though people's lives are increasingly invaded by technology through various gadgets suitable for online books, such as kindle, e-books, or various reading applications available on iPhones or virtual libraries, people still enjoy classic reading. Although the e-book market has enjoyed an upward trend in recent years, it remains a niche in Romania and globally. "Hundreds of thousands of books are still printed in the classic format in Romania and in the world, publishing houses exhibiting annually, at their (physical, but also virtual) stands, the newest editorials" (Gîju, 2021, pp. 20- 21).

The small number of e-reader owners, purchasing power, a small supply of titles, and a lack of demand are the main reasons why the digital book market remains small. Even if the digital book is not currently enjoying success, it will not disappear, on the contrary, it will coexist in parallel with the classic printed book (Michailov, 2014).

Currently, Romanian publishers consider electronic books a plus for the book market, and transitioning from a printed book to an electronic one is a natural transformation. To further emphasize the importance of this change, an analogy is made with the period in which there was a transition from papyrus to parchment, and then to manuscript and paper. E-reading is rather a new option for readers. The electronic book does not compete with the classic printed book, book formats are not in competition, but complements each other to meet the current needs of readers (Pătrășconiu, 2019, p. 5).

In 2020 the global book market was valued at \$132.1 billion and is expected to grow by 2.4% by 2028: "Technological innovations in the industry, with the emergence of e-books based on audio and video, attract consumers from all regions" (Grand View Research, 2021).

Rising consumer spending, along with an increased focus on personal development, is driving the book market. Consumers are more willing to spend on various products and services according to their hobbies and interests. In addition, more importance is given to leisure activities, leading to an increase in readership. Before the pandemic in 2017, the book market in Romania was estimated to have a turnover of approximately 100 million euros annually and was going to grow. In 2020, the most important 70 publishing houses on the Romanian market registered a decrease of 7.1% compared to 2019, reaching a value of approximately 84.06 million euros (Barbu, 2021a).

In Romania, there are approximately 1,000 publishing houses and 350 merchants according to a study carried out by KeysFin in 2016. Approximately 50% of bookstores and publishing houses are located in Bucharest, where almost 60% of the national business occurs, approximately 60 million euros annually (Negrescu, 2018). The top 10 publishing houses in Romania in 2020 according to their turnover and dynamics

compared to 2019 are as follows: Grup Editorial Litera – 16.2 million euros, a decrease of 12.6% compared to 2019; Art Klett – 5.9 million euros, an increase of 8% compared to 2019; Polirom – 5.8 million euros (-11%); Trei Publishing House – 4.2 million euros (-3%); Humanitas – 3.76 million euros (-7.8%), Paralela 45 – 3.73 million euros (-11.4%); Curtea Veche Publishing – 3.3 million euros (+1%); Booklet – 3.01 million euros (-10.4%); Didactica Publishing House – 2.9 million euros (+5.1%); RAO- 2.7 million euros (+0.1%) (Barbu, 2021a).

Following a CAWI-type analysis carried out within the Eureka Insights Consumer Panel, the most important categories of books that Romanians read in 2018 were: fiction, leisure hobby, psychology, pedagogy, foreign book, history, self-help (personal development), gastronomy, business, books for children, diets and fitness, philosophy, medicine, auxiliary textbooks for school, spirituality, foreign languages, exact sciences, art, architecture, and photography, travel guides books, religion, parenting and family, dictionaries, law and sociology (Eureka Insights, 2018).

Like many other industries, the book industry has been affected by the pandemic caused by the Covid-19 virus. Measures taken to limit the spread of the Covid-19 virus have led to the closure of brick-and-mortar bookstores and a sharp drop in book sales. A study published by the Federation of European Publishers reveals that, in April 2020, book sales fell by up to 96% at the European level, with e-book sales failing to cover the losses recorded by physical bookstores. At the height of the crisis, book sales fell by 80% in Portugal and Spain, 85% in Italy, and 90% in Slovenia (Verheyen & Kraus Vom Cleff, 2021).

In 2020 in France, with the emergency and the introduction of quarantine, book sales fell by 96% in large bookstores and up to 89% in small bookstores compared to the same period in 2019. Germany saw a 47% drop in value in retail book sales, and in Italy, bookstore sales fell by up to 85%. Decreases of up to 90% were recorded in Spain and Slovenia. The UK market did not do better for books either, registering in May 2020, at only 18% of normal values, with publishers reporting decreases in turnover of up to 60%. In the same period, Belgian booksellers of French books recorded decreases of up to 95% of turnover" (Verheyen & Kraus Vom Cleff, 2021, p. 5).

Another negative effect of the pandemic was the impossibility of organizing book fairs, public readings, festivals, and other important events for authors and books. Book fairs (as well as other events, from book festivals to public readings in bookstores) have been stopped, rescheduled, or permanently moved online, at the time of the declaration of the state of emergency and entry into quarantine (Verheyen & Kraus Vom Cleff, 2021).

In Romania, the decrease in the book market was only 7.1%, because we are referring to a considerably smaller market, Romania being at the bottom of the ranking in book consumption even before the pandemic (Wall-Street, 2021).

In 2020 during the quarantine period, Romania recorded up to 30% increases compared to the previous year in online book sales. The preferred literature was thriller, romance,

and children's books. Some of the most sought-after poetry authors were Mihai Eminescu and Alexandru Macedonski (Wall-Street, 2021).

According to the GpecC e-commerce study in Romania, carried out by iSense Solutions, book sales increased by 113% in 2021 compared to 2020, reaching second place in terms of online sales, with the average value of purchases increasing from 127 to 269 lei (approx. increasing from 30 euro to 55 euro) (iSense solutions, 2021).

Between January and June 2020, 58% of Romanians aged 18-65 read books in print at least once, and after the relaxation of restrictions, the percentage dropped to 52%, while reading books in electronic format remained constant in the two reference periods, at 32% (Croitoru & Marinescu, 2021).

2. Digital and printed book consumption behavior before and during the pandemic

According to a study carried out by Starcom in 2020, at the level of consumption behavior of printed books in Romania, there were no significant changes compared to 2019. Young people and women were and remain the main buyers of books. Young people purchase books, especially for school, and women "continue to have the greatest affinity for prose and poetry. As expected, families with children have the highest affinity for children's books (most likely related to childcare), while singles, young singles, for specialist books (most likely related to education). Regardless of their age or status, people prefer bookstores as a purchase channel, most likely appreciating walking through the bookshelves as an authentic experience. Teenagers are the ones who read the most on a daily and weekly basis. Regarding e-book consumption, there were no significant changes" (Starcom, 2020, p. 12).

Regarding reading behavior before the pandemic, 40% of respondents read once a week, 30% read on average 2-3 times a week, and the rest read more often. On average, people read 4 times in a week. Regarding the length of the reading session, 13% of readers allocate between 15-30 minutes of their time for reading, 45% allocate between 31-45 minutes, 22% between 46-75 minutes, and 19% between 76-120 or several minutes. To summarize, in the urban environment, the average duration allocated to a reading session by Romanians is approximately 64 minutes (Eureka Insights, 2018). Before the pandemic, a market study was carried out regarding Romanians' book consumption and purchase behavior, from which it emerged that the audiobook and e-book formats represented 51% of online book sales in 2017 (Iacob, 2017).

During the pandemic, Romanians in the 36-59 age group mostly read novels and specialized books. Regarding reading frequency, women aged 36-59 read the most during the pandemic. Classic books, on paper, are the books preferred by most Romanians. Regarding the preference for purchasing books, Romanians like to purchase books, especially from bookstores, but due to the pandemic, many people have purchased books online. In the urban environment, in the context of the pandemic, 50% of individuals preferred books in classic printed format, the e-book being used by a much smaller percentage (including rural readers).

People preferred to read classic printed books to the detriment of electronic ones, one of the explanations being that "readers tired of the monitors they were connected to with telework or supervising children at online school" chose to read books in classic printed format (Gîju, 2021, pp. 111-112). A year and a half after the start of the pandemic in Romania, "e-book sales have dropped dramatically", due to the work carried out mainly at home, to which the children's online school is added, most Romanians prefer to read a book in classic format than to "browse it on a phone, tablet or e-reader" (Gîju, 2021, p. 117).

The health crisis has brought some changes regarding the consumption of books in our country, observing an increased interest in children's books, as well as in local writers such as Mircea Cărtărescu, Radu Paraschivescu and Ioana Pârvulescu (Cincea, 2022). People purchased books mainly online, increasing the importance of personal recommendations vs. recommendations made by publishing houses through paid advertisements in social media (Barbu, 2021b). And the consumption of e-books has increased, by more than 300% compared to the same period last year. Other changes during this period are related to preferences for the type of book read: personal development books, activity books for children, practical books for adults, and, above all, fiction books sold best. For obvious reasons, travel books had the weakest sales (Barbu, 2021c).

Internationally, in some countries budgets allocated to books have been cut from the shopping list of consumers in several countries such as Brazil, South Africa, the UK, France, and Spain, where people spent up to 49% less on purchasing books. In countries such as India and Korea, book consumption has remained at the same level as before the pandemic (McKinsey & Company, 2020). As for the e-book market in Europe, e-book sales increased during the lockdown, but home-learning books were among the highly demanded literature, which recorded an advance of +62% in France and +134% in Spain. During the pandemic, Spain tripled its e-book sales (GFK, 2020).

In several countries, some publishers have preferred to release certain book titles only in electronic format. In some countries where bookstores were not forced to close, online and e-book sales failed to offset the decline in bookstore sales (Gabriel & Vanschoobeek, 2020).

3. Book consumption behavior in digital format vs. printed before and during the pandemic

Research methodology

The research aims to identify the consumption behavior of books in digital format compared to that of printed books before and during the pandemic, from a comparative perspective between the two periods. The research was carried out through the qualitative method, using the interview technique. The tool we used in data collection was the interview guide. In order to have a complete and objective picture of the situation, interviews were conducted with two groups of subjects: with representatives of the publishers, as well as with consumers, and book readers.

In order to identify the status of the book market, the changes that have taken place at its level and to identify if there have been major changes during this period, we have developed a set of questions that we addressed to some professionals in book editing. The specific objectives aimed at: identifying the characteristics of the books purchased during the quarantine/pandemic period and in the post-pandemic period; evaluation of the book market during the pandemic; defining the book format preferred by Romanians during the pandemic digital/classic printed format; sketching the future of book formats.

In order to analyze book consumption behaviors in depth and to identify if there have been changes during the pandemic period compared to the period before, the following objectives were aimed at understanding book consumers and their needs: understanding book consumer behavior in quarantine and pandemic period; identifying potential changes in book consumption during the quarantine and pandemic period compared to the previous period; the type of books preferred by book readers; understanding the motivations for book consumption. The interviews were conducted with a group of 20 people between the ages of 18 and 35, the age range that reads most frequently, both classic printed books and electronic books, as shown in the study *Trends of cultural consumption in Pandemic*, 2nd edition, produced by the National Institute for Cultural Research and Training (Croitoru, Marinescu, 2021). Our respondents are women and men, from the urban environment, passionate about reading, books, and social media communication. The interviews took place between May and June 2022.

Analysis and interpretation of data

Analysis and interpretation of data obtained from interviews with professionals in the field

Having to comply with the restrictions imposed by law in order to stop the spread of the Covid-19 virus, people had more time at their disposal, thus they paid more attention to reading: *"People seemed much more interested in the book at the beginning, to fill the spare time, initially they thought that everything would pass much faster. The material concerns intervened and I think the interest was diluted"* (P1). But not all people consistently read more, only those who are passionate about books: *"During the pandemic, people's preferences and priorities have changed dramatically along with the general insecurity induced by health and economic situation, so that only the most passionate readers have continued to consider the book a priority"* (P2).

Regarding book consumption in general, it did not change much during the pandemic compared to the pre-pandemic period: *"Consumption decreased at the beginning of the pandemic, and then it adjusted, returned to pre-pandemic levels"* (P3).

Lately, publishers and industry specialists are facing other difficulties that have an even greater impact on book consumption. The inflation rate, gas, electricity, and food prices are testing the book industry more than the pandemic did: *"A gradual return to pre-pandemic normality has been tried and is being tried, even if - including now - the conditions are much more drastic (the increased price of paper, production costs,*

electricity, etc.)" (P2); "We haven't noticed any other changes, except for price increases (paper, printing, distribution), but book consumption, in our country, has remained constant (perhaps because we haven't increased the selling prices yet)" (P4); "The war came, another kind of pandemic, it's worse than in a pandemic" (P5).

According to specialists in the book industry, the main segment of the public who read both during the pandemic and before the pandemic, and who buys books in general, is the *"Intellectual and the pensioner from among intellectuals" (P4) or "the intellectual without money" (P5)*. However, during the pandemic, a new consumer profile took a better shape: *"those who were more dependent on mobility, travel, young people in corporations consumed more books" (P3)*

Regarding the evolution of book kinds, specialists in the book industry claim that there were no major changes, but there were new book types that were launched during the pandemic: *"suddenly there were books inspired by this phenomenon (pandemic), of research and interpretation (including politics), but especially intimate diaries, novels, poems. Having time and reasons to stay at home, writers produced" (P4)* and there was also an increased interest in books for children, motivational and psychology books: *"But I noticed an interest in children's books and psychology" (P1) "for motivational books, but I don't sell such books" (P5).*

Regarding the promotion of books during the pandemic, all the specialists in the industry answered firmly that the only way of promotion they used during the quarantine was the online channel and social media: *"As far as we are concerned, the activities of online promotion worked" (P1); "Through social media and, in general, online promotion" (P2).*

Consumer preferences during the pandemic underwent some changes in the type of book, but that also depended on the offer or what the respective publishing house promoted: *"There is a greater inclination towards Romanian writers" (P2)*. Not only people's preferences have changed, but also the reader itself *"I imagine that it's not the preferences that have changed, but the readers themselves, altogether, now a more pragmatic and hurried generation is emerging" (P4).*

The impact of the pandemic and especially the quarantine has been quite strong in terms of this market, but not as strong as it has happened in other industries. Even so, the impact was not felt in the same way by all publishers, bookshops or online stores, some were affected more and closed, others remained at the same level and others registered increases: *"Unfortunately the pandemic meant the end for some publishing houses, which were unable to manage the extremely low current interest in the book. For others, it meant extreme caution, which translated into a low number of editorial appearances. The result of these trends was a very small number of books sold" (P2); "I don't know, in general, the publishing house F. has stagnated" (P4); "Consumption decreased at the beginning of the pandemic, and then adjusted, returned to pre-pandemic levels" (P3)*. The post-pandemic period is still too short to draw any relevant conclusions, but book publishers state that during this period the book market seems to

be on a somewhat upward trend: *"The book market seems to be on a slightly upward path"* (P2).

Regarding the literature kinds, Romanians' preferences have not changed much, people are generally loyal to the book they consume. The only changes identified are the type of motivational books that has grown quite a lot in the last 10 years and the fact that people read less than 10 years ago: *"The same types of books are consumed, to which motivational books have been added, in congruence with the general trend"* (P2); *"Books were eaten on bread"* (P5).

Print books were undoubtedly the most purchased during the pandemic, however, publishers say there have been increases in e-book consumption. Regarding the future of printed and electronic books, book industry specialists don't see a replacement of classic printed books with electronic books any time soon, but they don't rule it out: *"change will occur constantly. But it will take a few years before we see the electronic book at the level of the printed one"* (P3); *"as a modern person gets used to reading on paper, and writing at the same time, probably after at least another generation, the electronic format will dominate. For Romanians, however, just as the horse-drawn cart has not yet disappeared from the roads, even national roads, the same is true with the book on paper: it will not disappear even after 100 years!"* (P4).

As long as these book formats exist on the market, specialists do not exclude the fact that the future of books may belong to the electronic format: *"electronic books, if they have a present, the more they will have a future, including in audio format, but also in another format now hard to anticipate, because the human mind works continuously"* (P4).

Referring to a small book market, book industry specialists argue that the book market value cannot really decrease, possibly it will remain constant or increase, but all this also depends on the economic situation of individuals: *"it will increase provided that the income (purchasing power) of the citizen (employee) increases in relation to inflation. Otherwise, I estimate a temporarily downward curve (a year or two) with an upward trend afterward, provided that the war in Ukraine does not spread to the rest of Europe"* (P4).

As for the future of literature preferences, specialists in the book industry do not expect very big changes, but there will be some trends that will redefine both the book format and the type: *"it will remain constant, with a qualitative addition to the graphic presentation, according to western models. At the same time, the paper book will become more expensive"* (P4); *"I think that, by and large, the same types of books (with small additions) will be successful"* (P2).

Analysis and interpretation of data obtained from interviews with book readers

During the three months of quarantine, the 18-35 age group read an average of about 10 books. Among the people interviewed there was only one person who declared that he had not read any books, and at the opposite pole we had young people who declared that they had read between 30 and 40 books: *"Around 30-40, I did not keep the evidence"* (C5).

In terms of reading behavior, most young people claim that they have not changed their reading habits at all, however the average number of books read in the first months of 2022 is 7 books, compared to the average number of books read in quarantine which is 10: *"No, there are periods when I read a lot and periods when I don't read at all, and this was not influenced by the quarantine. And in quarantine, I had moments when I read a lot, and moments when I didn't read at all"* (C10). However, the quarantine represented for some young people a moment of change in terms of their behavior towards books and the types they read: *"I'm ashamed to say that I don't really read books, but that's the truth. Quarantine was a miserable time. Being bored, isolated from the world, just me and my family in a house, electronic devices started to bore me too, I couldn't find anything new or interesting anymore, I was up-to-date with everything. I knew I had some books around the house that I had bought a long time ago, and I decided to slowly start reading them. So the lockdown made me start reading again"* (C18); *"It didn't influence me. Maybe the number of books read, yes"* (C19); *"Very much. The pandemic gave me the chance to get to know myself and that's how I discovered self-help literature that helped me during that time to get rid of certain dark thoughts and emotions and to develop myself"* (C3).

Most interview participants stated that their reading behavior had not changed significantly. Despite the fact that the time for reading decreased quite a bit after the quarantine period and especially after the return to normality, many readers in the 18-35 age group stated that they read to the same extent or even more: *"I read more books, the psychoanalytic or psychological ones are interesting, the ones that make you know the person better"* (C16); *"Since I was already working from home before the pandemic, my habits remained almost unchanged, but towards the end of 2021 I started reading a lot in the evening, after 10-11 pm"* (C13); *"The frequency of reading actually increased, compared to the first part of the pandemic"* (C4).

The return to normality didn't bring significant changes in reading behavior, on the contrary, young people read just as much: *"Besides the fact that I don't read that much anymore due to lack of free time, my behavior has remained unchanged. I continue to read the same kinds of books and the method I use to read them has not changed"* (C17); *"I read a lot more than I watch Netflix and I go outside more"* (C11).

The types of books they read during this period have not undergone major changes, with most respondents claiming that they have not changed their preferences: *"I can't say that I have changed the type of books I read. I generally read fantasy, drama, romance or historical books"* (C8), *"Personal development, psychology, memoirs. The types of books that attract me have been the same for several years, they have not changed during the pandemic or not related to it"* (C12); *"Diversified, mostly thriller, fantasy and general fiction then and now"* (C2).

During the quarantine period, some readers turned to personal development and psychology books, a habit that didn't persist even after the quarantine was over. Young people felt the need to find a balance and connect with themselves, so they felt the need to read more books on personal development, sociology and psychology: *"Back then I was reading self-help (personal development) and scientific, now I read literature, fiction"*

(for school), scientific literature" (C19); "During the pandemic, I read social, psychological books in particular, and currently I read the same kind of books, but also about management or social media" (C11); "Then personal development, now fiction" (C13).

Also during the quarantine period, we also noticed an increase in fiction and fantasy. From a desire to disconnect from negative news and social media, some young people preferred to read books that let themselves be carried away in other worlds: *"During the pandemic I read a lot of fiction, especially historical, and now I'm heading more often towards non-fiction, memoirs and thrillers" (C12); "I started reading fantasy, thriller and personal development, and now I read a lot of fantasy, thriller and romance" (C6); "During the quarantine, I read a lot of science fiction, detective and mystery books, but also classics, now I read more comics and graphic novels" (C8).*

Most respondents associate reading with relaxation, satisfying curiosities, learning, transforming oneself, as well as disconnecting from everyday life: *"Books relax me, they transport me to a parallel universe, where I can step into the shoes of other characters and experience, together with them, certain experiences and feelings. Books and reading in general expand your vocabulary and help develop creativity. When I read, I like to imagine the action unfolding in my mind, build the characters and change their experiences step by step, depending on how the action changes too" (C15). But more than that, books give them pleasure and the opportunity to connect with themselves: "I read sometimes to find myself" (C1); "For pleasure and to stay educated/informed. It resonates with my personal wisdom value" (C11).*

When buying a book, the 18-35 age group is mainly motivated by the satisfaction of the desire for knowledge/self-knowledge, progress, and satisfaction of curiosity: *"Problems that arise in my life (an emotional problem occurs - I get a self-help book that I think it would help me)" (C7); "Personal / professional progress" (C14); "Basically curiosity, if it looks like an interesting book or if I have a book in the series and want to know how the story continues. Also, curiosity if a book is recommended to me by a friend" (C2).*

According to the answers received, young people in the age group of 18-35 buy their books mainly online, regardless of whether we are referring to classic printed books or electronic books: *"I only buy online from Elefant, Libris, and Okian" (C14); "Cărturești, Amazon for Kindle" (C2); "Cărturești and Elefant, they have discounts and a wide variety of products, I don't know if I have bought from other sites" (C10). As for their favorite store, most young people prefer to buy their books, especially from the websites elefant.ro and cărturești.ro.*

Before selecting a book, young people rely on reviews, on recommendations from friends, and acquaintances, but also depending on the summary or the subject of the books: *"I read the synopsis, then the first chapter/a few fragments (they are always available)" (C5); "First, I look at the book description. If I'm not convinced, I try to look for reviews, both in English and in Romanian, related to the respective book. This is usually where I decide whether or not I'm really interested in reading that book. Then I look at the price, and promotions. The author is also a criterion by which I am guided. I don't really*

read Romanian authors, so I look at international literature when looking for books" (C7); "It should be one of the topics I'm already interested in. I don't buy books just to buy, but on the contrary, I buy the books I want to read" (C20).

Most respondents prefer to read books in the classic printed format, but they do not completely reject the idea of reading books in electronic format. They prefer classic books due to the reading experience that gives readers a certain comfort, but also a sense of fulfillment in creating their own library: *"I prefer to read books in the classic, printed format. I can focus much better on the action, giving you a certain feeling of being able to flip through the book's pages. Besides, I have several bookshelves and they look very nice sitting there" (C2); "100% printed book. I have had enough of staring at phones and laptops, let alone reading e-books on these nasty blue screens. I prefer printed books because they don't tire my eyes, they help me to concentrate, to immerse myself better in the story, and even simply turning a page is a super, unmatched sensation" (C16); "I prefer the printed book, but I also like to read electronic books" (C15).*

If they had to inspire someone to read, most respondents said they would try to motivate people by emphasizing the benefits of books. *"I would tell him to try, because reading is the most wonderful thing in the world. I would tell her how I started reading, that it wasn't the best friendship at first (I hated reading when I was little) and I would give her some recommendations" (C2); "I would tell him that he will discover new universes with every book he reads. He will learn a lot from the characters and the situations they are put in, he will cry, he will laugh, and he will want to hit all the walls with his book when a character does something stupid. He will discover a new world, right in his mind" (C9); "I would give him a book as a gift that would awaken this passion" (C16).*

However, respondents believe that people cannot be persuaded to read by other people, and the love of books must be felt, not influenced by other people, because it doesn't work: *"I don't think I would try to persuade someone to read, you can't convince someone to do things they don't want to do, especially if they are things they should be doing for pleasure. I wouldn't convince people to read it, they have to convince themselves, I can only tell them as I would say for any other matter to give it a chance that maybe they will like it" (C2); "There is no universal message that you can get a person to read. Yes, many ideas and texts come to my mind, from the motivational and classic to the most profound and funny, but first I need to know the person in question. I need to know how she thinks, and what's stopping her from giving reading a chance, and read her for a few minutes, or any speech I might have prepared will be completely useless. In addition, before I show him the benefits of reading, I would look for a common topic (eg: fashion, travel, food, heroes) so that I can subtly bring books into the discussion" (C9).*

Even if they prefer books in classic printed format, all interview participants stated that they read books in electronic format: *"Yes, I read some books in electronic format, especially those that were not translated or found in bookstores in our country" (C5); "I've read it a few times, but I'm not a fan" (C4); "Yes, more. Last year I read one out of curiosity, and the topic caught my eye, it's called Sing Backwards and Weep, a memoir by the lead singer of a band I like. I had found it free (pirated) on the net, I didn't know if it was*

available here in physical format and I couldn't wait any longer, I hurried and read it in PDF format, on my laptop. I ate it in 2 days" (C9).

Most of the interviewees don't have special devices for e-books, but when reading an e-book they mainly use their phone, laptop, or tablet: *"Laptop or tablet, but the tablet is easier to use because it is easier to take anywhere" (C20); "in general, the laptop or the mobile phone, it depends on each individual situation" (C19); "The laptop or the phone... more the laptop, I'd say. I have a program that puts a semi-transparent red filter over the screen, making reading easier and less tiring for the eyes" (C8).*

Those who own special devices for electronic books such as Kindle or e-book reader, prefer to use them occasionally or not at all: *"I use it more when I go on vacation" (C4); "very rarely, once every few months" (C10); "I have an e-book, but I don't use it at all. In fact, someone received it as a gift and gave it to me, hoping I would use it" (C2).*

Research conclusions

Regarding the first specific objective of the research based on interviews with book industry specialists, namely to identify the characteristics of book purchase during the period of quarantine and pandemic and in the post-pandemic period, the main change was the purchase channel that completely shifted to online, as well as increased interest in motivational and applied psychology books. At the behavioral level, people devoted more time to reading during this period due to the restrictions imposed by the pandemic, which didn't allow them to invest time in other activities they did before the pandemic.

During the pandemic, the profile of the book consumer hasn't changed much, as book industry specialists say, those who consumed books during the pandemic are the same as before the pandemic: *"the intellectuals without money and the pensioner from among intellectuals"*. However, specialists appreciate that during this period the corporatists and those who were dependent on mobility, had more free time and devoted it to reading, but this doesn't mean that this category didn't read at all, but only that they began to read more than they did before the pandemic.

Regarding the second objective of the interview with book industry specialists, regarding the radiography and evaluation of the book market during the pandemic, the research results showed that the book market during the pandemic was changeable just like people's lives in general: major changes for some publishing houses, changes that entailed a dramatic decrease in sales, for others it was the end, and for other publishing houses higher sales increases than before the pandemic. Throughout this period, publishing houses, as well as bookstores, had to adapt to the new reality. To survive and get through this severe period, publishers and bookstores have given discounts and promoted themselves more aggressively than usual on social media.

Like any crisis, be it economic or health, it will always destabilize the business environment. During this period of crisis, some publishing houses closed, some remained with a constant income and some grew, but overall, the book market didn't

undergo major changes in terms of the evolution of sales, the number of readers or the types of books read.

Regarding the third objective of the interviews with book industry specialists related to the definition of the book format preferred by Romanians during the pandemic (classic printed/digital format), we identified that the book format preferred and loved by readers during the pandemic, as well as in the period before or after the pandemic, the classic printed format remains.

The fourth and last objective formulated for the research with the group of specialists in the book industry aimed to outline a future or some trends that will define the future of books. Although the e-book segment is very small today in Romania, it has a potential for growth in the future that will come true along with other changes that will occur in this industry.

One of the reasons why this e-book segment is stagnant and is still at a very low level, is the lack of electronic devices in the personal possessions of readers. According to the interviews, only two out of the twenty interviewed own such a device. The price of such a device pretty much limits a young person's decision to switch from a classic printed book to an electronic one. Certainly, young people will still read e-books, but they will use devices such as phones, tablets, or laptop, which will not create as pleasant an experience as an e-reader or Kindle device. Related to the evolution of long-term book volumes, specialists believe that the market will grow, even if more smoothly, as long as people can afford to buy books and their standard of living is not affected.

Related to the first objective formulated for the interviews conducted with the 18-35-year-old consumer group regarding the understanding of book consumer behavior during quarantine and the pandemic, the data analysis showed that during this period there were three essential changes. The first change was the shift from reading for relaxation to reading for escape, the second was the time they spent reading which increased due to the restrictions to limit the Covid-19 virus and the third was the increased interest for motivational and applied psychology books. Out of a desire to find some sort of emotional balance, people sought a reading that would help and support them on an interpersonal level.

The second objective for the interviews conducted with the 18-35-year-old consumer group was to identify possible changes in book consumption in the post-quarantine, pandemic period compared to the previous period. Regarding consumption, the 18-35 age group didn't read more books during the pandemic compared to the previous period. The exit from quarantine or the current context doesn't bring major decreases in terms of book consumption. Even if they have less time, the 18-35-year-old group is trying to adapt to the new normal without affecting the time dedicated to reading.

The third objective of the research conducted through interviews with the 18-35-year-old group was to identify the type of books preferred by book readers. For many readers, interest in certain book types has changed during the pandemic compared to the previous period. Escape reading during the pandemic has turned some readers to

other kinds of books than they were reading in the previous period. Some read more self-help books, some chose fantasy, some chose romance novels, and each reader tried to connect to a new normal at will.

The fourth objective set for the research with the 18-35 year group seeks to understand readers' motivations and what causes them to choose reading over other activities. Books and reading in general are strongly anchored in emotional consumption. Regardless of the context, people see reading as relaxation, a disconnection from everything, and stepping into another world. In addition to relaxation and pleasure, people also read out of the need to quench their thirst for knowledge, learn things, and experience or explore the substrates of their minds.

Final considerations and discussions

Book consumption behavior in Romania hasn't changed significantly during the pandemic, and most likely it will not change much in the coming years either. In response to being constantly connected to technology and social media, people prefer to read books in a classic way, just as they have always done. Not only in Romania, but people also have a common habit, unchanged for decades, that of experiencing a book in a "comfortable way, in an armchair, for a few hours on the weekend or in the evenings during the week, before going to bed, and reading dozens of pages from a classic, printed book - with cardboard covers and the smell of printing ink, an experience that can bring unique emotional and intellectual satisfaction" (Giju, 2021, p. 20).

Despite all the current opportunities, digitization, etc., in Romania, hundreds of thousands of books are printed in the classic format, and publishing houses exhibit their newest editorials annually at local book fairs. Probably just like today, in the future, classic printed books will remain as a relaxation alternative for most people, and e-books will be more accessible alternatives for those who are still in school, who want to study, the future young people, digital natives, those who need to feed their curiosity as quickly as possible and don't have the desire to search and purchase a book in a bookstore.

The future of book consumption in the short to medium term is likely to split between online and offline to respond to new book consumption trends and behaviors, and online is likely to continue to grow. Stores, brick-and-mortar bookstores, and classic printed books will never completely disappear, because readers like to browse, choose, and research several books before making a final choice. Moreover, some brick-and-mortar bookstores don't just offer books, they offer a book-buying experience, they offer ideas, and they offer relaxation to those who cross their threshold. The digitization of books is not the end of classic printed books, but an adaptation of books to the digital world, a way in which the book market adapts to meet the needs of all consumers.

The moment of decline of the book industry was recorded in the first part of the pandemic, namely in quarantine. Being in an unprecedented period, specialists in the book industry were forced to adapt to the conditions imposed by the pandemic. The main challenges for specialists in this industry was to maintain sales at a constant level

and consolidate businesses, rethinking the book promotion strategy, therefore they focused more on online marketing and adapting to a new sales channel, namely the online one.

In the context of the social reset, people turned more to the self, from a desire to disconnect from the uncertain and risky situation around them. Thus, during the pandemic, people sought to read books to help them overcome this unprecedented period. The motivation or self-motivation resulting from the increased interest in motivational books has materialized into building a stronger self, a new self that understands how to overcome this critical period.

In a crisis situation of any kind, regardless of whether we are talking about a financial or health crisis, people will always look for options that will positively influence their mental health, ideally within their reach. Also, people need courage and openness to other worlds, an openness to other perspectives, precisely to move on and accept change.

Regardless of the kind of books that will be read in the future or their formats, people will continue to read to quench their thirst for knowledge, relax, or disconnect from the everyday. Considering the need to protect the environment through sustainable consumption, the future will probably belong to e-books, not that printed books will disappear altogether, but they will probably be more expensive and people will find it easier to consume e-books.

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Annex

Research codification for professionals (P):

Code	Position
P1	Book editor, publishing house
P2	Editor in chief, publishing house
P3	Head of marketing department, publishing house
P4	Manager, publishing house
P5	Editor, publishing house

Research codification for book consumers (C):

Code	Gender	Age	Code	Gender	Age
C1	Fem.	19	C11	Fem.	20
C2	Fem.	20	C12	Male	27
C3	Fem.	32	C13	Fem.	27
C4	Male	22	C14	Male	35
C5	Fem.	27	C15	Fem.	33

C6	Male	26	C16	Fem.	21
C7	Fem.	34	C17	Male	20
C8	Fem.	21	C18	Fem.	30
C9	Male	34	C19	Fem.	25
C10	Fem.	30	C20	Male	25

GOOGLE MAPS AUGMENTED REALITY AND SMART TOURISM IN EUROPE: AN EXTENDED TECHNOLOGY ACCEPTANCE MODEL

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Abstract. *This study will ascertain which elements influence tourists' intention to use augmented reality (AR) applications during their trips. An online questionnaire collected data from 318 European tourists and their perceptions of Google Maps AR. Data were analyzed using partial least squares structural equation modeling. Findings show that an authentic experience and perceived enjoyment influence the intention to use AR apps and that personal innovativeness positively moderated these two significant relationships. The two factors from the Technology Acceptance model significantly affected the outcome of behavioral intention to use. Oppositely, interactivity did not impact the intention to use in the proposed model. Results from the multi-group analysis indicated higher importance of an authentic experience for males and higher importance of the perceived enjoyment for females. Personal innovativeness was found to enhance three relationships on behavioral intention to use: authentic experience, perceived enjoyment, and perceived interactivity. Instead, the analysis showed that the two moderation hypotheses on the Technology Acceptance Model constructs were not supported, demonstrating that for innovative individuals it is less vital that the new technology is simple and useful. Rather, the AR app must be unique, engaging, and enjoyable. We contribute to the current literature on AR usage and the Technology Acceptance Model in the tourism sector, offering implications for businesses and practitioners. This study's findings may benefit tourism professionals and developers of AR applications. Developing an authentic experience is still costly but worth the effort as one of the breakthroughs of this research. The importance of experience authenticity is higher for males and this should be considered especially for AR apps aimed at male consumers as a target. Enjoyment showed to be relevant for intention to use and stronger for females. With the increasing use of new techniques, more interactive apps could be developed and this factor, despite not being significant here, might influence future inquiries.*

Keywords: *Augmented reality; smart tourism, technology acceptance, authentic experience, enjoyment, interactivity, personal innovativeness.*

Introduction

Individuals' interactions with their physical and virtual environments have shifted dramatically because of recent technological breakthroughs. Augmented reality (AR) has received significant attention from industry and academia over the last five years as one of the most innovative technologies impacting human behavior (He *et al.*, 2018). One explanation for this surge in popularity is that more people are becoming aware of AR's ability to produce a filtered impression of the real world by seamlessly combining it with computer-generated material (Han *et al.*, 2016). Worldwide spending on AR is estimated to rise from over US\$12.0 billion in 2020 to US\$ 72.8 billion in 2024 (Statista, 2022).

The tourism sector can benefit greatly from AR because it promises to provide more interactive and authentic tourist experiences (Loureiro *et al.*, 2020; Tussyadiah & Wang, 2016). Mobile tourism apps enable users to get information about a destination while traveling through it (Kenteris *et al.*, 2011). Location-based applications (Noguera *et al.*, 2012), social networking sites such as mobile guides (Viana *et al.*, 2011), and navigation maps such as Google Maps all offer data that enables users to utilize while traveling. This data is merged to create digital maps that are realistic representations of the actual world, making them ideal for on-the-go tourists. Studies have been conducted demonstrating the potential of AR to improve the tourism experience in small towns, amusement parks, heritage sites, art galleries, and historic urban tourist industry sites (Boboc *et al.*, 2019; Cranmer, 2019; Han *et al.*, 2016; Mine *et al.*, 2012). Various recent researchers have examined the properties of apps that enhance the visitor experience (Ramtohul & Khedo, 2019; Ocampo, 2019).

This study investigates the factors influencing Google Maps AR's behavioral intention to use European tourists. We fill the gaps indicated by previous studies claiming tourist behaviors connected with smart tourism are mostly unknown (Hew *et al.*, 2017) and the understanding of how people interact with AR while traveling and/or afterward remains restricted (Kumar, 2021). This research contributes to the scholarly literature by extending the Technology Acceptance Model (TAM, Davis & Venkatesh, 1996), adding three important variables previously identified in the AR literature: authentic experience, perceived interactivity, and perceived enjoyment. TAM has grounded most of the research in the field (Cranmer *et al.*, 2019; Han *et al.*, 2016; Leue *et al.*, 2014), but we go beyond previous studies by proposing a model that includes the analysis of the moderating role of personal innovativeness, contributing to research done in the field of this individual trait (Huang & Liao, 2015).

Theoretical framing and hypotheses

The TAM is based on innovation disclosure and social psychology thus a useful framework for examining the communication and acquisition of innovations and concepts (Davis & Venkatesh, 1996). TAM was selected by past research to develop a conceptual model to investigate users' adoption of AR in tourism (Leue *et al.*, 2014), examine users' intentions to use AR apps (Haugstvedt & Krogstie, 2014), and to investigate users' acceptability of AR smart glasses (Kalantari & Rauschnabel, 2018). TAM was recently broadened to include additional determinants of acceptability, such as subjective criteria, in various study contexts (McLean & Wilson, 2019).

Behavior intention consists of the degree to which a person has developed conscious plans to behave or not in a certain way in the future (Warshaw & Davis, 1985). In other words, usage intentions reflect an individual's degree of deliberate engagement in a specific activity. The greatest predictor of an individual's conduct is his or her desire to act (Ajzen & Fishbein, 1980). Prior research shows that intention is critical in determining actual behavior (Venkatesh & Davis, 2000). In tourism, "effective behavioral intention" refers to a desire to travel, plan to visit, or invest money and time in tourism products and services (Meng & Choi, 2016).

Authentic experience

Authenticity is a consumer sensibility centered on how the services of one experience as fresh, genuine, one-of-a-kind, and outstanding (Gilmore & Pine, 2007). Variables such as knowledge, external information seeking, and a sense of authenticity, have a strong influence on slow-trip customer behavior (Meng & Choi, 2016). Additionally, the similarity with a real experience gained through technology boosts the user's behavioral intention (Guttentag, 2010; Yung & Khoo-Lattimore, 2019). Specifically, the realistic experience of mobile computing technologies enhances travel consumers' inclination to reuse mobile technologies (Kim *et al.*, 2017). Therefore, the following hypothesis is formulated:

H1. Authentic experience has a positive impact on behavioral intention to use AR apps.

Perceived enjoyment

Enjoyment can be defined as the extent to which an individual considers an activity pleasurable by itself, regardless of the expected performance consequences (Zhang *et al.*, 2012). Moreover, consumers' emotional experiences substantially and positively impact their behavior (Sohn & Lee, 2017). Recently, the emphasis on pleasure as an external attribute has grown considerably (Lee *et al.*, 2012). The role of fun in defining the adoption of new technology was found to be strong in consumers' perceptions of AR app usage (Ha & Stoel, 2009). Based on the previous literature examining the effect of perceived enjoyment (Leue *et al.*, 2014; Wojciechowski & Cellary, 2013), we formulate the following:

H2. Perceived enjoyment has a positive effect on behavioral intention to use AR apps.

Perceived interactivity

Interactivity in AR apps improves the user experience, enhancing engagement by allowing users to modify the virtual world and its modules (Nikhashemi *et al.*, 2021). Some studies have argued that interactivity should be further explored as a unique attribute of AR apps for its implicit ability to drive attitudinal and behavioral outcomes (McLean & Wilson, 2019; Yim *et al.*, 2017). More recently, one study revealed that perceived interactivity within AR influences mental images that ultimately trigger positive consumer attitudes and behavioral intentions (Park & Yoo, 2020). Thus, the following hypothesis is proposed:

H3. Perceived interactivity has a positive impact on behavioral intention to use AR apps.

Perceived ease of use and perceived usefulness

TAM determined that perceived ease of use and perceived usefulness are the two primary elements influencing customers' attitudes and inclination to use new technology (Davis, 1989). Several studies have simplified the TAM by omitting attitude (Venkatesh & Davis, 2000). The attitude construct's mediation effect on behavioral intention was not substantial (Lee & Lehto, 2013). Additionally, Venkatesh and Davis (2000) claimed that the simplified TAM may be more effective at predicting consumer behavior than the original TAM.

The term perceived usefulness is the degree to which system users believe the technology will boost their productiveness when performing activities such as traveling (Rouibah & Abbas, 2006). The term "perceived ease of use" refers to the degree to which a user believes that utilizing a system is simple (Davis, 1989). Previous research has confirmed the significant role of these two constructs of the TAM (Haugstvedt & Krogstie, 2014; Kalantari & Rauschnabel, 2018; Leue *et al.*, 2014), thus we hypothesize:

H4. Perceived usefulness has a positive impact on behavioral intention to use AR apps.

H5. Perceived ease of use positively impacts behavioral intention to use AR apps.

Personal innovativeness: moderation effect

Personal innovativeness refers to an individual's predisposition to be the first to accept unique ideas, concepts, or products, such as new technology (Lu *et al.*, 2013). Additionally, this individual ingenuity tremendously impacts consumers' willingness to embrace new technologies (Rogers, 1995). Individuals with a higher level of personal innovativeness will have a more favorable view of technological innovation and a desire to adopt it (Lu *et al.*, 2013). According to innovation diffusion theory, individuals with a high level of innovativeness are more likely to endorse new technology and services, have a greater ability for dealing with uncertainty, and tend to underestimate the impact of risks (Agag & El-Masry, 2016). In this study, personal innovativeness will be tested as a moderator in the proposed model, thus we hypothesize:

H6. Personal innovativeness strengthens the relationship between the authentic experience and behavioral intention to use.

H7. Personal innovativeness strengthens the relationship between perceived enjoyment and behavioral intention to use.

H8. Personal innovativeness strengthens the relationship between perceived interactivity and behavioral intention to use.

H9. Personal innovativeness strengthens the relationship between perceived usefulness and behavioral intention to use.

H10. Personal innovativeness strengthens the relationship between perceived ease of use and behavioral intention to use.

Methodology

The study's target audience comprises Europeans who travel at least once a year and have previously used Google Maps during their travels. Two screening questions were included at the survey's start to ensure that only respondents from the intended group could submit their responses. The current study uses a quantitative approach with an online questionnaire in two versions revised by native speakers (English and Italian). The survey was developed using Sphinx Declic software. The measures were taken and adapted (when necessary) from previous literature using a five-point agreement Likert scale. Personal innovativeness (PIN) was measured using 4 items (Agarwal & Prasad, 2021), authentic experience (AE) was measured using 4 items (Kim *et al.*, 2017), perceived enjoyment (PE) was measured using 6 items (Do *et al.*, 2020), perceived interactivity (PI) was measured using 5 items (Do *et al.*, 2020), perceived usefulness (PU) was measured using 4 items (Zhuang *et al.*, 2022), perceived ease of use (PEOU) was measured using 4 items (Zhuang *et al.*, 2022), and lastly, behavioral intention to use (BITU) was measured using 4 items (Hsu *et al.*, 2021).

A pilot survey was conducted with 15 individuals to gather feedback about the clarity and understandability of the items. After the questionnaire was refined, it was circulated through social media networks. A snowball sampling strategy was also used, disseminating an online link that ensured people could directly access and disseminate the survey. Seven responses were eliminated from the total of 325 respondents participating in the survey, leaving us with 318 valid responses. Table 1 shows the sample characteristics.

Table 1. Demographic profile of respondents (Author's Own Source)

Characteristics	Number	%
Gender		
1. Female	161	50.6%
2. Male	155	48.7%
3. Rather not to say	2	0.6%
Age group		
1. Under 25 years	152	47.8%
2. 25 to 39 years	150	47.2%
3. Over 40	16	5.0%
Country		
1. Italy	162	50.9%
2. Germany	55	17.3%
3. Netherlands	30	9.4%
4. France	21	6.6%
5. Spain	15	4.7%

6. Other	35	11.1%
Reason		
1. Mobility	117	36.8%
2. Tourist attractions	76	23.9%
3. Food or drinks	65	20.4%
4. Accommodation	42	13.2%
5. Other	18	5.6%
Destination		
1. National	82	25.8%
2. International	236	74.2%
Frequency		
1. Once a year	126	39.6%
2. Once every 6 months	87	27.4%
3. Once every 3 months	72	22.6%
4. Once a month	33	10.4%
Total	318	100%

The proposed research model included reflective measures and tests for moderating relationships, so partial least squares (PLS) structural equation modeling with SmartPLS 3.0 was used to test the model (Hair *et al.*, 2011). The SmartPLS multi-group analysis (MGA) was used to determine whether there are substantial variations in parameter estimations between preset data groups (Hair *et al.*, 2016).

Results

Evaluation of the measurement model

Reflective assessment methods require the validity and reliability of the items and conceptions (Hair *et al.*, 2013). Items with a loading of 0.40 to 0.70 may be retained in the model if their omission impairs the model's overall content validity (Hair *et al.*, 2011), as indicated by Average Extracted Variance (AVE) and Composite Reliability (CR). According to the analysis, the factor loading of the PIN3 item was insufficient thus this item was removed from the model to improve internal consistency. Since the items used to define these constructs are unidimensional and the equally reliable measurements are interchangeable, they can be modified or removed without affecting the construct (Bollen & Lennox, 1991). To assess convergent validity, three indicators were used: individual factor loadings, Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE). Table 2 shows the results of the outer model reliability and convergent validity.

Table 2. Measurement model results

Construct	Items	Loadings	α	CR	AVE
PIN	PIN1	0.916	0.827	0.893	0.737
	PIN2	0.781			
	PIN4	0.873			
AE	AE1	0.874	0.918	0.942	0.802
	AE2	0.918			
	AE3	0.878			
	AE4	0.912			
PE	PE1	0.814	0.937	0.950	0.762
	PE2	0.877			
	PE3	0.910			
	PE4	0.893			
	PE5	0.840			
	PE6	0.899			
PI	PI1	0.808	0.905	0.930	0.726
	PI2	0.857			
	PI3	0.879			
	PI4	0.884			
	PI5	0.831			
PU	PU1	0.703	0.819	0.879	0.647
	PU2	0.837			
	PU3	0.867			
	PU4	0.801			
PEOU	PEOU1	0.812	0.881	0.917	0.734
	PEOU2	0.868			
	PEOU3	0.883			
	PEOU4	0.862			

BITU	BITU1	0.867	0.886	0.922	0.747
	BITU2	0.792			
	BITU3	0.908			
	BITU4	0.887			

Discriminant validity must be established to verify that constructs are unique or extremely like one another. The Fornell-Larcker statistic is a critical component of partial least squares research since it is used to determine the discriminant validity of a model (Hair *et al.*, 2016). Table 3 shows the discriminant validity results.

Table 3. Fornell-Larcker criterion (Author's Own Source)

Construct	1	2	3	4	5	6
1. AE	0,896					
2. BITU	0,687	0,865				
3. PE	0,779	0,761	0,873			
4. PEOU	0,424	0,572	0,537	0,857		
5. PI	0,560	0,648	0,661	0,658	0,852	
6. PU	0,619	0,757	0,699	0,616	0,750	0,804

Evaluation of the structural model

To determine the magnitude and significance of path relationships inside the research model, it is important to analyze the p-values and t-statistics produced from a bootstrap with a level of 1000 subsamples and a significance level of 5% as recommended in the literature (Henseler *et al.*, 2009). The path coefficient values correspond to each hypothesized relationship between the latent variables (Hair *et al.*, 2016), indicating whether the formulated hypothesis is accepted or rejected. Personal innovativeness was tested as a moderator in the proposed model. Table 4 summarizes the hypotheses' acceptance results.

Table 4. Hypotheses acceptance results (Author's Own Source)

Hypotheses	β	t-value	p-value	Supp.
H1 AE \rightarrow BITU	0,162	2,542	0,011	Yes

H2	PE → BITU	0,312	4,935	0,000	Yes
H3	PI → BITU	0,006	0,111	0,912	No
H4	PU → BITU	0,354	6,125	0,000	Yes
H5	PEOU → BITU	0,117	2,364	0,018	Yes
H6	MOD PIN H1	0,144	2,323	0,020	Yes
H7	MOD PIN H2	-0.204	3,339	0,001	Yes
H8	MOD PIN H3	0,146	2,162	0,031	Yes
H9	MOD PIN H4	0,006	0,101	0,919	No
H10	MOD PIN H5	-0,045	0,846	0,397	No

The coefficient of determination expresses the exogenous component's effect on the endogenous component quantitatively. In mathematical words, R2 is the proportion of variance in the independent construct explained by the dependent variable (Hair *et al.*, 2011). The coefficient of determination quantifies the model's predictive capability (Hair *et al.*, 2016). The R2 value of 0.695 indicates that the proposed model has a strong explanatory power of the dependent variable behavioral intention. Figure 1 illustrates the research model and the obtained structural model results.

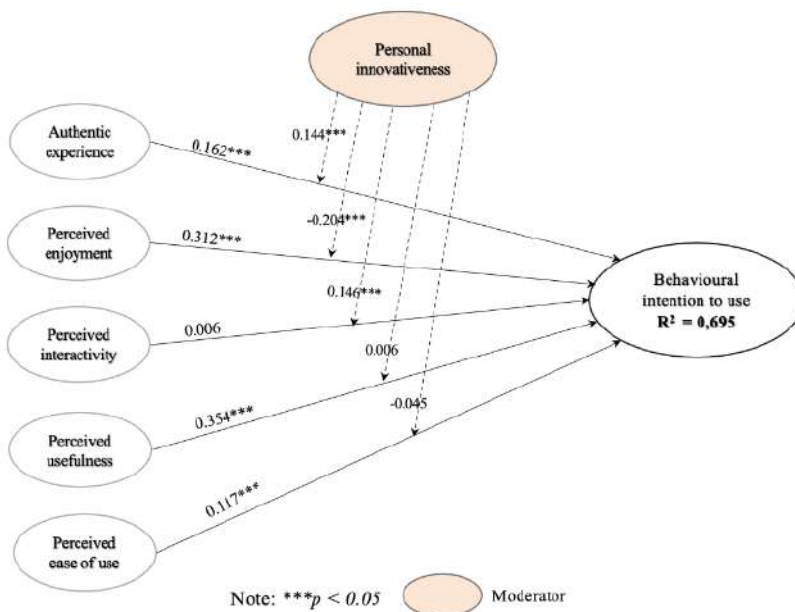


Figure 1. Structural model results

MGA was conducted to determine any discrepancies between subgroups in the sample. We tested for differences regarding age, gender, the reason to use Google Maps and frequency of travel. Only gender produced meaningful differences. The influence of authentic experience on behavioral intention to use AR apps is significantly different for males and females ($p = 0.002$) being stronger for males ($t = 4.613$) than for females ($t = 0.059$). Further, perceived enjoyment had a higher effect on behavioral intention to use for females ($t = 4.814$) than for males ($t = 1.936$), and this difference is statistically significant ($p = 0.008$).

Results and Discussions

This study aimed to determine how AR applications affect tourists' experiences by orienting them toward behavioral use intentions. To accomplish this, a research model extending TAM was devised, and Google Maps AR was chosen to be investigated.

This research contributes to the disciplines of AR in the tourism sector by expanding the classic TAM model, including the variables of perceived interactivity, enjoyment, and authentic experience (Yung & Khoo-Lattimore, 2019). The proposed research model had strong explanatory power and explored the moderating role of personal innovativeness (Lu *et al.*, 2005).

The findings indicate that authentic experience predicts purchase intention, which aligns with previous literature on AR (Kim *et al.*, 2017; Yung & Khoo-Lattimore, 2019). An authentic experience is one of the premises of virtual reality and augmented reality (Riva *et al.*, 2016), but its implementation still faces technological limitations. The importance of a credible experience was stronger for men. AR apps with males as the audience should be aware of the importance of a convincing app that brings an immersive and authentic experience.

The second hypothesis showed to be significant since perceived enjoyment is an intrinsic payoff to the use of technology (Davis, 1989). Numerous experts have emphasized the importance of enjoyment and general physiological experiences in adopting augmented reality in the tourism business (Haugstvedt & Krogstie, 2014; Leue *et al.*, 2014). This study confirms that visitors who experience greater enjoyment when interacting with a mobile AR application are more likely to continue to do so in the future. The finding from the MGA revealed that perceived enjoyment has a stronger effect on females' behavioral intentions than males. This finding contradicts previous studies and deserves further investigation (Khedhaouria & Beldi, 2014).

Perceived interactivity was shown to not impact purchase intention. This finding contradicts prior research in the field (Pantano *et al.*, 2017). Recent research has proven the positive impact of interactivity on female consumers in South Korea (Park & Yoo, 2020). One of the reasons might be that Google Maps AR does not yet have many interactive AR features implemented, users did not recognize the importance of this factor for an experience worth repeating. The fourth and fifth relationships examined in this study belong to the TAM and the two relationships were found to be significant.

Finally, personal innovativeness was revealed to enhance three relationships on behavioral intention to use: authentic experience, perceived enjoyment, and perceived interactivity. These findings indicate that innovative individuals are quite willing to move to new technologies in exchange for the unique experience provided by AR apps.

Previous research (Lu *et al.*, 2013) established the critical role of personal innovativeness in explaining people's behavior in various IT environments. Typically, innovative individuals are the first to embrace new technologies. They are satisfied with the application of modern technologies to their objectives (Huang & Liao, 2015). Instead, the analysis showed that the two remaining hypotheses were not supported. This demonstrates that for innovative individuals, it is less vital that new technology is simple and useful. Rather, the AR application must be unique, engaging, and enjoyable.

Limitations and future research

This study is not without limitations leading to future research possibilities. Our sample is restricted to the European continent; thus, it is recommended that future researchers consider other continents and countries, running cross-cultural comparisons. China is a rapidly developing destination with high investments in AR apps and could be the focus of further inquiry. Our main limitation resides in Google Maps AR selection. This tool brings only a few functionalities and its use is not yet popular among travelers. Our sample was not fully familiar with the application. The three variables added to the TAM model highly depend on how advanced the functionalities of the AR application are. Future studies should select AR apps promoting a realistic, fun, and interactive experience to test the motives behind tourists' intention to keep using those applications.

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Appendix

Measurement items

Constructs	Items	Source
Personal Innovativeness (PIN)	If I heard about a new technology, I would look for ways to experiment with it. Among my peers, I am usually the first one to try out new information technologies. In general, I am hesitant to try out new information technologies. I like to experiment with new information technologies.	(Agarwal & Prasad, 2021)
Authentic Experience (AE)	Using Google maps AR app would provide (provides) me authentic experience while travelling. Using Google map AR app would provide (provides) me genuine experience while travelling. Using Google maps AR app would provide (provides) me unique experience while travelling. Using Google maps AR app would provide (provides) me exceptional experience while travelling.	(Kim et al., 2020)

<p>Perceived Enjoyment (PE)</p>	<p>Using Google maps AR app would be (is) one of my favorite activities when travelling. Using Google maps AR app would be (is) enjoyable for me while travelling. Using Google maps AR app would make (makes) me feel good while travelling. Using Google maps AR app would be (is) pleasurable for me while travelling. Using Google maps AR app would be (is) fun for me while travelling. Using Google maps AR app would keep (keeps) me happy while travelling.</p>	<p>(Hai et al., 2020)</p>
<p>Perceived Interactivity (PI)</p>	<p>The information shown when I interact with the Google maps AR app would be (is) relevant while travelling. The information shown when I interact with Google maps AR app would meet (meets) my expectations while travelling. The information displayed when I interact with Google maps AR app would be (is) appropriate while traveling. The information shown when I interact with Google maps AR app would be (is) suitable while travelling. The information displayed when I interact with Google maps AR app would be (is) useful while traveling.</p>	<p>(Hai et al., 2020)</p>
<p>Perceived Usefulness (PU)</p>	<p>Using Google maps while travelling would allow (allows) me to easily find my destination. Using Google maps AR app while travelling would enable (enables) me to access more information about the destination of my trip. Using Google map AR app would improve (improves) the quality of my travel. The indication on the Google maps AR app regarding the destination while travelling would be (is) clear and understandable.</p>	<p>(Zhuang et al., 2021)</p>
<p>Perceived Ease of Use (PEOU)</p>	<p>Learning how to use Google maps AR app while traveling would be (is) easy for me. My interaction with Google maps AR app while traveling would be (is) clear and understandable. It would be (is) easy for me to become comfortable using Google maps AR app while travelling. I find the Google maps AR app easy to use while travelling.</p>	<p>(Zhuang et al., 2021)</p>

Behavioral Intention to Use (BITU)	I think I will use Google maps AR app or other AR apps in the future. I will always try to use Google maps AR app in daily life. I recommend to other to use Google maps AR app while travelling. I will tell other people positive things about the content of Google maps AR app.	(Hsu et al., 2021)
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BUSINESS MODELS IN PUBLISHING INDUSTRY. A COMPARATIVE ANALYSIS BETWEEN ROMANIA AND THE REPUBLIC OF MOLDOVA

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Abstract. *The book market in Romania and the Republic of Moldova is quite small and in an infant stage compared to the international market (especially when contrasted with mature markets such as Western Europe and the US). In the last decades, however, with the collapse of the communist era, more entrepreneurial initiatives emerged in these markets, growing slowly but steadily. This study focuses on the publishing industry and the successful business models in these countries. Two independent publishing houses, Nemira (from Romania) and ARC (from the Republic of Moldova) are analyzed through the business models canvas strategic management template.*

The key findings are further discussed to assess the competitive advantages, strategies, and key success factors of the business models used by these already well-established publishing houses. Combining the editorial part with the commercial side, having a well-thought marketing strategy and online presence, as well as strategic partnerships with cultural institutions and economic agents are significant aspects when it comes to the success of an editorial business. Each of the two studied publishing houses is adapted to their environment and deeply understands the market they operate in. As nowadays value is placed on customer experience more than ever, actors in the publishing industry are put in the position to understand their targeted audience and create suitable strategies for the needs they intend to fulfill. The analysis presented in this paper aims to assess what business models differentiate actors in the publishing field in Romania and the Republic of Moldova from the competition and how extra value could be added to this industry.

Keywords: *Book market; business models; cultural entrepreneurship; publishing industry; Republic of Moldova; Romania*

Introduction

The book market seems to be like the litmus paper of a society's economic and cultural life. It responds to economic and social changes, events, and dynamics. Aspects such as political regimes, people's wealth, or socio-economic crises highly impact this industry (Grigore, 2014). This happens because books do not represent essential goods for survival with inelastic demand (Stănciulescu et al., 2020), so people's willingness to read is not always proportional to their possibility to buy books. However, it often happens that the buying capacity eventually dictates the reading habits.

In recent years, companies from Romania and the Republic of Moldova followed the global digitalization trend. Disruptive for businesses worldwide was the COVID-19 period, which added pressure on companies in many industries, including the book

market, to adopt digital approaches, innovate, and find creative measures to keep in touch with consumers (Zbucnea et al., 2020). It can be said that the pandemic was a catalyst for the whole digitalization and *going online* phenomenon, which is quite important for the future of business models, including the ones in the publishing sector.

The current study seeks to appraise the successful business practices and strategies of publishing houses from the two countries, as well as the components of business models adopted by recognized actors in the field, which could prove useful for many entities in the whole value chain, benefiting the companies in the area, cultural institutions, local authors and readers, and society.

Two independent publishing houses, Nemira (from Romania) and ARC (from the Republic of Moldova) were chosen for the purpose of this study, as they are both entrepreneurial initiatives started in the first post-communist years (Nemira being established in 1991 and ARC in 1994), relatively similar in terms of size, market share, and turnover. Nemira is slightly bigger than ARC but if reported to their home markets they are approximately at the same stage. Due to these similitudes, their differences in business model approaches might represent each of the two markets.

This paper is structured in six sections aside from the introduction, exploring subjects like the Romanian publishing industry overview, Moldavian publishing industry overview, innovative business models specific to the publishing sector, a comparative analysis of the two publishing houses using business model canvas, ending with a short review of the findings and conclusions.

Literature review

Romanian publishing industry overview

From a historical standpoint, Romania has a more recent tradition in the book market than other European countries. Throughout the interwar years, the book industry grew, but it was disrupted by the communist regime's censorship and nationalization (Lefter, 2009). After communism's collapse, the book sector was revived, with many new independent players appearing in this business sector. Since then, the market evolved, branch associations were formed, and the numbers rose at a macro level. (Hrib, 2018). However, the 2008-2011 global economic crisis and the COVID-19 crisis affected the industry's progress, which remained in a stagnating state until now (Stănculescu et al., 2020).

Generally, in Romania, the publishing industry's operations' value chain is running on debt. The case for publishing houses is that they wait a rather long time for sales fees from book retailers and, in turn, have delayed payments to printing houses and warehouses where books are stored (Hrib, 2018).

Specific to industries in starting phase, publishing houses are currently disproportionately distributed territorially. Most of them conduct their activities in big cities, with strong university centers, a higher percentage of intellectuals and bigger incomes, where the demand for books is higher. There is a big discrepancy between book consumption in urban and rural areas (Hâncean & Oană, 2018). In order to improve this situation, the Culture Ministry implemented projects for written culture promotion, national and international book fairs, and funded programs for cultural

magazines, but a deeper commitment is needed to get statistically significant results (Ceobanu et al., 2016).

As the sector evolved, promotional practices in trend at the global level such as book launches or meeting the authors' events held in non-conventional places like cafes, parks or historical buildings have been adopted in recent years. The international model also organizes book fairs among well-known Gaudeamus caravan and local Bookfests in big cities (Hrib, 2018). The publishing houses' communication with the reader through marketing instruments such as newsletters or social media pages is not yet very well developed in a general context (Zbucea & Mocanu, 2013). The focus is on selling proposition more than customer experience (Zbucea et al., 2020). This is probably related to the fact that price is still the most important decisional factor for the Romanian book buyer.

Even though it is modernizing, the Romanian book market is quite traditional in its approaches, but its trends don't differ much from the global ones. Classical books on paper support are still the most popular among consumers, even though e-books are largely available and their market share grew in recent years (Hâncean & Oană, 2018). The audiobook market is not as developed as in the more mature markets, but some relevant initiatives emerged, including Voxa, based on the Audible concept, established by one publishing house owner in collaboration with another entrepreneur (Săniuță et al., 2021).

The same pattern is valid for the distribution systems, as physical, brick-and-mortar bookstores are still the most popular among Romanian consumers. Online distribution has gained market share in recent years in accordance with global tendencies, due to advantages such as lower price, increased practicality, and chose convenience, a trend which was accelerated by the COVID-19 situation when most of the physical bookstores were temporarily closed (Zbucea et al., 2020). Most of the important publishing houses offer the consumer the option to order online directly from them, running websites that act also as online stores where customers are able to place orders directly (usually at lower prices because no intermediaries are involved), some have also physical book shops or bookstore chains.

The Romanian publishing industry tends toward growth and modernization and has progress potential; however, assiduous work of both economic actors and public institutions is required to make this field prosperous and attractive for investors and entrepreneurial innovations.

Moldavian publishing industry overview

The book market in the Republic of Moldova is similar to the one in Romania, but it is smaller and in an even more incipient stage. The state control and strong censorship impeded the normal development of this sector until the USSR's collapse (Rusu, 2015). The industry remains affected, as the ideological impact was even more pronounced than in Romania, due to language alteration and russification efforts, especially in the country's biggest administrative centers (Ciubotaru, 2009). The sector was affected by crises (the 2008 world crisis and COVID-19) and social unrest and low incomes, which unfortunately persisted in post-communist years. Unlike Romania, the Republic of Moldova did not become a part of the European Union up to this date and benefitted in

a lower proportion from European cultural initiatives and grants. Nevertheless, most funds received by Moldavian institutions in the book industry are foreign; several known sources are Romania, the European Union, and World Bank (Rusu, 2015).

Due to a common language and culture, a widespread phenomenon in the Moldavian publishing industry is the internationalization of production, distribution, and selling processes in the more developed Romanian market (Rusu, 2015). As the Republic of Moldova was once part of the Soviet Union, most of the population knows the Russian language and has access to ex-soviet countries' culture and literature in its original form. Consequently, publishers from Moldova have a competitive advantage: the possibility to bring to the Romanian market new titles which are not limited to Moldova only, but are also translations from other ex-soviet countries, most common being the ones from Russian, and Ukrainian literature (Cozonac & Chitoroagă, 2022).

Predominantly, the Moldavian and Romanian publishing industries are interconnected. Consumers from each of the countries have access without significant impediments to the cultural products of the other country. As Romania is a bigger and more developed economy than Moldova, the general trends in this industry are often borrowed from Romania and the international market, with a small delay, which narrowed over the years with digitalization.

Distribution seems to be the weakest chain in the Moldavian book market due to the lack of local professional intermediaries with clear strategic plans, comprehensive information on editorial programs and full market coverage. The cost associated with trade and distribution is also high. Therefore, many publishing houses create their own distribution channels and internationalize to the Romanian market (Rusu, 2015).

The demand for books could have a certain potential if the population's income would rise. Recent studies show that almost half of the country's population is reading books generally, even though less than 10% do it daily (Cebotari & Ghimpu, 2018). The statistics in this area are insufficient and quite confusing but taking into account the existing information it appears that a big part of the population does not buy the books they read, preferring to borrow them from libraries or from acquaintances. The consumers are even more price-sensitive than the Romanian ones (probably due to lower earnings). Consistently, the most published materials are the ones people need to buy for their studies and jobs, the highest number of published titles on the Moldavian market being associated with schoolbooks and didactic works, nonfiction, and scientific literature (Cozonac & Chitoroagă, 2022).

Despite all the problems this sector faces, the publishing houses in the Republic of Moldova keep being productive and qualified, but the whole value chain in the book industry needs to be rethought for this to become a profitable field.

Innovative business models specific to the publishing sector

On the international market, especially in more modern economies with an advanced and complex book industry, the publishing sector is undergoing a transition towards digital technologies and formats. The classical business models in the industry are challenged by the ones more adapted to the technological environment (Øiestad & Bugge, 2014).

Lately, many innovative business models applicable to the publishing industry have emerged. Many well-established companies and even global leaders with great trustworthiness approach a *paid content business model* for their online publications, e-books, or audiobooks. Via different kinds of payment for content, these companies succeed in adding revenue for further value creation. The same segment of businesses focuses on *developing new products and services*. The increased income generated from selling newly developed products and services and their licenses' intangible value can be useful for growing revenue sources of the respective publishing firms (Aschwanden, 2017). Smaller businesses and newer entrants on the market frequently use the *crowdfunding* business model, consisting of raising money via the internet from many people willing to support publications. However, this is often a transition model towards a more sustainable one as their business grows. This business model is used long-term only in developed economies (Lindsay, 2021). Smaller firms also widely use the *print-on-demand model* (which has now been adopted by larger actors). Since the copies are only printed when the firm receives an order, it is possible to print smaller quantities and only the ones that will be sold. This allows for cost savings and increased effectiveness.

E-commerce is part of various strategies usually applied by companies with vertically integrated business models (Øiestad & Bugge, 2014). As this practice becomes increasingly popular on the international market, more businesses will adopt this strategy which requires a profound understanding of the consumer (Bradshaw, 2017). In the next years, it is possible that the whole publishing sector will be dramatically changed once AI technology is more and more implemented. Pilot experiments already prove that introducing AI in the value chain of the book industry, including content creation, may add value for the reader and successfully merge human creativity with AI insightfulness (Huston, 2022).

Companies in Romania and the Republic of Moldova generally adopt international trends. Even though these are still traditional markets, bigger actors in the field already use innovative business models in order to capture the value and thrive in these quite difficult markets and times. Due to its relatively decreased entry costs, E-commerce is already widely used in both countries even by smaller players.

Methodology

Business Models analysis through Business Model Canvas tool

Objectives:

Identification of business models in the publishing industry from Romania and the Republic of Moldova – the models used by the main actors in the field reveal information about the situation of the whole book sector and its development stage.

Identification of key success factors – successful practices bring valuable insights about the needs and wants of the consumers, as well as managerial approaches that work well on the studies markets.

Comparing the strategies of companies with traditions from each of the countries – as the two studied markets are interconnected, it is important to also understand the

differences between them and whether they could bring added value in the trade context.

Methods:

In order to achieve the research objectives, a critical and comparative analysis based on business model canvas, a strategic management tool that works through a systematized examination of the fundamental elements of a business, has been approached using the Strategyzer template. This tool acts as a schematic business plan, visually highlighting the core segments of a business. The right part of the canvas emphasizes the external factors, over which the company has less control, while the left part addresses key internal factors. Not coincidentally, “value proposition” is placed in the middle, as it constitutes the value exchange between the company and the customers.

For the current study, two independent publishing houses were selected, Nemira (as a representative of the Romanian market) and ARC (as a representative of the Moldavian market). As they are companies with tradition, established in the 1990s, at the very beginning of the sector’s revival, and roughly similar in many aspects, the two publishing houses were considered illustrative for each specific market.

A business model canvas (Figures 1 and 2) was developed for each publishing firm and followed by short observations of findings. Based on information sources available on the internet, such as articles, interviews, financial databases, and the two companies websites and social networks, conclusions on each core business element represented in the business canvas were drawn (customer segments, value proposition, customer relationships, channels, revenue streams, key resources, key activities, key partners and cost structure). Due to data confidentiality, financial information regarding these companies’ cost structure and revenue streams is limited.

Information sources:

The information sources used for this study are the two publishing houses’ websites and social networks, materials on Nemira’s blogs, and interview articles with these publishing firms’ representatives.

Table 1. Research Sources (Source: Authors' own contribution)

Research Sources	Nemira	ARC
Mass media interviews	<p>Cartepedia, 2021 https://www.cartepedia.ro/blog/interviu-aniversar-cu-echipa-nemira-3603</p> <p>Roşca, 2021 https://www.zf.ro/companii/interviu-ana-nicolau-editura-nemira-cu-afaceri-de-2-mil-euro-in-2020-20135139</p> <p>Bălulescu, 2019 https://adevarul.ro/stil-de-viata/cultura/interviu-eli-badica-editor-nemira-se-scrie-1989664.html</p>	<p>Vasile, 2022 https://bookindustry.ro/ro/tag/editura-arc/</p> <p>Caraman, 2021 https://limbaromana.md/index.php?go=articole&n=4022</p> <p>Gârneţ, 2003 http://www.contrafort.md/old/2003/103-104/542.html</p>
Publishing house's website	<p>Nemira, n.d. https://nemira.ro/</p>	<p>Editura Arc, n.d. https://www.edituraarc.md/</p>
Publishing-house blog	<p>Nemira Blog, n.d. https://blog.nemira.ro/</p>	
Publishing-house social media accounts	<p>Editura Nemira, n.d. https://www.facebook.com/ed.nemira</p> <p>Editura Nemira, n.d. https://www.instagram.com/edituranemira</p>	<p>Editura ARC, n.d. https://www.facebook.com/arc.editura</p> <p>Editura Arc, n.d. https://www.instagram.com/edituraarc</p>
Financial data websites	<p>RisCo, 2022, "Nemira Publishing House SRL" section https://www.risco.ro/verificafirma/nemira-publishing-house-cui-24966411</p>	<p>Data2B, n.d., "EDITURA ARC" section https://www.data2b.md/ro/companies/101262000482/editura-arc</p>

Limits of the research

The limitations of the current research arise from the sample size used for the study, as only two publishing houses were analyzed, and the findings are only estimative. The investigated data was also collected from a bounded number of sources. Additionally,

due to limited number of previous studies in the research area, the available information is not extensive, and many aspects are not yet covered.

Results and discussions

The two business models presented using the Strategyzer template represent an overview of how entrepreneurial initiatives started right after the communism period in Romania and the Republic of Moldova have been developed and succeeded to grow on these difficult markets. An interesting observation is that the differences in these companies' approaches are explanatory for the two markets' distinctions.

Business Model Canvas		Nemira Publishing House		
Key Partners Delivery suppliers External consultants Cultural and educational organization Independent bookstores and bookstore chains Libraries Digital platforms Publishing houses on the international market	Key Activities Relationship with the authors Redaction, correction and translation Portfolio design Creating books' concept and design Creating and maintaining relationship with distributors eCommerce specific activities Organizing book-related events Warehousing of own products Printing own products Key Resources Diversified portfolio in terms of books' form and a wide variety of genres for different age groups Vertically integrated approach Dependable delivery suppliers Partnerships with a broad spectrum of distributors (many bookstores and online retailers in Romania) Holistic marketing approach and constant communication with the consumer	Value Propositions Nemira business model is based on customer loyalty, generally exhibiting a proactive and supportive attitude towards its customers. The value proposition of Nemira publishing houses can be outlined as constant and genuine communication with the consumer, long-term commitment and diverse offering that could match any literature preferences.	Customer Relationships Customer oriented business model Constant communication with the consumer through newsletters, website updates and blog posts Loyalty program "Super-cititor Nemira" Customer behavior and preferences understanding Pleasant graphic design of the website and blog that creates a cozy atmosphere for their visitors Channels Digital channels such as their own blog, newsletters, Instagram account, Facebook account Own online store Partner bookstores and bookstore chains Online retailers	Customer Segments Middle and higher income All age groups with a passion for reading: Parents with kids Teenagers Young adults Middle-aged adults Older adults
Cost Structure Equity 35% - Debt 65% (2021) 7.7% Fixed assets - 92.3% current assets (2021) Net profit of 1.667.062 RON (2021) Value-driven strategy		Revenue Streams Books selling through online and offline channels New products creation (recent releases of a wide variety of audiobooks and e-books) Payment for digital content		

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Figure 1: Nemira business model canvas
 (Source: Authors' own research results/contribution)

Nemira Publishing House's business model is focused on customer experience. Through constant communication and feedback received from consumers, they manage to keep adapted to the nowadays constantly changing readers' preferences. The publishing house has also digitally adapted, producing e-books and audiobooks. It applies innovative business models and strategies specific to the publishing field such as *paying for digital content* (its e-books being available for immediate download for a fee), *launching new products* and using *e-commerce*. Nemira is vertically integrated as a structure, meaning it has its own printing houses and warehouse, as well as an online selling platform (its website, where the visitor can order books online in a user-friendly way).

The company also offers various genres, from children's books to non-fiction scientific books. It recently enriched its portfolio with a Manga collection in the Romanian language. These are the first of their genre launched directly in the Romanian language and benefit from professional translations. As Manga is a new section of Nemira's portfolio, they have a special space for readers to share their opinion on comic books. This new launch example is exemplificative for Nemira's business model.

By communicating closely with the consumer, they seek to understand market needs and lacunas and to fill them in, through value creation. The publishing house also has a loyalty program “Super-cititor Nemira” where readers can enroll, receive personalized offers, gain discount points, and invite their friends to buy books from the website. Another key success factor of this publishing house is its holistic marketing approach, its different departments acting together in synergy for improved customer experience and positive brand image, as they have good delivery suppliers, partnerships with a wide variety of physical and online distributors, and a whole communication department focused on bringing value to the customers through social networks posts, blog articles and newsletters regularly sent. Even during the lockdown, they tried to make a difference by stepping up with online events and supporting programs (launching podcasts and a series of free materials such as children's toys and coloring pages for adults) (Zbucnea et al., 2020).

Business Model Canvas		ARC Publishing House		
Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Printing houses Cultural and education institutions Book shops and bookstore chains from the Republic of Moldova and Romania Online retailers from the Republic of Moldova and Romania Publishing houses on the international market	Relationship with the authors Redaction, correction and translation Portfolio selection Creating books' concept and design Creating and maintaining relationship with suppliers (printing houses, warehouses, distributors) Creating partnerships with cultural institutions Organizing and participating in book-related events Key Resources Diversified portfolio in terms of book genres Orientation towards local educational needs, publishing of school manuals and other educational materials as well as partnerships with local schools and school libraries Partnerships with local and international cultural institutions and publishing houses Partnerships with local and international retailers	ARC business model is based on a diversified portfolio and strategic partnerships with cultural and educational institutions from the Republic of Moldova, but also with international actors from cultural sphere, and international retailers. ARC publishing house maintains a diverse book offering adapted to the local demand and to customers' preferences.	A hybrid approach (customer oriented and transactional) Adaptation of the offer to local needs Adaptation to the local educational needs Channels Social networks such as Instagram and Facebook Partner bookstores and bookstore chains Online retailers	Educational institutions (schools) Libraries Medium income households All age groups
Cost Structure		Revenue Streams		
Net Profit 4,96 mil MDL (2018) Hybrid business model between cost driven and value driven		Books and school manuals and other materials sales		

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Figure 2. ARC business model canvas
(Source: Authors' own research results/contribution)

ARC Publishing House puts value on their customers' needs, wants, and preferences; however, it has a more transactional approach when compared with Nemira. Its focus points are specialization in editorial activities and creating valuable and sustainable partnerships, both in the local and international markets. Unlike Nemira, ARC is not vertically integrated, preferring to rely on various partnerships on both sides of its economic chain. This might be inclusively because internationalization is an important part of their strategy. They collaborate with suppliers, bookstores, and institutions from ex-soviet countries as well as with the ones from Romania, European Union, and other countries. Interestingly, ARC publishes many of its children's books in co-edition, printing them in China. With regard to their distribution, besides the local market where their products are sold for the most part in physical bookstores, a considerable share of ARC's sales is in Romania, where the publishing house has partnered up with online shops and retailers, as well as with several physical book chains.

One of the successful elements of ARC's strategy is its diversified book portfolio, suitable for all ages and tastes, to which the specific niche of schoolbooks, manuals, and educational materials is added. The publishing house has adapted to the local market's educational needs and considered the local demand statistics when designing its strategy (as mentioned before, specialized didactic materials are in high demand in the Moldavian book market). This niche strategy allows more complex partnerships with educational and cultural institutions. Schools and local libraries also become potential active buyers for this product segment.

In terms of marketing and promotion, ARC Publishing House uses classical methods, such as social networks, their own website and partners' websites, sales promotions, book launches, and other events, as well as book fairs. According to ARC's copyright manager, book fairs proved the most effective over the years. Such events allow for human-to-human interaction and people working on the books can discuss directly and present them to the end consumer.

Conclusions

In an increasingly dynamic and volatile economic environment, publishing houses must adapt to their local circumstances and global trends. Just as in other industries, especially the creative ones, the success of a company does not come only from their costs savings and boosted sales, but also from experience creation and keeping the consumer connected. Strategic partnerships, innovation, diversified portfolios, and revenue sources are important to successful business models.

Romania and the Republic of Moldova are quite difficult markets for the cultural sectors, especially in written content due to specific historical conditions and turbulent socio-economic situations, but they exhibit growth potential. As Romania has a more developed market than the Republic of Moldova, successful strategies used by local companies are quite different, relying in a larger proportion on customer experience, e-commerce, and product innovation. In the Republic of Moldova, conversely, creating partnerships with international institutions, obtaining sponsorships, developing suitable niches on the local market, and internationalization of production or/and distribution activities are key success factors in the case of publishing houses and not only. The current study reveals that practical actions taken by companies match the theoretical research and statistics in the field and the publishing houses in each country try to match the local demand (a relevant example would be the school books and didactic materials niche in the Republic of Moldova). Additionally, given that price is an important decisional element for people in both countries, the companies in the area frequently take actions such as loyalty programs and sales promotions.

In order to gain market share and remain successful companies in the publishing market need to sustain a continuous improvement approach, constantly adapting to the new technologies, distribution channels and, most importantly, customer needs and wants. Developing differentiation strategies with unique selling propositions and adapting to consumers' expectations and requirements are generally valid principles for a business model's success. However, in the publishing field, especially when the market is in the beginning phase, they become essential for a company's survival and growth.

As nowadays publishing landscape goes through great changes, companies from all over the world, including Romania and the Republic of Moldova should adjust to the new technologies and transform upcoming challenges into opportunities. Creativity and innovation are key to the future publishing industry's survival and progress.

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DO MACROINDICATORS CORRELATE WITH COVID-19 IN EUROPEAN COUNTRIES? A COMPARATIVE ANALYSIS

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Abstract. *The Covid-19 health crisis influenced economies and societies to a large extent, determining researchers and practitioners to study the economic consequences of this crisis. This paper aims to analyze if and how macroeconomic evolutions were related to the evolution of Covid-19, during the major years of the pandemic, 2020 and 2021, in selected European countries. The methodology was based on testing the correlation analysis between Covid-19 cases and macro-level indicators (such as GDP change, unemployment, and inflation). Four countries were studied, categorized according to geographical location and size (large Western European countries, small Western European countries, large Central and Eastern European countries, and small Central and Eastern European countries), and 3 countries were selected in each group for analysis. Results illustrated that Western European countries were more affected at the macroeconomic level by the health crisis than Central and Eastern European countries. Among all groups, small Western European countries were the most affected. Also, inflation was the macro-level phenomenon most correlated with the evolution of Covid-19 cases.*

Keywords: *Covid-19 crisis; European countries; macroeconomic evolutions; GDP; unemployment; inflation.*

Introduction

The health crisis determined by the Covid-19 virus had unprecedented and unexpected consequences for the entire world (Tudorache & Nicolescu, 2021). Communities of both researchers and practitioners are concerned by the economic effects of the crisis (Bremmer, 2020; Manyika, 2020) and about how the world will evolve after the Covid-19 crisis ends. This is a current topic of discussion with high expected importance for the future; therefore, it is debated in the literature to a large extent. Different articles investigate the impact of the crisis at a general economic level (Ibn-Mohammed et al., 2021), while others look at the impact of the Covid-19 epidemic on specific industries, for example, the auto industry (Belhadi et al., 2021) and the airline industry (Amankwah-Amoah et al., 2021). Other articles speculate on the future and try to imagine how the world will look after the Covid-19 crisis will end (Rebelo, 2020; Sneider & Singhal, 2021; Tudorache & Nicolescu, 2021).

The purpose of the present paper is to investigate the existence or not of a correlation between the evolution of Covid-19 and the economies of European economies during

the Covid-19 crisis, considering from an economic point of view the main macro-level aspects. The main objectives relate to identifying if there is a relationship between the evolution of Covid -19 cases and the country-level GDP, unemployment, and inflation in the respective country. The methodology used to reach these objectives includes the correlation analysis between the number of Covid -19 cases and each macro-level indicator considered, respectively the GDP, unemployment, and inflation. Four European countries were included in the analysis: small Western European countries, large Western European countries, small Central and Eastern European countries, and large Central and Eastern European countries. Also, as part of the methodological endeavor is a comparative analysis between the four groups of countries, as far as the relationships between macroeconomic indicators and the evolution of the Covid-19 cases, is concerned. The paper has the following organization: the next section refers to what the literature presents about the Covid-19 crisis and its effects; after that, the methodology section presents the main methodological aspects considered; the following section tests the correlation between the Covid-19 cases and the macro-level economic indicators in the selected European countries during the years of the core COVID-19 outbreak, respectively 2020 and 2021; the conclusion section ends the paper.

Literature review

According to specialists the Covid-19 health crisis had effects that manifest at multiple levels (Bremmer, 2020; Manyika, 2020) in societies and economies. Numerous authors identified the main levels at which the impact of the Covid-19 health crisis is felt: world level, national level, industry level, company level, and individual level (Belhadi et al., 2021, Ibn-Mohammed et al., 2021). Consequently, the effects of Covid-19 need to be analyzed at each level.

At the world level, the economic impact of the Covid-19 health crisis is profound (Tudorache & Nicolescu, 2022). The pandemic determined a global recession (Aramayo & Vokoun, 2020; Gruszczynski, 2020), that manifested at the level of the global economy and at the level of national economies. At the beginning of the pandemic, at the global level, the global supply chains have been disrupted (Garofali, 2020), due to the high degree of worldwide integration of production processes, as well as the high level of integration of distribution systems, globally (Gruszczynski, 2020). Consequently, companies dependent on foreign supplies encountered an increased risk of disruption during the pandemic, illustrating that outsourcing became a much riskier strategy than before the Coronavirus -19 outbreak (Zahra, 2021). Also at the global level, at the outset of the health crisis, international trade was negatively affected, with large declines being registered, mainly due to a) governmental measures such as lockdowns; b) transportation disruptions; c) protective measures with the limitation of exports for certain product categories (medical products, food, and hygiene products) that were scarce at the time (Aramayo & Vokoun, 2020).

At the country level, the demand for many products declined with negative consequences on production. The decrease in product demand was associated with some people losing their jobs (Aramayo & Vokoun, 2020) and consequently have lower purchasing power. Other people displayed higher cautiousness when spending due to a perceived high level of future uncertainty. All these determined a decline in many countries' economies.

At the industry level, the situation differed depending on the industry, with some industries being highly positively influenced, while others being highly negatively influenced. Among the industries on which Covid-19 had negative influences were certain service industries such as tourism, catering, restaurants, and bars, but also air transport, entertainment, and personal care services (Ibn-Mohammed et al., 2021; Zahra, 2021), but also manufacturing industries such as the auto industry and the garment industry. Among the industries on which Covid-19 had positive influences were industries related to the internet (e-commerce, internet communication) (Sneider & Singhal, 2021) and to the medical industry (sanitary products and medical equipment) (Zahra, 2021). The information technology sector also developed highly during this period, due to the shift of many activities online: teleworking, telehealth, and e-learning. At the same time, cybersecurity was in high demand due to the development of many online activities.

At the company level, the Covid-19 crisis had huge impacts. Small and medium-sized companies were at risk and many went bankrupt (Amankwan-Amoah et al., 2021), while other small and large companies had to adapt their way of operating to survive. The needed company-level changes were determined by legislation: health and safety measures (distancing, sanitizing), but also by the need to adapt to new conditions: remote working for staff, higher levels of digitalization, and the incorporation of newer digital technologies (Zahra, 2021).

In this context, it is interesting to investigate the relationship between Covid-19 and macro-level evolutions, as the activity of all other economic actors (companies and individuals) highly depends on what happens at the macro level in the economy (Tudorache & Nicolescu, 2022).

Methodology

The general purpose of the present paper is to investigate if the economic evolutions of European countries were related to the evolution of the Covid-19 cases. In order to pursue this purpose, the paper has as major objectives: a) to investigate the existence or not of correlations between the number of Covid-19 cases and a series of macro-level aspects in European countries and b) to compare the relationships existent between Covid-19 cases and the considered macroeconomic aspects in different groups of European countries.

The macro-level indicators that portray an economy are GDP change (quarterly) and unemployment and inflation (monthly). Data for these indicators was collected for the main two years of the Covid-19 pandemic, 2020 and 2021. The data about the COVID-19 number of cases was collected weakly and computed at a monthly level also for the period January 2020 – December 2021.

European countries have been categorized according to two criteria: a) the traditional geo-political geography: Central and Eastern European (CEE) countries and Western European (WE) countries and b) the dimension of the country measured by population size in: large countries (over 10 mills. inhabitants) and small countries (less than 10 mills. inhabitants). By combining the two criteria, four groups of countries resulted: large CEE countries (with over 10 mills. inhabitants), small CEE (with less than 10 mills. inhabitants), and large Western European countries (with more than 10 mills.

inhabitants) and small Western European countries (with less than 10 mill. inhabitants). In each group the first three countries (as size) were considered, for analysis. Table 1 shows the European countries included in the study with their populations.

Table 1. Population of European countries included in the study
(Source: Worldometer)

Countries			
Large Western European countries > 10 mill. inh.	France	Germany	Italy
Population 2020 (thousands)	65,273,5	83,783,9	60,461,8
Small Western European countries < 10 mill. inh.	Austria	Ireland	Switzerland
Population 2020 (thousands)	9,006,3	4,937,7	8,654,6
Large Central and Eastern European countries < 10 mill. inh.	Czech Republic	Poland	Romania
Population 2020 (thousands)	10,708,9	37,846,6	19,237,6
Small Central and Eastern European countries < 10 mill. inh.	Bulgaria	Hungary	Slovakia
Population 2020 (thousands)	6,948,4	9,660,3	5,459,6

Data for all countries was collected from the Eurostat interactive database, the European Statistical Recovery Dashboard for the economic data (GDP change, unemployment rate and inflation rate) and the data about the Covid-19 cases was collected from European Centre for Disease Prevention and Control of EU.

Appendices 1-4 present the data for the two years of analysis (2020-2021) for all considered indicators and all countries included in the study.

The research method is based on the correlation analysis by computing the Pearson coefficient. Correlation is seen as a measurement of the monotonic association between two variables and depicts the linear relationship between two continuous variables, usually known as the Pearson product-moment correlation (Schober et al., 2018). The correlation shows the degree to which the change in one variable determines changes in the second variable. Pearson coefficient (r) is used to measure the correlation between two continuous variables and depicts direction and strength of the association of the two considered variables. The direction of the linear relationship can be positive (the two variables move in the same direction: when variable 1 increases also variable 2 increases) or negative (the two variables move in opposite directions: when variable 1 increases, variable 2 decreases). The strength of the correlation can be interpreted as weak (r between 0.1 and 0.3), medium (r between 0.3 and 0.5) and strong (r above 0.5) (Laerd Statistics, 2020).

In the present study, in order to conduct the correlation analysis and identify the existence or not and the direction and the strength of a linear relationship between variables, the number of Covid-19 cases at 1000 inhabitants was calculated and included in the analysis, along with the existing macroeconomic indicators.

Results and discussions

For each group of countries were analyzed the correlations between the three main types of macro indicators considered (GDP change, unemployment, and inflation and the Covid-19 number of cases (measured at 1000 inhabitants). The purpose was to investigate if there was a relationship between the evolution of Covid-19 cases and the evolutions at the macro level of the European economies. The results presented in Tables 2 and 3 indicate both similarities and differences in the way Covid-19 correlated with the economies of countries. The analysis will be done first on variables correlated and then on groups of countries.

Table 2. Level of correlation between cases of Covid-19 and main indicators at a macro level (Source: authors' calculations)

Countries	Pearson coefficient		
	Covid-19 cases/1000 inh. with GDP change	Covid-19 cases/1000 inh. with unemployment	Covid-19 cases/1000 inh. with inflation
Large Western European countries			
France	-0.0391	-0.0524	0.3744
Germany	0.0261	-0.3041	0.5855
Italy	0.0754	0.1681	0.3255
Small Western European countries			
Austria	0.1965	-0.1140	0.4679
Ireland	0.3175	-0.6630	0.8463
Switzerland	0.2643	0.3160	0.8173
Large Central and Eastern European countries			
Czech Republic	0.2184	0.4147	-0.0549
Poland	0.1644	0.4405	0.3656

Romania	0.0722	-0.2014	0.2520
Small Central and Eastern European countries			
Bulgaria	0.3407	0.1904	0.3054
Hungary	0.1790	-0.0318	0.4199
Slovakia	0.0333	0.1842	0.1521

The correlation between Covid-19 and the change in GDP. The relationship between the number of cases of Covid-19 and the change in the GDP proved to be rather weak in all countries. Most of the larger countries, from both geographical regions, registered very low, almost insignificant values of the correlation coefficient (under 0,1), whereas the largest values of the coefficient were encountered in smaller countries, with the highest in Bulgaria (0,34), Ireland (0, 31) and Switzerland (0,26). This suggests that in general, in Europe, the evolution of the GDP was weakly correlated with the evolution of the number of Covid-19 cases in 2020-2021.

Table 3. Interpretation of correlation between cases of Covid-19 and main indicators at a macro level (Source: authors)

Countries	Pearson coefficient interpretation		
	Covid-19 cases/1000 inh. with GDP change	Covid-19 cases/1000 inh. with unemployment	Covid-19 cases/1000 inh. with inflation
Large Western European countries			
France	Negative, Very weak	Negative, Very weak	Positive, Medium
Germany	Positive, Very weak	Negative, Medium	Positive, Large
Italy	Positive, Very weak	Positive, Weak	Positive, Medium
Small Western European countries			
Austria	Positive, Weak	Negative, Weak	Positive, Medium
Ireland	Positive, Medium	Negative, Large	Positive, Very large
Switzerland	Positive, Weak	Positive, Medium	Positive, Very large

Large Central and Eastern European countries			
Czech Republic	Positive, Weak	Positive, Medium	Negative, Very weak
Poland	Positive, Weak	Positive, Medium	Positive, Medium
Romania	Positive, Very weak	Negative, Weak	Positive, Weak
Small Central and Eastern European countries			
Bulgaria	Positive, Medium	Positive, Weak	Positive, Medium
Hungary	Positive, Weak	Negative, Very weak	Positive, Medium
Slovakia	Positive, Very weak	Positive, Weak	Positive, Weak

The correlation between Covid-19 and unemployment. There are countries where the relationship between the cases of Covid-19 and unemployment was direct and positive (Italy, Switzerland, Czech Republic, Poland, Bulgaria, and Slovakia), suggesting that when the number of Covid-19 cases increased, unemployment also increased. However, the strength of this linear relationship highly differed from one country to another. Moderate positive correlations were encountered in Poland (0,44), the Czech Republic (0,41), and Switzerland (0,31), where the increase in Covid-19 cases was associated with an increase in unemployment, as many people lost their jobs due to the lack of activity of the companies they work for. Still positive, but with a lower strength were also the correlations from Italy (0,16), Slovakia (0,18), and Bulgaria (0,19). In half of the studied countries, unemployment increased with Covid-19 cases.

In the other half of the studied countries, the relationship between Covid-19 cases and unemployment was indirect, suggesting that unemployment decreased when the number of Covid-19 cases increased. Except for Ireland where this correlation was very strong (-0.66) and in Germany where the correlation was moderate (-0.30), in all other countries the correlation was rather weak (France: -0.05; Austria: - 0.11; Hungary: - 0.03).

The differences in the correlations between the number of Covid-19 cases and unemployment are explained by the different governmental policies of countries, with countries with higher social protection having decreasing unemployment during the Covid-19 period, this being rather Western European countries (France, Germany, Austria).

The correlation between Covid-19 and inflation. Inflation was the macro level indicator that correlated with the number of Covid-19 cases the most in all countries. The correlation was positive in all countries (except the Czech Republic) illustrating that at an increase of the number of Covid-19 cases, an increase in inflation took place. In most countries the correlation was medium to strong, indicating a tight common evolution of these phenomena. The countries with a strong positive correlation between the number of Covid-19 cases and inflation were Ireland (0.84) and Switzerland (0.81), while the countries with moderate positive correlations were Germany (0.58), Austria (0.46),

France (0.37), Italy (0.32), Poland (0.36) and Hungary (0.41) and the countries with small positive correlations were Romania (0.25), Bulgaria (0.30) and Slovakia (0.15).

The correlation between Covid-19 cases and macroeconomic indicators in large Western European countries. In this group of countries, Covid-19 was correlated with macrolevel evolutions to a small up to medium level: with the highest correlation in the case of inflation; with two countries with negative correlations between the number of Covid-19 cases and unemployment and with very weak correlations of the GDP change with Covid-19.

The correlation between Covid-19 cases and macroeconomic indicators in small Western European countries. For this group of countries, the number of Covid-19 cases was correlated to a higher extent with macro-level phenomena: inflation was highly and positively correlated with Covid-19, and unemployment's correlation with Covid-19 differed from one country to another, but there were again two countries with negative correlation and GDP's change weakly correlated with Covid-19 (but to a higher level than in the case of large Western European countries).

The correlation between Covid-19 cases and macroeconomic indicators in large Central and Eastern European countries. In this group of countries the relationship between Covid-19 and GDPs' change was rather weak; moderate and positive correlations were registered with unemployment and the correlation of Covid-19 with inflation was also weak to moderate.

The correlation between Covid-19 cases and macroeconomic indicators in small Central and Eastern European countries. For this group of countries correlations of macroindicators with the cases of Covid-19 were weak to moderate, with the highest correlations in case of inflation; with weak correlations for unemployment and variate correlations in case of GDP change.

Table 4 presents a synthesis of the types of correlations encountered between the number of Covid-19 cases and different macro-level indicators in the four groups of European countries,

Table 4. Synthesis of correlations between cases of Covid-19 and macrolevel phenomena (Source: authors)

Groups of countries	Synthesis
Large Western European countries	1 Large, 3 Medium, 1 Weak
Small Western European countries	2 Very large, 1 Large, 2 Medium, 3 Weak
Large Central and Eastern European countries	3 Medium, 4 Weak
Small Central and Eastern European countries	3 Medium, 4 Weak

It can be concluded that small countries from Western Europe were the most affected at macrolevel by Covid-19 crisis, as there were encountered more and stronger correlations between Covid-19 and macrolevel phenomena. They were followed by large countries in Western Europe, where Covid-19 was also moderately and strongly correlated with a number of macro-level indicators. So, countries in Western Europe were more affected by Covid-19 at macrolevel.

Conclusions

The social and economic life at global level was affected by the Covid-19 health crisis. Specialists consider that the effects of the Covid-19 outbreak are visible at multiple levels: starting with the global level and continuing at country, industry, company and individual levels.

The present paper presents the results of a study that looked at how macrolevel evolutions were related to the evolution of the Covid-19 cases. The main findings of the research include:

- at a general level, the GDP change is weakly correlated with the evolution of Covid-19 in the selected European countries.
- inflation was the phenomenon that was the most correlated with the evolution of Covid-19 in most countries, with some countries having very strong positive correlations.
- unemployment was also correlated with the evolution of Covid-19, but rather with weak and moderate correlations. However, the direction of the correlation was different, with some countries registering negative correlations and illustrating that unemployment decreased when Covid-19 cases increased. This was due mainly to protective and social measures taken for the population, which was encountered in more Western European countries.
- countries in Western Europe were more affected by Covid-19 at a macroeconomic level, as stronger correlations were found between the evolution of Covid-19 and macroeconomic indicators in these countries.
- smaller countries were more affected than larger countries by the evolution of Covid-19.

The results of the present study were similar to the findings of Olkiewicz (2022) who also identified correlations between the increasing infection rate and macrolevel indicators in the G7 countries. He considers that the identified dependencies, even though small, had economic significance and that the pandemic of Covid-19 determined the economic indicators that further affected in a direct manner the business confidence in the analyzed countries.

The paper contributed with an analysis of the relationship between the evolution of economies in European countries and the evolution of Covid-19 during the main years of the Coronavirus pandemic, respectively 2020 and 2021, and with a comparison between groups of European countries. Differences were encountered between CEE countries and Western European countries on the one hand and between small and large countries, on the other hand. The paper has also a practical impact on governments that need to be aware of the influence of sanitary crises on economic evolutions and consider macro-level policies to diminish the negative influence of health crises and support economic development in their countries.

The study has also a number of limitations. First, the research was limited only to a number of European countries, but further studies can look at other regions and other countries of the world. Second, the study only tests the correlation between macro-level phenomena and Covid-19 cases, but further study can continue the analysis with further inferential statistics, such as regression analysis. Third, only a limited number of macrolevel indicators were included in the study. Further research can also extend the number and types of economic indicators to be tested to exports and imports, for example.

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Appendix 1 Quarterly GDP, 2020-2021 (Source: Eurostat)

Quarterly GDP change	Large CEE countries > 10 mill. inh.			Small CEE countries < 10 mill. inh.			Large Western European countries > 10 mill. inh.			Small Western European countries < 10 mill. inh.		
	CZ	PL	RO	BG	HU	SK	FR	DE	IT	AU	IE	CH
2020-Q1	-3.4	0.1	0.4	-0.1	-0.5	-3.9	-5.7	-1.8	-5.7	-2.5	3.7	-1.5
2020-Q2	-8.9	-9.2	-11.2	-7.2	-14.4	-7.2	-13.5	-10.0	-12.9	-11.4	-3.3	-6.2
2020-Q3	6.7	7.5	5.6	2.9	11.4	9.1	18.6	9.0	15.6	10.9	9.5	6.3
2020-Q4	0.8	-0.2	3.8	1.8	1.8	0.4	-1.1	0.7	-1.6	-2.0	-4.7	-0.1
2021-Q1	-0.4	1.6	2.2	1.4	1.5	-1.4	0.1	-1.7	0.3	-0.4	10.0	-0.1
2021-Q2	1.3	1.8	1.5	0.8	2.0	1.9	1.3	2.2	2.7	4.2	5.2	1.8
2021-Q3	1.6	2.3	0.4	0.6	0.7	0.4	3.1	1.7	2.6	3.8	0.9	1.7
2021-Q4	1.9	2.0	0.3	0.7	0.6	0.4	0.7	-0.7	2.9	3.5	1.2	2.1

Note: CZ - Czech Republic; PL - Poland; RO - Romania; BG - Bulgaria; HU - Hungary; SK - Slovakia; FR - France; DE - Germany; IT - Italy; AU - Austria; IE - Ireland; CH - Switzerland; CEE - Central and Eastern European

Appendix 2 Monthly unemployment, 2020-2021 (%) (Source: Eurostat)

Country/ Months	Large CEE countries			Small CEE countries			Large WE countries			Small WE countries		
	CZ	PL	RO	BG	HU	SK	FR	DE	IT	AU	IR	CH
2020M1	1.9	3.0	5.0	4.4	3.6	6.0	8.1	3.4	9.7	4.4	3.4	4.1
2020M2	1.8	3.0	5.1	4.2	3.5	6.0	7.7	3.5	9.7	4.5	3.5	4.1
2020M3	1.9	2.9	5.6	4.5	3.4	6.0	7.5	3.6	7.3	4.9	3.6	4.3
2020M4	2.2	3.0	6.2	5.8	3.6	6.6	7.5	3.7	7.4	6.0	3.7	4.6
2020M5	2.4	3.2	6.4	5.9	4.9	6.7	7.1	3.8	8.5	7.1	3.8	4.9
2020M6	2.7	3.3	6.7	5.6	4.9	6.7	7.5	3.9	9.5	7.7	3.9	5.0
2020M7	2.9	3.4	6.3	5.3	4.3	7.0	8.7	4.0	10.1	6.8	4.0	5.1
2020M8	2.7	3.3	6.2	5.3	4.2	7.1	9.0	4.1	10.0	6.4	4.1	5.1
2020M9	2.8	3.3	6.1	5.3	4.3	7.0	9.0	4.1	10.1	6.4	4.1	5.1
2020M10	3.1	3.2	6.2	5.4	4.0	7.0	8.3	4.1	10.0	6.1	4.1	5.1
2020M11	3.0	3.2	6.3	5.4	4.3	7.1	8.0	4.1	9.6	6.1	4.1	5.1
2020M12	3.2	3.4	6.4	5.6	4.2	7.1	7.8	4.0	9.8	6.8	4.0	5.2
2021M1	3.2	3.7	6.0	5.9	4.5	7.1	7.9	3.9	10.2	7.3	3.9	5.4
2021M2	3.2	3.9	6.0	6.0	4.5	7.1	8.1	3.9	10.1	7.0	3.9	5.5
2021M3	3.4	3.9	5.9	5.9	4.0	7.2	8.1	3.8	10.0	6.7	3.8	5.4
2021M4	3.3	3.8	5.5	5.6	4.1	7.1	8.3	3.7	10.1	7.1	3.7	5.4
2021M5	3.1	3.6	5.3	5.5	4.2	7.0	8.3	3.6	9.9	6.7	3.6	5.3
2021M6	2.8	3.4	5.2	5.2	4.1	6.9	8.1	3.5	9.4	6.2	3.5	5.2
2021M7	2.6	3.2	5.2	5.0	4.1	6.7	8.0	3.4	9.2	6.0	3.4	5.1
2021M8	2.8	3.1	5.4	5.0	4.1	6.6	7.9	3.4	9.3	5.9	3.4	4.9
2021M9	2.6	3.0	5.2	4.9	3.6	6.5	7.7	3.3	9.2	5.2	3.3	4.9

2021M10	2.6	3.0	5.2	4.9	3.9	6.4	7.6	3.3	9.4	5.7	3.3	4.9
2021M11	2.2	3.0	5.2	5.0	3.8	6.3	7.5	3.2	9.2	5.3	3.2	4.9
2021M12	2.2	3.0	5.2	5.0	3.8	6.3	8	3.2	9	5.3	3.2	4.9

Note: CZ - Czech Republic; PL - Poland; RO - Romania; BG - Bulgaria; HU - Hungary; SK - Slovakia; FR - France; DE - Germany; IT - Italy; AU - Austria; IE - Ireland; CH - Switzerland; CEE - Central and Eastern European; WE - Western European

Appendix 3 Monthly inflation, 2020-2021 (%) (Source: Eurostat)

Country / Months	Large CEE countries			Small CEE countries			Large WE countries			Small WE countries		
	CZ	PL	RO	BG	HU	SK	FR	DE	IT	AU	IE	CH
2020M1	3.8	3.8	3.9	3.4	4.7	3.2	1.7	1.6	0.4	2.2	1.1	0.2
2020M2	3.7	4.1	2.9	3.1	4.4	3.1	1.6	1.7	0.2	2.2	0.9	-0.2
2020M3	3.6	3.9	2.7	2.4	3.9	2.4	0.8	1.3	0.1	1.6	0.5	-0.4
2020M4	3.3	2.9	2.3	1.3	2.5	2.1	0.4	0.8	0.1	1.5	-0.3	-1.0
2020M5	3.1	3.4	1.8	1.0	2.2	2.1	0.4	0.5	-0.3	0.6	-0.8	-1.0
2020M6	3.4	3.8	2.2	0.9	2.9	1.8	0.2	0.8	-0.4	1.1	-0.6	-1.3
2020M7	3.6	3.7	2.5	0.4	3.9	1.8	0.9	0.0	0.8	1.8	-0.6	-1.2
2020M8	3.5	3.7	2.5	0.6	4.0	1.4	0.2	-0.1	-0.5	1.4	-1.1	-1.4
2020M9	3.3	3.8	2.1	0.6	3.4	1.4	0.0	-0.4	-1.0	1.2	-1.2	-1.1
2020M10	2.9	3.8	1.8	0.6	3.0	1.6	0.1	-0.5	-0.6	1.1	-1.5	-0.9
2020M11	2.8	3.7	1.7	0.3	2.8	1.6	0.2	-0.7	-0.3	1.1	-1.0	-0.8
2020M12	2.4	3.4	1.8	0.0	2.8	1.6	0.0	-0.7	-0.3	1.0	-1.0	-1.0
2021M1	2.2	3.6	2.0	-0.3	2.9	0.7	0.8	1.6	0.7	1.1	-0.1	-0.6
2021M2	2.1	3.6	2.5	0.2	3.3	0.9	0.8	1.6	1.0	1.4	-0.4	-0.4

2021M3	2.3	4.4	2.5	0.8	3.9	1.5	1.4	2.0	0.6	2.0	0.1	-0.2
2021M4	3.1	5.1	2.7	2.0	5.2	1.7	1.6	2.1	1.0	1.9	1.1	-0.1
2021M5	2.7	4.6	3.2	2.3	5.3	2.0	1.8	2.4	1.2	3.0	1.9	0.3
2021M6	2.5	4.1	3.5	2.4	5.3	2.5	1.9	2.1	1.3	2.8	1.6	0.5
2021M7	2.7	4.7	3.8	2.2	4.7	2.9	1.5	3.1	1.0	2.8	2.2	0.5
2021M8	3.1	5.0	4.0	2.5	4.9	3.3	2.4	3.4	2.5	3.2	3.0	0.8
2021M9	4.0	5.6	5.2	4.0	5.5	4.0	2.7	4.1	2.9	3.3	3.8	0.8
2021M10	4.8	6.4	6.5	5.2	6.6	4.4	3.2	4.6	3.2	3.8	5.1	1.3
2021M11	4.8	7.4	6.7	6.3	7.5	4.8	3.4	6.0	3.9	4.1	5.4	1.5
2021M12	5.4	8.0	6.7	6.6	7.4	5.1	3.4	5.7	4.2	3.8	5.7	1.3

Note: CZ - Czech Republic; PL - Poland; RO - Romania; BG - Bulgaria; HU - Hungary; SK - Slovakia; FR - France; DE - Germany; IT - Italy; AU - Austria; IE - Ireland; CH - Switzerland; CEE - Central and Eastern European; WE - Western European

Appendix 4 Monthly number of Covid-19 cases, 2020-2021 (Source: European Centre for Disease Prevention and Control of EU)

Country/ Months	Large CEE countries			Small CEE countries			Large WE countries			Small WE countries		
	CZ	PL	RO	BG	HU	SK	FR	DE	IT	AU	IE	CH
2020M1	0	0	0	0	0	0	6	14	2	0	0	0
2020M2	3	0	3	0	0	0	143	154	2153	12	0	24
2020M3	2823	1862	1903	346	444	348	40029	63681	102834	9184	2624	14250
2020M4	4970	11831	11491	1272	2586	1044	90384	100282	108249	6398	18881	15548
2020M5	1507	10091	6364	895	857	107	16106	17793	20264	1059	3484	957
2020M6	2347	10123	6809	2112	258	149	13584	12045	7034	982	449	755
2020M7	5166	12987	25781	7211	399	690	27460	16909	8162	3686	723	3927
2020M8	9797	19033	28647	3707	4222	2045	138024	34996	29456	7578	2960	7779

2020M9	27365	17478	34276	3592	13665	3371	232996	39494	39645	13417	4964	9369
2020M10	208820	174448	96862	18743	42704	38604	727054	172041	286700	45915	24195	54152
2020M11	234222	607733	208993	83135	116387	53747	933569	492910	905113	164993	13333	186160
2020M12	135332	317398	170931	70332	127151	99429	323323	582501	507319	87805	9081	122679
2021M1	313661	254894	109919	21234	52035	185732	600956	561172	501449	60152	110418	86282
2021M2	252995	195885	74629	28088	64205	143839	497295	224118	378284	44406	23405	32312
2021M3	314303	736580	174664	105553	256947	119201	928155	448658	724427	98757	18196	53223
2021M4	228910	647161	147452	92448	221155	85824	801159	390287	581704	82433	14929	45699
2021M5	135332	317398	170931	70332	127151	99429	323323	582501	507319	87805	9081	122679
2021M6	153061	688382	145082	94620	190880	63760	1064422	631430	566268	92600	16034	67308
2021M7	41188	110428	29426	21121	33153	19879	488302	379129	239139	34610	15040	42789
2021M8	5430	7266	2934	3294	3504	3357	107762	46846	40501	5790	9587	7983
2021M9	6534	3442	2875	3539	1604	1414	366350	47177	103064	9703	30814	16875
2021M10	76075	126503	455671	108670	53369	88463	171054	414608	114564	99172	60917	40486
2021M11	366691	490815	118102	87593	222089	221100	436496	1204482	248341	315266	114460	132817
2021M12	350560	612874	32997	59556	165560	177296	2663600	1402688	1505755	136835	268857	339543

Note: CZ - Czech Republic; PL - Poland; RO - Romania; BG - Bulgaria; HU - Hungary; SK - Slovakia; FR - France; DE - Germany; IT - Italy;
 AU - Austria; IE - Ireland; CH - Switzerland; CEE - Central and Eastern European; WE - Western European

BIBLIOMETRIC ANALYSIS OF THE RESEARCH ON LITERARY TOURISM

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Abstract. *Literary tourism is a peculiar form of old tourism that seems to benefit from renewed interest. Besides the relevance for tourists choosing this form of travel, literary tourism can generate positive benefits for many economic and social actors. It can significantly contribute to the branding of places, such as in the case of the famous Dracula. Considering this, the present study aims to map the existing knowledge on literary tourism following a literature review. Several items are considered: the evolution of the academic interest in literary tourism, the main lines of investigation, the geographical distribution of the mainstream literature, the types of outlets used to disseminate the research, the authorship and co-authorship, as well as the impact of the research. The study shows that academic studies in literary tourism are a nascent field of investigation, with the number of studies increasing mainly in the past few years and the narrow geographic distribution. Also, most publications are articles based on case studies and narrative literature reviews. Older studies focus on more abstract themes such as the history of tourism and perceptions related to heritage, while the more recent studies are more interested in tourism forms and destinations. We find a wide heterogeneous and rather shallow investigative approach. The investigation also highlights that literary tourism could be a successful path to destination development.*

Keywords: *literary tourism; literature review; bibliometric analysis; Dracula, Harry Potter*

Introduction

Literary tourism is an old form of tourism, existing since Ancient Greece. Troy and Micene, for instance, have been places of a specific type of "pilgrimage". *Mirabilia, miracula*, and places related to Plato and Socrates were famous and visited. Anghel (2016) argues that the modern concept of tourism cannot be applied to ancient tourism, which seemed to be more motivated by religions, traditions, as well as literature masterpieces although the tourists' experiences were also important. Ancient tourism was not mass tourism, a mixture of religious and laic interests, with a strong cultural trait (Anghel, 2016) where literature-related places might have been relevant. Later, in

medieval times, we also spot some literary-linked travels. For instance, Francesco Petrarca lived and died on a small estate near Padua in the 14th century, and in the following hundreds of years, his house witnessed visitors from various parts of the region, from Italy, or even abroad – as in the case of Lord Byron (Trapp, 1998). Even if visiting destinations related to great writers or great books is a much older phenomenon (Mansfield, 2015, pp. 28-35), the origins of modern literary tourism can be traced back to the eighteenth century, in Great Britain. Most literary tourism historians concentrate on the Victorian era when this type of travel had become a developed industry and cultural norm (Westover, 2012).

Pocock (1992) makes the case that literature, like film, can encourage tourists to travel and shape their expectations of a destination in one of the field's foundational assessments. Although niche tourism, literary tourism, might be dynamic and reinvent itself. It also could have a very significant impact. Sometimes, literary tourism might be so strong that it gives unique profiles to a place. Such a phenomenon occurred in the case of Bran Castle in Romania in the context of Dracula tourism. There are some examples of good practices when a place is developing sustainably due to its literary ties, as is the case of Shakespeare's Stratford-upon-Avon. Another example of good practices could be considered Harry Potter-induced tourism in London. This evolution and complexity of phenomena are even more relevant considering that Harry Potter is not only a fictional character, but his world is fantastic. Another interesting case is the Maigret tourism in Paris, based on a fictional detective developed by a Belgian author who lived in Canada. Understanding these phenomena would be useful for tourism businesses and local administration to better design their offer, based on a sustainable development place strategy.

Studies show that literary tourism, when promoted as a special interest tourist type, offers destinations a variety of advantages (Çevik, 2020): revenue generator effect of the literary tourism activities depending on the increasing number of tourists and uniqueness since tourists cannot locate the same activities at other destinations or have similar experiences. Therefore, literary tourism is relevant at many levels: individual and collective, economic and cultural, and micro- or macro-level.

The bibliometric analysis aims to determine the scope and characteristics of the literature in the area. Several factors have been taken into account to achieve this goal, including the development of interest in the field, the primary research areas, the geographic distribution of the research, the types of media outlets used to disseminate the results, the authors' and co-authors' affiliations, and the significance of the research (citations). The authors employ several research tools for this exploratory study. Using VOSviewer, the authorship and topic networks have been located.

Another goal of the paper is to determine best practices that can be adapted to the Romanian Market. The timing is appropriate since in the near future a new law will be voted to design the legal framework for the organization and structure of Destination Management Organizations. Literary tourism could be a topic to be explored soon.

As literary tourism in Romania is associated only with Bram Stoker's *Dracula* one goal of the paper is also to present the multiple possibilities and forms that this kind of tourism can take and how can be exploited by the autochthonous tourism industry. This case study also can shed light on how Romania could develop other local brands based on literary works and characters.

Literature review

The complex relevance of literary tourism

Literature, literary characters, and film productions that embed characters in real or imagined settings while sharing narratives and qualities that appeal to the consumer is driving a developing global industry for literary tourism (Connel, 2012). Literature significantly impacts consumer culture, whether directly through literary works or indirectly through corresponding depictions in films and television (Ingram et al., 2021). Novelli (2005) mentions that literary tourism has a rising potential to enter the mainstream as the tourism sector always tries to adapt to new market trends. According to research by Hosany, Buzova, and Sanz-Blas (2019), advertising had an important impact on Spanish tourists' decision to travel to the Swiss Alps, which served as the backdrop for the movie Heidi (based on the book with the same name). Also under the six motivational factors for visiting Hobbiton (the land from the Land of the Rings) Singh and Best (2004) reported also interest in Tolkien's novel alongside, gratifying kids' curiosity, learning, discovering something new, and iconic attractions. Therefore, associating literary-motivated travel with relevant motivations and additional appeal is a successful recipe for literary places.

As we can observe, literature can be a useful marketing tool to promote a destination, and are cases when a destination become well-known thanks to novel characters, it is the case of Dracula, who made famous worldwide a small locality in a virtually unknown country - Bran, a commune in Brasov county, Romania. Many foreigners come to Bran to visit the Castle of count Dracula or other places associated with Dracula or with Vlad Tepes, the Romanian ruler who supposedly inspired the author. Due to the famous character developed by Bram Stoker, Bran Castle is by far the most visited museum in Romania, with a high percentage of foreign visitors (Business Insider, 2017). Dracula tourism is a successful literary and movie tourism (Mureşan & Smith, 1998); at the same time it is a form of dark tourism (Light, 2016) and it was even considered a form of pilgrimage tourism (Hovi, 2010). The phenomenon's origins are in Bram Stoker's novel, *Dracula*, published in 1897 and inspired by the historical figure Vlad the Impaler, as well as by Transylvanian folklore. The novel is one of the most successful, considered among the best 100 novels in the UK (McCrum, 2014), coining an iconic character, which highly influenced popular culture imposing vampire fiction, and was support for many films. The image of the Transylvanian Count Dracula went around the world and created without purpose a brand for Romania, not just for Bran. Interestingly, despite its success, Dracula is considered by many Romanians or even by the Romanian state as an unwanted association. Therefore, the policies developed by the Romanian government related to its country brand and its relationship with Dracula were a mixture between valorization and denial (Light, 2007). Still, the desire to attract more tourists and the capitalization on this myth seem to be the winners, and this negative stereotype of the country is valorized as an opportunity (Candrea, Ispas, Untaru, & Nechita, 2016). Numerous private initiatives try to attract tourists who follow Dracula. Even the state tried to profit by proposing in 2001 a complex Dracula Amusement Park, but the plan was never implemented due to strong opposition (Light, 2007, pp. 758-759). The economic effect of Dracula tourism is positive, including new travel agents and tourism actors, jobs, and commercial opportunities mainly associated with the souvenir market (Teodorescu et al., 2020).

Another popular novel character, much younger but probably even more famous nowadays, is Harry Potter, the young wizard, who has a page on visitbritain.com. So the

tourists can choose to travel in the footsteps of their favorite literary character, and enter a fantastic world entangled with the real one. To satisfy their deep emotional attachments to the series, Potter enthusiasts have begun visiting various locations. The tourists are given a magical experience that grounds them in the beloved fictitious world by visiting Harry Potter tourism attractions, which blurs the boundaries between fact and fiction. The increase in Harry Potter tourists is impacting both the city's already-existing tourism industry and the people's daily life (Webb, 2020). Even more, Harry Potter tours appeal to children and a wider audience, both national and international. While experiencing Harry Potter magical-themed places, tourists also understand the local history and tales; various landscapes are transformed and revealed as they are during these tours. (Lee, 2012). A professor from the London School of Economics estimated that Harry Potter was worth £4 billion to the UK economy in 2016 alone, making it a tremendous direct triumph for British creative, the source is cited by *The Independent* (Cox, 2017)

The motives (and benefits) of tourists related to literary tourism are diverse. Knowledge is an important aspect. Tourists will experience a sort of animation of the knowledge they already have and probably gain new knowledge that has a superior significance for them. A review of related literature made by Bu et al. (2021) summarizes that literary tourism motivations are very diverse, including both spiritual such as emotional connection, spiritual enhancement, and nostalgia, and experiential, such as cultural enhancement, engagement with history and heritage, living authenticity, and escape.

The relevance of literary tourism is also high considering the variety of stakeholders involved. Mansfield (2015, p. 103) groups them into three main categories, as presented in Table 1.

Table 1. Stakeholders of literary tourism

Public Sector	Private Sector	Literary world
Town planning department of urban councils	Hotels, restaurants, and cafes in the area. Transport and travel companies.	Publishers
Regional Destination Management Organisations	Tourist attractions and local shops.	Rights holder
Departments of Destination Management Organisations	Specific literary visitor site, based o property.	Writers or beneficiaries
Local Destination Management Organisations	Non-fixed literary attraction eg tour guiding.	Enthusiasts. Readers and Tourists.

Source: Mansfield, 2015, p. 103

Having so many stakeholders, successful literary tourism initiatives could cooperate with them in various ways to design and deliver the offers, for a good communication process, and for ensuring unique experiences for tourists for the benefit of all parties involved.

The forms of literary tourism

The success of literary tourism might be also connected to the large variety of forms, as presented in Table 2. It offered many different types of motives and destinations to tourists.

Table 2. Forms of literary tourism

Type	Example
A. Tourism based on fiction / the text	
The author is anonymous / the name is lost or too distant in history	Elements associated with fairy tale characters brought to the attention of mainstream consumers by Disney and transformed Disneyland into a place to be visited; Neuschwanstein is associated with Cinderella or Sleeping Beauty.
The author is known and the place associated with a fictional character is accessible	Kronberg Castle, Elsinore, Denmark, home of Shakespeare's character Hamlet; Romeo and Juliet balcony in Verona;
The fictional work has sufficient clues to mark the actual place used by the author, and the place still exists	The Cobb, Lyme Regis where Louisa jumps down the steps to Captain Wentworth in Jane Austen's <i>Persuasion</i>
B. Tourism based on the author	
Author's birthplace	Charles Dickens's birthplace museum, Portsmouth; Ernest Hemingway's Birthplace Museum, Oak Park, Illinois; William Shakespeare's childhood home in the heart of Stratford-upon-Avon
Author's houses, homes, or hotel stays	In an article published by <i>The Guardian</i> , Fox (2021) mentions 11 UK writers' homes that are holiday homes: Agatha Christie, South Lodge at Greenway, Devon; William Shakespeare, The Arden Hotel, Stratford; Alfred Lord Tennyson, Farringford House, Isle of Wight; Nancy Mitford, Asthall Manor, Oxfordshire; Sir John Betjeman, 43 Cloth Fair, London; Vita Sackville-West, Priest's House, Cranbrook, Kent; John Keats, Keats Cottage, Shanklin, Isle of Wight; DH Lawrence Sons and Lovers Cottage, Nottingham; Bruce Chatwin, Capel-Y-Ffin Monastery, Monmouthshire; Ted Hughes, Aspinall Street, near Hebden Bridge, West Yorkshire; Edmund Blunden, The Mill, Long Melford, Suffolk.
Author's grave or memorial	Lithub (Temple, 2018) proposes a list of 75 graves of famous writers, among which: Oscar Wilde, Père Lachaise Cemetery, Paris, France; Vladimir Nabokov, Cimetière de Clarens-Montreux, Montreux, District de la Riviera-Pays-d'Enhaut, Vaud, Switzerland; Virginia Woolf, Monk's House garden, Rodmell, Lewes District,

	East Sussex, England; Franz Kafka, New Jewish Cemetery, Prague, Czech Republic; Jorge Luis Borges, Cimetière de Plainpalais, Geneva, Switzerland; or Pablo Neruda, Isla Negra, Santiago, Chile
A place, such as a café, known to be frequented by authors and important to their creative practice	The Californian Abroad (2016) recommends cafes where famous writers used to be seen: Bistro La Rotonde (Paris); Les Deux Magots (Paris); Café de Flore (Paris); La Closerie des Lilas (Paris); Café Montmartre (Prague); Bewley's on Grafton Street (Dublin); The Elephant House (teahouse in Edinburgh); Caffè Le Giubbe Rosse (Florence); Antico Caffè Greco (Rome)
Performance space used currently by an author	Morden Tower, Newcastle Upon Tyne, where Seamus Heaney and Allen Ginsberg performed their verse; City Lights Bookstore, San Francisco, where Allen Ginsberg, Jack Kerouac, and Yves Bonnefoy performed their work
<i>C. Tourism based on mediation and promotion</i>	
Original papers or manuscripts are held in a physical form accessible to tourists or visitors	The Exeter Book in Cathedral Library, Exeter, Devon; National Poetry Collections at London Southbank; Scottish Poetry Library on Edinburgh's Canongate; Morpeth Small Press Poetry Collection in Northumberland.
Literary festivals and book festivals with or without the author present but using their work	Vacation Idea (2022) lists 25 "Best Literary Festivals" in the World, among which Edinburgh International Book Festival, Cheltenham Literature Festival, Haus der Berliner Festspiele in Schaperstrasse, Emirates Airline Festival of Literature, The Gothenburg Book Fair
Film locations used to make a film of a book, even when the shooting location is not the setting of the novel	New Zealand and Tolkien's Lord of the Rings trilogy; King's Cross Station in London — Harry Potter
Bookshop tourism	Ler Devagar, Lisbon, Portugal; The Wee Book Inn, White Avenue, Edmonton, Canada, Dussmann das KulturKaufhaus, Berlin, Germany, Palabras Bilingual Bookstore, Phoenix, Arizona; Librairie Mollat Bordeaux, France; Changing Hands Bookstore, Phoenix, Arizona; Books Upstairs, Dublin, Ireland; Vibes & Scribes, Cork, Ireland; Books Are Magic, Brooklyn, New York; Chaucer's Books, Santa Barbara, California; Maison Assouline, London, United Kingdom; Powell's City of Books, Portland, Oregon; Daunt Books, London, England; The Writer's Block, Las Vegas, Nevada; Three Lives & Co., New York City, New York; Cafebrería El Péndulo, Mexico City, Mexico; Marrowbone Books, Dublin, Ireland; Shakespeare & Co, Paris, France; Square Books, Oxford, Mississippi (Lonely Planet, 2022)

Adapted from Mansfield (2015), Gentile, and Brown (2015)

Also, the typology of tourists interested in literary tourism is diverse. A study by Ingram et al. (2021) show that persons highly interested in literature are more likely to visit a place described in a novel/poetry or where a character or writer lived. The findings are summarized in Figure 1.

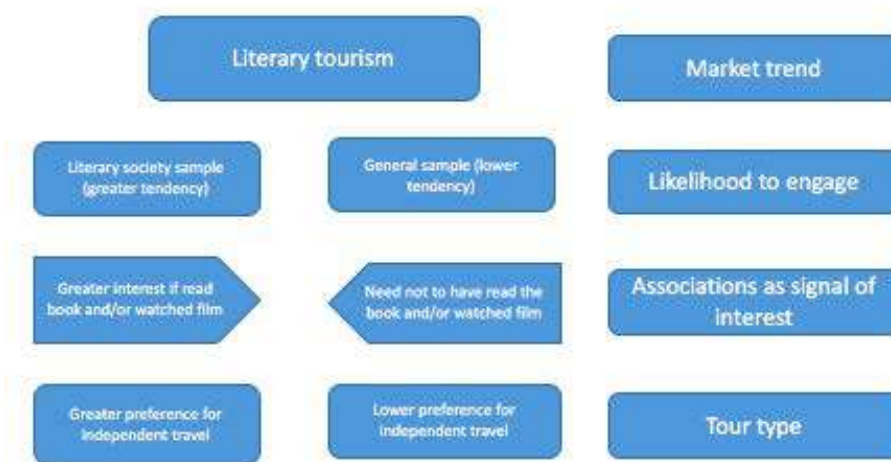


Figure 1. Conceptualization of General Sample and Literary Society Sample Comparison
(Ingram et al. 2021)

It may not surprise that members of literary societies are more inclined than average tourists to visit a site for literary tourism. In contrast to conventional tourists, it also seems that they are more interested in going when they know a site's literary ties. Those who have a hobby of reading and love literature can design their travels with the help of various websites (such as Literary traveler and Literary tourist) or can choose from recommendations such as 'Top Ten Literary Tourist Destinations' (Alen, 2009): London, Stratford-upon-Avon, Edinburgh, Dublin, New York City, Concord, Paris, San Francisco, Rome, and St Petersburg. Although it is not mentioned at the top above, maybe because when we think of Stockholm we have in mind the vibrant tech scene and the simple architecture, the most well-known archipelago in Scandinavia is home to a rich literary past that is waiting to be explored through the Literary Tour of Stockholm (Slow travel Stockholm).

Although personal inclinations, interests, and hobbies are relevant to inducing motivations, marketing can also contribute to the success of a literary tourism offer. The findings of the research developed by Hosany et al. (2019) demonstrate how location connection formed due to narrative media content affects visit intention.

Methodology

The bibliometric analysis aims to identify the dimension and the dynamic of the publications in the field. To reach this aim, several aspects have been considered: the evolution of the interest in the field, the main lines of investigation, the geographical distribution of research, the types of outlets used to disseminate the findings, the authorship and co-authorship, as well as the impact of the research (citations). For this

exploratory research, we use several investigative tools. The authorship and thematic networks have been identified using VOSviewer. Figure 2 presents the flow of the investigations.

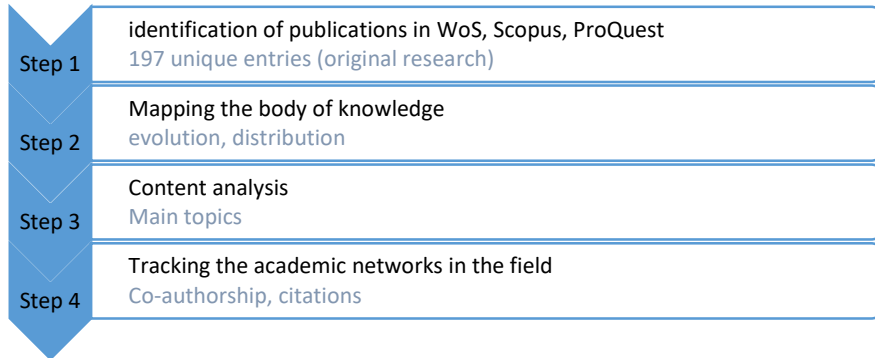


Figure 2. The research flow

Step 1 consisted in identifying the publication on literary tourism in the main academic databases. We considered Web of Science, Scopus, and ProQuest considering their prestige, the quality guarantee they offer, their large coverage as well as their intense traffic. Since we aimed to identify only the studies focused on literary tourism, we considered the publications which include the concept or associated ones (such as associated types of literary tourism, literature, destination branding, or film-induced tourism) in the title or abstract. The initial selection process identified more than 500 entries, but after vetting the lists and excluding the articles in the field of history, literature studies, or not directly focused on literary tourism, we have identified in each of the investigated databases the following situation: Web of Science – 115 entries, Scopus – 158 contributions, and ProQuest – 46 entries. Step 2 aimed to map the body of knowledge in the field. We considered several dimensions: the evolution in time, the geographical distribution, and the main academic journals published in the field. Step 3 focused on the contents, identifying the main sub-topics investigated. Finally, step 4 included the academic networking analysis, with two lines of investigation: co-authorship and citations. VOSviewer allows the investigation of the authorship networks using several dimensions: authors, organizations, and countries. We considered all three dimensions for a complete perspective. Citation analysis developed investigated two dimensions: cited authors and cited references. We opted for fractional counting to exclude multiple numbering of works with several authors. The minimum number of citations per author considered was 10, to illustrate the most influential researchers in the mainstream academic databases. The same analysis has been considered for cited references, aiming to map the studies with more than 10 citations.

Findings and discussions

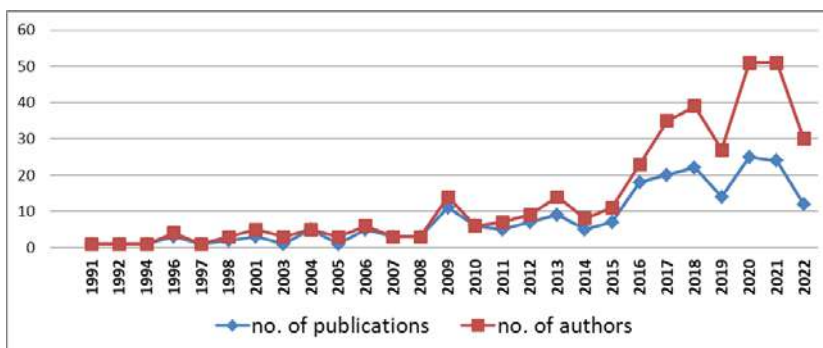
Eliminating the double and triple contributions from the identified entries, we obtained a final database of 214 unique entries, published since 1991. We excluded from the article published by Seed in 1983 since it is focused on an important American literature work, a product related to the tourism experience of the author, and only secondary discusses how this work might influence tourists' views (Seed, 1983), even if it is

considered among the oldest studies in the field in other literature reviews (Arcos-Pumarola, Marzal, & Llonch-Molina, 2020).

The academic interest in literary tourism did not start in 1991, with the Ph.D. thesis published the following year on literary tourism associated with Beatrix Potter's Lake District (Squire, 1992), being older as proved by a series of studies: Burton, 1977; Parris, 1984; Butler, 1986; Herbert, 1986; Ousby, 1990. Nevertheless, preliminary investigation shows that literary tourism is a niche academic interest, relatively recent and with a relatively thin penetration into mainstream academic databases.

Dynamics and structure of the research

Especially since 2016, the number of contributions in literary tourism that entered the main academic databases started to increase more accelerated, as presented in Figure 2. A continuous increase in the number of studies was also documented by Çevik (2020), who investigated the evolution of academic research between 1997 and 2016 in other databases, respectively in EBSCOHost, Science Direct, Taylor & Francis, respectively Emerald, Sage Premier, and Google Scholar. The differences are related to the different databases considered, but both analyses show increased interest in the field, with a relatively small growing pace.



***Figure 3. The evolution of publications and authors between 1983 and 2022 (until September).
Authors' elaboration***

Figure 3 also depicts the growing number of authors investigating the topic. Still, the average number of authors per article is relatively low, with a slow tendency to increase. Since 2017 the average number of contributors for each article has gotten closer and surpassed two.

In terms of structure, most contributions have been included in academic journals, as presented in Figure 4. We also identified a relatively high number of reviews (17), which will be excluded for further investigation, leaving us with a database of 197 entries.

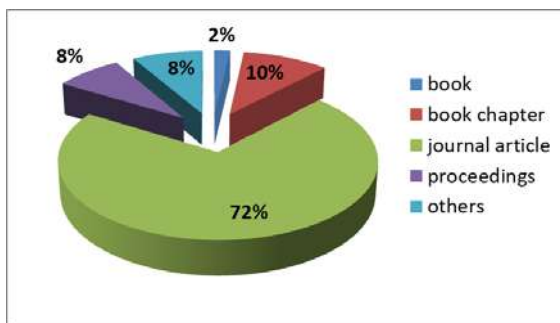


Figure 4. Types of contributions in the field.
Authors' elaboration

The most popular venues for investigations in literary tourism are the *Annals of Tourism Research*, *Journal of Tourism and Cultural Change*, *Tourism Geographies*, *Current Issues in Tourism*, and *Journal of Tourism and Development*. Most journals documented are dedicated to tourism studies, but some other journals included research in the field, such as *Sustainability* or the *International Journal of Heritage Studies*. The journal entries are more recent, suggesting a diversification of the research interests in the field.

Geographic distribution is considered from two perspectives: the affiliation of the researchers investigating this field and the focus of the research. The authors of the identified studies are based in 48 countries. Only in 10 countries, there are more than five papers represented. Figure 5 presents the geographic distribution of authors and their power to disseminate research.

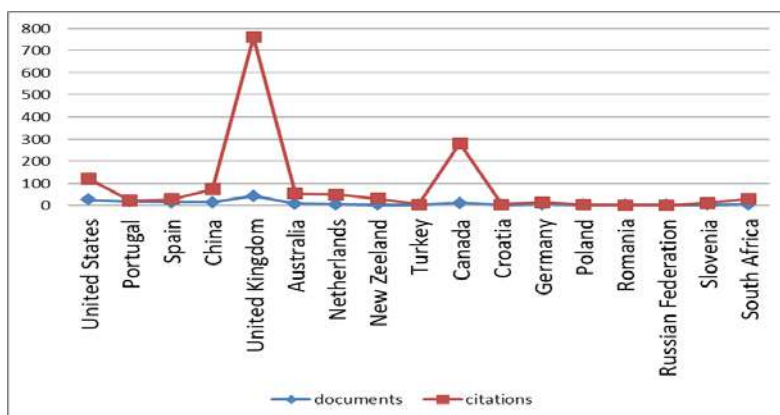


Figure 5. The geographic profile of researchers.
Authors' elaboration

The best-represented countries are the United Kingdom (with 44 papers), the United States (26), and Portugal (19). Considering the impact of the research, contributions of the academics in the UK are the most cited in absolute terms (with 760 citations), but considering the average impact of studies published, the situation is as follows: Canada has 25.5 citations per contribution, UK - 17.3 citation for each paper, the Netherlands - 10 citations, New Zealand - 8 citation, and Australia - almost 7 citations.

VOSviewer 1.6.18 also revealed some geographic research networks, illustrated in Figure 6. It presents three main clusters: (1) the United Kingdom + the United States + Turkey; (2) the Netherlands + Portugal + Spain; and (3) China + New Zealand + Australia. We observe that geographic proximity seems to be an influential factor. We also observe a more recent interest in some countries related to this line of investigation, as in the case of Portugal, Spain, and China.

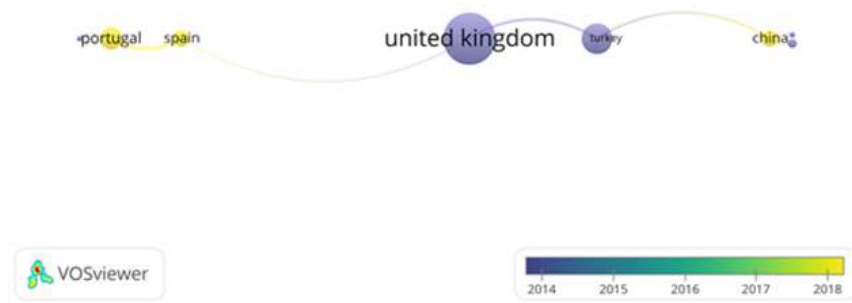


Figure 6. The geographic profile of researchers

Figure 7 shows that researchers based in a certain country tend to research in relation to that country, except the US. Other countries investigated in the context of literary tourism research, including in the mainstream investigations, are Greece, Iran, Japan, Romania, Slovenia, Sweden, Turkey, Albania, Colombia, Estonia, Germany, Hungary, Island, Kenya, Korea, Kosovo, Malaysia, Norway, Poland, and Tasmania.

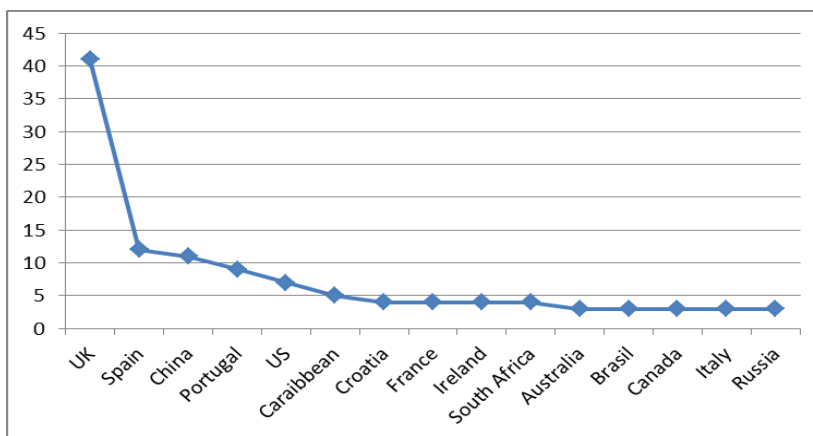


Figure 7. The geographic distribution of the focus of the studies. Authors' elaboration

Figure 8 shows that the main approach is based on the existing literature, followed by case studies. The relatively small number of investigations based on specific research tools suggests that this field is only beginning.

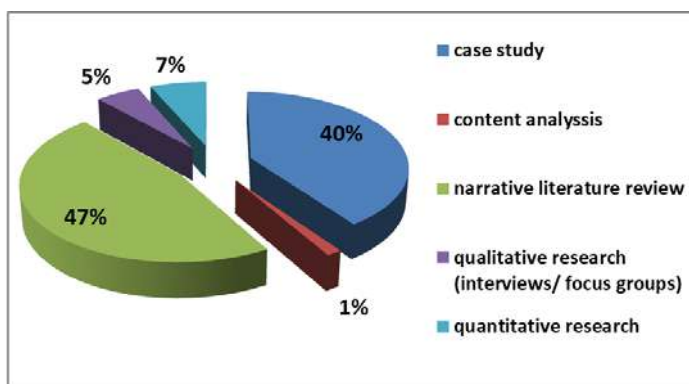


Figure 8. The typology of research. Authors' elaboration

Research topics

As presented before, tourism related to the English literature tends to be the main focus of case studies and other investigations in the field. The case studies are diverse – related to authors, literary works, characters, or places.

To identify the main research topics, we used VOSviewer. The most frequent keywords used are literary tourism and tourism – which are too general; therefore, we excluded them from the analysis. We identified a list of 14 items used at least five times. We also observed that the older studies approach topics more abstract such as the history of tourism and perceptions in relation to heritage, while the more recent studies are more interested in tourism forms and destinations. Figure 9 presents the network of the main research topics, which occur at least 3 times, considering the relatively small number of entries in the database, as well as the wide diversity of the field of research.

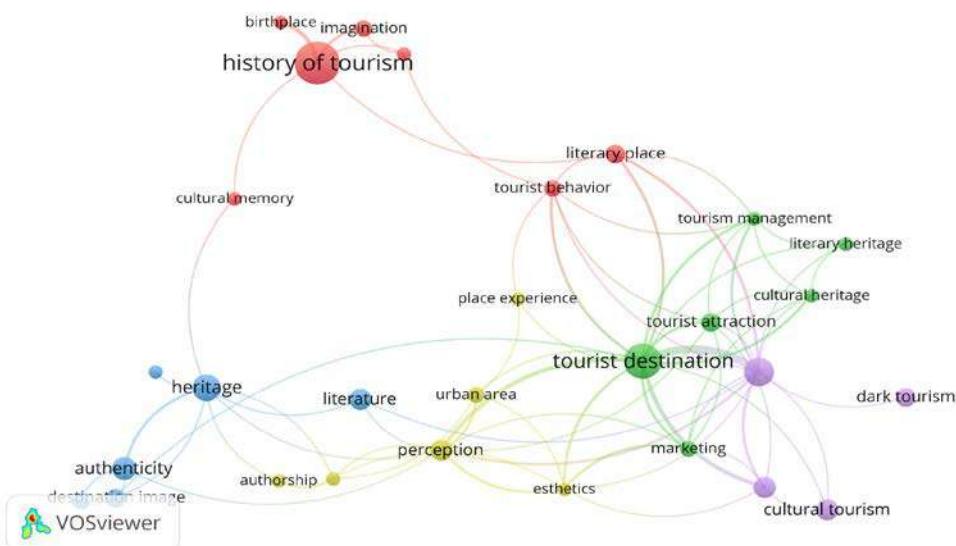


Figure 9. The main investigation network

The network in Figure 9 shows fluid boundaries for the research, respectively low specialization of studies. This is not unexpected considering that case studies are the

most common investigative approaches. Still, a few clusters can be identified (see Figure 9 depicting the main clusters). The “history of tourism” cluster (in red) considers a historic view of the phenomenon. The Heritage cluster (in blue) considers a more general, philosophical, and literary perspective. The tourism destination cluster (in green) is the most complex and diverse one. The heritage tourism cluster (in violet) is investigating various forms of tourism associated with literary tourism. The fifth cluster, the perception one (in yellow), concentrates on immaterial aspects.

Authorship and impact

The papers identified have 247 authors. Only 14 of them have more than 3 papers in the database. Two of them, S.J. Squire (Charleton University, Canada) and G. Busby (Plymouth University, UK), benefit from more than 250 citations for the included studies. VOSviewer analysis also revealed weak cooperation in the field, as suggested by the preliminary analysis of the databases (see Figure 10).

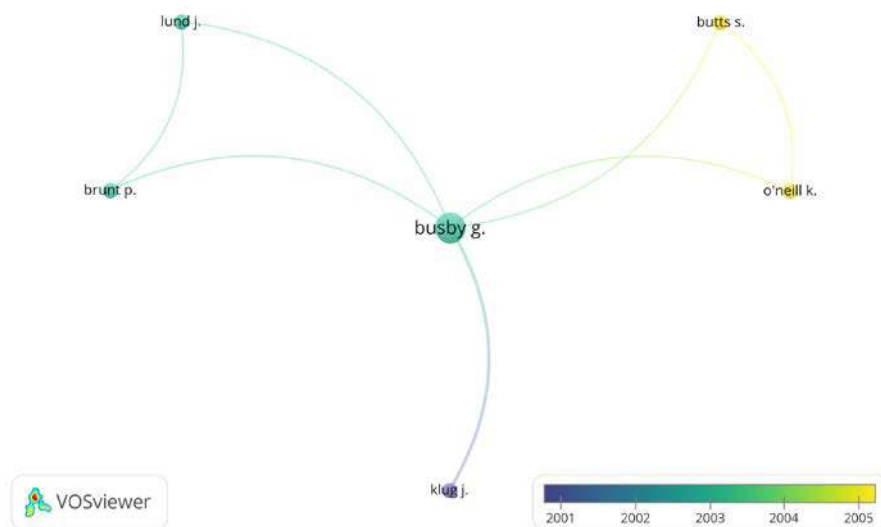


Figure 10. Author cooperation network

To identify the most influential papers, we developed the co-citation network using VOSviewer. From more than 3500 sources, only 14 have been cited more than 10 times, and 6 more than 20 times: Squire, 1994; Herbert, 1996, 2001; Fawcett and Cormack, 2001; Watson, 2006; and Hoppen, Brown, and Fyall, 2014. The wide variety of topics these contributions approach again highlights the heterogeneity of the research in the field.

Conclusions

Literary tourism could significantly contribute to place branding and the prosperity of communities. Destination marketers should place high importance on endowing locations with symbolic and emotional significance since this establishes the foundation for developing place attachment in potential tourists. Marketers should create communication strategies based on literature to evoke an emotional connection with

places in the pre-travel phase. Effective destination management might look into their destinations' literary and media traditions and exploit their potential as a source of traveler traffic. We observe that literary tourism could be used more in developing the destinations' brands including by creating modern novels that have the power to attract tourists. The effect will be multiplied if around the books will be developed an entire experience from producing movies, retail products, food experiences, and other forms of entertainment.

If we have a look at the Romanian market, it is hard to argue that Romania would benefit from literary tourism (especially the international one) based on what was written till now – as the authors and their books weren't sufficiently promoted – but it is a huge potential in attracting award-winning authors to develop stories about places in Romania and also to invest in Romanian authors to create bestsellers that include different destinations, as we are speaking about creativity any city, small or big, can become “overnight” a touristic attraction if interested parties would collaborate with authors and publisher to write the right stories and beside this to develop experiences around them that would attract tourists, summarizing when you do not have the awareness of Harry Potter or you are not the city where the action of Romeo and Juliette happened, you have to write the story and to create the awareness. The good news nowadays is that having the new media tool the word can spread swiftly and what today can be an unknown place with a smart communication strategy can become tomorrow the new Hobbiton.

The literature review reveals that literary tourism is a topic that has more potential to be studied, both qualitative and quantitative. The academic interest is rather new and shallow, case studies and narratives are the norm, but the growth potential is significant. Literary tourism is emerging and diversifying. In this framework, we observe that it has the potential for developing innovative business models for the book market. In this vein, we also stress that when youngsters tend to read less, creating experiences that combine tourism with literature can motivate them to read.

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6

Management and Leadership

DIFFERENT SUBCULTURES TENSIONS IN A MULTINATIONAL CORPORATION

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Abstract. *As the future tends to become increasingly international and globalized, and with the growth of multicultural teams, the importance of efficiently managing multinational corporations grows, accompanying the evolution of multicultural work and remote international teams. Understanding and awareness of cultural differences have evolved in the last decades, with important contributions from authors defining cultural dimensions and studying cultural contexts across countries, providing a broad view of existing asymmetries and creating a starting point for cultural integration. In this study, an action-research methodology is followed, resorting to exploratory interviews to diagnose the environment of a multinational corporation. This multinational corporation is Portuguese and operates in 10 countries with very diverse cultures. Thus, it is a good example to be analyzed. After identifying and analyzing tension points, suggestions for improved international management practices are presented to refine headquarters-subsidiary relations, multicultural communication, and international team functioning. Cultural differences among units and centralization are recognized and shown as the main sources of the called tension points, especially between culturally distant geographies that appear to have different ways of working and communicating. Management solutions can mitigate these tensions and contribute to a better work environment in the company, as well as leveraging some value added by appropriate management practices and multiculturalism. This study contributes to the field by providing customized solutions for the given organization, which may be adapted to the context of other companies and guide authors to conduct these kinds of analyses in the future.*

Keywords: *centralization; cultural differences; international management; multicultural integration; multinational corporation*

Introduction

The focal objective of this investigation is to make a diagnosis and present a plan to integrate the different subcultures existing in a multinational corporation (MNC). To do so, we collected information regarding the cultural differences within the organization and the tension points created by them. Then, we analyzed how these may be mitigated, while taking advantage of the benefits created by cultural diversity. This results in suggested actions for MNCs which are struggling with the same issues resulting from worldwide multinational teams.

The main topics of investigation can be assimilated within the scope of the Cross-Cultural Management (CCM) study, a field that analyses organizational behavior among several countries and cultures, probing to understand and, thus, improve the interaction amid numerous internal and external agents, from different backgrounds and cultures, in an MNC (Adler & Gunderson, 2008).

This research tries to understand and examine the cultural context (national and organizational) of the numerous subsidiary units of the same MNC. It proposes a way to integrate its differences and allow the enterprise to benefit from its diversity. Results may be applied in the companies' scope to improve relations between the headquarters and subsidiaries, international teams functioning, and general international management practices and communication.

Ten interviews were done and codified to better understand the MNC's context. Relation to time, ways of building trust, and the importance of words were the most relevant pain points. We propose to integrate the added value that these differences could bring and some solutions to mitigate the tensions.

Literature review

According to Hofstede et al. (2010), culture is something individuals learn, that originates from the social environment. It is a collective part of one's *mental programming*, and specific to the groups to which someone belongs, either geographical, field, or organizational (Hofstede et al., 2010; Johnson et al., 2017).

Schein (2004, p. 6) describes organizational culture as "basic assumptions and beliefs that are shared by members of an organization, that operate unconsciously and define in a basic taken-for-granted fashion an organization's view of itself and its environment".

MNCs are expected to have different organizational subcultures among their subsidiaries, located in different geographies and cultural contexts, and diverging in cultural values and characteristics (Johnson et al., 2017; Morgulis-Yakushev et al., 2018).

Meyer (2022) defined eight scales to classify national culture. For this study, six will be considered – *high vs low-context communication*, *egalitarian vs hierarchical leading*, *consensual vs top-down decision*, *task vs relationship-based trust*, *confrontational vs non-confrontational disagreement*, and *linear vs flexible-time scheduling* (Meyer, 2022). **Figure 2** (Meyer, 2022) shows the dimension scores for a selected group of countries, displaying Germany as an outlier, with highly different values in dimensions such as *Low vs high-context communication*, *task vs relationship-based trust*, and *linear vs flexible-time scheduling* (Meyer, 2022). Morocco differs from the Latin European countries, although less than Germany (Franco & Meneses, 2021; House et al., 2004; Meyer, 2022).

Because of this, and in light of the increasing globalization, it is important to understand how to manage these differences to benefit from them and enhance the competitive advantage created by this unique set of subcultures (Stahl et al., 2016).

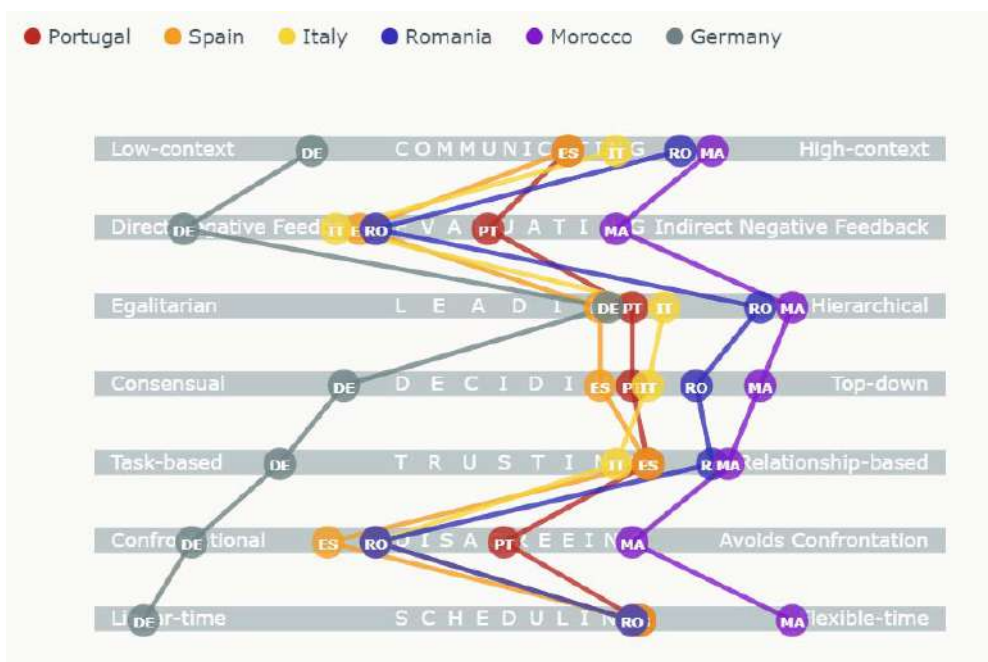


Figure 2. Culture map for Erin Meyer’s dimensions of culture (Meyer, 2022)

Usually, international business theories and approaches consider cultural differences as negative and imply the best scenario to happen when these differences among units are the fewest possible (Morgulis-Yakushev et al., 2018; Stahl et al., 2016). However, other studies show the benefits of cultural differences in knowledge creation and transfer, control and integration, creativity, and response flexibility (Beugelsdijk et al., 2018; Cox & Blake, 1991; Lopez-Saez et al., 2021).

Methodology

Research context

Company X is an MNC from Portugal with experience worldwide and currently operates in many countries throughout Europe, North Africa, and Latin America (Latin and Germanic Europe and North Africa will be considered for this study). However, it lacks some structure in international management practices and may benefit from a shift.

This study was conducted following an action-research methodology, a qualitative methodology consisting of three activities: (i) problem diagnosis, (ii) action plan design, and (iii) intervention and reflective learning. It involves testing a theory, in practice, obtaining feedback, and trying again with new contributions to the theory (Avison et al., 1999). However, this study reflects only two steps, (i) diagnosis and (ii) action advice.

In the diagnosis stage, an exploratory investigation was conducted to collect information regarding various aspects of the organization. Organizational culture, including Headquarters (HQ)-subsidiary relations and international management practices, was

analyzed and the cultural differences among units were investigated. From this, tension points were identified.

Qualitative research was conducted in the form of semi-structured interviews (**Table 1**), to understand organizational structures and functioning, cultural differences among units, and how these are perceived by Company X employees, identifying tension points.

The first interviewees were chosen based on convenience sampling (Sekaran & Bougie, 2016). From there, each respondent proposes who to interview next (Claasen and Roloff (2012)). Saturation was reached with ten interviews.

Table 1. Respondents' characterization

Respondent	Business Unit	Role	Nationality/place of work	Main geographies referred
A	a	Brand & Services Communication Manager	Portuguese/PT	N/A
B	b	Business development & client care EU	Portuguese/GE	GE, PT
C	c	Executive director	Portuguese/PT	GE
D	d	Head of Iberia (d)	Portuguese/SP	SP
E	a	Treasury Manager EU & NA	Romanian/PT	N/A
F	a	Head of Marketing IT, GR & RO	Italian/IT	GE, PT
G	c	Head of Legal EU & NA	Romanian/RO	NA
H	b	Business develop. & client care NA	Portuguese/NA	NA
I	a	HR country coordinator IT & RO	Italian/IT	PT
J	e	Managing director GE	Swiss- Portuguese/GE	GE, PT

Note: PT = Portugal; EU = Europe; N/A = not applicable; GE = Germany; SP = Spain; NA = North Africa; IT = Italy; GR = Greece; RO = Romania.

Data analysis

After conducting and transcribing the interviews followed the data analysis. Using the software NVivo, the transcripts were coded to facilitate the subsequent data assessment (**Table 2**). This provided an overview of the respondents' perception, and cross-analysis with cases (e.g., Geography referred, BU, place of work) allowed to understand which countries are more culturally distant.

After coding, an axial analysis was performed to understand the connections and links among the defined categories and the context of these linkages (Kendall, 1999; Scott & Medaugh, 2017). This included the creation of a summary table (**Table 3**).

Results and discussions

The results show an evident prevalence of notable cultural differences among international units over those not notable (see **Table 2**), as well as a clear perception of the centralization of Company X. As expected, the most culturally distant countries according to respondents (see **Table 3**), are the ones featured in distant cultural groups, as is the case of Germany (Germanic Europe vs Latin Europe) and the North Africa countries (Middle East vs Latin Europe) (House et al., 2004; Meyer, 2022).

Nonetheless, some unexpected results also emerged, as cultural differences that cannot be linked to any of the considered cultural dimensions arose (Meyer, 2022), as is the case of the Importance of words, Control, and procedures (related to *uncertainty avoidance*, as defined by House et al. (2004)), and Gender inequality (associated with *gender egalitarianism*, as defined by House et al. (2004)) with significant impact in business.

Table 2. Codes from NVivo

Code	Respondents	References
Cultural differences		
Not notable	6	13
Notable	10	73
Time relation	5	12
Control & procedures	4	7
Relationship vs task	4	7
High vs low context	2	4
Importance of word	2	6
Gender inequality	2	4
...		

Table 3. Cultural differences per geography

	Ger many	I taly	Port ugal	Rom ania	S pain	Nor th Africa	T otal
Assertiveness	1					1	3
Control & procedures	4		3	1		1	9
Formality	2	1	3		1	1	8
Gender inequality							3
High vs low context	4		2	2		1	9
Importance of word							6
Language	6		2		3		11
Negotiation							3
Others	2	1	2	2	1		9
Relationship vs task	5	2	3		1	2	13
Time relation	4	1	3			1	9
Total	26	5	17	5	6	23	

Organizational culture

Management practices were discussed throughout the interviews, with respondents stating what is done and what could be done differently.

Centralization of Company X generates tension. Top management is made up exclusively of Portuguese and most technical jobs (e.g., architects, engineers). This way, the HQ decides over most subsidiary-related matters, which may result in a lower local response capability, as markets differ in characteristics and consumer preferences (Gates & Egelhoff, 1986; Lunnan et al., 2019; Sageder & Feldbauer-Durstmüller, 2019). Foreigners are left behind in decision-making, damaging the feeling of belonging of subsidiary workers, and overlooking the importance of diversity, acknowledged by the workers (Beugelsdijk et al., 2018; Cox & Blake, 1991; Lopez-Saez et al., 2021). This attitude resembles in-group favoritism, as Portuguese business practices tend to be replicated in other markets, which can be associated with ethnocentrism (Hammond & Axelrod, 2006). Such situations “generate frustration and aversion to a central decision” (E), causing tensions between the HQ and subsidiaries.

Company X is very centralized and suffers because it is not agile. (...) There always has to be some centralization, but not this much. (A)

I think Company X says [the subsidiaries] are autonomous units that add value, but, in practice, the temptation to replicate the Portuguese model is very high. (...) You must hear in Company X: "in Portugal, we do it like this". (E)

These practices go against *reverse knowledge transfer* (Kostova et al., 2016), as they destroy the space for dialogue and creation/transfer of knowledge among different subsidiaries and geographies, which could benefit from diversity (Beugelsdijk et al., 2018).

The level of control exercised over subsidiaries also creates tension, as there are procedures to follow, regular reporting, organization-wide goals and strategy, and subsidiary budgeting, examples of *output* and *process control* (Sageder & Feldbauer-Durstmüller, 2019). The administrative workload can get excessive, generating tension in some teams.

We are overloaded with a lot of small stuff that is not adding value – administrative things, which, in some cases, we are able to externalize, for support on payroll, legal advice, brokers for insurance, and things like that. But still, locally we have a lot of administrative practices where we are losing a lot of time. Support on this would be very appreciated, we already tried several times to have additional resources, but we didn't make it. (I)

On the other hand, a valuable practice regards global HR management, as Company X practices show effort on using locals in foreign teams, as expatriate management is used reasonably. Portuguese, locals, or third-country foreigners may be chosen to be responsible for a certain region. Expatriate managers are mostly used in situations in which cultural differences, risk, and uncertainty are high (Colakoglu & Caligiuri, 2008), as is the case of North Africa (Middle East vs Latin Europe cultural differences (House et al., 2004; Meyer, 2022)). Here, expatriates benefit the organization, transferring from the HQ "important processes that should not be altered" and "the ways in which the organization works" (C). Although the head is Portuguese, other relevant roles are offered to locals, as is the case of the operations director and shopping center workers, as literature recommends (Colakoglu & Caligiuri, 2008; Mezas, 2002; Muellner et al., 2017). However, as using expatriates may also bring liabilities (Colakoglu & Caligiuri, 2008; Mezas, 2002; Muellner et al., 2017), this is not made in every culturally distant geography. In Germany, leaders are locals or long-term residents. The country has specific characteristics that would not facilitate the acceptance of expatriate managers (*consensual decision* and low *power distance* (House et al., 2004; Meyer, 2022), demanding speaking in German, etc.).

National Culture

Cultural differences generate asymmetries in working, communicating, and dealing with power within MNCs, creating tensions in multicultural environments. This happens mostly among culturally distant countries, as in Latin vs Germanic Europe (House et al., 2004; Meyer, 2022).

In Germanic Europe, there is a high level of *confrontation* and *linear-time scheduling* when compared to Latin Europe (House et al., 2004; Meyer, 2022), as well as a strict following of rules and procedures, assimilated to the high levels of *uncertainty*

avoidance, as defined by House et al. (2004). The latter generates friction, as the Portuguese perceive Germans as “a lot less flexible” (A), and as “unable to be creative and find solutions on their own, (...) slower when dealing with problems or difficulties” (B). Likewise, there exists tension created by the friction between German *linear-time* and Latin European *flexible-time scheduling*, especially in meetings, as one prefers sticking to the schedule, having no interruptions, and following an organized structure, while the other prioritizes fluidity, changing tasks as opportunities arrive and adaptability (House et al., 2004; Meyer, 2022). Adding, the *task vs relationship-based trust* (i.e., trust and relationships being built over business-related activities or over the informal conversation) also generates differences in meetings, as Latin Europeans appreciate and engage in small talk, while Germans can become agitated if they don’t go straight to the business topics (House et al., 2004; Meyer, 2022). Aggressive communication is also a tension source, as Latin cultures may misinterpret German assertiveness (House et al., 2004; Meyer, 2022). *Low-context communication* also generates tensions, as this culture tends not to read between the lines, thus needing explicit instructions in procedures and recommendations, contrary to Latin European *high-context* in which the “expectation is that someone tells us more or less what we need to do, and people start doing it and expand its meaning, even if it’s not quite what was intended” (E) (House et al., 2004; Meyer, 2022).

Conversely, time relation is also a problem in the Middle East, as they have an even more *flexible-time* relationship than Latin Europeans (House et al., 2004; Meyer, 2022), generating tension, as, for them, “time is just flowing around” (G). Meetings are often interrupted for praying rituals or changed from one day to another, making interaction and work harder with this culture.

In the European world, you have never seen someone interrupting a meeting for religious purposes. [In North Africa] there are praying rituals with specific schedules, (...) their phone rings and they interrupt what they are doing to pray.
(H)

North African countries tend to negotiate every aspect of the business. Besides making deals a lot harder, it delays transactions even further. There are also problems related to the low level of gender equality, reflected in the low scores of *gender egalitarianism* in the Middle East (House et al., 2004), as they “have difficulties accepting a woman as a boss” (G). This creates great tension for the Head of Legal, as she worked with lawyers from North Africa who did not feel comfortable being overseen by her and got annoyed at reviews of their work. However, the importance of words is the biggest tension in the cultural differences between Latin Europe and the Middle East (House et al., 2004). In North Africa, agreements and contracts may often be revoked and promises are unimportant, creating great problems in business agreements and uncertainty. This forced Company X to use a different approach in these countries, and always be alert to possible disappointments. Although most problems reported are external to the organization (i.e., in interactions with clients), these show the company’s reality and the local culture, which reflects itself in the day-to-day negotiation and practices within the company.

I had dealt with price variations of 30, 40, or 50% below the suggested price; (...) then negotiation goes from price to other variables and factors. (H)

We had a strange situation at the time when I was revising his work on a contract (...) and he got really annoyed, saying “I hope you do not pretend to know better

French than me". I am not pretending, it is my job to revise this; it was a bit strange because he was really out of place, he was acting in an inappropriate manner because he was offended by a woman revising and supervising something he did. (G)

However, cultural differences and multiculturalism are valuable for the company, and the respondents consider them a source of motivation and satisfaction in their day-to-day work lives. Multiculturalism benefits business, as diversity in nationality and background, equals diversity in point of view and skills (Cox & Blake, 1991), and it also improves workers' satisfaction.

For me, it's part of the employee value proposition. One of the things I enjoy most about working in Company X is that now I am meeting with a Portuguese, later I will be with a Spanish, and at the end of the day with an Italian and a German. It motivates me deeply. (A)

Cultural differences that originate tensions may also be perceived positively. For instance, the strict following of rules and procedures makes Germans trustworthy and consistent, easing the need to control their work and progress. Similarly, their *flexible-time* relationship (Meyer, 2022) may be linked to efficiency. Additionally, these different characteristics of Germans and Portuguese create a set of heterogenic aptitudes when the two nationalities work together – Germans provide organization and planning, while Portuguese are flexible and have a better ability to respond to unexpected occurrences (Cox & Blake, 1991; House et al., 2004). Another example is the way interaction and experiences with different cultures are valued, as with North Africa, which presents high levels of *relationship-based trust*, conducting business meetings in settings such as big family lunches, as happened with a worker of Company X making a deal with local clients (Meyer, 2022).

Suggestions and actions propose

The final part of this research consists of drawing some suggestions that can better fit the international and multicultural environment of this MNC, with the objective of promoting the feeling of belonging throughout the geographies, improving the functioning of international teams, and benefitting from diversity. Following these recommendations will hopefully benefit business and talent attraction, through a desirable employee value proposition. Suggestions and their impact on tensions and value-added can be found in **Table 5** and **Table 6**.

Cultural integration concerns cultural awareness and integration of practices to improve the functioning and well-being in the multicultural environment. For this, cross-cultural training is crucial (Colakoglu & Caligiuri, 2008; Lucke et al., 2014), to teach employees that there are cultural differences regarding ways of working, communication, and time perception, drawing attention to some examples of the most mentioned asymmetries that may be a source of tension. Correctly observing and understanding cultural differences may be challenging, and requires a certain level of expertise, which can be facilitated by cross-cultural training (Lucke et al., 2014). Then, compromise should be made to pursue better results in teamwork.

Table 5. Mitigating tensions

Suggestions	Tensions mitigated
<p>Culture integration Offer cross-cultural training and adapt practices to improve intercultural interaction</p>	<p>National culture tensions: Reduce tensions by adapting behaviors to improve the satisfaction of the parts involved; Reduce uncertainty in distant markets by understanding culture and being prepared beforehand for risks and unfortunate events.</p>
<p>Use of ambassadors Use employees to create a bridge of knowledge and communication between units</p>	<p>Organizational culture tensions: Enhance HQ-subsidaries contact, taking into consideration their conditions and perspectives, shortening the distance between them; Flowing HQ-subsidaries communication, accelerating decision-making and reducing negative perception of centralization.</p>
<p>Interpersonal relations Develop relationships among employees from different cultural backgrounds</p>	<p>National culture tensions: Using personal relations to better understand differences and reduce tensions generated by them.</p>
<p>Visit and interaction Organize regular visits to subsidiaries/HQ</p>	<p>Organizational culture tensions: Frequent visits, contribute to a greater feeling of belonging and perception of self-worth by the subsidiaries; Closer contact with subsidiaries, raising awareness of their needs and considering them in decision-making; Closer contact with subsidiaries, enhancing the vision of business functioning and valuable practices, fostering knowledge transfer across units.</p>
<p>Diversity in decision and teams Ensure culturally diverse teams and management</p>	<p>Organizational culture tensions: Inclusion of different countries in the decision-making process, taking into consideration the subsidiaries' context and point-of-view; Enhancing <i>reverse knowledge transfer</i>; Diversifying decision roles, battling ethnocentric attitudes, and defensive standpoints, and aversion to the central ruling.</p>

Table 6. Leveraging value

Suggestions	Value leveraged
Use of ambassadors	Support “Culture integration” solution
Interpersonal relations	Support “Culture integration” solution National culture value: Fostering multicultural environments and contact in the workplace, improving employee satisfaction.
Visit and interaction	Support “Culture integration” solution Support “Interpersonal relations” solution National culture value: Fostering multicultural environments and contact in the workplace, improving employee satisfaction.
Diversity in decision and teams	Support “Culture integration” solution Support “Interpersonal relations” solution National culture value: Creating multicultural teams, leveraging the value of different point-of-views in decision-making; Fostering multicultural environments and contact in the workplace, improving employee satisfaction.

Ambassadors, i.e., displaced representatives of their country, will serve as an HQ-subsubsidiary bridge, facilitating communication, shortening distance, and improving the feeling of belonging, while also being a strong asset for fighting tensions. For MNCs to better benefit from ambassadors, they should speak both languages and understand both cultures while maintaining regular contact with teams in both countries. This is key to facilitating contact and helping both countries adapt to each other’s cultures. Having ambassadors from subsidiaries in the HQ would also be of interest, as they would help in contact and in understanding cultural differences as well but also be a great way of imposing the feeling of belonging and importance of the subsidiaries, as foreigners are seen as equally suitable to work in the HQ.

Interpersonal relations may indirectly help in understanding culture and adapting – what is caused by cultural differences might many times be mistaken for personal differences, and more naturally recognized; if someone knows and works with a significant number of people from the same culture, with a little help of cross-cultural training, patterns can be recognized, and cultural consciousness may evolve. This way, interpersonal relations supplement cultural understanding, complementing the consciousness of cultural differences with the consciousness of personal differences, leading to adaptation to the context and fighting tensions created by cultural differences.

Cultural consciousness and interpersonal relations can be enhanced by regular visits between countries and consequent interaction among people from various backgrounds. When subsidiaries are regularly visited by the central corporate members, such as their superiors from the executive commission, HR representatives, or team members, the feeling of belonging boosts, and the HQ-subsubsidiary distance decreases.

This may also help the BU executive leader build a connection with the subsidiary workers, which is important for businesses to work efficiently (Sahlmüller et al., 2022). Closer contact may also result in a higher awareness of the corporate center about the subsidiaries' problems, needs, and best practices, which may help enhance the importance given to them in decision-making and foster *reverse knowledge transfer*.

Finally, including diversity in decisions and teams may be the solution with a stronger impact, despite its hard implementation. For this, practical suggestions include using expatriates for knowledge transfer (Moeller et al., 2016), projects with online transversal teams across units, and designing succession plans with diversity goals for top management, guaranteeing different nationalities in the executive commission in the long term.

Conclusions

MNCs are complex organisms that incorporate different sub-cultures (Johnson et al., 2017; Morgulis-Yakushev et al., 2018). In light of globalization, it is crucial to develop efficient ways to manage and benefit from multiculturalism (Stahl et al., 2016). This way, managing MNC and HQ-subsidiary relations requires considering the cultural context of each unit.

Although Company X has valuable practices and assets, it may suffer from the numerous tensions arising from flaws in international management and attitude toward cultural differences. This organization's main sources of tension are caused by centralization and cultural differences. In this context, solutions are suggested to mitigate them, while also leveraging the value of the MNC: culture integration, use of ambassadors, interpersonal relations, visits and interaction, and diversity in decisions and teams.

Some of these solutions may be easily applied and result in rapid outcomes, while others involve great effort and may imply structural changes. Nevertheless, they will help the organization better manage its international business and teams if well applied.

Future research should consider the implementation of such solutions and measure their impact on MNCs, complementing the present study and making suggestions applicable to a broader context of MNCs.

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STUDY ON RISK MANAGEMENT ANALYZED WITHIN A ROMANIAN COMPANY

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Abstract. *Based on the engagement of an integrated research process, both quantitatively and qualitatively, in the form of an in-depth case study on a Romanian company, the identification and assessment of the risks related to the management activity are identified and assessed. The evaluation method used to analyze the level of readiness of the organization in which the risk management study was conducted was the questionnaire. The results are evaluated, and the observations are noted where necessary. In terms of risk analysis methods, the intuitive experience of managers was first used. This has proven to be a partially unsatisfactory technique since they rely solely on their experience and specialization. Company experts were interviewed to identify a few risks specific to functional areas of activity. If the data collected were not sufficient, we estimated the specific parameters through the associations, as well as the detailed analysis of possible scenarios. In any field of economic activity, there is the issue of risk because its inevitable presence brings consequences that cannot always be predicted or anticipated in terms of consequences. The choice of the research topic in the field of risk management was justified on the one hand by the novelty of this field, by the increasing theoretical and applied concerns of the profile organizations, and on the other hand by the need to elaborate complex strategies. at the level of the organization, to ensure its protection against the influences of various factors.*

Keywords: *risk management; organization; risk analysis; SWOT; evaluation method.*

Introduction

Risk is an inherent component of all management activities, whether simpler or more complex. Therefore, the size or complexity of an activity is not always an appropriate measure of the degree of potential risk. But the dependence is direct in most cases. Complex activities are associated with higher risks. The leaders of our century, in the conditions of globalization, the rapid development of technology, and competition, carry out their activity, more and more, in conditions of uncertainty, their decisions are made under risk.

The problem of risk arises in any area of economic activity that has consequences that cannot always be predicted or predicted in terms of consequences. The risk arises from ignorance of future actions or events; almost every change involves some risk. Risk is pervasive - every activity or project must consider the occurrence of a risk situation. Risks are usually caused by unintentional situations or misconduct by those involved. In most cases, progress is made through such events, and one often learns from mistakes.

Through a review of the available literature, Leo (2019) seeks to analyze and evaluate machine learning techniques that have been investigated in connection with bank risk management, and to identify areas or problems identified in risk management. insufficient and possible areas for further research. Similar problems have been addressed by Araz et al., 2020; Samimi, 2020; Pournader et al., 2020 and Hansen, 2019).

Ullah (2020) 796, based on a comprehensive literature review of a systematically reviewed article, proposes a multi-layered risk management framework for sustainable smart city management based on technology, organization, and environment.

Wilumsen (2019) states that risk management is a widely accepted practice. Vigani and Kathage (2019) analyze the effects of risk management on farm productivity. The impact of different risk management strategies and portfolios at different risk levels on overall factor productivity was estimated using survey data from the French and Hungarian economies.

Fan and Stevenson (2018) worked on developing an overall definition and conceptual framework to review the existing literature on supply chain management; assess the use of the previous theory; and determine future research directions.

Other relevant research belongs to Zhou and Yang (2020); Kuhlicke et al. (2020); Nawaz et al. (2019); Anton and Nucu (2020); Bugarová and Šimíčková (2019) and Belás et al. (2018).

Method used and results obtained

The assessment method used to analyze the level of preparedness in the organization conducting the risk management survey was the questionnaire. 110 questions were asked in trimodal form (with possible answers: yes / no / relatives) to key people

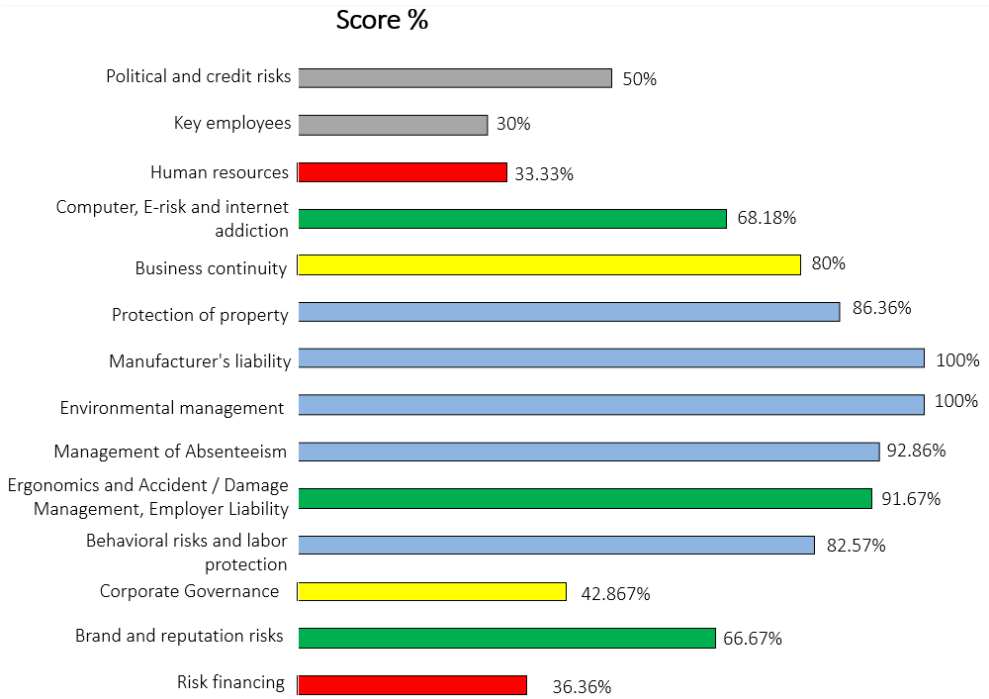
(managers). The results are evaluated, and observations are recorded where deemed necessary.

Using an electronic program made it possible to obtain the percentage of compliance for each chapter, as well as the overall indicator. Different weights were assigned to each question in the questionnaire to calculate a risk score for each chapter based on the significance that was proper for every question in the analysis under consideration.

The level of compliance for each chapter is shown in Table 1. This table shows the chapter scores calculated from the responses to the questionnaire. Figure 1 shows the scores for all analyzed chapters.

**Table 1. Results calculated for each chapter
(Source: personal contribution)**

	Chapter	Score	Maximum result	Score %
I	Risk financing	400	1100	36%
II	Brand and reputation risks	800	1200	67%
III	Corporate Governance	300	700	43%
IV	Behavioral risks and occupational safety	1650	2000	83%
V	Ergonomics and Accident Management / Damage Employee Liability	550	600	92%
VI	Absenteeism Management	650	700	93%
VII	Environmental management	900	900	100%
VIII	Manufacturer's liability	400	400	100%
IX	Property Protection	950	1100	86%
X	Business continuity	400	500	80%
XI	Computer, E-risk, and internet addiction	750	1100	68%
XII	HR	200	600	33%
XIII	Key employees	300	1000	30%
XIV	Political and credit risks	200	400	50%



COLORS ASSIGNED TO EACH SECTION

Risk financing	Red
Brand and reputation risks	Green
Corporate Governance	Yellow
Behavioral risks and occupational safety	Blue
Ergonomics and Accident Management / Damage Employee Liability	Green
Absenteeism Management	Blue
Environmental management	Blue
Manufacturer's liability	Blue
Property Protection	Blue
Business continuity	Yellow
Computer, E-risk and Internet addiction	Green
Human resources	Red
Key employees	Red
Political and credit risks	Red

Legend



Figure 1. Chapter scores calculated based on the questionnaire (Author's contribution)

Evaluation of the obtained results

Risk financing

The chapter score is 37%. This indicator is a rather low indicator, like a red flag indicating that risk financing is an issue that needs more attention from the management of the organization in which the study was conducted. This strategy does not have a longer time horizon, which will be weaker considering longer-term future risks.

Fluctuations in the prices and amounts of raw materials and currencies have a significant, but not very large, impact on the company's performance, increasing the risk of financing. At the same time, introducing the full cost of a risk system will overstate or underestimate the value attributed to long-term financial risks. The shortcomings are due to the lack of a dedicated risk management budget at the enterprise level.

Brand and reputation risk

The estimate obtained here is 67%. If a company's reputation is compromised, the consequences can be catastrophic due to loss of customer confidence, and insurance coverage for these types of risks is difficult. To date, the organization has not had any significant reputation loss issues. However, the operation of the business requires special attention, and a counterfactual analysis is required to assess the possible consequences. Conducting a formal financial assessment of a company's core brand, in addition to using different methods to measure brand performance, will increase chapter scores and by implication reduce reputational risk.

Corporate Governance

Here we have a value of 42.86%, primarily due to the lack of a risk management training program and an information system to identify major risks and their causes. Although the company manages relatively risk at a high management level, it does not have a complete and comprehensive application of the risk management process.

Long-term results can be achieved if the integrated risk management system implementation process is initiated and maintained. This enhances internal communication about significant risks and losses with potential economic implications and allows the company to align its goals with a shared vision that may be considered incomplete based on analysis by research organizations.

In an organization, management wants to maximize risk and ensure long-term profits. This goal is ultimately the responsibility of the CEO of the organization. CEOs are called "senior" risk managers because risk is essential to achieving this goal, and it is not uncommon for risk managers to report directly to the company's CEO.

Behavioral risks and occupational safety

Division score 82.50%. The score is high, but there are some significant risks involved. Behavioral risk analysis is extremely important because in recent years companies have been involved in restructuring without explicitly considering the impact on employee behavior.

Factors leading to behavioral risks that could affect the company's results were only partially identified and various methods were used to evaluate the effectiveness of the operational approach. Workplace risk factors and risk mitigation program awareness are as follows:

- Accident investigation and cause analysis – what is already done in the organization,
- Review of potential risks of workplace tasks partially done,
- Risk identification and elimination-partially done,
- Risk Probability and Severity Analysis-Not yet done, but part of the management program for the next period
- Suggestion.

Ergonomics and accident / damage management, employer liability

The main score is 91.67%, which is one of the highest scores ever achieved. Effective ergonomic programs should show improvements in manual operation (or documented improvements in other areas of ergonomics) and reduce exercise-related accidents. This helps reduce the number of work-related accidents such as device replacements and workplace changes.

The company creates ergonomic programs worldwide that cover research related to upper limb use, accident management / management, or ergonomic risk. There are also programs for accident rehabilitation and reemployment procedures, as well as regular reviews of employee health. One area that needs improvement is the proper handling of employee complaints. The importance of this section stems from the fact that the northeastern part of the organization is very difficult to find and maintain a skilled workforce due to the large-scale migration of the workforce to the EU's more developed countries.

Absenteeism management

The result of this category is 92.86%, which is more because the company has created programs to record different types of absences. However, the lack of a strategy to address the problem of absence due to health reasons leads to the existence of risk factors in this area which companies should eliminate. The existence of stress management and management programs in the organization are available to those who find it difficult and positive to reach out to Romanian companies.

Environmental management

The score in this category is 100%. It shows that environmental issues are important and a priority in the company's vision for sustainable development. The existence of a formal environmental policy governed by responsible management leads to a higher level of uncertainty and risks due to environmental accidents that occur during a company's business.

But in this case, the company's reputation is due to its lack of activity, which can seriously damage the natural environment. This aspect can be useful in accessing

structural and harmonious ways to improve operations and increase economic competitiveness in the face of major environmental problems arising from EU integration.

Manufacturer's liability

Many of the points in this section reflect Romania's commitment to complying with European standards brought about by its accession to the European Union. Continuing this line reduces the risk in this area. However, the industry's regulatory framework changes frequently, so company management should constantly monitor this section.

Property protection risk

After answering the 9 questions in this section, the score for this sector is 86.36%. Taking asset protection measures is important for business continuity. In this sense, real estate is considered socially important and has an advanced asset protection system that is regularly assessed and modeled for new risks in this critical area. The risks that society may face are:

- Earthquakes, floods, storms, lightning, etc. Fires, natural disasters, etc.
- The following intentional actions - theft and arson, terrorism-bomb threats, etc.
- Defective machinery and electronic devices,
- Accidents of employees and third parties such as visitors and contractors.

The risk of business discontinuity and counteracting it

Given the company's current business focus, a business continuity plan is required. The department score is 80% higher on average and requires special attention. Your business continuity plan should include emergency preparedness, crisis management methods, communication, and recovery strategies.

The main purpose of creating a business continuity plan is to minimize the impact of downtime and to determine the time required for recovery from a complex situation regardless of the cause of downtime.

The risk of computer, e-risk, and internet addiction

In this sense, the consent rate is 68.18%. Improvements in this index are considered necessary for the rapid expansion of the virtual marketing space for various products and services at the national and European levels. Focus more on IT risk assessment, training company employees to deal with emergencies in the area, selling products via the Internet, and implementing security measures to use these IT features.

Human resources

The estimate for this section is 33.33%. Below-average values require special attention from company managers in HR management. This section contains a variety of risks, the most important of which are events from the last operating period of the company, such as numerous layoffs, short-term operations, and organizational personnel-related proceedings.

For the person to continue working under optimal conditions, the need to compensate for such risks needs to be analyzed as soon as possible.

Key employees

Department consent rate 30%. According to the Human Resources Department, even if the original person can be identified, there is no strategy to lose the original person. Other issues addressed by key employee concerns are related to financing alternative employment. You need to consider the resources you need to hunt a boy. If you lose an important person and need to hire a new employee, you must have access to resources to pay higher salaries.

Political and credit risk

The rating for this category was set at 50%. This is one of the company's main risks, such as counterparty risk, primarily because the company is struggling to generate revenue. Credit insurance is not enough to cover too much risk in this case and more basic and comprehensive measures are needed to reduce the existing risks. Export problems in recent years have helped reduce valuations.

Analysis of the risks identified within the organization

Risk assessment by the probability of occurrence and impact

The results of the risk assessment process are summarized in the risk matrix below. The next step is to assess risk by estimating two dimensions:

- a) *Impact*: It measures the impact of each risk and indicates the potential size of the loss. Values are given on a scale of 1 (negligible effect) to 4 (very high effect).
- b) *This determines the probability of an event on a scale of 0 to 1.*

In the risk assessment process, risks fall into four categories.

- a) **Strategic risks**: These risks affect a company's value and can lead to bankruptcy, recession, or decline due to the company's inability to adapt to the ever-changing competitive environment. Customer priorities, threats to traditional or new players, changing brand awareness, changing access to financial capital, problems with access to human capital, new technological developments, and global economic and geopolitical movements.
- b) **Financial risk**: These risks are related to interest rate, exchange rate, raw materials, stock and other asset fluctuations, credit risk, and liquidity risk.
- c) **Operational risks**: key personnel and successor development, board formation and management, human and commercial resources, information technology systems, accounting, audit and management systems, non-compliance, design errors, performance, and procurement.
- d) **Dangerous risks**: Risks of natural events, physical damage to assets, employee behavior, legally responsible events, product, and integrity recalls, and business interruptions that cause a decline in non-financial assets.

Assessment of risk exposure using the risk matrix and the risk factor

To effectively assess and manage risks, firms must look at the risks as a whole and learn to mitigate and / or finance internal and external risks. Different methods are used for their quantitative assessment depending on the nature of the risk. In general, data estimates regarding risk intensity and probability were based on expert opinion, but due to insufficient data collection, specific parameters were assessed through a detailed analysis of potential association situations.

However, risk management is a predictable strategy, not an accurate science and its quality improves with time and capital investment. Since there is no risk management background after the introduction of integrated systems, it is recommended to invest in future risk management information systems and involves employees in the risk management process to improve the risk management process. The effectiveness of this activity. The first step identifies a total of 35 risks.

The risk assessment table contains the results of the risk assessment and the impact assessment identified from the study and the treatment of the information obtained from the documents provided by the company's management (Table 2).

***Table 2. Risk assessment table
(Source: personal contribution)***

No	The name of the risk	Risk description	The type of risk	Impact [1-4]	Probability [0-1]	Risk factor	Priority
1	Risk of insurance premiums	Agreed insurance does not cover unconventional risks.	Economic	1	0.90	0.90	Yellow
2	Strategy risk	Unexpected risks in the general strategy of the company due to lack of risk strategy	Strategic	2	0.80	1.60	Red
3	The total cost of risk	Failure to allocate the required amount for prevention of expected risks due to failure to take overall risk expenditure measures.	Economic	1	0.90	0.45	Yellow
4	Risk of major price fluctuations	Significant changes in the price and quantity of materials used in the operation affect the company	Economic	1	0.50	0.50	Green
5	Brand risk	Consumer confidence in the company's	Strategic	3	0.30	0.90	Yellow

No	The name of the risk	Risk description	The type of risk	Impact [1-4]	Probability [0-1]	Risk factor	Priority
		brand or market recognition has waned					
6	Treasury risk	Failure to recover timely due customer	Economic	2	0.70	1.40	
7	Risk management	Insufficient information on risk at middle and upper management level	Strategic	1	0.50	0.50	
8	Risks related to labor protection	Inadequate active participation of staff in occupational safety and health activities	Operational	2	0.50	1.00	
9	Risk of litigation	The company works in court for a variety of reasons	Strategic	2	0.50	1.00	
10	Equipment risk	Wrong risk behavior	Operational	2	0.40	0.80	
11	Economic climate risk	Risks due to local, national, and European economic climate change	Economic	2	0.60	1.20	
12	Credit risk	Risks due to large financial changes at the macroeconomic level	Economic	2	0.35	0.70	
13	The risk of internal communication	Problems with staff due to their non-involvement in the communication program	Operational	4	0.10	0.40	
14	Business continuity risk	Suppliers are likely to lose key suppliers due to their relatively small portfolio	Operational	4	0.55	2.20	
15	Business continuity plan risk	Extreme risk due to non-existence of alternative business plan	Operational	2	0.65	1.30	
16	IT risk	Risks due to inadequate planning for data recovery in digital media	Operational	2	0.50	1.00	

No	The name of the risk	Risk description	The type of risk	Impact [1-4]	Probability [0-1]	Risk factor	Priority
		and computer security					
17	Crisis communication plan	Inadequate control at the company level of ways in which crises occur at different levels	Operational	3	0.15	0.45	
18	Occupational safety risk	Inadequate reasoning for workplace safety planning	Operational	3	0.50	1.50	
19	Employee benefit risk	Risk due to inadequate fairness of ways to provide rewards and benefits to employees	Operational	3	0.85	2.55	
20	The risk of absenteeism	The risk of a high absence at the company level	Operational	3	0.10	0.30	
21	The risk of ergonomic policy	Insufficient sound in a work ergonomics plan; Poor design or implementation of health risk assessment and	Operational	2	0.10	0.20	
22	Behavioral risk al	Intentional loss of company by employees (theft, non-compliance, sabotage)	Operational	2	0.35	0.70	
23	Environmental risk	Activities with impact on the environment	Operational	2	0.05	0.10	
24	E-risks	Insufficient evidence for an analysis of the operation of the Internet	Operational	2	0.80	1.60	
25	Risk financing	Long-term risk Risk arising from lack of financing strategy	Strategic	2	0.50	1	
26	Risk of handling toxic substances	Risks when handling and controlling toxic and hazardous substances	Operational	2	0.05	0.10	
27	Risk of employment / dismissal procedures	Risks due to unreasonable and complete recruitment and	Operational	2	0.05	0.10	

No	The name of the risk	Risk description	The type of risk	Impact [1-4]	Probability [0-1]	Risk factor	Priority
		/ or dismissal procedures					
28	The risk of key employees	Risk of concentrating key activities in the hands of a small group of employees with inadequate preparation for their successor	Operational	3	0.90	2.70	
29	Property risk	Risk due to possible litigation regarding company ownership	Operational	2	0.05	0.10	
30	Risk of accidents	Investigate occupational accidents without considering the ergonomic reasons involved	Operational	2	0.10	0.20	
31	Risk of appeal proceedings	Risk due to inadequate organization of complaint analysis methods from employees and / or customers	Operational	2	0.40	0.80	
32	Natural hazards	Risks arising from the complete failure to prepare a response plan in case of danger	Hazard	3	0.10	0.30	
33	Fire risk	Risks due to inadequate systematic training in fire prevention	Hazard	4	0.05	0.20	
34	Risk of liability of the manufacturer	Risk due to inadequate preparation of assessment of manufacturer's liability towards its customers	Economic	4	0.10	0.40	
35	Competition risk	Risk due to intense competition and lack of continuous monitoring of	Strategic	1	0.50	0.50	

No	The name of the risk	Risk description	The type of risk	Impact [1-4]	Probability [0-1]	Risk factor	Priority
		competitors' development					
Minor risk		Medium risk		Severe risk			

The comparative risk structure is used for the probability and intensity of the risk matrix.

The risk matrix consists of three separate fields, and the risk priorities are determined according to the data shown in the table above. Table 3 shows the resulting risk matrix for the organization.

Table 3. Risk matrix
(Source: personal contribution)

I m p a c t	4	13, 33, 34	14				
	3	17, 20, 32	5, 18	19, 28			
	2	21, 23, 25, 26, 27, 29,30	8, 9, 10, 12, 16, 22, 31	6, 11, 15	2, 24		
	1		4, 7, 35		1, 3		
		[0-0.25]	[0.26-0.5]	[0.5-0.75]	[0.76-1]		
Probability							

Red zone risks can create social challenges and are significant and need to be addressed first. On the other hand, the risk in the opposite corner (green zone) is the lowest priority.

Most are in the green zone, as you can see in the risk matrix. This is confirmed by the overall score of the company. This indicates that the company's risk exposure is relatively small.

Conclusions

Risk identification involves documenting conditions and events related to achieving an organization's goals or areas of competitive advantage. The information needed to identify the risk was obtained as follows:

- A study of documents produced by organizations, strategies, and plans, results of organizations and competitors, national and regional policy documents, and macroeconomic forecasts for national and industrial development. The status of the most important documents, annual reports, financial and accounting documents, and fixed assets of the companies surveyed. Explanatory materials, technical documentation, security insurance publications, contract terms, and organizational insurance records for company-operated facilities.
- Site visits or discussions with representatives of the analyzed organization's management.

Filling out a standard questionnaire to assess the degree of risk management implementation and filling out by those involved in performing the activity is a reliability factor due to the complexity and processing of the information received. It contains 110 questions divided into 14 categories (possible answers: yes / no / relatively).

The "Environmental Management" and "Producer Responsibility" sections are the highest (100%), and the "Major Employees" and "Personnel" sections are the lowest (30% and 33%, respectively).

According to the analysis of the questionnaire, the overall score calculated by the weighted average of the importance given to each section by the evaluator is 67.7%, which is a good value indicating the above-average organizational level. crisis management. To society

For the 14 categories analyzed, the most appropriate ways to reduce threats and improve opportunities were determined.

Based on surveys and interviews with key players, 35 risks were identified and categorized into four categories: finance, strategy, operations, and risk.

Use the 1 to 4 and 0 to 1 probability scales for risk analysis and evaluation of event probabilities and results. Once you have identified two aspects of risk, start calculating risk factors and include them in your risk matrix to determine mild, moderate, or severe risk.

The manager's intuitive experience was used for risk analysis techniques for the first time. This turned out to be an inadequate method, as it relied solely on their own experience and expertise in part. We interviewed company experts to identify some of the specific risks of each functional business. If the data collected was insufficient, certain parameters were evaluated through a detailed analysis of possible scenarios.

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POLITICIZATION OF THE ROMANIAN PRE-UNIVERSITY EDUCATIONAL SYSTEM. TEACHERS' PERSPECTIVE

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Abstract. *This paper examines the teachers' perspective on the politicization of the Romanian education system. There are numerous studies on the politicization of the administrative systems and particularly of the education systems, but prior research has not examined the inside perspective of teachers on this negative phenomenon. To reveal the level of politicization of the Romanian educational system and to see if the opinions regarding educational issues increase the opinions regarding politicization, a survey was conducted on the Romanian teachers from pre-university education (N= 3140). The findings show that the teachers consider to a great extent that managerial positions in education are occupied with political influence. The results of the regression indicate that only the opinions that legislation in education, curriculum, teachers' motivation and school connection with the labor market are problems of the educational system that increase the opinion that there is politicization. Given the value of the adjusted R square, it can be concluded that the opinion regarding politicization is slightly influenced by the opinions regarding the educational system problems. These findings show that the contest to occupy the managerial position in education should be transparent and involve teachers in order to diminish the opinions regarding politicization. The teachers' opinions regarding politicization should be improved so that reforms or policies in education, i.e., Educated Romania of the Romanian Presidency, to succeed.*

Keywords: *politicization; Romanian education; teachers; problems in education; linear regression*

Introduction

Politicization gained additional popularity within the context of European integration, expanding from a macro (continental) to a micro (state) level, a fact that calls into question the European politics (Zürn, 2019, p. 977). While Romania has crossed the 15-year of EU membership threshold and continues to advance on its European path, politicization remains an issue that requires further research, particularly to understand its impact on implementing EU goals.

The educational policy develops in political groups with common interests and wants to dominate in promoting opinions (Supovitz, 2017, p. 53). In Romania, politicization has negative implications in all systems, and the educational one is not an exception (Profiroiu & Negoită, 2022; Troncotă & Ioniță, 2022). Although certain advantages can be pointed out, its broad and long-term consequences make depoliticization preferable. Politicization stems primarily from appointing people lacking the necessary competence to leadership positions, and contributes to the overall inefficiency of educational institutions. Programs such as *Educated Romania* initiated by the Romanian presidency (2021) demonstrate the national interest in the educational environment. This program does not specify the presence of politicization in the Romanian educational system, but it stresses the absence of professional standards and the appropriate initial training of the principals. Moreover, the “increased role of inspectorates in appointment /organization contests for the position of principals, in the disadvantage of the role of the school community, in which the manager will activate” (p. 64).

In light of these aspects, the present article aims to identify to what extent teachers – as directly involved actors, with first-hand knowledge – believe that politicization exists and whether their views on educational issues influence their opinions regarding the political implication of occupying management positions in education. Based on the specialized literature and previous research, we propose the following research questions on this topic of interest:

RQ1: To what extent do teachers consider the Romanian pre-university education system politicized?

RQ2: To what extent do the teachers' opinions regarding the educational system's problems influence their opinions regarding the politicization of the Romanian pre-university educational system?

The research questions were answered on the basis of a survey completed by 3140 teachers from the preuniversity educational system.

Literature review

Theoretical framework of politicization

Depoliticization is a topic of increasing interest (de Nardis, 2017, p. 341). Politicization is an increasingly discussed and controversial topic globally and locally, and in both public (state) and private (such as multinational) systems. The political system can impose its power over the administrative system through politicization, so politicization can be perceived as a vital tool in this regard (Ståhlberg, 1987). Previous studies show that the most common political appointments are in bureaucracies in the United States and many Latin American countries (Weber et al., 2007). Moreover, politicization is

present in more rigorous bureaucracies that manifest in other forms, such as trust in influential political advisers, i.e., Westminster-style governments and French cabinet ministers (Eichbaum & Shaw, 2008). Also, Asian countries are no exception to the manifestation of politicization by adopting less transparent and more indirect methods and avoiding the direct formulation of actions (Poocharoen & Brillantes, 2013). Continuing on a European level, "politicization is one of the most intensely discussed concepts in research on the European Union (EU) today" (Hurrelman et al., 2015, p. 43). Furthermore, "Central and Eastern European (CEE) countries have been characterized as highly politicized" (Bach et al., 2020, p. 5). However, despite the common communist heritage, the CEE countries developed different pre-communist administrative models (Kuhlmann & Wollmann, 2019).

There is no agreement among researchers or within international organizations regarding politicization, there are various perspectives of politicization, both from a geo-political, organizational, and social point of view. With the amplification of the crises in the European Union, European integration took place through different stages: "public discussion, debate, and contestation" (Schmidt, 2019, p. 1018). Therefore, the most important factors in the politicization process of Europe are national governments and political parties, because they become the links between specific countries and the European Union. As a result, the governments in question have tremendous power in influencing citizens' views on the European Union integration. Critical situations can arise from this point, such as political crises that lead to the organization of referendums (Ares et al., 2017). A landmark moment is the UK's vote to leave the EU (2016 Brexit referendum). Therefore, an indication of citizens' attitudes toward the EU is given by the trust they have in state institutions (Ares et al., 2017).

According to Hustedt and Salomonsen (2020), politicization is based on the relationship between the politician and the civil servant, respectively political control over the bureaucracy. On the other hand, Palonen (2003, p. 171) maintains that "politicization marks an opening of something as political, as «playable»". Given that the role of politics has long been discussed in various fields, it shows the "political potential" of politicization (Chelli & Cunliffe, 2022, p. 4).

In democratic societies, politicization remains a concept with a negative meaning (Peters & Pierre, 2004). The first and most important aspect is the inseparable link between public service and the political structure. This structure is important "in determining who gets what from the public sector" (Peters & Pierre, 2004, p. 2). In this sense, a fair relationship with the citizens, through public service is expected.

Peters (2013, pp. 17-19) identifies six subtypes of politicization: *direct politicization* – this type of politicization is considered to be rare, *professional politicization* – which consists of the appointment of individuals who are loyal to the ruling party as directors or other persons in managerial positions; *redundant politicization* – a mix of competent civil servants and loyal political officials appointed to oversee the former for future policy decisions; *anticipatory politicization* – discourages individuals from remaining in or running for leadership positions when a political regime is dominant or comes to power; *dual politicization* – this is common in presidential regimes, when two political institutions with different policies try to impose their own candidates; *social politicization* – social actors or key opinion leaders (KOLs) have the power to influence the situation of political officials, respectively political fields, through street or online actions.

Regarding the mechanism of politicization, this phenomenon can take three forms: (1) formal, (2) functional, and (3) administrative politicization (Hustedt & Salomonsen, 2014, p. 747). The first form can work as a method of trust between the minister (or another political figure) and the party with beneficial results for both parties. Under the legal practice, this results in certain formal rules that allow for political recruitment detrimental to meritocratic recruitment. Thus, formal politicization can function as a means for the minister to ensure party political responsiveness, provide additional powers, and provide the minister with an advisor based on a relationship of personal trust (Hustedt & Salomonsen, 2014). The last two are the most important forms of politicization (Hustedt & Salomonsen, 2014). The way in which the public service behaves politically is functional politicization. Thus, the core of this type of politicization is "the provision of political-tactical advice" (Hustedt & Salomonsen, 2014, p. 750), while administrative politicization consists in the "intervention that undermines the principles and conventions associated with a professional and impartial public service" (Eichbaum & Shaw, 2008, p. 343). Thus, this type of politicization helps to identify how policy advisers "affect the neutral function of public office" (Öhberg et al., 2016, p. 3), since they take into account the fulfillment of the political agenda (Fuenzalida & Riccucci, 2018). An appropriate example in the present research is the intervention in appointing people to educational leadership positions.

To sum up, the politicization of public administration refers to using political criteria instead of merit-based criteria in the selection, retention, promotion, rewarding, and coordination of the work of public service employees (Peters & Pierre, 2004). This is considered a negative phenomenon, but it can also turn into positive results at the level of decision-making processes because it does not exclude the employees' managerial skills and relevant competencies. Therefore, in this paper, politicization is not defined positively as the process by which certain issues become the subject of public debate and, consequently, become concerns for the political system as it happens with the "politicization of the European Union" (De Wilde, 2011).

Politicization: from a Global to a National Perspective

Over time, the educational system has been more and more politicized, so it has become a topic of interest for candidates in electoral campaigns, hoping to influence the electorate to vote for them (Rose, 2004). And this would not necessarily be a negative thing if the politicization were transparent, and aimed at improving student results in a fair way, and the change of the old policy would also be achieved. In the United States of America, the most politicized state in education is Michigan where there is a major shift in power in favor of officials with little or no school experience (Andrews & Warren, 2018). These challenging situations in the Michigan case are a symptom of anti-democratic trends and power grabs by well-connected individuals who want to make changes according to their own agendas for their own benefit (Andrews & Warren, 2018). Eastern European countries try to overcome their shared communist legacy of many years of economic stagnation, but "models of civil service neutrality exported from Western democracies may not be as suitable." (Peters and Pierre, 2004, p. 4). At the same time, there is diversity even in Western democracies considering that politicization depends on the constitution and administrative traditions (Eichbaum & Shaw, 2013; Hood & Lodge, 2006).

In Romania, the politicization of the educational system is not an exception; especially when it comes to appointing high positions (directors, inspector) by the ruling party or

by the dominant political spectrum in the county / locality (Frunzaru & Ștefăniță, 2021). According to the laws, the local authorities are involved in funding schools and have representatives in the schools' councils. Therefore, cooperation between the education system and the local authorities is indispensable, and principals must gently manage this relationship (Frunzaru et al., 2014).

The consequences of politicization

The consequences of politicization are generally considered to be negative, especially when it comes to the administrative and educational systems, which are perceived to be less effective the more politicized they are. Moreover, politicization can lead to the loss of confidence in the correctness of political institutions (Peters & Pierre, 2004).

"At the national level, politicization is a complex phenomenon" (Schmidt, 2019, p. 1018). According to a local study (Frunzaru et al., 2014, p. 42), the greatest dissatisfactions of Romanian teachers in pre-university education are related to the budget for education, legislation in education, curriculum, pupils' interest to learn, teachers' motivation, teachers' salaries, and school connection with the labor market. These dissatisfactions are associated with how people with decision-making power get into management positions (Frunzaru & Ștefăniță, 2021). This phenomenon is seen by teachers as negative, given that politicization is linked with greater opportunities for political corruption and more (Kopecky et al., 2016), so politicization affects the efficiency of the system in question (Ståhlberg, 1987). Therefore, the Romanian teachers consider that the aggravation of the problems of the educational system is determined by the excessive politicization, particularly by the employment of teachers in leadership positions with political influence (Frunzaru & Ștefăniță, 2021, p. 29). Hence, teachers believe that five main aspects require the attention of education union leaders: "improving communication, depoliticization, involvement of leaders, increasing motivation and increasing the prestige of teachers" (Frunzaru et al., 2014, p. 65).

The interviewed teachers believe that principals, inspectors, and the administrative management positions in the ministry of education are affected by political changes at the governmental level and, implicitly, this affects the stability of the education system, the quality of the managerial process, the level of trust in leadership figures, and it also leads to favoritism and demotivation (Frunzaru & Ștefăniță, 2021). Most teachers accuse political criteria of occupying leadership positions and believe this leads to disregard towards school problems, poor management, and abuses in the system. Politicization interferes not only with management positions but also in important decisions, budget allocation, relationships with other institutions, and bureaucratic or even curricular aspects. The belief that the system is subject to politicization leads to a decrease in trust in trade unions and a weaker involvement (Hantke, 2008), preventing addressing and solving school issues. In a study on the influence of local politics on educational decisions conducted by Ray and Bigham (2013), the results emphasize the importance of making data-driven decisions instead of politically influenced choices in regard to pedagogy, curriculum, instruction, and assessment by educational leaders. A solution can be a more active and vocal participation of teachers to help restore the balance (Warren et al., 2017), and the depoliticization of the system to improve the educational process (Frunzaru & Ștefăniță, 2021, p. 29).

Methodology

Method

A survey on Romanian teachers (N=3140) was conducted online using the Qualtrics platform between the 3rd of November and the 3rd of December 2020 to answer the research questions. Therefore, the study was realized during the COVID-19 Pandemic, when instruction was either frontal or online, or even hybrid (both frontal and online), depending on the virus incidence in the locality where the school is. Anonymity of the participants was guaranteed.

Sample

The majority of the respondents are Romanians (95%), women (83%), members of a trade union (83%), have an executive position in school (93%), have a full-time job in one school (84%) and live in the locality where the school is (64%). The participants in the survey are teachers from kindergarten to high school, from the rural area (31%) and the urban area, including Bucharest (15%). The youngest respondent is 18 and the oldest is 73 years (average=43,1; SD=9,4). Even if the questionnaire was administered using convenience sampling, the sample size and heterogeneity are reasons to accurately answer the research questions.

Measurements

The opinion regarding the politicization of the Romanian pre-university educational system was measured with a four-item scale developed by the authors. The respondents were asked to express their level of agreement on a five-point Likert scale, ranging from 1 (totally disagree) to 5 (totally agree) with regard to how much the following four positions - school principals, school deputy-principals, school inspectors, and administrative management positions in the ministry of education, are occupied by the means of political influence. The higher the average of the answers is, the higher teachers consider that there is politicization in the Romanian pre-university educational system. The scale is reliable ($\alpha=0.85$). Similarly, the opinions regarding how much some aspects (budget, legislation, curriculum, pupils' interest to learn, teachers' motivation, teachers' salaries, and the relationship of school with the labor market) are problems of the educational system were measured on a five-point Likert scale, ranging from 1 (totally disagree) to 5 (totally agree). The control variables are: gender, age, and if the respondents are members of trade unions and have management positions in the school.

Results and discussion

The teachers consider that there is politicization in the Romanian pre-university educational system to a high extent (Table 1). One of four respondents considers the highest level (with an average of 5 which is theoretically the maximum) that the principals, the inspectors, and the administrative management positions in the ministry of education are occupied with political influence. Only 10% of the participants have an average score of less than 3, the theoretical middle of the scale.

Table 1. Opinion regarding the politicization. Descriptive statistics

Mean	4.05
Median	4.25
Mode	5.00
Std. Deviation	0.91
Skewness	-1.07
Kurtosis	0.88
Minimum	1.00
Maximum	5.00

More than 80% of the research participants believe that there is political involvement in filling the positions of school inspectors and employees with management positions in the ministry, and also for school principals (70%), and deputy principal (60%). The current opinion on politicization is in line with previous results as teachers considered the politicization of education a problem of great significance, specifically referring to the way in which principals and school inspectors are appointed (Frunzaru & Ștefăniță, 2021).

The linear regression shows that the teachers' opinions that legislation in education, curriculum, teachers' motivation and school connection with the labor market are problems of the Romanian educational system that make respondents believe to a higher extent in politicization (Table 2). Moreover, the male respondents, of greater age, and are members of the trade union consider more that there is politicization in the Romanian pre-university educational system. Nevertheless, the model explains only 7.6% of the dependent variable. Therefore, the opinions regarding the problems of the education system influence only to a small extent the belief that managerial positions from the educational system are occupied with political support.

Table 2. Linear regression with politicization as a dependent variable

Independent variable	Standardized Coefficients (Beta)	Sig.
Budget for education	.013	.618
Legislation in education	.097	.000
Curriculum	.045	.042
Pupils' interest to learn	.031	.148
Teachers' motivation	.076	.001

Teachers' salaries	.018	.436
School connection with labor market	.079	.001
Sex	-.061	.001
Age	.060	.001
S/he is member of a trade union	.046	.015
Has a managerial position in school	-.031	.099

Note: Sex: 1=female, 0=Male; S/he is member of a trade union: 1=Yes, 0=No; Has a managerial position in school: 1=Yes, 0=No. Adjusted R Square=0.076

Conclusions

The current research reinforces the fact that teachers largely believe that there is politicization in the Romanian education system. Moreover, the findings show that teachers' opinions that legislation in education, school connection with the labor market, teachers' motivation, and curriculum are problems of the Romanian educational system increase their opinion regarding the politicization of the educational system. Nevertheless, the independent variables explain to a small extent the dependent variable (given the small Adjusted R Square). Therefore, politicization is generally seen as a big problem in Romanian education regardless of other problems of this system. However, the belief that some of the school problems are associated with politicization is emphasized in a previous study (Frunzaru & Ștefăniță, 2021), and the depoliticization of the system is a solution desired by most teachers. In the long run, political interference in leadership positions is considered to affect the stability of the system and the coherence of the managerial process. The multiple changes initiated in accordance with the political alternations at the governmental level are also considered to affect the quality of the educational process, the image of education, and the chance to benefit from real, coherent reforms with long-term visions. Teachers recommend depoliticizing the management positions at the level of inspectorates and educational units, and a selection process based on expertise and management skills. In regard to the possible negative consequences of the politicization of education, Dhungana (2012) mentions the disruption of education, especially in times of conflict, political indoctrination, political patronage, and jeopardizing school governance. Moreover, a basic element in Romania's pro-EU orientation is fighting corruption (Butnaru-Trancotă & Ioniță, 2022). Nonetheless, politicians can also "politicize the public service in order to change the policy" (Peters & Pierre, 2004, p. 6) and thus lead to depoliticization and an efficient functioning of the system in general, especially that of education.

Grindle (2012) mentions that "the national interest could best be served" by technocratic governance and thus, by expanding the state's role in the country's development. This means swapping the loyalty of a political actor or party with the one towards the state. Another good practice could be to regularly test the skills of both management and subordinate employees, regardless of the field of activity. Also, inspired by regulatory methods in the US, agencies specializing in skills validation have been developed recently (Hood & Lodge, 2006, p. 94). In addition to these practices,

transparency is another method by which politicization can be reduced, namely the constant and clear communication of ongoing actions.

The negative perception of teachers referring to politicization is in line with how politicization is used in common parlance, differently than turning a problem into a political one (Calhoun, 2002). Because through politicization we mean the appointment of employees (usually with management positions) on political grounds and not according to their competence, or making administrative decisions without taking into account the public interest, the findings show the dissatisfaction of Romanian teachers with the education management.

Since education is a powerful tool in developing societies, it can also be misused for different political purposes or affected by political interests or governmental changes which can leave a negative lasting impact on school management, resources, and the ability of the system to evolve. Therefore, politicization remains highly relevant in the education system and raises questions about the most appropriate ways to appoint school principals or other relevant leadership functions. Education trade unions in Romania accuse the politicization of the system and recommend that any reform in education start with eliminating political appointments at the level of management positions in schools and inspectorates (Dumbrăveanu, 2020).

The politicization of education is a problem that can lead to abuses in the system, especially in the relationship with school inspectorates, to political appointments in schools that affect the quality of school management and services. All these issues affect the beneficiaries of the education system and, in the end, society at large.

A major limitation of the research was that the survey was carried out in the context of the COVID-19 pandemic, during which the education system experienced extremely high challenges and stress. Moreover, the study was conducted in only one country, therefore the findings should be tested in different educational and political systems. In future research, other variables that can influence the opinion regarding the politicization of education must be considered. Also, we recommend continuing this research with studies on the consequences of the teachers' opinions regarding the politicization of the education system.

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Generation Z's career aspirations. Literature review and preliminary findings

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Abstract. *This research investigates the professional goals of persons born between 1995 and 2012, known as Generation Z, Gen Z, or digital natives. Generation Z was born and raised with the social web, they are digitally oriented, and technology is an extension of their identity. This generation will enter the workforce in the future, but still, there is less knowledge about their strengths, demands, and work style. This paper systematically reviews the academic literature about Generation Z's aspirations. The research was done in three major academic databases to gather material for review: Web of Science, Scopus, and Google Scholar. The predictions of previous studies concluded that Generation Z had well-defined professional aspirations and objectives for career development. They demand increased freedom and the ability to work remotely, collaboratively, and seamlessly across all of their devices in the workplace. Contributing meaningfully to the world is also essential to them. Individuals want their participation to be valued and are less tolerant of authoritarian circumstances, such as a hierarchical corporate culture. This research focuses on the career goals of Generation Z, their varied characteristics, and the environmental factors that influence their professional progress and job aspiration understanding the new generation's aspirations are critical for designing successful employment policies. Youth employment programs that aim to align talents with labor market opportunities may continue to fail if career aspirations and life objectives are not considered.*

Keywords: *Career aspiration; Career development; Generation Z; Gen Z; Employment.*

Introduction

Generation Z constitutes 26% of the total population across the world (Wise, 2022). Generation Z will soon surpass Millennials as the world's most populous generation, representing more than a quarter of the global population (Wise, 2022). Its members are about to enter the workforce, therefore their professional aspirations must be studied to support organizations in building an efficient inclusion strategy for them.

According to the current searches, generations are linked through shared experiences, life experiences, and values; each generation has different views regarding labor and the workplace (Pinzaru, et al., 2016). Companies are continuously struggling to improve their people strategies in order to comply with the needs of Generations X and Y. In addition to this, now, organizations should update their strategies in order to meet the aspirations and demands of a very new generation, Generation Z. The appearance of these new employees will have immediate effects on the workplace, retail consumption, and technology, as well as on politics and society. This generation has a different outlook

on employment and how to measure success in life and at the workplace compared to Millennials (Deloitte, 2019).

The challenges for companies are not just to serve Generations X and Y, but also to anticipate the working demands of the upcoming Generation Z, so that multigenerational teams may function effectively (Maloni, Hiatt, & Campbell, 2019). Therefore, companies should anticipate the demands of the workplace and adjust their strategies for attracting, motivating, and retaining these new young workers who will soon be entering the workforce. It is essential for companies to understand in order to retain the talents of the newest generation, as well to realize their advantages to sustain the company's growth. By knowing the qualities and interests of Generation Z, organizations will be able to attract and connect them so they can be developed to become the company's future leaders. Without this knowledge, companies would struggle to recruit and retain the most brilliant members of Generation Z, and they will fail to excite and inspire them, which will have a negative influence on organizational performance (Pinzaru, Mihalcea, & Zbucnea, 2017).

This theoretical investigation aims to answer the following research questions: What characteristics and particulars define Generation Z? Which studies have been conducted on Generation Z in the area of its professional aspiration? Because many Generation Z studies have been conducted on students, predicting their working behavior is difficult. This research combines current information about Generation Z students' job objectives and the expectations of their prospective employers and synthesizes empirical studies on Generation Z professional ambitions. It outlines the findings of theoretical research on Generation Z.

Literature review

There has been a generational gap in understanding between older employers and younger applicants every time a new generation has entered the workforce. A generation is a cohort of individuals born around the same time who are influenced by the same social, economic, technological, and political conditions (McCrandle & Wolfinger, 2010). They also define a generation as a group of individuals with a common birth date, go through the same formative experiences, and are influenced by the same era's social, economic, technological, and political climates (McCrandle, & Wolfinger, 2010). Belonging to a group, sharing similar values and practices, and have had similar life experiences and viewpoints are the three most important criteria for grouping people together (Howe & Strauss, 1992).

Academic studies have extensively researched older generations such as baby boomers, Generation X, and Millennials (Callahan & Greenhaus, 2008; Chaudhuri & Ghosh, 2012) but with Generation Z entering the workforce, organizations must understand also this newest generation to fulfill all of their employees' workplace demands and to create the proper organizational culture. Identifying the trends of a new generation may be difficult, particularly in areas such as communication preferences, professional goals, workplace needs, and methods of working and attaining objectives. It can be also challenging to foster an organizational culture that inspires individuals of all ages, cultures, values, working experiences, social and professional competencies, and communication skills to work together productively. Therefore, it is difficult to design

managerial systems that will adequately educate organizations and employees for such professional environments (Vasilyeva et., 2020).

Preliminary studies in the fields of education and marketing have looked into Generation Z and their educational choices, as well as how to sell to them. Generation Z has been described as digital natives (Noble & Bernes College, 2018; Twenge, 2017) extremely achievement-oriented (Barna, 2018), and seeking intriguing and important jobs (Schroth, 2019). The studies show that members of this generation have grown up with the Internet always present in their lives (Roblek et al., 2019). This generation has more friends than previous generations (Lazányi & Bilan, 2017) and maintains frequent contact with them. Despite their ability to deal with many tasks at once, they often struggle to focus on any of them for very long. They are materialistic in that they want everything and they want it now, but they are also practical. They are ambitious and open to new ideas. They get much of their education online and often develop new concepts on their own, rather than relying on more established bodies of information. They openly disseminate online information (Lazányi & Bilan, 2017). When it comes to the workplace, members of Generation Z are accustomed to using digital recruiting tools (Derous & De Fruyt, 2016) and are more likely to select flexible work schedules (Lazányi & Bilan, 2017).

Generation Z is not satisfied with the traditional view of a profession as a series of incremental gains over time; they want success now and want it to come easily. They are characterized by their mobility and knowledge of other languages, which leads them to seek employment not only in their direct proximity but also in other countries. They easily adjust to new nations and environments. Generation Z is open to high risk. Its members are not always concerned about job security. They want variety and dislike regularity. They are eager to learn about and discover new things, for example, by a willingness to communicate with people from other cultures, take on foreign internships, implement new work methods, and improve existing processes (Chomątowska et al., 2021).

Organizations are seeing a mix of four generations simultaneously, with Generation Z as the newest player in the workplace. Organizations are witnessing an increasing work-value conflict and variances in learning styles, beliefs, and communication styles with four distinct generations in the workplace (Lyons & Kuron, 2014; Solaja & Ogunola, 2016).

The essential dilemma is whether corporations will push this younger generation to adhere to established organizational cultures, or whether managers will attempt to adjust organizational responses to this shifting environment and Generation Z's preferences. Good organizational cultures often have solid foundations and solid standards, but companies must also be responsive to changes in the nature of their workforce pool, demonstrating flexibility based on the problem-solving process and lessons learned (Fratřičová & Kirchmayer, 2018).

Methodology

The literature review is a crucial component of the research to detect potential gaps, offer the appropriate background for the intended investigation of Generation Z's professional aspirations, and determine which questions have already been answered.

From a practical standpoint, this research aims to establish a foundation upon which to build the future management model for Generation Z.

The objectives of this review are to:

- O1. Identify the relevant literature about Generation Z's aspirations, beliefs, expectations, and the relationships between them.
- O2. Compile the existing studies and provide a comprehensive review of Generation Z's career aspirations
- O3. Determinate research gaps and make recommendations for future desired data collection.

Because each area of this review has its own scope and aims, multiple search approaches were used to identify the most relevant research. In order to build the notion of aspirations, early academic and business discussions of aspirations were reviewed (Bert & David, 2016). The criteria for the systematic review follow a clear strategy (Figure 1). The papers utilized in this study were found by a systematic search (Rother, 2007) of Google Scholar, Web of Science, and Scopus databases. The search outcome is a total of 127 articles, business reports, conference papers, and books from the aforementioned data sources.



Figure 1. Methodology
(Source: Own processing)

The research was done by searching the following terms using versions of Boolean connectors ("AND" and "OR"). Aspirations, Generation Zs' aspirations, aspirations and labor market outcomes, occupational outcomes and choices, drivers of aspirations, social interactions and aspirations, aspirations, and economic change, career development, career aspiration, Generation Z, Gen Z, and iGen were among the keywords used to identify relevant papers. The article or book title, primary author, source database, type of work, organization or scientific publications, the country where the paper was published, publication year, and keywords related to the research were all indexed in an excel-folder. The preliminary findings imported into an excel spreadsheet have been read and assessed whether to be included in the review (Carver et al, 2013). The final step included reading all of the titles returned by the search and the abstracts and complete articles. The inclusion criteria followed the abovementioned path but applied to standalone industry reports. The research eliminated certain publications where the article's focus was not on Generation Z's professional goals. Some publications just referenced Generation Z briefly and concentrated on other generations in the workforce, particularly millennials or Generation Y. There were excluded articles that did not make a clear distinction between Generation Z and other generations in the workforce. Some articles used the phrase Generation Z to refer to both Generation Z and Generation Y. The articles that did not provide any empirical data to support their findings have been excluded and industry reports without consistent evidence of data gathering.

Results and discussion

Despite the fact that the majority of research was conducted on students, it is important to note that the studies that have been reviewed presented worldwide perspectives on Generation Z's aspirations for their professional lives. It is worth highlighting an increased focus on this topic after 2020 (Figure 2).

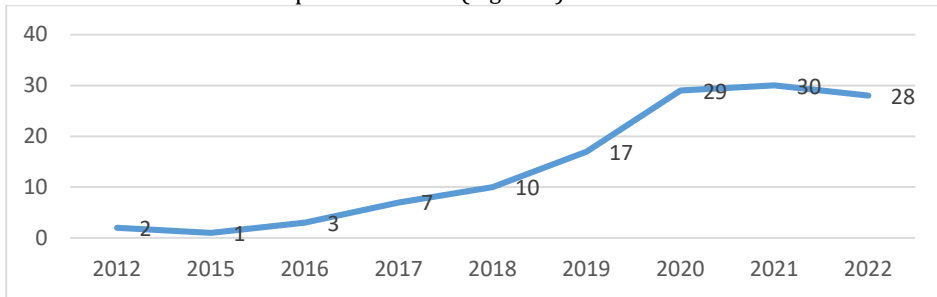


Figure 2. Years Distribution
(Source: Own processing)

After consistently reviewing the existing literature (Figure 3), this research classified the following subthemes under the larger topic of professional aspiration: personal elements influencing job ambitions, external factors influencing career aspirations, and future organizations' leadership model.

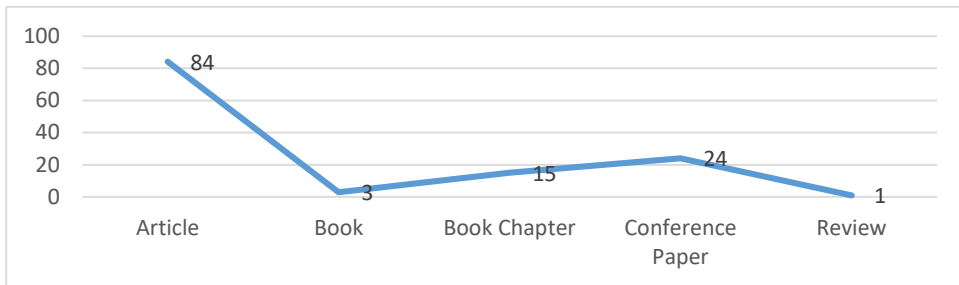


Figure 3. Type of papers(Source: Own processing)

Personal elements influencing Generation Z's professional aspirations

Generation Z has high self-perception and awareness (Iorgulescu, 2016). Generation Z's strong levels of self-confidence and perseverance are the result of their independent learning and practice. Their perseverance enables them to develop the optimistic and self-confident outlook necessary for achieving entrepreneurial success and monetary objectives (Cseh-Papp et al., 2017).

Dell (2018) questioned 12,000 high school and college students from around the globe, where 17 countries have been represented, about their views on future careers. The key findings (Figure 4.) align with the majority of the existing studies. Generation Z is eager to use their skills to the development of new technologies and to teach others about them; Generation Z wants more than simply money for its work; Generation Z is ready for more human engagement; Generation Z is concerned about data security but is

unclear how to solve it; Generation Z is confident in their technological abilities but that does not correspond to job readiness (Dell, 2018).

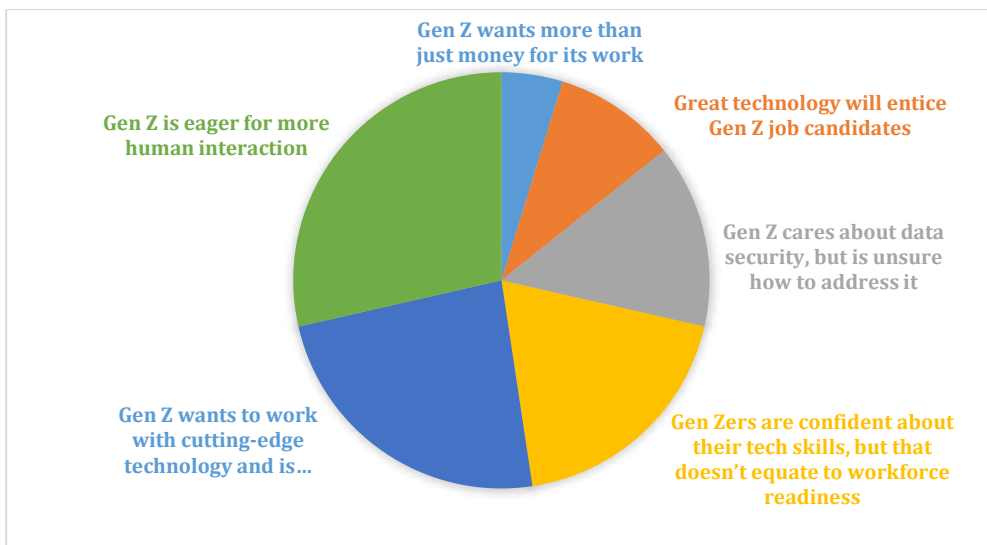


Figure 4. Generation Z aspirations
(Source: DELL, 2018)

External factors influencing Generation Z's professional aspirations

Deloitte (2022) performed a recent study on Generation Z in order to analyze their top concerns. According to Deloitte(2022), members of Generation Z are extremely concerned about the status of the world and are struggling to find a balance between their desire for change and the limitations of their day-to-day lives. They are experiencing concerns over their finances while also attempting to invest ecologically. Regardless of their exhaustion, many are doing second jobs while advocating for better pay and greater freedom in their first employment. Employees increase their influence on their employers to take actions to combat climate change, particularly in areas in which they can make a difference. Businesses, on the other hand, maybe give up opportunities to encourage more comprehensive and efficient climate action. They have motivated their organizations to improve conditions for mental health at work, but employees are not always open to discussing their own issues or taking advantage of existing support services. Many individuals all over the world have reviewed their priorities as a result of the dynamic circumstances of the previous few years. This period of unprecedented voluntary turnover gives several chances for Generation Z. Employee requests for ongoing workplace transformations, such as higher compensation, more flexibility, a better work-life balance, increased learning and development opportunities, better mental health and wellness support, and a greater commitment from businesses to positively impact society, are also the strategies that will help employers attract and retain talent (Dell, 2018).

Generation Z desires to work in software enterprises (Dell, 2018; Glassdoor, 2019). 80% of Dell, (2018) survey respondents wanted to work with cutting-edge technology. Companies such as IBM, Google, Amazon, Microsoft, and Deloitte are five of the most

aspiring places to work because of the independent work culture promised by them (Glassdoor, 2019).

They justified their decision with phrases like "work atmosphere," "flexible hours," and "excellent salary" (Glassdoor, 2019). Over the course of three months, positions such as software engineers and software developers drew one out of every five Generation Z candidates across all industries, including information technology (IT), retail, manufacturing, and finance (Glassdoor, 2019). Organizational characteristics, such as size, attracts Generation Z employees (Iorgulescu, 2016; Cseh-Papp et al., 2017) and nearly half of Iorgulescu's (2016) sample expressed the desire to work for a multinational corporation.

Future organizations' leadership model

This research outlines the big dilemma of organizations that do not know if their organizational culture should be adjusted to new generation aspirations or push them to comply with existing models. Organizations are still unsure how to fulfill Generation Z's job goals based on what is known about them (Fratričová & Kirchmayer, 2018). Generation Z is now 26% of the global workforce (Manpowergroup, 2018), making it critical for enterprises to understand them to make realistic suggestions. While most companies have access to technology, Generation Z may have unfulfilled professional aspirations since organizations are not always ready to host this new generation.

Companies must assess their performance appraisal and compensation adjustment systems in order to develop and benefit from this generation. Employee engagement and making the workplace enjoyable will ensure employee loyalty and organizational performance.

Conclusions

This research met its initial objectives and concluded that there is an increased academic interest in Generation Z's professional aspirations, life, and customer perspective.

Furthermore, the findings identified the practical need for future research on leadership models and managerial techniques to address Generation Z's needs. Moreover, the existing research is focused on the personal and external drivers that define Generation Z's goals. However, there is a research gap regarding the industry concerns about the impact of Generation Z on the company's growth. It is important that future research be also concentrated on filling this gap in order to provide a consistent approach.

Regarding the leadership framework, the key takeaway is that members of Generation Z have distinct demands and preferences from businesses. Fortunately, there are distinguishing factors between some of them. However, in order to attract Generation Z employees, managers and HR departments in particular will need to build a new leadership model so that they can meet Generation Zs' demanding standards for communication speed, transparency, openness, commitment to core values, etc.

The key individual factors from this research and the review literature are linked to the need for a new leadership model that is more inclusive of the new generation's expectations. Generation Z is driven by innate motivation. Companies must recognize this and create more empowering and self-driven rules rather than hierarchical ones. The emphasis of speed, efficiency, and data validation are emphasized in Generation Z

DNA. Companies must establish trustworthy relationships with these on-the-go employees and try to realize that their restless outer behavior is what makes them productive and effective at multitasking. The more effective method to approach the core of this generation is through proper training, a friendlier attitude, and social networking. Organizations must assess their performance appraisal and compensation adjustment systems in order to develop and retain this generation. Employee engagement and making the workplace enjoyable will ensure employee loyalty and performance for the firm.

Generation Z is the newest generation to enter the workforce. With limited research on this cohort, this research compiles the existing knowledge of Generation Z students' career aspirations and their future employers' expectations. All research on Generation Z is focused on students; hence, predicting their workplace behavior is challenging (Barhate & Dirani, 2022). In addition, the fact that there are just a few academic databases selected as sources presents an extra limitation for the research to overcome. From a practical perspective, there is also an additional constraint in the industry involvement in quantifying the impact of Generation Z's entry into the workforce. Practical researches are a critical element for having a comprehensive understanding of Generation Z adoption. This research compiles the existing limited knowledge about Generation Z's professional aspirations and introduces the need for empirical studies to assist the organization and managers in identifying how to empower, engage, and grow Generation Z employees.

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**COMPREHENSIVE STUDY OF THE INTERNATIONAL UNIVERSITY
INNOVATION ECOSYSTEM
UNIVERSITY PARTNERSHIP
STAKEHOLDER ENGAGEMENT**

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Abstract. Higher education institutions play a vital role in the economy with their ability to produce knowledge, transfer technology, and create a qualified human resource base. Innovation is strongly connected to their life due to their special research in a complex ecosystem with many heterogeneous stakeholders from different areas such as industry, government, and social fields. The commitment of the internal and external partners greatly affects the success of the collaboration of the members, the culture of the entire cooperation, and the achievement of the targeted objectives. For this reason, stakeholder management is a key task. As for the implementation, the trust of stakeholders and their strategic goals are significant. This requires careful planning in which the interest, and the mutual benefits should be kept in mind in order to eliminate potential conflicts. The tasks of stakeholder management are diverse. It requires flexibility as each partner needs to be involved and engaged in a different way. The research paper investigates the partnership structure of the universities in the innovation ecosystem. A broad literature review focusing on the role of the university, the stakeholders, and the multifaceted phenomenon of innovation serves as a basis for the study. The research looks at the case of a Hungarian university and its partnerships.

Keywords: Innovation, Innovation ecosystem, Partnership, Stakeholder, University

Introduction

Innovation plays a key role in the “knowledge-based economy” (Ankrah, & Al-Tabbaa, 2015). The word itself comes from the Latin origin “in-novare”, “innovatus”, which represents a complete renewal (Kaya, 2015, p.26), however, it is a multifaceted phenomenon. Innovation is part of the entire economy and human life. One pillar of it is the cooperation between the different members, such as the academic sphere and the industry, which aims range from financial goals to human factors, but knowledge

creation and technology transfer should also be highlighted (Ankrah & Al-Tabbaa, 2015).

The innovation process exists in an ecosystem where a complex set of actors does not linearly interact with one input and output, but collaboratively act (Madelin, 2016, p. 18.). This ecosystem provides a heterogeneous background and different perspectives (Kumari et al., 2019) in order to achieve strategic goals. Collaboration between universities and industries is becoming even more necessary to respond to innovation's challenge (Ćudić et al., 2022). Knowledge and technology contribute to the growth of businesses, regional and national economies, and the need from side of society to be up to date and provide appropriate answers to the problems of the world with innovations, adequate skills, and technological advancements (Kang et al., 2019) is powerful. Collaboration can exist in an open innovation system, the advantages of which include knowledge sharing and creation with external partners by the fusion of the knowledge they already have separately (Albats et al., 2019).

Literature review

Role of the universities

Universities have a special role in the development of the economy and collaboration with different stakeholders (Koszttyán et al., 2020). They can contribute to strengthening the region, contribute to competitiveness, generate new knowledge, and provide expertise and human resource (Kálmán, 2019), but at the same time, their role in modern society has changed a lot. Traditionally, the main task of universities was to educate (Tolstykh et al., 2021) but it was transformed by Industry 4.0. and got augmented with entrepreneurial perspectives (Makai, & Rámháp 2020). In this view, their necessary tasks are to manage a strong collaborative network and to create up-to-date knowledge (Tolstykh et al., 2021) that serves as the basis of the development and innovation processes (Ye, & Wang, 2019).

Universities strongly influence their environment through education programs, technology transfer, research activities, and other services such as consultancy, platform functions for different networks, and incubation. Hence, it is in the interest of higher education institutions to provide market services to maintain their sustainability in a long run (Feketéné Czakó, 2017). In general terms it can be denoted, that universities make a major contribution to the "development of society" (Moscardini, Strachan, & Vlasova, 2020) with their "strong knowledge production capacity" (Birkner et al., 2022), their scientific and business research activities. Higher education institutions are encapsulated as they form cooperation with stakeholders building on their knowledge (Koszttyán et al., 2020). A basic form of the cooperative relationship is the Triple Helix Model proposed by Etzkowitz and Leydesdorff in which three major actors, university, industry, and government, collaboratively act to intensify their innovative capability (Abd Razak, & White, 2015). The model was quickly enhanced with the elements of the society and environment as they actively influence the partnership (Maruccia et al., 2020). Furthermore, the third mission of the universities should be mentioned, that they are taking responsibility for their entire environment (Compagnucci & Spigarelli, 2020).

Table 1. The roles of the universities (Source: own edition)

Source	Defined roles
Schiuma & Carlucci, 2018	Their task is to improve the “local innovation ecosystem”, and to create a skilled human workforce, experts, and entrepreneurs for the future.
Koszytan, Fehervolgyi, Csizmadia, & Kerekkes, 2020	The duty to support the progress of the economic and social evolution.
Compagnucci & Spigarelli, 2020	Their prior function is transmitting knowledge to the civic sector and institutions and supporting innovation processes, especially social innovation.
Zhou & Tang 2020	Significant role in teaching, research, and third mission activities to assist development and knowledge transfer.
Karpov, 2017	Major importance in assisting humanity’s innovativeness, economic rise, prosperity, and well-being. Technology transfer, commercialization of products or services, introducing them to the market, intellectual property management, and support for start-ups.

The table briefly summarizes the defined roles of the universities described in the literature. Based on the analyzed scientific publications, it is clearly visible, that universities should operate on a wide area of coverage in which knowledge exchange with students, organizations and citizens plays a major role, thereby they also contribute to shaping their environment in social, technological, and economic areas. Furthermore, it is not irrelevant that a shift to the role of entrepreneurial universities should happen, by which they can actively support businesses with up-to-date skills, a properly trained human workforce, and business constancy through incubation.

The importance of partnerships

In the innovation ecosystem development, greater emphasis has been placed on the universities, especially on collaboration with the industry. The academia and the business sphere have different goals, cultures, and possibilities however, they are seeking to find the appropriate way to cooperate, create a “strategic, operational or transactional” collaboration (Marinho et al., 2020), and find mutual benefits that increase their innovation potential and economic benefits (Schiuma & Carlucci, 2018). A significant ingredient of the partnership is the knowledge that supports innovation,

creative thinking, value creation, competitiveness, and development in which trust between the partners is significant (Marinho, Silva, Santos, 2020). The cooperation style between academia and industry can be diverse, constantly changing, and dependent on the stakeholders and the strategic and economic goals (Felix, 2020). Two-sided research cooperations have become popular as universities have highly skilled researchers and the appropriate infrastructure to manage research projects that can be useful for business in the field of R&D (Lutchen, 2018). On the other side, the advantages of cooperation for the higher education institutions can be seen in shared knowhow, skills, expert knowledge, and technology (Marinho, Silva, Santos, 2020) that can create new academic programs, support mobility and provide internship places (Jonbekova, Sparks, Hartley, & Kuchumova, 2020).

There are diverse partnerships that can be categorized by time frame or involvement. It can be long-term collaboration such as research with trained experts and financial support or short-term cooperation with a single class activity (Felix, 2020). Furthermore, partners at various levels can be involved in partnerships. Some of them provide institutional involvement on the other hand in some cases only a person seeks to establish the partnership (Feketéné Czakó, 2017). In sum, cooperation at various levels and between diverse stakeholders can contribute to the increase of human capital, the knowledge creation, can also positively affect the budget, and prestige, and contribute to the intellectual property and operational work (Felix, 2020), however, the success depends on the management of all of the stakeholders. Therefore, a successful partnership must be based on trustworthiness, clearly defined goals, responsibilities, communication, and engagement.

Stakeholder management

In order to deeply understand the nature and role of stakeholder management a short insight should be given into the stakeholder theory created by Freeman (1984) which summarizes the core elements of a network of people and the vested interest of an organization. According to his definition formulation, stakeholders are “any group or individual who can affect or be affected by an organization” (Freeman, 1984, p. 46.; Hörisch et al., 2020), vital for the existence of the business and have an influence on each other within the partnership (Pedrini & Ferri, 2017). The necessary tasks of the management within an organization are to find the balance between the stakeholders’ expectations, to constitute an advantage for them, to create trust between them, and to reduce conflicting situations (Hörisch et al., 2020).

A fruitful collaboration is the result of accurate preparation from the side of the management (Marinho et al., 2020) therefore stakeholder management is a key task for success (Nguyen et al., 2018). There is a need to understand the stakeholders, their perspectives, strategic visions, and their own languages. In this cooperation, the stakeholders’ goals and motivations should be considered and constantly monitored because a major aim is to constitute a long-lasting and strong connection between the partners (Pedrini & Ferri, 2017). A necessary part of success is the choice of the appropriate partner with satisfactory skills and strength, comprehensive, well-defined goals, clear rules, mutual agreements, the role of the leader on both sides, the way of communication and trust that should be established among the partners (Marinho et al., 2020). Trust has a complex meaning and is dynamic. It arises from the individuals’ “mind and soul, “ influencing the perception of humans and the entire world (Blaskova et al.,

2015). People presume that trustworthiness is a “virtue” (Özer & Zheng, 2017), however, a deterioration of trust can be seen in society (Ipsos, 2021). Trusting in someone is hazardous and fragile (Özer, & Zheng, 2017), but collaborations cannot exist without a certain extent of trust.

**Table 2. Components of the successful academia-industry partnership
(Source: own edition)**

Source	Success factors
Siebert, 2020	<i>Trust that is built up from the mixture of credibility, reliability, intimacy, and self-orientation</i>
Marinho, Silva, & Santos, 2020	<i>Balance between stakeholders, conceptual convergence, shared management, agreement on objectives, in case of universities successful knowledge transfer, trust, mutual confidence, engagement of the individuals</i>
Felix, 2020	<i>Clear purpose, process, roles and structure</i>
Ankrah, & AL-Tabbaa, 2015	<i>External ties, interactions between the partners</i>

A stakeholder can be a single person, a private or a public group, an organization, an institution, but there is the fact of “power relation” which indicate the strength and direction of the relationship of the organization with the stakeholder. This relationship exists with the aim of creating mutual benefit. For example, an influential stakeholder has a strong potential bound and the organization greatly relies upon this type of stakeholder group (Avci et al., 2015, Seres et al., 2019). Power relations can be different in the case of all stakeholders, but these can indicate how much the stakeholder affects the life of the institution and how much attention should be paid to the relationship with them. Digging deeper into the stakeholder evaluation, many categories can be seen based on the affiliation of the stakeholders’ interests. According to their stake, primary and secondary stakeholders can be distinguished. In the first case, the institution’s life cannot go on, and cannot exist without this group. They are members who are responsible for the operations, and regulations, they can be the employees, suppliers, and customers. Secondary stakeholders also have an impact on the firm, but do not take part directly in the activities of the business such as media or unions (Benn et al., 2016). In another classification stakeholders can be internal ones, who are actively involved in the life of the organization such as employers, directors or they can be external stakeholders. According to another categorization, actual and potential or compatible or incompatible stakeholders can be differentiated (Crane & Ruebottom, 2011). In stakeholder management, the analysis of stakeholders is one of the business’s very first duties to be able to successfully cooperate with them.

Higher education institutions also need to determine their stakeholders due to the importance of their activities in social and economic terms. Their success or failure is firmly influenced by their partners. The stakeholders of a university are strongly connected to the life of the higher education institution. Based on it, stakeholders can be involved in education, research, administration, and operative management tasks (Seres et al., 2019). According to researchers, well-determined categories of the university's stakeholders are being defined. Based on the work of Burrows (1991) legislative bodies, like the state, operational, administrative, executive management, staff, graduates, relatives of the students, "suppliers, rivals, donors, friends, alumni, local communities, government and non-governmental regulators, financial intermediaries, and joint venture partners" (Burrows 1991, In.: (Avci et al., 2015) are all stakeholders of higher education institutions, that should be taken into consideration, managed closely and involved into the processes of the university.

Stakeholder engagement

Engaging the stakeholders is a relevant part of a collaborative process which requires the precise definition of the group of partners, and identification of their needs in order to maximize them, however, it also involves many other fields that should be taken into account, such as CSR, ethics, leadership, environment, and organizational culture (Kujala et al., 2022). As for universities, defining their stakeholders is a necessary task in order to achieve strategic goals in the long run (Avci et al., 2015). Networking has a major role that is an interaction with the aim of constructing an advantageous relationship in order to gain competitiveness, new customers, knowledge, ideas, skills, business possibilities, or carrier opportunities. Networking can help to retain old partners, but it can support gaining new ones. Its necessary part is the stakeholder analysis which has well-defined steps. In stakeholder analysis, the first rule is to map all affected people, then categorize them into internal and external ones. It is also an important part of the analysis to define the impact and size of the effect on the stakeholders, whether positive or negative, because it can influence the project's success. The advantages of well-defined stakeholder analysis include shared resources, information, and know-how. Successful stakeholder management can contribute to favorably coordinating the partners and to mapping conflicting interests (Bahadorestani et al., 2019). To engage the stakeholders in the long run, communication, involvement in the business's life, and continuous information with the defined stakeholders are essential to building up a strong relationship based on trust. Stakeholder engagement can use incentives, as well as other strategic tools. Models such as the spiral (Boje et al., 2017) with an ever-expanding scope, a matrix with a diversified project scope, or agility with quick reflections should be selected and adapted to the goals. Stakeholder engagement is a long and complex process that requires regular tasks to be carried out in order to keep contact, however, the outcome of a well-defined stakeholder mapping can result in engagement on an advanced level, improved performance, well-being and effectiveness of the institution (Kujala et al., 2022).

Methodology and objectives of the research

The main objective of the research is to provide an overview of the university innovation ecosystem and the role of the partnership with a focus on the stakeholders and their engagement. The research paper examines the elements of the innovation ecosystem

and emphasizes the duty of the university-industry collaborative partnership with a broad literature overview and introduces the concept of stakeholder management. The study's research question explores and collects the elements that determine the successful partnership between universities and industry, by analyzing previous studies. In addition, the example of a Hungarian university will be presented in the field of stakeholder management. The aim is to identify who matters in the life of a university and how these stakeholders can affect or can be affected. The research paper presents the initial phase - mostly based on secondary data - of a complex research that is aiming to investigate the academia-industry partnership, and compiles recommendations for the universities as to how to make a successful collaboration with national and international partners in the innovation ecosystem.

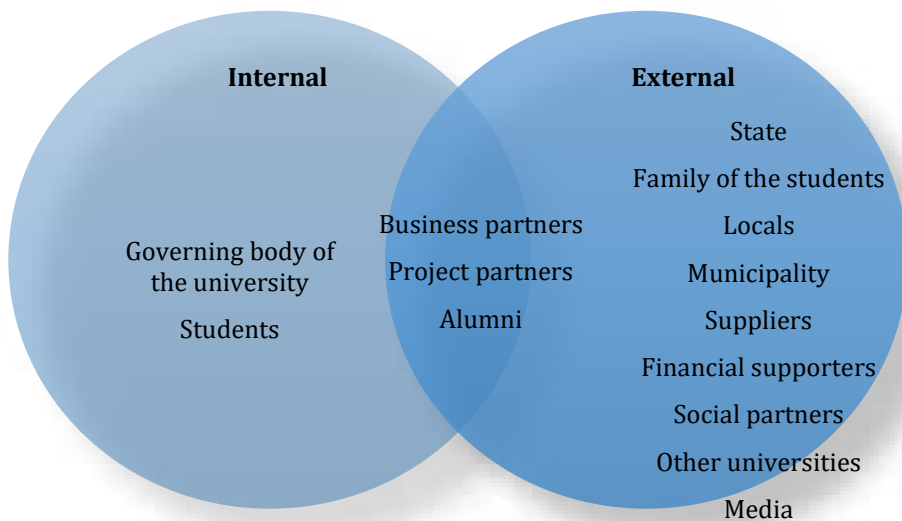
Introduction to the stakeholders of the University of Pannonia

The University of Pannonia is located in Veszprém county and operates with five faculties in four settlements: in Veszprém, Kőszeg, Zalaegerszeg, and Nagykanizsa. The stakeholders play a significant role in the life of the university as it is written in the institutional development plan, founding document, and quality assurance framework of the institution in order to be able to achieve the strategic goals that include high-quality education programmes, research and contribution to the R&D. Taking into account the institution and its environment, many internal and external partners can be mentioned. The Hungarian state ensures a legal framework with regulations, indicators, and standards for the operation programs as an external stakeholder. Based on the organogram of the institution, there is a governing body at the top of the university, followed by internal stakeholders such as the board of trustees, senate, rector, chancellor, and unions. The doctoral council, the Hungarian Academy of Sciences (MTA), and advisory boards such as the AACSB advisors, consultants, and the National Research, Development, and Innovation Office (NKFIH) perform a major partnership with a special stake in the life of the university.

Students of the faculties such as the Faculty of Business and Economics, of Engineering, of Information Technology, etc., including postgraduate students and PhD. students are internal stakeholders interested in getting a prestigious degree, high-quality education, and recognition in the employment market. As an external stakeholder, the students' relatives should also be determined whose aim is to see their relatives succeed. External stakeholders include those who have already graduated, left the university, and are active in the labor market or start a course in another institution. They are the alumni group who have a huge influence on the brand of the higher education institution and can positively or negatively affect its reputation. An external partner is the City of Veszprém, with the locals and the governing municipality as well as the business partners, such as industry partners offering placements, strategically connected large, small, and medium-sized enterprises, non-governmental organizations, members of the regional innovation platform such as MOL Group, Herend Porcelain Manufactory, Continental, hotel chains from the region, tourist offices, restaurants with the aim to get appropriate, highly skilled workforce with foreign language knowledge, etc.. That is why the need of the market is essential to be heard and embedded into the curriculum of the students. International partners like other universities and business partners should also be mentioned as external ones, and the suppliers, such as the cleaning, catering companies, or dormitories. There are financial supporters, project partners at national and international levels, and competitors such as other universities with the same teaching and research scope. There are civic partners such as the church, and public

education institutions based on the third mission activities of the university, whose aim is to get proper dissemination, like in the form of summer schools for teenagers or retired people. The media has a strong influence as an external partner, that can affect the brand image or perception. Last but not least a significant internal stakeholder group should be mentioned, the human resource base of the institution with the lecturers, researchers, professors, administrative and operative employees who can highly affect the operation of the university and their aim is to have a reliable, long-term workplace.

Figure 1. Summary of the stakeholders (Source: own edition)



Results and discussion

Innovation is a push factor toward the development of the economy. For this reason, universities are a significant part of the innovation ecosystem with special roles from traditional teaching, and research activities to the third mission. Their societal impact on knowledge creation and transfer influences the development of their local and global environment by creating new scientific products or services. In order to utilize this potential, long-term fruitful partnerships are necessary. The collaboration of academia and businesses has a long tradition and benefits can be felt on both sides, however, the establishment of a successful collaboration requires thorough planning, continuous control, and evaluation based on the strategic goals, the motivations, and the direction of the partnership. In collaboration, the stakeholders should be understood, informed, and actively involved in order to establish trust that serves as a basis for the interaction. Therefore, stakeholder management is a complex and vital task for institutions. Universities should cope with this and map all their partners with their special interests whether they have strong power relations or only minimal. They have a compound stakeholder base ranging from the national and institutional ruling government, administrative bodies, students, and their parents to other universities. These stakeholders affect the university's success, influence the brand, and the perception, and contribute to the efficiency and effectiveness of the institution. The stakeholders' engagement is in the institution's interest, but continuous communication, information

flow, involvement, and mutual goal determination are necessary to achieve engagement networking.

Conclusions

The paper investigates the partnership between universities and businesses in the innovation ecosystem based on a broad literature review on the current topic of higher education. The changed role of the universities brought, that they have a vital third social mission and should carefully create their own partnerships with the industry. Necessary task of them, to define their goals, and relationships and carry out their activities with this in mind. There are different types of collaborations and relationships between the partners. The spiral relationship makes the bottom-to-top growing involvement possible and creates a spillover effect. The matrix presents relationships with different stakeholders from different areas, in which well-defined actors can characterize the universities such as the lecturers, researchers, the different project teams, roles of the departments or faculties. Finally, the agility model can be mentioned in the constantly changing and dynamic world, which enables speedy communication, conflict management, and formal and informal communication. The question for further research is, which model can be most appropriate for the university structure in order to actively involve the stakeholders and create long-term fruitful collaboration.

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SHIP MAINTENANCE AND RISK ASSESSMENT THROUGH A SURVEY APPLIED TO SEAFARERS

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Abstract. *Safety is a major issue for the maritime industry and poor maintenance has been and remains one of the main causes of many incidents, although predictive maintenance methods have been progressively implemented on board ships over the last decade, in addition to the Planned Maintenance System (PMS).*

The main objective of the research is to provide a real overview of the types of maintenance applied to onboard equipment, and how it can improve the operational safety of ships, and at the same time protect seafarers and the environment. Considering these aspects, this paper presents the main results of quantitative research, developed through Google Forms, on ship maintenance and risk assessment in maintenance activities. By establishing a research framework and developing a questionnaire, much information was collected from seafarers with experience and responsibilities in maintenance. Results showed that predictive maintenance supersedes traditional maintenance programs for most of the onboard equipment and ships. Also, for a better implementation of these technologies related risk factors should be well-known and managed accordingly.

Keywords: *questionnaire, risk in maintenance, ship maintenance, survey.*

Introduction

One of the main elements of international trade is represented by the shipping industry, given that 85% of goods are transported using river or sea routes. Technological improvements have facilitated maritime transport development to reach this value. To reduce the risk of accidents, simplify the operation of the ship and increase the efficiency of maritime traffic, automatic equipment, and systems (*such as the Integrated Bridge System*) have been developed, onboard systems and machinery follow a strict maintenance protocol and procedures are revised to align with the new standards imposed by international law.

Usually, the life of a ship exceeds 25 years of operation. The role and importance of maintenance are constantly increasing, challenging both operational and management personnel to make proper arrangements for maintenance and always keep the ship in a safe and seaworthy condition.

The research identifies the current practices for ship maintenance and the risk factors in maintenance-related activities. It also provides a quantitative analysis of related maintenance activities and the degree of implementation of proactive maintenance for ship systems and determines the average level of risk factors identified from bibliographic research. The methodology used was a questionnaire-based survey of 46 respondents with theoretical and practical experience in the field.

The paper consists of four essential parts addressing the following issues: co-relation between safety and maintenance considering related literature and reports about maritime accidents, description of research objectives and conceptual framework for data collection, methodology of the research, and results after the analysis of the information collected and some directions for further direction of research.

Maintenance – a matter of safety for ships

To support the continuous growth of international trade, ships have experienced significant technological improvements regarding capacity transport, ease of operation, route management, and safety. More than 20.1% of container vessels and 31.2% of tankers have a GT>60,000. However, contrary to the widespread opinion that *a high level of automation means more safety*, technology can contribute to the occurrence of accidents caused by human error and therefore defeats the purpose for which it was introduced. (Bielic, 2017)

In a study regarding maritime accidents between 2002 and 2016, inappropriate/ineffective maintenance was identified as an overall cause of all types of accidents for about 12.1% of cases. Also, a fairly large percentage, 11.5% of cases, were produced because of a technique or equipment failure (Acejo, 2018).

Analyzing the data presented in Table 1, foundered (sunk/submerged) wrecked/stranded and fire/explosion are the top three causes of total losses over the past decade, accounting for 85% of all losses in the period 2010-2020, worldwide. (Allianz, 2020)

Since 2011, more than a third of reported incidents (around 9,334) were caused by machinery damage or failure – well over twice as many as the next highest cause, collision (3,288). For 2020, machinery damage/failure was the top cause of shipping incidents, accounting for 40%. (Allianz, 2020)

However, the perception that *technology is fully reliable* can lead to underestimation of risks and, consequently, to a change in attitudes toward good sea practice and standard procedures, thus allowing human error. According to several studies, these are just some of the causes of incidents caused by human error, which is the determining factor in the development of accidents in the maritime industry. (Schröder –Hinrichs et al. 2012; Ugurlu, 2015)

Table 1. Total losses by cause between 2011 and 2020 (Allianz, 2020, p. 14)

Total losses by cause	2011 2016	2017	2018	2019	2020	Total	Percent
Foundered (sunk/submerged)	334	57	31	31	24	477	54.45%
Wrecked/stranded (grounded)	135	15	11	4	7	172	19.63%
Fire/explosion	66	8	6	9	10	99	11.30%
Machinery damage/failure	39	9	2	-	1	51	5.82%
Hull damage (holed, cracks etc.)	22	5	1	1	-	29	3.31%
Collision (involving vessels)	21	1	2	1	2	27	3.08%
Contact (e.g., harbor wall)	3	-	-	-	-	3	0.34%
Missing/overdue	2	-	-	1	-	3	0.34%
Piracy	1	-	-	-	-	1	0.11%
Miscellaneous	8	-	-	1	5	14	1.60%
TOTAL	631	95	53	48	49	876	100%

At the beginning, corrective maintenance was the first strategy for maintaining ships at a satisfactory operation level. The demand for larger transport capacity and accidents such as the Tory Canyon determined major changes in the structure of ships to improve safety and lower the risk to the marine environment (Hawkins, 2017). Also, preventive programs were imposed by I.M.O, in addition to corrective actions.

Now the maritime industry implements a predictive program that assesses the state of the equipment and applied maintenance procedures to prevent breakdown.

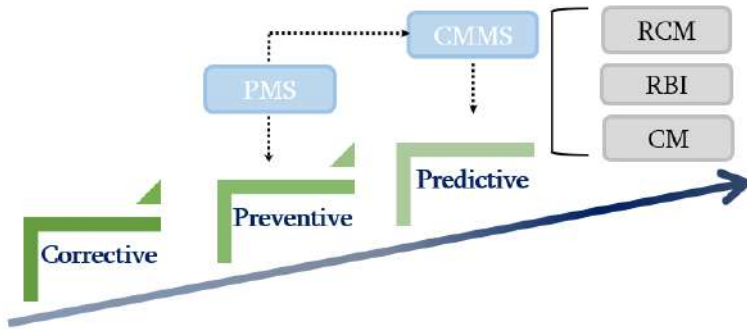


Figure 1. The evolution of the maintenance process in the shipbuilding industry (adapted from Lazakis, 2010)

In figure 1, predictive maintenance is divided into three categories: reliability-centered maintenance-RCM, risk-based inspection-RBI, and condition monitoring-CM (Lazakis, 2010). Preventive and predictive maintenance methods have evolved by implementing IT solutions to manage the maintenance process. Considering all of the above, an optimized maintenance program will focus on extending equipment lifespan, optimizing downtime, reducing costs, and improving safety. (Simion, 2021)

Theoretical aspects regarding the present study

The overall objective of this study is to identify opportunities to improve maintenance for ship systems by evaluating current practices and risk factors in maintenance. In this regard, a conceptual framework (*an action plan*) has been developed in accordance with the Formal Safety Assessment (FSA) method and IMO regulations in this area (IMO FSA, 2018). The research was structured in two stages, as presented in figure 2. In the first stage, the research's authors synthesize the internal and external sources of information from the literature (Nicolae, 2020). Three directions of the research are outlined:

- main systems on board the ships;
- current maintenance practice and level of implementation for predictive maintenance;
- risk factors in maintenance.

This stage is based on the analysis of relevant literature and documents in maritime, engineering, energy, industrial, and offshore maintenance, from 2010 to 2021, using the "free consultation" resources available online. A finding is that for the maritime sector Failure Mode, Effects, and Criticality Analysis (FMECA) and Fault Tree Analysis (FTA) are the main techniques used for risk assessment (Simion, 2021).

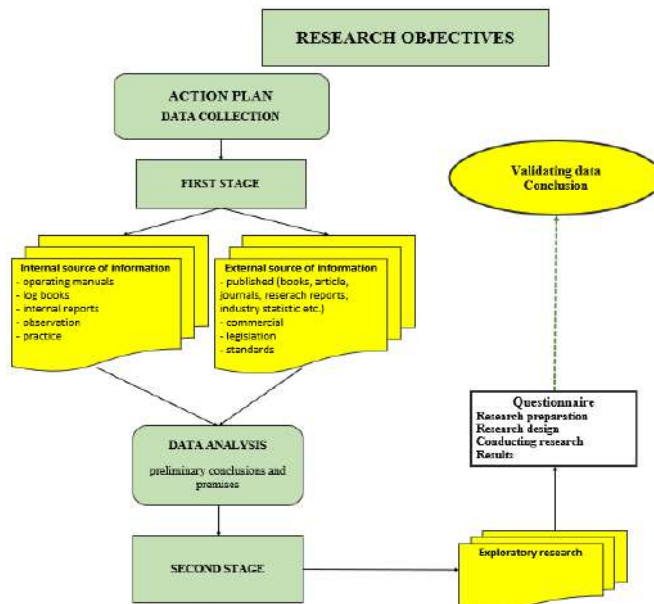


Figure 2. Sources of data collection
(adapted from Nicolae, 2020)

As some issues identified in the theoretical study could not be clearly defined and included in the ship maintenance, the second stage is necessary as exploratory research to consult technical specialists in maritime transport. The second stage considered appropriate for using techniques and methods derived from market research, begins with some theoretical aspects, as presented in Figure 3.

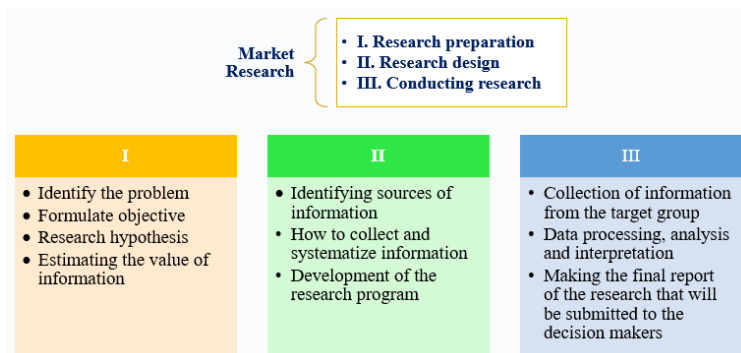


Figure 3. Stages of market research
(source: personal interpretation based on Cătoiu, 2002 and Adams, 2007)

The research methodology used was a questionnaire-based survey, which was designed to perform descriptive and inferential analyses of the data collected. The questionnaire is a useful tool for identifying risks in the maritime field and is often used on board ships to improve safety practices and to develop operational procedures.

The answers offer a detailed picture of the following aspects, which represent the research objectives:

- the current state of implementation for different maintenance policies;
- maintenance particularities for onboard equipment;
- possibility of improving maintenance to increase system reliability and operational safety;
- variables for establishing the critical level of equipment;
- determination of critical ship system and equipment.

After data processing \, the results will further provide a deep understanding of critical mechanisms and systems on board the ship and their current state regarding operation and maintenance. The research conclusions will be used to develop further risk assessment applications for increasing ships' equipment's safe operation.

The methodology of the research

A survey regarding maintenance policies implemented onboard ships and risk management in ship maintenance was conducted. The research intended to demonstrate that only some risk management methods are used in shipping, and critical analysis for onboard equipment is needed to prioritize maintenance tasks. The research problem is as follows – *What are the current state of maintenance and related risk factors for onboard equipment and what will be the course of action to increase system reliability and operational safety?*

Preliminary conclusion after completing the first stage set the foundation for developing a questionnaire based on the next seven premises:

- P1. the technical expertise of onboard personnel increases with the transition to the managerial level (over 7 years experience);
- P2. on board ships predictive maintenance is applied in addition to corrective and preventive program but not all predictive maintenance techniques are applied on board ships;
- P3. the high technological level of ships implies the adoption of modern maintenance techniques;
- P4. some factors that contribute to the low implementation of predictive maintenance;
- P5. there are risk factors in maintenance that may adversely affect the equipment and safe operation of ships;
- P6. for onboard equipment should be an assessment of criticality for setting priorities in maintenance activities;
- P7. the main risk assessment methods (FTA and FMECA) used mainly in the literature must be applied in practice.

The questionnaire was divided into four sections, with 18 questions, as follows:

- Section I: four questions about respondent profiles and recent activity

- Section II: one question for assessing the level of application for existing maintenance policies and eight statements to determine whether some of the conclusions of the maintenance studies are also valid for naval equipment;
- Section III: four questions for assessing the degree of implementation for predictive maintenance methods for onboard equipment
- Section IV: eight questions regarding risk management in maintenance activities for onboard equipment.

Open-ended questions were used to formulate the answer to achieve the responding specialists' appropriate profile and the maintenance activities' particularities, and closed-ended questions with a single answer, respectively, with multiple answer options.

Identifying and exploiting the interdependencies between the defined variables were analyzed and interpreted using the IBM SPSS Statistic software tools. Thus, based on the data collected during the research, the variables were defined in the IBM SPSS Statistics Data Editor program, the modules "Variables view" and "Data view" resulting in a document with the extension sav that allowed: database management, data recording, variable analysis research and centralization of data in tabular and graphical form. (Pallant, 2011)

The research on the current state of maintenance and risk assessment for on-board equipment was initiated on a sample of 46 respondents, staff with theoretical and practical experience in the maritime field, operational and managerial areas (second officers, captains, chief engineers) and experts in the field of maintenance (engineers, superintendents, university professors) specialists in the field of ship repair, inspectors of naval classification registers. The questionnaire was applied between 01.03-31.03.2022, through the Google Forms platform.

Results and discussion

At the end of the response collection period, the data were added and processed in the IBM SPSS Statistics Data Editor. Five respondents did not provide complete answers to the mandatory questions (sections III and IV), and these data were not processed. The data are interpreted in the same order as they appeared in the questionnaire available at <https://forms.gle/bpZdebqutNdd1G8BA>

Results for the first section of the questionnaire

The purpose of the first section of the questionnaire was to collect data on the profile of the respondents and recent activities in the maritime/shipping industry. The first question was to collect the email address to validate the unique participants because the questionnaire was published online and there could be multiple answers. The results of the next two questions in this section are summarized in table 2.

Table 2. Details about the group sample used for the study

Question	Frequency	Percent
2. Professional experience		
Under 7	9	22%

Question	Frequency	Percent
Between 7 to 15	15	36.6%
Between 15 to 25	8	19.5%
Over 25	9	22%
TOTAL	41	100%
3. Ships age		
Under 7	9	22%
Between 7 to 15	18	43.9%
Between 15 to 25	5	12.2%
Over 25	9	22%
TOTAL	41	100%

Regarding the age of the ships in which they carried out their activity, it is observed that more than 65% have experience on board ships under 15 years, in other words, in most of their professional career they have operated new generation equipment and systems at the time of embarkation, ships with a high degree of technology and safety.

The fourth question, with an open answer, aimed at identifying the types of vessels on which the respondents carried out their professional activity. Given the broad classification of ships, some responses were grouped into the class of special vessels (technical vessels, tugs, military vessels, offshore support vessels) and accounted for 26% of the total responses. The other types of ships can easily fall into the general category of cargo ships (bulk cargo, liquid bulk cargo, containers) and passenger transport. Figure 4 shows the percentage and frequency of the answers provided.

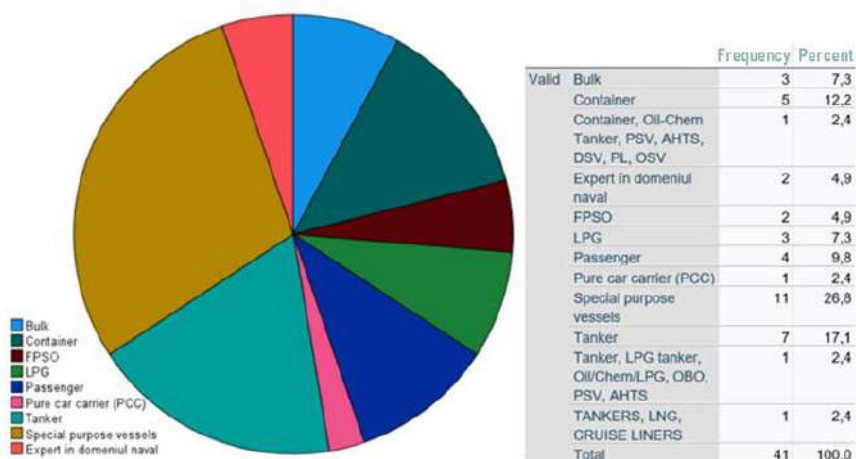


Figure 4. Answer distribution for ship type

The respondent's profile, depending on the vessels' age and experience, can be observed from the data presented in Figure 5. Given that respondents with more than 7 years of experience working on new generation ships (less than 15 years old) represent more than half of the total, we can say that their technical expertise is relevant and provides a detailed image of the maintenance process for ship systems with a high degree of automation. Also, about 30% of respondents worked on ships that carried dangerous goods (oil tanks, chemical tanks, FPSO, and LPG) where legislation imposed high safety standards for onboard equipment and crew training (Figure 4).

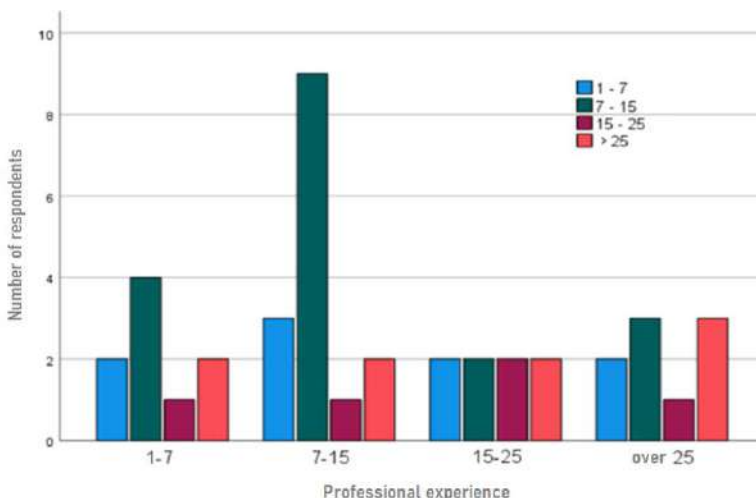


Figure 5. Profile of the respondents

Results for the second section of the questionnaire

The next question assesses the overall level of implementation for different maintenance policies. The process of transforming maintenance into a predictive system is still in progress in this area, and the degree of implementation is different. According to the distribution of answers in Figure 6, the predictive maintenance system is applied mainly to ships 1-15 years old, 27 of the respondents confirmed that there is a certain degree of implementation, as part of the classic maintenance program (corrective and preventive). Simultaneously, there is a low level of implementation for ships over 25 years old, explained by the fact that a large part of them must be upgraded to extend class certificates and operating resources. Additionally, upgrading of some types of vessels (oil tanks, offshore support vessels) must align with the new safety and environmental standards.

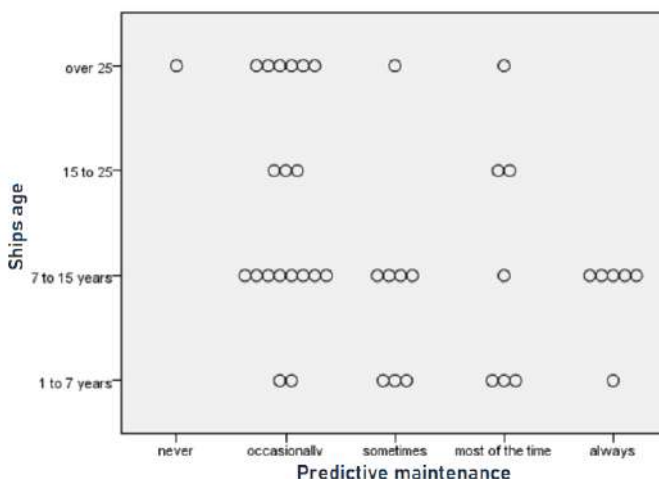


Figure 6. Overall level of implementation of predictive maintenance

The main objective of the second section was to determine whether some of the conclusions of the maintenance studies are also valid for naval equipment and onboard systems. In this regard, respondents assessed, on a scale of 1 to 10, to what extent the eight statements apply in their field of activity. The statistics are presented in Table 3.

Table 3. Response statistics for statements A1 to A8

Statistics	A.1	A.2	A.3	A.4	A.5	A.6	A.7	A.8
Mean	7,51	7,00	5,39	8,59	8,12	7,85	6,39	8,12
Median	8,00	8,00	6,00	9,00	8,00	9,00	7,00	9,00
Mode	7	8	6	10	10	10	8	9
Std. Deviation	2,135	2,711	3,032	2,073	2,064	2,383	2,783	2,088
Variance	4,556	7,350	9,194	4,299	4,260	5,678	7,744	4,360
Skewness	-1,526	-0,807	-0,076	-2,029	-1,463	-1,076	-0,440	-1,677
Std. Error of Skewness	0,369	0,369	0,369	0,369	0,369	0,369	0,369	0,369
Kurtosis	2,678	-0,526	-1,335	3,607	2,464	0,216	-0,893	2,628
Std. Error of Kurtosis	0,724	0,724	0,724	0,724	0,724	0,724	0,724	0,724
Minimum	1	1	1	2	1	2	1	2
Maximum	10	10	10	10	10	10	10	10

A symmetrical distribution of responses (Skewness with values close to 0) is observed for statement A3 - For equipment with a high degree of redundancy (pumps, fans) maintenance can be delayed without significantly affecting the operation of the ship and statement A7 - Works Maintenance performed too often (over maintenance) does more harm than good. The other statements have an asymmetrical distribution of answers, with a negative distortion.

Results for the third section of the questionnaire

This section assesses the degree of implementation for predictive maintenance methods beginning with the seventh question, "Which proactive policies are part of the maintenance program onboard." Condition-based maintenance (CBM) is presented in 20 responses followed by Risk-Based Maintenance/Inspection (RBM/RBI) in 18 responses. At a low level, 11 responses are for Reliability-Centered Maintenance (RCM) and Total Productive Maintenance (TPM). Also, two of the responses are for not applying proactive maintenance onboard.

Next, respondents had to assess the extent to which predictive (proactive) maintenance is part of the on-board maintenance program and the information is summarized in Table 4.

Table 4. Degree of implementation of proactive maintenance for onboard system and equipment's

Evaluation scale	Main engine propulsion system		Generators (DG, TG, SG)		Steering gear		Boilers (steam system)		Compressed air sys., CO ₂ , inert gas	
	No	%	No	%	No	%	No	%	No	%
Poor	1	2,44	2	4,88	3	7,32	3	7,32	4	9,76

Fair	4	9,76	3	7,32	6	14,63	8	19,51	10	24,39
Average	9	21,95	10	24,39	9	21,95	10	24,39	12	29,27
Good	18	43,90	17	41,46	16	39,02	13	31,71	9	21,95
Excellent	9	21,95	9	21,95	7	17,07	7	17,07	6	14,63
Total	41	-	41	-	41	-	41	-	41	-
Evaluation scale	Navigation equipment		Deck systems		Life-saving appliances		Cargo handling equipment			
	No	%	No	%	No	%	No	%		
Poor	3	7,32	2	4,88	2	4,88	2	4,88		
Fair	6	14,63	8	19,51	9	21,95	7	17,07		
Average	11	26,83	14	34,15	6	14,63	9	21,95		
Good	11	26,83	9	21,95	14	34,15	14	34,15		
Excellent	10	24,39	8	19,5	10	24,39	9	21,95		
Total	41	-	41	-	41	-	41	-		

The data confirm that predictive maintenance is applied to various machinery and ship systems, with more than 35% for the propulsion system, electric system, and steering gear. For navigation equipment, we have a low level of implementation, true because of the construction characteristics of this equipment (most of them are non-repairable components and maintenance must be replaced after breakdown).

Analyzing the responses to the ninth question confirmed what most research articles and projects shown, that proactive maintenance can increase the reliability of the equipment. By processing the answers and tracing the histogram in Figure 7, an asymmetric distribution of the answers on the right and an average rank of 9 (on a scale from 1 to 10), which confirms, through the experience of respondents, the true value of this statement for the maritime domain.

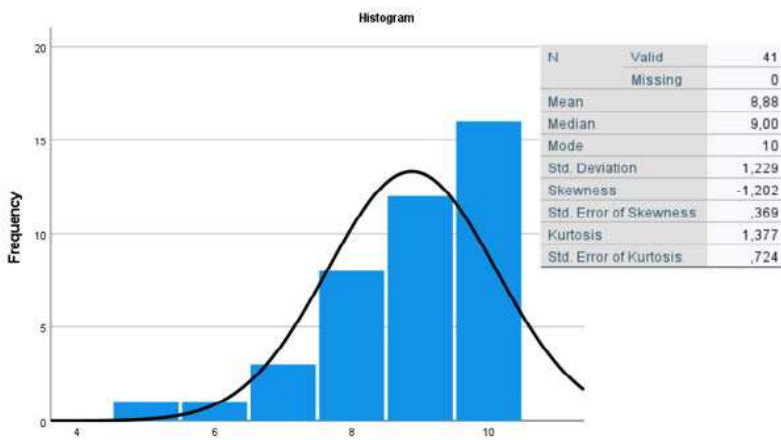


Figure 7. Histogram for question 9

The last question in this section focuses on the factors that contribute to the low level of implementation of predictive maintenance, although the benefits in other areas of activity are significant. Respondents assessed the main contributing factors and the percentage analysis is presented in Table 5.

Table 5. Factors for a low level of predictive maintenance implementation

Factors	Sometimes (%)	Most of the time (%)	Always (%)
Lack of procedures or implementation guidelines	41,46	31,71	2,44
High installation costs	26,82	41,46	17,07
Lack of technical training	36,58	29,26	12,19
Company management	29,26	34,14	17,07
Improper use of condition monitoring data	24,39	24,39	7,31

Results for fourth section of the questionnaire

The last section contains eight questions for collecting data for the detailed stability of certain categories of maintenance risk management. Question 11 proposes maintenance risk factors for evaluation.

By analyzing and evaluating the specific activities in the naval field, three main components of the maintenance system (human resource, maintenance process, and maintenance system) were established and 15 risk factors were identified:

- Risk factors H.1 – H.5 (human resource);
- Risk factors P.1 – P.5 (maintenance process);
- Risk factors S.1 – S.5 (maintenance system).

Thus, following the evaluation of the answers, the average values for the frequency of occurrence and impact were obtained for each risk factor. These values correspond to an average level for both frequency and impact. However, to determine the level of risk exposure in maintenance activities, risk indices were generated as a product of the two elements of each identified risk factor, using the syntax editor of the IBM SPSS Statistics.

Based on the results obtained from calculating the exposure level, the risk profile of the three components was created using two tools specific to risk analysis: a radar diagram (figure 8) and a risk matrix (figure 9).

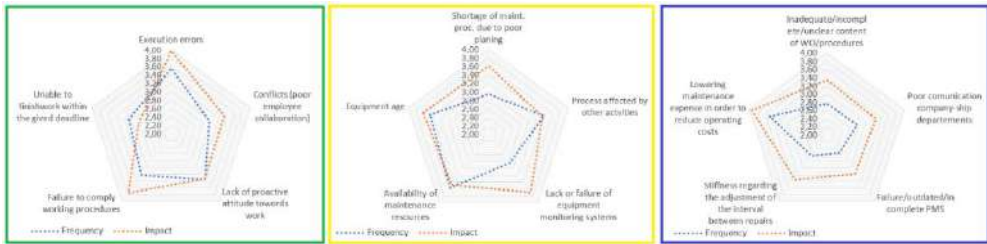


Figure 8. Radar diagram for risk factors (IBM SPSS Statistics)

Using the risk matrix, it is observed how the risks are distributed in the three areas marked using representative colors (green, yellow, and red) to mark the severity of the risk. The average values of the overall risk indices were obtained:

- The human resource component has a frequency of 3.23 (very possible) and an impact of 3.44 (major);
- The process component has a frequency of 3.24 (very possible) and an impact of 3.55 (major);
- The system component has a frequency of 2.83 (very possible) and an impact of 3.40 (major).

The data show a high level of symmetry on the three components of risk for naval maintenance.

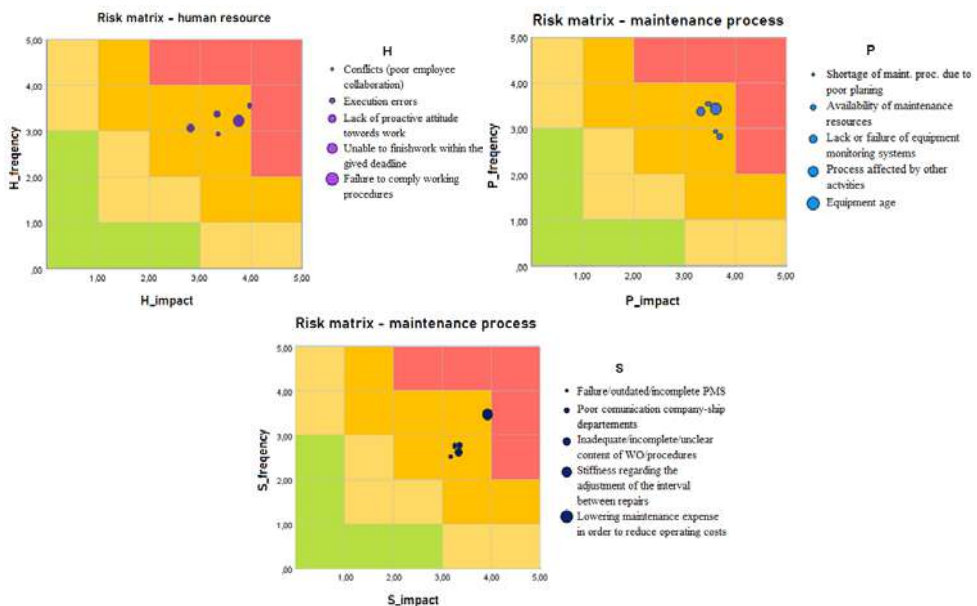


Figure 9. Matrix for risk factors

The next two questions address the criticality analysis issue for naval equipment. The purpose of a criticality analysis is to determine the level of risk associated with each failure as a combination of the likelihood and consequences to prioritize maintenance activities and measures to improve reliability.

Table 6. Critically analysis factors for onboard equipment

Factors	Rarely (%)	Occasionally (%)	Sometimes (%)	Most of the time (%)	Always (%)
Impact on ship operations	-	12,2	7,3	34,1	46,4
Environmental impact	7,3	2,4	22,0	31,7	36,6
Cost of maintenance activities	2,4	12,2	31,7	34,1	19,6
Redundancy level of equipment	2,4	14,6	19,6	39,0	24,4
Cost of equipment	2,4	7,3	29,3	36,6	24,4
Age of equipment	4,9	7,3	31,7	34,1	22,0
Reliability of equipment	-	17,1	26,8	22,0	34,1
Spare parts availability	7,3	4,9	14,6	31,7	41,5
Availability of monitoring technology	-	19,5	17,1	43,9	19,5

Over 80% of respondents said that criticality analysis is used for naval equipment. The five most important factors to consider when ranking equipment in terms of the risk of failure are in descending order of importance, those related to the safety of navigation and environmental protection, diagnostic possibilities, availability of spare parts, and the level of redundancy and similar on-board equipment; the statistical analysis of the answers are presented in table 6.

The following three questions were aimed to identify the main systems and equipment on board, in terms of the following:

- increased failure rate (question 14);
- low-failure rate/high reliability (question 15);
- the impact on the ship safe operation in case of failure (question 16).

Table 7. Statistical analysis of the failure rate for onboard equipment

Factors	Q 14 (high failure rate)		Q15 (low failure rate)		Q 16 (greatest impact on ship safe operation)	
	No	%	No	%	No	%
Main engine and propulsion system	11	13,25%	9	13,85%	23	23,47%
Generators (DG, TG, SG) / main switchboard	13	15,66%	7	10,77%	22	22,45%
Steering gear	5	6,02%	8	12,31%	19	19,39%
Boilers (steam distribution system)	4	4,82%	3	4,62%	5	5,10%

Factors	Q 14 (high failure rate)		Q15 (low failure rate)		Q 16 (greatest impact on ship safe operation)	
	No	%	No	%	No	%
Pressure system	5	6,02%	3	4,62%	-	
Navigation equipment	1	1,20%	-		-	
Deck equipment	4	4,82%	2	3,08%	-	
Life-saving appliances	1	1,20%	2	3,08%	1	1,02%
Cargo handling system (2)	6	7,23%	3	4,62%	7	7,14%
Pumps, valves, fittings (3)	12	14,46%	1	1,54%	3	3,06%
Ballast system	2	2,41%	3	4,62%	2	2,04%
Separators/purifiers	5	6,02%	2	3,08%	-	
Bridge equipment (4)	4	4,82%	6	9,23%	4	4,08%
Other electrical equipment (5)	10	12,05%	2	3,08%	-	
Fire safety appliances (6)	-		5	7,69%	5	5,10%

(1) Compressed air, CO₂, inert gas, refrigeration systems

(2) Cranes, liquid-cargo discharge pump, davit, DP systems

(3) Pumps, valves, fittings

(4) Radar, ECDIS, GPS

(5) General alarm system, auxiliary switchboard, fans

(6) Main fire line

The open-ended questions allow evaluators to develop the best possible answers given their experience and knowledge in this field. The statistical analysis of the answers is presented in Table 7. More than 75% of answers included two or more systems/equipment. Two types of equipment were observed at the top of respondents' preferences: main engine and propulsion system and power generators/power plant.

The reason for including these three questions in the survey was to establish the priority level of the ship's equipment and systems from the perspective of maintenance activities. If the first two questions concerned the failure rate and reliability, several pieces of equipment on board ships are found, the answers to the last question are oriented in three main directions: energy systems (propulsion, electrical, steam), cargo installations, and security systems. Additionally, validates the importance of these systems for safe navigation. In conclusion, maintenance resources and activities should focus on non-redundant critical equipment (the main engine and steering gear are unique on board) and safety navigation equipment.

The section ends with two questions about the main risk assessment methods, FTA and FMECA, used in the literature. The statistical analysis and graph of the distribution of answers are presented in Figure 10.

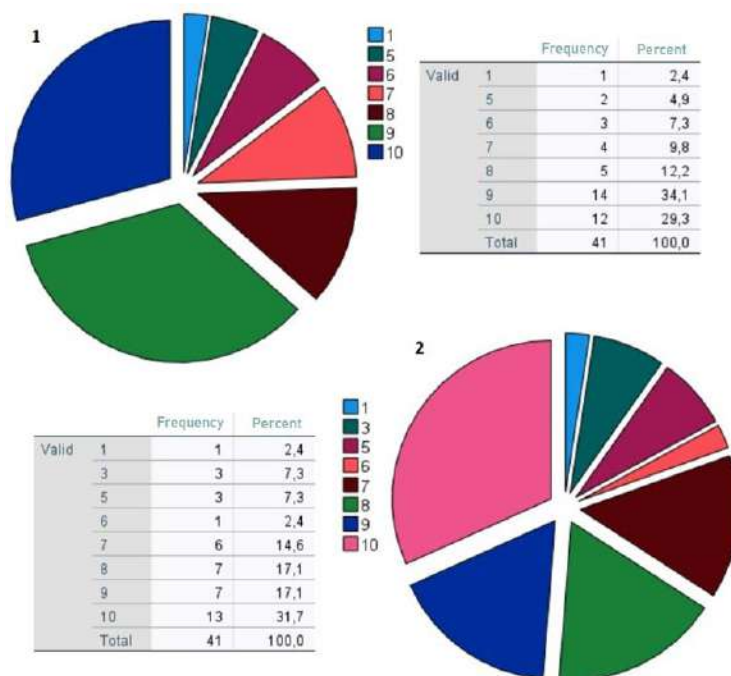


Figure 10. Opportunity to use FTA and FMECA for onboard equipment (17th and 18th question)

Thus, on a scale of 1 to 10 (where 1 represents total disagreement and 10 total agreement), respondents assessed the value of the benefits that FTA and FMECA methods can bring to maintenance (question 17) and the opportunity to develop applications that use these techniques to identify possible ways of failure for the safe operation of the ship's equipment (question 18). More than half of the answers agreed that there are benefits and that they can be used in practice in ship systems by developing dedicated applications.

Discussion and conclusions

The study's results bring to attention details about maintenance activities for onboard equipment using a questionnaire-based survey. The questionnaire structure and content facilitated clear responses from the specialists and validated the research premises.

First, the results show that most of the statements regarding general maintenance are also true for the maritime domain. The highest values are for the quality of maintenance work and resources and for the efficient checklist method onboard ships and in maintenance-related tasks. Questions about predictive maintenance reveal that these methods are implemented on a different level, regarding the type/age of the ships and the importance of equipment on ship operation. Maintenance management should focus on lowering the level of identified factors to adopt predictive policies for most of the equipment. Also, some measures will be needed to adapt the interval between repairs to a better resource and spare parts management.

Second, the risk of maintenance activities was also brought to attention in this article. The results show that all 15 risk factors identified have high values on a low-extreme scale for consequence and probability. Maintaining these factors at a minimum level is important to improve reliability, availability, efficiency, and quality and to protect the environment and personal maintenance.

Another research point was to classify the systems regarding failure rate and reliability and the importance of criticality analysis to prioritize maintenance tasks and resources. Results reveal that maintenance resources and activities should focus on non-redundant critical equipment (main engine and steering gear) and power generators.

The research limitations are related to the relatively small sample of respondents. However, their technical expertise is relevant and provides a detailed picture of the maintenance process for ship systems with a high degree of automation. Also, the questionnaire can be regarded as a pilot study and give a basis for extended research related to shipping maintenance.

Another direction for further research is to identify possible ways for using risk assessment methods, like FTA and FMECA, for the safe operation of the ship's equipment and developing dedicated applications for planning and executing maintenance-related tasks.

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PERFORMANCE RELATED PAY IN EDUCATION – ROMANIAN TEACHERS' STANDPOINT

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Abstract. *The introduction of performance-related pay in educational institutions is debated in many countries. Most of the performance-based educational grids were introduced as pilot programs in which teachers could choose whether they wanted to participate or not, or the schools were establishing their own performance criteria for teacher evaluation. In Romania, introducing a performance-based pay system sparked a wave of debate, especially regarding the evaluation criteria of teachers' performance. Thus, the present paper proposes to explore the opinions of Romanian teachers regarding introducing a performance-related pay system and the possible evaluation criteria that could be used for differential pay. We address the research objectives through a qualitative approach based on 58 semi-structured in-depth interviews with teachers from the pre-university education system in Romania. The results show that Romanian teachers do not have a firm opinion against the introduction of the performance-related pay system, instead, they argue for differential pay while claiming that the implementation of performance-based pay is rather difficult to utopian. The main arguments regard legislative obstacles, and especially the heterogeneity of the Romanian education system. Moreover, the research shows that selecting evaluation criteria is one of the main concerns associated with fears of inequity. Based on the research data, we advance a few recommendations for a possible performance-based pay and add to the literature on issues concerning such a policy.*

Keywords: *performance-related pay, evaluation criteria, education, Romanian teachers' perspective*

Introduction

There is an increased interest in performance-related pay (PRP) programs for teachers in Romania and around the world. This interest in PRP for teachers stems from the desire to improve the quality of educational systems and students' academic achievements (Liang, 2013). Therefore, the adaptation of PRP programs in education represents a subject marked by a multitude of opinions and divided attitudes. Considering this situation, most of the PRP projects were introduced either as pilot programs in which teachers could choose whether they wanted to participate or not or in the aftermath of education reforms, in which schools were given the task of establishing their own performance criteria for teacher evaluation (Lohman, 2011; Checchi & Mattei, 2021).

Romania uses a salary system in which teachers are paid according to the level of education and years of experience in the educational field (Law no. 153/2017 on the remuneration of staff paid from public funds). Discussions regarding the introduction of PRP began in 2019, when the Minister of Education at the time, Ecaterina Andronescu, argued that in the Romanian educational system, it is necessary to introduce a performance-based payment, but the proposal sparked an intense public debate (Peticilă, 2019). Also, in 2021, the Minister of Education Sorin Cîmpeanu returned to this proposal and argued that introducing this type of system is necessary to establish fair compensation in the educational field (Peticilă, 2021). These proposals led to a strong debate, one of the main dissatisfactions with PRP being the idea of rewarding teachers based on the performance achieved by their students. The teachers argued that the students' performance depends on several variables, and the PRP system focuses only on certain aspects (Dolean, 2021).

This paper brings a review of opinions regarding the use of PRP in education, highlighting the main obstacles to the implementation of PRP. Also, the paper presents the difficulties related to establishing performance criteria for teachers. In addition, the research provides useful insights regarding the opinion of Romanian teachers on the implementation and evaluation criteria of a performance-based payment.

Literature review

Perspectives on a pay-for-performance model in education

The idea of paying teachers based on their performance is a topic regularly analyzed in educational reform worldwide (Woessmann, 2011). The interest in this subject is fueled by public pressure and the broader demand for increasing teachers' effectiveness and improving students' educational achievements (Liang, 2013). Performance-related pay is considered a potential incentive tool for teachers, but the constant debates call into question whether the introduction of this type of incentive can be a solution for increasing student performance (Kingdon & Teal, 2002).

PRP is "a compensation system that rewards teachers with extra financial rewards beyond the annual salary raise on the salary schedule for outstanding performance in the performance evaluation" (Liang, 2013, pp. 100-101). According to Lavy (2007), performance-based pay is a salary scheme that depends on an assessment process. The variables evaluated in this process can be schools' or teachers' efforts, their achievements, or the students' measured performance. Thus, performance-based pay

can be organized as a system in which teachers are rewarded for individual performance, as a system based on group-level performance or school-level performance, and in this case, individual performance does not influence the value of the received compensation, because its value is calculated according to the level of group performance (Lavy, 2007; Liang, 2013). However, some studies claim that performance-related pay must be a compensation system based only on the teacher's personal performance (Lundström, 2011).

An efficient system of performance-related pay uses performance targets formulated in accordance with the analyzed position. The set targets determine both the efficiency and equity of the performance-based pay system (Lavy, 2007). Moreover, in the educational field, there are different school environments and different demographic categories, which makes it difficult to establish performance targets that are attainable nationally (Nichols, 2018).

Those who support implementing this system claim that PRP increases teachers' motivation to perform, thus increasing their effectiveness if they receive additional compensation (Hulleman & Barron, 2010). In addition, previous research has reported that implementing the PRP system positively affects students' academic achievements (Figlio & Kenny, 2007). Another reason to introduce PRP in educational institutions is that this system can help recruit and retain more highly qualified teachers. Besides the fact that this program can attract more teachers with outstanding pedagogical skills, research shows that PRP can solve the problem of teachers in certain areas such as mathematics or science (Bueno & Sass, 2018). As for good practices, Breeding, Bêteille, and Evans (2021) analyzed a series of PRP programs from several countries and selected three characteristics related to the design and implementation of successful PRP projects that improved student performance. The first characteristic identified in this regard refers to matching the size of the reward (individual or group-based) and finding the types of incentives according to the context of each country. In this sense, the authors recommend that PRP projects start from a well-documented analysis of the types of incentives that teachers would appreciate the most, incentives can be both financial and gifts. The second characteristic refers to ensuring accountability using multiple forms of teacher performance evaluation, not just by analyzing student scores. Also, the third characteristic refers to the identification of plans regarding the sustainability of the PRP project.

Although such arguments show the positive effects of implementing the PRP system in schools, other opinions support that this type of system is unsuitable for the educational field. The main argument against using PRP for teachers is that this type of payment system would lead to the "commercialization of education" (Lingard et al., 2017). This type of compensation can favor dysfunctional behavior in the case of teachers because they are encouraged to focus only on those rewarded aspects (Lavy, 2004). Besides, the educational system is based on teamwork, while the introduction of PRP can favor decreased cooperation among teachers (Liang, 2013). Additionally, research shows no consistent effects of PRP on the academic achievements of students (Springer et al., 2009; Goodman & Turner, 2013). Therefore, the first research question addressed by the present study refers to:

RQ1. What are the opinions of Romanian teachers on introducing performance-related pay in the education system?

Evaluation criteria for a performance-based pay system

One of the most important aspects associated with introducing PRP programs is setting the performance evaluation criteria. Analyzing some PRP projects from the USA (Lohman, 2011), Italy (Checchi & Mattei, 2021), and the UK (Sharp et al., 2017), it can be observed that the performance evaluation criteria and the definition of merit vary. The PRP system applied in Denver, USA (Professional Compensation for Teachers or ProComp) uses four categories of performance indicators: school and student academic performance and growth, advanced degrees and professional-development activities, evaluation ratings, and market incentives if teachers work in hard-to-staff schools or teach essential disciplines (Lohman, 2011). In this program, the student academic performance and growth indicators are measured by comparing student results with a series of performance objectives set by teachers and school leaders at the beginning of the school year. These objectives can include multiple quantitative or nonquantitative measures: nationally standardized tests, and teacher-created tests, among other data sources. Also, the evaluation ratings obtained by the teachers in this program resulted from the evaluations made by the school administrators (Briggs et al., 2014).

In 2015, Italy carried out an important reform of the education system. The *Buona Scuola* reform introduced a PRP where schools can establish performance criteria. The evaluation criteria introduced by the schools can be classified into three areas of analysis: quality of teaching and contribution to school performance, improvement of students' basic competencies, and teachers' organizational responsibilities (Checchi & Mattei, 2021). Also, a survey conducted in 2015 among schools in England shows that the most used performance indicators are student progress, exceeding teacher standards, contributions linked to the school's self-improvement plan, student attainment, and feedback from students (Sharp et al., 2017).

From an economic point of view, performance monitoring is considered a process that involves significant costs (Langbein, 2010). Thus, in the private sector, as performance is hard to measure as the costs of monitoring performance are increased, performance-based pay is, consequently, less used (Langbein, 2010). In the case of public schools, teachers' salary is not necessarily aligned with their productivity level, as happens in private organizations that operate according to standard economic models in which companies must maintain a competitive salary. Schools are not prone to go out of business if they do not pay their teachers an adequate salary, but performance-related pay represents a retention mechanism for performing teachers (Hanushek, 2011). As PRP programs are costly to maintain and can put pressure on the budget, it is necessary to establish clear performance criteria in accordance with each country's characteristics (Breeding et al., 2021).

Although in Romania an integrated system of PRP has not been introduced in public schools, there is a form of compensation based on merit, called merit grading. This form of merit pay is obtained after a competition to which teachers can apply if they have more than 5 years of experience and have obtained the qualification "very good" in the evaluation carried out by the school inspectors (Ministerul Educației, 2022). Teachers awarded with this merit pay receive a salary increase of 25% of their basic salary. In this competition, teachers are rewarded for their outstanding performances, which are measured in terms of student results, didactic innovation, or the use of technology/internet in the student training process, outstanding student results in school competitions results in preventing and combating school dropout or the integration of students with special educational needs (Ministerul Educației, 2022). The

second research question focuses on the different evaluation criteria used in educational institutions:

RQ2. What criteria should be used for performance-related pay from the perspective of Romanian teachers?

Methodology

The overall research objective is to identify the opinions of Romanian teachers on performance-related pay, especially the reasons for a possible introduction of performance-based pay or the counterarguments, and the criteria that should be taken into account for this type of assessment.

A qualitative method was employed to address the research questions, based on a semi-structured in-depth interview with 58 teachers in the pre-university education system in Romania, in April 2020.

The interviewees are teachers from all forms of education, with or without management positions at the level of the school or at the trade union level. Also, in order to capture the diversity of opinions, we interviewed people from rural and urban areas, from schools in classical and special education.

Most interviewees (43) are women, and in terms of status, most interviewees are school principals (21), union members (19), and union leaders (14). The subjects are predominantly secondary education teachers (18) and high school teachers (16), and 10 of them work in kindergartens. The interviewees are from 16 counties (including the capital, Bucharest), from all historical regions. The shortest interview lasted 20 minutes, and the longest lasted 72 minutes (the average was 36 minutes).

Results and discussion

Teachers' opinions regarding performance-related pay

There has been no strong opinion expressed against performance-related pay at a general level, irrespective of the school's residence environment or the educational level, the position in the hierarchy of the syndicate, or the leadership position of the teachers at the school level. In fact, most of the respondents consider PRP as necessary, but all raised the issue of implementing such a policy which would enable legislative arguments or reasonings related to the Romanian educational system's heterogeneity.

The secondary school principal considers that performance-related pay would be useful because it motivates the employees to be more involved in the teaching activity and harmonizes employee engagement levels. A middle school teacher touches on the issue of auxiliary teachers and non-teaching members, who deal with heavy workloads and can be even more motivated if performance-related pay exists.

Some union members and leaders hold a similar point of view, believing that it is normal for those who carry out more activities and who sign up for different courses to develop their abilities to be paid for their achievements, thus taking into account their professional training as well, not only the activities as such.

However, the idea that the teaching quality differs from one teacher to another is, for some people, hard to accept. A trade union leader affirms that accepting "the performance-related payment means that we accept that some people do their work

better than others, and we cannot accept this when it comes to education. Everything has to unfold very well". But the reality which is emphasized by union members or school headmasters is that some academic members "get involved more or don't get involved at all". Besides the delicate problem of differentiating among teachers regarding teaching quality, a teacher brings to attention the problem of envy between colleagues. As the principal of a highly-prestigious kindergarten affirms, "people are very sensitive when it comes to the financial aspect and possibly, in some schools, this idea may not be very well received and it can lead to animosities between colleagues", thus, affecting the balance of the work environment. This view is supported by previous work on destabilizing cooperation in the educational system (Liang, 2013). Lavy (2009) supports that the nature of the working environment in educational institutions determines the prevalence of the use of salary systems based on group performance compared to those based on individual performance, because the educational process involves teamwork, which leads to the need for a group-level evaluation.

Some research participants affirm that there is already a form of PRP by simply considering the seniority in education, the teaching degree level, or the merit grading pay bonus. Regarding the seniority in education, a syndicate member from a secondary school points out that the last level of payment is for 25 years of experience in the educational system whereas, in the past, it was for 40 years, and therefore, there is no PRP for teachers who have more seniority in education. Some professors consider that since there is already a form of performance-related pay, implementing a performance-based pay system is not truly needed.

Regarding implementing a performance-related pay system, most interviewees consider that even though it might be a useful idea, putting it into practice is a "utopia". A union leader raises the issue of quantifying professors' activities and taking into consideration the heterogeneity of the undergraduate education system. Many arguments relate to the difficulty of finding performance indicators that can capture the diversity of school situations.

Some interviewees consider that the impossibility of putting a differential pay system in practice drifts from the frequent legislative changes, but keep an optimistic view regarding a possible future implementation - "in a few years, we can think about the performance related payment, based on well-established performance-related criteria." These concerns are in line with previous studies (Lavy, 2007; Nichols, 2018).

Differential payment, based on performance criteria, is mostly perceived with reluctance since there is a constant fear related to the fact that the evaluation criteria would favor the schools where students achieve significant performances. A high school principal says implementing this idea would lead to discrimination because teachers who work with good students attain better results. This would create "chaos" as the teachers from the technological high schools will be dissatisfied and will demand to exchange places with their colleagues from high schools with good educational results. We should mention that all the interviewees, including those from highly-prestigious high schools, with students who acquired great educational results, raised the problem of fairness in terms of criteria for performance-related pay.

Overall, we can say that there is generally a favorable opinion regarding performance-related payment. At the same time, there is the fear that this system would generate inequities determined by the evaluation criteria and who conducts the evaluation. Some teachers mentioned that performance-related pay already exists, due to merit grading.

This last aspect was often mentioned by the interviewees, and while some of them perceive it as a form of accurate financial motivation, others perceive it as an artificial method, at the border of fraud and political implications. The discussion related to merit grading reveals opposing views as well. A trade union leader at a central level affirms that the merit grading was “a good solution that the syndicate proposed to the Ministry”, but the problem is that this should be offered based on performance-related criteria, with regard to non-teaching activities as “teachers are already paid for their class activity”. The criteria for this type of salary differentiation are also disputed among the research participants. While some teachers considered that the merit grading should not be given for the teaching activity, some interviewees believe that the evaluation has to be done on the basis of the teaching activity as questionable evidence is provided for other activities and “not all papers conform to reality”.

There are also opinions about the political implication or other external influences on granting the merit bonus. The interviewees connected the merit grading to the so-called bureaucracy (paperwork load), the debatable and subjective evaluation criteria, and the politicization of education. The experience of the merit grading is diverse and explains the mistrust in implementing performance-related pay.

Evaluation criteria for performance-based pay

The interviewees raised many questions regarding the evaluation criteria for a performance-based pay system which emphasizes the fears and concerns of the school personnel regarding equity. The most addressed issue refers to the differences registered regarding the students’ performances when comparing schools from rural and urban areas, technological high schools and highly prestigious schools, and even classes in the same institution.

The respondents have raised the issue of schoolchildren’s interest in learning, parents’ poor material resources, and even the parents’ educational level as important factors that can impact evaluating teachers’ performances. Also, private tutors increase the students’ school progress, making it difficult to assign merits.

The concern regarding the subjectivity of evaluation led to multiple discussions based on the centralization of the educational system, if the criteria should be established on a central level, the same for the entire system, or if the criteria have to be established at the Inspectorate level and even at the school level. With respect to this last point, the teaching personnel discussed the transparency of the evaluation criteria and most interviewees would welcome a mixed system.

Another problem raised by the interviewees concerned whether or not the evaluation criteria would refer to the teaching activities and/or the extracurricular activities such as the involvement in auxiliary projects, courses, committees, administrative tasks, etc. Many teachers consider that the evaluation system should ponder the pupils’ performances, the prizes won at national/international contests, the number of pupils who managed to pass the class especially if they were at risk of dropout or the number of children with special educational needs that were integrated into the class group. The interviewees emphasize the differences registered between disciplines in terms of importance.

Nonetheless, there are both for and against arguments for evaluation criteria based on extracurricular activities and the ones related to class work. Mistrusting the possibility

of correctly measuring the academic personnel's performance concerning the educational objectives represents a hurdle in implementing performance-related pay. This view is in line with the literature and the concerns of a fair system, and also with the fear of enabling a dysfunctional behavior pattern as teachers might start focusing only on the rewarded indicators (Lavy, 2004; Lingard et al., 2017).

Generally speaking, the interviewees without a leading position reckon these indicators should be established at a central or inspectorate level. A high school teacher states that finding the right indicators should be in the Institute of Education Sciences service, which "is no longer taken into consideration as it should be" and suggests that the indicators should be set at a central level. Most interviewees think there should be some general indicators, set by the Ministry and the labor unions, and some individual indicators specific to the school institution, considering the school's needs and development strategy. Beyond finding the right set of indicators, the fear related to the subjectivity of the school's management was often expressed and brought to attention.

The liaisons between different problematic aspects mentioned by the interviewees as interfering with a performance-based pay system can be consulted below:

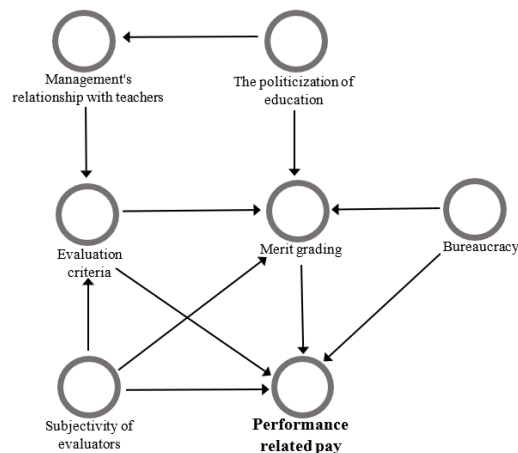


Figure 1. Performance Related Pay - Conceptual Map

Conclusions

Considering altogether the heterogeneity of perspectives regarding the evaluation criteria, the possibility of having a reliable and fair measurement grid, the fear of subjectivity at the school management level, and the varied experiences with the merit grading, a possible differential payment should accommodate all these concerns. Therefore, even though there is openness to having performance-related pay, the implementation raises skepticism among teachers, and a vast communication effort is needed to address the current fears. These aspects are also emphasized by teaching and auxiliary personnel in a survey-based study that tackles the differential pay issue among 3304 respondents at the pre-university level, in Romanian schools (Frunzaru & Ștefăniță, 2021). As Luechow (2008) puts it, such a system's success depends on whether it is viewed as a reward mechanism that can increase engagement and

performance, and not as a punitive or discretionary system that would favor the installation of a sense of injustice.

Considering the research results, we advance further recommendations for implementing performance-related payment. To begin with, performance-related pay should not be the main goal in evaluating the school personnel, but alternatively, inquiring about the reality in order to implement policies for boosting teachers' performances. The criteria must be clear and transparent to present a minimum risk for subjective evaluation, and should remain consistent for a complete evaluation cycle. The set of indicators should consider the wide diversity of situations in regard to the teaching activity such as schools' residence environment, the evolution of students' performances, the number of students in a class, the number of students who have special educational needs, the number of students in the school (for the evaluation of headmasters), etc. The evaluation could consider both the indicators that relate to the teaching activity and those that are connected to the extracurricular activity. A possible system of criteria might be established at a central level. Only part of the assessment can be based on specific indicators developed at the level of educational institutions, eventually with the help of joint committees. All in all, the development and implementation of a performance-based pay system require efficient communication and consultation sessions with all the possible public, beginning with employees in educational institutions and trade unions.

The research could be expanded by including the auxiliary personnel in schools to broaden the perspective on differential pay. The time frame for collecting the data was a limitation of the study as several changes were in place during the pandemic, which could have led to a higher reluctance to change or to a more pessimistic view concerning the possible implementation of a performance-based pay system. Moreover, while the qualitative approach allows for the collection of insightful information, for future research, a quantitative method could add to the database and allow for generalization and data-driven public policies.

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MANAGEMENT OF ORGANIZATIONAL CHANGE IN PUBLIC INSTITUTIONS IN THE DYNAMICS OF INTERNAL AND EXTERNAL SECURITY TRANSFORMATION

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Abstract. *The scientific paper aims to present the organizational change of the institutions in the law enforcement system due to socio-economic factors, legislative policy, and internal or external threats and risks to the state's security as a whole. In the current socio-economic context, characterized by the unprecedented depth, complexity, and pace of technological, social or any other evolution currently taking place, law enforcement organizations operate in a dynamic and complex environment from the perspective of fulfillment / non-fulfillment of the assumed objectives that justify their existence, the ability to adapt to changes in the internal and external security environment has become a fundamental condition for their success and, in most cases, a condition for their good resilience to the impact of changes in the security environment in which they operate. The law enforcement authorities within the Ministry of Internal Affairs are permanently challenged to adapt to these changes and how they carry out their activities. The human perspective in the process of organizational change is fundamental because people in a law enforcement institution, even if it has a strong formal character, strictly regulated by law, everything relates to the human factor, these are those whose behavior determines certain organizational changes that can be made and what expected results will be obtained because of this process. This is due to the fact that organizations of all kinds, including those within public authorities, are first and foremost human systems.*

Keywords: *Management; Change Management; Security Environment; Strategic Leadership; Organization.*

Introduction

The global society acts on the organizations that are an integral part of it, which, in turn, influence its evolution. The interactions are reciprocal and the external and internal security environment, in the case of law enforcement institutions, permanently influences them in the way of development and adaptation to change, so these organizations also change to meet the role of ensuring individual and collective security for which they were created. (Pislaru, 2020)

Change management plays a key role in the process of transformations taking place in contemporary society. Law enforcement authorities are facing major, sometimes fundamental, changes given the innovative technologies and the importance of public service delivery.

As an entity, change within a law enforcement organization involves its connection with the environment in which it acts to achieve its objectives.

Romania's transition from a totalitarian communist status to a constitutional democracy based on Euro-Atlantic values meant, from the perspective of transforming and modernizing law enforcement institutions, components of the national security system, a continuous adjustment of the organizational framework, imposed by socioeconomic factors, economic and legislative policy, as well as internal and external security threats and risks as a whole. In this context, the institutions within the Ministry of Internal Affairs have undergone a process of continuous organizational transformation, as a result of their adjustment to be able to have a certain degree of organizational resilience, of continuous adaptation to the internal and external security environment, so that it can assume the role of a factor of balance and stability in maintaining the rule of law.

The formula for organizational change is based on the following considerations: it is made in accordance with the strategy of the organization and the organizational environment, changes at the organizational level act both individually and collectively, changes at the level of individuals or groups of professionally structured individuals are a specific organizational behavior.

Organizations can undergo transformations in almost every aspect, structural, human resources, objectives, mission, and strategy.

Organizational change in law enforcement institutions is a systemic process, which means their response to the action of external factors but also acts in the sense of internal organizational factors, representing the organizational climate.

Literature review

The scale of the changes in the current security zone, predisposed by global changes, can easily translate into major security threats (eg threats of the current COVID-19 pandemic). The effect can significantly reshape the current security systems, impacting both the internal and external environment of any organization moreover they can degenerate into major crises such as the crisis of some essential sources (food, environmental pollution, energy, etc.). The "golden rule" of organizational change is the process of change, as a result of the accumulation of knowledge at the level of managers who will adapt their own behavior, working methods, and attitudes, in a way that determines the process of change of their subordinates or those in the lower echelons. (Rousseau, 2022)

Methodology

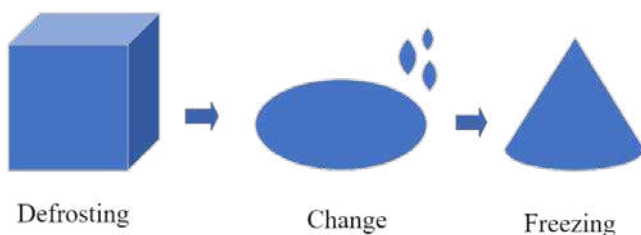
A key method used to understand the change from the perspective of the human factor is the Kurt Lewin model. The basic stage of this model is the advance toward change in which management and human resources begin to implement new relationships, methods, and behaviors. (Stefanco, 2019) Organizational change within law enforcement institutions cannot be applied using a simple model but a number of useful rules can be implemented, an essential condition being harmonizing the measures and processes of the organization's transformation with its activities and management processes.

Results and discussion

Organizational change in the institution of the Mystery of Home Affairs

The magnitude of the changes in the current security zone, influenced by global changes, related to the dynamics of translating some security threats (eg threats of the current COVID-19 pandemic), which had the effect of modifying current security systems, affects both the internal and external environment, taking into account that they can degenerate into major crises such as the crisis of some essential sources (food, environmental pollution, energy, etc.). In such a situation, many leaders of organizations may be left without alternatives in adapting their organizations to the interaction of factors that have the ability to affect the organization, from an economic, social, or political perspective and that may lead to a decisive decrease in responsiveness and resilience of any law enforcement authorities in terms of effectively responding to these threats to the environment in which they operate. Organizations do not change because of a lack of or unstoppable change, but because they are part of a complex system of development and they need to respond to environmental changes, legislative, functional, and other requirements; opportunities, and changes that are imposed by the fulfillment of the purpose for which they were created. (Platon, 2021)

People need to be persuaded to accept the changes, which in the first stage may appear purely technological or structural, but which will affect them irreversibly in some way. Adapting to organizational change also means shaping the human factor from several perspectives such as acquiring new knowledge, implementing and processing new categories of information, and changing the attitude towards the values and objectives of the institution as an organization. The change of values and attitudes is vital in a situation where no real change can be made without the change of attitude of the human resource. (Pîslaru, 2020) A useful concept model referring to the change from the perspective of the human factor was developed by Kurt Lewin, a sequential model, the stages of which are represented in Figure 1.



**Figure 1. Kurt Lewin change model
(mindtools, 2022)**

Defrosting means a state of "organizational unrest" consisting of dissatisfaction, fear, and discomfort. The intensification of this process usually involves a higher degree of tension than usual, which has the effect of the need for change.

The basic stage of this model is the advance toward change in which management and human resources begin to implement new relationships, methods, and behaviors. (Stefanco, 2019) Freezing occurs when the individual who has changed in the context of organizational transformation notices this situation on their own initiative. There are four levels of change as shown in Figure 2.



Figure 2. Levels of change
(Pîslaru, 2020, p. 70)

Changes in the external and internal environment usually impact the change of the human factor in an organization. Changes in the area where an organization operates can positively or negatively impact changes in employee behavior, especially in the Ministry of Internal Affairs, as they are in constant contact with the external environment. (Pîslaru, 2020)

Change management in the institutions of the Ministry of Internal Affairs

Organizational change within law enforcement institutions cannot be applied using a simple model but a number of useful rules can be implemented. An essential condition would be harmonizing the measures and processes of the organization's transformation with its activities and management processes. There is a possibility of competition in the achievement of complex objectives in the event of a shortage of qualified human resources, so that in a short period of time there is a possibility that some people may be required both to plan or prepare for change and fulfill current duties. The situation becomes complex, in organizations that are undergoing major changes, such as in the case of a major structural reorganization or implementation of new working technologies (digitization, automation of processes, etc.). This technology requires a major structural adjustment and a strong point is to prepare the human resources to use new technologies efficiently, without too many errors in their exploitation, and by getting the expected results in a timely manner. (Rousseau, 2022) A second applicable rule is that managers need to establish the concrete change measures that need their guidance and decide on how they will be directly involved in taking action that can underpin the transformation of their own organization.

In large institutions, such as the Ministry of Internal Affairs, top management cannot be directly involved in all changes in the organizational environment, but some changes must be coordinated directly, or appropriate explicit or general solutions must be found in which support can be provided at all levels of the organization. A third rule refers to the various processes of organizational change being harmonized with each other. Sometimes there are situations in which various structural components work together on similar issues (for example the implementation of new technologies for processing and analysis of information), in this situation may come proposals that are not necessary to fit into the general management policy as well as some procedures, standard methodologies or which may require the allocation of very large resources. The fourth aspect presupposes that, in order to coordinate the organizational change, it is necessary to work taking into account its various aspects of technological, structural, procedural, human, psychological, organizational, policy, financial nature etc. This is a fundamental responsibility and the most difficult organizational change management task. This process involves the involvement of specialists who usually try to impose punctual but essentially limited opinions on complex and multidisciplinary issues related to redefining the objectives of the law enforcement organization. The fifth aspect assumes that, in order to coordinate change, management needs to decide on the use of different methods and techniques to approach change that will give a good start to this process, guarantee the defeat of resistance and improve its effects, until full consensus on the achievement of the objectives of change, to guarantee the cooperation of the human factor in the real implementation of change. (Pîslaru, 2020, p. 76) Any stage of organizational change requires a good start to the process. The entities involved in the change have the role of promoting organizational values the innovation, experiments, and the spirit of initiative in the field of activity. For management, these organizational values not only mean accepting deviations from the routine and organizational "tradition", but also accepting that this goal cannot be achieved without considering the associated risks. It also means pursuing a staff policy to encourage and motivate innovation, giving the good ones the opportunity to work, to enhance their professional skills, thus highlighting the very good results of the staff and using those with outstanding performance as examples to indicate the level of performance and achievements of the organization.

According to the literature, it can be said that management functions can be a so-called essence of leadership so these functions could be a necessary and sufficient condition for the proper conduct of management processes as represented in Figure 3.

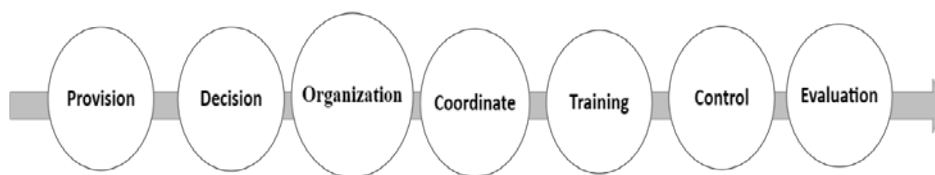


Figure 3. Management functions
(Marinescu, 2019, p. 94)

Training, as a function of management, represents the totality of the work processes through which it determines the institution's staff to participate in setting and fulfilling the objectives, taking into account the factors that motivate them. The role of the training function is to get involved as deeply as possible, as efficiently as possible, and

to achieve the proposed objectives. The foundation of training is motivation, which aims to meet the needs and interests of staff. The quality of staff motivation results in the fulfillment of management functions. Approaching motivation from a modern managerial perspective involves the elements that intervene in the motivation process and the system of material interests representing social needs. In addition to material interests, other non-material elements that influence people's behavior must be considered. By identifying and meeting the needs of each official, participation in work is encouraged and the personal needs of officials in those organizations are synchronized. (Marinescu, 2019) Knowledge is considered to be the intangible resource of the organization and it is more difficult to use efficiently and effectively. Knowledge in an organization aims to provide goods and services for consumers to meet their needs. Knowledge management is represented by the managerial process through which the formation of knowledge is developed and organizational dynamics are obtained, in relation to the organization's standards. (Brătianu & Bejinaru, 2019) Successful knowledge management requires balance and coordination between the top-down articulation of policies, bottom-up cultivation, and the evolution of practices and culture in the workplace. (Caroll, și alții, 2003)

Knowledge management is one of the components of the managerial process, which represents the link between operational and strategic management in an organization. Strategic management aims to make decisions for the future and operational management is characterized by a given time in the calendar year.

The implementation of knowledge management within organizations is characterized by the knowledge that is the dominant resource and their management must form a specific field, cursive and with new responsibilities. In the book *Strategic Management*, the authors define the organization as "a group of people in their own organizational structure, who work together to achieve goals in order to obtain a product or service for a customer." (Oprean & Țițu , 2002, p. 3) One of the criteria for separating organizations is the quality of knowledge, which they use in order to produce something that has value on the market. Therefore, more or less developed aspects of knowledge management are found in many organizations, without gaining the coherence necessary to define a new management process.

Knowledge is the most important intangible resource. People are constantly generating new knowledge, which means that they are inexhaustible, and through their use, they are not consumed. A very important aspect to consider is that human intelligence is the only one that can process knowledge, this activity cannot be done with the help of technology, including computers. Computers only process information or data, while knowledge is generated at the individual level, which has the ability to develop at the group and organizational levels. The vision of knowledge derives from the company's strategic thinking, respectively, from the vision of its managers. Development strategies are based on the vision of knowledge. Efficient leadership is represented by a leadership model well adapted to contemporary society's new requirements (high mobility, permanent reorganizations, the crisis of the traditional values system, and globalization). The leadership style is characterized by the way in which the manager decides to influence other people in the planning, organization, and control process. Leadership style influences the organization in which it is practiced in several directions: the level of intellectual productivity and work of the led group, psychosocial

relationships in the center of the group, group cohesion, subordinate behavior, and level of personal satisfaction of group members with the organization.

Increasing the efficiency of leadership styles is an important concern of the theory and practice of organizational management. Although numerous studies have been carried out in this field, it has not been possible to formulate universally valid principles, the observance or practice of which will certainly ensure increased management efficiency. Forming a foundation to support the functional structure of knowledge management, creating dynamic structures that accelerate the dynamics of knowledge and confirm the use of knowledge management to the long-term economic success of the company.

Strategic leadership in the management of the organization

Leadership is the process of influencing the behavior of others and influencing them to act in a certain way to achieve goals. Strategic leaders create organizational structures, allocate resources, and impose a strategic vision. Strategic leadership refers to the potential of a manager to have a vision for the organization and to motivate the organization's members to accept this vision, the main benefit being productivity. (Tonie, 2016)

Leadership involves overcoming the professional duties of the job in order to influence the behavior of others.

Managerial education is the most representative block of knowledge based on conceptual skills. A manager must have a solid knowledge of management models and techniques and the different ways of organizing, planning, deciding, and controlling. A good manager must have psycho-pedagogical knowledge, general knowledge, technical knowledge, and the ability to understand the trends of major change.

Leadership is the essential element of life, the key strategic element in streamlining the organization. Life is also part of an organization, for which the organization and management of work is an objective necessity. (Frunzeti, 2013)

The success of organizations is influenced by how they lead, by the efficiency of talented leaders and those imaginative people, full of perseverance, and curiosity, focused on ideas, able to encourage diversity, and with a continuous willingness to turn the vision into reality. (Tonie, 2016) Messages to be persuasive, to be decoded by the consciousness of the recipient of the communication, must use human terms, not technical, to obtain a connection with the recipient of the message. In order to formulate such messages, communicators have a duty to manage their emotions and to have a series of personal and interpersonal (social) emotional traits.

In conclusion, the emotional state of the team is consistent with the emotional state of the leader, a phenomenon known as "emotional contagion" and thus influences motivation, absenteeism, performance, stress, and exhaustion. The positive link between the leader and employee communication presupposes the leader has emotional and social skills. A first competence would be the ability to meet the difficulties employees face both at work and in private. People relate in order to satisfy each other's need for friendship, collaboration, support, etc. The strong point of a positive relationship is the reciprocity in satisfying these needs, which is why it is necessary to identify them by understanding their own emotional states and those of the interlocutor.

Another aspect of the strength of a relationship is the exchange of information related to emotions and feelings. This connection represents more than sharing information that refers to facts, data, figures, names of people, etc. Interaction also involves disclosing personal information with an impact on the relationship and purpose of communication, through self-disclosure, listening and interactive speech, and giving and receiving feedback. Simple, honest, human language is relevant in the relationship with the interlocutor, it influences his ability to react and in turn, influences the ability of the person who initiated the communication to react. Knowing this mutual influence, the emotionally intelligent leader will have the opportunity to anticipate the interlocutor's manifestations and will adapt his message to the advantage of the relationship with employees. Leadership involves an attitude that, in difficult, uncertain situations, such as the COVID-19 pandemic, must act through controlled vulnerability (relevant to the purpose) and truthfulness. Awareness of our behavior and empathy define us and make us good partners, leaders, and core members of society. Emotional, personal, and interpersonal intelligence is a key element in forming more self-aware and empathetic leaders, who are aware of all interconnected connections and ensure the systemic well-being of all, by being better communicators.

Emotional intelligence can be defined as the ability to control, be aware of, and manifest personal emotions, and coordinate interpersonal relationships effectively and empathetically. (Goleman, 1998)

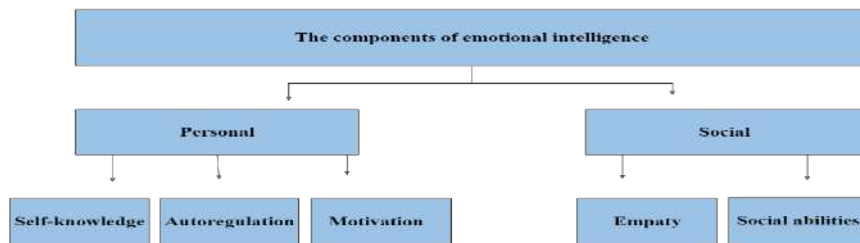


Figure 4. The model of emotional intelligence after Daniel Goleman (Bitcă, 2019, p. 110)

The COVID-19 pandemic had an effect on the emotional states of both employees and managers, suggesting that mental resilience and the ability to return in a short time from stress and trauma, has a positive impact on job satisfaction and involvement, for the welfare of the organization. Emotional intelligence manifests itself in adaptability, emotional intelligence, and social style. The management of employees' human, social, and mental resources is based on understanding how they think, act, and react to properly coordinate how we behave. The aim is to obtain an atmosphere that offers employees well-being, resilience, and performance at work. (Cândeia, 2021) Managerial experience starts with professional experience. A very important aspect of managerial experience is the position's stability. Psycho-pedagogical knowledge is determined by the fact that the manager does not directly solve the organization's objectives but through people. From this point of view, he needs human knowledge and skills in order to be able to determine the subordinates to do what he wants. Practicing management in a modern organization involves a high level of language, a well-developed vocabulary,

and a good perception of the use of concepts and theories. Scientific research work, inseparable from this activity, shows that the intellectual level associated with the profession involves having an advanced level of knowledge that allows expressions to be understood by other people, who usually have a simpler view of the organization and its purpose in society, technical knowledge or concrete aspects of the work they lead. Increasing the company's interest in managerial responsibility and ethics is another aspect that managers need to understand. Also, the leadership process involves having several skills. Conceptual skills: the manager's ability to see the organization as a whole, to know the position of each department in the organization, of the organization in the community, and the ability to think strategically and make long-term decisions. Human skills: the manager's ability to work with and through people, to be effective as a member of a group, to motivate people, and to get involved in conflict resolution. Technical skills: understanding specific tasks, knowledge of methods, techniques, and equipment involved in production, finance, or marketing. (Tonie, 2016, p. 83) It is important for the manager to have all the knowledge in these areas necessary to form an effective style. (Alimo-Metcalfe, Alban-Metcalfe, Bradley, Mariathan, & Samele, 2008) Manager training requires a multi-level leadership style. A manager with poor professional training will choose mainly an authoritarian style, avoid consulting his collaborators, be surrounded by incompetent collaborators, and be influenced by the upper echelons. A manager without knowledge of interpersonal relations will not consider these aspects and will focus on the technical-productive aspects, of the objectives. A competent professional manager will have the opportunity to recognize the professional skills of subordinates, will consult them, and propose the promotion of those competent. A manager with sufficient knowledge in the field of social and human sciences will aim to create a pleasant working climate, his activity will be focused not only on the technical-productive objectives, but also on the social-human ones. (Pendleton & Furnham, 2013, pg. 1-14) Taking into account certain personality traits and under certain social conditions, knowledge of social sciences and leadership can lead to a benevolent, democratic, or technocratic style and the manipulation of social and human aspects in order to maximize production results. As with other factors, the influence of training level on leadership style must be correlated with the influence of other personal and situational factors.

Conclusions

Organizational change, at the level of conception and managerial action, within the authorities of the Ministry of Internal Affairs, must ensure continuous organizational transformation through knowledge and their adaptation to the environment of action, based on the adoption of strategies, programs, procedures for organizational transformation, with the principles of the rule of law and law enforcement, the adoption of objectives and missions that correspond to their structural and human resources policy dimensioning.

Adopt measures to improve the management of organizational transformation, comprising mainly:

- ✓ a coherent legislative policy, which should provide the legal framework for organizational change;
- ✓ the adoption, by the persons with management and coordination functions from the Ministry of Internal Affairs, of an anticipatory,

participatory managerial behavior, of management and organization of specific work, as well as of promoting well-trained, well-motivated human resources to ensure resilience organizations in the field to any major change in the security system;

- ✓ active participation of civil society, through its leaders, in the initiatives of organizational change of the institutions of the Ministry of Internal Affairs, in the hypothesis that it can contribute to adjusting the objectives and mission of these organizations in the spirit of promoting universal values of protection of fundamental human rights and freedoms. law enforcement.



Ideally, a manager should configure his or her leadership style according to the circumstances. This is not usually the case in most organizations. Most managers remain in a certain leadership style, regardless of the situation. A very important aspect is the flexibility of the leadership style for a successful manager. Knowledge of leadership styles, from different perspectives, is a benefit for a manager. First, it gives them the opportunity to identify their weaknesses and strengths. Secondly, it allows him to understand the behavior of employees. Although it is difficult for a leadership style to reach perfection, it can tend to crystallize such a style. In general, the differences are made according to the best marketing formulas, but in the end, it is the leadership that makes the distinction between successful organizations and those that face failure. The activity performed must not only be additional, and diligent, but intelligent, ingenious, and different.

The success of a change that transforms the organization will depend on its leader's vision in relation to developing a strategic plan.

Standard models, especially those of specific command and control in the Ministry of Internal Affairs, simply do not work. Group leaders must act decisively, but never arbitrarily. They must make decisions without limiting the autonomy perceived by the other participants.

Creating and maintaining an atmosphere where others can leave their mark on the universe is the creative act of the leader. The leader understands and puts into practice the power of appreciation.

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7

Towards Sustainable and Digital Organisations and Communities

ARCHAEOLOGY AND SUSTAINABLE DEVELOPMENT IN THE PUBLIC EYE

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Abstract. *Researchers have pointed out that public perception of archaeology has generally changed in the past few decades. Increasingly archaeology has been credited with the capacity to contribute to sustainable (local) development in many ways. It contributes mainly to increased prestige for the community, social and cultural development, and attracting investments leading to more prosperity. Controversial relationships could be observed also between archaeology the infrastructure investments. All these dynamics determine certain perceptions of archaeology in the eye of the wider public. The present paper covers a gap by documenting how the Romanian public perceived the contribution of archaeology to sustainable development. Quantitative research at a national level, comprising both the general public and archaeologists, has been developed to shed light on four aspects: evaluation of archaeology, perceived contribution to sustainable development, the relationship of archaeology with investments, and the personal relevance of archaeology. The findings reveal a positive evaluation among archaeologists, women, and young respondents. On specific aspects, some regional differences also have been identified. Archaeology as a science tends to be more appreciated as the actual impact that archaeology might have on contemporary society and sustainable development.*

Keywords: *archeology; archaeology and society; sustainable development*

Introduction

Archaeology might seem a very specific domain, relevant only for the people working in the field, or for those with special interests in archaeology or history. Still, the development of contemporary society, as well as the interest in the past makes it relevant for the wider society, with many types of implications and interactions, having in mind economic, social, cultural, and political implications (Meskell, 2002; Smith, 2004; Pyburn, 2011; Atalay, 2012; Atalay et al., 2016). We would mention only a few arguments here.

The EU-financed infrastructure programs, as well as various public or private construction investments, are rapidly changing the landscape of Romania and will, therefore, impact the archaeological and immobile cultural heritage. We believe that public awareness of archaeology and its role/importance will become important, influencing these investments and how the public sphere is designed. The great issues in public perceptions of archaeology are first concerning preservation (integrating cultural management into every form of planning and development in both rural and urban contexts and the control of excavations) and second concerning fulfilling public interest in archaeological objects/ places/ excavations. A particular aspect of the former is that public awareness can limit the big business impact on the archaeological landscape. Big builders (realty developers, infrastructure tycoons, etc.) often see archaeological discoveries as a nightmare that delays their projects and increases their expenses. If done properly, big business can have a positive impact on archaeology. In countries such as Spain or England most rescue excavations are undertaken by private companies whose qualified workforce can only be maintained by continuous employment in the private sphere. In other countries, there is little hope of maintaining such an expensive qualified workforce.

Another aspect we mention is that there seems to be an ever-increasing interest in archaeology and history. Documentaries, historical films, books, or various products (such as games, and clothing) inspired by the past are increasingly numerous. Re-enactment festivals and organizations seem to be increasingly popular, with more people attending the events and more volunteers/associations of amateurs involved. This evolution is probably the cause of the increase in public awareness of archaeology and the perception of its relevance to society.

Considering this context, there is increased interest in mapping the perception of archaeology by the wider public. For instance, in the US, a complex survey nationwide developed by the Society for American Archaeology (Ramos & Duganne, 2000) was structured into four sections: awareness, perceptions, and knowledge; interest and participation in archaeology; importance and value associated with archaeology; and attitudes about conservation, laws, and management. The study revealed that archaeology is perceived as valuable and relevant for understanding society, even shaping it with a scientific and educative value, but is less relevant for the economy (Ramos & Duganne, 2000, pp. 25-26, 31-32). The most comprehensive and largely implemented survey was developed under the NEARCH project for the EU in ten countries (Marx, Nurra, & Salas Rossenbach, 2017). It investigates the perception of archeology and its role, how respondents related to archaeology, and how archaeology contributes to economic development. This survey has been considered the base for our investigation, allowing us to better contextualize Romanians' opinions within the EU.

Seeing public awareness as a process rather than a definitive result opens new paths to explore the ways and means that influence the construction of public perception of archaeology in a changing society. The way in which we look at the importance of preserving and communicating about archaeological heritage has widened during the last decades, integrating topics related to current concerns of societies. In other words, the public perception of archaeology changed alongside archaeology as a discipline. Delving into how the general public regards archaeology and its purposes is therefore relevant to any conversation about the core values of the discipline and about sharing its results with the general public and future generations. To this end, we organized the

present study around four main current conversation themes related to public perception of archaeology and its link to sustainable development aiming to shed a light on this topic in the case of the Romanian public.

Literature review

Commonly, there is a perceived contradiction between archaeology and economic development (Marliac, 1997). While archaeology and history are credited with being relevant to identity, knowledge, and connecting people and communities with their past, they are also subject to being used to manipulate the public and partisanship, despite their scientific profiles. At the same time, archaeological capital could be valorized to increase the community's prestige, determine social and cultural development, and attract various investments leading to more prosperity. Therefore, we could consider different scales to evaluate the value of an archaeological site and its contribution to communities and economies.

Public awareness concerning the preservation of archaeological heritage might be considered as old as the discipline of archaeology (in its modern understanding). The invention/construction of archaeological heritage gained momentum during the 19th century through a combination of cultural and political actions aiming either to legitimate the interest of various powerful European nations in "classical antiquity" or, in the case of smaller nations, to share the effort in building-up national narratives based on a common past whose existence had to be proven by all kinds of archaeological evidence supporting claims of precedence and ancientness of such and such people in a given territory (Diaz-Andreu, 2001; Murray & Evans, 2008). It follows that public perception about what archaeology is supposed to be, and is supposed to stand for, had evolved alongside the discipline itself. Actions such as displaying archaeological artifacts in museums in order to convey larger narratives (Moser, 2003), publicizing archaeological findings in media (both old and new - Ascherson, 2004; Clack, 2007; Wahlgren & Svanberg, 2008; Huvila, 2013; Maldonado, 2016) and also in school textbooks (Ruiz-Zapatero & Alvarez-Sanchís, 1995; Davis, 2000; Vijand, 2018) and including archaeological sites in larger visitor attraction programs (Della Corte et al., 2009; Poria et al., 2011) had their contribution to the construction of a degree of public awareness in relation to the preservation of archaeological heritage.

Sustainable development and broader benefits derived from the existence of an archaeological site nearby a community/city are now often at the core of many studies and experiences involving activities such as field research and preparing/managing an archaeological site for touristic exploitation, both in south-eastern Europe (Musteață, 2020; Nikolić, 2011; Lazarević et al., 2022), as well as in other parts of the world (Fleming, 2014; Repetto Málaga & Brown, 2019; Hemo, & Linn, 2017). No surprise, the more prestigious the site, especially if included on the World Heritage Site list, the more consistent the socio-cultural and economic benefits for locals and tourists (Zbucnea, 2020). Additionally, archaeologists have been credited with being independent mediators and facilitators between communities, residents, tourists, and various stakeholders (Pacífico & Vogel, 2012). Getting together all the stakeholders of an archaeological site is no simple endeavor considering their diversity and various interests (Zbucnea & Anghel, 2016). Therefore, although many options for managing an archaeological site are available to mediate the public's access to its value, finding and implementing the right mix is a great challenge (Zbucnea & Anghel, 2016).

Closely related to the benefits of investing in archaeology are the efforts to research and preserve findings made during large-scale infrastructure projects that unearth previously unknown human sites (most often prehistoric settlements or burials) as well as ruins or human remains in known locations (including early modern buildings, industrial sites, modern war sites, etc.). Established and organized under the framework of the la Valetta Convention in 1992 (Novaković & Horňák, 2016) and known under different names - rescue archaeology, salvage archaeology, preventive archaeology, or even development lead archaeology (Demoule, 2012, Novaković & Horňák, 2016; Watson & Fredheim 2022) these activities have produced massive amounts of knowledge about past societies, visible everywhere, from publications to large museums and accessible archaeological sites. They also contributed a lot to increase public awareness of matters related to archaeology (Hofman & Hoogland 2016). Sometimes framed by the media as a break to infrastructure development or a financial burden whose benefits are unclear (Sloane, 2021), preventive archaeology had a major impact on the profession. It is worth investigating its contribution to conveying a more nuanced image of archaeology in public opinion.

Last, but not least, archaeology appeals to individuals on a personal level. This personal dimension also alters public perception. Two main themes are lately part of the general conversation around how archaeology can actually contribute to a larger impact on people's lives: the quality of life and its attractiveness for tourist-related activities (Timothy & Tahan, 2020; Walker & Carr, 2013).

Methodology

All these topics have been grouped into four main themes and explored, the scope of our investigation being to document the perceptions in Romanian society related to archaeology's role in sustainable development. The study aims to observe several dimensions associated with this topic:

RQ1: How is archaeology generally evaluated when considering its relationship with contemporary society?

RQ2: Does archeology contribute to sustainable development, in the view of Romanian society?

RQ3: What is the relationship of archaeology with the investments and realty developers, according to the respondents?

RQ4: What is the personal relevance of archaeology, in connection with the quality of life, in the view of the respondents?

For each dimension, several items have been considered, as presented in Table 1. Each item was tested using a 5-point Likert scale, where 1 represents the minimum/negative evaluation while 5 represents the maximum/positive measure.

Table 1. Items investigated

Research question	Item	Scale
RQ1	Utility	How do you rate the utility of archaeology?
	Present-day relevance	When you think about archaeology, how do you rate it in relation to its degree of present?
	Utility for society	How do you rate the general usefulness of archeology to contemporary society?

	Importance	Personally, you would say that: Supporting and developing archeology is important to my country.
RQ2	Sustainable development	Evaluate to what extent you think archeology contributes to the sustainable development of an area, local or national economy.
	City advantage	Personally, you would say that: The existence of archaeological remains is an advantage for a city.
RQ3	Priority	Personally, you would say that: Construction of roads and buildings should be delayed when archaeological remains are found nearby.
	Preventive archeology	Personally, you would say that: Preventive archeology supports economic investment rather than heritage conservation.
RQ4	Life quality	Rate to what extent do you think archeology contributes to the development / improvement of the quality of life.
	Tourism relevance	Personally, would you say that: Archaeological sites are very attractive tourist attractions for the general public.

The survey aims to observe if there are significant differences between the general public and archaeologists & professionals in the heritage field.

The questionnaire has been pre-tested and then filled in during August 2022. It was distributed online, mainly via Facebook, and on numerous FB groups dedicated to archaeology, tourism, or heritage. A national sample has been considered, comprising of 412 respondents (table 2). As the respondents were voluntary, it is assumed that they were, from the start, positively predisposed toward archaeology.

Table 2. Structure of the sample

		Frequency	Percent
Gender	Woman	165	40.0
	Man	247	60.0
Age	18-24 years	26	6.3
	25-34 years	77	18.7
	35-44 years	121	29.4
	45-59 years	159	38.6
	60+ years	29	7.0
Education	high-school at most	64	15.5
	Undergraduate	121	29.4
	Postgraduate	227	55.1
Residency	Bucharest and the metropolitan area	158	38.3
	Muntenia, Oltenia, Dobrogea	89	21.6
	Moldova, Bucovina	55	13.3
	Ardeal, Maramureş, Crişana, Banat	110	26.7

We mention that more men answered voluntarily the questionnaire, which is contrary to the usual behavior for online self-administered surveys. It suggests that the topic of archaeology is stimulating men more than women. We also observe that adults aged 35-59 are more interested in the topic than other age categories. Additionally, regarding geographical distribution, we registered more respondents from Bucharest and its metropolitan area, as well as from Transylvania and Banat. Nevertheless, overall, the sample is quite balanced, and the number of respondents is high enough. Even if it is not

representative of the entire population, it reflects the opinions of those who are to some degree interested in archaeology, lay persons, or professionals.

Considering the professional status, archaeologists, historians, and professionals in heritage preservation present some differences from the general public. This group includes more women; it is more educated and tends to be older, as presented in the bar charts in Figure 1 below. The number of professionals in heritage consists of 132 respondents, representing 32% of the total sample.

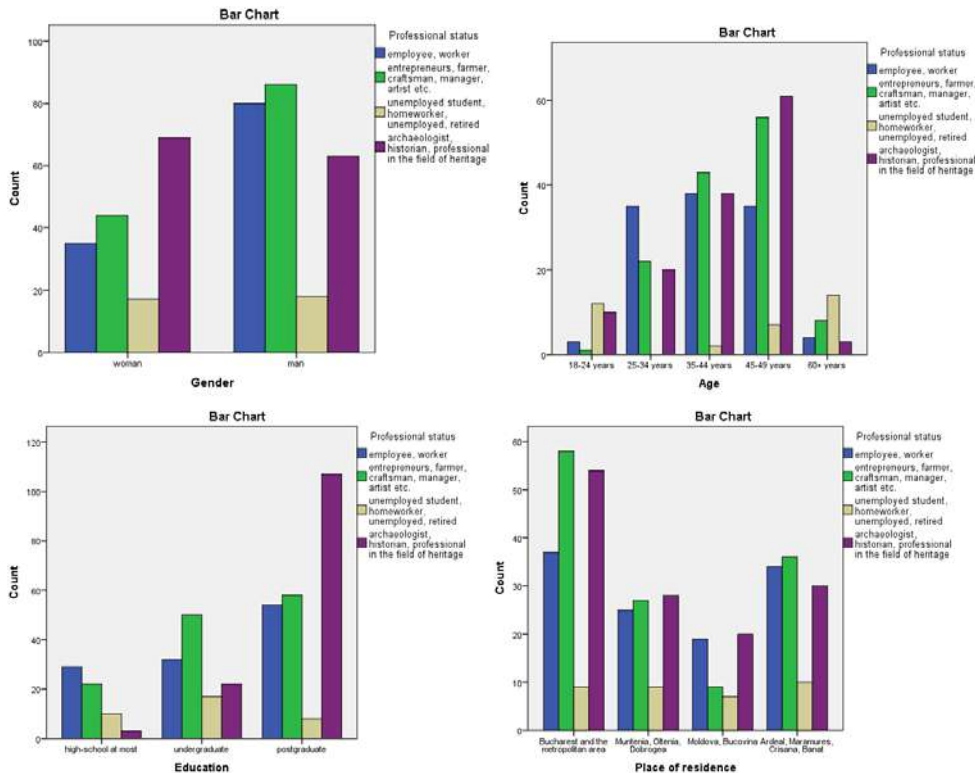


Figure 1. Structure of the sample, by professional status

Analysis of findings

General evaluation of archaeology

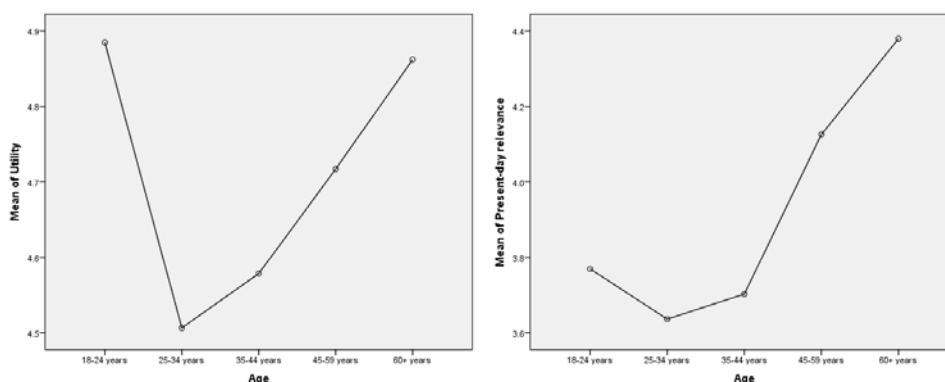
All respondents consider that archaeology is an important concept, as revealed in Table 3.

Table 3. Descriptive statistics presenting the view on archaeology

	N	Minimum	Maximum	Mean	Std. Deviation
Utility	412	2	5	4.66	.659
Present-day relevance	412	1	5	3.91	1.156
Utility for society	412	1	5	4.23	.958
Importance	412	1	5	4.59	.780
Valid N (listwise)	412				

We observe that the abstract utility is perceived as being higher than the actual practical utility. Also, it is interesting to mention that the importance of safeguarding archaeological heritage is perceived as a little higher than its practical utility. Women received that the present-day relevance of archaeology ($M = 4.13$, $SD = 1.043$) higher than that reported by men ($M = 3.76$, $SD = 1.205$), with T test score $t(410) = 3.221$, $p = .001$. Similarly, women consider that the utility for society ($M = 4.41$, $SD = .883$) is higher than that perceived by men ($M = 4.11$, $SD = .989$), with a T-test score $t(410) = 3.070$, $p = .002$.

The ANOVA test showed significant differences in the utility and actuality of archaeology by age (see Figure 2). We mention that differences between age groups are registered for all investigated variables, but they are not statistically significant.

**Figure 2. Means plots for utility and present-day relevance**

In terms of educational level, the only statistically significant difference has been registered related to the perception of archaeology's present-day relevance (Figure 3). The more educated the respondents, the more they consider that archaeology is connected to contemporary society. We also mention that the more educated tend to consider archaeology more useful for society, but the differences are not statistically significant.

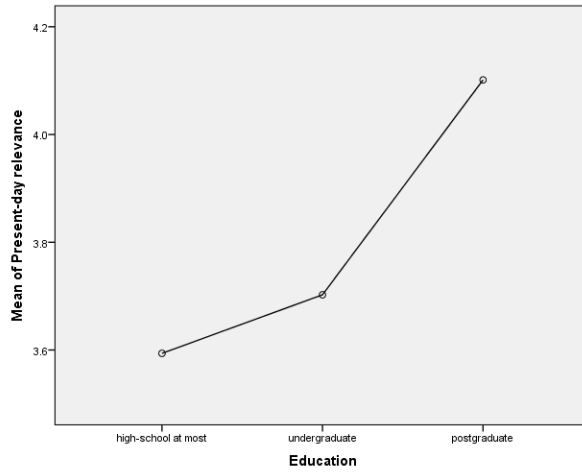


Figure 3. Means plot for present-day relevance

Some significant differences in perceptions are also registered among respondents considering their residency (Figure 4). Generally, respondents from southern Romania evaluate higher all dimensions investigated than the rest of the country.

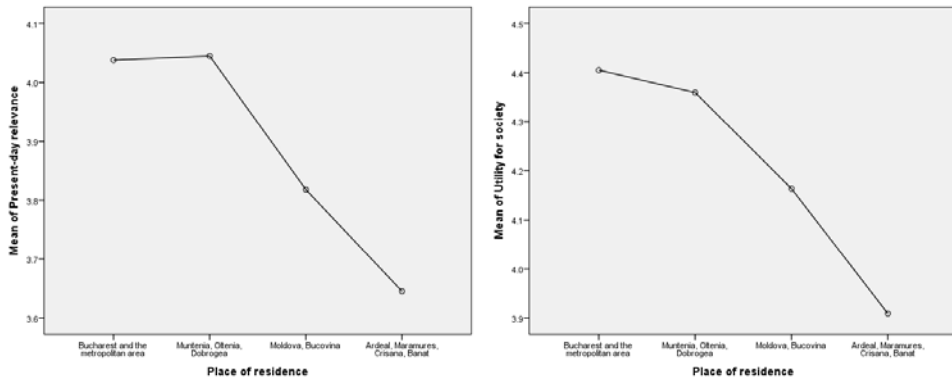


Figure 4. Means plot considering the residency place

When considering the professional status, Archaeologists and other professionals in the field of heritage tend to have higher scores than the other groups. The highest differences are generally in reports with entrepreneurs, managers, artists etc. See Figure 5 for details, considering that the relevant statistical differences are mostly in relation to the Present-day relevance of archaeology.

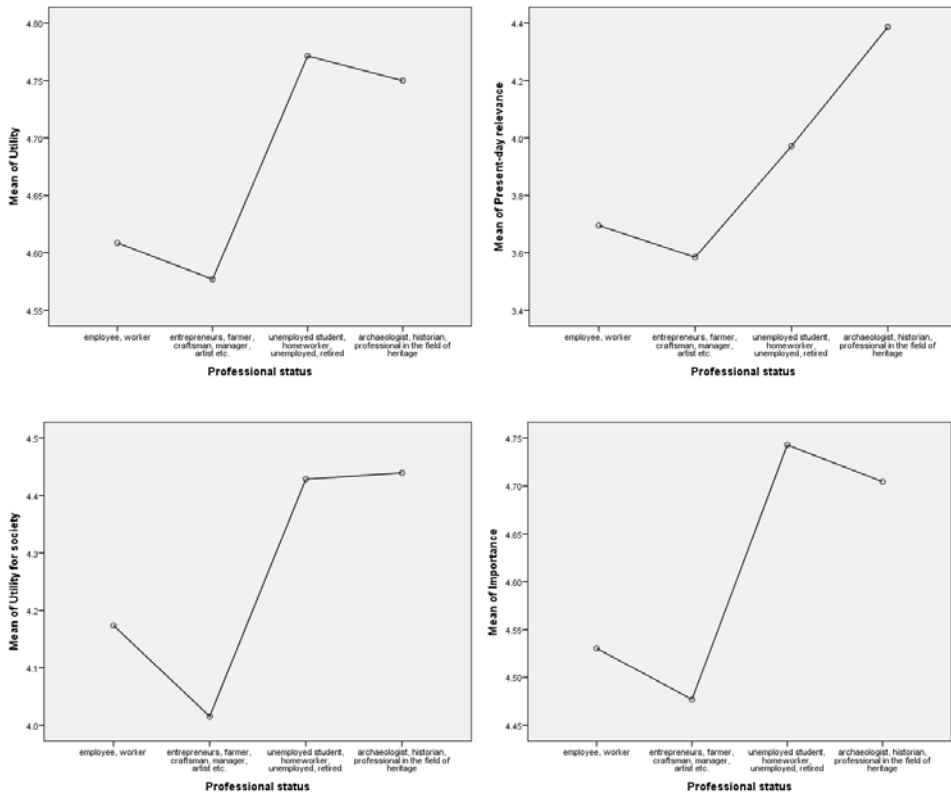


Figure 5. Means plot considering the professional status

Lastly, we document medium correlations among all the four items investigated, with the strongest one between the perceived utility for society and importance to support and development (Pearson’s $r = .54$).

Archaeology’s perceived contribution to sustainable development

We tested two items: a general evaluation of the contribution of archaeology to sustainable development and the advantages that archaeological heritage would have for a city. Table 4 shows a positive evaluation in both cases, especially considering the actual advantages for a city.

Table 4. Descriptive statistics presenting contributions to sustainable development
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sustainable development	412	1	5	3.78	1.206
City advantage	412	1	5	4.63	.738
Valid N (listwise)	412				

The two items are mildly correlated to each other (Pearson’s $r = .42$). They are also positively correlated especially with the declared utility for society and importance of development. The correlations are a little stronger in the case of city advantages, especially connected to the perceived importance (Pearson’s $r = .64$).

Archaeologists and other heritage professionals tend to evaluate the impact more, especially compared to entrepreneurs and managers, etc., as presented in Figure 6.

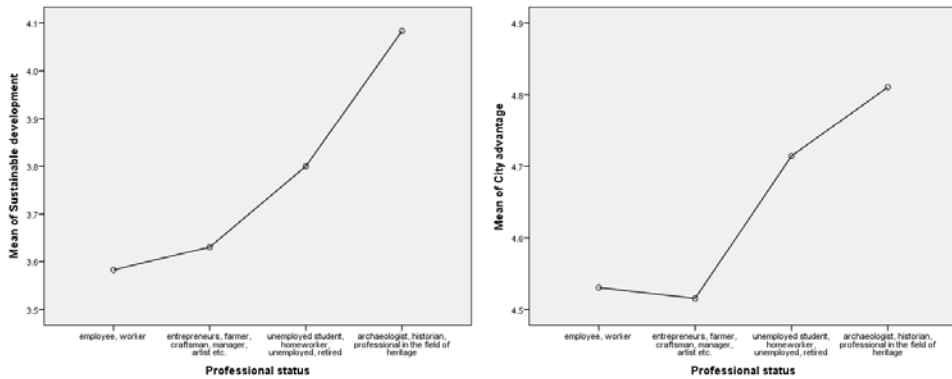


Figure 6. Means plot considering the professional status * contribution to development

Gender is a factor influencing the evaluation, with women being significantly more appreciative than men (see Table 5).

Table 5. Perceived contributions of archaeology to sustainable development by gender

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Sustainable development	woman	165	4.06	1.040	.081
	man	247	3.59	1.272	.081
City advantage	woman	165	4.75	.657	.051
	man	247	4.55	.779	.050

Age does not statistically influence the evaluation, although there is a tendency for the youngest and the oldest to evaluate the two dimensions. Education is not a significant influencer, as is the place of residency. We only mention that the greatest differences in evaluation are registered between respondents from Bucharest and the surrounding area compared to those living in Transylvania and Banat.

Archaeology and investments

We considered two dimensions. One is the perceived priority – either archaeological research or constructing roads and buildings. The second is the perception of preventive archaeology’s role in supporting economic investments rather than conservation of archaeological heritage. Results are presented in Table 6.

Table 6. Descriptive statistics presenting the relationships with investments

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Priority	412	1	5	4.21	1.114
Preventive archeology	412	1	5	3.01	1.293
Valid N (listwise)	412				

There are weak correlations between the two dimensions (Pearson's $r = .13$), between priority and importance to support archaeology (Pearson's $r = .29$), as well as between priority and utility for society (Pearson's $r = .30$).

Gender is influencing the opinions in terms of setting the priority of archaeology by postponing other investments. Women ($M = 4.40$, $SD = 1.005$) consider to a wider degree than men ($M = 4.08$, $SD = 1.166$) that the construction of roads and buildings should be delayed when archaeological remains are found nearby, with a T-test score $t(410) = 2.873$, $p = .004$. No differences between women and men are documented to evaluate preventive archaeology.

Age, place of residency, and education are not significant influencers for the two items. Nevertheless, we mention a slightly surprising tendency for postgraduates to evaluate both dimensions less. There are no significant differences between the archaeologists, those working in the heritage field, and the other professional groups considered.

Relevance of archaeology for the quality of life

We investigated two aspects. One item is Life quality, which measures the perception regarding the contribution of archeology to the development / improvement of the quality of life. The second item is Tourism relevance, referring to the perceived attractiveness of archeological sites as tourist attractions. The perception is presented in Table 7.

Table 7. Descriptive statistics presenting the relevance of archaeology in relation to the quality of life

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Life quality	412	1	5	3.15	1.319
Tourism relevance	412	1	5	4.17	1.061
Valid N (listwise)	412				

The relationship between archaeology and quality of life is perceived as mild. But respondents consider that archaeological sites are attractive tourist destinations, generally. For both dimensions, women gave higher scores than men. The two dimensions are also weakly correlated (Pearson's $r = .37$). Other significant correlations have been documented between life quality and sustainable development (the strongest relationship, with Pearson's $r = .75$), life quality and importance to support archaeology (Pearson's $r = .44$), tourism relevance and importance to support archaeology (Pearson's $r = .43$), tourism relevance and sustainable development (Pearson's $r = .35$), life quality and utility for society (Pearson's $r = .53$). Other relevant correlations are with the perception of city advantages associated with archaeological heritage. The correlation between tourism relevance and city advantage presents a Pearson's r of $.41$, while between city advantage and life quality present a Pearson's r of $.39$.

In terms of age, one observes a statistically significant polarization of opinions between the young and old respondents on one hand, and those aged 25-44 on the other hand (Figure 7). The age group 45-59 considers archaeological sites more attractive than other age groups, but the differences are not statistically significant.

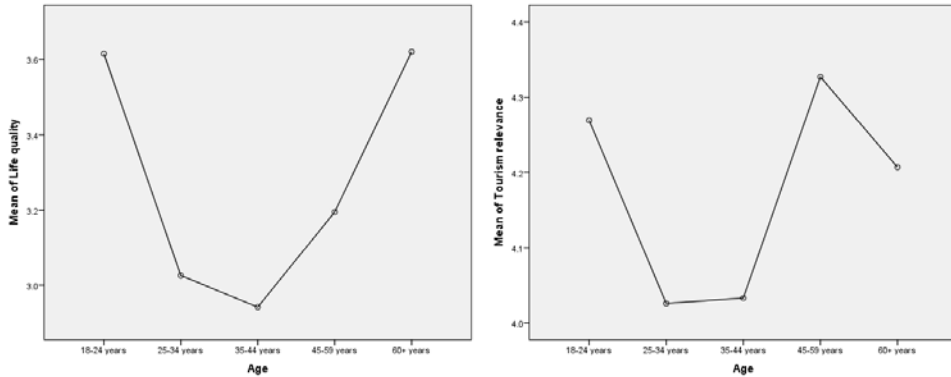


Figure 7. Means plot considering the age of the respondents

The place of residency also is correlated with the evaluation. There are some statistically significant differences between respondents in Southern Romania and those in Moldova + Bucovina, respectively those in Transylvania + Banat (Figure 8). In relation to the perceived impact on the quality of life, the largest gap is between the evaluation of respondents in Muntenia, Oltenia, and Dobrogea ($M=3.35$) and those in Transylvania and Banat ($M=2.82$).

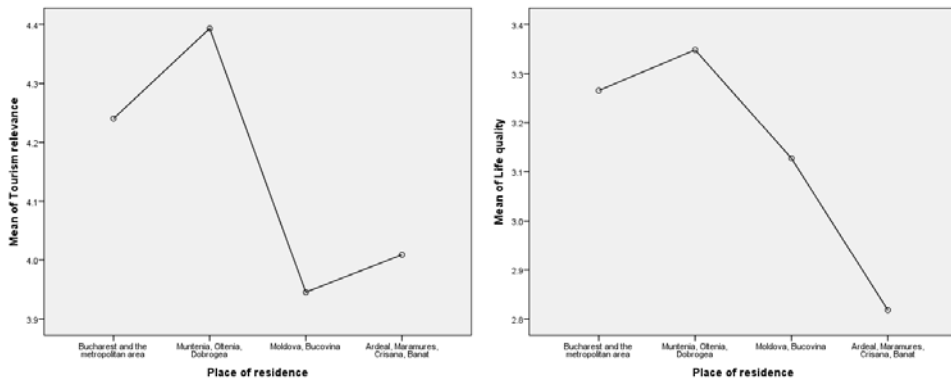


Figure 8. Means plot considering place of residence

Educational level does not determine significantly different perceptions, but we observe a tendency of those more educated to consider that archaeological sites are not a popular tourist attraction. In other words, they tend to consider that the general public is not interested in archaeological sites.

As expected, there are significant differences between archaeologists and other professionals in heritage, compared to other employees, as documented in Figure 9.

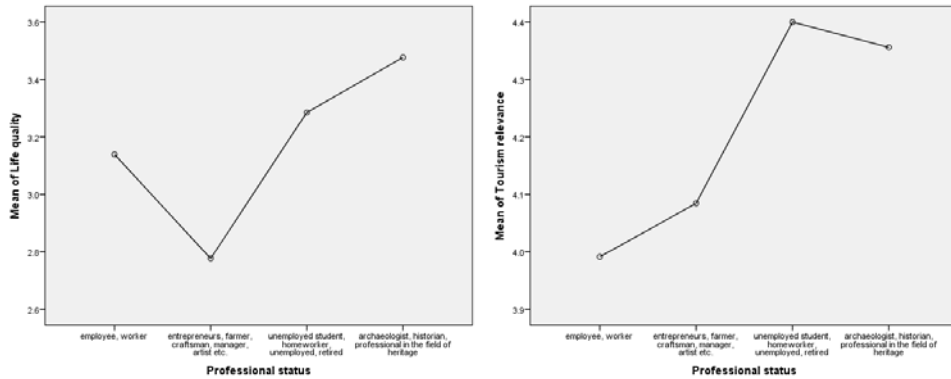


Figure 9. Means plot considering professional status

Conclusions

Archaeology has become increasingly more important for the wider society, being relevant outside the core group of those interested in archaeology and history as cultural manifestations and representatives of the past. The economic value of archaeology, its contribution to economic development, has been increasingly acknowledged by professionals and researchers. A few investigations have also mapped the perception of archaeology in the eyes of the wider public. The present study takes further this initiative, by investigating how is perceived the role of archaeology in sustainable development in Romania.

Considering the first line of investigation followed by this study, referring to how is archaeology evaluated in general, when considering its relationship with contemporary society, the findings highlight that archaeology is prestigious, important, and considered useful in a general way, but less connected to the present society and its needs. Women and older respondents tend to be more favorable when considering the actual concrete value of archaeology today.

Romanians consider that archeology contributes to sustainable development, especially by offering local advantages. In all dimensions evaluated, archaeology is, not surprisingly, crediting more archaeology considering other categories of the public. The most skeptical seem to be the group of entrepreneurs, managers, craftsmen etc. Women are also more supportive than men.

Referring to the third dimension investigated, the relationship of archaeology with the investments and realty developers, the perception of Romanians is that archaeology should prevail in front of the construction of infrastructure and edifices. Somewhat contradictory, preventive archaeology has a lesser relevant perception. This might be related to a weaker understanding of preventive archaeology, a low level of trust, or/ and the lack of knowledge referring to the associated mechanisms.

The last dimension considered the personal relevance of archaeology, in connection with the quality of life. While seeing the more direct/pragmatic connection with tourism, the respondents tend to consider the relationship between archaeology and the quality

of life as negative. The respondents with more nuanced views on archaeology, who consider the positive connections of archaeology to sustainable development, also credit it more with contributing to increased quality of life. Women are, again, more favorable than men. Young, as well as older respondents, are also more supportive of this contribution. Archaeologists are also more appreciative than the rest of the respondents.

Interpreting the study's results, one should also consider the study's limits. The main aspect is the relevance of the sample. The study includes a rather wide and diverse sample, nevertheless, the respondents have chosen to answer the survey with no incentive or pressure, and therefore, it is probable they are already interested in archaeology more than other segments of the population. The results are reflecting the evaluations and opinions of highly educated people. Another aspect to consider is the subjectivity of perceptions, depending on the personal experiences and values of the respondents. The present study does not measure in any way the actual contribution of archaeology to sustainable development, but the contribution with which it is credited.

The study contributes to a better understanding of the perception of archaeology among educated Romanians, considering the lay public and archaeologists. It has revealed a certain gap between the two groups and between women and men considering the investigated topics. Showing a relatively high appreciation of archaeology in a conceptual sense, together with a lesser positive perceived actual contribution to sustainable development and the quality of life, it suggests a need to better communicate the relevance of archaeology to the public, as well as to the actual impact it has proved in various instances. We mention that the same gap between the conceptual and cultural value of archaeology and its perceived contribution to sustainable development has been identified by the NEARCH study developed in 10 other EU countries (Marx, Nurra, & Salas Rossenbach, 2017), but the values identified were somewhat higher than in Romania.

The study also suggests a low understanding of preventive archaeology. Generally, archaeology needs to be better communicated, especially since the sample reflects higher evaluations than the rest of the population. For future research, we would recommend qualitative investigation for unveiling in a more detailed way the perceptions of the general public and the aspects leading to these perceptions of the relevance of archaeology for contemporary society.

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SOCIAL MEDIA COMMUNICATION STRATEGIES OF ROMANIAN UNIVERSITIES. A CONTENT ANALYSIS OF FACEBOOK AND INSTAGRAM PAGES

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Abstract. Higher education institutions rely on platforms such as Facebook, Instagram, Twitter, or websites to interact with multiple stakeholders, including prospective and current students, alumni, teaching staff, or politicians. Moreover, evidence suggests that prospective candidates frequently turn to social media in order to find more information about universities and student lifestyles (Peruta & Shields, 2017). Recent studies have focused on analyzing the online communication strategies of universities, monitoring categories of published content, the format of posts (text, video, photo, link), or engagement indicators (likes, comments, shares). Consequently, the paper explores Romanian higher education institutions' social media communication strategy. The method used was content analysis on the official social media pages of Facebook and Instagram for a sample of 30 universities (from 50 public universities). The results show that, although there are differences in the mix of communication channels and content, there are common features such as specific categories of postings more frequently used or preferences for postings format. The study highlights the characteristics of the online communication strategies of Romanian universities, discussing successful practices and identifying possible implications for engaging with target stakeholders.

Keywords: communication strategy; social media content; social media platforms; university

Introduction

Universities worldwide find themselves under immense pressure to keep up with new practices for attracting candidates. Many prospective students are interested in continuing to study across the border, which compels universities to focus on communicating with national and international candidates (Bélanger et al., 2014). Consequently, the competition for candidates' attention is growing and higher education institutions must do their best to draw as many qualified candidates as possible.

However, charming prospective students may prove to be a very difficult task in the online environment. Users are overwhelmed by the amount of information available, and the lack of proper promotional strategies may lead to low engagement rates and oversaturation (Peruta & Shields, 2017).

More and more prospective students turn to online channels to find information about the universities they are interested in. Details about the admissions process, available scholarships, and course offerings are what users look for when browsing online (Irfan et al., 2018). Evidence also suggests that accessing statistical data, such as university ranking, is one of the essential steps in candidates' decision to apply to a certain university (Uncles, 2018). Additionally, future students are also concerned about adjusting to university life, which explains why they are interested in learning more about campus activities and social life (Peruta & Shields, 2017). Not finding relevant information online might be a deal breaker for some candidates. They sometimes remove universities from their prospective list if they have a bad experience with their respective institutions' websites (Alexa et al., 2012).

Apart from recruiting students, many other underlying motives exist for including online platforms in universities' marketing strategies. Social media channels and websites are also used to disseminate information among current students and build a sense of community among alumni (Lund, 2019). Another goal of higher education institutions is bringing financial and material support, which can also be attained through creating university brand recognition (Lund, 2019; Williams & Omar, 2014). Thus, it becomes obvious that communication efforts must be directed toward different stakeholders. Students, alumni, potential donors, politicians, employees, business leaders, or journalists are among the groups universities target (McAllister & Taylor, 2007).

Although higher education institutions rely on offline and online promotional practices, paying special attention to communication on online platforms may bring extra rewards. With online becoming the preferred method of communication for younger generations, modern universities have to be capable of identifying the needs and interests of their audience and creating content accordingly (Assimakopoulos et al., 2017; Bélanger et al., 2014; Bonilla Quijada et al., 2021; Nyangau & Bado, 2012). But simply posting on social media is not enough to reach their goals. Instead, institutions must pin down effective practices and have dedicated specialists to build a marketing plan (Lund, 2019). Moreover, there isn't a "one size fits all" strategy, as effective practices may vary between universities (Bonilla Quijada et al., 2021). Hence, more research is needed to identify successful methods regarding the online communication of universities.

Literature review

Since the growing popularity of social networking sites (SNS), communication specialists have started differentiating between *outbound* and *inbound marketing*. Outbound marketing refers to traditional practices, which in the case of universities means participating in college fairs or disseminating promotional materials on paper (Rekhter, 2012). This kind of practice used to be the main method of communication for attracting candidates (Bélanger et al., 2014). On the other hand, inbound marketing includes using SNSs for communication purposes (Rekhter, 2012). For universities, SNSs and websites are useful channels for interacting with stakeholders. Generally,

websites have the main advantage of including a great amount of information regarding the institution, while social media platforms allow networking through different types of content (photos, videos, links, text) (Alexa et al., 2012; Peruta & Shields, 2017).

Although traditional marketing practices haven't been cast aside, communication efforts nowadays focus mostly on promotional activities in the online environment due to the advantages of using such platforms. One of the most important benefits of online marketing is the reduced promotion cost. With fewer financial investments needed compared to traditional practices, online marketing can help disseminate information to wider audiences nationally and internationally (Alexa et al., 2012; Assimakopoulos et al., 2017; Rekhter, 2012). Additionally, SNS platforms such as SNSs allow trackability (e.g. identifying prospective students' interests) and facilitate interactivity (Khan, 2013; Nyangau & Bado, 2012; Rekhter, 2012).

Previous research has highlighted the role of online platforms in helping new students adjust to university life (DeAndrea et al., 2012; Yu et al., 2010). DeAndrea and his colleagues (2012) analyzed how first-year students use the social media platform developed by a university in the United States. Their research has shown that the platform has facilitated connections between students, contributing to creating an online community in which the members helped each other. Interestingly, the main reason for using the platform was not related to obtaining academic success (DeAndrea et al., 2012). Similarly, Peruta and Shields (2017) highlighted the fact that new students manifest special interest in aspects related to networking and social life. Previously, another research (Yu et al., 2010) emphasized the importance of Facebook in establishing relationships among university students, consequently helping with their adjustment to the new context and contributing to their commitment regarding the university.

As far as SNSs are concerned, online practices have been studied in relation to engagement (Bonilla Quijada et al., 2021; Fähnrich et al., 2020; Lund, 2019; Peruta & Shields, 2017). Social media engagement is usually measured through user interactions with content, such as *clicking*, *liking*, *sharing*, or *commenting*. Along with the number of followers, these metrics are used to assess the success of a social media page (Bonilla Quijada et al., 2021). Specialists draw attention to the effort associated with these actions, emphasizing that *liking* implies the least amount of effort, as it requires only one click (Peruta & Shields, 2017).

Recent studies have identified online practices are significantly correlated with high engagement rates. For example, an investigation among the top five universities in the world (Bonilla Quijada et al., 2021) has shown that elements appealing to emotions have been more successful on Instagram. More specifically, publishing photos or videos with the university or the city resulted in better engagement rates (Bonilla Quijada et al., 2021). A slightly different approach was taken on by other studies in the past years (Fähnrich et al., 2020; Lund, 2019; Peruta & Shields, 2017), focusing their research on post frequency, the difference between posting on workdays and at weekends or content format. Users seem to appreciate visual content more, as this type of post has recorded greater fan engagement rates than text-only content (Fähnrich et al., 2020). Surprisingly, video posts seem to negatively affect the number of likes and comments, but contribute to an increase in the number of shares (Fähnrich et al., 2020). A high posting frequency has been shown to reduce engagement metrics, one of the possible

explanations being the oversaturation of social media feeds (Lund, 2019; Peruta & Shields, 2017). Regarding posting time, evidence suggests that weekend publishing leads to more successful content than workdays (Fährnich et al., 2020). Moreover, the evening seems to be the ideal time for universities to publish their posts on Facebook (Fährnich et al., 2020).

The marketing departments' efforts within higher education institutions should not be limited to posting on websites and social media profiles. Instead, recent research (Assimakopoulos et al., 2017) suggests that improving universities' marketing strategies can also rely on managing online groups. Assimakopoulos and his colleagues (2017) have highlighted the importance of the activities in which universities engage within Facebook groups, having identified five factors that may play a role in students' perception of educational offers: 1) administrators' contribution, 2) members' contribution, 3) group usage, 4) information seeking and 5) members' interests and engagement. Interestingly, the most important factor was the *administrators' contribution*, which refers to group administrators' ability to provide information to members and engage in activities such as posting or file sharing (Assimakopoulos et al., 2017). Evidence such as this highlights the importance for universities to use most of (or all) the options available on online platforms. With the fast development of digital tools, those in charge of university marketing must stay updated with technological advancements to maintain their relevance in the online environment and still be competitive.

Considering all this, it is necessary to explore how higher education institutions communicate online. Research has clearly emphasized the fact that the success of an online strategy may vary between universities, as each institution needs to identify the interests of its prospective students and tailor its content accordingly (Assimakopoulos et al., 2017; Bélanger et al., 2014; Bonilla Quijada et al., 2021; Nyangau & Bado, 2012). In addition, statistics show that social media usage preferences differ across countries or regions (DataReportal, 2022), prompting us to wonder if cultural factors may play a role in engagement rates. Thus, in order to help Romanian universities build effective online communication strategies, there is a need for more research regarding existing practices and their level of success.

The research objectives are: (1) to explore the mix of online communication channels chosen by the Romanian universities; (2) to identify specific social media content strategies of Romanian universities on Facebook and Instagram; (3) to find the most used content categories and format types on their social media accounts.

Methodology

For the purposes of this research, a quantitative method was chosen. The content analysis applied to universities' Facebook and Instagram pages provided a perspective on their social media communication strategies and online practices. The content analysis scheme was developed for the Facebook and Instagram official accounts of 30 Romanian universities, representing the analysis unit as a first step in the research. For the Facebook accounts, the following aspects were analyzed: the presence of links to other official online channels of the universities (website, Instagram, TikTok, Twitter, YouTube), engagement indicators (number of followers, likes and check-ins), the About section and the presence of contact information (email, program, and address),

description of cover page which is typically used for promotion purposes (information about the future academic event, presence of logo, of building pictures or collages, academic staff or promotional messages), frequency of posting in the past 3 months (May, June and July, the former generally used for promoting admission details). For analyzing the content of the posts from the Facebook pages, the research instrument was developed based on the technique used by Peruta & Shields (2018), and the final content categories were as it follows: promotion, admin and staff, athletics, campus events, student achievements, university spirit, news related, research/scholarly/creative, alumni, programming, admissions, academic events, performances and exhibits, student organizations, development, entertainment, guests from the professional industry. Each post belongs to one category, so they do not overlap in content. The format included the following options: text-only, video, photo/image/photo collage, share from other pages/accounts, link posts, text+video, text and photo, text and share, and text and links. The collected data included the posts from 3 months: May, June, and July 2022. A total of 3,572 posts were analyzed from the official Facebook accounts of 30 Romanian universities with various profiles (comprehensive, technical, medical, agronomy, arts and sports, and others). The universities were selected alphabetically, the first 30 publicly listed universities in Romania.

For Instagram, the following data were collected from the official accounts of the same universities included in the initial sample: number following, number of followers, number of posts, presence of contact information (email, website, program, hashtag), frequency of posting, profile picture (logo, general photo, students, other), presence of highlights and whether they are organized in categories. As far as the content that was posted on Instagram in the same time interval is concerned (May, June, and July), the same content categories analyzed on Facebook were used, whereas the format included the following: single photo, carousel (more photos/videos in the same post), video, and reels. A total of 926 Instagram posts were collected from 22 university accounts, as not all the universities owned an official Instagram account. All the data (pages and posts) was analyzed in August 2022 by 3 coders trained to code according to the research requirements.

Results and discussion

In order to explore the topic of this research, we conducted an analysis regarding the online accounts owned by the universities included in our study. Facebook was the most popular channel, with only one university (the University of Architecture and Urbanism Bucharest) not having an online presence on this platform. YouTube and Instagram were also widely used among universities, with 25, respectively 23 having an account on these networks (Figure 1). However, not all universities had an active Instagram page at the time of the research, which is an interesting fact when discussing the importance of online communication among higher education institutions. Additionally, more than half of the universities in the sample (17 of them) had a LinkedIn account, while Twitter and TikTok were not included in the online communication efforts of most of the institutions analyzed (11 of them had a Twitter account, while only 5 chose to set up a TikTok page).

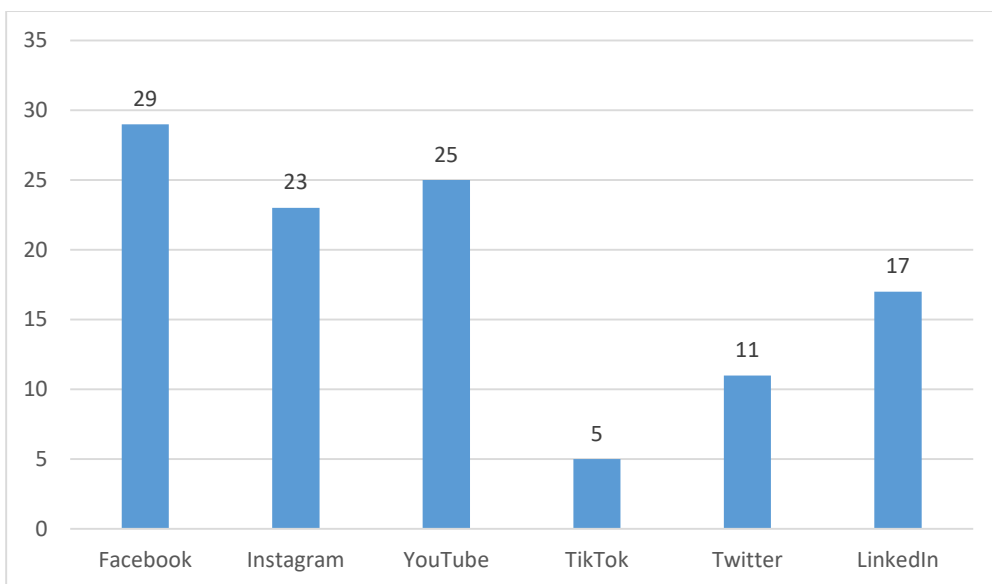


Figure 1. Number of universities communicating on different online platforms (out of 30)

Results of content analysis on Facebook. The analysis of the Facebook pages was focused on two main aspects. First of all, we wanted to investigate the extent to which universities could set up a proper account and personalize it in such a way that it included links to their accounts on other online channels, contact information, and cover pictures. All twenty-nine pages included links to universities' websites, while only ten considered including a link to their Instagram account. Few universities were also able to provide a link to their YouTube (6 universities), TikTok (2 universities), or Twitter (one university) accounts. Regarding the availability of contact information, the address was the only element included in all of the analyzed pages. Contact email addresses were also frequently mentioned, with only one university (Technical University of Cluj-Napoca) not including such information in their account. Furthermore, almost two-thirds of the universities (19 of them) chose to provide details about their opening hours.

With cover pictures being one of the first elements observable when visiting a Facebook account, occupying a significant amount of space on the page, we chose to analyze them based on the content universities wanted to depict. Most of the images analyzed (9 cover pictures) included promotional campaign messages, while the least preferred option was using pictures that included academic staff (only 2 of them chose it). The other 18 universities were split between cover images that included photo collages of the buildings (6 universities), future academic events (4 universities), logos/slogans (3 universities) or other types of content (5 universities).

On Facebook, users are able to see the number of page likes, followers, or check-ins. Regarding the number of followers, two universities distanced themselves from the others, gathering over 100.000 followers on their page: the University of Bucharest (104.396 followers) and the University of Iași (100.401 followers). Moreover, these universities were also top-ranked when it came to the number of page likes, with the

University of Bucharest also having more than 100.000-page likes (101.427 likes), while the University of Iași is placed just below this level (98.855 likes). Notably, both of them are comprehensive universities. Other than this, there were no obvious similarities or differences between the different university profiles.

During the three-month period included in the present analysis, a great number of universities (19 of them) posted daily, with one or more posts per day. Other five universities also recorded a high frequency of posting, making sure to create content every two days on average, while the remaining five opted to post only twice a week. The most active accounts in the research time frame were those owned by the University of Art and Design (UAD) Cluj-Napoca (346 posts) and the Polytechnical University of Bucharest (343 posts), followed by The National University of Political Studies and Public Administration (SNSPA) Bucharest (234 posts) and the University of Theatrical and Filming Art (UNATC) Bucharest (213 posts). (Figure 2)

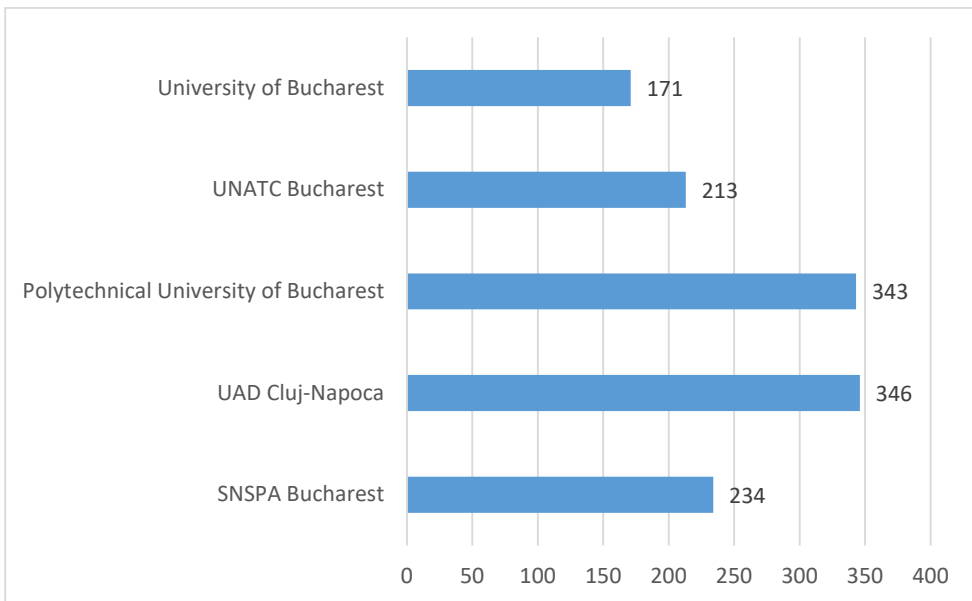


Figure 2. Number of posts for the five universities posting the most frequently on Facebook

Moving on to the analysis of the content posted, we discovered that the most frequent categories of postings (calculated using the average proportion of each category) were: „Promotion” (13.98% on average), „Academic events” (12.37% on average), „Admissions” (11.7% on average), „News” (11.04% on average) and „Campus events” (10.4% on average) (Figure 3). Other categories used moderately were „Performances and exhibits”, „Students’ achievements” and „Research”.

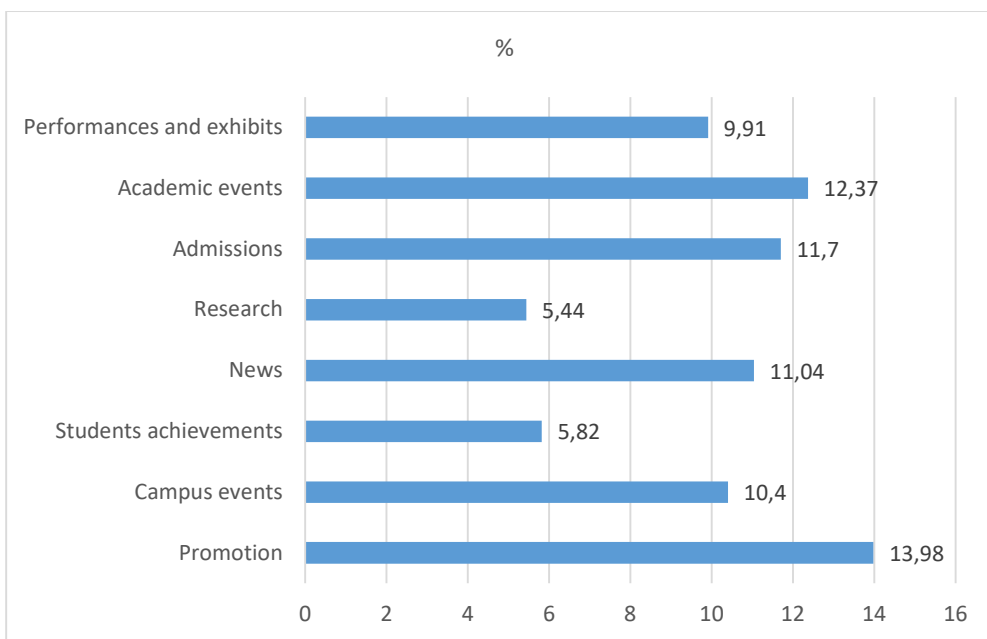


Figure 3. The most used categories of postings (average) on the Facebook pages of universities

Among the least popular categories among the universities included in this study was the one related to “Student organizations”, with only three universities covering this aspect, but to a considerably small degree. In general, universities used different content categories in their communication efforts, ensuring not to dedicate an overwhelming number of posts to only one type. The only exception here is the Technical University of Iași, having more than half of their posts (69.70%) in the “Promotion” category.

The posts’ format was also considered when analyzing Facebook pages. It was obvious that universities preferred to publish posts that included both text and visual aid (photo/video) or a link/share from other sources. The combination of text and photo was preferred by twenty-one universities, which chose this format for more than half of their posts. For example, the University of Arad opted for this type of format for 93.75% of their posts, while the University of Medicine and Pharmacy of Craiova had 87.50% of posts included in the “text + photo” category. Interestingly, although twelve universities decided to publish text-only posts, they did this to a very small extent, with most of them (10 universities) choosing this format for less than 3% of their posts.

Results of content analysis on Instagram. Only twenty of the thirty universities included in our research posted on Instagram between May 1st and July 31st 2022. Notably, some of the other ten universities did not even have an Instagram account or had an account but no posts at all. Therefore, the following data was obtained based on the analysis of universities that had an active account at the time of this research.

The first step was to analyze basic information, usually required when setting up an account, such as a profile picture or description. Regarding the profile picture, as expected, most universities opted for elements specific to their visual identity, with 90%

of accounts (18 accounts) using the university logo. As far as the description is concerned, we investigated whether contact information was available in the profile, such as website, email, or schedule. The link to the website represented the main information included, with nineteen universities having their address available in the account bio. However, only eight universities mentioned an email address in their profile, while none of the accounts investigated had a schedule available for users.

Considering the account customization options available on Instagram, we examined whether universities included any hashtag in their account description, the possibility to see the highlights section, or whether these highlights were organized in categories. The analysis has shown that only four universities decided to mention a hashtag in their profile, while highlights were more often observed among the accounts under analysis. More than half of the universities (65%) had a highlights section, but only nine took advantage of the possibility of differentiating between multiple categories of stories.

On Instagram, the community created around an account can be analyzed, and the platform gives access to information about the number of followers and following or the total number of posts since the creation of the account. While most of the universities included in our research had a total number of followers between 1.000 and 9.999, we noticed four institutions placed outside this interval. The lowest-ranked universities regarding the number of Instagram followers were the University of Arad (669 followers) and Sports University of Bucharest (229 followers). Only two universities managed to attract more than 10.000 followers to their accounts – the University of Bucharest (107.000 followers) and the University of Craiova (60.500 followers). Apart from the exceptionally big difference between these two universities and the others, it is important to note that both top-ranked institutions are comprehensive universities. Other than this, there were no obvious similarities or differences between the different university profiles.

Although the frequency of posting was lower on Instagram in comparison with Facebook, more than half of the universities (11 accounts) posted either daily or every two days. The highest number of posts in the analyzed time frame was 125 posts, published by the University of Theatrical and Filming Art (UNATC) Bucharest. Subsequently, among the highest-ranked profiles by the number of posts were: The Polytechnical University of Bucharest (98 posts), the University of Galați (88 posts), and the University of Agricultural Sciences and Veterinary Medicine (USAMV) Cluj-Napoca (87 posts). (Figure 4)

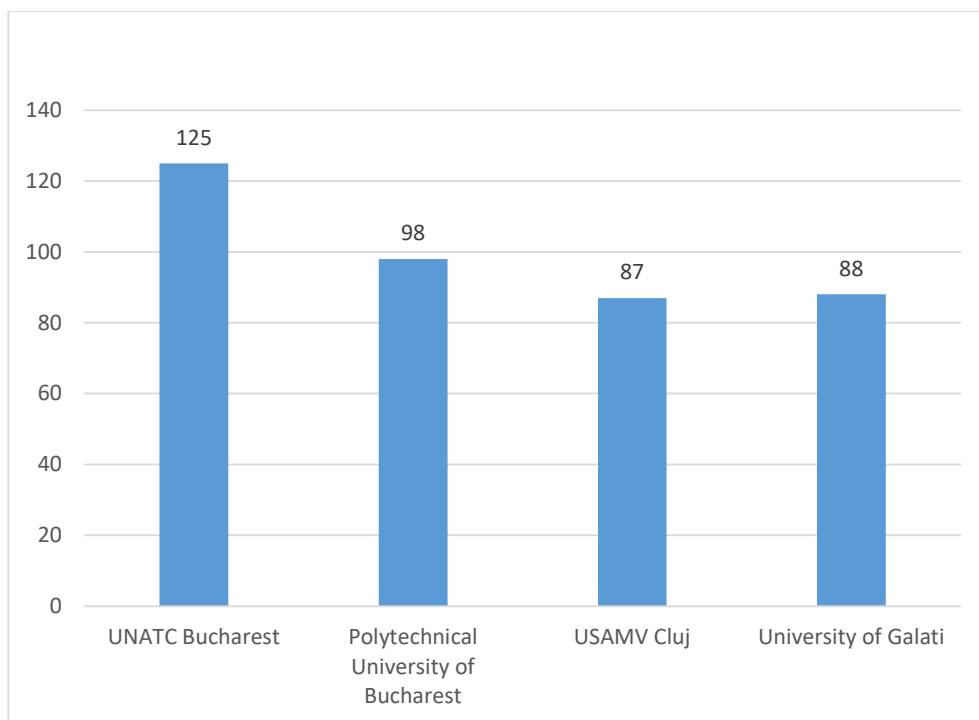


Figure 4. Number of posts for the five universities posting the most frequently on Instagram

Furthermore, we explored the types of content posted and the preferred formats on each Instagram page. Most of the content categories in the analysis grid were represented among the total number of posts. Interestingly, similar to the Facebook findings, the “Student organizations” type of content was the least represented, the only category with no posts at all. Moreover, regarding the posts related to “Guests from the professional industry”, only one university opted for this type of content, respectively the University of Theatrical and Filming Art (UNATC) Bucharest, which published only four such posts (3.20%), from a total of 125. While analyzing content categories, posts that included information about admissions emerged among the preferences of universities, with three of them allocating an overwhelming number of posts, over 50%, to this type: National University of Political Studies and Public Administration (SNSPA) Bucharest (56.82%), University of Arad (66.67%) and University of Craiova (75%). Other categories of postings used frequently were „Promotion”, „Research” and „Campus events” (Figure 5).

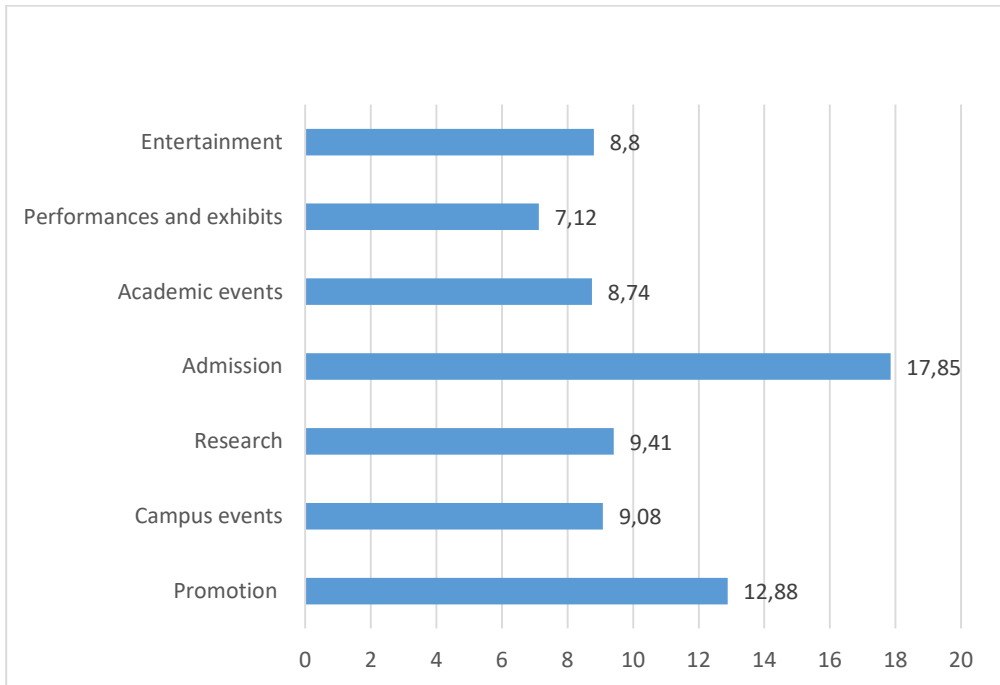


Figure 5. The most used categories of postings (average) on the Instagram pages of universities

Turning our attention to the post formats available on Instagram, data obtained from this research shows that videos, reels, and guides are among the least favorite types. Single photo posts and carousel posts were referred to a large extent, with most universities choosing to include images in their online communication strategy on Instagram. Moreover, results have shown little to no variety in some cases, with three universities deciding to post only single photos (the University of Braşov, Sports University of Bucharest, University of Art and Design Cluj-Napoca) and other two having more than 90% of their posts as single photos (the University of Galaţi and SNSPA Bucharest).

Conclusions

Among the online communication channels used by universities, Facebook was the most preferred (29 universities out of 30) followed by Youtube (27 universities out of 30) and Instagram (25 out of 30). Only slightly more than half of the universities in the sample used also LinkedIn, only one-third used Twitter, and only a few used TikTok.

Regarding the content strategies on Facebook, the frequency of posting was high: nineteen of the thirty universities in the sample posted daily, while five were posting three times a week, and only the remaining five posted only once a week. Among the possible formats, the format which combined text and photos was the most preferred by the universities in the sample, with twenty-one of them choosing this format for more than half of the postings. These findings show that for Romanian universities is important to maintain the conversation with the key public, while choosing the easiest and most traditional format for Facebook. The most used categories of postings were:

„Promotion” and „Academic events”. The preferences for specific categories of postings show that the most prominent partner of dialogue, among all the stakeholders, were the students or the prospective students, together with the internal academic community. Thus, the internal public seem to be more present in the social media communication of the universities, leaving out dialogue and interaction with other categories of stakeholders, such as the graduates or the local community.

The results of the Instagram content analysis align with the content analysis of the Facebook pages. Although the number of posts is lower in comparison with Facebook, the categories of postings preferred are almost the same, and the most accessible format (single photo or carousel) was widely used, conducting to similar conclusions about the main characteristics of online communication and the relative importance of stakeholders.

Finally, based on these findings, the suggestion that could be made to communication coordinators of universities would be to diversify the interaction and conversation with several categories of stakeholders (alumni, experts from the professional field, or other members of the academic community). This change of strategy would be useful because the external stakeholders may bring also benefits such as trust or visibility, strengthening the reputation of the university.

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THE IMPACT OF SUSTAINABLE MANAGEMENT STRATEGIES ON ORGANIZATIONAL PERFORMANCE AND ON ORGANIZATIONAL REPUTATION – A ROMANIAN MANAGER’S PERSPECTIVE

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Abstract. *The present study offers an overview on the perspective that Romanian business managers have regarding sustainable management (in all of its dimensions) in their daily life, and its subsequent implications on their business. Relying on the Triple Bottom Line approach, as it has been vastly explained and analyzed from 1994 onwards, our study wants to see whether, from Romanian business managers’ view, there is a perceptual influence between the conceptual dimensions this strategy encompasses, and the organizational performance and organizational reputation, respectively.*

The research design is an exploratory one, our aim being uniquely qualitative: having a better understanding of Romanian managers’ perceptions on sustainable management and its dimensions, and its implications on their everyday life.

Therefore, we conducted a series of structured interviews with Romanian business managers in order to pilot test what the specialized literature has been postulating ever since the creation of the above-mentioned business approach: a sustainable-oriented organization is, to a certain extent, more performant and has a better consolidated reputation. This is why we would rather focus on the latter in the literature review part, instead of on Elkington’s concept.

Nevertheless, it is important to mention that this step precedes the quantitative approach, as we manage to have an in-depth understanding on the main challenges and concrete facts that build up to the perception of sustainable management strategies in the Romanian managers’ business life.

The study clearly shows that, as well as the all-encompassing main topic (i.e. sustainability), the sustainable management strategies also entail an impressive operationalization, depending on many variables.

Notwithstanding, there appears to be a common ground that is starting to receive a clear contour: there is an influence that sustainable management strategies have, at a perceptual level, on organizational performance and on organizational reputation, which are worthy of being further operationalized and explored.

Keywords: *cultural management strategies, economic management strategies, environmental management strategies, organizational performance, organizational reputation, sustainable development awareness, social management strategies.*

Introduction

Sustainable development should be the goal of a society that will help govern economic, cultural, and environmental development. Research shows that there is a relationship between environmental pollution, exploitation of resources, and climatic change calling

for the establishment of ecological strategies and policies (Popescu et al. 2014). Evidence shows a positive relationship between organizational financial performance and social sustainability, making it essential to understand how organizations can innovatively integrate sustainable development into their practicing theories (Sroufe et al., 2019). A purposeful sample from leading firms in the world showed that a positive relationship exists between sustainable managerial practices that leads to social sustainability and improve the firm's financial performance (Sroufe et al. 2019). The study results evaluate organizational sustainable development practices like sustainable management awareness, social management strategies, environmental management strategies, economical management strategies and cultural management strategies effect on organizational reputation and performance.

Literature review: organizational performance and reputation

Once the previously defined social, economic and environmental awareness coined by Elkington (1994) is understood, the concepts of: (1) organizational performance and (2) organizational reputation emerge as a consequence of the former.

Organizational Performance

Organizational performance is the basis of a company's survival. It results from the correct functioning of different variables of interest, covering areas as diverse as human resources, marketing, business management, strategy and information systems (Hult et al., 2008).

Bititci et al., (2012), understand that the ultimate goal of Organizational Performance research is to explain how Organizational Performance can be improved, adapted and sustained to help firms improve their profitability and long-term survival.

Kaplan and Norton, (1992), when defining their Balanced Scorecard, state that organizational performance depends on both financial and non-financial indicators capable of assessing the extent to which organizational goals and objectives are achieved.

Some authors, including Richard et al. (2009), have distinguished between organizational performance and effectiveness, stating that while the former refers to the market attitude and shareholder returns, the latter represents a broader concept that, in addition to financial performance indicators, includes indicators of operational efficiency, customer satisfaction, corporate social responsibility and other results that go beyond financial quantification.

Ultimately, organizational performance can be defined in terms of financial ratios such as return on assets (ROA) and return on equity (ROE), market outcomes, human resource-related outcomes (such as job satisfaction and commitment, knowledge transfer (Zbucnea et al., 2019), or knowledge management (Hargitai et al., 2021), respectively) or organizational outcomes (productivity, service quality, new product development). In comparison, performance indicators can be measured with subjective information such as performance indicators, innovation efforts, and performance of human resource practices, among others (Razouk, 2011).

Organizational Reputation

Reputation is one of a company's most important intangible assets, to the extent that recent research studies have focused on analyzing its impact on company profitability.

Reputation is an antecedent of satisfaction and loyalty that business management often neglects. On the other hand, studies claim that more than half of the reputation effect is mediated by satisfaction.

This means that reputation can only partially be considered a result of consumers' own experiences with a company. To achieve consumer loyalty, organizations need to create both a good reputation and high satisfaction (Gardberg and Fombrun 2002). Fombrun defines corporate reputation as "a perceptual representation of a firm's past actions and future prospects that describes the overall attractiveness of the firm to all its key stakeholders compared to other prominent rivals" (1996: 72).

Reputation is a socially shared impression, a consensus about how a company will behave in a given situation. It is, in short, how a company conducts, or is perceived to conduct, its business (Bromley, 2002). It refers to the "attitudes and beliefs about the company held by stakeholders, which have been shaped by the organization's own communication processes" (Middleton and Hanson, 2002).

According to Larkin (2003), "the biggest obstacle to making a case for building, maintaining and managing reputation is how to measure it effectively". In this framework, corporate reputation is interpreted as an intangible asset that offers a sustainable competitive advantage due to its valuable, rare, inimitable and non-substitutable nature. Moreover, it captures accumulated impressions from inside and outside (Chun, 2005).

Perceived corporate reputation can be understood as individuals' impression of a company, based on the company's ability to deliver valuable results to all stakeholders (Fombrun et al., 2000).

In order to manage reputation, it is essential to analyze its behavioural effects. For example, it is believed that customers are more loyal to the products of companies with good reputations (Morley, 2002). However, empirical evidence on the effect of reputation on the formation of customer satisfaction and loyalty is scarce, so loyalty management could benefit from this research.

It is an immediate mental image that individuals conceive of an organization. However, it is formed over time, based on what the organization has done and how it has behaved, which means that it evolves as a result of consistent behaviour that engenders trust (Balmer and Greyser, 2003).

Shamma (2012) concludes that "the construct of corporate reputation is correctly conceptualized as the integration of corporate concepts such as corporate identity and corporate image". Furthermore, the sum of all images developed resulting from stakeholder perceptions forms the corporate reputation. One of the subsequent developments of corporate reputation's conceptual model can be seen in figure 1.

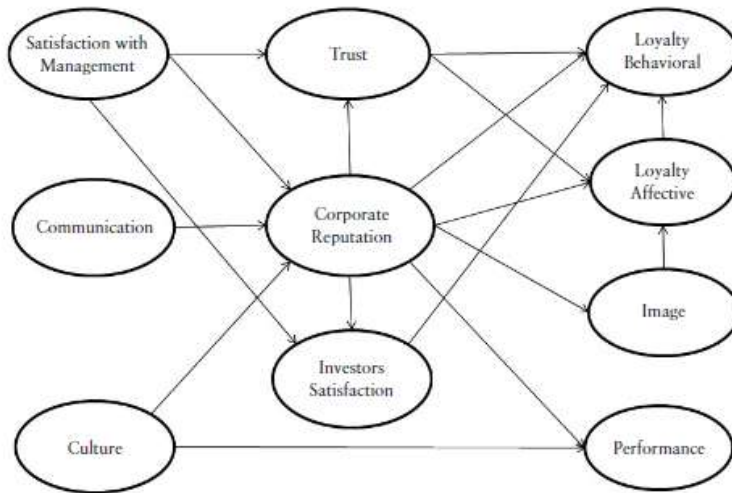


Figure 1: Corporate reputation – a conceptual model (Casimiro Almeida & Matos Coelho, 2015)

The Organizational culture

According to MacIntosh and Doherty (2007), organizational culture is defined as the set of core values, beliefs and assumptions that are guided by leaders and shared by employees. They set the tone and explain how procedures are carried out within organizations.

Freiling and Fichtner (2010), argue that corporate culture reflects the values and beliefs that are absorbed and shared by employees. Therefore, a strong culture influences the financial performance of an organization. In addition, culture leads to greater consistency in employee behaviour regarding coordination and control, improves goal alignment and increases employee commitment and effort.

Freiling and Fichtner, (2010) examined the direct and indirect effects of organizational culture and corporate reputation on financial performance. Their work showed that a more robust corporate culture leads to a higher reputation rating, leading to higher financial performance.

Methodology: a concise overview

Problem statement

Sustainable development should be the goal of a society that will help govern economic, cultural, and environmental development. Research shows that there is a relationship between environmental pollution, exploitation of resources, and climatic change calling for the establishment of ecological strategies and policies (Popescu et al. 2014). Furthermore, evidence shows a positive relationship between organizational financial performance and social sustainability, making it essential to understand how organizations can innovatively integrate sustainable development into their practice

theories (Sroufe et al., 2019). A purposeful sample from leading firms in the world showed that a positive relationship exists between sustainable managerial practices that lead to social sustainability and improve the firm's financial performance (Sroufe et al. 2019). The study results evaluate organizational sustainable development practices like sustainable management awareness, social management strategies, environmental management strategies, economic management strategies and cultural management strategies' effect on organizational reputation and performance.

Therefore, this paper's main objective is to summarize the key literature on the use of objective and subjective measures, assessing organizational performance and reputation to provide empirical results in research conducted on performance measures reported by middle and top management to determine how it influences firm performance and profitability.

The model is based on seven variables that try to measure the perception of business managers on each of them:

1. Sustainable Development Awareness
2. Economic Management Strategies
3. Social Management Strategies
4. Environmental Management Strategies
5. Cultural Management Strategies
6. Organizational Performance
7. Organizational Reputation

For each of these variables, it is defined:

- a. The literature that has dealt with the subject
- b. The indicators through which each of these can be measured.

It is also important to mention that each variable will be studied through a survey applied to market professionals, to investigate the internal and external elements in the exercise of sustainable corporate strategies of businesses, which will allow the development of new management applications and models for sustainable decision making. Also, we would like to highlight that the whole instrument measures managers' perceptions in the business field.

Operationalization of the variables: definition and indicators

Variable	Operationalization	Definition	Indicators
1. Sustainable Development Awareness	The degree to which the manager is aware of the main aspects that build the sustainable paradigm.	"Essentially, it is the economic sustainability of the business, in the medium and long term, to maintain the economic profitability of its productive activities. For this, it is necessary to contemplate new	1. Reducing environmental impact by purchasing and consuming high-quality, durable products. 2. Use of recyclable materials or products 3. Splitting waste

		<p>concepts of risk and opportunity associated with the triple bottom line aspects. Furthermore, it requires that the economic, environmental and social dimensions are integrated and interact in balance and are managed in an integrated manner" (KPMG, 2019).</p> <p>In other words, the ecosystem provides the factors of production that underpin economic growth: land, natural resources, labour and capital. Economic sustainability manages these resources so they are not depleted and remain available for future generations (Beattie 2021).</p>	<p>4. Do not mix hazardous waste with general waste.</p>
<p>2. Economic Management Strategies</p>	<p>Concrete business strategies applied that may fall under the sustainable development paradigm.</p>	<p>Economic sustainability is the use of different strategies to employ, safeguard and maintain human and material resources optimally, to create a responsible, beneficial and sustainable balance in the long term (Bascom, 2016). Moreover, as a business strategy, sustainability</p>	<p>For a company to be economically sustainable, it must be profitable, but not at any cost:</p> <ol style="list-style-type: none"> 1. Compliance, good governance and risk management. 2. Immediately stop using fossil fuels or chemical fertilizers. 3. Pay for or repair the damage done.

		emerges as a new paradigm for the internal management of organizations, presenting itself as a new option to the traditional growth and maximization model of profitability (Portoles de la Torre et al., 2009).	4. Unemployment rate 5. Poverty rate
3. Social Management Strategies	Concrete inclusive and equalitarian policies adopted in the decision-making process.	Figuroa López and García de la Torre (2018) highlight that the sustainable paradigm, from a strategic perspective, takes into account stakeholders so that managers take on the challenge of sustainability and achieve more significant competitive advantages and benefits in general. They argue that adopting corporate responsibility policies, improve corporate performance and brand positioning. It aims to ensure that economic activity improves the quality of life for all, not just a few (Barrios Vera, 2010).	1. Employee training policies. 2. Policies for work-life balance. 3. Women's participation 4. Strengthening of a development that does not perpetuate or deepen poverty and social exclusion, 5. Social justice and social participation in decision-making, so citizenship is a fundamental part of the development process. Cultural diversity *Monitoring the results obtained
4. Environmental Management Strategies	Concrete business strategies applied that take into account the environmental dimension.	Corporate environmental responsibility is essential to protect future generations and to achieve	1. Reduce water consumption Policies for efficient water use:

		sustainable and equitable development for humanity. However, current production and consumption patterns do not guarantee that future generations will have the same capacity as today to meet their needs (Gollier, 2016).	2. Reduce energy consumption * Policies for efficient use of resources *Promote employee participation *Monitor results achieved
5. Cultural Management Strategies	Concrete business strategies applied that may fall under the sustainable development paradigm.	Only through the public promotion of a sustainable culture that reaches all levels (business, consumers and citizens) and a sound policy based on the long term, will it be possible to redirect the current problem towards a viable and lasting solution. Therefore, undermining the prevailing mindset is the first and most crucial step toward developing new forms of governance and operations. Altering the values and norms that govern the choices of every aspect of a company is the key (Doppelt, 2010).	1. Decent and stable workplaces 2. Access to health care 3. Incorporate ethical principles voluntarily, not by imposition of regulations. 4. Culture of responsible consumption
6. Organizational Performance	The concrete set of financial and non-financial indicators that are taken into account in addressing the organization's needs and objectives, that	Organizational performance focuses on explaining how organizational performance can be improved, shaped and sustained to	1. Relationships between HR practices and firm performance. 2. Effects of people

	<p>may fall under the sustainable development paradigm.</p>	<p>help firms improve their long-term profitability and survival (Bititci et al., 2012). It can also be defined as a set of both financial and non-financial indicators capable of assessing the extent to which organizational goals and objectives are being met (Kaplan and Norton, 1992). It refers to performance in achieving shareholder return, organizational effectiveness, financial performance, operations efficiency, customer satisfaction, corporate social responsibility and other outcomes beyond financial quantification (Richard et al., 2009).</p>	<p>management on operational performance measured in terms of cost, quality, delivery, and flexibility.</p> <p>3. Profitability. Establishing that both organizational commitment and HR practices are significantly related to operational performance measures.</p> <p>4. ROA and ROE to measure the variation in performance caused by new management practices with the involvement of HR functions within the business and corporate strategy.</p>
<p>7. Organizational Reputation</p>	<p>Concrete intangible assets that are taken into account in addressing the organization's needs and objectives, that may fall under the sustainable development paradigm.</p>	<p>Corporate reputation is a driver of economic performance. Therefore, corporate reputation has become an essential field for academic research and the development of reputation management actions (Barnett,</p>	<p>1. Delivery of high-quality products.</p> <p>2. Fair treatment of employees</p> <p>3. Good financial performance</p> <p>4. Satisfaction to explain loyalty</p> <p>5. Meeting expectations</p>

		<p>Jermier & Lafferty, 2006). There are empirical studies with approaches to measuring corporate reputation, ranging from specific exploratory approaches that simply describe the construction of reputation (Walsh & Beatty 2007) to studies that incorporate more sophisticated models of corporate reputation into a broader nomological network. The latter regards corporate reputation as an intangible asset that interacts with antecedents and economic consequences related to the firm (Money & Hillebrand 2006). The increase in corporate reputation is due to new policies, which generates being prepared to face adverse situations that may arise due to profits obtained over a long period (Pérez, Espinoza & Peralta, 2016).</p>	
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Table 1: Construct matrix (Advanced by the author)

Operationalization of the variables: objectives, hypotheses and interview questions

Variables	Objectives	Hypotheses	Interview Questions
1. Sustainable development awareness	<p>O1: To investigate the relationship between sustainable development awareness and economical management strategies, from the Romanian business managers' perspective.</p> <p>O2: To investigate the relationship between sustainable development awareness and social management strategies, from the Romanian business managers' perspective.</p> <p>O3: To investigate the relationship between sustainable development awareness and environmental management strategies, from the Romanian business managers' perspective.</p>	<p>H1: There is a positive relationship between sustainable development awareness and economical management strategies.</p> <p>H2: There is a positive relationship between sustainable development awareness and social management strategies.</p> <p>H3: There is a positive relationship between sustainable development awareness and environmental management strategies.</p> <p>H4: There is a positive relationship between sustainable development awareness and cultural management strategies.</p>	<p>Q1: Are you familiar with the sustainable development paradigm? What does it mean for you, in your specific area of business?</p> <p>Q2: How would you describe your experience with creating and implementing sustainability policies? What is the major challenge?</p> <p>Q3: If you had to choose one area of sustainability to focus on, what would it be? Why?</p> <p>Q4: Which is the primary input from financial/economic data to your business' sustainable strategy (if any)?</p> <p>Q5: Which is the primary input brought by social management strategies to your business' sustainable strategy (if any)?</p> <p>Q6: Which is the primary input from environmental management</p>

	<p>O4: To investigate the relationship between sustainable development awareness and cultural management strategies, from the Romanian business managers' perspective.</p>		<p>strategies to your business' sustainable strategy (if any)?</p> <p>Q7: What is the primary input of cultural management strategies to your business' sustainable strategy (if any)?</p>
<p>2. Social management strategies</p>	<p>O5: To investigate the relationship between social management strategies and organizational performance from the Romanian business managers' perspective.</p> <p>O6: To investigate the relationship between social management strategies and organizational reputation, from the Romanian business managers' perspective.</p>	<p>H5: There is a positive relationship between social management strategies and organizational performance.</p> <p>H6: There is a positive relationship between social management strategies and organizational reputation.</p>	<p>Q8: When it comes to social management strategies, what are the things that you would say that can directly affect organizational performance?</p> <p>Q9: When it comes to social management strategies, what are the things that you would say that can directly affect the organizational reputation?</p>
<p>3. Economical management strategies</p>	<p>O7: To investigate the relationship between</p>	<p>H7: There is a positive relationship between</p>	<p>Q10: Whenever we talk about economic management strategies, what are</p>

	<p>economical management strategies and organizational performance, from the Romanian business managers' perspective.</p> <p>O8: To investigate the relationship between economical management strategies and organizational reputation, from the Romanian business managers' perspective.</p>	<p>economical management strategies and organizational performance.</p> <p>H8: There is a positive relationship between economical management strategies and organizational reputation.</p>	<p>the things that you would say that can directly affect organizational performance?</p> <p>Q11: Whenever we talk about economic management strategies, what are the things that you would say that can directly affect the organizational reputation?</p>
<p>4. Environmental management strategies</p>	<p>O9: To investigate the relationship between environmental management strategies and organizational performance, from the Romanian business managers' perspective.</p> <p>O10: To investigate the relationship between environmental management strategies and organizational</p>	<p>H9: There is a positive relationship between environmental management strategies and organizational performance.</p> <p>H10: There is a positive relationship between environmental management strategies and organizational reputation.</p>	<p>Q12: Regarding the environmental management strategies, what are the things that you would say that directly affect organizational performance?</p> <p>Q13: Regarding the environmental management strategies, what are the things that you would say that directly affect the organizational reputation?</p>

	reputation, from the Romanian business managers' perspective.		
5. Cultural management strategies	<p>O11: To investigate the relationship between cultural management strategies and organizational performance, from the Romanian business managers' perspective.</p> <p>O12: To investigate the relationship between cultural management strategies and organizational reputation, from the Romanian business managers' perspective.</p>	<p>H11: There is a positive relationship between cultural management strategies and organizational performance.</p> <p>H12: There is a positive relationship between cultural management strategies and organizational reputation.</p>	<p>Q14: Do you think that cultural management strategies affect organizational reputation? How?</p> <p>Q15: Do you think that cultural management strategies affect organizational performance? How?</p> <p>Q16: How would you describe the organizational performance in your business sector, from a sustainable point of view?</p> <p>Q17: How would you describe the organizational reputation in your business sector, from a sustainable point of view?</p>

Table 2: Methodological matrix for the operationalization of the variables (Advanced by the author)

Techniques and instruments for data collection

The data collection to be used in this research will be in the natural setting where the subjects and objects of research occur; the data collection techniques will be

observation, the survey in its two modalities (interview or questionnaire), documentary analysis and content analysis.

Study population and sample

The present study will be based on a non-probabilistic sampling, mainly because of the niche targeted. Therefore, to ensure that there is plenty of data about the views of Romanian business managers, we consider it would be best to have a sample full of people meeting this criterion.

Data processing and analysis techniques

The data will be analyzed using the NVivo software for the qualitative part (interview) and both SPSS and SmartPLS for the quantitative part (questionnaire).

Smart-PLS is a software for "variance-based structural equation modelling using the partial least squares path modelling method" Hernández Sampieri et al. (2014). It is used for data analysis in research studies. It starts with a "Measurement Model" and then adds a particular value to the variables' interrelations, therefore helping in observing if there is any kind of influence from one to another.

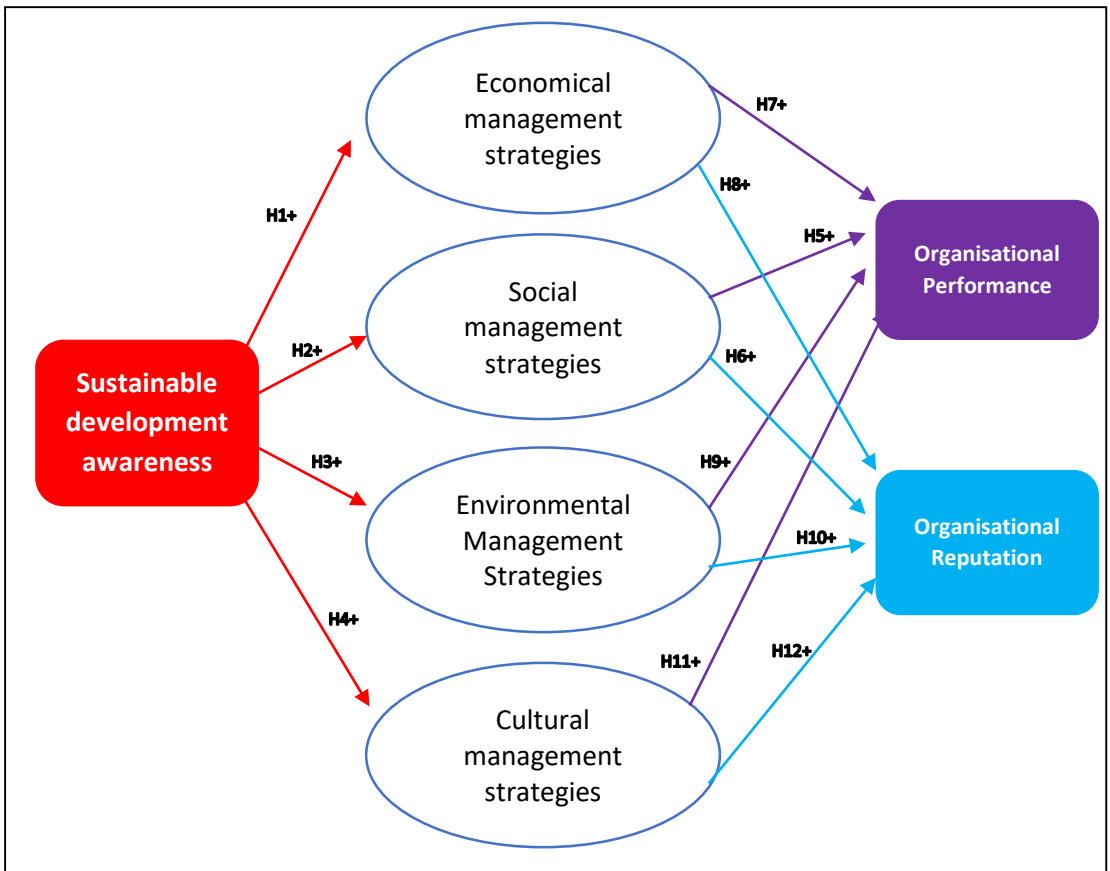
This model provides important reliability in assessing the internal consistency of constructs. Reliability in SMART-PLS is assessed by "Cronbach's alpha". Validity is assessed by establishing convergent and discriminant validity.

One of the main objectives of multivariate statistics is to increase "the explanatory power of empirical testing of theory, or to increase theoretical knowledge in cases where it is scarce" (Statsoft, 2013).

This empirical research model allows for the simultaneous examination of a series of dependence relationships between independent and dependent variables. This statistical technique shows the relationships between constructs ("latent variables") and indicators ("observable variables"). In this way, the researcher can assess the contribution of each item, or, in other words, detail which indicators define each construct. In addition, it assesses the reliability of constructs and indicators.

The partial least squares (PLS) approach is based on the analysis of variance. This implies a more flexible methodology as it does not require parametric assumptions on the data distribution, i.e. it uses non-parametric tests. "PLS models are used under predictive and non-confirmatory situations" (Hair et al., 2017: 2).

Theoretical conceptual model



*Figure 2: Research model
(Advanced by the author)*

Sustainability and sustainable management strategies through the lens of Romanian managers – preliminary conclusions of the findings

The present research compares literature conclusions with the perceptions of Romanian business managers to understand how they cross paths with the sustainable paradigm and at which business levels.

We have seen that a specific profile is starting to get portrayed by the managers' perceptions collected in our qualitative approach, even if the sample, at the moment of the presentation of this report, consists of a reduced number of respondents (the process of data collection is still ongoing).

As well as what happens in the theoretical dimension, we see that the empirical one gives us a broad spectrum while management professionals are asked to comment upon what sustainability is for them. *For example, community welfare, well-being for the*

The next question starts with the set of questions that prove the broad scope of the sustainable paradigm, not only regarding its definition but also its implementation. Focusing on one field within the comprising scope of the sustainable paradigm proves to be all-encompassing: education, sustainable communities and buildings, packages and people. These divergent answers offer a glimpse into what managers think their businesses' sustainable competitive advantages look like, fitting their organizational needs and, as it is only natural, sheltering their future development perspectives.

Moving forward, another apparent unexplicit theme is unfettered: the financial /economic, social, environmental, and cultural management strategies' toll on the business' sustainable strategy (within the *Sustainable development awareness* subfield).

The financial dimension's input is either connected with the specificities regarding the production process of the end product, or being put under the large umbrella of responsible management of financial issues.

Besides, the social dimension's input was ruled out by one of the managers, even though references to the social activities of the business were made and detailed. For the others, the social dimension was directly linked to human resources management, acknowledging that strategies concerning people directly influence the overall business strategy.

Then, the environmental dimension's input surfaced concepts like waste management, and circular economy, all answers seeming to converge: the business' infrastructure has to be designed to reduce pollution and to be cost-effective. However, the operationalization of this reached common ground will vary from business to business. Notwithstanding, it is essential to mention that examples of actions were provided, yet none of the respondents mentioned a sharply-defined operationalization contextualized to their business's needs.

Concerning the cultural dimension's input, we observed its exclusion from two of our interviewees. The other two linked it with a people-oriented perspective, which might gain a certain degree of relevance depending on the organization's dimension and culture. Nevertheless, it is vital to understand that one of the peculiarities of culture is its emergent character, meaning that it is not deliberate.

The next subfield, *Social management strategies*, changes the focal point from a not clearly delineated action-based perspective to a result-oriented approach. Our aim here was no longer to understand a conceptualization, but to understand the direct implications derived from the daily put into use of the studied concepts. From this point onwards, we wanted to see the added value each variable might entail, articulated on a bi-dimensional scale, in terms of business performance and reputation.

Therefore, various relations have been established:

- **Social management strategies -> organizational performance**

Under this relation, a series of relations crystalized:

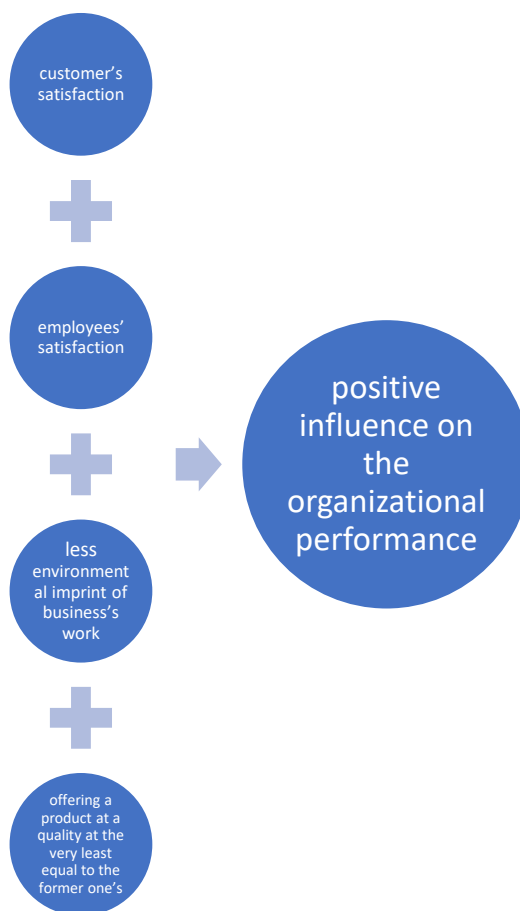


Figure 5: Social management strategies' influence on organizational performance (as depicted by the interviewees) (Advanced by the author)

Also, the interviewees have underlined the positive influence of the conditions both outside and inside of the business world. This pinpoints towards an inside-out perspective when approaching the social management dimension in business, if the final aim is to keep all the expectations covered.

○ **Social management strategies -> organizational reputation**

It seems that in this relation, it is essential to see whether the end user interacts with employees or directly with the product. If it does with the former, a people-oriented strategy is enhanced and developed, as the employees become promoters of the business, so they have to be motivated, very well trained, and up to date with the business's core values to avoid any kind of misrepresentation. The social management strategies seem to rely on the business's human resources if this were the case.

If, on the contrary, the interaction happens with the product, then the business should pay attention at all the levels of the product and ensure a comprehensive lookout for the product (production, marketing, communication, etc.), because, in this case, the product

itself is the promotor of the business. Therefore, social management strategies are transformed into marketing, communication, and management-reinforced policies if this were the case.

- **Economic management strategies -> organizational performance**

Another distinction comes into action: product vs service.

In the case of a product whose target falls within the B2C spectrum, a reluctance toward too many changes has been noticed over the years. Despite that, if any significant changes should be made, they should be presented gradually. All the more reason to adapt gradually and only when it is compulsory if the product's target falls into the B2B spectrum: sustainable collaborations require steadiness and reliability.

Apparently, a service requires clearer KPIs, with a time-based monitoring and assessing schedule.

We can see that, regardless of the target, even though changes and adaptations keep many companies in business, there is a certain degree of reluctance when we approach this concept which appears to be directly linked with economic management strategies in a sustainable framework.

- **Economic management strategies -> organizational reputation**

Seemingly, here we maintain the dichotomy of product vs service.

Products seem to rely on the same attributes as they did in the case from above (of organizational performance), just that now they seem to have to pass the proof of time, which gives them fairness, consistency, and trustworthiness. By doing so, they become assets directly influencing the organizational reputation.

In an apparently conservative narrative, the sustainable innovation concept is brought forward, suggesting that sustainability and innovation go hand in hand and can positively influence organisational reputation if they are part of an economic management strategy, fact that has been successfully proven before, in recent studies (Stănescu et al. 2021).

In the case of services, an organisational-centred paradigm is depicted, as all the responsibility that the product has is now falling on the shoulders of the business and its reputation.

These two perspectives have a convergent point: organizational reputation needs time, numbers, and consistency to be proven.

- **Environmental management strategies -> organizational performance**

Much to one's surprise, we see that environmental management strategies are a catalytic factor of change, due to external regulation policies, or to each market's standards. Nevertheless, as was presented before, change must be comprehensively managed to fulfil its productive potential.

Accordingly, we notice a determining relationship between the two elements (innovation and environmental management strategy) being sketched. Even so, as previously mentioned, there is a lack of solid business strategy, leaving aside legal regulations.

- **Environmental management strategies -> organizational reputation**

In this case, 3 out of 4 interviewees linked this relationship with risks and liabilities, envisaging the negative repercussions they might have on the organizational reputation. Taking into account the coercive motivation depicted in these responses, we make an educated guess by saying that we expect our 10th hypothesis (i.e. *There is a positive relationship between environmental management strategies and organizational reputation*) to be confirmed by our further research. It appears that its significant level of risk might turn it into a managerial hotspot, stressing thereby the importance of environmental management strategies.

- **Cultural management strategies -> organizational reputation & performance**

Cultural management strategies appear to be the most challenging ones for Romanian managers, as they might not be a part of the market in which a business activates, or they might be portrayed as relevant only in intercultural environments. Here we have come across responses that altogether treated cultural management strategies' influence on organizational reputation and performance. This might be a sign of the novelty of the topic in the Romanian business reality, hence, its lack of awareness among management professionals in the market.

- **Organizational performance**

By asking managers to define this concept in their own words, from a sustainable perspective applied to their context, we came across with an important, yet previously acknowledged, distinction: B2B and B2C. It looks like this concept acquires quite different meanings when it shifts from one type of business, to another.

On the one hand, in B2C, the conceptual sphere of organizational performance interlocks perfectly with the one of financial performance. Thereby, we assume that as long as there are economic restraints, we cannot really talk about a far-reaching organizational performance, but rather about an organizational performance seen through finance. On the other hand, in B2B, the concept of organizational performance encompasses many more aspects, such as: business relationships, collaborations and "out of business" activities.

- **Organizational reputation**

According to the answers received so far, it looks like the point agreed upon is perception (consumer and competition), valid for small businesses and, as a business starts to evolve, it might add up some other quantifiers too, such as: awareness, which is a valuable asset when it comes to further development, and shared history (both with businesses and clients), which generates trustworthiness.

Final considerations and limitations

Our aim during the methodological design was to ensure that we piloted the main findings corresponding to each research dimension, hypothesis, objective and variable developed upon the literature review, given the all-comprising and inclusive character of the studied phenomena.

Understanding Romania's social economy evolution and the contribution it has impacted to a sustainable economy is vital. Therefore, businesses should emphasize adopting new creativity and innovative measures to create new business models and strategies that support sustainable development. Moreover, businesses should embrace the concept of the sharing economy to become innovative and creative, create new business models, create effective business assets and business management, and improve employee working conditions (Zbucea et al. 2018).

In addition, businesses' role in sustainably supporting urban development is vital in determining organizational performance and reputation. The interconnection of different stakeholders and the community is linked with a common goal of supporting development locally, making the stakeholders and public administrators engage at different levels to facilitate sustainable development (Zbucea et al., 2021). It gives individuals a sense of belonging as it stresses the importance of community innovativeness and their initiatives to enhance sustainable economic growth, poverty eradication, and individual development.

Overly, culture should be used to stress the importance of community inclusivity and creating mutual trust between companies and the local communities in society. In addition, culture stresses the importance of respecting the rule of law, the importance of democracy, the value of solidarity, and importance of solidarity. Sustainable management strategies should therefore respect the individual culture and support societal inclusivity from the business side, too, as it will help build an organizational reputation and improve organizational performance (Zbucea et al., 2021).

Based on our preliminary findings, it has become clear that these discussions help us grasp the real issues and perceptions of Romanian managers when coming across a sustainable-oriented business strategy which, as we mentioned, has gradually become widespread. The input offered undoubtedly enriches our perception and helps us adjust and narrow down the quantitative research so that the present research could be even more reliable, relevant and valuable to nowadays' Romanian business managers.

The following steps will consist of a thorough content analysis performed with NVivo software to ensure that everything is double-checked and standardized. From that point onwards, the presented research model / hypotheses might be adjusted according to the received input (and each variable's quantifiers will be enhanced). Finally, a cross-check table with the main changes after the pilot test (interviews) will be presented.

From that point onwards, the quantitative instrument will be designed and launched online (questionnaire-based survey), to a more extensive, significant number of Romanian business managers. In addition, the personal network and snowball technique will be used.

Lastly, the collected data will be processed in SPSS to confirm the reliability of the study. Subsequently, the data will also be processed in SmartPLS to get a variance-based structural equation modelling, which is ultimately the main methodological aim of the present PhD thesis.

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THE GREAT RESET – CHALLENGES, CONCEPTS AND OPPORTUNITIES

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Abstract. *Is it possible to have a "reset" button? - Klaus Schwab, together with Thierry Malleret, raises this issue. Are we starting with the idea that "A Great Reset" is a conspiracy theory and that people will be against this idea of being controlled? Or is "The Great Reset" just a transformation into a new order, where life will become more "sustainable"? The Great Reset applies a set of economic and social policies that will try to make the world recover after Covid into a better, fairer, and more sustainable environment in the future. Conspiracy or not, the Great Reset may be perceived as unintentional and disruptive to the world economy. One fact is certain: the Covid crisis has brought a "reset" to the economic environment by digitizing it and adapting to the new economic, technological, and social environment. The proposed study will analyze the reaction to some components of "The Great Reset" of the actors: economic agents, teachers for the Economics schools, and the pupils / students involved. Among the elements pursued in the research are: success factors in the pandemic, opportunities / challenges, information on investments, the level of digitalization and aspects of globalization, technology transfer, the jobs of the future, and the necessary skills, etc.*

Keywords: *Covid, digitalization, future jobs, globalization, great reset, technology transfer*

Introduction

"Great Reset" seems to be the latest. The concept was coined by German economist Klaus Schwab, founder of the World Economic Forum (WEF), held in Davos each year. In the July 2020 book "COVID-19: The Great Reset," he and his French coauthor Thierry Malleret describe Covid-19 as an "opportunity" to "reset" the world. This new reality would be "greener, smarter, fairer," avoiding the "systemically interdependent" risks of climate change, biodiversity loss, and ecosystem collapse. Already, the pandemic has led to "polarization, nationalism, racism, and increased social unrest and conflict." (Schwab & Malleret, 2020) The authors posit that these challenges must be addressed from a systemic perspective. The International Monetary Fund and companies like Microsoft

have joined the trend. The United Kingdom's Prince Charles thinks we need a "new Marshall aid plan for nature, people and planet" and "a shift in our economic system" toward "sustainable inclusive growth." According to the book, Covid recovery funds should be channeled into green stimulus measures – which they frequently are, for example, in the European Union. The authors also discuss growth and stagnation, fiscal and monetary policies, and geopolitical challenges, treading a fine line between prediction and prescription. The associated podcast series is more openly prescriptive.

"The World Economic Forum was not simply Klaus Schwab's invention, but was born out of a CIA-funded Harvard program led by Henry Kissinger and brought to adulthood by John Kenneth Galbraith and the "real" Dr. Strangelove, Herman Kahn. This is the amazing story behind the real people who recruited Klaus Schwab, helped him create the World Economic Forum, and taught him to stop worrying and love the bomb.

(...) My research indicates that the World Economic Forum is not a European creation. In reality, it is instead an operation that stems from the Kennedy, Johnson, and Nixon-era public policies of American politics; all of them had links to the Foreign Relations Council and the associated Round Table Movement, with a supporting role played by the Central Intelligence Agency (CIA).

Three extremely powerful and influential men, including Kissinger, led Klaus Schwab to their ultimate goal of complete global domination aligned with the American Empire through the creation of social and economic policies. In addition, two of these men were at the center of manufacturing the ever-present threat of global thermonuclear warfare. Examining these people through the broader context of the geopolitics of the period, I will show how their paths in the 60s would intersect and intertwine, how they recruited Klaus Schwab through a CIA-funded program, and how they became the real driving force behind the creation of the World Economic Forum.

By the late 1960s, John K. Galbraith and Henry A. Kissinger had become considered two of the most important lecturers, authors, and educators in America. They were also emeritus at Harvard, Galbraith a professor of economics, and Kissinger as a professor of government administration. The two men focused on creating foreign policies for America and the newly developing Europe.

Kissinger would introduce Klaus Schwab to John Kenneth Galbraith at Harvard, and as the 1960s ended, Galbraith helped Schwab transform the World Economic Forum. Galbraith would come to Europe with Herman Kahn to help Schwab convince the European elite to support the project. (contramundum.ro). Schwab's technocratic movement depends on the successful development of innovative technologies that will push us toward a vision manufactured largely in 1967. But what Schwab seems to ignore, forcing this futuristic agenda on all of us, is that many of Kahn's predictions have also been combined with warnings about the dangers that will be created by future technological advances.

The Great Reset is written and published in the midst of a crisis whose consequences will unfold in many years to come. No wonder we all feel somewhat amazed - a feeling so understandable when an extreme shock strikes, bringing the unsettling certainty that its results will be both unexpected and unusual. Albert Camus captures this strangeness well in his 1947 novel "The Plague": "However the changes were, in a sense, so fantastic and were made so precipitously that it was not easy to consider them as likely to be

permanent." Now that it has been unimaginable to us, what will it be like to happen next, immediately after the pandemic and in the foreseeable future?

If we look at the history of the Davos conferences, the current "Great Reset" fits into the pompous headlines and grand goals that this event has accustomed us to. In this sense, the same journalist reminds us about "Shaping the Post-Crisis World" (2009), "Rethink, Redesign, Rebuild" (2010), "The Great Transformation" (2012) or "Creating a Shared Future in a Fractured World" (2018).

Despite all these spectacular headlines, the consequences were not in the least to match, on the contrary, occasionally, society moved in opposite directions to the expected one. Even though hundreds of millions of people have been lifted out of poverty, global economic polarization has increased, with the wealth of a minority elite continuing to grow much faster than the rest of the population.

Companies, driven solely by the criterion of profitability, have turned to the largest markets and cheaper labor, leaving behind a poorer and more alienated Western middle class, a deepening social tensions and frustrations.

Inequality and poverty

Piketty is a French economist and renowned professor in the contemporary era who became highly regarded for the volume published in 2013 "Capital in the Twenty-First Century", where he criticized the neoliberal policies that led to a sick increase in economic inequality. He believed that any human society must somehow justify inequality, otherwise, all social and political edifices could collapse. The West must provide a viable explanation for the inequality of the last four decades, and this is where attempts have been made to propagate the anti-corruption experiment. According to studies, 100 years after the French revolution, income inequality was more pronounced than before this historical event. The author also shows how the West took a different route after implementing the policies promoted by Reagan or Thatcher, the '80s being the beginning of the phenomenon of modern inequality. In 2018, the top 10% of the population held 54% of the National Income in sub-Saharan Africa, 56% in Brazil, 48% in the US, and 34% in Europe. Looking at this data, it is clear that a less favorable model for the rich would have brought more benefits in reducing poverty. In fact, the distribution of economic growth is essential in the fight against inequality. The wealth of the richest 1% in the world has increased 4 times more in the last 40 years, compared to the cumulative economic growth in this range. Piketty points out that the reduction of inequality in the twentieth century was caused by the progressive tax system, much criticized over the last 20 years by the great economists in the hands of multinationals. It should be known that the transition from the ternary society to that of owners was also a cumbersome and complicated process, which aroused phenomenal changes at the social level.

It is obvious that the economy operates more effectively under the domination of the private sector, but no one can dispute that the excesses of corporations require a theoretical revision at the level of the economic system.

Between opportunities - concepts, and paradigms

An interdependent world is a systemic world with deep connectivity, where all risks affect each other through a network of complex interactions. Under such conditions, the

statement that the economic risk will be limited to the economic sphere or the environmental risk will not have repercussions on the risks of others of a nature (economic, geopolitical, and so on) is no longer sustainable. We can all think of the economic risks that turn into political (such as the sharp rise in unemployment, leading to social unrest), or the technological risks that move into social ones (such as the problem of tracking the pandemic on mobile phones causing a social reaction). When considered isolated, individual risks – economic, geopolitical, social, or environmental – give a false impression that they can be contained or mitigated; in real life, systemic connectivity shows that this is an artificial construct. In an interdependent world, risks amplify each other and, in doing so, have cascading effects. That is why isolation cannot rhyme with interdependence and interconnectedness.

The shock that the pandemic has caused the global economy has been more severe and occurred much faster than anything else in recorded economic history. Even in the Great Depression of the early 1930s and the Global Financial Crisis of 2008, it took several years for GDP to contract by 10% or more and for unemployment to rise above 10%. In the pandemic, disaster-type macroeconomic outcomes - particularly, the rise in unemployment levels and the fall in GDP growth- happened in March 2020 in just three weeks. COVID-19 has caused a crisis in both supply and demand that has led to the deepest dive on record for the global economy in over 100 years. As the economist, Kenneth Rogoff warned: "It all depends on how long it lasts, but if it lasts a long time, it will certainly be the mother of all financial crises. (Goodman, 2020)

At various times between February and May 2020, when they were trying to shut down the pandemic, governments around the world made a deliberate decision to shut down much of the world's economies. This unprecedented course of events has brought about a fundamental change in how the world economy works, marked by a sudden and unsolicited return to a form of relative autarchy, with each nation trying to move towards certain forms of self-sufficiency and a reduction in national and global production. The impact of these decisions seemed all the more dramatic because they primarily targeted service industries, a sector traditionally more immune than other industries (such as construction or production) to cyclical fluctuations in economic growth. As a result, the services sector, which is by far the largest component of economic activity in any developed economy (about 70% of GDP and more than 80% of employment in the US) has been hit the hardest by the pandemic. It has suffered other distinctive features: contrary to production or agriculture, lost service revenues have disappeared forever. They cannot be postponed because the service companies do not have stocks or raw materials.

When it was published in 2016, the Fourth Industrial Revolution stated that "Technology and digitalization will revolutionize everything, making the adage overused and often poorly used "this time it is different". Simply put, major technological innovations are on the verge of fueling important changes around the world." Technological progress has moved impressively fast in the four short years since then. Artificial intelligence is now around us, from drones and voice recognition to virtual assistants and translation software. Our mobile devices have become an integral and permanent part of our personal and professional lives, helping us on many different fronts, anticipating our needs, listening to us, and locating us, even when they are not asked to do so ... Automation and robots are reconfiguring the way companies work with amazing speed and returns on an unthinkable scale just a few years ago. Innovation in

genetics, with synthetic biology now on the horizon, is also interesting, paving the way for innovative healthcare developments. (Holmes, 2020).

In short, the speed and scale of the Fourth Industrial Revolution were and continue to be remarkable. The big reset argues that the pandemic will further accelerate innovation, catalyzing the technological changes already underway (comparable to the exacerbating effect it has had on other domestic and global issues) and "turbocharge" any digital business or the digital dimension of any business. It will also emphasize one of the biggest social and individual challenges of technology: privacy.

With the economic emergency responses to the pandemic, one can seize the opportunity to make institutional changes and policy choices that will put economies on a new path to a fairer, greener future. The history of the radical rethinking us in the years following World War II, which included establishing the Bretton Woods institutions, the United Nations, the E.U., and the expansion of welfare states, shows the scale of possible change. This raises two questions: 1) How should the new compass be for tracking progress? and 2) What will be the new drivers of an inclusive and sustainable economy?

BRICS – strategic vector of the future

To get here, China and Russia made great sacrifices. They have swallowed Western arrogance for years, hoping that the day will come when they will sit down at the negotiating table. We believe that this day has come... while the West has remained with Facebook and the ridiculous media manipulations, the emerging states led by China and Russia have prepared their pieces for the future. Other important global leaders in the resource market have also been welcomed into the wider circle. The BRICS controls both today's and tomorrow's resources represented by rare metals. The EU is so strategically backward that it speaks of the green revolution without having the necessary resources. You can not talk about the Green deal and electric cars, given that the battery market is dominated by Chinese firms. Although gas and oil are a topic, in 10 years time we will be looking at photovoltaic panels and cars in front of the house waiting for containers full of components from China.

The big reset – or strategic planning of the future in a few ideas: China has bought over 7 million hectares worldwide in the last 20 years, while the US and the UK have acquired together somewhere in half. The Great Asian power owns about 9% of Ukraine's fertile land. Autocratic leaders know that without food and existential resources, any political system collapses like a domino. In this regard, food prices increased by 18% in 2022, the largest increase in the last 50 years. The pandemic has shown us that freedom is worth as much as a grain of rice for the evolved individuals of the West. The lesson that BRICS representatives know by heart is that people do not care about freedom. It is an invented and mystified concept, in reality, only a minority understands and appreciates this landmark. The real problems arise when the economic system no longer provides predictability and food resources. Western leaders are not prepared for cold or exorbitant food prices.

Methodology

At the micro level, that of industries and companies, the Great Reset will involve a long and complex series of changes and adaptations. When faced with it, some industry leaders and senior executives may be tempted to associate reset with restarting, hoping to return to the old normal and restore what has worked in the past: traditions, tested

procedures, and familiar ways of doing things — in short, a return to business as usual. This will not happen.

The study represents *two socio-statistical surveys*. The community investigated in these researches comprises teachers and students / pupils.

The research method planned for the collection of empirical data used the questionnaire as a research tool, without any doubt", being the most commonly used method, the method that many authors consider to have dominated and still dominates the socio-human space – with online administration on the Google Workspace platform – Google Forms. The data collection was carried out between February and May 2022, a total of 250 of which only 234 were distributed and collected after checking the accuracy of the data.

The research unit and also the survey unit are represented by 74 companies, respectively 234 individuals (of which 92 teachers and 142 pupils and students).

2 questionnaires have been designed:

The first questionnaire was addressed to the business environment.

The questionnaire contains 15 questions, logically related to each other, which aim to obtain the primary information necessary for the study, with a minimum level of possible errors. The questionnaires are mainly made up of closed questions that allow the quantification of the researched phenomena according to the scale used (Likert), which are structured on 4 large topics aimed at: the effect on the company's financing, the technologies in the business environment, the economic challenges and the trades of the future.

The second questionnaire is addressed to educational experts / teachers, and pupils. This questionnaire also contains a number of 16 questions structured on 3 important topics, namely: the changes imposed by the pandemic in the business environment, digitalization in the context of increasing globalization, and the trades of the future.

The questionnaires were applied in a pilot study that tested their effectiveness and followed the concise formulation of the questions to prevent errors due to the faulty conception of the questionnaire.

They were distributed through self-administration online, on various social networks between February and May 2022.

The response rate was 100%.

The samples were drawn up on the basis of the random sampling method, on the principle of ensuring equal opportunities for all subjects regarding inclusion in the sample. A number of 234 people and 74 persons were interviewed through legal representatives, so it would be possible to extrapolate the results to the level of the investigated population within the limits of a sufficiently small error. The research carried out has essentially a qualitative and not a quantitative purpose, it was not intended to ensure statistical representativeness but rather to obtain a basis of analysis that would allow the outline of guidelines regarding the changes imposed by the pandemic.

This study aims to identify the main factors influencing globalization in the pandemic and post-pandemic context.

Starting from the aspects highlighted above, within the literature, we considered it relevant for our exploratory study to answer the following questions:

1. What will define the new normal of a post-coronavirus business landscape?
2. Is there a cross-cutting approach between technology education and the economic reset of the future?
3. How will companies find the best possible balance between past success and the foundations now needed to succeed in the post-pandemic era?
4. What skills and abilities do you need to acquire in the context of the great socio-economic recovery?
5. What are the important aspects of globalization with the global economic context in mind?
6. What skills will be sought in the conditions of the great economic reset in the labor market?

Objectives:

1. Identifying the factors of success/ failure in developing the business in the pandemic context.
2. Identify development opportunities for the great economic reset.
3. Formulating forecasts/predictions regarding the revolutionization of new technologies and highlighting global digitalization.
4. Identifying new trends in employability / the trades of the future
5. Identification of parameters for future generations' development of (competencies, and abilities) in the context of the great social-economic reset.

In the undertaken quantitative study, *the statistical hypotheses* were:

H1. More than 50% of Romanian companies mentioned success factors were the use of telework, and the implementation of good health protection.

H2. More than 40% of Romanian companies improve the current model used.

H3. More than 50% of economic operators say they will improve the current model. It also goes towards investments in human resources (training, motivation, etc.) and digitalization.

H4. More than 60% of teachers, pupils, and students agree to put social intelligence novel and & adaptive thinking, and computational thinking at the bottom of the rankings.

H5. More than 50% of teachers (73.91% versus 23.94%) believe education is the main way young education can prepare for future jobs.

H6. Less than 50% of the respondents believe that aspects of globalization in today's society tend from indifferent to very important, an aspect that requires increased attention, if we follow the trends in any economic field.

H7. For more than 60% of students, the most important criterion is adaptability (59.6%), followed by the ability to act intelligently.

The response is obviously dependent and industry-specific and the severity with which it has been affected by the pandemic.

Results and discussion

A number of 74 companies from Suceava County answered the online questionnaire. 42% of the analyzed companies are micro-enterprises with between 1-9 employees, 18.9% are small enterprises with a number of employees between (10-49), 13.5% medium-sized enterprises (50-249 employees), and 10.8 % are large enterprises with more than 250 employees.

Regarding professional status, 39,3 % are teachers (92 people), and 60,7%, 142 people) are pupils in final year or students. Only 14 students are employees.

Table 1. Status of the respondents (Source: Authors' own research results)

Respondents	Total no.	Age					Your gender		
		under 25 years	25 - 35 years	35 - 45 years	45 - 55 years	over 55 years	Female	Male	I prefer not to answer
Teachers	92 39.3%	-	-	26	34	12	42	4	-
Pupils / students	142 60.7%	138	4	-	-	-	55	15	1

1. What will define the new normal of a post-coronavirus business landscape?

A percentage of 35.1% of the responding companies increased their turnover in 2021 compared to a year ago, 5.4% obtained a turnover between 50% and 100%, and 8.1% recorded a turnover of less than 50% of that of 2020.

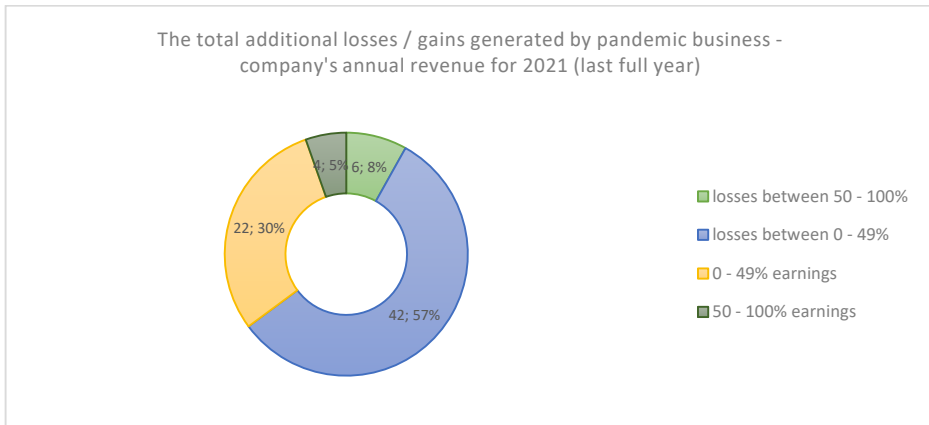


Figure 1. The total additional losses / gains generated by pandemic business - company's annual revenue for 2021 (last full year)

Source: Authors' own research results / contribution

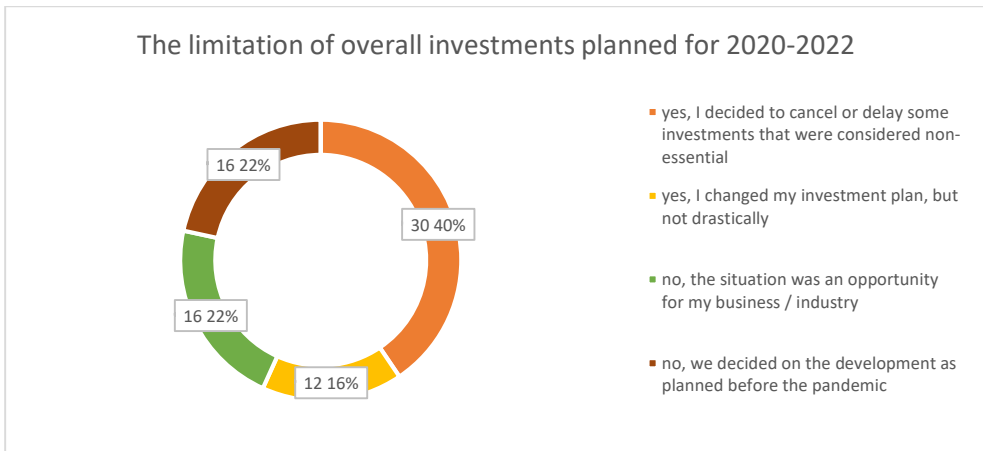


Figure 2. The limitation of overall investments planned for 2020-2022

Source: Authors' own research results / contribution

The most frequently mentioned success factors were the use of telework, the implementation of good health protection measures, the limitation of investments and the quality of managerial decisions. By far, the most unlikely success factor is employee professionalism, the optimization of activities and the quality of product.

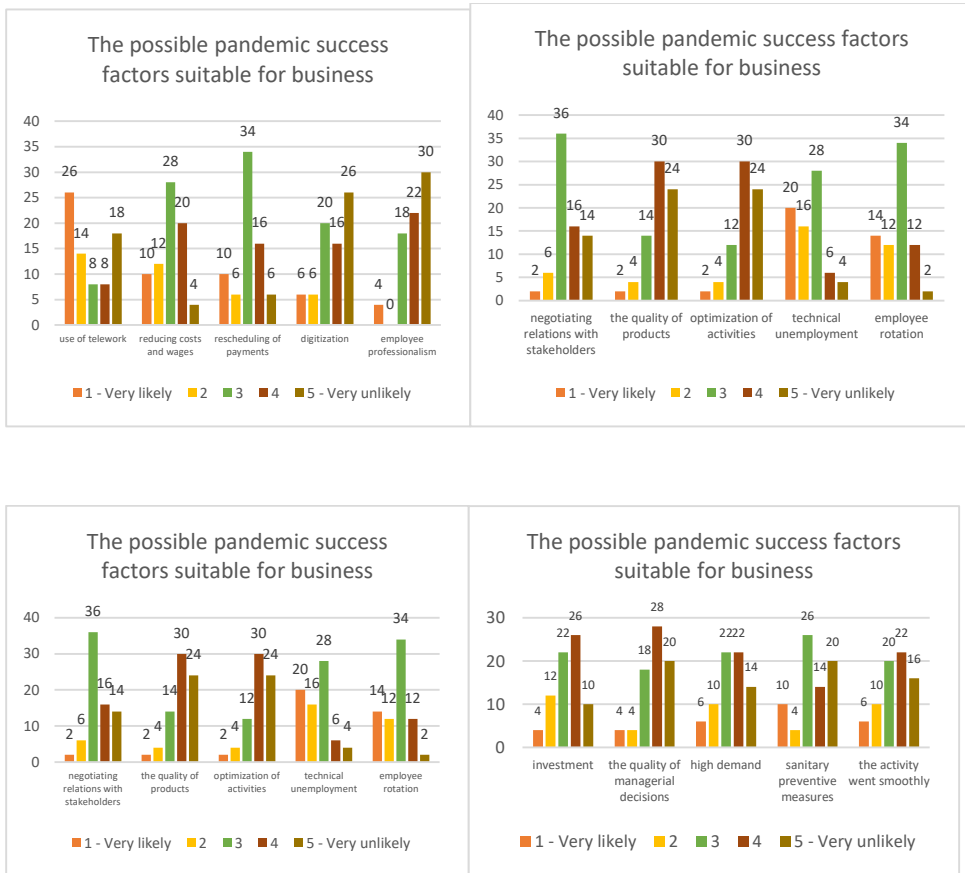


Figure 3. The possible pandemic success factors suitable for business

Source: Authors' own research results / contribution

Almost half (41%) of the interviewed employers claimed that they were limited to investments in development plans (e.g. Launching into new markets, setting up new subsidiaries, investing in equipment), followed by investing in employees (26%) and IT (22%).

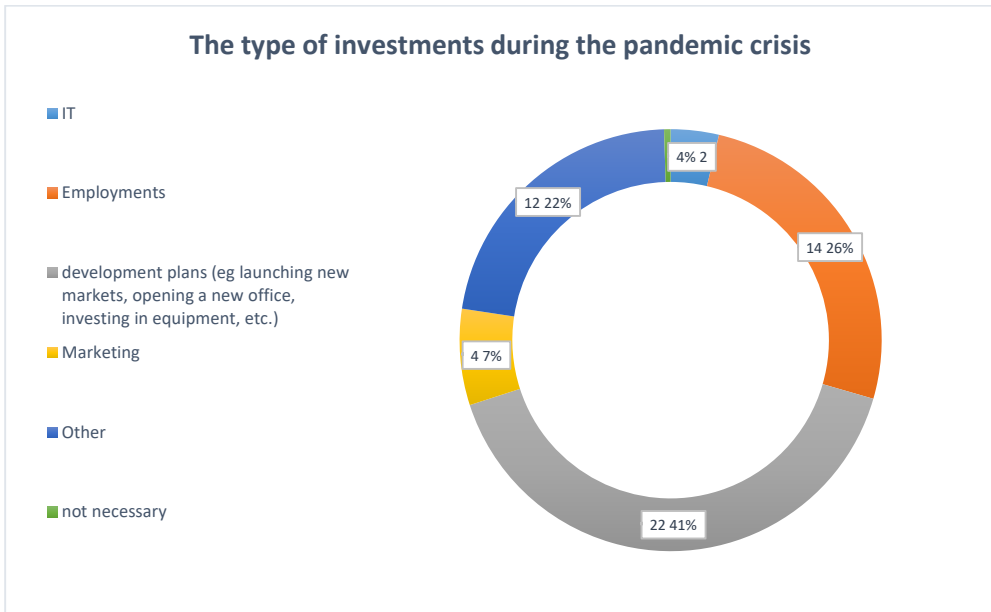


Figure 4. The type of investments during the pandemic crisis

Source: Authors' own research results / contribution

Post-pandemic challenges are somewhat private uniformly. Both teachers and students greatly appreciate the high cost of raw materials (84, respectively 64 of those interviewed). Regarding the strategy at the global level, but also locally, the opinions are equal, with a high quota of responses (42 respondents for both teachers and students), and the need to improve their own strategies is also close. A big difference seems when it comes to balancing the balance of income and expenses, only 12 teachers consider it a challenge, while 64 students they pointed this out.

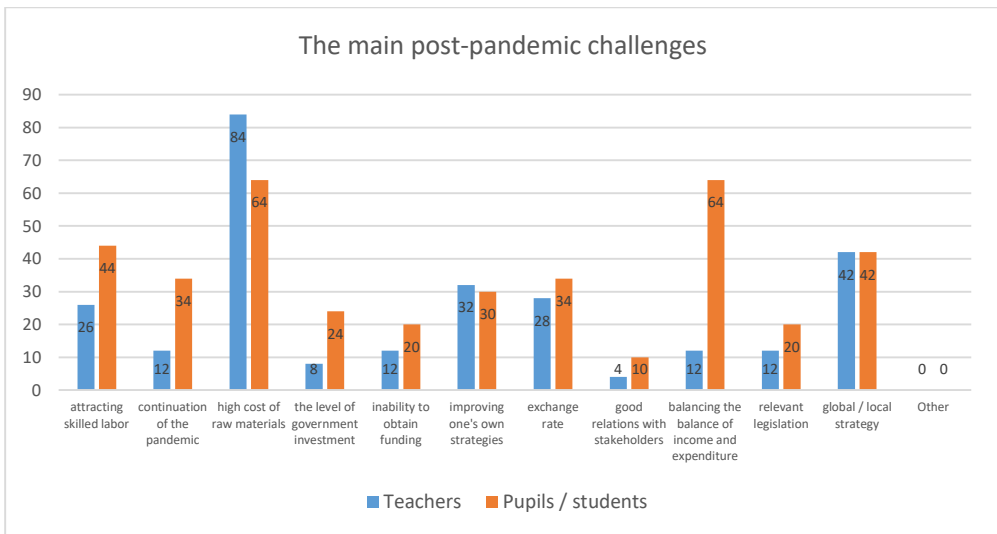


Figure 5. The main post-pandemic challenges

Source: Authors' own research results / contribution

When we talk about the opportunities identified during the pandemic crisis, all respondents agree that some of the most important was the introduction and use of the online menu and digitalization, then the new markets, products specific to the Covid pandemic and European projects, appreciated more by students / pupils than by teachers.

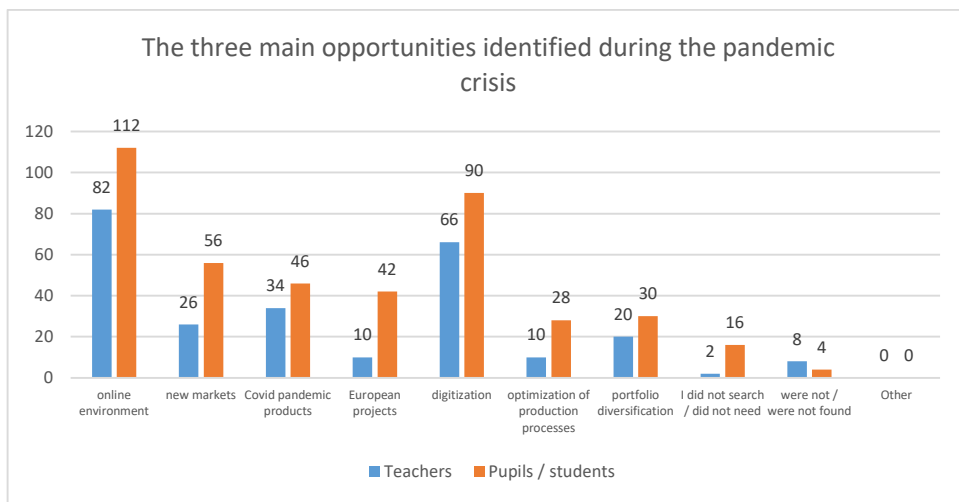


Figure 6. The main opportunities identified during the pandemic crisis

Source: Authors' own research results / contribution

2. Is there a cross-cutting approach between technology education and the economic reset of the future?

In the near future, more than 50% (51.4% to 38 economic operators) say they will improve the current model used. It also goes towards investments in human resources (training, motivation, etc.) and digitalization. The least (10 respondents – 13.5%) think about accessing European funds.

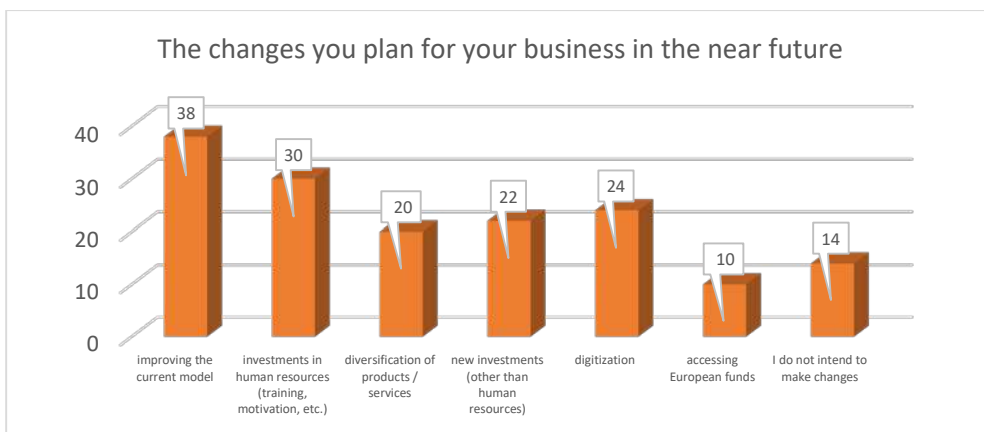


Figure 7. The changes you plan for your business in the near future

Source: Authors' own research results / contribution

When we talk about the company's reaction to the needs of digitalization, opinions are divided between "total agreement" and "indifferent" for most criteria, among which we mention: the adoption of an online payment system for customers, digital solutions in relation to suppliers, online solutions for orders / contracting. We are drawn to the relatively uniform proportion of the indicators.

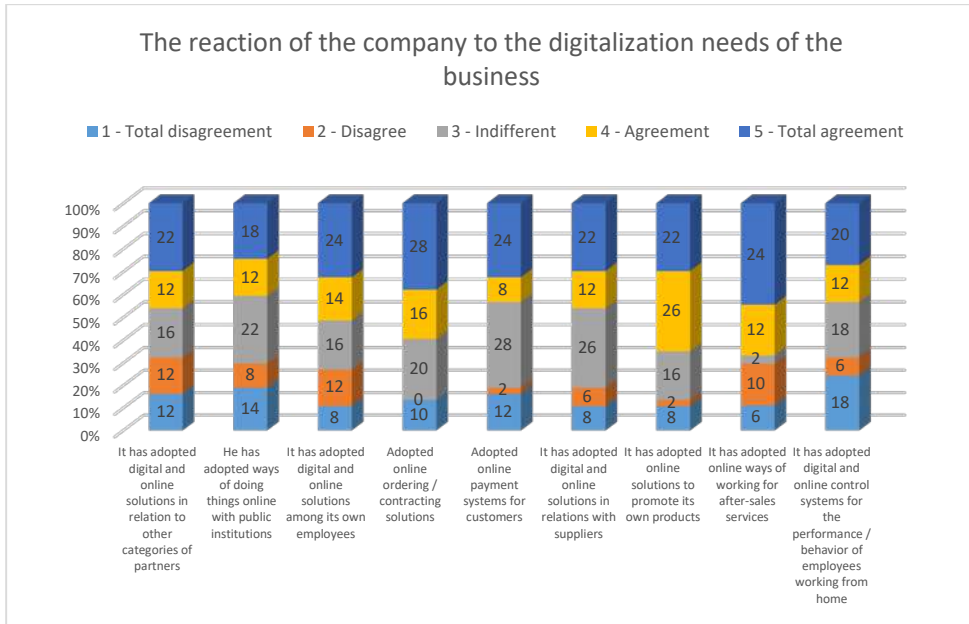


Figure 8. The reaction of the company to the digitalization needs of the business

Source: Authors' own research results / contribution

In the recruitment process, just over half (54.1%) apply for a certificate of ICT skills, at a considerable distance (18.9%) which evaluates the future employee according to an officially published set of criteria (Digicomp, Bestjobs, etc.). Note that 35.1% do not assess digital skills, which is worrying today.

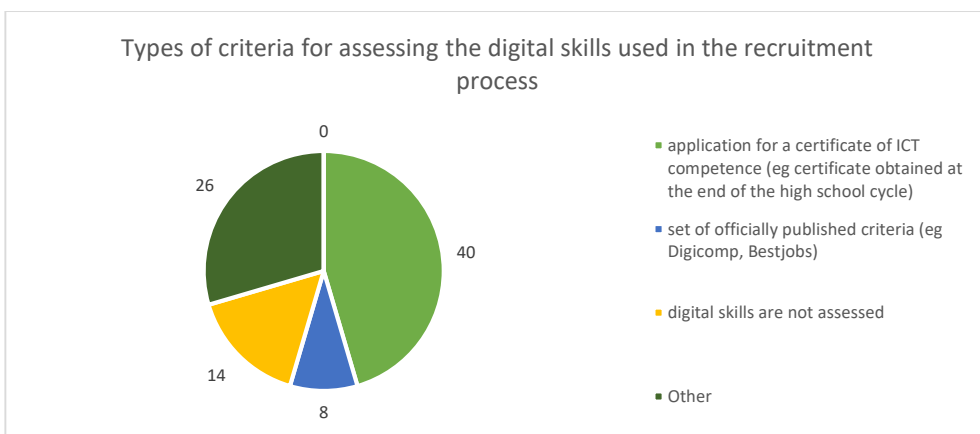


Figure 9. Types of criteria for assessing the digital skills used in the recruitment process

Source: Authors' own research results / contribution

From the point of view of teachers and students/ students, simple criteria (such as familiarity with programs for editing documents and spreadsheets or presentations) are the most used in the recruitment process when it comes to digital skills, followed by the application for a certificate of ICT skills (e.g. certificate of certification of professional qualification). We note that if teachers are balanced when we look at the two criteria, for pupils and students the balance is much tilted towards simple criteria than certification (115 versus 56).

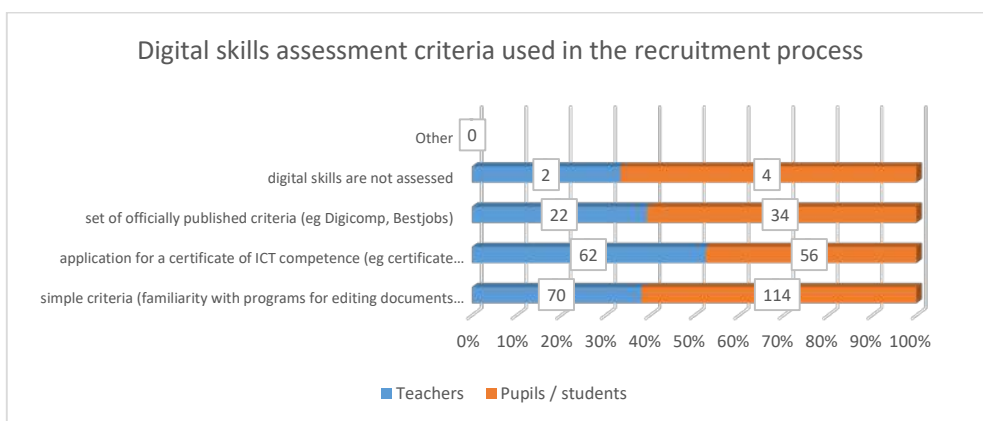


Figure 11. Digital skills assessment criteria used in the recruitment process

Source: Authors' own research results / contribution

Among the categories of technology transfer services in which investments are intended in the next 5 years, we point out that almost half of the responses (48.60%) go towards continuing education and training, followed by the identification of possible investments (37.8%). We note that consultancy for strategic business development

received 0 votes, and support services in intellectual property management and protection of industrial rights only 2 votes each.

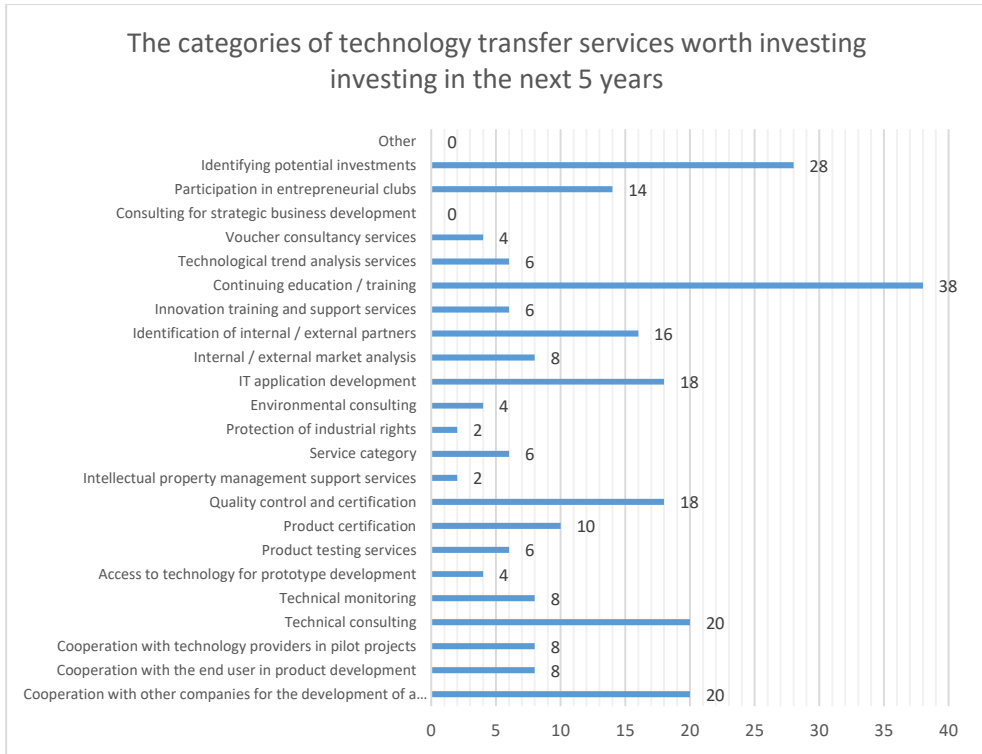


Figure 10. The categories of technology transfer services worth investing in the next 5 years

Source: Authors' own research results / contribution

3. How will companies be able to find the best possible balance between past success and the foundations now needed to succeed in the post-pandemic era?

The main opportunities identified by the economic agents during the pandemic were: the online environment (51.5%), the new markets (40.5%), and digitalization (37.8%). The fewest votes were received from European projects (8.1%).

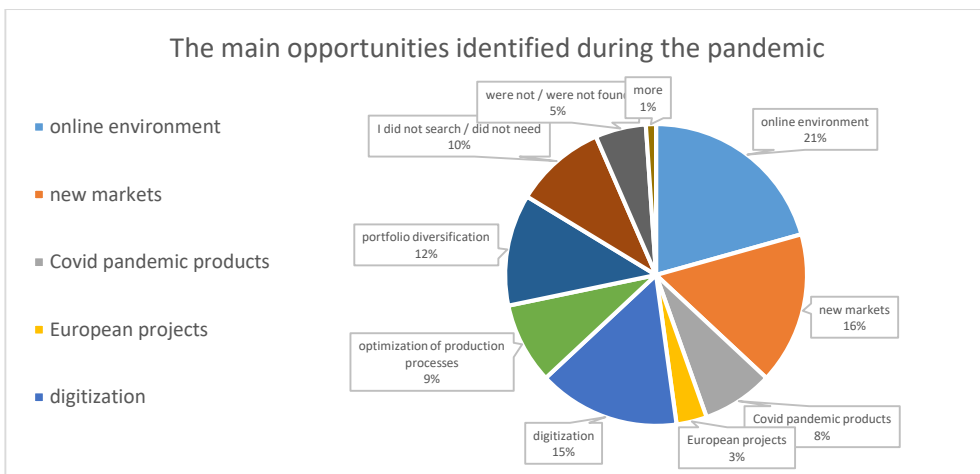


Figure 12. The main opportunities identified during the pandemic
 Source: Authors' own research results / contribution

When economic agents are put in the situation of identifying the challenges for the post-pandemic period, the leading place is divided equally (with 32 responses) between attracting specialized labor, the high cost of raw materials and improving their own strategies. We note that the fewest votes were given good relations with stakeholders (4 votes), followed by the exchange rate.

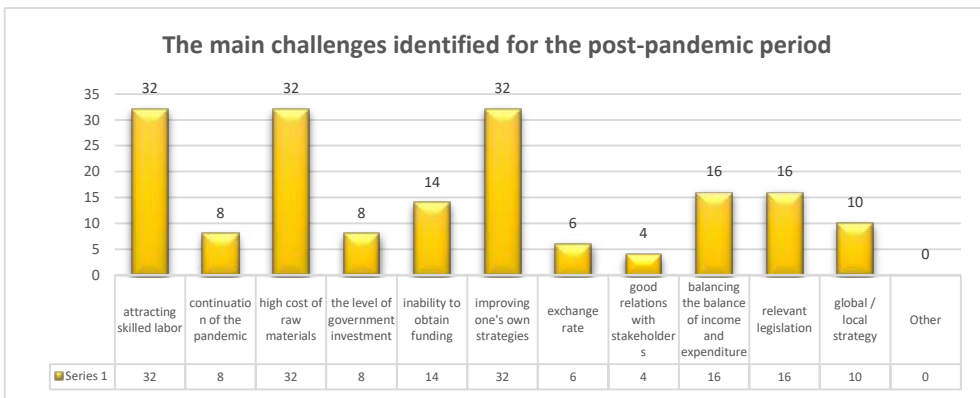


Figure 13. The main challenges identified for the post-pandemic period
 Source: Authors' own research results / contribution

The opinion of teachers and pupils and students are divided when asked about the skills needed in the future in the labor market. Both categories agree to put social intelligence novel and & adaptive thinking and computational thinking at the bottom of the rankings. Differences arise if teachers appreciate transdisciplinarity, mindset design students/students, and virtual collaboration.

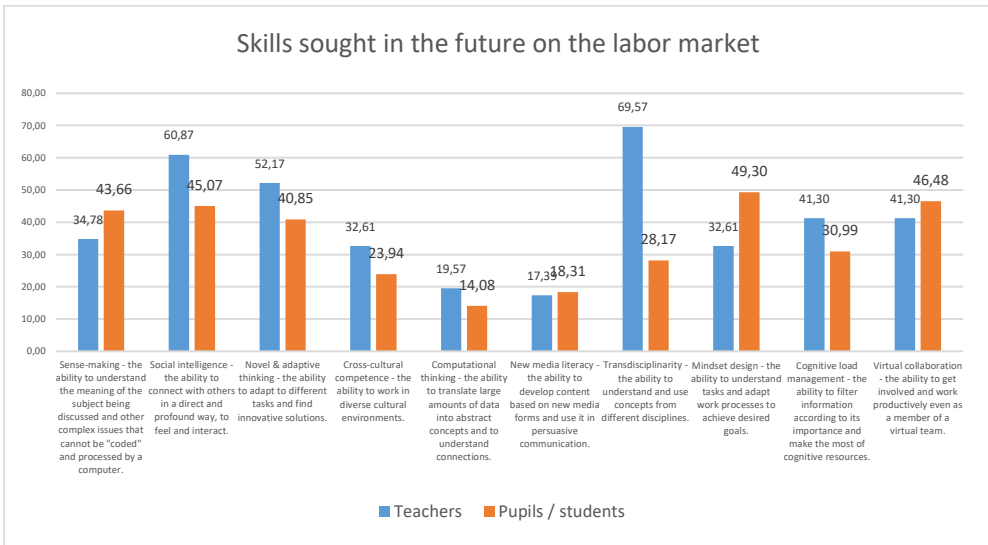


Figure 14. Skills sought in the future on the labor market
 Source: Authors' own research results / contribution

4. What skills and abilities do you need to acquire in the context of the great socio-economic recovery?

Both teachers and students agree that in order to keep up with the changes brought about by the trades of the future, adaptability is needed in the first place. However, teachers put the opening to the new in second place, while the students and students the passion. It is to be observed relatively uniform proportions in student/student responses.

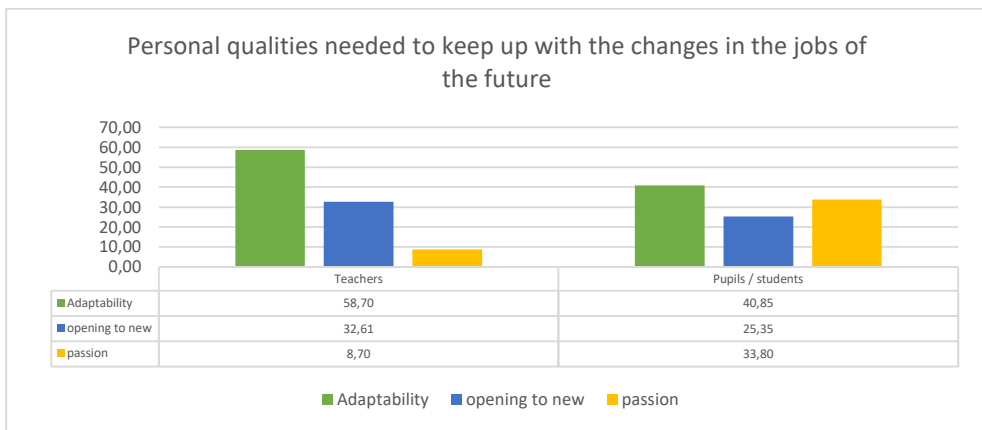


Figure 15. Personal qualities needed to keep up with the changes in the jobs of the future

Source: Authors' own research results / contribution

An overwhelming majority of teachers (73.91% versus 23.94%) believe that education is the main way in which young education can prepare for the jobs of the future. Communication is the most important for students, followed by access to education and, only in the last place, education.

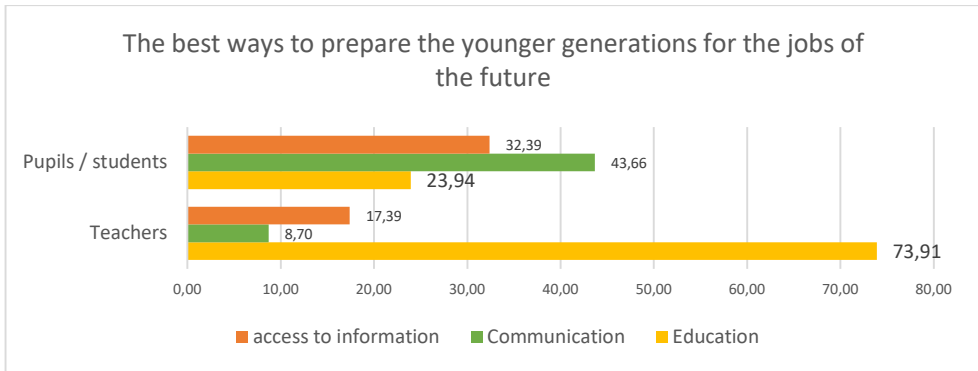


Figure 16. The best ways to prepare the younger generations for the jobs of the future

Source: Authors' own research results / contribution

If we refer to the categories of technology transfer services, we observe relatively a balance between the responses of teachers and students / students. However, there are differences in the classification of some services, such as: the development of IT applications (56.52% teachers and only 33.80% students and students), Cooperation with other firms for the development of a product / service (59.15% students and pupils and only 43.49% teachers or innovation training and assistance services (32.61% teachers versus 12.68% students/ pupils).

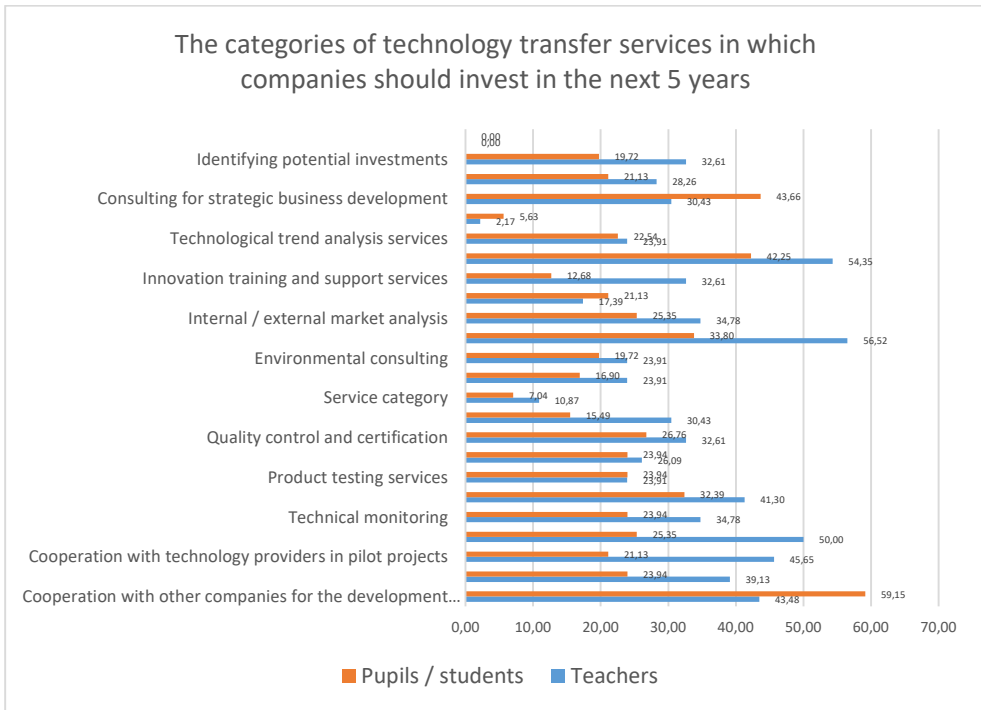


Figure 17. The categories of technology transfer services in which companies should invest in the next 5 years

Source: Authors' own research results / contribution

5. What are the important aspects of globalization with the global economic context in mind?

The aspects of globalization in today's society tend from indifferent to very important, an aspect that requires increased attention, if we follow the trends in any economic field. We note that almost half of those surveyed (43.2%) are indifferent to the activation of global connectivity; another attention signal is that the prevention of climate change and resource scarcity has a percentage of 21.6% "unimportant" and 35.1% "regardless".

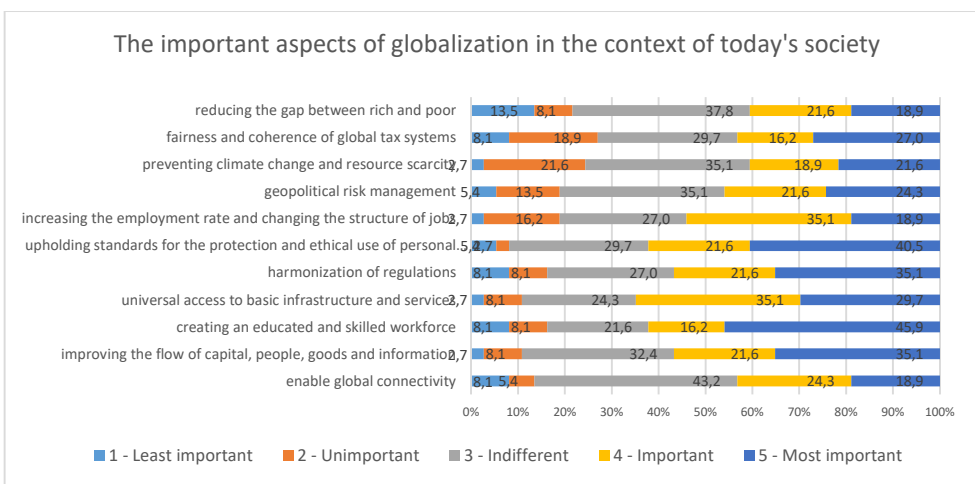
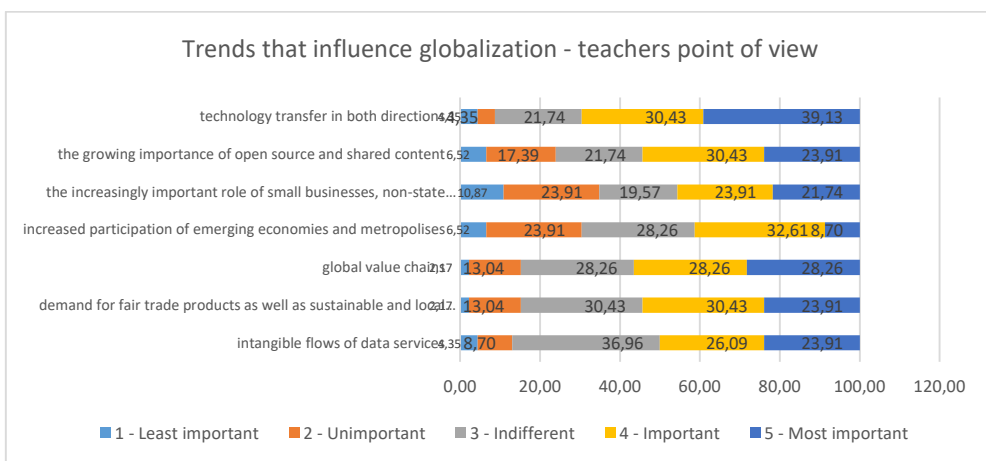


Figure 18. The important aspects of globalization in the context of today's society
 Source: Authors' own research results / contribution

When we talk about trends that influence globalization, both teachers and students and students pay attention to them, yet at most indicators, a percentage of 20 to 30% are indifferent to both categories. We see increased attention to the technology transfer in both directions of both interviewed categories, but then teachers turn their attention to global value chains and the growing importance of open sources and content, and students and students are more interested in increased participation of emerging economies and metropolises.



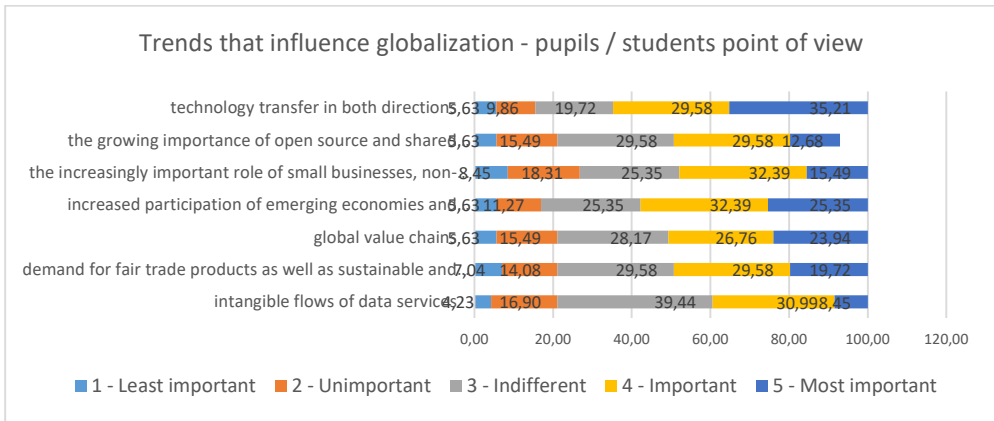


Figure 19. Trends that influence globalization

Source: Authors' own research results / contribution

Both teachers and students are much more interested in the aspects of globalization in the context of today's society than economic agents. We see small values, up to 16%, when discussing the unimportance of these indicators for both categories. However, we can point out that if for teachers, the emphasis is on "very important" and "important", for students and students it is noticed that the trend of economic agents of indifference remains quite high.

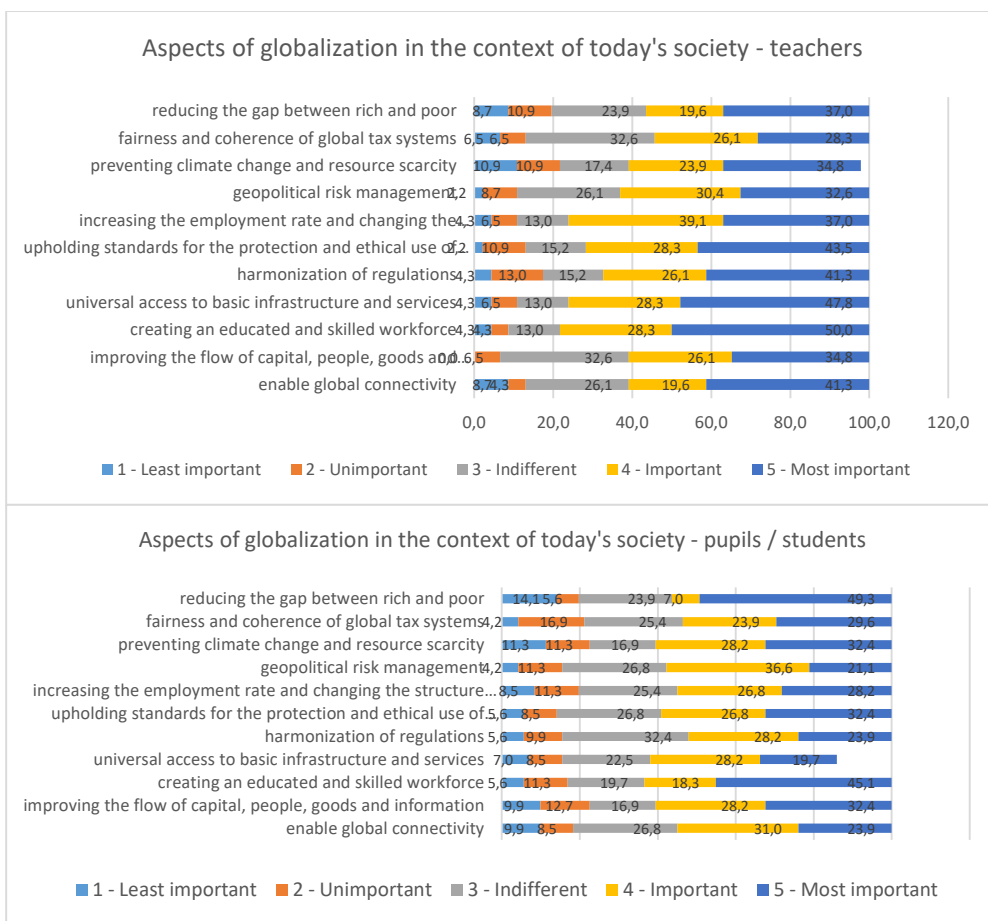


Figure 20. Aspects of globalization in the context of today's society

Source: Authors' own research results / contribution

6. What skills will be sought in the conditions of the great economic reset in the labor market?

When asked about attractive future trades, teachers and students are attracted to trades such as space tour guiding, biomedicine engineering, biotechnology engineering (teachers), and robot programming/ artificial intelligence (students and students). Among other options, we see counselors / psychologists for teachers and policemen for students and pupils.

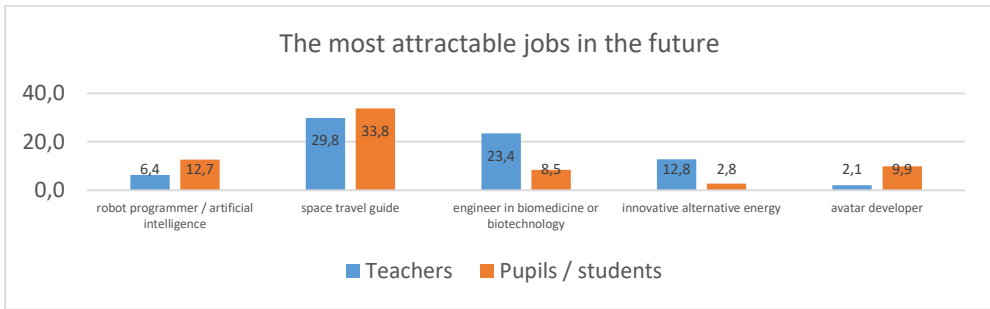


Figure 21. The most attractable jobs in the future
 Source: Authors' own research results / contribution

Professional areas of the future about a topic of dispute between teachers and students / students; only when we talk about medicine can we say that both categories agree (12.7% and 12.8%, respectively). If teachers believe that the professional fields of the future are robotics and education, students and students opt for business and social media and the Internet.

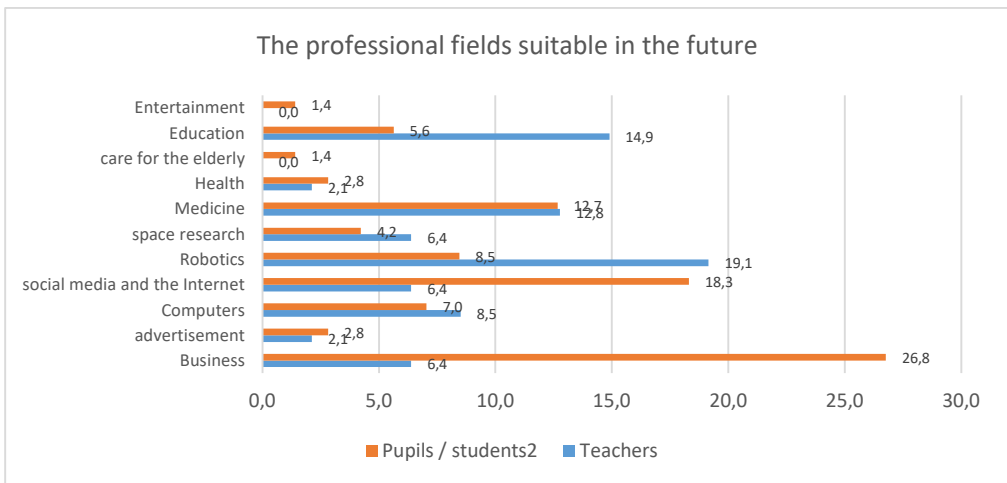


Figure 22. The professional fields suitable in the future
 Source: Authors' own research results / contribution

Respondents were invited to rank the 10 key skills highlighted by Forbes in 2021 for the trades of the future. We note that the most important criterion for teachers is adaptability (59.6%), followed by the ability to act intelligently. If for teachers, only one criterion recorded a value of 50%, for students and students more key skills are in their attention, with equally high values: the ability to act intelligently, imagination, curiosity and entrepreneurship. We note that for students and students, adaptability is not an important key skill (with a relatively uniform percentage distribution).

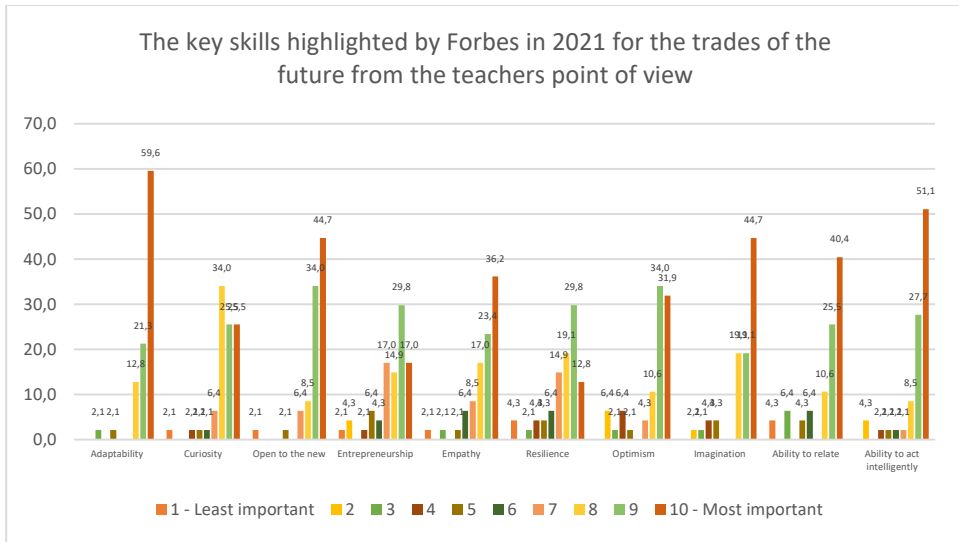


Figure 23. The key skills highlighted by Forbes in 2021 for the trades of the future from the teachers' point of view
 Source: Authors' own research results / contribution

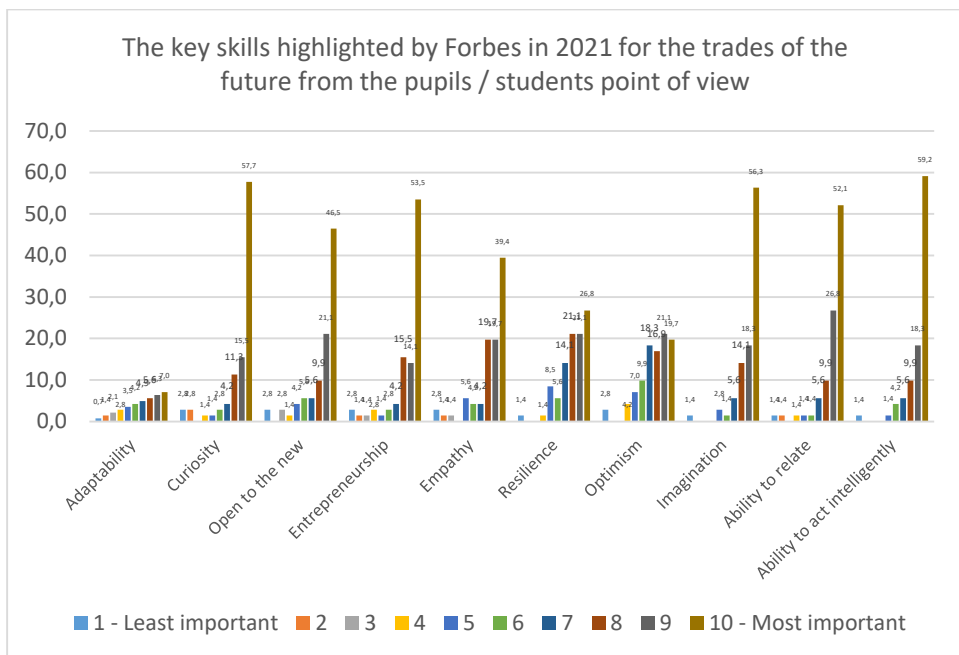


Figure 24. The key skills highlighted by Forbes in 2021 for the trades of the future from the pupils / students' point of view
 Source: Authors' own research results / contribution

Conclusions

Freedom in unlimited dose has created chaos and uncertainty. respect for authority has disappeared, which is seen most prominently in the younger generation that no longer respects anything, from family to teachers or intellectuals.

The pandemic has come to the fore to put an order to this chaos. The idea is simple. If the finite physical universe cannot provide the premises for attaining full happiness by satisfying the desire for recognition, then it is not left for us to move a man into an infinite virtual universe. The individual will become an avatar in the metaverse, where everything can be infinitely accessible. The younger generation relates to virtual space totally differently from the rest. The younger generation is almost totally moved to online, if we consider the data that attests that almost 8h per day is consumed on Netflix, Facebook, Instagram, or Tik-ToK. After 2 years of strains, the concept of social distancing has entered the subconscious for a long time. Those who have managed to break away and save themselves will live and develop in truth and complete happiness in the physical, finite universe. Those who have failed to understand will become avatars in the metaverses, hidden from fear through dark rooms in the infinite virtual universe.

Since capitalism cannot solve the problem of inequality, another solution must be found: the Great Reset. The world must again accept the rarity and separation between social classes. The reset created will permanently divide the globe for several decades. Paradoxically limited resources - unlimited needs will become current and individuals will learn to value the value of money again.

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MOBILE APPLICATIONS IN TOURISM AND DESTINATION PROMOTION

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Abstract. *The subject of this paper is the potentials of competitiveness of applicative digital technologies, namely mobile applications in the marketing promotion of destination tourism products. The purpose of the paper is to explore the relationship between mobile applications and tourism offers, as well as the attitudes and perceptions of destination offer stakeholders towards the use and efficiency of mobile applications. The paper's aim arises from the aforesaid: an exploration of mobile applications in valorizing the online promotion of tourism destinations. The qualitative methods used in the preparation of the paper are: the methods of description, analysis, synthesis, generalization of methods of compilation, and inductive and deductive methods. The quantitative statistical methods and creative thinking methods have affected the formation of new knowledge and the paper's contribution. The set research goal impacts the formation of the main hypothesis: Mobile applications contribute to promoting, recognisability, and education about destination tourism products. Research so far has dealt very little with the attitudes of different stakeholders who, actually, are the key holders of tourism offers and creators of tourism policies, on the grounds of which specific products are formed. By argumentation and comprehension of the respondent sample diversification and appreciation are achieved of all tourist stakeholders who form quality and influence competitiveness. Their consideration and attitudes represent an innovative contribution of the paper, directed towards specific services, augmented reality, pricing aspects, and digital innovations.*

Keywords: *digitalization, mobile apps, smart tourism destination, technology, tourism offer*

Introduction

The implementation of modern technologies was intensified by the fight for competitiveness in the tourism sector. Through digital strategies, tourism destinations

use numerous tools by which they present their offers in an innovative, attractive, and interactive way. However, the question is asked what exact tools contribute to digital visibility? With the omnipresent Internet, mobile technology of applications for mobile smartphones represents a new marketing challenge, from the application itself as a product, pricing dimension, and promotional aspects, to the method of reaching users, and consumers of information about products that the tourism sector wishes to present and offer. This paper considers the topic area of mobile applications within the digital marketing system of tourism destinations. It explores the attitudes of destination stakeholders and creators of the destination tourism offer. It synergically creates a strategic destination marketing mix within which it is an important factor in digital promotion using mobile applications. The aim is to explore the importance of achieving new competitiveness through a destination digital strategy. The set research goal impacts the formation of the main hypothesis: Mobile applications contribute to promoting, recognisability, and education about destination tourism products. directed towards the impact on competitiveness.

This paper is composed of four chapters. The introductory chapter presents the theory and literature review; namely, it deals with tourism destination products, tourism stakeholders, and the importance of digital promotion. It explains the aspects and importance of mobile apps created specifically for mobile smartphones that enable immediate, just in time, information for tourists, enhancing their tourism experience. The second chapter presents the methodology and research design. The third chapter presents the research results, where each part of the research is discussed, and the significance of the findings is explained. The fourth chapter presents conclusive remarks followed by the references chapter.

Theory and literature review - Destination stakeholders and tourism products - cooperation for competitiveness including mobile applications as specific tourism product

Organisation and marketing of destination tourism offer is an ongoing topic area of the modern organization of both global, Croatian, and Istrian tourism. Strategic management and marketing of tourism organizations and destinations represent a factor of competitiveness, and the ICT technology catalysts are innovations that affect the positioning. This is the topic of research of Sabou and Majorescu (2020) who explore the challenges of smart tourism. Križman Pavlović (2008) studies the marketing of tourism destinations, emphasizing the importance of marketing for sustainable development. Dulčić A., and Petrić L. (2001) write about tourism development management, referring to the organization of tourism offer, while Cooper (2008) studies the stated elements through the prism of the tourism economy. Kušen (2002) explores tourism attraction as a base for valorizing innovative tourism programs.

Tourist satisfaction with their stay in a tourism destination is conditioned by the level of quality and innovativeness of the offer, by which increasingly demanding wishes and needs of modern demand are fulfilled. Retention of the existing and attraction of new tourists is conditioned by a continuous innovation process and development of both destination and accommodation products and offers, as stated by Floričić (2016).

This presumes linking, synergy, cooperation, and networking of stakeholders, as well as overcoming individual limitations with a view to creating new values and excellence (Stipanović et al., 2017). The structure and quality of tourist offers result from available resources, from infrastructural to human, which affects the creation of new values in

entertainment, recreation, culture, and accompanying projects. The shaping of tourist offers encompasses a three-dimensional concept that includes the market, the product, and the technology which satisfies the wishes and needs of the tourists' leisure organization. Bordas (1994) presents the concept in which he considers the totality of destination offer, from the resource base, tourism attractions, events, infrastructure and equipment, choice of service facilities, and organization at all levels.

Holders of tourist offer in the destination formulate developmental strategies and online and offline marketing strategies, including all the holders of the tourism offer (Čavlek et al., 2011). In strategic planning that is directed towards the raising of destination competitiveness, the existence of feedback for facilitation of monitoring and control is of the utmost importance; more precisely, of monitoring the realization of the plan of development of the destination products, as well as their promotion (Floričić & Floričić, 2019).

Also, destination management emanates from the need for cooperation of different subjects in tourism, such as the private sector or the local population. Hasan (2000) notes the necessity of rising above the framework of competition among companies and steers towards finding cooperation models, especially through strategic partnership marketing, to achieve new competitiveness. Kušen (2002) identifies the key stakeholders in tourism destination management: tourism boards, local government and self-government, spatial and other developmental planners, statistical services, and the tourism economy. The synergy of their activities is directed towards an adequate organization of tourism products in the destination and efficient promotion as a component of the marketing mix. As a catalyst of the changes towards new competitiveness, technology facilitates a fast, price-wise favorable, and diversified presentation of the resource base, tourism attractions, and other material and non-material destination values in tourist demand. By understanding the platform's importance of cooperation and forming of integral tourism products and their promotion through mobile digital technologies, a basic paper goal is presented: affirmation of the importance of versatile online mobile applications for destination competitiveness and tourism development. This is why the consideration of attitudes of the destination stakeholders about the importance of digital technologies, namely mobile Internet and mobile applications, are the focus of interest and represents the key topic of this paper.

Mobile applications in tourism

As early as in the nineties of the last century, interactive appliances were introduced in tourism destinations, such as audio guides and, somewhat later, also digital handheld appliances. The disruptive innovation was recorded in 2008 when mobile telephony developed the application services iStore and Google play, platforms for downloading of created applications for diversified services and contents, of which write Urvina, 2022 and Jia et al., 2015. Due to the omnipresence of smartphones in everyday life, tourism destinations have today adapted to modern habits and developed digital applications for mobile telephony to improve the experience of visits to the destination and cultural attraction base, which Felicetti et al. (2020) explore, as well as associated tourist facilities (Tsai & Sung, 2012). Griefe (2010) deals with this topic and Dias & Alfonso (2021) deepen it, considering the influence of applications on the overall experience in the destination. This affects the formation of the destination identity, which is communicated through the application design and synergically corresponds to the identity vision (Kuo, 2019).

The basic purpose of tourism mobile applications is assistance and support in the choice and planning of the travel itinerary, as well as of stays in the destination (Tan et al. 2017, Marzano, 2018). Further, it is important to mention that tourists, passing through all the travel cycles, use their mobile telephones to explore, book, photograph, and video destinations and then share their impressions with the wider public. Moreover, Urvina et al. (2022) deal with tourist preferences and consider applications according to predominant interests.

Owing to applications, tourists can more easily find the desired destination, obtain information about the destination's receptive facilities, and other users' comments and reviews can assist them in choosing their accommodation and other services (Law et al., 2018). User experience is the topic area extensively dealt with by Palos-Sanchez et al. (2021) and they develop a discussion related to the question: Do the quality of tourism applications and user experience influence their acceptance by tourists? Furthermore, Choi and Yoo (2021) explore how perceived risk influences tourism consumers' technology readiness toward tourism mobile apps. This problem area is considered as, in comparison to the use of websites optimized for mobile appliances, the predominance in the use of mobile websites is evidenced in relation to the applications.

The main task of mobile applications for tourism destinations is assistance in the interpretation of the attractiveness base in a modern way, provision of information about destination products, as well as sharing information about the location, hospitality offers, maps and traffic, and numerous other infrastructural services in tourism. Mobile applications of this type provide visitors with very informative and interactive experiences in various locations. They also provide professional guidance in different languages, help get around and offer useful information about tourism products and other destination services. Destination mobile applications serve as digital guides for guiding visitors around the locality resource base (Lombardo & Damiano, 2012), but also as a platform for augmented reality, through which intangible values in the tourism destination are affirmed, discuss Do et al. (2020) and Saragih and Suyoto (2021), who explain that interactive mobile apps use marker-based augmented reality and provide information and maps of tourist sites. By downloading specific applications before visits to desired localities, visitors can obtain information about the facilities on offer and plan their visit in more detail, supported by the geolocation GPS services (Szark-Eckardt, M., 2017). Apart from this, mobile applications can also be used as marketing tools in tourism, so it can be said that they equally have an important promotional role.

Tourism applications can further be divided in more detail; Grieve et al. (2010) divide them into ten main groups:

1. Applications for travel planning – They provide the possibility of creating of the entire travel itinerary, with the possibility of booking of accommodation, tickets and other services (TripIT, Tripcase, TripDeck).
2. Applications for accommodation booking – These applications provide all the necessary information about hotels and other accommodation facilities and their capacities, as well as the possibility of booking (Booking.com, Hotels.com, Airbnb)
3. Applications for transport planning – They enable users to find information about transport and booking and purchase tickets (Kayak, Flight track, Trainline).

4. Applications with information about events – These applications provide information about events and activities in the selected destination, with the possibility of sending recommendations to other users (Buzzd).
5. Applications for satellite navigation – These applications provide satellite navigation services (Google maps).
6. Interactive electronic guides – These are the guides around destinations and have the possibility of exchanging experiences with other users of the same application (NY Travel Guide).
7. Social networks based on locations – This type of social network provides the possibility of finding, i.e. exact locating of attractions and services the selected destination offers (Gowalla and Foursquare).
8. Specialised applications, created for tourism companies – These are the applications that are created for the needs of specific companies and their clients (Lufthansa and British Airways).
9. Specialised applications for museums and cultural institutions – This application represents a substitute for local tourist guides (London Museum Guide and ThrillSeeker).
10. Applications with useful information for tourists – They offer translation services and provide different information, such as weather forecasts, exchange rates, etc. (eCurrency, Language translator).

The technology development and the interest transformation of the segment of tourists of the Millennials and Gen Z generations, the importance is pointed out of the development of different applications belonging to the group of social networks (YouTube, Facebook, Instagram, TikTok, Snapchat). They considerably encourage tourism trends and substantially promote tourism (Naramski & Herman 2020). Apart from their own applications, DMOs and tourism boards are present in social networks with their profiles and websites, also representing the stakeholders of destination applications by which the overall destination offer is integrally presented, and which encourages loyalty and as long and deep as possible interaction which fosters emotional attachment and forms returning guests.

Methodology

In the paper, qualitative and quantitative methodologies have been applied, verifying and descriptively interpreting the results. Qualitative methods include the method of meta-research, analysis, synthesis, the method of deduction, and generalization. They include techniques of creative thinking which influence the formation of new knowledge and the proposal of the scientific contribution. The original empirical research includes a scientific analysis of the potential competitiveness of the usage of mobile applications through digital technologies in tourism. The research was conducted on 31 tourism destination stakeholders in January 2021, in South Istria, Croatia. It was conducted by means of survey questionnaires, which were distributed to the targeted sample of the workshop “Digital marketing” – the importance of innovations and digital marketing – the perspective of tourism destination stakeholders. The questionnaire consisted of three parts. The first part explored the sample demographic characteristics. The second part explored the intensity of agreement and statements as well as the perception of usage of mobile applications using a Likert scale 1-5. The third part of the research was directed toward the attitudes related to the future usage and usefulness of mobile applications in tourism. The research was coded and digitally processed using the IBM SPSS Statistics 21 informatics tool.

Results and discussion

According to the socio-demographic profile of respondents, the largest number of respondents were students, 22.6%, and 19.4% were representatives of the catering–accommodation sector and restaurateurs. DMOs' representatives comprised 16.1%, representatives of educational institutions, 12.9%, DMCs' representatives, 6.5%, and other representatives 22.4% (renters, entrepreneurs, representatives of public institutions, and representatives of family farms and similar). The majority of respondents came from South Istria, 64.6% of whom 45.2% were from the Town of Pula. The respondents from the towns of Zagreb, Poreč, Rovinj, and Svetvinčenat follow, each making up 6.5%, and the lowest number of respondents were from Raša, Rabac, and Buje, each making up 3.2%.

As for the years of work experience in tourism, 38.7% of the respondents had less than three years of work experience (corresponding to the number of students who were at the beginning of their business careers) or over ten years of work experience. Furthermore, 12% of respondents had three to seven years of work experience in tourism, while 9.7% had between seven and ten years of work experience. The data weighs in favor of the validity of the sample and points to its relevance and reliability, given the years of service in tourism and familiarity with the trends for future development. In further consideration of familiarity with mobile applications, the majority of respondents, 55% of them, stated that they had installed applications related to tourism on their smartphones, while 45% of respondents declared not having installed applications. Further to this, familiarity with applications related to tourism of their destination was explored, where 32.26% of respondents stated that they were familiar with one or two smartphone applications, 29.03% were not familiar at all and 25.81% of respondents were familiar with two to three smartphone applications related to tourism. The lowest percentage of respondents, 12.9%, declared being familiar with more than three smartphone applications related to tourism in their destinations.

The results point to the attitudes which are summarised as follows:

- 45.1% of the respondents agree with the statement that traditional offline promotion (brochures, magazines) was important for the development of tourism, 38.7% of them are indifferent and a mere 16.1% of respondents did not agree with this statement. This points to the fact that offline promotion continues to be valorized as an important tool for affirming destination products and attractions.
- Almost all the respondents agreed that the Internet is an important source of information for tourism and hospitality. 6.5% of respondents agreed, while 93.5% completely agreed.
- 51.6% of respondents agreed or completely agreed that tourism stakeholders use Internet marketing tools efficiently, 25.8% of respondents were neutral, while 22.6% of them did not agree that tourism stakeholders use Internet marketing tools efficiently.
- A total of 45.2% of respondents were familiar or unfamiliar with numerous digital marketing tools and their possibilities. 38.7% were familiar with numerous digital marketing tools and the possibilities of digital marketing. Moreover, 16.1% were unfamiliar with digital marketing tools and possibilities.
- 96.8% of respondents completely agreed or agreed that digital marketing continues to expand, while 3.2% of respondents were not of that opinion.

- 58% of respondents followed the news and innovations related to digital promotion in tourism, while 22.6% of them were neutral and 19.4% of respondents did not follow the news and innovations related to digital promotion in tourism.
- Regarding digital marketing implementation, 51.6% of respondents were neutral in the statement that digital marketing implementation is expensive. 19.4% of respondents believed that digital marketing implementation is not expensive or that, ultimately, it is more expensive. Furthermore, 9.7% of them believed that digital marketing implementation is not expensive at all.
- 38.7% of respondents were neutral as concerned with the statement that, in their work, they were finding it difficult to estimate the financial results of the implemented digital promotion. 29.1% of respondents agreed or completely agreed that they have difficulties in estimating the financial results of the implemented digital promotion in their work, while 32.3% of them did not agree or did not completely agree.
- The majority of the respondents, 84.2%, believed that smartphones have changed the tourism and travel industry, and 16.1% did not agree with that statement.

The results of the exploration of the importance of mobile applications are shown below.

Table 1 Tourism competitiveness of a destination and importance of new tourism products

Statement - Level of agreement *		5*	4	3	2	1	Total	Average grade	Rank
1	N	20	6	2	3	0	31	4.39	1
	%	64.5	19.4	6.5	9.7	0.0	100.0		
2	N	4.0	11.0	10.0	4.0	2.0	31.0	3.35	3
	%	12.9	35.5	32.3	12.9	6.5	100.0		
3	N	14.0	9.0	6.0	1.0	1.0	31.0	4.10	2
	%	45.2	29.0	19.4	3.2	3.2	100.0		
Usage of mobile apps - level of agreement									
4	N	15.0	8.0	7.0	1.0	0.0	31.0	4.19	5.0
	%	48.4	25.8	22.6	3.2	0.0	100.0		
5	N	21.0	6.0	3.0	1.0	0.0	31.0	4.52	1.0
	%	67.7	19.4	9.7	3.2	0.0	100.0		
6	N	17.0	7.0	6.0	1.0	0.0	31.0	4.29	4.0
	%	54.8	22.6	19.4	3.2	0.0	100.0		
7	N	5.0	11.0	14.0	1.0	0.0	31.0	3.65	8.0
	%	16.1	35.5	45.2	3.2	0.0	100.0		
8	N	19.0	9.0	2.0	1.0	0.0	31.0	4.48	2.0
	%	61.3	29.0	6.5	3.2	0.0	100.0		
9	N	10.0	8.0	9.0	4.0	0.0	31.0	3.77	7.0
	%	32.3	25.8	29.0	12.9	0.0	100.0		
10	N	12.0	8.0	8.0	2.0	1.0	31.0	3.90	6.0

	%	38.7	25.8	25.8	6.5	3.2	100.0		
11	N	15.0	9.0	5.0	2.0	0.0	31.0	4.19	5.0
	%	48.4	29.0	16.1	6.5	0.0	100.0		
12	N	19.0	4.0	7.0	1.0	0.0	31.0	4.32	3.0
	%	61.3	12.9	22.6	3.2	0.0	100.0		

* 5 is the highest level of agreement, 1 the lowest level of agreement with statements.

1. Smartphone mobile applications related to the destination offer are important
2. Tourists in the destination download tourism applications and use them frequently
3. Human factors and people, workers in tourism, are more important than mobile applications and technologies
4. Used as sources of tourist information, tourist guides – tour escorts
5. Used as a source of service information
6. Used as an agency for booking of accommodation, tickets, and cars
7. Used as a guide for shopping
8. Used as navigation
9. Used as a currency rate calculator
10. Used as a translator
11. Used as a photographer
12. Used as a link to social networks

Source: Authors' own research, processing, IBM, SPSS, Statistics 21

The results of the first part of the research indicate that the majority of the respondents, 93.5% of them, agreed or completely agreed that the smartphone mobile applications related to the destination offer are important, while 6.5% of respondents were neutral. Furthermore, 48.4% of respondents agreed or completely agreed that tourists download tourism applications in the destination and frequently use them. 32.3% of the respondents had a neutral attitude, while 19.4% did not agree that tourists download tourism applications in the destination sufficiently or use tourism applications frequently. The majority of respondents, 74.2%, believed that the human factor and people, workers in tourism, are more important than mobile applications and technologies. 9.4% of respondents were neutral, while 6.4% of them did not agree at all or did not agree with that statement. By summarising these three questions, an awareness is presented of how, although the predominant value of smartphone mobile applications is recognized, destination stakeholders perceive human contact, work and interpersonal communication as more important than the exclusive use of technologies.

Further to this, the perception is explored of the usefulness and use of different mobile applications which provide tourists with information and services in order for them to be better informed and to get by in the destination more easily.

- 74.2% of respondents believed that tourism applications are used or frequently used as sources of tourist information, tourist guides – tour escorts. 22.6% of the respondents were neutral, while 3.2% of them believed that they were not sufficiently used.

- 87.1% of respondents believed that mobile applications are used as a source of service information. 9.7% of them were neutral and 3.2% believed that mobile applications are not used as a source of service information.
- 77.4% of respondents believed that mobile applications are used as an agency for booking accommodation, tickets, and cars. 19.4% were neutral, while 3.2% of respondents believed that mobile applications are not used as an agency for booking accommodation, tickets, and cars.
- 51.6% of respondents believed that mobile applications are used as a guide for shopping, 45.2% were neutral, while 3.2% of the respondents were of the opinion that mobile applications are not used as a guide for shopping.
- 90.3% of respondents believed that tourism mobile applications are used as navigation. 6.5% of respondents were neutral, while 3.2% of the respondents were of the opinion that tourism mobile applications are not used as navigation.
- 58.1% of respondents believed that tourism mobile applications are used as a currency rate calculator. 29% of respondents were neutral, while 12.9% of respondents were of the opinion that they are not used as a currency rate calculator
- 64.5% of respondents believed that tourism mobile applications are used as a translator. 25.8% were neutral, while 9.7% of the respondents thought that tourism mobile applications are not used as a translator at all.
- 77.4% of respondents believed that tourism mobile applications are used for photographic purposes, while 16.1% were neutral. A few of them, 6.5%, believed that tourism mobile applications are not used for photographic purposes.
- 74.2% of respondents believed they are used as a link to social networks, while the rest of the respondents, 25.8%, though they are not used as a link to social networks, or were neutral.

The results of the third part of the research are presented below, using open-ended questions, where the respondents could present their ideas and possible innovations for affirmation of the promotion of tourism products.

The data from Table 2 shows possible modalities of how to present mobile applications to users and how to motivate them to download and use them onto their mobile appliances and use them.

Table 2 Methods of encouraging tourists to download smartphone applications for the purposes of better promotion and sale

	Frequency	% of respondents	Cumulative %
Via social networks	3	9.7	9.7
Via promotional materials	2	6.5	16.1
Benefits	7	22.6	38.7
Other	19	61.3	100
Total respondents	31	100	

Source: Authors' own research, processing IBM SPSS Statistics 21.

The results show that 61.3% of the respondents believed a new product should be suggested that would be unique and interesting for users. It is also desirable to better inform users about the existence of smartphone applications and make the applications as useful and interactive as possible, ensuring they are regularly updated. The

respondents believed it is hard to talk tourists into downloading specific content if they do not benefit from it. For the purposes of better promotion and sale, each tourist has to be approached individually in order to determine their needs and wishes and, ultimately, to offer them a free product or service (for example, a free small bottle of olive oil at the Tourism Board office, a free souvenir made of olive tree wood, tastings, free entrance tickets for museums, churches, etc.). They also mention showing QR codes in busy locations and in accommodation facilities.

Furthermore, 22.6% of respondents believed that one way to ensure better promotion and sales with the realization of benefits is to encourage tourists to download smartphone applications. For example, downloading applications with additional discounts and special offers in the application, facilitating discounts, or appropriate free materials/services (for example a free Uber ride).

Also, 9.7% of respondents declared that one of the ways of encouraging tourists to download smartphone applications and promotions is through social networks (Facebook, Instagram, and similar), and 6.5% of respondents were of the opinion that one of the ways of stimulation is also the promotion of the existence of information desks in the places where accommodation facilities which inform about the availability of applications are situated.

In the research of affirmation of specific forms of tourism, 58% (N=18) of respondents answered that they were familiar with the mobile applications focused on specific forms of tourism. The respondents believed they are important if a certain destination needs to be branded to attract tourists with specific interests, extend the tourist season throughout the year, and reduce the overloading of destinations with mass tourism. With the development of digital technologies and smartphones, applications directed toward tourism are being developed daily. Their creation is very important; as new generations are increasingly directed toward digital technologies. With regard to the larger number of competitors in the market and the development of digital technologies, it is certainly important to offer as much content of products/services to place in the market. 35.5% (N=11) of respondents could not say whether they were familiar with mobile applications focused on specific tourism forms but believed that it would be of great importance to present the destination and its attractiveness to tourists. 6.5% of respondents were still not familiar with the applications, as they think they are too scattered and not unified (for example, for the whole County of Istria, and similar).

In the line with the aforesaid, the creation of applications is an added value by which a service or products can be improved and by which new users can also be attracted.

Table 3 Grade of intensity of the importance of the quoted statements

	AVR	STDEV	Total responses
Grade of the importance of foreign languages in the design of mobile applications for tourism	4.81	0.601	31
Grade of the importance and attractiveness of the creation of the augmented reality as a tourism product of mobile applications	4.16	0.969	31

Source: Authors' own research, processing IBM SPSS Statistics 21.

The average grade of 4.81 refers to the importance of foreign languages in the design of mobile applications for tourism. The respondents believed that the role of foreign languages in the design of mobile applications is of the utmost importance. The respondents are of the opinion that foreign languages are of great importance for attracting potential tourists. Foreign languages are important and represent the breaking down of barriers to communication difficulties.

The largest number of respondents replied that the English language (23.16%), the German language (22.11%), and the Italian language (17.89%) are in the leading places, followed by the French language, 9.47%, Russian 7.37%, Dutch with 4.21%, Chinese with 4.21%, Slovene with 3.16%, and other languages. For tourists, it is easier to access the application in their native language, attracting more interested and disinterested clients and, accordingly, the interested ones become users. The German, English, Italian and French languages are exceptionally important due to the increased tourist traffic from the emissive market.

This is why the respondents, 7.37% believe that it is important to use standard languages and think about creating applications in new foreign languages for the new market due to increasing visits by tourists from those areas (China, Korea, Japan).

Furthermore, the average grade of 4.16 relates to the importance of the attractiveness of the creation of augmented reality as a tourism product of mobile applications. Augmented reality represents a novelty in digitalization and an increasing number of users from the younger generations are using it; it is, therefore, increasingly significant in the creation of the tourism product. This technology has not been available previously, and now represents innovation and an approach to the users themselves. Also, augmented reality is of the utmost importance, as it provides a new experience, which is particularly important for disabled persons who, in real life, have not been able to visit a specific locality. Furthermore, the familiarisation with tourism products, related to the associated mobile applications, where 45.2% of respondents declared that they are equally familiar with or are not familiar with tourism products related to mobile applications, while 9.7% were not familiar at all. This shows discrepancies in the results; namely, the respondents did not express awareness of the importance, nor were they sufficiently educated in relation to the existing products and innovations by which they could enrich their destination online promotion using smartphone applications. The products they were familiar with are presented in the following graph:

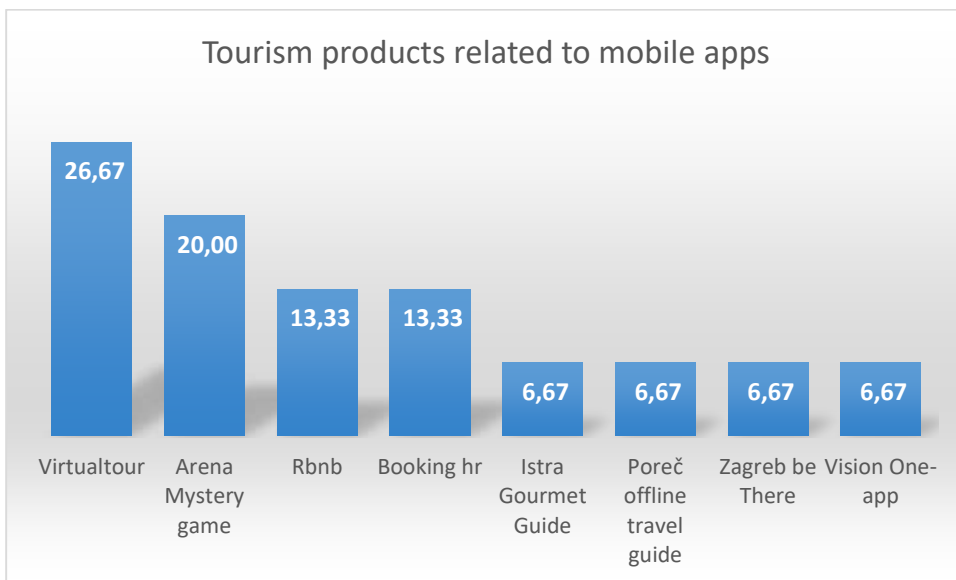


Figure 1 Tourism products related to mobile apps
Source: Authors' own research, IBM SPSS Statistics 21.

The largest number of respondents were familiar with the Virtualtour application (26.67%), followed by the Arena Mystery game (20%). 13.33% of respondents were familiar with the Rbnb and Booking.hr applications, while the rest of the respondents were familiar with the Istra Gourmet Guide, Poreč offline travel guide, Zagreb be There, and Vision one-app applications(6.67%).

Table 4 Tourists are prepared to pay for downloading of augmented reality applications

	N	% Respondents	Cumulative %
Yes	15	48.4	48.4
No	3	9.7	58.1
Maybe	3	9.7	67.7
Do not know	10	32.3	100
Total respondents	31	100	

Source: Authors' own research, processing IBM SPSS Statistics 21.

Table 4 points to how 48.4% of respondents believed that tourists are prepared to pay for the downloading of augmented reality applications, while 32.3% of the respondents were not familiar with the tourists' payment preferences. Moreover, 9.7% of respondents declared that tourists are not prepared to download augmented reality applications, and an equal percentage of the respondents were neutral. The respondents were of the opinion that a certain group of tourists would surely be prepared to pay for downloading of the augmented reality applications (tourists with higher purchasing power). Also, if the application offers something new, not seen yet in the market, and if the current users' reviews are graded satisfactorily, the number of persons prepared to pay to download the application will be greater.

Also, they think that, in the beginning, during their familiarisation with new technologies, the application for augmented reality should be free of charge, after their acquaintance with it and use it. Moreover, when it has already been tried by a considerable number of users, a number of values should be added within, at a certain cost; in the beginning a symbolical sum, and later a little higher. Some respondents stated that tourists should be paying up to €5 or €10, for foreign tourists between one and five euros, and that for domestic tourists it should be free.

Furthermore, 9.7% of respondents believed that they would not be prepared to pay, as they find everything on Google and, even if they paid, it would have to be a negligible amount and an application that they would be able to use repeatedly, and which would always be attractive and up to date.

A few of the respondents were not informed about the prices and could not estimate them; they would probably pay only if it included some benefits they would be able to use during their stay, but also following their stay (discounts, materials, a certain number of something = a prize).

Table 5 Grade of the potential of entertainment through tourism mobile applications (gamification, storytelling)

	AVR	STDEV	Total - Responses
Grade of the potential of entertainment through tourism mobile applications (gamification, storytelling)	4.23	0.990	31

Source: Authors' own research, processing IBM SPSS Statistics 21.

Overall, the respondents produced an average grade of 4.23 which concerns the potential of entertainment through tourism mobile applications. The respondents thought that the entertainment potential through tourism mobile applications is very interesting and encouraged the development of such products. The applications containing gamification and storytelling will certainly attract people to use the application as they provide entertainment.

The respondents believed that the mobile application Storytelling would be excellent because, when a tourist connects to Wi-Fi, the option of downloading the application with geolocation would be provided, by which he would be able to, simultaneously, perceive the attraction through narration. They also thought that, apart from the usual approach, a different approach to sightseeing in a town would be also interesting.

Conclusion

The need for tourism mobile applications has emerged due to accelerated digitalisation and the omnipresence of mobile phones in peoples' everyday lives. There are several types of mobile applications in tourism; those based on metasearch, narration, interactive games, and applications based exclusively on audio or video recordings.

Today, people spend increasingly more time on mobile appliances, networks, and pages, and it is a great possibility to interest potential users in their downloading and usage. The potential is pointed out of affirmation of tourism mobile, entertaining applications which can represent a kind of destination social network where users, while staying

there, can share their experiences using pictures, sound, and text as well as their impressions and grades. It is easier to reach users through entertainment; therefore, the potential for entertainment through tourism mobile applications is substantial. A certain dose of entertainment in mobile applications is an advantage, especially for younger generations.

Examining the trends of remote work and digital nomads, the potential of the competitiveness of the formation of applications with diversified information for digital nomads, given that they are used to digital technologies in broad application. Generationally considered, for Generation I and Millennials, applications and mobile ICT are a part of their lives that has been present since they were born while, for Generation X, an amusing attraction and, for older tourists, they can represent a problem, expressed through the absence of humanization. With the development of technology during the COVID-19 pandemic isolation, augmented reality has increasingly been gaining importance. Tourists appreciate such content which, in the international environment, is more developed than in Croatia. The respondents believe that tourism is one of the fastest growing sectors in the economy and that the plans for tourism product development should be directed towards not only the current sector needs, but also towards the future period and that destination stakeholders should take account of all reactive groups, including disabled persons, to whom mobile applications can bring them closer and present destination offers in a quality way, as well as facilitate their use in both personal and virtual ways. The importance of the creation of augmented reality as a tourism offer is at a very high level. Quality mobile applications, developed by the destinations, have entertaining characters and develop attractive games that surpass local aspects, and have the potential for monetarization and financial gain. It is important to recognize consumer needs, and this is possible by in-depth profiling of the market segments, regardless of whether it concerns geographical segmentation or is based on specific interests. Consumer needs evolve, and the tool must follow or even get ahead of the trend.

The research responds positively to the paper's problem question: How important are mobile applications for digitalizing tourism products in destinations? The importance of product diversification has been recognized but their integration into the unique platform, specific products have been graded and ranked, and the importance of cooperation between destination stakeholders, focused on excellence and quality, has been emphasized. New knowledge also opens new questions and represents a platform for future research. The question directed toward comprehending the attitudes of potential and real users of mobile applications in tourism can be distinguished. It is also necessary to explore the applications' functionality and the transformation of traditional destinations into smart destinations, which base their development on technology, inclusion, sustainability, and affirmation of cultural heritage. Also, broadening of the research is proposed to national levels and within the European context, by which the limitation of the study related to the sample will be bridged, which, although local, and at the same time indicative, presents the attitudes of the key destination stakeholders engaged in the creation of the destination policy and online marketing strategy.

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PHILANTHROPY ON SOCIAL MEDIA PLATFORMS THROUGH THE LENS OF ARCHETYPES. HOW INFORMATION DISORDER AND WEAPONIZATION OF CONTEXT ARE INFLUENCING THE FACEBOOK USER' SOCIAL INVOLVEMENT

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Abstract. *While popular and alluring, social media platforms encounter a downsizing effect due to a wave of distrust in the validity of information distributed online, concern about privacy issues, and the perceived lack of meaning of time spent online, which recent studies indicate as a source of anxiety and discontent for most online users. The new perspective we bring through this study is exploring the idea that the perceived meaningfulness of social media participation might be better understood under the theory of archetypes. Generally considered models of thought and patterns of behavior that can explain human interaction, archetypes also turn out to be catalysts for the positive valorization of time spent online, as our research has proven. Moreover, we tested the moderating effect of information disorder and weaponization of context in social activism expansion. Based on a national survey, a sample of 309 Romanians using the Internet and with active Facebook accounts, this research shows that positive evaluation of Facebook time is sparked by the internal drive and a predisposition to help. Respondents highlighted that their involvement in charitable activities increases the value of their online activity. Also, the scale used to examine archetypal patterns showed that respondents had the propensity to exhibit heroic and caregiver traits, with the heroic archetype's feature of tolerating injustice being the most obvious. Another research aim was to demonstrate that the information disorder leads to a high level of mistrust in humanitarian causes promoted on Facebook. People back off and engage in more enjoyable activities when faced with stressful exchanges between other users over incorrect information. Although our research has confirmed an intrinsic need to help and support others, it also showed that the fear of becoming a victim of fake news causes social activists and philanthropists to refrain from doing good. Our sometimes-paradoxical findings have confirmed once more that the field of online human behavior is an endless source of captivating findings worth proceeding even more in-depth.*

Keywords: *Archetypes; context weaponization; fake news; information disorder; online activism; social media platforms.*

Introduction

Social media platforms, a general term for new media platforms engaging users in various online activities, are enriched with benefits that may also explain their addictiveness: access to information and the alluring digital landscape of “endless choices for consumers” (Rushkoff, 2016), constant connectivity to friends and family (Serafinelli, 2020), the facilitation of “sociality” (Miller et al., 2016) and social aggregation by interests and values (Aiken, 2019), social validation and ego satisfaction (Aiken, 2019; Rushkoff 2016), creation of “networked archives of remembrance” possibilities (Philipets, 2019). However, these positive roles are shadowed by worries regarding the privacy of the “time distortion effect” (Aiken, 2019) while browsing online data.

The benefits of using social media are scrutinized by the distrust in the validity of information distributed via social media in the context of the growing phenomenon of fake news (Corbu et al., 2020, Masullo et al., 2020). The promise of the digital age led us to believe that if we lived in highly linked communities and had instant access to any information we needed, only good things would happen. The realization that our information ecology is now severely poisoned and is dividing us rather than uniting us has replaced this idealized image (Wardle, 2019). And the direct victims are exactly those who need help the most. Information disorders linked to new media during the so-called “post-truth era” increased public distrust (McIntyre, 2018). It determined that more people would reduce their presence on the platform or show less interest in involvement and empathy.

Another reason for people to worry regarding their own online behavior, as observed by a recent study conducted across five countries, is their double-edged fear of, on one hand, exposing their privacy, and, on the other, of the inability to stop sharing personal information on social media (Masullo et al., 2020). Moreover, the same study highlights the joy people feel at the thought that such platforms make their lives easier on many levels, from staying in touch with relatives and close friends to reconnecting with estranged acquaintances. Nevertheless, this joy is combined with the frustrating feeling of the perceived wasted time while browsing on social platforms, when users analyze their own social media consumption patterns (Masullo et al., 2020).

Archetypes: mirrors for self-discovery and a catalyst for the positive valorization of time spent online

Throughout history there was a growing interest in describing behavior patterns, from Plato’s metaphysical ideas to Freud’s archaic unconscious reminiscences to Jung’s primordial images, later named archetypes (Jung, 1919 / 2013). The “process of self-actualization” described by Jung (1946/ 2013) brings out a set of instinctive elements with mythological resonance and it translates them by discovering their repetitive characteristics, the behavior patterns that can help understand why people gravitate around a certain idea or why some event triggers a seemingly out of proportion reaction in some of them. More precisely, the archetype reevaluated, simplified, and demystified concept refers to an “operative paradigm or schema in which an individual can experience the world, be compelled to action, and provide a model for behavior” (Shadraconis, 2013).

We start by assuming that archetypes are filters through which we see reality. Pearson describes the relation between the archetypes we resonate with and our behavior derived from that mindset in a symbiotic way: "How we view the world is defined by what archetype currently dominates our thinking and acting. If the Warrior is dominant, we see challenges to be overcome. When the Caregiver is dominant, we see people needing our care. When the Sage is dominant, we see illusion and complexity and strive to find the truth" (Pearson, 1991, p. 7-8). We can translate the archetypal patterns into meaningful compasses showing a slice of the reason-why behind human behavior. Nevertheless, using archetypes as mirrors for self-discovery can also show their shadows, the negative side of these patterns, and their addictive side (Pearson, 1991). This tendency towards addictive and destructive behavior can often be experienced in relation to digital media, amplified by the "cyber effect" (Aiken, 2019), a concept referring to how digital media accelerates and magnifies users' tendencies.

Aiken gives some examples of how this effect of digital platforms alters human behavior: it can enhance altruism, making people very generous and keen to help others through philanthropic online donations or enhance addiction and amplify destructive money-spending behaviors such as compulsive online shopping. An explanation for such extreme tendencies in online behavior might reside in the instant gratification mechanisms of social platforms, in the sense that "what we experience as a personal choice feeds into a continuum of anticipatory pleasure and suggestibility activated each time that we reconnect with our favorite content" (Pilipets, 2019, p. 3). A trap of technologically driven pleasure of self-validation and the illusion of self-control.

To escape this trap, people might feel the need to invest their online actions with a positive meaning and struggle to find an outcome that can bring them a sense of purpose. So, "dialectical tensions" (Masullo et al., 2020) observed by researchers studying the relation between well-being or, on the contrary, depression and informational development (Castells, 2014) might be a form of self-regulating psychological mechanisms.

From the Orphan to the Hero: archetypal echoes surfacing in social media

The most frequent archetypal patterns activated in the context of philanthropy mediated by social media platforms are the ones focused on "leaving a thumbprint on the world: Hero, Outlaw, Magician" (Mark & Pearson, 2001, p. 101), described as very powerful archetypes oriented towards obtaining mastery, while embracing risk and adventure and gaining the ability to transform their lives and the lives of others. Action-oriented, "the Hero is invigorated by challenge, feels outraged by injustice and responds quickly and decisively to difficulty or opportunity" (Mark & Pearson, 2001, p. 107), embarking on adventures so he can return and heal others. The giving back to others dimension of the Hero is particularly important when assessing its prevalence as often auto-designated savior of those in need, because "if successful, the hero can return with an elixir, or panacea, to resolve problems of the community" (Shadraconis, 2013, p. 3). More radicalized and oriented towards a revolutionary shift to reshape reality, the Outlaw can „break outdated rules in a manner that feels liberating to people" (Mark & Pearson, 2001, p. 126). Moving further, the Magician can accomplish miracles, representing a driving force for accomplishments that were hard to believe possible (Mark & Pearson, 2001).

The group affiliation need is expressed through the effort to be part of a community. Online communities are prideful in being powerful and creating a global impact. The

need to pass the normative regulations of certain online group identities (Aiken, 2019), and the tendency to give in to the “peer pressure” in our “quest for conformity” (Berger, 2017, p. 37) is engraved in human nature. But the question arises: is this need for conformity powerful enough to motivate online users to donate money and get involved to help, through time and energy devoted to the philanthropic cause, by replicating the online group behavior and manifesting a prominent contagion effect in their online behavior?

Returning to archetypal intrinsic needs, let us explore the need to be the savior that devotes completely to helping others, a tendency generally viewed as a dominant trait for women, particularly in the stage of life when they become mothers or prepare themselves for that journey. But of course, any Caregiver needs an Orphan that needs to be rescued. Orphans are the shadow archetypes of Innocents, those who experienced “the fall” (Pearson, 1991, p. 9) by betrayal, abandonment, disappointment, or objective hardship faced alone.

Information disorder and weaponization of context on social media

Human history has been shaped through the centuries by the alternation of war and peace, which has established national boundaries and structured our social interactions, economic systems, and political ideologies. But the connections that knit the world together also drive it apart (Leonard, 2021), transforming social media platforms into battlefields. Through the weaponization of context on social media, the internet is changing war and politics, just as war and politics are changing the internet (Singer & Brooking, 2021).

Disinformation is as old as the communication process, but the techniques have changed and have been constantly improving. We are increasingly seeing the weaponization of context, and the use of genuine content, but content that is warped and reframed (Wardle, 2019). Anything containing a grain of truth is more effective at persuading and grabbing people's attention. But the effects are so powerful that communication and defense specialists call this new phenomenon a real war (Singer & Brooking, 2021), in which millions of people can cause harm to one another online. Instead of being troops, the victims are civilians, and they number in the millions rather than the thousands (Leonard, 2021). Disinformation can be understood in a very broad or a very narrow sense. Some go as far as considering it lying or simply false information, while others limit it even more strictly. One thing is clear: disinformation is a vast operation, a complex process of careful coordination based on clear objectives of manipulating the truth (Volkoff, 2009). Things are not black and white just as misinformation is not just a collection of lies. Cyber academics have been trying to find a word or a phrase to describe our liminal condition (Leonard, 2021), somehow caught between a state of war and one of peace. Kello (2018) rehabilitated “a beautiful Anglo-Saxon word to describe disorder on the internet: “unpeace”, the gray area in which the virtual world is trapped.

Reality has been radically fractured by digital media in such abusive manners that there is no consensus on the truth, and as a result, societies are separated not just by differences in beliefs but also by fact (Leonard, 2021). The expansion of the fake news phenomenon has created fertile ground for mistrust in social platforms, since they facilitate the spread of misinformation (Bargaoanu, 2018, Masullo et al., 2020). Also, the complexity of fake news supremacy in today's media landscape resides in the fact that they are “neither always false, nor always news” (Bârgăoanu, 2018) and the diffused

borders of truth and false classification confuse users to the point where nothing seems to be worthy of their trust.

Disinformation – be it based on communication errors, unintentional misinformation or pure propaganda – takes the shape of plausible truths very often, which is the reason for its penetration force (Bârgăoanu, 2018). On the other hand, Wardle (2017) comes up with a typology in order to provide a better definition of the term, which includes the potential to fool the audience, misleading content for the deceptive use of information, imposter content that suggests the impersonation of legitimate sources, fabricated content that is entirely false and created for deceptive purposes, the false connection when visuals, captions, or headlines are not in line with the content, and purely false content. Another taxonomy was created by Tandoc, Lim, and Ling (2018) and it covers various forms of malformed content such as: news satire, news parody, fabrication, manipulation, propaganda, and advertisement.

Exaggerated humor is another strategy used more often since the 2016 US elections, especially during the Covid-19 pandemic. Technically, news satire refers to content that makes fun of news programs and uses humor to engage their audience members (Tandoc, Lim & Ling, 2018). On the other hand, while similar to satire, parody can be definitely considered a different form of fake news. The distinction between the two is determined by how the humor is employed. According to Tandoc, Lim, and Ling, "instead of providing direct commentary on current affairs through humor, parody plays on the ludicrousness of issues and highlights them by making up entirely fictitious news stories" (2018, p.142). Political parody outlets, in particular, profit from the vague plausibility of the news item. But the result is the same: confusing the reader to the point that he can no longer distinguish between true and false. However, research shows that satire and parody websites can strongly influence a person's belief system and may be more persuasive than people believe (Tandoc, Lim & Ling, 2018).

There are two opposite tendencies of online users when facing the fake news expansion, the one doubting everything they read or see or the self-sufficient one, based on the perceived proficiency in detecting such altered truth. At this point, users tend to consider themselves immune to such manipulation. On that note, a recent survey in a national, diverse sample of adult Romanians reveals that there is a "significant third-person effect regarding people's self-reported ability to spot fake news and that this effect is stronger when people compare their fake news detection literacy to that of distant others than to that close others" (Corbu et al., 2020, p. 1). In the context of the disinformation phenomenon, concerns with message credibility and media trust are frequent. Losing credibility is a significant issue since the media depends on trust to keep their supremacy in communication. People often rely on their interpersonal relationships in the social media environment to analyze the information they come across, and when dealing with trustworthy and credible sources, they make fewer cognitive attempts to assess a message (Metzger et al., 2010).

The relation between social activism on Facebook and information disorder. Looking toward the Russia-Ukraine conflict and the humanitarian response

The information ecosystem was not designed to spread false information, but the social media platforms' design makes it possible to capitalize on the emotional response at the expense of the logical one (Wardle, 2017). And the emotional response was more than obvious at the beginning of the Russian-Ukrainian war, for example, when, dealing with the greatest humanitarian crisis since the Second World War (United Nations

Organization, 2022), social media users' reaction was immediate and truly compassionate.

Human social existence depends on empathy. There is valuable insight on that matter by simply observing how newborns create bonds with their caregivers, as Hogenboom notes: "Children will try to help adults before they can even talk, leading to the idea that humans have an inborn desire to help, as we need to form strong social bonds." (2021, p. 251). Of course, how we react to other people's pain is a different discussion and one's reaction can vary depending on the circumstance and the individual (Raposa et al., 2015; Riess et al. 2012). But this time, compared to similar situations of the refugee crisis, the Romanians felt like being a part of the tragedy of the millions of Ukrainians who had to flee their homes. Whether geographical closeness or transgenerational hatred against Russians, Romanian's empathy with the victims of aggression instantly surfaced in society, both online and offline. Only in the first three months of the war, 6,5 million people, especially women, and children, ran away from bombs and missiles (United Nations Organization, 2022), meaning more than 15% of the total population of Ukraine. A country bordered by Romania, a society like the Romanian one, and a tragedy that could have been avoided led to a massive reaction of: hundreds of Facebook Groups where people formed communities especially for helping refugees, thousands of people offering their homes, people with hot food and beverage waiting at the borders, multiple donations, etc. But the enthusiasm and involvement lost their power as the social media platform was transformed into a rabbit hole, the main spread engine of misinformation, fake news, and conspiracy theories. Before the Covid-19 pandemic, researchers discovered that people are likelier to believe conspiracy theories when they feel anxious, uncertain, afraid of their personal safety, or out of control (Morrish, 2020). Similarly, once people felt like they couldn't distinguish between true and false or that the refugees were not worth their attention or donations, the level of empathy dropped. The experience of empathic feelings has been found to be emotionally draining and overwhelming, and a possible source of stress and burnout, especially for individuals exposed to human suffering (Manczak et al., 2016).

Disinformation strategies come in many ways to convince the reader of the alternative truth. Politics-related conspiracy theories frequently reflect and feed off peoples' political inclinations. However, they also have the power to alter attitudes and relationships. What has emerged is more comparable to a conspiracy theory worldview, where individuals can select from various incorrect beliefs (Morrish, 2020).

During the first months of the military conflict, fake news and conspiracy theories were present on social media in all forms, as classified by Stefureac (2020): by word of mouth (negative labels to discredit someone), by number (manipulating statistics to increase or decrease the magnitude of an event), by repetition, by hearsay (delivery of bits of information that cannot be verified, but are given credibility by inducing the feeling of privileged access to their content), by cliché or by altered images (with the use of artificial intelligence). For years, conspiracy ideas have simmered on the periphery of society, but they discovered fresh audiences in 2020 and keep gaining new addicts.

Intrinsically, the inner conflict people experienced when dealing with information disorder was the vacillation between the instinct of helping others and showing empathy and the natural survival mechanism of being cautious for seemingly harmless contexts that can turn into threats. Which one turned more powerful? Which one influenced more the online behavior of social activists? These key research questions led our research as it will be assessed further on.

Methodology

This research design is based on a national survey of a sample of $N = 309$ Romanians using the Internet and with active Facebook accounts, with an average age of 41 years old, mainly female (80%). The data were collected from September 1st to 5th 2022, through an online tool distributed in various Facebook Groups for better representativity of the sample, groups dedicated to charity and philanthropic efforts for various people in times of need, be it little children facing rare diseases or victims of the Russian-Ukrainian conflict.

The research theme is the perceived meaningfulness of social media participation in the combined effects of information disorder and weaponization of context, as well as social validation mechanisms of social media users. The research topic derived from the theories analyzed is the antagonized valorization of time spent online by social media platforms users (Masullo et al., 2020) depending on the references chosen to classify the online activities, be it those generating a sense of well-being, or those generating anxiety over the perceived addiction to such platforms and their toxic nature in terms of information disorders.

The novelty of our research was the correlation between archetypes and the philanthropic efforts mediated by social media platforms (Aiken, 2019), most frequently related to online Facebook Groups dedicated to social aid objectives for various situations. Our premise was that by correlating the time spent online helping others, users tend to experience positive associations regarding the overall time spent online, because it gains a positive meaning and enhances their well-being level, as well as a sense of social validation. However, the moderation effect on that correlation of the perceived unsafe informational environment represented by Facebook itself because of the spread of disinformation it allows was also something we considered.

The main research objective was to highlight the moderating effect of philanthropic online behavior on the positive correlation between social media addictiveness and the perceived anxiety of online users while using or after using social media platforms. In other words, we wanted to investigate if the positive valorization of time spent online for a social cause can increase the well-being of users and thus, reduce their anxiety over spending too much time online and fearing becoming victims of online disinformation. A secondary objective was identifying the impact of the social validation need and conformity (Goldsmith et. al, 2005; Berger, 2017; Aiken, 2019) on increasing online activity of members of such charity Facebook Groups or charity call-to-actions in general, distributed on the Facebook platform.

Our research hypotheses were:

H1. Intrinsic motivations such as natural availability to help others (patterns of behavior aligned to the Hero and Caregiver archetypes) increase the positive valorization of online activities on social media platforms, especially Facebook.

H2. The need for social validation and conformity plays an important role in increasing the positive valorization of online activities on social media platforms, especially Facebook, which is an important role in increasing time spent online.

H3. The online disinformation phenomenon amplifies distrust over social media platforms and can reduce the level of empathy among its users and thus their reaction

to philanthropic calls on Facebook, be it on Facebook Groups or generally spread in their News Feed.

To identify key personality traits related to the Hero or Caregiver archetype we created a Likert scale inspired by the Heroic Myth Index (Pearson, 1990), including three attributes for each of the key archetypes, along with four other specific traits related to other archetypes (Magician, Lover, Innocent, Fool).

To test the perceived level of well-being and anxiety level, we used a revised version of the Beck Depression Inventory (Beck et al., 1996).

Finally, to measure the addiction and intensity of Facebook use we applied revised versions of the Bergen Facebook Addiction Scale (BFAS) according to Andreassen et al. (2012) and Facebook Intensity Scale (Ellison et al., 2007).

Results and discussion

Although the positive valorization of time spent on social platforms does not necessarily increase the perceived amount of time spent, as our respondents noted, there is valuable data to sustain H1, regarding intrinsic motivation and the natural tendency to help as catalysts of positive appreciation of time spent on Facebook. For example, 21.6% of the respondents noted that their activity dedicated to charity causes on Facebook makes their online time more valuable. Also, the fact that helping others creates the context to create more engagement on the social platform is visible by the type of activities noted as ways to help, besides donating money or products or volunteering for different activities, involving by sharing information on their Facebook profile about the cause (20%) or even using Facebook Messenger as direct messaging application to raise awareness for the cause (11%).

The Scale investigating archetypal patterns revealed that the respondents were inclined to manifest tendencies of Hero and Caregiver, with the most visible trait for the heroic pattern the one of sanctioning injustice for 48.9% of respondents as a frequent response, while very frequent was recorded for 23.6%. For the Caregiver archetypal pattern, the self-sacrificing attitude was the most preeminent when 43.4% of the respondents answered that they often find it hard to say no when their help is needed, while 27.2% noted they feel this very often.

The need to help gets validated on the Beck Depression Inventory as well, where 52.4% of respondents answered they are interested in the well-being of others a lot, and 12.9% stated they are very interested.

Regarding the natural need for helping, 58.6% of the respondents stated that it is something they have always been keen on, while 19.1% confirmed they felt this need more intensely after they become a parent.

For the H2, the role played by the need for social validation and conformity, the results highlight a moderate tendency, perceived as smaller, probably from the third-person effect visible in the control questions designed to investigate that. However, if a Facebook friend asked for a charitable action, people tend to respond more easily, as 10.4% stated they often respond instantly to such requests, while 21% stated they answer such requests with moderation, while their proactive action to convince a

Facebook friend to donate for a charitable action is less frequent (in the proportion of 25.6%) or even nonexistent, as 58.3% stated they never send private messages to Facebook friends to convince them to donate for a cause. So, people value their Facebook friends' opinions regarding their social media behavior, and they try to impress them or at least be non-intrusive, and if a Facebook friend reaches out for help, the conformity instinct tends to get activated.

The information disorder, whether misinformation or fake news, leads to a high level of mistrust in humanitarian causes promoted on Facebook, confirming H3 of the research. Almost one out of two respondents (44.4%) feel the need to always verify the information by themselves to proceed with the donations or promote the cause. Another 21.7% of the respondents admit they often have the feeling of being victims of online fraud and do their own research before getting involved in charity efforts, while 19.7% confess they will follow the topic to find the truth and decide if the cause is worth the donation. The direct consequence: the fear or precaution of becoming a victim of fake news causes social activists and philanthropists to lower their expectations and restrain from doing good although this is not a guarantee of becoming immune to disinformation disorder, but merely a form of self-protection. When confronted with tense interactions with other users, regarding fake content or misleading information, 25.6% take a step back and get involved in more pleasant activities, giving them more fulfillment. These interactions lead to leaving the group and instantly abandoning the cause for 22.5% of the philanthropist users.

On the other hand, this result confirms research studies previously investigating the third-person effect theory (Davison, 1983) with reference to group members who almost completely deny the exposure to information disorder, being convinced it has a high influence on others, not on themselves (Corbu et al., 2020). More than 48% of the respondents are convinced that news articles read on Facebook would never influence their opinions and decisions while 71.5% consider themselves immune to satires and parodies' effects on their beliefs and actions. Only 20 out of 309 respondents admit they might become victims of fake news based on exaggerated humor.

The research paradox regards the difference between the practical and emotional involvement of the respondents. While being members of an average of six charity Facebook groups and being active donors and promoters of social causes, more than 47% declared themselves indifferent to the results, while 27.3% confessed they would be experiencing a feeling of sadness if the cause would not reach its goal.

Conclusions

The novelty of our research is the focus on the implications of behavior archetypal patterns in the context of social media dependency and how these motivations can enhance the feeling of well-being and the need to intensify philanthropic acts through social media, thus creating a sense of purpose for online users. By applying the layer of archetypal meaning to the online behavior we confirmed our main hypothesis, as respondents exhibited heroic and caregiver traits, with the heroic pattern's feature of tolerating injustice being the most obvious. The perceived effect of spending time in a more meaningful way on social media platforms when engaging in charitable activities was visible, but not in the amount we initially thought possible, either because of the third-person effect influence or by the subliminal moderating effect of overall

disinformation spread online that downsized the general feeling of the online browsing experience. While we were content to test our hypothesis and confirm some of our intuitive observations, we still believe more in-depth approaches are open to further research. Maybe a qualitative one that can tap into more subtle and less conscious motivations for online behavior could cast light on our sometimes-paradoxical findings.

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THE HINDERING BARRIERS OF DIGITAL EDUCATION - ROMANIAN AND ICELANDIC STUDENTS INSIGHTS

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Abstract. *The COVID-19 pandemic urged higher education to drastically change the educational process by shifting from onsite to online learning. The transition was short; students and teachers had to adapt and find solutions concerning technology assets (devices and software), conditions for studying, and digital skills. Universities heavily invested in boosting the use of technology and development of online teaching, learning, and assessing methods. But barriers to online education, such as lack of access to an adequate Internet connection, lack of resources to acquire the necessary devices and software, lack of adequate conditions for studies in the students' private homes as well as lack of training to support the enhancement of digital skills were reported, but rarely addresses and analyzed in relation to educational performances and motivation for studying on the long run. So, the paper aims to better understand the factors hindering full engagement in online education by using the data collected among students from Romania and Iceland and to discuss the implications on institutional policies to provide high-quality online learning.*

Keywords: *online education, perceived barriers, e-learning technology.*

Introduction

The sudden and profound transition from onsite education to online education since the beginning of the covid-19 pandemic surprised all the actors involved in the educational process at all levels, from educational staff to students, to parents, to educational institutions and policymakers.

Many challenges arose due to moving education to an online setting, being largely approached by multiple studies. Among students, the transition to online education impacted physical and mental well-being. Thus, some of the studies carried out in recent years have highlighted the adverse effects of increasing study workload on the level of stress and anxiety (Bray et al., 2020). Other studies pointed out the negative impact of extensive time spent on electronic devices on physical health (such as eye problems, back problems, etc.) (Srinivasan et al., 2021; Chaturvedi et al., 2021). Other adverse effects of online education on students' lives were related to a lack of social interaction in the online educational setting and feelings of isolation (García-Morales et al., 2021; Chaturvedi et al., 2021). Moreover, other authors showed a decrease in students' academic achievements and motivation during the pandemic compared to the period before the pandemic (Gillis & Krull, 2020; Meinck et al., 2022).

Although the pandemic had negative effects, it also had positive facets, leaving now higher education institutions in the face of a new challenge, namely how to include online education on a constant basis in teaching and learning. Some of these positives were the emergence and use of innovative learning and teaching methods and technological tools (Mseleku, 2020; Adedoyin & Soykan, 2020). Moreover, some educational institutions were forced by the situation to technologically modernize and pressured to support the teaching staff in developing digital skills. Adedoyin and Soykan (2020) noted that other inherent advantages of online education are flexibility and self-paced learning capability, the agency of both students and teachers in balancing their careers with their private lives without losing engagement, and performance increasing significantly.

The shift to online education and the duration and depth of the changes operated upon institutions' infrastructure, as well as upon teaching and learning processes are currently almost impossible to be forgotten, many teachers and students want in fact to find a balance in between advantages and disadvantages of online education and urge higher institutions to find solutions for hybrid/mixt education.

Literature review

Many of the students' challenges during the pandemic were directly caused by barriers preventing adequate access to education. Baticulon et al. (2021) identify five types of barriers to online education: technological (related to technological infrastructure), individual (related to learning styles and mental well-being), domestic (family-related issues), institutional (related to resources, teachers, or curriculum) and community barriers (related to lockdown restriction and political climate). Similarly, Akhter et al. (2022) identified four types of challenges in online education for students: financial (lack of financial resources to participate in online education and issues related to basic needs), institutional support (lack of training or support from the institution, low digital

skills among teachers), technological (devices, Internet, and digital skills) and personal (physical or mental health or well-being).

One of the main barriers to online education discussed extensively in the literature is connectivity (Arnhold et al., 2020; Darmody et al., 2021; Akhter et al., 2022; Gu, 2021; Mathrani et al., 2021; Srinivasan et al., 2021, Katz, Jordan & Ognyanova, 2021; Gillis & Krull, 2020). Online education, especially real-time education, requires a fast Internet connection (broadband or mobile). Students with a slow or no Internet connection were especially disadvantaged during online education.

Another technology access factor that obstructed access to online education during the pandemic was the absence of necessary electronic devices or quality devices. Thus, many authors state that the absence of PCs, laptops, smartphones, tablets (as well as other peripheral devices), and poor-quality devices impacted students' access to education during the pandemic, further deepening the inequalities in education. Many authors (Srinivasan et al., 2021, Gu, 2021; Akhter et al., 2022; Katz et al., 2021; Gillis & Krull, 2020) remarked that the lack of electronic devices is among the main factors hindering online education participation during the pandemic.

Another factor regarding the technological infrastructure, but more related to basic needs, which is less discussed in the literature, but prevented access to education during the pandemic, was the lack of electricity or problems with power cuts, which are more common in developing countries. Srinivasan et al. (2021), Akhter et al. (2022), and Azionya and Nhedzi (2021) observed the harmful impact of electricity problems in developing countries on student participation in education during the pandemic.

The shift from face-to-face interactions to online education required students to learn to use new software programs and platforms to keep up with the changes brought by the pandemic. The lack of knowledge and digital skills necessary to use devices, platforms, and software programs posed difficulties to students in online learning. Studies (Baticulon et al., 2021, Akhter et al., 2022; Srinivasan et al., 2021; Katz et al., 2021, Grigorescu et al, 2021) showed that many students could not adequately use online resources during the pandemic due to the lack of knowledge to use the Internet and platforms.

The literature also showed the lack of institutional support and school resources as hindrances to online education. Consequently, previous research (Srinivasan, Jishnu & Shamala, 2021; Akhter et al., 2022; Baticulon et al., 2021; Aboagye et al., 2021) illustrated the lack of training and assistance on the use of devices and platforms, the lack of involvement in solving potential problems with the platforms, and the lack of digital skills among instructors as obstacles for students to participate in online courses. Other researchers argued that some students did not have adequate software tools to communicate with teachers or for coursework, nor the possibility to access online library materials (Kerres,2020; Mseleku, 2020).

The lack of adequate physical learning space was another challenge for students during online education. The lack of distraction-free learning spaces, the use of learning room space simultaneously with other family members due to the housing situation, and house chores that interfere with online education have created real issues in participating to online education (Srinivasan et al., 2021, Mathrani et al. 2021).

Other factors that hindered online education among students, identified by researchers, were financial barriers of students' families related to the expense of buying devices and paying Internet and electricity bills (Baticulon et al., 2021; Akhter et al., 2022). Srinivasan et al., 2021; Baticulon et al., (2021) also emphasized the importance of obstacles to online education related to students' mental and physical health amplified by confinement restrictions, lockdowns, and uncertainty.

Many researchers attributed the difficulties some students experienced to the pre-existing educational inequalities before the pandemic, amplified even more by the transition of education to the online environment. Other authors emphasize in their studies the term "digital inequality" (Katz et al., 2021; Srinivasan et al., 2021) or "digital divide" (Gu, 2021; van de Werfhorst et al., 2022; Mathrani et al., 2021; Gillis & Krull, 2020). Digital inequality or digital divide is defined in the context of online education as "the disparity in the access, distribution of technology, information because of various socioeconomic and cultural factors" (Srinivasan, Jishnu & Shamala, 2021, p. 34). In the literature, three levels of the digital divide are distinguished: the first level of the digital divide is related to access to technology, the second level is related to skills and usage, and the third level is related to outcomes or effects of technology access and skill usage for a specific goal (Katz et al., 2021; van de Werfhorst et al., 2022; Mathrani et al., 2021). The digital divide among disadvantaged students impacted their participation in online education because of the lack of access to technologies and digital skills.

Researchers observed differences in online education participation and barriers faced among students by socioeconomic status, gender, and area of residence. Students belonging to families with low socioeconomic status, with difficulties regarding access to technology had a reduced probability of participating in online education compared to those with higher socioeconomic status (Gu, 2021; Katz et al., 2021). Researchers also observed that students with a socioeconomic status have a lower probability of having the necessary digital skills (van de Werfhorst et al., 2022; Mathrani et al., 2021). Researchers also observed differences in online education participation and experiences along gender. Werfhorst et al. (2022) showed that male students have lower levels of digital skills than female students. On the other hand, female students reported more often issues related to household and family care responsibilities or issues related to inadequate devices that prevented participation in online education (Mathrani et al., 2021). Studies also revealed that students from rural areas were disproportionately more disadvantaged during online education than those from urban areas (Srinivasan et al., 2021).

Methodology

As said before, for this paper, we aim to analyze perceived barriers to online education among students from Romania and Iceland and how these barriers are associated with different educational experiences and outcomes.

In order to reach the paper objectives we use the survey data collected under the project "Moving towards the new normal in digital education – the new dimension of human capital in higher education" NEW-DIGI-EDU, financed under EEA Grants 2014-2021. The survey was carried out in the first three weeks of June 2022 and reached 944 respondents with a completion rate of up to 58%. The questionnaire was applied online,

using the facilities provided by SurveyMonkey, to higher education students at all levels of education, from bachelor to post-doctorate programs, mostly public universities being addressed. In the final sample, 61.5% of respondents were from Romania, while 35.6 were from Iceland.

Students were consulted via the survey on different topics related to online education, such as: pros and cons opinions, barriers to online education, experiences during a pandemic and the last academic year, workload, motivation for education, ways to upgrade digital skills, perceived educational performances, as well as expectations with respect to future of online educations after the end of the pandemic. Barriers addressed in the survey and analyzed below-covered access to the Internet, personal or household endowment with needed devices and software, the studying conditions, and the level of digital skills required to participate fully in education. The students were required to rank the above-mentioned barriers' importance in hindering their online education participation.

Starting with the selected barriers, we employed a K-means clustering in order to profile the mix of barriers that students had to cope with during the two years of the pandemic. Then, the identified profiles were analyzed using the exploratory technique of correspondence analysis in relation to workload, motivation, perceived performances, etc. We used SPSS 21 in order to process and analyze the data collected.

Results and discussion

Barriers to online education in Romania and Iceland

Network connectivity, along with electricity rank at the very top of the problems that students had to cope with during the pandemic (see Table 1), the obstacles being assessed as important with small differences in between Romanian and Icelandic students. Electricity scores higher among Romanians (as in other developing countries), while connectivity ranks higher among Icelanders (probably mostly due to their geographical features). Having to leave the campuses and the university centers, where Internet connection had an adequate quality, and having to move back to their own homes or their family homes left the students in the face of the more general problem of access to the Internet. Even if Network connectivity scored higher among the Icelandic sample, limited data seems to be a problem higher among students from Romania. As expected, when access to the Internet is limited, we could expect also difficulties in acquiring needed devices for online education, the problem scoring again significantly higher among Romanians. The socio-economic background of students, more diverse among the Romanian sample is in fact reflected by the answers to these items.

In the second place as important, we find in both samples, the conditions for studying,, back to their families or homes during a pandemic, were considered rather inappropriate by almost one-third of respondents.

And, for those succeeding in coping with previous barriers, the last obstacle resides in the level of digital skills and access to needed programs and software in order to fully engage in online education. As expected, digital skills, even among higher education students, proved to be a significantly bigger problem for the Romanian sample as against the Icelandic one, but in accordance with the digital statistics for both countries.

Table 1. Factors hindering participation to online education in Romania and Iceland (% important and very important)

Factors	Romania	Iceland
Network connectivity	70.0	81.6
Limited data	51.0	29.5
Problems with needed electronic devices (computer, webcam, laptop, etc.)	55.1	34.8
Electricity	57.9	47.7
I had no quiet place to study	38.8	35.7
I had no desk for myself	31.3	23.4
I had no programs and software required	41.0	22.5
I had low skills to use technology	25.1	16.1

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043

We can conclude that there is a high diversity of students with respect to their socio-economic background, coming from different strata of the society, diversity being higher in Romania, a developing country characterized by higher inequalities. The rapid shift to online education and the measures adopted to contain the pandemic practically gave weight to the socio-economic background in influencing participation, engagement, and educational performances of students in both countries, with obstacles slightly more prominent among Romanians students.

In order to correlate perceived barriers to online education with different experiences and outcomes of online education, we proceeded to segment the population of students and identify different profiles/mixes of barriers to online education. In order to do so, we run a K-means clustering, all variables being significant in designing the clusters. We obtained 4 clusters (Figure 1) with a balanced distribution of the identified profiles within the analyzed sample (Figure 2).

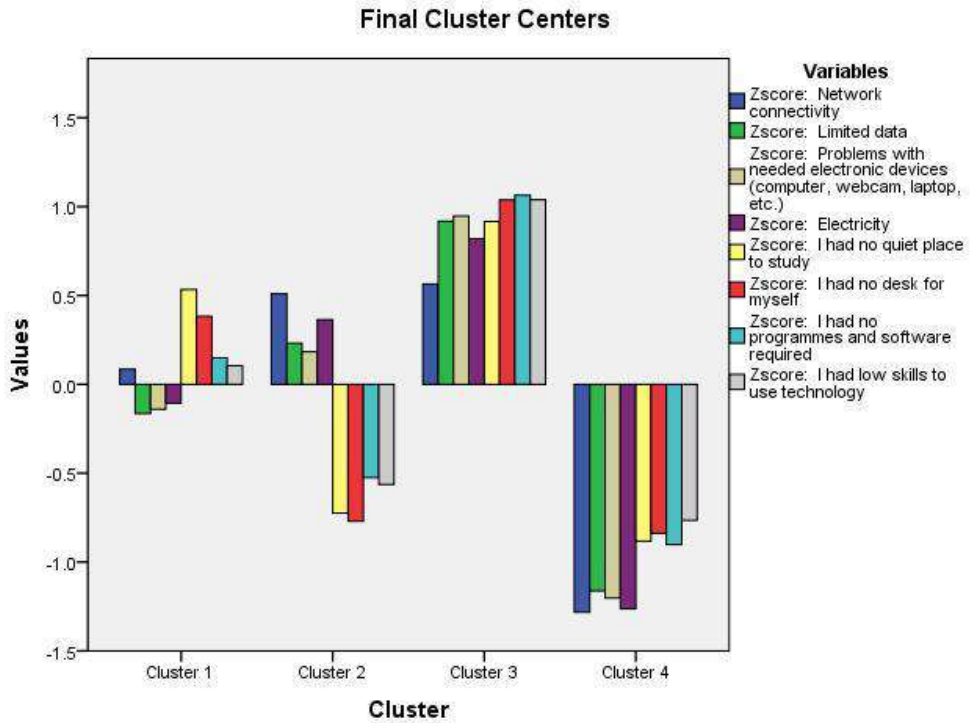


Figure 1. Cluster solution

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043, Authors' estimations

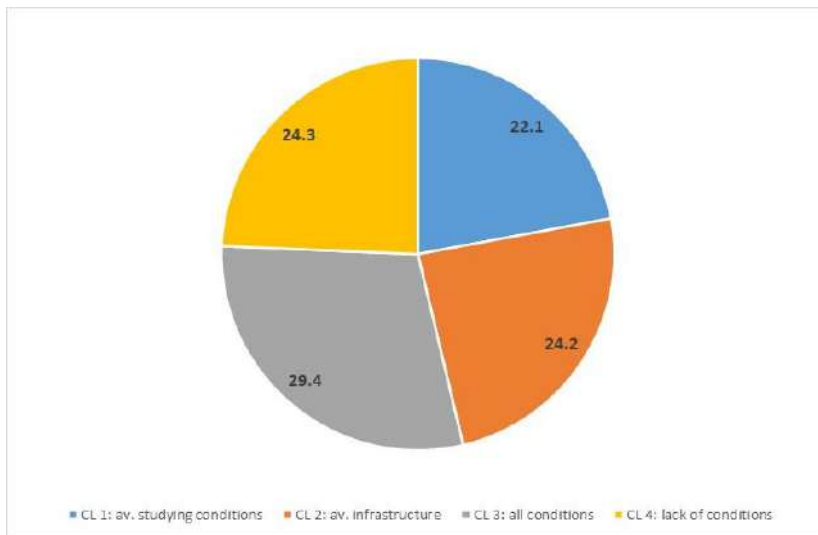


Figure 2. Distribution of clusters in the sample (%)

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043, Authors' estimations

The identified clusters have the following characteristics:

Cluster 1 is characterized by low access to Internet infrastructure and needed devices, but with average access to quality conditions for education.

Cluster 2 is characterized by average access to Internet infrastructure but low access to quality conditions for studying and low digital skills.

Cluster 3 gathers those students with good access to Internet infrastructure, devices and software, good conditions for online education and also good level of digital skills.

Cluster 4 gathers the most disadvantaged students that had to face all barriers in order to engage and perform in online education

Table 2. Socio-demographic characteristics of clusters (%)

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
<i>Country</i>				
Romania	18.7	21.0	35.6	24.6
Iceland	26.9	29.9	19.3	23.9
<i>Level of study</i>				
Bachelor	21.7	24.6	30.6	23.1
Master	22.9	24.8	27.1	25.2
Doctorate +	18.9	22.6	26.4	32.1
<i>Age class</i>				
18-24 years old	23.5	21.8	33.0	21.8
25-34 years old	21.3	28.2	19.1	31.4
35+ years old	20.3	25.6	31.9	22.2
<i>Gender</i>				
Women	24.3	25.2	32.0	18.4
Men	17.9	21.4	23.2	37.5
<i>Occupational status during studies</i>				
Full-time jobs	19.4	23.3	33.2	24.1
Part-time and occasional jobs	24.7	27.8	21.2	26.3
No job	22.5	23.3	31.3	22.9

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043

Table 2 displays different characteristics of the clusters. We can notice that Cluster 3 is more prominent among Romanian sample, possible due to the fact that public universities in Romania tend to attract more likely the students from the medium and upper class of society and to a less extent those from disadvantaged communities. Also, Cluster 3 reaches higher shares among bachelor students and also aged 18-24 years old,

these being in fact those students participating to education by making use of the Internet infrastructure and technological endowments of their parents/families. Those aged 25-34 years old being in process of transiting from living with their families to living by their own are also more likely to be found among Cluster 4. Surprisingly women have higher shares among Cluster 3, while men reach higher shares among Cluster 4, the structure of the samples by age explaining the distribution. As expected, students aged 25+ are more likely to have full-time jobs and access to all needed resources, along with students aged 18-24 years old and living with their families (that are more likely not-employed).

Barriers to online education, study workload and skills development

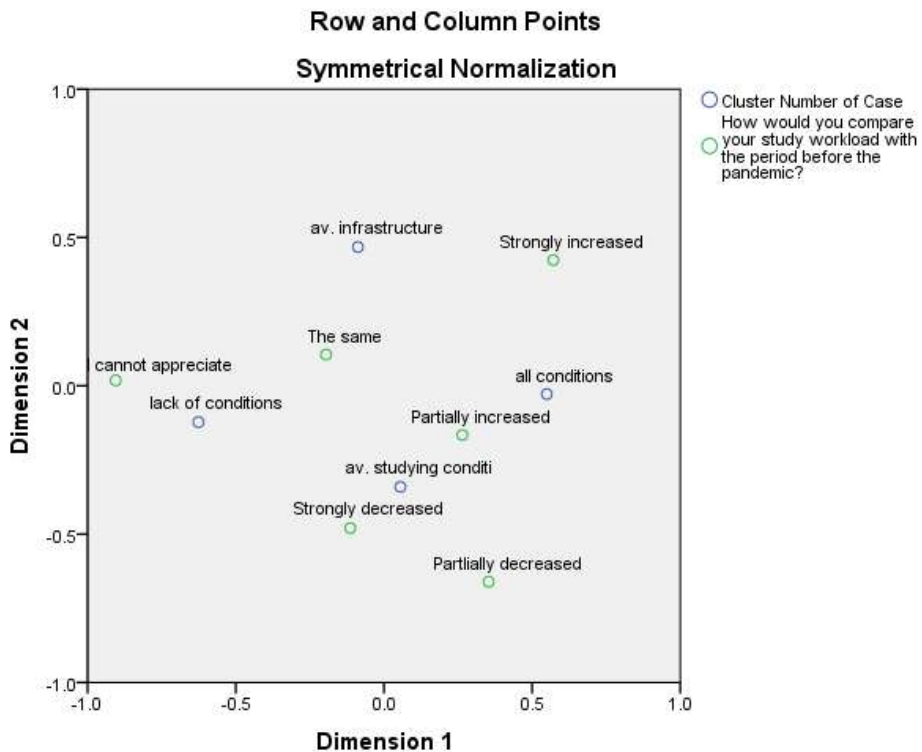


Figure 3. Correspondence analysis between type of clusters and perceived study workload during pandemic

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043, Authors' estimations

Figure 3 presents the plot of the correspondence analysis between the clusters identified based on factors hindering participation to online education and the subjective assessment of the students with respect to changes in their workload. First, the results indicate an opposition between those having all conditions needed for online education and students characterized by lack of such conditions. Those with no adequate conditions for participating to online education tend to be unable to assess changes in the education-related workload during pandemic. Obviously, lack of

adequate conditions has limited the access of students to educational activities. On the other hand, students possessing all the needed conditions more probably experienced a partial increase in the education related workload. Moreover, they are more similar with students having average studying conditions and poor infrastructure who more probably experienced a decrease in their workload. It is clear that lack of infrastructure prevented some students to be as engaged as before pandemic in educational activities. Also, students with average infrastructure, but poor studying conditions and those reporting no change or a strong increase in their workload are quite distinct by the rest of the students.

In addition, the correspondence analysis between clusters of students based on factors hindering online education and their need for skills development in this respect indicate a strong association between these characteristics (Figure 4). The results confirm the opposition between students having all the needed conditions and those lacking the adequate conditions for online education. The plot suggests that students possessing all the conditions experienced the need to develop their skills to a large extent in order to participate to online courses and seminars. On the other hand, students who didn't need to develop their skills are more probably among those lacking conditions for online education or those possessing some infrastructure, but with poor studying conditions. In these cases, students didn't feel the need to acquire new skills for online education. In the same time, possessing average studying conditions, but poor infrastructure resulted in the need to develop skills to a certain extent in order to attend online education.

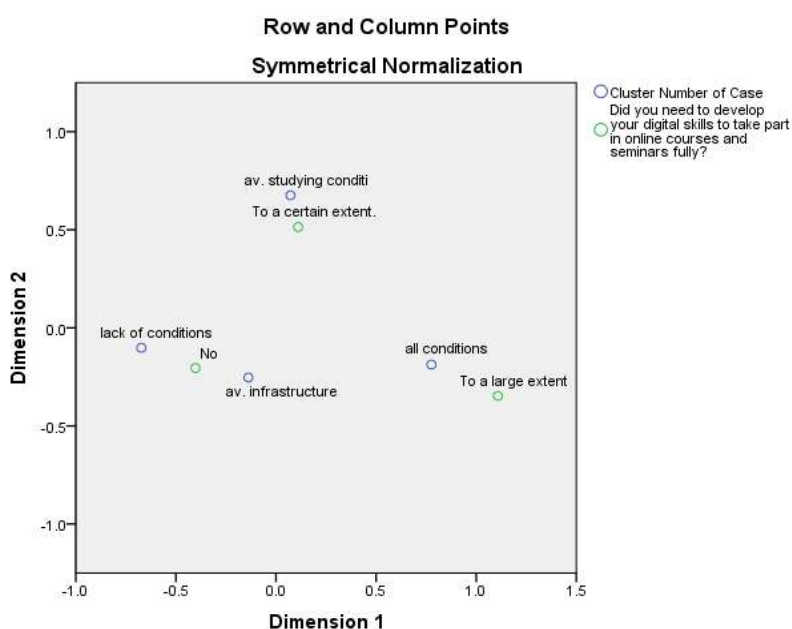


Figure 4. Correspondence analysis between type of clusters and investment in digital skills development

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043, Authors' estimations

Barriers to online education, motivation for studying and perceived educational performances

Moreover, factors hindering online education seem to be related to how the motivation of students evolve during the pandemic (Figure 5). Again, students lacking all the needed conditions tend to be unable to assess their motivation change, showing a disengagement from educational activities. Students possessing some infrastructure and poor studying conditions are more likely to report a strong increase in their motivation. Also, students having all the needed conditions are more associated with an increase in their motivation level. In the same time, students with average studying conditions are more probably to experience a decrease in their motivation. In this respect, our results suggest that the needed infrastructure has been a relevant element of influence for students' motivation when shifting to online education.

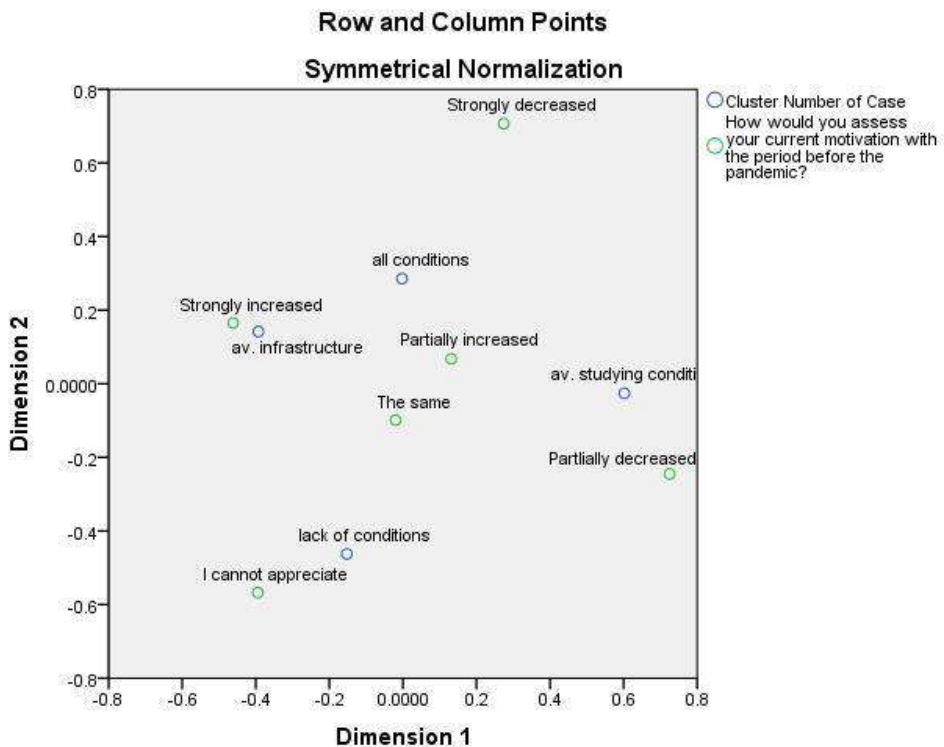


Figure 5. Correspondence analysis between type of clusters and perceived evolution of motivation for studying during pandemic

Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043, Authors' estimations

Figure 6 presents the results of the correspondence analysis between clusters of students and how their educational performances evolve in the pandemic. Students possessing all the needed conditions are not related to a specific pattern of evolution with respect to their educational performances. On the other hand, students with

average studying conditions, but poor infrastructure are associated with low probability of improvements in educational performances. In the same time, students possessing some infrastructure, but poor studying conditions and those lacking conditions report an increase in their educational performances during pandemic. So, lacking proper studying conditions seem to be associated with an improvement in educational performances when shifting to online education, but we have to keep in mind that the item measures perceived educational performances.

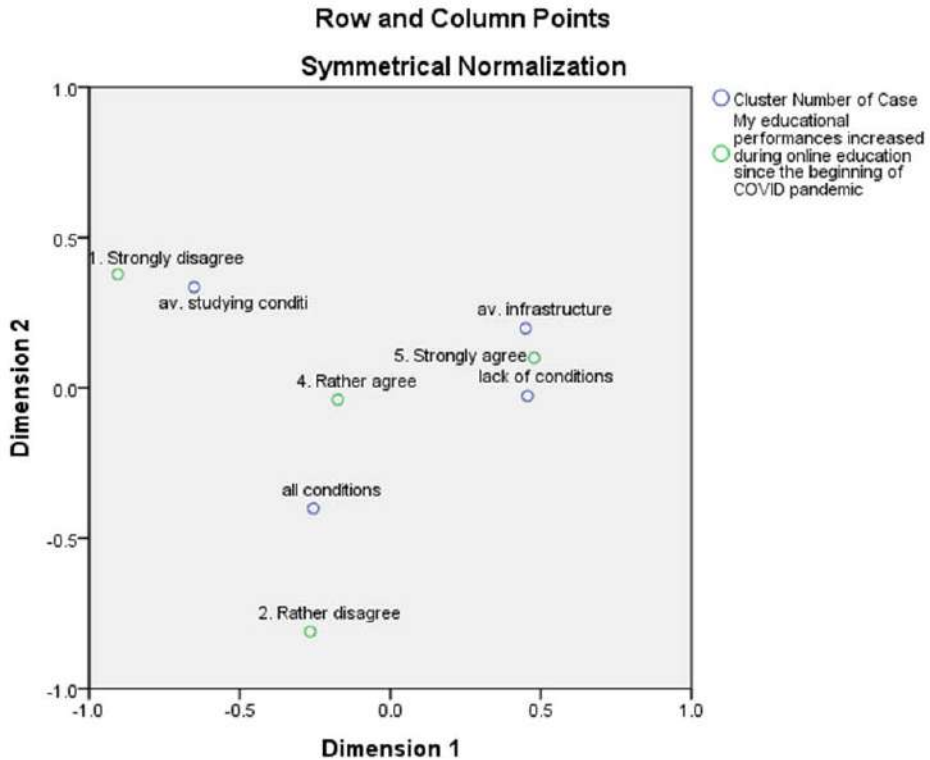


Figure 6. Correspondence analysis between type of clusters and perceived evolution of educational performances during pandemic
Source: Survey among higher education students from Romania and Iceland carried out within the project NEW-DIGI-EDU 20-COP-0043, Authors' estimations

Conclusions

Transformations generated by the shift to online education, investments that higher institutions already carried out in technological infrastructures, as well as the positive changes witnessed in the lives of students and teachers will probably urge institutions to develop mixed education, combining onsite and online education. But the designing and implementation of mixed education must consider a balance between advantages and disadvantages generated by the use of new technologies, as well as the implications on the quality of education.

Our paper aimed to explore the links between barriers to education and different experiences on online education, considering the diversity of students. Students have experienced unequally the barriers hindering online education during pandemic. Furthermore, these differences in barriers are associated with differences in how students experienced the workload, skills need, motivation and educational performances. Most important, students with no conditions at all for online education have been mostly disengaged from the educational activities. On the other hand, students having all the needed conditions who were probably the ones most engaged in online education reported an increase in their workload, higher level of skills needed and a higher level of motivation after shifting to online. However, they experienced no important changes in their perceived educational performances.

For students in Romania and Iceland, not having the needed infrastructure for online education has been a factor of demotivation during pandemic, findings being similar to other studies in the field. On the other hand, shifting to online education brought some improvements in educational performances of students lacking proper studying conditions as probably new teaching and learning practices specific to online education have been more accessible for them. Moreover, students possessing some infrastructure but poor studying conditions, and also poor digital skills, benefited the most from the shift to online education as they reported an increase in both their motivation and educational performances.

Concluding, public interventions focused on improving the infrastructure available to students seem to be most effective for supporting educational resilience in contexts of online education. Also, a specific importance has to be put on developing IT departments in universities in order to support the proper digital upskilling among students in their efforts to fully make use of platforms and software.

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SMART WORKING ACROSS ECONOMIC SECTORS IN EUROPE; THE MANIFOLD OF UBIQUITOUS BIG DATA

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Abstract:

The stream of the new society is driving us to smart working and the digital transformations is one of the most important engines. Using Big Data as an effect of the new digital tools such as Artificial Intelligence, Social media, the Internet of Things, etc., could indicate the potential smart working. Starting from the consideration that Big Data usage is ubiquitous and social and economic life depends on it more and more. We appreciate that this ubiquitous appearance is different at any time and everywhere. In our opinion, there are differences in the economic sector, size of the company, or geographic location. To appreciate these, it was supposed to find a way to measure the usage of the Big Data. The indicator and row data used was Big Data analysis provided by EUROSTAT with a unit of Measure Percentage of enterprises where employed persons have internet access. The findings reconfirm that Big Data ubiquitous but highlight the manifolds of the usage depending on company size, location, and economic sector.

Keywords: *Big data, Digital transformation, Innovative behavior, new business models Smart working, Sustainability*

Introduction

Nowadays society, after facing the COVID-19 pandemic with a lot of restrictions has to adapt the working style and the business models accordingly. A big step was made by the digital transformation that was expected to be implemented for more than ten years but the process was slow.

Forced by necessity, the public organization and companies understood that sustainability stays in implementing the technology-driven models (Romanelli, 2022). Adopting combined hybrid working systems (digital and physical), and encouraging

innovative and collaborative work environments, the smart managers enforced smart innovative solutions and increased the organization's resilience (Romanelli, 2022). More than this Romanelli (2022) stated that the use of ICT, digital and interactive technology helps to drive sustainable public organizations, a remark that could be extended to the business as well.

The transformation to a hyper-connected society and economy, towards an "Industry 4.0" (W. Bauer et al., 2015) can be considered only if a critical mass is involved in digital transformation. Digitalization with all its components: infrastructure, application, and skilled human resources are the main tool for acceding to the next industrial level and changing many socio-economic behaviors.

Digitalization and data-intensive activities are the base of industry 4.0 and smart businesses or organizations. This technical update and tremendous upgrade could not be done without significantly changing human resources skills and organizational culture. The congruence of the technical aspects and the employees W. Bauer et al. (2015) examines the work architecture of qualification, leadership, and demography-resistant on the new framework.

Crowdsourcing is increasingly present in various areas, sometimes not expected, as a way of creating and sharing information and knowledge, offering services, and changing the world of work. Bauer & Gegenhuber (2015) identified four types of values for crowdsourcing actors: creative expertise, critical items, execution capacity, and bargaining power, due to its global dimension. The authors highlighted the tendency to twist and shift roles and attributes.

Cloud computing technology gives an example of the global dimension, a facile alternative to a classic database. The advantages of fewer investments and maintenance costs were highly appreciated by the financial institutions, but not only (Al-lawati et al., 2016). We have to be awarded by the accessibility and security of the storage data, and the fast cybernetic and digital crime evolution.

Under different labels Industry 4.0 (Europe), made in China 2025 (China), Smart Cities (Asia), Society 5.0 (Japan) or Industrial Internet (USA) is a global phenomenon with a strong impact on industrial policies. This transformed all the coordinates of the life-work framework Industry 4.0 claiming Quality 4.0., new skills being required as critical thinking, digital skills, Information and Communications Technology (ICT) knowledge, and big data usage (Santos et al, 2021). The changes in the professional's core knowledge and skills are now related to the challenges introduced by digital transformation, innovation, creativity, teamwork, mind flexibility, the know-how of new ITC applications and high wishful thinking to be in the stream. These are becoming reality only with the contribution of skilled human resources (Arora et al., 2021).

Our understanding is that the usage of big data gives a relevant hint of the potential for a fast and successful shift to smart working and business. The present study is mapping the usage of big data for several economic sectors in Europe for 2021.

Literature review

Smart working. The relationship between the employee and the organization is changing, more and more professionals are looking for flexible work and hybrid or full

remote work, short-time contacts, or part-time jobs. The understanding of smart jobs involves an innovative, collaborative, motivational environment (Decastri, 2020). Smart working is related to talent hunting and expectation, more complex and changed from the regular, new component as ethics, personal valuation potential, and eco-friendly, green process being part of. The smart working organization culture includes cultural values, innovative behavior, collaborative work, and commitment (Romanelli, 2022). An image of a smart working based on big data is a retail store built on a complex interconnected database and interlinked big data systems from suppliers to distributors, banking system, and tax control (Evans & Kitchin, 2018). The smart working performance measurement proposed by Yuan et al. (2015) includes: 1) a smartphone-based APP to collect employee attendance, work, and location information; 2) a data warehouse to preprocess and store the data; and 3) a smart data analysis center to make a comprehensive and systematic evaluation of employee work performance.

Setting the work-life balance is the challenge to be addressed by smart work, both organization and employee benefiting an open, network results-oriented organization (Butera, 2020). Digital transformation and remote work with access to resources and the possibility to provide results on-time, and work in a collaborative way, no matter the location of the professionals, is the way to be considered for a smart organization. The cultural change to new business models could be done innovatively, components of smart work supporting and speeding the process, and a road map of the process implementation must be considered by the management (Torre & Sarti, 2018).

Smart data using Big Data collected by the organizations, reunited in huge volumes, processed, filtered, cleansed, and offered to the decision-makers to be analyzed for insights (Foote, 2018). Big Data is characterized by value, variety, volume, velocity, and veracity. The difference between Big Data and Smart Data is the volume detection and the relevance increase. Foote (2018) appreciates that "Variety may, or may not, be reduced, depending on the screening process used to filter the data. Value, velocity, and veracity (accuracy) should all increase with the decrease in volume."

Data analysis plays a very important role in transforming data into information; they are techniques meant to eliminate the noise and retain useful data as usable information. They are transforming Big Data into Smart data when they act on large amounts of information, contributing to smart decisions (ESA, 2021). Smart data are accurate for machine learning, they give the possibility for the machines to identify patterns and efficiently and effectively adapt to the new tasks (ESA, 2021).

Digital transformation is present in the academic environment from two perspectives: 1) adapting the academic working space to the new challenges of cyberculture and 2) reforming the teaching programs to the new skills needs. The digitalization of the universities will include all structural aspects: infrastructure, human resources, management, and relationships. All teaching, researching, evaluating, and monitoring processes will be digitalized (Hahanov et al., 2016). Cloud mobile management based on metric measurement improves the education quality, research results, global visibility, and performance of scientists (Kurth et al., 2016). Moreover, a highly integrated smart factory concept is appreciated as a potential business or society model (Kurth et al., 2016).

An important factor of the digital transformation is human resources, the appetite of the employees for new opportunities, tools, and novelty is increasing the potential for adaptability and development (Abukhait et al., 2020). The new models in business consider the importance of competitive advantage built on knowledge transfer, innovation, and the employees' skills playing a significant role in the transformation into a smart organization (Graczyk-Kucharska et al., 2017).

Data analytics transforms government and business people, processes, and policy. Using the data could be created added value and engage the stakeholders and incorporate data resources in their analytical initiatives as they tackle important questions. The managers who understand and implement collaborative, inclusive networks that leverage knowledge from previous experiences to orient current analytical endeavors will drive the organization to a smart level. For example, the study of Cronemberger & Gil-Garcia (2022) suggests "that data analytics practices in local governments that implement a smart city agenda are knowledge-driven and developed incrementally through inclusive networks that leverage stakeholder knowledge and data resources."

Industry 4.0 is one of the challenges we are facing for a few years one pillar of this transformation is Big Data. While using Big Data represents an opportunity to improve performance, Big Data does not necessarily mean good data, it can be uncertain, imprecise, ambiguous, etc. Uncertainty is one of the most important risks to be addressed and confidence in the data source has to be increased.(Souifi et al., 2022). The impact of Industry 4.0 was investigated for cargo logistic business in Bangladesh and Canada using big data, smart factories, cyber-physical systems, and the Internet of things, showing differences for various countries. (Rahman et al., 2022)

We identify a gap in quantitative methods of measuring smart working in the literature. Our original contribution is to measure the presence of smart working by using big data, regardless of their typology, in different sectors of activity in Europe.

Big data usage is the first step to the digital transformation of the socio-economic and environment in a ubiquitous manner. The cleaned Big Data is Smart Data functional and valuable input for Artificial Intelligence (AI). IA algorithms becomes more and more accessible and with extremely rich applications. The typologies of big data are differentiated by the big data creation process, the technology of analysis, and by the economic data market. But beyond all these developments, there is more and more of a trend to specialize these tools according to economic sectors' specific activities.

We sketch some patterns of Big Data usage by sector profile, relevant issues of the present study are:

- a) mapping the smart working development in 2020 by NUTS0 and sector
- b) new skills development of human capital for new occupations.

Methodology

The research objectives are identifying patterns of Big Data usage by sector profile and new skills development of human capital for new occupations.

Butera (2020) appreciates that Big Data is ubiquitous regardless of economic sector, country, or company dimension. We appreciate that Big Data, although ubiquitous, has

ways of measuring usage and differences based on the economic sector, country, and company size. The hypothesis is that Big Data usage is the same regardless of economic sector, place, or company size.

The research methods used by the authors for the present study are: statistical comparative analysis, Pareto graphs, and profiling of the sectors but Big Data usage. While its common to refer to Pareto as the "80/20" rule, under the assumption that, in all situations, 20% of causes determine 80% of results, this ratio is merely a convenient rule of thumb and is not, nor should it be considered, an immutable law of nature.

The indicator and the row data used was Big data analysis [ISOC_EB_BD] provided by EUROSTAT with a unit of Measure Percentage of enterprises where employed persons have internet access [PC_ENT_IUSE]. The economic sectors are considered at NACE rev 2(see Table 1) and the reference area covers EU-Member States, Iceland and Norway, Candidate countries, and potential Candidate countries (Eurostat, 2021). The considered indicator was measured by EUROSTAT using a sample of about 135000 companies of 1.4 million EU enterprises, covering all sizes (SE - small 10-49 employees, ME – medium 50-249 employees, SME - – small and medium 10-249 employees, LE – large > 250).

Table 1. Economic sectors covered: Enterprise size (10 or more employees and self-employed persons) and NACE Rev. 2

2 digits	1 digit	NACE Rev 2 sector
10_C10_33	C	Manufacturing
10_D35_E39	D-E	Electricity, gas, steam, air conditioning and water supply
10_F41_43	F	Construction
10_G45_47	G	Wholesale and retail trade; repair of motor vehicles and motorcycles
10_H49_53	H	Transportation and storage
10_I55	I	Accommodation
10_J58_63	J	Information and communication
10_L68	L	Real estate activities
10_M69_74	M	Professional, scientific and technical activities
10_N77_82	N	Rental and leasing activities, Employment, travel agency, security and investigation, service and landscape, office administrative and support activities

Source: authors selection, data Eurostat, 2021

The indicator and the raw data offered by EUROSTAT were grouped and selected the components that are giving a dimension of the smart working (see Table 2)

Table 2. Indicators of information society relevant for big data employees use

Code var	Variable
E_BDA	Analyse big data internally from any data source or externally
E_BDAINT	Analyse big data internally from any data source
E_BDAEXT	Have another enterprise or organisation perform big data analysis for the enterprise (externally)

E_BDBUY	Enterprises purchased (access to) any big data
E_BDSELL	Enterprises sold (access to) its own big data
E_BDAAM	Analyse big data internally using any method (of E_BDAML, E_BDANL, E_BDAOM)
E_BDAOM	Analyse big data internally using other methods (than E_BDAML, E_BDANL)
E_BDAML	Analyse big data internally using machine learning
E_BDANL	Analyse big data internally using natural language processing, natural language generation or speech recognition
E_BDAOS	Analyse big data from other sources (than E_BDASDS, E_BDALOC, E_BDASM)
E_BDASDS	Analyse big data from smart devices or sensors
E_BDALOC	Analyse big data from geolocation of portable devices
E_BDASM	Analyse big data generated from social media

Source: authors selection and synthesis, data Eurostat, 2021

We used the data of Eurostat Information and Communications Technologies (ICT) usage in enterprises (isoc_e). The collected raw data is very complex; Big Data is a component of the e-business, part of a vast area of digital transformation measures. There are collected data about: General information about ICT systems; Access to and use of the internet including mobile use of the internet, e-commerce, e-business including Cloud computing, Internet of Things, Big data analytics, 3D printing, Robotics, Artificial Intelligence, etc.; ICT specialists, training on ICT and e-skills; ICT security; Covid-19 impact (Eurostat, 2021). This study uses data for the 2020 year. Data was gathered on the basis of the National Statistical Institutes.

We used IBM SPSS Statistics 23 for the statistical analysis and the Pareto graphs to measure de manifolds of Big Data usage.

Results and discussion

We used relative data, and indirect measures for the smart working. The main conclusion is that the process of producing, exploiting, and usage of Big data is becoming more and more converted by the sector profile, dependent by location in two ways:

- a) by the source of innovation
- b) by the sectoral space dependence profile, if it is the case.

The research objectives and measure in a quantitative way the smart working by the proxy "Percentage of enterprises where persons employed have access to the internet and analyze big data internally from any data source or externally in 2020 in EU 27 and Romania any type of Big data analysis and source.

First, we select the data and organize them by company size. Table 3 presents the synthesis for EU-27 and Romania. It could be seen that the usage of Big Data belongs to

the LE and significantly less to SMEs. Romania has a similar behavior as the European countries. The analyses of big data internally from any data source or externally, (E_BDA) present this activity as specific to LE. In the EU, the share of employees in LE using Big Data is 34% and for SE it is 13%. In Romania, the gap compared to the EU 27 average values is represented by levels of big data use with values 2 times lower. (Table 3)

The first result is NO validation of the hypothesis. Big Data usage is ubiquitous but is NOT the same by company size.

Table 3. Big data usage by employees in firms by dimension in 2020

Code var	European Union - 27 countries (from 2020)					Romania				
	Total	SE 10-49	ME 50-249	SME 100-499	LE >250	Total	SE 10-49	ME 50-249	SME 100-499	LE >250
E_BDA	15	13	21	14	34	6	6	8	6	14
<i>E_BDAINT</i>	13	11	19	12	31	5	5	6	5	13
<i>E_BDAEXT</i>	3	3	5	3	11	2	1	2	2	3
E_BDBUY	1	1	2	1	4	1	1	2	1	4
E_BDSELL	0	0	1	0	2	0	0	0	0	0
E_BDAAM	7	6	11	6	24	5	5	6	5	13
<i>E_BDAOM</i>	5	4	8	4	17	3	3	4	3	9
<i>E_BDAML</i>	3	2	4	2	11	2	1	2	1	5
<i>E_BDANL</i>	1	1	2	1	5	1	1	1	1	3
E_BDAOS	3	2	5	3	12	1	1	2	1	4
<i>E_BDASDS</i>	3	2	6	3	17	2	1	2	2	6
<i>E_BDALOC</i>	7	6	9	7	14	3	2	4	3	8
<i>E_BDASM</i>	7	6	9	6	15	2	2	3	2	5

(Source: Big data analysis [ISOC_EB_BD], Eurostat)

Smart market data (buy and sell) is reaching the average of UE only by the ME. In Romania, the market for data is not identified, neither for sales nor for buying, no matter

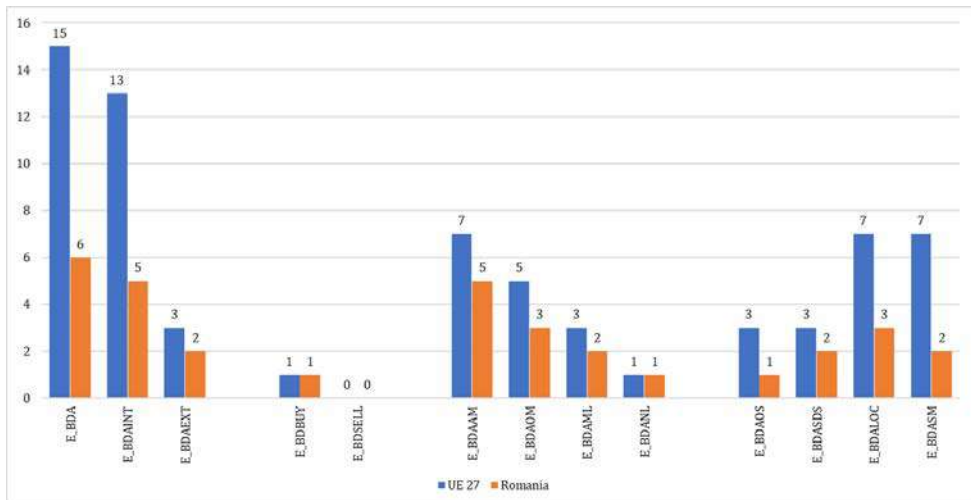
the company size. We can underline that there are records for the LE, most probably the multinational, where the activity of buying data is about 4% in Romania and the EU.

The usage of Big Data can be done in various ways and they are contributing with different shares. Usage of Machine Learning or Artificial Intelligence (AI) is 3% for the EU and 2% for Romania, with the LE contributing with the larger share, in this case, 6 times more than the SE. The pattern is similar in Romania LE having 5 times the rate of SE. we can appreciate that there is a large gap between the LE and SE in using AI in EU countries. The usage of natural language processing or speech recognition is 3 times less in the EU and 2 times in Romania compared to Machine learning. but find the same gap between the LE and SE.

Considering the Big Data analysis on the type of the tool we should look at Smart devices and sensors that provide Big Data for 3% of the companies in the EU and 2% in Romania. Again the LE has 6 times more than SE, and the gap for Romania is only 3 times. Geo-location of portable devices smart devices or sensors provides 7% of Big Data for companies in the EU and 3% for Romanian companies. In this case, the gap between the LE and SE remains present (3-4 times more). Social media provides 7% of Big Data in the EU and 2% in Romania, with LE being the favorite.

The conclusion is that Big Data usage is present in all most companies but it significantly differs based on the company size, in accordance with our analysis of market share, analysis methods, and tools for collecting and reproducing data. It is obvious that the LE has a higher probability of Big Data usage than the SE and confirms the potential and the orientation to smart work.

Figure 1 Employees accessing the internet and analyses Big Data internally or externally in 2020 in EU 27 and Romania.



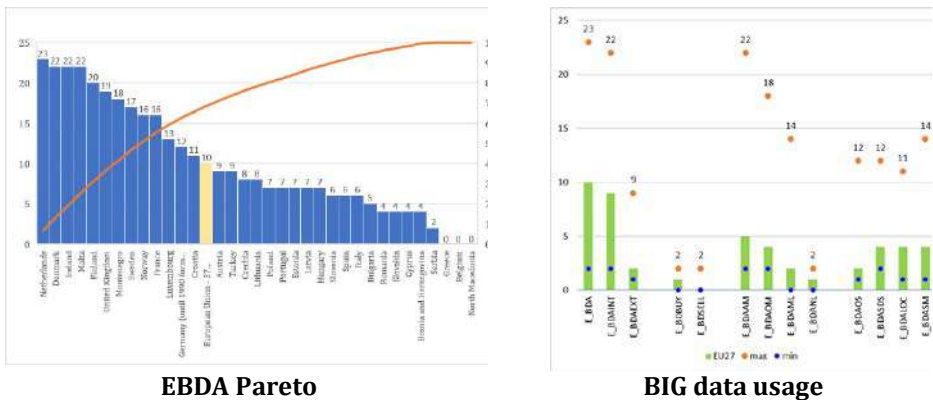
(Source: Big data analysis [ISOC_EB_BD], Eurostat)

It can be seen in figure 1 the Big Data analyses highlight the contribution of the Geo-location of portable devices smart devices or sensors and Social media, with shares of 7% for UE and 3% for Ro.

The usage of Big Data is at the 'start us' stage, the current activities indicate the production of Big Data and less the exploitation of them and the contribution of AI or the Internet of Things (IoT).

The second step of our analysis is the sectoral patterns by the percentage of enterprises where persons employed have access to the internet and analyze big data internally from any data source or externally in 2020 in EU 27 countries and other 6 European Countries by any type of Big data analysis and source (Source: Big data analysis [ISOC_EB_BD], Eurostat) and Pareto graphs.

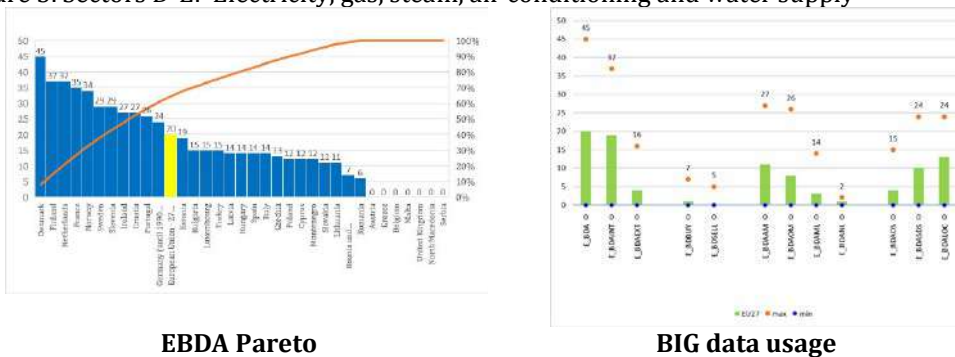
Figure 2. Sector C - Manufacturing



Source: authors' representation (Big data analysis [ISOC_EB_BD], Eurostat)

Figure 2 is presenting for the sector of manufacturing the specialized locations in using Big Data: Netherlands, Malta, Ireland, and Denmark. The main usage is internal (22% for EU), the market, both sales, and buying are low (about 2%), analyses methods – the most frequent is AI with 14% machine learning and tools are social media with a 14% maximum, geo-location with maxim 11% and sensors with 12% maximum.

Figure 3. Sectors D-E: Electricity, gas, steam, air conditioning and water supply

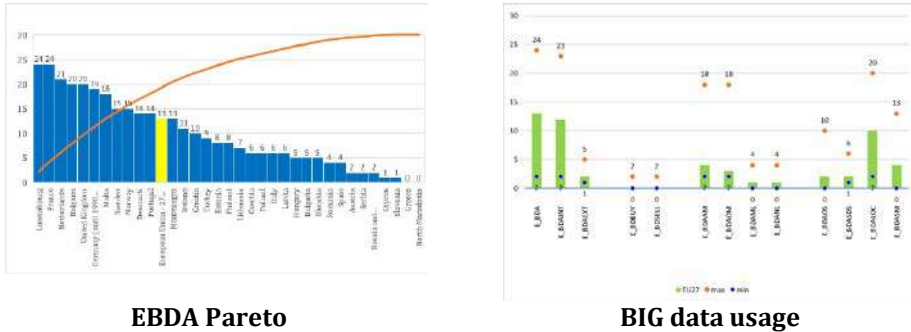


Source: authors' representation (Big data analysis [ISOC_EB_BD], Eurostat)

The Electricity, gas, steam, air conditioning and water supply sector (Figure 3) has the specialized locations on Denmark, Finland, Netherlands, France, and Norway. The

predominant usage is internal (maximum 45% and average 20% in EU). The presence of the data market is modest with a maxim of 7% and an average of 5% in the EU, the most frequent method of analysis is AI and the tools are geo-location and sensors.

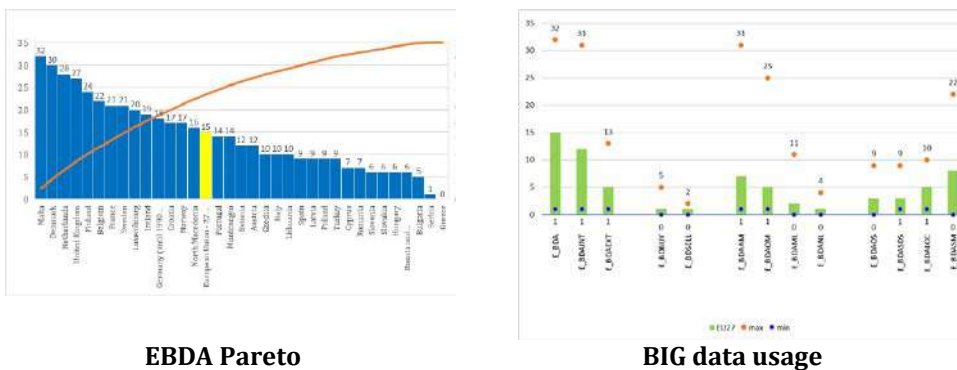
Figure 4. Sector F: Construction



Source: authors' representation (Big data analysis [ISOC_EB_BD], Eurostat)

For constructions (Figure 4) the main locations are: Luxemburg, France, Netherlands, Belgium, UK, Germany, and Malta. The usage a mainly internal, but significantly higher (maximum 23%, average 12% for EU), the data market is very low, and the frequent method of analyses is AI and Natural Language Processing (NLP). The geolocation and social media are the most used tools.

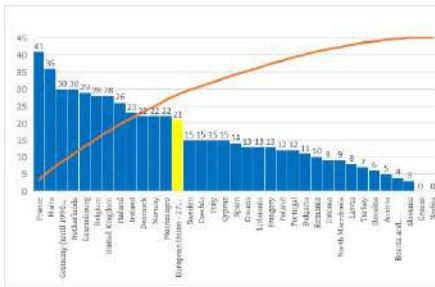
Figure 5. Sector G: Wholesale and retail trade; repair of motor vehicles and motorcycles



Source: authors' representation (Big data analysis [ISOC_EB_BD], Eurostat)

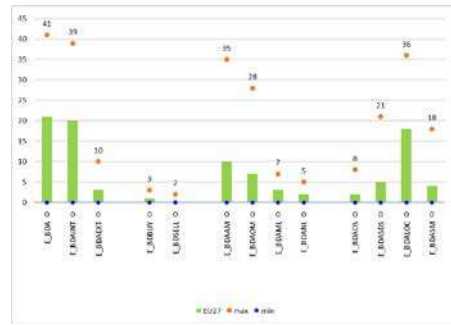
Wholesale and retail trade; repair of motor vehicles and motorcycles sector (Figure 5) has the specialized locations of Big Data usage in: Malta, Denmark, Netherlands, UK, Finland, Belgium, France, Sweden over 50% of the frequencies, usage is mainly internal (maximum 31% and average 12% for EU), market presence is low, analyses methods are AI and NLP and the tool is social media with a maximum of 22%.

Figure 6. Sector H: Transportation and storage



EBDA Pareto

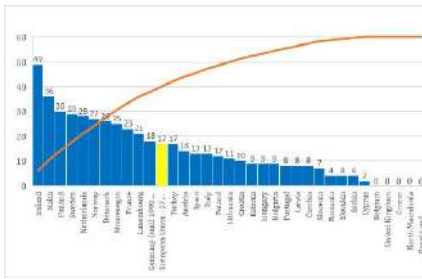
Source: authors’ representation (Big data analysis [ISOC_EB_BD], Eurostat)



BIG data usage

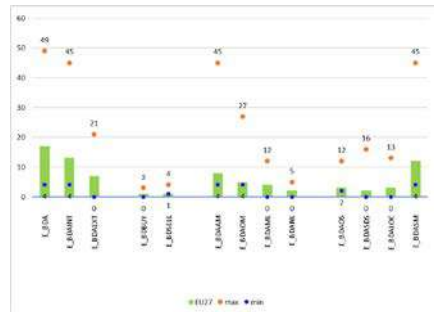
Transportation and storage (Figure 6) shows the most important locations for Big Data usage: France, Malta, Germany, Netherlands, Luxemburg, Belgium, UK, Finland, Ireland, and Denmark. The internal usage is Consistent, but low market share. The same methods of analysis are used and geo-location is the main tool.

Figure 7. I: Accommodation



EBDA Pareto

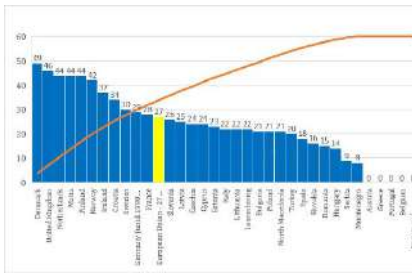
Source: authors’ representation (Big data analysis [ISOC_EB_BD], Eurostat)



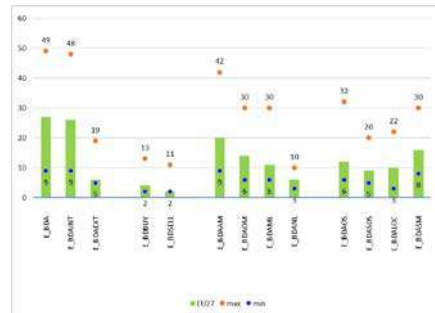
BIG data usage

For the accommodation sector (Figure7) the specialized locations are: Ireland, Malta, Finland, Sweden, Netherlands, and Norway. We can appreciate that there is a prerequisite of a cluster. There is an internal high usage (maximum 45% and average of 13% for EU) and a low presence on the market, social media 12% media with a maximum of 45% is the main tool.

Figure 8. Sector J: Information and communication



EBDA Pareto

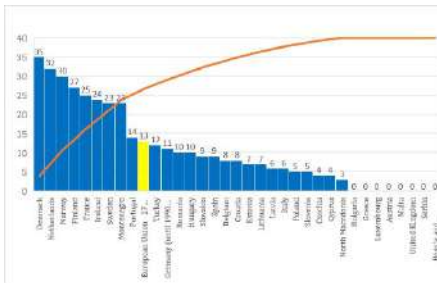


BIG data usage

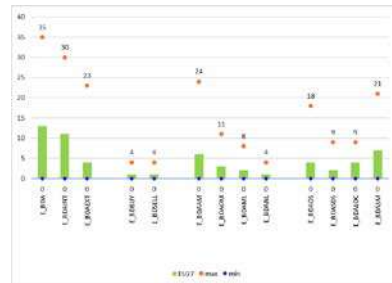
Source: authors’ representation (Big data analysis [ISOC_EB_BD], Eurostat

The Information and communication Sector (Figure 8) is very concentrated: Denmark, UK, Netherlands, Malta, Finland, Norway, and Ireland. The internal usage is very high (maximum 48% and average 26% for EU). Compared with the other sector, the market presence is high with a maximum of 13% and an average of 11% for the EU. The most present analysis method is Ai and the most used tool is social media.

Figure 9. L: Real estate activities



EBDA Pareto

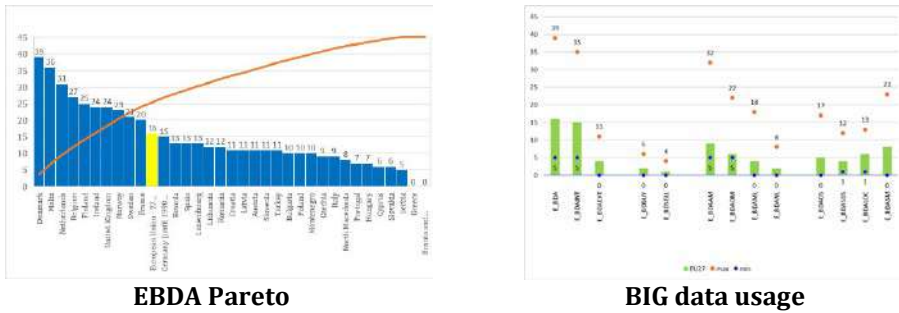


BIG data usage

Source: authors’ representation (Big data analysis [ISOC_EB_BD], Eurostat

Another sector that has a very concentrate spatial usage is Real estate activities (Figure 9), the main locations are: Denmark, Netherlands, Norway, UK, Finland, France, Ireland, and Montenegro. A high internal usage with a maximum of 30% and an average of 11%, but a low market presence is recorded. Methods of analyses and tools are the same.

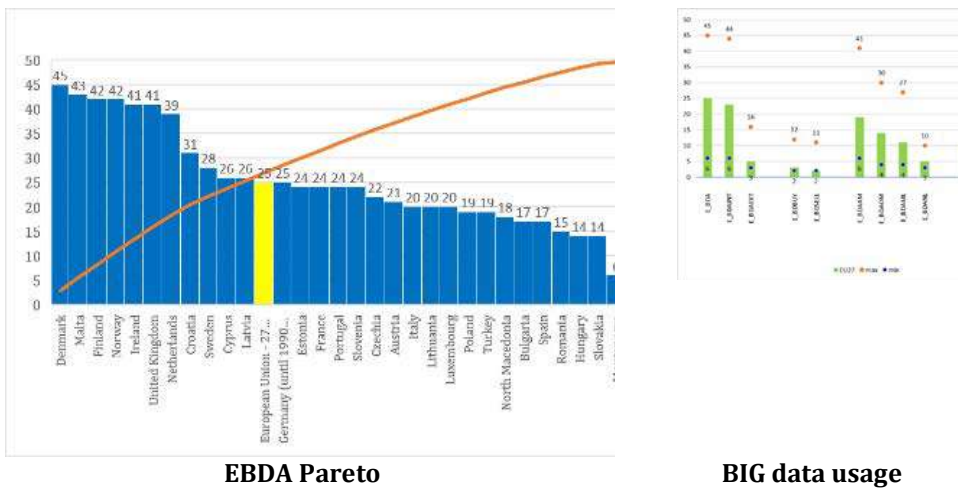
Figure 10. M: Professional, scientific, and technical activities



EBDA Pareto **BIG data usage**
 Source: authors' representation (Big data analysis [ISOC_EB_BD], Eurostat)

Professional, scientific and technical activities (Figure 10) is also very concentrated in terms of space usage of Big Data, the main location are: Denmark, Malta, Netherlands, Belgium, Finland, Ireland, UK, Norway, Sweden, France. The internal usage is high and the market presence is medium. Ai and Social media are the main methods and tools used.

Figure 11. N: Rental and leasing activities, Employment, travel agency, security and investigation, service and landscape, office administrative and support activities



EBDA Pareto **BIG data usage**
 Source: authors' representation (Big data analysis [ISOC_EB_BD], Eurostat)

For Rental and leasing activities, Employment, travel agency, security and investigation, service and landscape, office administrative and support activities the main locations are Denmark, Malta, Finland, Northway, Ireland, UK, Netherlands, Croatia, Sweden, Cyprus, Latvia.

Conclusions

Our Hypothesis: Big data usage is the same regardless of the economic sector and space is informed. The huge development of Big data usage is more specialized than we expected and more localized. The process of innovation contamination is still in development. While is still new Big data usage offers a monopole advantage for the pioneers.

It could be seen from the analysis that the LE are the main beneficiary and contributors of the Big Data usage compared with SE or ME, or even SMEs, their presence being several times higher. In terms of sector, it is obvious that Big Data usage is ubiquitous, but it takes manifolds pending the activity characteristics. The geographic spread of the Big Data usage analysis shows that the Pareto distribution (we do not apply the strictly 80/20 rule) is located in several, usually 6-7 countries. On the other hand, we identify a regional concentration that is the initial stage of cauterization.

In conclusion, the process of producing, exploiting, and using Big data is becoming increasingly transformed by the sector profile, dependent by location in two ways>

- a) By the source of innovation
- b) BY the sectoral space dependence profile, if it is the case.

Major limitations of the current research are related to using relative data and indirect measures for smart working. Smart working is ubiquitous in the new content of work, but, according to sectoral Big Data usage specificities, the potential occupational mobility could be infringed. Further developments of the study are a deep analyze of the localization of the Big Data usage, the potential of cauterization, and the overlay effect of the sectors. A new dimension could be exploring Big Data usage in education and research and the overlay effect on the economic sector.

Nevertheless, the present paper is the first attempt to measure the potential of smart working through Big Data usage.

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THE DIGITIZATION SYSTEM AND THE IMPLEMENTATION OF THE TELEWORK PROGRAM IN THE PUBLIC ADMINISTRATION IN ROMANIA AND THE EUROPEAN UNION

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Abstract: *The information society is characterized by the predominance of information processes based on information and communication technology that implicitly lead to reconceptualization and reengineering systems that provide information services and products. In this context, the specification of new methods of organizing the activity, and the work of integrating the new competencies for the collection, processing, organization, and communication of information becomes an indispensable requirement for the efficiency and effectiveness of a structure (Drăgănescu, 2003).*

The Lisbon Strategy adopted by the European Union states that "the transition to a knowledge-based digital economy will be a powerful engine for increasing competitiveness. Moreover, it will improve the quality of the environment and the lives of citizens. Information technology and communication facilitate the participation of European citizens at all levels of social activity. Public administration responds to the needs of society and operates based on organizational structures, processes, roles, relationships, policies, and programs. It influences sustainable economic prosperity (Kaufmann & al), social cohesion, and people's well-being.

Keywords: *Communication; Digitization; Information; Public administration; Technology.*

Introduction

The purpose of this article is to analyze the progress in the digitization of services in Romania, as well as in the member states of the European Union, taking into account the pandemic period that surprised the whole world. Many people, in recent years, have turned to the purchase and use of internet platform services, thus replacing services from physical points.

Considering the pandemic crisis, the digitization process has started rapidly in terms of both public and private services. The first part of the article highlights the main theoretical aspects of the digitization process at the level of the European Union, and in

the second part, we will have an analysis of the implementation of the digitization process in Romania compared to the member states.

Digital transformation or digitization is one of the global megatrends that leads to structural and organizational reforms in the public and private environment by adopting information and communication technology (ICT) solutions to optimize operations and provide improved services to customers or citizens (Lappi et al., 2019).

The globalization of the labor market, the increase of the specialization degree in the workplace, and the appearance of new technologies represent one of the most important elements that influence the labor market both at the level of the European Union and at the global level.

In 2018, at the level of the European Union, approximately 5% of employees aged between 15 and 64 were working from home. The countries with the highest percentages that practiced work from home are the Netherlands (13%), Luxembourg (12%), Finland (12%) at the opposite pole Romania (0.4%), and Bulgaria (0.3%). Innovative public administration involves creativity, development, and implementation of some practical ideas that achieve a public benefit and these ideas must be at least technological improvements, not just simple improvements. Some of the benefits of introducing smart solutions in the administration are: improving the activity of public administration, citizens' access to information thanks to services, user satisfaction, more services geared to the needs of citizens, a rapid provision of services, simplification of administrative procedures, improvement

working conditions and employee satisfaction and reducing the costs of adoption a digitized way of working. Innovations in public administration can be achieved by changing public policies and a legislative framework, changes in thinking, in the approach to the provision of public services, and in providing relevant solutions within the public administration. To address these challenges, the public sector must be open to all, collect best practices, and collaborate with other institutions in the country and abroad to achieve sustainable social change. Public utility is an area that implies the need for providing certain services or making available to the general public elements of infrastructure, to meet some needs considered fundamental.

Digitization of services in Romania - member states of the European Union

In international law, the International Labor Organization (I.L.O.) is the body regulating labor standards that gather the most members at a global level. Among the I.L.O. most important incidents in telework and work at home should be mentioned in Recommendation R184 / 1996 of the I.L.O. looking work-from-home regime. States are encouraged to add labor and protection legislation to their legislation certain provisions so that each Member State should, by national law and practice, designate an authority or authority responsible for formulating and implementing national policy on working from home.

The European Framework Agreement on Telework and several Directives are relevant to European Union law in telework and work at home. The EFA aims to make European workers more flexible and increase their safety at work, thus aiming for a balance between the flexibility of forms of work and safety at work.

The European Framework Agreement on Telework aims to make it more flexible and increase the safety at work of European workers, thus aiming for a balance between the flexibility of forms of work and safety at work. This agreement refers to all employment relationships that use means of communication distance and have provided in their content another place adopting a place or place where the employer carries out his permanent activity.

The agreement does not enjoy immediate applicability and does not set concrete tasks for the Member States, but its provisions lay down several standards by which the Member States offer employees (teleworkers) the same collective rights as employees working at the employer's premises.

Directive 2003/88 / EC on the organization of working time presents particular importance as it provides the Member States with certain minimum standards they need to implement regarding the organization of working time. Among the measures which have been taken through transposition into the laws of its Member States directives include a rest period of 11 hours every 24 hours; break time every 6 hours worked; day off compulsorily granted every seven days; at least four weeks of paid annual leave; free medical checks for workers night etc. The Court of Justice of the European Union has ruled in Case C-306/16 - A. Marques da Rosa, that he opposes a worker being forced to take leave first, before knowing if he is entitled to be paid for this leave (Moarcăș, 2018).

Directive 89/391/CEE on implementing measures to promote the improvement of the safety and health of workers at work. Directive 91/533/CEE on the employer's obligation to inform workers of the conditions applicable to the contract or employment relationship.

ROMANIA- Romania is a member of the ILO and must consider its recommendations and conventions in drafting labor and social security legislation.

The information society is characterized by the predominance of information processes based on information and communication technology that lead to the reconceptualization and engineering of information services and product systems.

The Lisbon strategy adopted by the countries of the European Union shows that the transition to a digital economy based on knowledge will be a powerful engine for increasing competitiveness.

Information and communication technology facilitates the participation of European citizens at all levels of social and economic activity. ICT can contribute to social support in public administration, governance, health, education, and work from home.

The Europe 2020 strategy has promoted smart cities by investing in human capital development infrastructure and solutions that take advantage of new technologies and digitalization.

According to the latest report of the European Commission, Romania is on its last among the 28 member states. The level of digitalization of the economy and the digital competencies of the population are low and make the process difficult.

The unprecedented isolation and social distress triggered by the COVID-19 epidemic renewed the importance of appropriate employee policies. Public administrations in the area The EU / OECD has taken various measures to protect its employees and, at the same time, to ensure providing essential services to citizens and companies and to ensure the proper functioning of state institutions.

Moreover, public sector staff is often at the forefront of the fight against the epidemic, and some participate in developing and implementing measures related to the consequences of the crisis on health, economic and social situation. Their workload has also increased to new ways of delivering results. Remote work requires not only technical infrastructure (hardware, internet connection, access to IT systems, and digitized workflows), but also adjusted management skills and collaboration tools. Countries with extensive telework experience and staff-appropriate legislation have quickly adapted to this working method. But not all administrations The EU / OECD have succeeded in this, according to a study carried out by the European Commission together with

OECD - Public administration: response to the COVID-19 pandemic - Government responses to public relations of EU Member States to the COVID-19 pandemic. The same study reveals that for citizens in Romania applications and supporting documents submitted for assistance benefits such as state child allowances and unemployment can be submitted by post or email. In European public administrations, Romania occupies a comparatively inferior position to the other Member States or other European countries. In Romania, in the case of public administration, there is only spatial and temporal flexibility. In the case of spatial flexibility, two apply forms: leatherwork and work at home, and in the situation of temporal flexibility three forms: are program flexible (uneven or individualized), compressed work schedule (reduction of the working week to a maximum of 4 day days and part-time work. The possibility of flexibility numerical or functional is not currently available in the Romanian administration. Telework, but especially work from home (although, in general, the schedule remained the same as in the case of office work) was applied on a large scale in the Romanian administration during the immobilization of emergencies and to run the first mentioned was in Decision. Not. 6 of March 9, 2020, of the National Committee for Combating Special Emergency Situations regarding the approval of additional measures to combat the new coronavirus, which provides in art. 9, that both public institutions and private operators will arrange, where possible, for some of the employees to carry out homework. This provision was by the provisions of art. 108-110 of Law 53/2003 regarding the Labor Code, corroborated with the provisions of art. 2 of Law no. 81/2018 regarding the regulation of telework activity. Subsequently, by Decree 195/2020 on the establishment of the state of emergency on the territory of Romania (since 16 March 2020) In addition to working from home, the concept of telework has also been introduced, with the mention that they will be achieved by a unilateral act of the employer. These two options have been strengthened by Law 55/2020 on some measures for prevention and combating the effects of the COVID-19 pandemic (May 2020) which specifies, according to art. 17, that during the alert state, the employer may order the activity of telework or work at home, by changing the job or its duties. In contrast to the previous normative act Law 55/2020 carrying out the activity in the telework regime or work workings done with the employee's consent. By 2022, Member States must transpose two directives into their legislation. Direction 2010/18 (to be implemented by August 1, 202ch gives the right to employees who return from maternity or paternity leave to request flexible

working arrangements such as reduced working hours, flexible working hours, or other arrangements.

Directive 2019/1158 (to be implemented from 2 August 2022) will allow all parents who have children up to the age of 8 and all caregivers the right to apply working arrangements such as reduced working hours, flexible working hours, or flexibility in what regarding the location of the work.

IRELAND- In Ireland, a common form of flexibility in public administration is sharing space job sharing/work sharing, introduced in 1984. This involves two or more many employees sharing tasks full-time. In general, this type of work flexibility in Ireland is implemented by sharing a job between two people employees, sharing at the same time the salary and benefits according to the time worked. This form allows employees to cope with responsibilities outside the workplace. This scheme also worked effectively in the times when Ireland was facing high unemployment rates.

Another form of time flexibility in Ireland, according to the study Flexible Work Arrangements and innovations in the Irish public service (2000), another form of time flexibility in Ireland is career breaks. This arrangement motivates the employee about the organization, allowing him to take a break while keeping their job for personal or professional reasons. This would translate into the administration's ability to suspend the service report at the initiative of the civil servant (according to art. 514 and 515 of Emergency Ordinance no. 57/2019 on the Administrative Code) for a maximum period of two years.

In the vicinity of Ireland, another country frequently uses the form of flexibility in public administration job sharing, namely the United Kingdom of Great Britain and Northern Ireland. Here there is a platform (The Job Share Finder¹) where civil servants looking for a reduced work norm can find a partner with the same skill sets to achieve together a norm of work. Although initially this method was introduced to support parents who returned from maternity and paternity leave, subsequently enjoyed real success and in among other categories of employees (including those preparing to retire, thus ensuring a smooth transition).

THE UNITED KINGDOM has begun to create its regulations for digital services, no longer subject to the rules of European Union law. Some agencies of Uk. The regulatory authority (Competition and Market Authority (CMA), Office of the Information Commissioner, Financial Conduct Authority, and Office for communications) work together to provide advice on the Kingdom's strategy United for regulating digital markets. Together, they form the Working Group (Task Force) digital of the United Kingdom, which published in early 2020 a series of recommendations on digital markets and services. The regulatory regime proposed by the Digital Working Group includes code conduct (with different rules for different types of companies), pro-competitive interventions (including solutions such as mobility and interoperability of personal data), and consolidated merger regulations. The common goal of all these proposals would be supervised by a new unit of digital markets. The Working group regime targets digital companies with a strategic "market status" (SMS) to be determined based on an assessment based on various market factors. This reflects the approach in the EU strategy to temper companies perceived as having consolidated market power. But unlike the EU approach, the working group proposes that such an evaluation by SMS be

applied to the specific activity of a company, rather than the company as a whole. Although the digital working group considers a pro-active regime, open relationships, and productivity with SMS companies, it goes beyond the EU in the proposed sanctions.

The Working Party recommends that the British Government apply sanctions to fines of up to 10% of overall turnover.

GERMANY: In order to keep the jobs, Germany has applied the so-called time flexibility method

Kurzarbeit (short work). This means a more flexible work schedule depending on the orders or requests for services that the employer has. It is an existing model from 1910 which represents a reduced workload (due to external imbalances), the difference up to when covering the normal working hours being covered by technical unemployment (which is paid by the state).

Specifically, for the hours the employee works, he is paid 100%, and the period in which he is not working (technical unemployment) is paid by the state (up to 70%). This model was successfully applied during the financial crisis of 2009. During the crisis, COVID-19 applications are much higher compared to the crisis of 2009 (especially in the manufacturing industries and tourism), but this method has managed to keep many jobs.

ESTONIA- Estonia is considered one of the most developed countries in the world from the point of view of the digitalization of society, from public administration services to education or social services. Investments and approaches aimed at digitizing several areas of Estonian society have also been facilitated by the Law on Telecommunications since 2000, a normative act by which internet access was enshrined as a right of citizens. Art. 5 of the Law provides:

(1) universal services (understood as guaranteed public utility services) comprise a set of telecommunications services that meet the technical and quality requirements set by the Government of Estonia, through which it offers all consumers who wish to have access to the public telephone network at a reasonable price in the designated area of the operator the public telephone network concerned.

(2) the set of telecommunications services referred to in paragraph 1 of this section consists:

1) a telephone service provided on a 3.1 kHz bandwidth channel, available at the same price for all consumers, regardless of their geographical location;

2) an internet service available at the same price for all consumers, regardless of their geographical location;

3) a publicly available telephone service that uses cash as a means of payment or cards;

4) the possibility to have free access to police, ambulance, and intervention services in emergency cases;

(3) The requirements for the provision of universal service shall be established by the Minister of Roads and communications. The main objectives for the development of internet infrastructure in Estonia were:

- Completion of the medium-speed high-speed network
- Extension of the broadband access network in the regions affected by the malfunctions of the market, by: reducing the administrative burden related to building an infrastructure network for communications by simplifying the relevant legal framework; promoting Community initiatives for the development of fast internet connections; supporting the installation of internet infrastructure in areas with market failures, including in rural areas, if necessary; analysis of the need for external connections and implementation of relevant projects when necessary; ensuring the availability of radio frequencies that meet the requirements of society to provide end-users with internet access in areas where they are not fixed networks available;
- Promoting the principle of net neutrality, which means that network operators' electronic communications may not restrict end-users access to electronic communications services online legal assistance, websites, or other available platforms;
- Promoting secure public WiFi networks, provided mainly by (local) organizations from the public sector.

GREECE- In Greece, a revision of the Constitution took place in 2008, bringing a series of amendments also in force in 2021. Art. 5A refers to the right to information of the citizens of the Republic of Elene. According to him: "(1). all citizens have the right to information, as specified by law. Limitations on the exercise of this right may be imposed by law only to the extent necessary and justified on grounds of national security, by combating crime, or by protecting the rights and interests of third parties. (2) Anything the citizen has the right to participate in the Information Society. Facilitating access to information transmitted electronically and their production, exchange, and dissemination constitutes an obligation of the State, always in compliance with the guarantees of Articles 9, 9A, and 19."

FRANCE- On August 24, 2021, the Law on the observance of principles was promulgated Republic. At the second reading of the draft amendment to the Law, which referred to combating separatism, the National Assembly adopted a text in which the platforms will be obliged to "make public the resources they allocate to combat illicit activities "and" implement procedures and proportionate human resources and technological "for this. French law requires platforms to designate a contact point for cooperation with judicial and administrative authorities and to preserve reported and deleted content. A "system of easily accessible and user-friendly reporting "for users and the establishment of a "third party "status part of trust ". One of the amendments given to the original form was intended to anticipate partly the future European regulation on digital services. A new regime of moderation of illegal content is imposed by the end of 2023, for online platforms (procedures for processing legal applications, informing the public about the moderation system, risk assessment, etc.). The Superior Audiovisual Council will have to monitor the moderation processes implemented by social networks, platforms for video sharing, search engines, etc., and may impose financial sanctions (up to EUR 20 million) or 6% of global turnover. Art. 42 paragraph (4) of the Law is also an obligation

for public/user information platforms. (Platforms) Report to the public the means implemented and the measures to combat the dissemination to users in France, an illegal content. This reporting will be done by rules set by Superior Audiovisual Council, and at a frequency recommended by it. However, the European Commission has expressed reservations about the new French regulatory act, stating that it will likely jeopardize the desired unitary application of future European acts. The incident for digital services in France is also the Law 2019-759 on creating a tax on digital services and changing the trajectory of the tax decline on advantage. This Law establishes a separate tax regime for legal entities that operate in the "digital sector".

Article 299.-I. introduces "A fee due based on the amounts collected by the companies in the digital sector defined in ch. III, in exchange for supply to France for one year calendar, of the services defined in ch. II. II. Taxable services are:

1. Providing, through electronic communications, a digital interface that allows users to get in touch with and interact with other users, especially for the delivery of goods or the provision of services directly between these users. However, providing a digital interface is not a paid service then When:

a) users use it to:

- digital content;
- communication services;
- payment services,

b) the digital interface is used to manage the following systems and services:

- interbank settlement systems or the settlement and delivery of financial instruments;
- trading platforms - crowdfunding consultancy activities, and, if it facilitates the granting of loans, financing intermediation services participatory;
- other connection systems, mentioned in an order of the Minister of Economy, whose activity is subject to the authorization and supervision of a regulatory authority to ensure the security, quality, and transparency of transactions involving instruments financial, savings products, or other financial assets;

c) the digital interface is intended to allow the purchase or sale of services that aims to place advertising messages.

AUSTRIA- is one of the few EU countries that has developed clear regulations on digital services before acts developed at the level of the EU institutions. The most important legislation in this regard is the Federal Law on Measures for protecting users on communication platforms. Section 3 of the law are n certain obligations for service providers, referred to in the context of the law as "Information society services". The above-mentioned section states: "Suppliers of services must establish an efficient and transparent procedure for the treatment and processing reports on allegedly illegal content available on the platform communications. Such a procedure should be designed

in such a way that users can have functions in a light, constantly available, easy-to-communicate platform." Section 4 also regulates a report that the platforms must prepare periodically: "Service providers are required to draw up an annual report and, every six months for communication platforms with over one million registered users, about how complaints about alleged illegal content are handled. The report must be submitted to the supervisory authority no later than one month after the end period recorded in the report and at the same time made available on the company's website, so that it can be easily found. " Section 8 of the law regulates the status of supervisory authorities:

"(1) The supervisory authority for this federal act is the authority of communications from Austria established by Section 1.

(2) Administrative support in matters of this federal law and the function of the bureau of complaints is the responsibility of RTR-GmbH under the responsibility of the Director-General for the media department. As part of the activity report to be drawn up, the supervision, with the support of the complaints office, must assess the effectiveness of the measures and the obligations of conduct outlined in this federal act and developments in that regard in the two previous calendars".

Figures, tables a, citation style

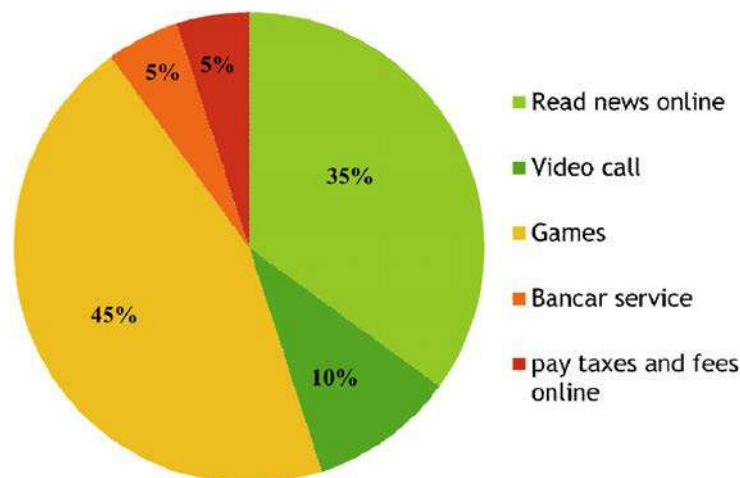


Figure 1. Internet use in Romania
(Source: National Institute of Statistics, 2019)

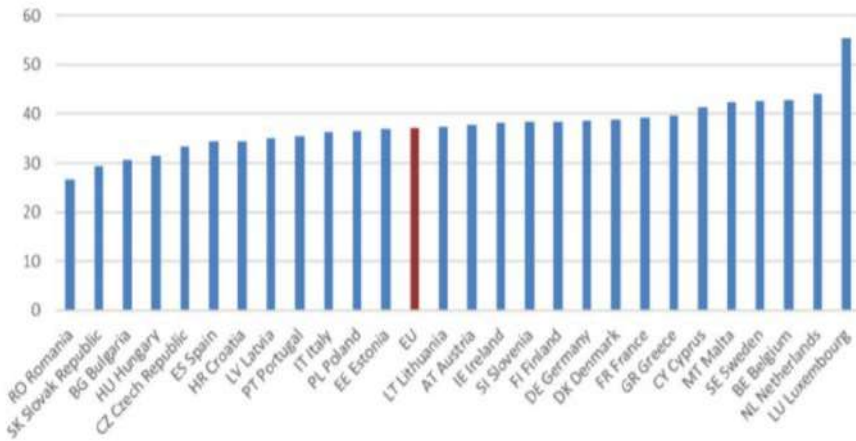


Figure 2. The potential for teleworking in Europe and the risk of a new digital divide
 (Source: European Commission and Eurofound, 2020)

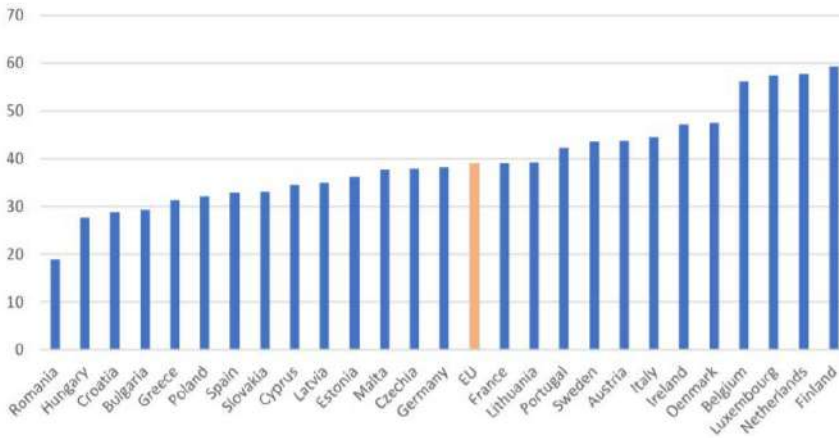


Figure 3. Employees working from home during the COVID-19 crisis in the country
 (Source: EF Covid Survey, 2020)

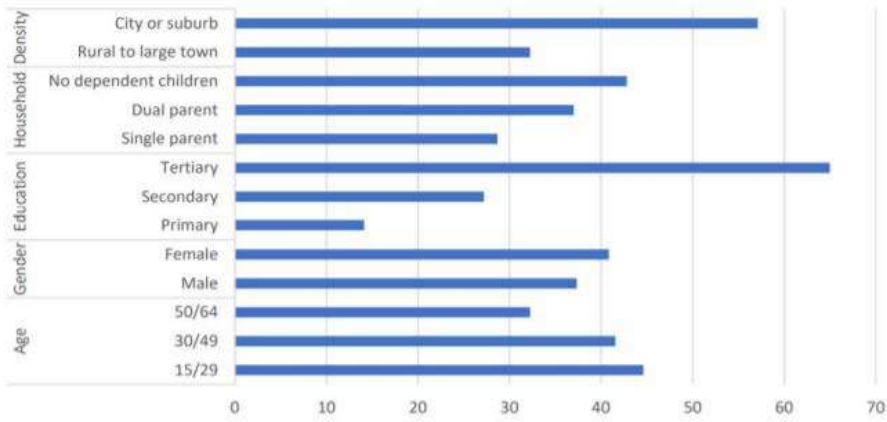


Figure 4. Employees working from home post-COVID 19 (Source: EF Covid Survey, 2020)

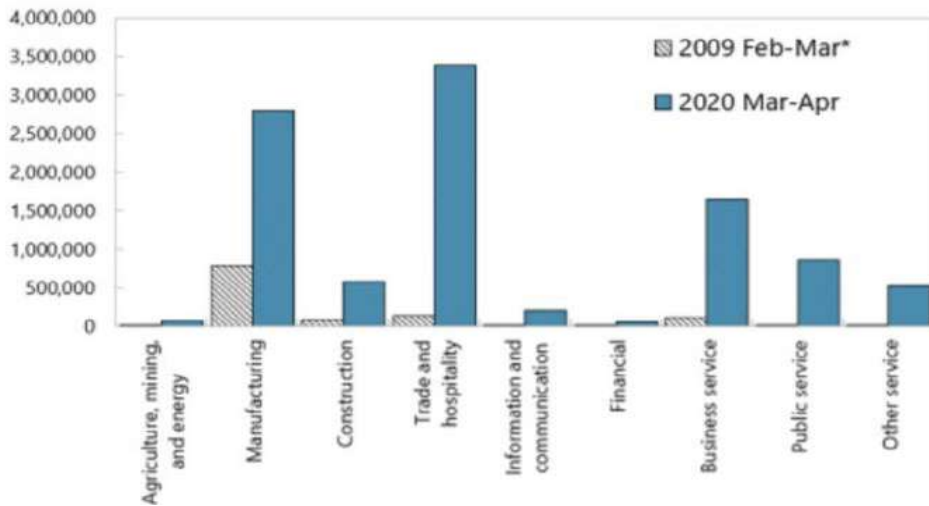


Figure 5. Applications in Germany for Kurzarbeit in 2020 compared to 2009 (Source: FSO and IMF calculations, 2020)

Conclusions

The pandemic has forced all Member States to switch primarily to flexible space (telework and work at home). But compared to the advanced savings in the block community-based, knowledge-based, in Romania, telework and work at home apply to a smaller percentage of the employed population.

A study by the European Commission's Joint Research Group and Eurofound (The potential for teleworking in Europe and the risk of a new digital divide, 2020) shows us that Romania is at the bottom of the ranking regarding the number of employees who are in occupations that can be carried out from home. At the opposite pole are Nordic states and Luxembourg, the Netherlands, Belgium, and Malta. Consequently, according to the figure below, a small number of employees in Romania, compared to the state's temperament, started working from home after the COVID-19 crisis.

Similar situations there were found in Hungary, Croatia, and Bulgaria. On the other hand, Belgium, the Netherlands, Luxembourg, and Finland pushed an even larger number of employees into telework.

According to the Eurofound (2020) study, Regulations for addressing work-life balance in the context of flexible digital working arrangements, 30% of Europeans have been teleworking/working from home since the pandemic outbreak, while later mass - the EU average reached almost 40%.

Finland has reached the highest share of the number of employees who started working from home, respectively 60%. The main characteristics of European employees who started working from home during the COVID-19 crisis are higher education (highly skilled, knowledge-based jobs are suitable for flexible forms of work), a relatively young age, and working in urban areas.

Women worked more flexibly at home than men, generally due to their disproportionate relationship regarding work tasks and family duties. Surprisingly, a larger number of childless employees began working from home compared to colleagues with dependent children.

Remote work requires not only technical infrastructure (hardware, internet connection, access to IT systems, and digitized workflows), but also adjusted management skills and collaboration tools. Countries with extensive telework experience and staff-appropriate legislation have quickly adapted to this working method.

But not all administrations The EU / OECD have succeeded in this, according to a study carried out by the European Commission together with OECD - Public administration: response to the COVID-19 pandemic - Government responses public relations of EU Member States to the COVID-19 pandemic. The same study reveals that for citizens in Romania applications and supporting documents submitted for assistance benefits such as state child allowances and unemployment can be submitted by post or email. Similarly, in Slovenia, electronic communication between citizens and the public administration is simplified, so that it is not necessary for requests and other types of communication electronic signature (for example, a simple e-mail would suffice or if civil servants

officials would have doubts about the identity of the person, scanned copy of a document with a handwritten signature).

Germany has applied the so-called time flexibility method *Kurzarbeit* (short work) to keep the jobs. This means a more flexible work schedule depending on the orders or requests for services that the employer has. It is an existing model from 1910 which represents a reduced workload (due to external imbalances), the difference up to when covering the normal working hours being covered by technical unemployment (which is paid by the state).

Specifically, for the hours the employee works, he is paid 100%, and the period in which he is not working (technical unemployment) is paid by the state (up to 70%). This model was successfully applied during the financial crisis of 2009. During the crisis, COVID-19 is much higher than the crisis of 2009 (especially in the manufacturing industries and tourism), but this method has managed to keep many jobs. The *Kurzarbeit* model was also approved in Romania during the COVID-19 crisis by the Ordinance of Emergency 132/2020 on support measures for employees and employers in the context of the epidemiological situation caused by the spread of SARS-CoV-2 coronavirus, as well as to stimulate employment growth, but this only applies to the private sector, not the public administration.

Given that the administrative environment is largely bureaucratic, the lack of electronic signatures in many authorities and Public institutions was one of the biggest obstacles. With all that many officials were forced to work from home, he had to return to the office at some point to sign documents. Although part of the management staff receives a signature electronically in some situations, this does not always facilitate the bureaucratic process, as there is a chain of signatures behind the managers' signatures from staff with executive functions. Thus procurement of electronic signature certification services both for managers and execution staff, for central and local public administration institutions is one of the first steps to be taken to unblock the current situation. This is an essential element for digitization administration. Simultaneously with the purchase of signature certification services, electronic several new working procedures needs to be developed, which be by both remote and flexible ways of working in the office, respectively for coordination between activities, people, structures, and institutions. In addition to the workflow procedure, provisions on monitoring must be mentioned. This aspect also depends on the degree of trust in employees. Where there is a high degree of trust, monitoring may be reflected in the delivery of results and not through additional procedures or reports that may complicate and/or fragment the activity of contract officials/staff. Many employees forced to work in telework do not have benefited from logistical support from the institution, given that it was an emergency. Many of them had to use their PC, and security features in cybernetics in working with state documents were often missing. It does not benefit from the means related to information and communication technology and/or the secure work equipment necessary to perform the work, according to the provisions of art. 7, para. a) from Law 81/2018 on the regulation of telework activity. Through the funds, European projects can be accessed and implemented to acquire IT&C equipment.

Last but not least a guide on implementation in the administration of Romania would benefit all parties involved. In the end, it is only a matter of time before the Romanian

administration will align with those Europeans, but the sooner the better, both for public sector employees and its beneficiaries, operators economic, citizens, and other categories of beneficiaries.

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Do companies walk the talk of sustainability? A foray into the particularities of corporate greenwashing in Romania

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Abstract. *Recent European regulations enforced the need for more responsible and ethical companies from an environmental, social, and financial point of view. Various incentives and programs have been introduced over the last few years to assist businesses in focusing their efforts on sustainability goals and support the EU in achieving climate neutrality by 2050. Sustainable companies are no longer characterized by their financial statements but by how they handle sustainability-related risks and opportunities. As a relatively recent topic in the research field, greenwashing is described as deceptive communication meant to suggest or create the impression that an organization's products, aims, and/or policies are environmentally friendly. This exploratory study aims to uncover the primary causes and peculiarities of greenwashing in Romania from several expert viewpoints. The initial stage in a more comprehensive study seeks to determine the effect of greenwashing communication on Romanian consumers and their views on the subject. To further identify the grounds and expert opinion on this issue, semi-structured interviews with experts from various sectors and areas were performed. Engineers, consultants, NGO staff members, corporate communicators, and influencers in sustainability-related job positions were invited to participate. As highlighted in the data analysis, the main causes of greenwashing occurrence in Romania are the lack of education on sustainability in communication departments, the lack of clear and consistent regulations in measuring corporate sustainability, and the complexity of the topic. Sustainability and green education are severely harmed in the absence of adequate education in the formal system and information about green products is often obtained through the media. The novelty of this research is identifying subtle particularities of greenwashing in Romania compared to other types of misleading communication. In addition, it provides a series of methods that may assist individual customers in identifying and combating greenwashing.*

Keywords: *greenwashing; green claims; green products; misleading communication; sustainability.*

Introduction

The world as we know it is already transforming, and future scenarios foresee more changes that lie before us. The present human systems became more difficult to maintain in our natural environment, and businesses began to adapt. But are these businesses putting forth an honest effort with pure intentions? How can they (and us) keep up with the new requirements established to regulate corporate activities in a more sustainable way? At the investors' level, many consultants and experts give their advice on what data should be asked and how it is presented afterward through reports. However, at the consumers' level, things get more difficult. The average customer lacks the time and resources to investigate a company's overall approach to sustainability.

They are exposed to the final product and rely on labels, statements, and visible packaging or marketing materials to make a judgment. When companies offer misleading, ambiguous, or incomplete information, consumers may be deceived. Greenwashing has become more prevalent in recent years as firms attempt to paint themselves as concerned about the environment and its impact on the ecosystem.

Why do businesses fear communicating in a transparent manner? How do we reach a point where an open, honest dialogue begins when discussing a balance between economic development and environmental protection? Before answering these challenging questions, we should first understand and educate society in developing a vocabulary and a common framework in addressing planetary health. Experts in this field notice the raise of greenwashing activities, at the harm of genuinely conscious brands. This research aims to go deeper into the real causes of greenwashing by exploring different points of view from professionals acting in both the public and private sectors. Based on their experience and knowledge, participants offer several solutions and methods to approach misleading communication from individual and corporate perspectives.

Literature review

Environmental claims in the context of the sustainability field

In a broad sense, sustainability refers to the capacity to constantly support or maintain a process over time. Usually, the notion is divided into three pillars: economical, environmental, and social. Hence, the word encompasses environmental concerns and influences on communities, cultures, and interpersonal connections. The environmental pillar refers to air and water pollution, ecosystem management, and any other component which can be part of environmental preservation and climate change mitigation. Because there is currently no globally acknowledged definition or methodology for determining if a product or a business is sustainable, politicians and marketers increasingly use it as a catchphrase, diminishing the term's original meaning.

Since 2016, statistics show that individual awareness and interest in nature and climate change have continuously climbed globally. Search engines report a yearly rise in searches related to nature loss and biodiversity. More and more people share their concerns and opinions on social media and news on behalf of nature (The Economist Intelligence Unit, 2021). From this viewpoint, the market for consumer goods is under pressure to adapt and provide more sustainable and ethical products and services to consumers. Hence, green, or environmentally friendly outputs may be characterized as those that do less environmental damage in terms of polluting the earth or depleting natural resources, and/or can be maintained or recycled (Shamdasani et al., 1993). Aside from academics, several European regulations and guidelines have attempted to define what environmental or green claims are. Hence, a comprehensive definition refers to “the practice of suggesting or otherwise creating the impression (in a commercial communication, marketing or advertising) that a good or a service has a positive or no impact on the environment or is less damaging to the environment than competing goods or services” (European Commission, 2021). This practice might be related to the product's composition, how it was created, how it can be disposed of, or the anticipated decrease in energy consumption or pollution resulting from its usage. Hence, relevant to evaluating an environmental claim is the product's major

environmental consequences throughout its lifetime and supply chain. An environmental claim should relate to characteristics that have a major bearing on the environmental effect of the product. When such claims are false or cannot be easily verified, it can be referred to as *greenwashing*, but it is also known as eco-washing, eco-bleaching, green makeup or whitewash.

Greenwashing in business-to-consumer communication

Like other misleading advertising practices, oil firms such as Chevron were among the first to violate the idea of green advertising in the mid-1980s by downplaying their role in environmental damage for years. Over the years though, more companies tried to convince their audience about the benefits of their products from an ecological point of view and self-promoting an environmentally responsible corporate image. Greenwashing occurs when the public perceives a business's environmental claims as deceptive.

In the context of business-to-consumer communication, promotion practices that include green attributes of products can refer to "all types of statements, information, symbols, logos, graphics, and brand names, and their interplay with colors, on packaging, labeling, advertising, in all media (including websites) and made by any organization, if it qualifies as a 'trader' and engages in commercial practices towards consumers" (European Commission, 2021). At the moment, Directive 2005/29/EC (Unfair Commercial Practices Directive) is the primary EU act that addresses unfair practices that affect the economic interests of consumers, including deceptive green claims. There are a few Member States which implemented national guidelines to complement and detail the ones at the EU level. However, there is still a need for clarity in this area, since the guidelines only address environmental claims and do not regulate the broader idea of *sustainability claims*, which includes labor and human rights.

Types of greenwashing

One of the most popular classifications of greenwashing was published by TerraChoice, an environmental marketing company that researched international markets and concluded that 98% of North American brands were greenwashing their audience (de Freitas Netto et al, 2020). They provided a list of seven sins to be taken in consideration in order to avoid greenwash traps: the sin of the lesser of two evils, the sin of irrelevance, the sin of the hidden trade-off, the sin of no proof, the sin of worshiping false labels, the sin of fibbing, the sin of vagueness.

In a widely cited study, Carlson et al. (1993) split environmental advertising claims into a matrix of five distinct categories: 1) Product-orientated; (2) Process-orientated; (3) Image-orientated; (4) Environmental fact; and (5) Amalgamation. These types can be further divided into a second typology divided into: (a) vague/ambiguous claims; (2) omission; (3) false/outright lie; (4) combination; (5) acceptable.

In recent years, new studies (De Jong et al., 2020; Torelli et al., 2020) have embarked on a journey toward a novel approach of greenwashing by distinguishing between the type of green claim, company, or macro-level that it is initiated on when examining its effects on consumers. De Jong et al. (2020) categorization of greenwashing includes "vocal green," "partial" (also known as "half-lies"), "full" (also described as "lies")

greenwashing, "taking credit for following legal requirements," and "acting on own initiative". Their research proves that partial and full greenwashing has comparable negative consequences on brands' reputations compared to true green conduct. Interesting to discuss from this perspective the relevancy of the term *green-blushing*. As defined by the public relation firm Dix & Eaton, green-blushing refers to "walking the walk, but being too shy or unsure to talk the talk" (UL, 2016, p. 7). When businesses fail to communicate their social and environmental sustainability practices, they miss the chance to actively promote corporate sustainability values and encourage stakeholders and competitors to participate in constructive transformations.

On the other hand, Torelli et al. (2020) questioned that the previous literature in the greenwashing field only addresses consequences on the product or company level. Hence, they introduced two new levels: strategic and dark level. From their perspective, the strategic level is defined as "misleading environmental communication concerning aspects related to the future firm's strategies" (Torelli, 2020, p. 409). Dark level though is defined as "misleading environmental communication finalized to hidden illegal activities" (Torelli, 2020, p. 409).

Methodology

More than ever, in order to stay relevant to investors and consumers, businesses are concentrating on all three pillars of sustainability, including social and environmental. Companies are expected to build stronger policies and procedures to meet different sustainability standards. Yet they may use deceptive claims about their environmental performance to their profit becoming susceptible to greenwashing. This study seeks to answer the question: "What are the main causes of greenwashing in Romania and how can they be addressed?" This investigation's objectives are twofold: (1) to easily grasp the main culprits of greenwashing in communication; (2) to identify the distinct characteristics of greenwashing as opposed to other misleading communication practices.

In-depth, semi-structured interviews were conducted with seven senior practitioners with expertise in several sustainability-related sectors. Communication professionals inside for-profit organizations, influencers, sustainability engineers, and consultants were engaged to increase universal applicability and give solid explanations on greenwashing from several viewpoints. This paper investigated how professionals in Romania describe and recognize greenwashing activities in corporate communication materials. To assure accuracy, interviews were recorded, transcribed, and sent back to the interviewees with an English translation of the original transcript.

Each interview lasted between 30 minutes and 2 hours and was recorded with the participants' permission. Atlas.ti was used for both coding and analysis. Before all papers were exported from Atlas.ti, they were cleaned for repeated phrases ("yes, yes") and utterances ("uhm", "ihm"). Text documents were imported into Atlas.ti for coding and modeling the relationships between codes after being edited, cleaned, and prepared. Six of the seven participants were female, and one was male. The capture of data began in May 2022 and continued until August 2022.

Results and discussion

All interviews were imported as primary source materials into Atlas.ti, and 113 significant text fragments or quotations were identified. As the quotations are the basic units of analysis in Atlas.ti, they are connected by codes to increase their relevance, significance, and processing efficiency. The main areas of coding for this research were organized into three themes, namely a) Examples of greenwashing and its characteristics in Romania; b) Causes of greenwashing; and c) Potential solutions.

The findings demonstrate the complexity of the greenwashing issue and how it is driven by the absence of clearly defined terminology and regulation at national and international levels and the lack of education on this given matter inside and outside of companies. The most prominent greenwashing mentioned by respondents refers to the final product, which is visible to customers; examples from the interviews include cleaning products, cosmetics, and home goods. As customers seek eco-friendly alternatives to harmful items, they may be confused by misleading pledges made by manufacturers. They use packaging and labeling to give the idea that their product is a greener choice, however, it is not: *"And you sit and ask yourself why bother to make the packaging part and put the eco-label when keeping the other part which is, if not the same, maybe even more important, right?"* (Interview_RC3). As most customers are unaware of the internal procedures and strategies of the producers, the green claim addressing the product characteristics is the most obvious to consumers. Therefore, they are more vulnerable to greenwashing through ambiguous assertions or withholding crucial information on packaging or marketing materials. *"People won't research, they don't have the time and resources to research, like the logistics and the companies owned by who and who are the partners and so on", "so most visible for them is, for example, a carton box with plastic inside. That's greenwashing"* (Interview_RC1). Biodegradable products like bags and other single-use accessories were often mentioned by respondents as greenwashing solutions proposed by different companies in order to convince their customers and investors of their support of green choices: *"this is a lie because all biodegradable compostable packaging should be put into compostable biodegradable packaging categories and taken to recycling centers"* (Interview_NGO1). Biodegradable products are *"very difficult to compost or recycle because of the material from which they are produced"* (Interview_RS2). In terms of communicating and promoting a product, those responsible for the creation and execution of the materials might lack a sufficient understanding of green claims and the regulations for using terminology such as green, eco-friendly, bio, etc. Without sufficient training, they are prone to make errors and use vocabulary improperly while referring to their company's goods and services: *"And then it happens sometimes because the people who communicate about this are marketing people, so they have no idea what they're doing. They don't know about greenwashing. It happens in my company as well."* Therefore, one factor contributing to greenwashing in Romania may be the novelty of the concept in the relatively young field of sustainability, the lack of individual education on the subject, and the limited resources they have to adopt more sustainable daily habits.

From the standpoint of participants, however, image orientation-based greenwashing may be the most bothersome. This deceptive green claim is based on the company's involvement with an environmental cause in its marketing materials, as pushed mostly via corporate social responsibility (CSR) efforts and it has become very common during the previous several years: *"Basically anybody who has CSR projects and they want to*

market them, they do it, they over market them (...) It's just the impression I get from commercials on the radio or tv." The majority of respondents said that it is not the fact that these companies are promoting their CSR initiatives, but rather the exaggerated benefits they claim that are providing to the environment or society while neglecting the damaging effect they have. Nonetheless, there were more straightforward respondents who argued that a company's impact cannot be anything but harmful for the environment, hence any green marketing message may be considered greenwashing. *"You can plant your trees as long as you don't put a communication part in that budget"* (Interview_NGO1), *"as long as my belief is that there is no sustainable growth, therefore, no sustainable business, anything you do would be greenwashing because if you say you are sustainable, but I believe there is no sustainable, it means you're lying. So, greenwashing"* (Interview_RS1).

Regarding Torelli et al. classification, this strategy-level greenwashing is easier to identify when professionals work in the field and are responsible for assessing or writing sustainability reports. Hence, the lack of clear regulations and transparency in sustainability reports can lead to vague claims and omissions in the communication materials of the corporations. *"Any sustainability report and what people communicate are done based on what the company considers material for the company. There is no clear rule on performing this materiality analysis, except some guidelines"* (Interview_RS1). Even though consultants in this field are optimistic about their work and its effect on putting organizations on the road to sustainability, they agree that the absence of data and sometimes the resistance of the management level hinder development attempts at the executive level.

But for most participants in this research, the lack of public information and education on this topic facilitates misleading corporate communication. *"So educational campaigns made by companies and especially big companies, or NGOs supported or having partners, oil companies, for example, will just do some type of campaigns (for example, recycling). But nobody will say we need to be more mindful of consumption and everything"* (Interview_RC1). The most visible campaigns on environmental topics are sponsored by big companies, most of the time as part of their communication campaigns. The end goal of these campaigns is usually gaining more visibility for the brand. The results are included in sustainability reports, marketing communication, and other commercial materials that big companies create to prove their consciousness.

The solutions proposed by the respondents could be grouped into two main categories, according to the active agent responsible for driving the change. The public sector, at the national and international levels, is expected to get involved in individual education on one hand. But on the other hand, they are expected to rethink the standards in evaluating the companies to better reflect what a sustainable organization should look like: *"I wouldn't like to live in a world, which is extremely regulated because it's not good for anyone. (...) But on the other hand, I think authorities could address this issue and reconsider and deep dive into this subject"* (Interview_RC1). The authorities could do this with better results if they team up with both professionals in the field of regulatory beneficiaries: *"I think we need to gather experts in different things at the table and try to connect with them more. And with the people who actually are consuming or benefiting from the rules and legislations that are being made"* (Interview_RS1). As referring to a relatively new topic to be included in the public policies, experts and professional

expertise could help politicians address the correct issues and develop the best solutions for Romanian society.

At the individual level, the urgent need for more education in Romanian formal education was mentioned by several professionals. While growing up abroad, one of the respondents highlighted the importance of children's education in environmental issues at an early age: *"they taught us a kind of civic education, how to do selective collection, and when you grow up, you will do them well by reflex"* (Interview_RS2). Another respondent observed the same solution in young educational programs *"it needs to become some sort of mass common knowledge and that means it needs to go into the structures of the state... laws that force you to put this into school and then the laws force companies to have some sort of a common knowledge"* (Interview_RS1). A more educated audience would also mean more educated communication and marketing professionals who could spot unintended misleading green claims before they leave the organization and better-prepared audiences who could spot and draw attention to greenwashing tentative across different markets. Equipped with better environmental skills customers won't be deceived to purchase a product that is not clearly green, and they won't feel overwhelmed when navigating through numerous corporate claims and slogans: *"I think it can be obtained through a lot of education as in people actually learning what the concept of sustainability means at its basic definition. And what all of these words are being used for"* (Interview_RS1).

Curiously, even though the companies themselves perform the greenwashing activities, no specific action points were mentioned for them to implement. Sometimes seen as performing misleading communication activities intentionally, they are expected to be exposed by more educated consumers or clear regulations. Transparency and honesty are expected from the private sector, but no clear action was asked from their side in order to help build a better-reporting standard or change the way we look at consumption and education in this field. This could suggest that in the subconscious mind, the objective of making profits is hard to associate with more honest sustainability actions. Except for stopping to exaggerate the benefits of a product or service, the companies are not seen as reliable educational actors or genuine promoters of a green economy.

Conclusions

In conclusion, this exploratory research aimed to identify the fundamental reasons and particularities of greenwashing in Romania from the perspective of a number of experts in the field such as engineers, consultants, NGO personnel, corporate communicators, and influencers roles connected to sustainability. The preliminary phase of a larger research aims to assess the real impact of greenwashing communication on Romanian consumers and their perceptions of the topic. The results show that the primary reasons for greenwashing in Romania are the lack of awareness on the topic in communication departments, the absence of clear and uniform laws in evaluating corporate sustainability, and the complexity of the issue. The solutions suggested by respondents in this research involve public authorities, public education, and individual research as more knowledge about the green claims could help employees develop more sustainable products inside the company and could support customers in spotting and denouncing misleading information and practices in corporate communication.

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MICROMOBILITY - A CLOSER LOOK AT THE CASE OF BUCHAREST

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Abstract.

This paper examines the traffic safety of users and non-users of micro-mobility, the necessity of a public-private partnership for an improved and coherent urban mobility strategy, the level of consumer satisfaction based on perceived safety and convenience, and the impact of the Covid-19 pandemic on the micro-mobility industry within the urban area of Bucharest, Romania.

Micro-mobility is the focus of intense media attention nowadays. It is well-established that this form of mobility appears to be here to stay and also, in a fast-evolving urban transport environment, it is changing how people move on a daily basis. In the meantime, it is bringing alongside its mobility revolution new and important challenges for both riders and non-riders.

In order to achieve the objectives, it was appealed to specialized literature, an interview with a representative of an important shared electric vehicle company, a questionnaire built for micro-mobility users, and testing the hypotheses formulated through statistical analysis procedures.

The results showed a strong conclusion in the same hypothesized direction: even if Covid-19 was a catalyst for the continuous growth of micro-mobility in Romania, the citizens will not leave traditional vehicles for micro vehicles unless further improvements are made by both private service providers and public authorities for a higher level of safety for both riders and non-riders, and ideally, these improvements are made in a coherent strategy of urban mobility in Bucharest.

This paper offers a strong overview of the micro-mobility in Bucharest, Romania, and also a better understanding of the key pillars of further development work.

Keywords: *electric mopeds, electric scooters, micro-mobility, safety, shared vehicles, transportation, urban mobility.*

Introduction

Micromobility is a new and strongly debated term that refers to a rapidly evolving range of light vehicles that are rapidly gaining popularity on city streets worldwide. "Micro-vehicles" appear to be released on a daily basis for private or shared use on congested city streets. The expansion of shared e-bike and e-scooter companies exemplifies the breadth of their popularity, which was perhaps unforeseeable. Micro-mobility also refers to privately owned vehicles that date back over a century: bicycles, kick scooters, and even powered standing scooters (Gibson, 1915) and powered skates (Scientific American, 1906).

Horace Dediu, an American industry analyst, and investor, coined the term micro-mobility. It began in 2016 by introducing connected bicycles, scooters, and moped-sharing services. The term "micro" can refer to both the vehicles used, typically less than 500 kg, and the short-distance trips that can be entertaining, cheap, and convenient, according to (Dediu, 2019).

Micro-mobility appears to be a long-term trend. The development of lightweight, powered vehicles enabled the portable electric power revolution, which began with the invention of the lithium-ion battery in 1991. (National Academy of Engineering, 2014) These micro-vehicles have a low environmental impact, producing little noise and emitting no exhaust. Compared to other vehicle types, their lightweight suggests a lower carbon footprint over the vehicle's life cycle (OECD/ITF, 2020). Bicycles and other human-powered micro-vehicles also benefit public health by keeping people active. Smaller vehicles also use less space, which is the city's most valuable resource. Micro-mobility appeals to both individuals and policymakers for all of these reasons.

Who is the target audience for micro-mobility? In car-oriented cities, the majority of cyclists are young to middle-aged males. Conversely, cycling is more inclusive in bicycle-friendly cities, with a higher percentage of women, children, and seniors participating (Garrard et al., 2012). Using standing e-scooters in shared fleets may follow a similar pattern, but the cost of such services may also be a factor. In a pilot study, the (City of Santa Monica, 2019a) gathered data on shared electric scooters and bikes operated by private companies. The early adopters were mostly men (67%) and between the ages of 25 and 34 (64%) with a higher-than-average income distribution.

However, data collected in Washington, D.C. indicates that shared micro-mobility provides new options for traditionally underserved communities, and that adoption of shared micro-mobility was higher among black and African-American residents. (Clewlow, 2018)

The media focuses a lot of attention on the safety of micro-vehicles and shared micro-mobility services. Countries and cities have begun adapting road safety regulations to include micro-mobility, resulting in a patchwork of regulations. In 2019, "personal mobility devices" were incorporated into traffic regulations in France and Germany, requiring micro-vehicle users to ride in cycling facilities where they exist (JORF, 2019). Since 2013, kick-scooters and e-scooters in Portugal have been subject to the same traffic laws as bikes and e-bikes.

Conversely, micro-vehicles in South Korea are subject to the same regulations as cars and are not permitted to use bike lanes (Road Traffic Act, 2019). Motorized micro-vehicles are simply prohibited from using public roads in the United Kingdom and Ireland until definitions of vehicles permitted for use on the road are updated to include them.

Literature review

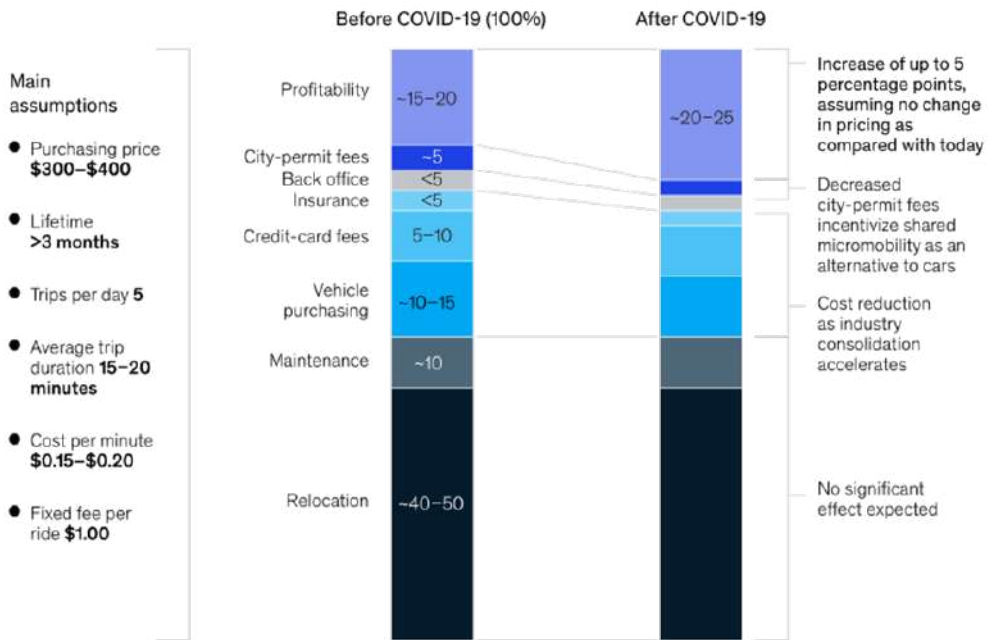
The success of micro-mobility has been made possible by technological advances and innovations in business models, has encouraged the development of new shared mobility services, which use small, often electric vehicles through services operated by private companies, within a sharing system and offer new opportunities to travel in the

city, as preferences for urban mobility change. Although it offers many opportunities, micro-mobility also involves challenges related to regulation and infrastructure. (Heineke, 2022) (Nikolaus Lang, 2022) The existence of a public-private partnership to facilitate conditions for carrying out traffic activity with vehicles like mopeds, scooters, bicycles or other similar examples is a need that is becoming increasingly pressing, in a context in which micro-mobility has become an option for some of the most important cities in Romania, particularly in this paper in Bucharest.

Shared micro-mobility services are intuitive and easy to use, offering sustainable travel options for short journeys and can be a solution for connecting with public transport for longer distances. Different conceptual and technical solutions exist, starting from systems with predetermined parking stations to those completely independent of fixed parking points. (Dediu, 2019) Although it offers a number of benefits, the spread of micro-mobility also generates a number of (negative) externalities and gives rise to controversy due to the importance given to the feeling of traffic safety of users of micro-mobility. (OECD/ITF, 2020)

Micro-mobility can offer a number of benefits to both users and (administrations) of cities, such as intuitive and easy-to-use sustainable mobility options for short journeys (often faster than walking or other means of transport). Such vehicles require a modern, technology-based, and attractive solution for target groups who would not otherwise be willing to give up driving. The level of consumer satisfaction depends very much on the safety conditions mentioned above, but also on an important factor: how easily they can access these services through the conditions offered by the infrastructure. (OECD/ITF, 2020) (OECD/ITF, 2020)

During the Covid-19 pandemic many governments recommended and then imposed social distancing. Therefore, the limits on the movement of goods and people have forced the whole mobility industry to reimagine itself. In March and April 2020, it seemed like the majority of the well-established shared micro-mobility providers of Europe were going to have a very unexpectedly unpleasant year — but nearly all of them have regained traction, buoyed by highly increasing consumer interest in open-air convenient mobility alternatives. (Kersten Heineke, 2020; Aoyong Li, 2021). According to McKinsey's research, the profitability of shared e-scooters could increase by up to 5% after the Covid-19 pandemic (Figure 1).



Source: Expert estimates and interviews; press and web research; McKinsey analysis

Figure 1 - Estimated breakdown of costs per ride for a shared free-floating e-scooter

Methodology

For a direct approach to the dynamics of the vehicle access phenomenon that refers to the concept of micro-mobility in Bucharest, we call for procedures for quantitative analysis of data collected by applying a questionnaire built in the digital environment disseminated through online communication channels - social media, namely, the WhatsApp platform. The collected data was analyzed through the IBM SPSS Statistics Version 26 program and the SPSS Amos extension, the same statistical analysis program.

To validate the attributes of the questionnaire, we will further discuss methodological issues and assess the level of adequacy through statistical analysis performed in the programs mentioned before by reporting on the chosen topic and data collected from respondents.

The objectives of this paper follow multiple dimensions of the dynamics of the micro-mobility concept, customized at the level of Bucharest. The aspects we follow concern two attributes through which the variable micro-mobility is operationalized: aspects related to the level of development of micro-mobility in the capital by reference to infrastructure and consumer perception, by appealing to consumption behaviors and the level of satisfaction obtained in following access to these types of vehicles. The constructed questionnaire aims to evaluate the benefits of an integrated mobility ecosystem by using real-world data to support confirming or refuting research hypotheses.

The objectives will be achieved by appealing to the specialized literature, a case study on micro-mobility in Bucharest, the questionnaire built for micro-mobility consumers, and testing the hypotheses formulated through statistical analysis procedures. As a result of the aforementioned, we have identified four main hypotheses:

The first hypothesis is: A public-private partnership would lead to a coherent and efficient urban transport strategy; therefore, it would improve the living conditions of the community.

The second hypothesis is: Adoption rate of micro-mobility would be higher if rides were safer for riders and non-riders.

The third hypothesis is: Adoption rate of micro-mobility would be higher if rides were more accessible.

The fourth hypothesis: The Covid-19 pandemic did not jeopardize micro-mobility, but on the contrary.

The specialized literature, reviewed in the previous section, offers a theoretical framework through which we will detail the concept of micro-mobility and an exhaustive analysis of the global context, then transition to local issues to support the validation of objectives and hypotheses formulated by the case study in Bucharest. At a 90% confidence level and a 7% margin of error, the sample size should be at least 139 valid answers (Milton, 1986). The questionnaire completed by the respondents recorded 159 valid answers and was built on several sides of the micro-mobility concept as a measuring instrument. A 6-level Likert-type scale was considered to construct the questionnaire items. To bypass avoidant responses, respondents are forced to provide a perspective as close as possible to the perceived reality of access and how to report this type of mobility in Bucharest. This element can be an inconvenient source to complete, but providing an answer that tends towards a concrete direction on variables such as the level of satisfaction with access to micro-mobility, for example, can provide a realistic picture of the concept.

The statistical analysis of the questionnaire was performed by SPSS and SPSS Amos and graphical representations were generated through the same programs or the author's own processing of the relationships between variables. Factor analysis was supported by the following models: exploratory factor analysis, confirmatory factor analysis, and discriminatory factor analysis.

In order to determine the internal consistency of the factors identified in the questionnaire, the value of the Cronbach Alpha parameter was taken into account, referring to the latest references in assessing its importance and reporting according to the most recent considerations made by (Vaske, Beaman, & Sponarski, 2017). At the same time, the values of the KMO measurement were taken into account for measuring the adequacy of the applied model, as a condition of the possibility of applying the factor analysis.

Results and discussions

Internal consistency

The questions in a questionnaire are designed to measure a certain attribute (attitude, factor, behavior, knowledge). Internal consistency is defined as the property of items that correlate with the "overall score" of the test or scale to which it belongs. Since all items must reflect a certain attribute, they must manifest a common variance, correlate with each other, and at the same time correlate each individual with the score that reflects that attribute. The correlation between an item and the total score, from which that item is omitted, indicates the relevance of that item to the overall test result. When each item is relevant, we can say the test is "internal consistency". Another facet of the consistency of an instrument is its safety in repeated applications. It can be described as the stability of the score when that instrument, or an equivalent alternative form, is applied to the same subjects.

Without being the only statistical procedure usable in such situations, the Cronbach alpha coefficient is by far the best known of all, being used to indicate the accuracy of measuring a test, the internal consistency, and the fidelity of an instrument. Normally, the value of the Cronbach alpha index tends to increase as the number of items increases. The basic criterion for this range of values of the Cronbach alpha index is to have a value as close as possible to 1. The values can be recorded between 0 and 1. The level of 0.70 is accepted as a threshold by most researchers, the value of Cronbach's alpha cannot be less than 0.60. (Sava & Popa, 2011)

To test the internal consistency of the constructed questionnaire, we refer to the Cronbach Alpha parameter, obtained through the Reliability Analysis procedure from the SPSS program.

According to the literature, a Cronbach Alpha $\alpha = 0.937$ is close to the ideal case, namely the approximation of the value 1. For the present questionnaire, the value thus recorded is one that ensures internal consistency and indicates the accuracy of measurement of the questionnaire in terms of consistency, but also fidelity as a tool.

Characteristics - descriptive statistics and discriminatory analysis of factors

Next, we will follow the characteristics of the questionnaire, by referring to the qualitative parameters of descriptive statistics, taking into account the way in which the questionnaire covers certain specific benchmarks in the way consumers perceive micro-mobility in Bucharest.

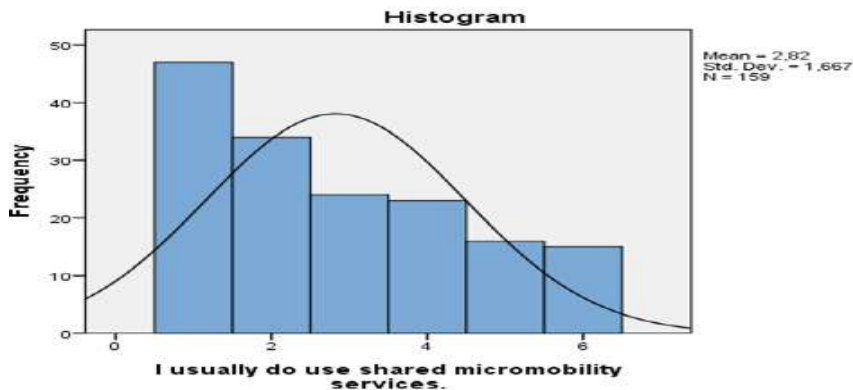
Items that refer to the demographic data of the sample of respondents - Q1 and Q2. Thus, we can talk about the age variables, by reporting more age groups, and gender respectively (Table 1). The 159 respondents responded to the age-related item with a proportion of 46.5% as female and 53.5% as male.

Table 1. Frequency analysis of the variable gender (Source: Authors own research)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	74	46,5	46,5	46,5
	Male	85	53,5	53,5	100,0
	Total	159	100,0	100,0	

Regarding the age group of Bucharest residents who completed the questionnaire, we are talking about a special trend as follows: 66,67% of the respondents are between 16 and 18 years old, 17,61% are 19 to 24 years old, 7,55% are 25 to 30 years old, and the rest are between 31 to 60 years old.

Car users represent 67.92% of the sample and up to 100% choose another mobility option. The question refers to possessing such a vehicle, so this does not prevent access to micro-mobility in Bucharest through bike-sharing options. For example, 18,87% of the responders do not own any transportation vehicle. The fourth question verifies the existence of consumption behavior. All 159 respondents had the option to set the level of interest given to this type of transport, by shared micro-mobility services, verifying this option as a real solution to which they apply in traffic, whether or not they are owners of micro-mobility vehicles (feature verified in item Q3). According to Figure 2, the histogram of the distribution of values is balanced, with an asymmetric tendency to the right and a platykurtic shape.

**Figure 2- Histogram of Q4 item**

The parameters of symmetry and vaulting are defined by values that provide the characteristics of right asymmetry and the platykurtic distribution by reference to the interpretation values. For a symmetry parameter - skewness greater than 0 - the distribution of values will show an asymmetry to the right, while a vaulting parameter - kurtosis less than the value 1 - has a platykurtic distribution. At the same time, the average of the answers tends towards the level 3 response option, which defines the consumption level of micro-mobility in Bucharest at a satisfactory level and keeping the same level of openness constant up to level 6.

Items from Q5 to Q7 show consumers' preference for three types of micro-mobility vehicles, the most common in Bucharest; bicycle, scooter, and moped. The results show that the bicycle is the preferred vehicle; 54,72% of the respondents use it. 1,89% of the respondents stated that they are always choosing a scooter or a moped, while more than 69% stated that they never choose one of those types of vehicles.

Items Q8 to Q12 refer to the level of consumer satisfaction with micro-mobility consumption in relation to micro-vehicle access conditions. According to the descriptive analysis of the items, the value distributions indicate asymmetries to the right and left, but platykurtic forms, except for the distribution of item Q10, which approaches to the case in which the value of the kurtosis indicator approaches 1 and indicates a leptokurtic form of the distribution in terms of vaulting. Simultaneously, we observe in Pearson correlations statistically significant correlations between items, having moderate or strong association relations between items for a confidence threshold of 99%, and respectively 95%.

Items Q13 to Q17 refer to how local infrastructure responds to consumer needs by making decisions to facilitate access to micro-mobility through an efficient public-private partnership between public administration and private micro-mobility service providers. According to the items' descriptive analysis, the distributions of the values indicate asymmetries to the right, but platykurtic shapes. At the same time, we observe in Pearson correlations statistically significant correlations between items, having moderate or strong association relations between items, for a 99% confidence threshold.

Items Q18 to Q23 refer to how consumers have a significant level of willingness to use micro-mobility. According to the descriptive analysis of the items, the distributions of values indicate asymmetries to the right and to the left, but platykurtic forms, with kurtosis indices lower than the value 1. Concurrently, we observe statistically significant correlations between items in Pearson, having moderate or strong association relations between items, for a 99% confidence threshold.

Items Q24 to Q31 refer to the level of safety perceived by users when accessing micro-mobility services. According to the descriptive analysis of the items, the value distributions indicate asymmetries to the right and left, but platykurtic forms, with kurtosis indices less than 1, except for items Q30 and Q31 which approaches a leptokurtic distribution at kurtosis index values of 0.999 and 0.696. We observe in Pearson correlations statistically significant correlations between items, having moderate or strong association relations between items for a confidence threshold of 99%, and respectively 95%.

Items Q32 to Q34 measure the level of safety consumers perceive according to the means of micro-mobility transport. The bicycle is the most preferred vehicle, while mopeds are perceived as the most dangerous.

Items Q35 to Q38 measure an increasing trend in the use of shared micro-mobility vehicles in the context of the COVID-19 pandemic. According to the descriptive analysis of the items (Table 2), the distributions of the values indicate the asymmetries to the right, with kurtosis indices lower than the value 1, so platykurtic distributions. Also, we observe in Pearson correlations statistically significant correlations between items, with strong association relations between items, for a confidence threshold of 99%.

Table 2. Descriptive analysis of items that measure a tendency to increase the frequency of use of micro-mobility in the context of the COVID-19 pandemic (Source: Authors own research)

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Q35	159	1	6	2,47	1,657	,917	,192	-,325	,383
Q36	159	1	6	2,47	1,630	,996	,192	-,110	,383
Q37	159	1	6	2,50	1,606	,831	,192	-,451	,383
Q38	159	1	6	3,00	1,757	,468	,192	-1,084	,383
Valid (listwise)	N 159								

Exploratory factor analysis

Exploratory factor analysis (EFA) is one of the most widely used statistical techniques. Its main purpose is to identify the number and nature of the factors underlying a set of overt variables. Factor analysis solves two types of problems: reducing the number of variables to increase the speed of data processing and identifying hidden patterns in the relationships between data. Factor analysis refers to a wide range of statistical techniques used to represent a set of variables in accordance with a small number of hypothetical variables, called factors.

The structure of the SPSS database contains 159 records and 36 items, of which the opening ones will not be considered, aiming at demographic data about the respondents.

After applying the Principal Component Analysis method, results were obtained that described descriptive statistics, correlation matrix, KMO and Bartlett test, commonality, total variance explained, Scree Plot image, component matrix, and component matrix after rotation.

The KMO (Kaiser-Meyer-Olkin) index is used to compare the dimensions of the observed correlation coefficients with the dimensions of the partial correlation coefficients.

The value of Bartlett's test (3312,694 Sig = 0.000 <0.05, KMO = 0.871), is small enough to reject the hypothesis that the variables are uncorrelated. As a result, there is a strong relationship between the data. These values indicate the presence of one or more common factors which motivates the application of a procedure to reduce the number of factors, for a statistically significant value, which presupposes the adequacy of the proposed model.

Commonness represents that part of the variance of a variable explained by the structure of a factor (Pohlmann), or in other words, the common character of a variable represents that part of the variance of the variable that is common to the variance of other variables. Minimum values of the common character for certain variables indicate that those variables are not well represented by the applied factorial model. In this case, most variables are well represented by the factorial model used.

The first information specific to the factor analysis is presented by the Total Explained Variance. Using the method of Analysis of Main Components (ACP), a number of 6 main components, so-called factors, were generated, all 6 meetings the selection criteria (eigenvalues > = 1).

In Graph 10, the eigenvalues for all main components, obtained by applying the ACP method, are represented graphically in a sequence of main factors. The number of factors is chosen where the graph levels show a linear decreasing pattern. The result suggests the existence of a five-factor solution.

The matrix of components, provides the list of items and their contribution to the loading of each of the selected factors, in terms of correlation. The data refer to the initial factorial solution, before applying the rotation procedure.

In the matrix of rotating components containing the data obtained after the application of the factor rotation procedure by Varimax with Kaiser Normalization, we notice the alignment of 5 factors is observed: the level of safety perceived by consumers; the level of interest given to micro-mobility, the level of satisfaction in using micro vehicles, the level of access to micro-mobility in relation to infrastructure, the level of perceived development of the public-private partnership, the growing trend of consumer interest during COVID-19

Using this type of factor analysis, we can obtain useful information on the factors that have a great influence on people's quality of life, giving statisticians the opportunity to track its upward or downward evolution by reporting micro-mobility.

Confirmatory factor analysis

Byrne argues that confirmatory factor analysis (CFA) procedures for validating an instrument are indicated when the investigated instruments have reached a certain degree of maturity, and when there is sufficient data on their factorial structure.

Confirmatory Factor Analysis

Factor Loadings

Factor	Indicator	Estimate	SE	Z	p
Factor 1	The level of interest given to micromobility	0.938	0.126	7.44	< .001
	The level of safety perceived by consumers	4.477	0.619	7.23	< .001
	Level of satisfaction in using micromobilities	6.286	0.490	12.82	< .001
	The level of access to micromobility in relation to infrastruct	4.244	0.446	9.51	< .001
	The level of perceived development of the public-private partne	5.201	0.425	12.25	< .001
	The growing trend of consumer interest during COVID-19	4.220	0.440	9.60	< .001

Factor Estimates

Factor Covariances

	Estimate	SE	Z	p
Factor 1 Factor 1	1.00*			

* fixed parameter

Figure 3 – Confirmatory Factor Analysis
(Source: Authors own research)

Using the JAMOVI program, to test the construct validity, a confirmatory analysis of the 6-factor model was used (Figure 3).

This could be done because the condition of normal data distribution for each of the 6 factors of the instrument was met. Following the confirmatory factor analysis, a value of the fit of the model was obtained (Figure 4) $\chi^2 (9) = 32.0$, $p < 0.001$ which indicates significant differences between the raw data matrix and the matrix obtained based on the links specified in the model. This significant value, however, may be due to the relatively large number of the sample, so it cannot be considered a criterion for rejecting the model, with a total of 159 records recorded.

Model Fit

Test for Exact Fit

χ^2	df	p
32.0	9	< .001

Fit Measures

CFI	TLI	RMSEA	RMSEA 90% CI	
			Lower	Upper
0.942	0.904	0.125	0.0798	0.173

Figure 4 – Model Fit
(Source: Authors own research)

The RMSEA indicator had a value 0.125, relatively acceptable, the TLI indicator had a value 0.904, adequate, and the IFC indicator had a value 0.942, considered desirable. (Sava & Popa, 2011) Thus, we can conclude that the six-factor model is validated.

Conclusions

Authorities should repurpose space to create physically protected micro-vehicle lanes to create a safe and connected network for micro-mobility. This network should be more appealing than sidewalks, with design guidelines for a wide, safe cycling infrastructure being developed. Light separation on busy streets and traffic filtering on residential streets are proven techniques for rapid, low-cost development. Authorities at all levels should increase their efforts to address dangerous driving habits such as speeding, distracted driving, and intoxicated driving.

There is a lack of knowledge about the safety performance of various micro-vehicle types and models, the role of various crash factors, and the most effective countermeasures. Micromobility safety research necessitates accurate crash data from police and health services, as well as trip data from governments via operators, travel surveys, and on-street observation. The collection of this information should be a top priority for road safety organizations.

Operators of shared micro-mobility should examine their pricing structures to ensure they do not encourage risk-taking. Renting by the minute can encourage people to speed or break traffic laws. As a result, businesses should reduce minute-based charging and compensate with other methods. A fixed-amount trip charge, a distance-based charge, or a membership fee are all possibilities. In addition, in partnership with central authorities, they can be integrated into multimodal transport platforms, where users can access different types of vehicles, both operated by public authorities or by private companies, and have the possibility to switch effortlessly from one transport service to another while commuting.

Although it offers many opportunities, micro-mobility also involves challenges related to regulation and infrastructure and gives rise to controversy due to the importance given to users' feeling of traffic safety. The existence of a public-private partnership to facilitate conditions for carrying out traffic activity with micro-vehicles is a need that is becoming increasingly pressing, in a context in which micro-mobility has become an option for some of the most important cities around the globe, particularly in this paper in Bucharest.

Micro-mobility can offer a number of benefits to both users and communities, such as intuitive and easy-to-use sustainable mobility options for fast short journeys. The micro-vehicles require a modern, technology-based, and attractive solution for target groups who would not otherwise be willing to give up driving. The level of consumer satisfaction depends very much on the safety conditions mentioned above, but also on an important factor: how easily they can access these services through the conditions offered by the infrastructure.

Even though the Covid-19 pandemic imposed social distancing, forcing the whole mobility industry to reimagine itself, micro-mobility has regained traction, buoyed by highly increasing consumer interest in open-air convenient mobility alternatives.

The present work has certain limitations and would benefit from further improvements. Firstly, the sample might be biased. In this case, the people who responded to the survey questions may not truly be a random sample due to the limited ability to gain access to the appropriate type or geographic scope of participants. Secondly, the research instrument comprised self-reported answers, hence subjective measures for all constructs, which should be thoroughly considered in other methodological designs.

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THE ROAD TRANSPORT SYSTEM IN ROMANIA IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT. NEWS, PERSPECTIVES AND SUSTENABILITY

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Abstract: *The paper presents concrete research, in which exact, up-to-date data and figures are reported about the road transport system in Romania, over which a systematic analysis of the main elements that define and constitute its foundation was made: the infrastructure and the national fleet of vehicles. As for the road infrastructure, those interested can find out data on the stage of development and the length of highways in our country, data on the structure, density/1.000 km² of the territory, and the dynamics of the mobility index of the other categories of roads existing in Romania on this date. Regarding the national fleet of vehicles, those interested can find out data on its evolution and stage of development in the last ten years, the situation of registrations of road vehicles by category at a national level, the situation of registrations per quarter during the period January 2019 - December 2021, the distribution of road vehicles according to the fuel used for propulsion, the distribution according to the age of the road vehicle fleet, the degree of motorization (the number of vehicles/1.000 inhabitants) and the number of registrations of second-hand vehicles versus new vehicles registered for each county of the country. Further, readers can also learn about how the Romanian authorities ensure the sustainability of this sector, through the National Recovery and Resilience Plan. Finally, the conclusions and subsequent directions of research and development are presented. The scientific work was carried out with the purpose of implementing some technical and managerial concepts, which bring added value and contribute to the sustainable development of motor vehicle transports, based on the study and analysis of the current data researched by the authors from the documents elaborated, edited or approved by the European Union and the Romanian authorities.*

Keywords: *sustainable, development, sustainability, road transport infrastructure, national car park, reform, investments.*

Introduction

investments

"Sustainable transport is a complex system designed to ensure mobility needs for current generations, without damaging environmental and health factors". (WCDE, 1986)

The author (Basgan, 2003) shows that, in order to make energy and material consumption more efficient, it must make it possible to meet in optimal conditions, from an economic-ecological-social perspective, the need for mobility for future generations. It is the essence of the movement in the daily lives of European citizens, being the main way in which it "facilitates their access to social activities and services" (Basgan, 2003), (Pop, 2002), (Zamfir & Zamfir, 1995).

Analyzing very carefully the road transport system in Romania, we can easily see that, after the revolution of 1989, there was a so-called, *easy adaptation to the market*, noting, contrary to some measures stipulated in the White Paper, a tendency of strong growth of the road transport (of goods and passengers) and respectively an unequal evolution of the other transport systems. If we look at them in their own image, they started from a lower level than what was required then. The transport operators at that time, mostly with the state capital, had an outdated, physically and morally worn transport vehicle park made up mainly of domestic vehicles. The road infrastructure at a national level was poorly developed and unmodernized (the 60s), and the transport legislation was not aligned to European requirements.

Based on these starting points, we can say that road transport was one of the first areas in which there was a rapid change from a form of communist property, state property, to private, capitalist property. Road transport was a sector that developed more quickly and chaotically, compared to railway transport in Romania. Currently, road transport at the national and European levels is still on the rise.

We consider that the road transport guidelines and policy practiced today in the European Union are leading to the further development of this type of transport within all the countries which have joined or are about to join the Schengen area, placing particular emphasis on the development and modernization of the road infrastructure and the national fleet of motor vehicles, an infrastructure that will be covered in the future by modern means of transport.

According to the National Start for Sustainable Development of Romania (*Horizons 2013-2020-2030*), it is envisaged "to promote a transport system in Romania, which will facilitate the safe, fast and efficient movement of people and goods at the national and international level, in accordance with European standards" (Romania & Development, 2008, p. 47)

Method used and results obtained

Research objectives:

Studies and research on the development stage of the road infrastructure in Romania on December 31, 2022;

Studies and research on the development stage of the national road vehicle park in Romania on December 31, 2022;

Studies and research on the sustainability status of the road transport system in Romania on December 31, 2022;

Research hypotheses:

The road infrastructure in Romania is deficient;

The national road vehicle fleet is aging;

The Romanian Government supports the road transport system through measures that will be applied in the medium and long term.

Research tools used: bibliographic research; consultation of websites of the European and Romanian public institutions, analysis, comparison and exposure;

Respondents/studied corpus: the road transport system in Romania (infrastructure and national road vehicle fleet);

Arguments:

In Romania, after the Revolution of 1989, the road transport system developed rapidly, compared to the railway transport system;

In Romania, the road infrastructure is largely constituted on the structure of the roads built at the level of the '50s-'60s, it is poorly developed, having communication ways that cross the main localities, produces congestion and delays of the road vehicles in traffic, creates stress and distrust among users;

In Romania, the national road fleet is aging, consisting mainly of second-hand vehicles from the West, physically and morally worn out, which predict uncertainty in operation, endanger the safety of goods and the safety of passengers;

The measures taken by the Romanian Government in the short, medium and long term, through the National Recovery and Resilience Plan (NRRP), will contribute to the sustainable and durable development of the road transport system.

The period of time during which the study was conducted: January 2019 - December 2022.

How the data were collected: studies and bibliographical research on the documents elaborated by the European Union and Romania authorities.

Word, Excel, and Adobe Photoshop are software programs used for data processing.

Road transport infrastructure

As regards the network of motorways and expressways at a national level, critically analyzing this aspect, we specify that before December 1989, 113 km of the motorway were built, and between December 1989 and 2007, the last being the year when Romania entered the European Union, being a transitional period, only 148 km were inaugurated, Romania reached a total of 261 km. During 2008 - 2017, our country accessed European funds and managed to inaugurate 487 km, reaching a total of 748 km.

At the end of 2018, the national highway network reached the figure of 823 kilometers built. Given this number, only 101 km were built in 2018, but only 60 km were used. On May 31, 2022, 961 km of the highway are being built and used in Romania.

We agree with the authors who claim that "Romania is on this date, on the last place at the European level in terms of the number of kilometers of highway built per 100,000 inhabitants" (Ministry of Internal Affairs, 2021, p. 33) .

According to a 2019 Economic Forum Report, Romania ranks 119th out of 141 countries analyzed regarding road infrastructure quality. (World Economic Forum, 2019, p. 479).

Figure 1 shows the situation of motorways at the national level on May 31, 2022, which also includes motorways and open expressways, which are currently in the execution stage.

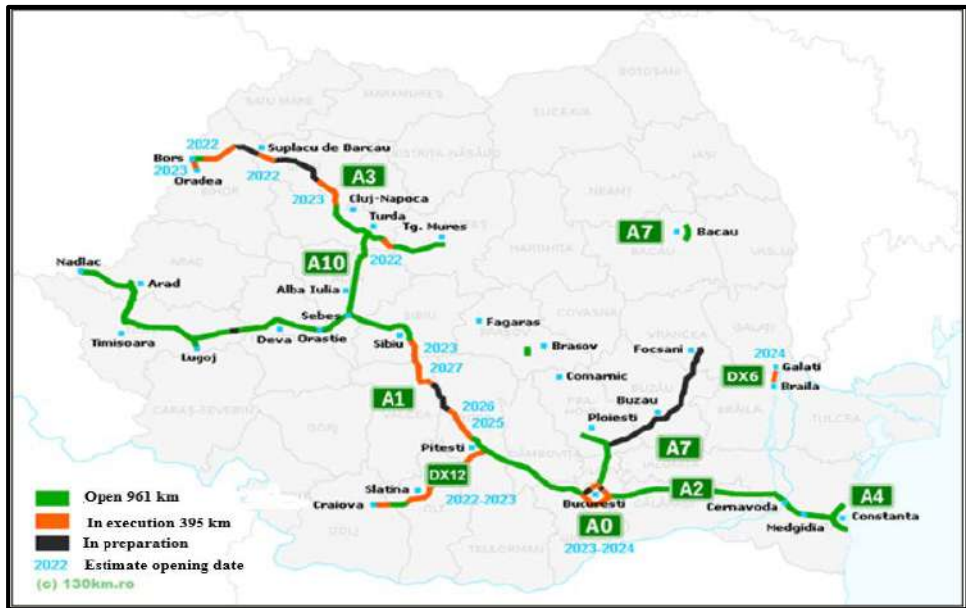


Figure 1. The situation of national highways at May 31, 2022 (km.ro, 2022)

Given the data made available by the National Institute of Statistics (INS), Table 1 shows the statistical data on the total length (km), by category, of the existing roads in Romania on December 31, 2019, respectively December 31, 2020.

Table 1 Total length (km), by categories, of roads existing in Romania on December 31, 2019, respectively December 31, 2020 (INS, 2021, p. 1)

Road categories	31.12. 2019			31.12. 2020		
	National roads	County roads	Communa l roads	National roads	County roads	Commu nal roads
Modernize d roads	16.991	14.840	6.335	17.091	15.232	6.866
Roads with light clothing	720	13.227	7.418	659	13.370	7622
Paved roads	144	5.310	12.377	145	4.802	12.105
Earth roads	18	1.706	7.305	18	1.681	7.200

Analyzing these data, we claim that as of December 31, 2020, the length of public roads totaled 86,791 km, of which 17,913 km (20.6%) national roads, 35,085 km (40.4%) county roads, and 33,793 km (39.0%) communal roads. Regarding the density of roads per 1,000 km² (INS, 2021, p. 1) of the national territory, we show in Table 2 its evolution compared to 1990.

Table 2. Road density per 1000 km² of the national territory (Ministry of Internal Affairs, 2021, p. 32)

	1990 (%)	2010 (%)	2011 (%)	2019 (%)	2020 (%)
Road density per 1.000 km ² of territory	30,5	34,6	35,1	36,2	36,4

Given the data presented, we hereby state that the density of roads per 1,000 km² of the territory has permanently increased, but not enough. This indicator managed to increase in 2020, compared to 1990, only by 5.9%.

Infrastructure is quite deficient between regions, especially industrial or commercial centers, and road traffic transiting villages, communes, and cities create major traffic jams. Our point of view in this regard is that the acute lack of high-speed infrastructure at the national level negatively influences the mobility index of goods and the population.

The SARS-CoV-2 pandemic of 2021 and 2022 further reduced this index. The density of the public road network per 1,000 km² territory in 2020 is 36.4 km.

If the public road network expanded, compared to 2010, by 5.34%, the mobility index (Table 3), calculated as millions of vehicles x kilometers traveled, experienced a continuous and sharp increase, so that in 2019 it had a value of 140%, much higher compared to 2010. The most spectacular increases, year by year, were recorded in 2017 (an increase of 21.5%) and 2018 (an increase of 23.7%) (Ministry of Internal Affairs, 2021, p. 33).

Table 3. Dynamics of the road mobility index and its evolution in the period 2010 - 2020 (Ministry of Internal Affairs, 2021, p. 33)

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mobility index*	73.0	74.5	80.8	85.6	90.4	95.2	116.8	140.1	140.1	140.1	140.1

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Annual evolution (%)	0	+1,7	+8,5	+6,0	+5,7	+6,3	+8,7	+2,1	+2,3	+1,1	-1,6

* Expressed in millions of vehicles x kilometers traveled.

Given the analysis carried out, compared to 2019, in the context of the mobility restrictions imposed by the SARS-CoV-2 pandemic, the road mobility index in Romania in 2020 decreased by 16.3% (from 175,427 million vehicles x kilometers traveled in 2019, to 146,921 million vehicles x kilometers traveled in 2020). (Ministry of Internal Affairs, 2021, p. 34).

National motor vehicle fleet

According to the data studied for 2021, on December 31, 2020, "Romania had an impressive fleet of road vehicles that reached the figure of 9.222,280 units" (Ministry of Internal Affairs, 2021, p. 25) . To all this, we also add the registrations of road vehicles from 2021, "which have reached the number of 649,284 units". (INS, 2022, p. 1).

The analysis showed that, as of December 31, 2021, our country owned a total number of registered road vehicles of **9.871,564**. Table 4 shows the registrations of new road vehicles, by category, at a national level, in 2020 and 2021.

Table 4. Situation of road vehicles registrations new, by categories, at a national level, in 2020 and 2021 (INS, 2022, p. 1)

-units-

Road vehicle category	2020				2021			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
I. Road vehicles for passenger transport	138996	98279	134258	152262	125042	130485	151275	126711

Road vehicle category	2020				2021			
	Q u a r t e r 1	Q u a r t e r 2	Q u a r t e r 3	Q u a r t e r 4	Q u a r t e r 1	Q u a r t e r 2	Q u a r t e r 3	Q u a r t e r 4
- of wich: new vehicles	2 9 0 4 3	22 76 9	36 96 5	4 4 1 9 3	21 97 5	28 93 8	42 86 0	34 38 5
Mopeds and motorcycles	2 3 8 6	30 21	45 19	4 2 3 4	25 29	45 00	46 82	27 47
- of wich: new vehicles	8 7 7	10 27	16 84	2 2 3 4	10 40	17 95	21 18	12 78
Passenger cars	1 3 6 0 5 9	95 03 9	12 91 92	1 4 7 5 2 5	12 20 57	12 55 14	14 61 48	12 35 65
- of wich: new vehicles	2 7 9 8 0	21 63 4	34 98 5	4 1 7 3 0	20 76 1	26 93 9	40 56 4	32 94 6
Buses and minibuses	5 5 1	21 9	54 7	5 0 3	45 6	47 1	44 5	39 9
- of wich: new vehicles	1 8 6	10 8	29 6	2 2 9	17 4	20 4	17 8	16 1

Road vehicle category	2020				2021			
	Q u a r t e r 1	Q u a r t e r 2	Q u a r t e r 3	Q u a r t e r 4	Q u a r t e r 1	Q u a r t e r 2	Q u a r t e r 3	Q u a r t e r 4
II. Road vehicles for the transport of goods	2751	22600	28877	30270	30458	31126	29081	25106
- of which: new vehicles	8744	7550	9963	10313	10475	12956	11993	10303
Trucks*	15978	13585	15346	17361	16271	16347	15636	13878
- of which: new vehicles	4018	3580	3923	4596	3952	5178	5148	4561
Road tractors	3084	1693	2889	2965	3854	3609	2945	2807
- of which: new vehicles	822	433	677	725	963	1238	900	1103
Trailers and semi-trailers	8189	7322	10642	9944	10333	11170	10500	8421

Road vehicle category	2020				2021			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
- of wich: new vehicles	3904	3537	5363	4992	5560	6540	5945	4639

*Special purpose road vehicles are included.

If we analyze the evolution of the trend of vehicle registrations from 2010 to 2020, we see that it was an increasing one (fig. 2).

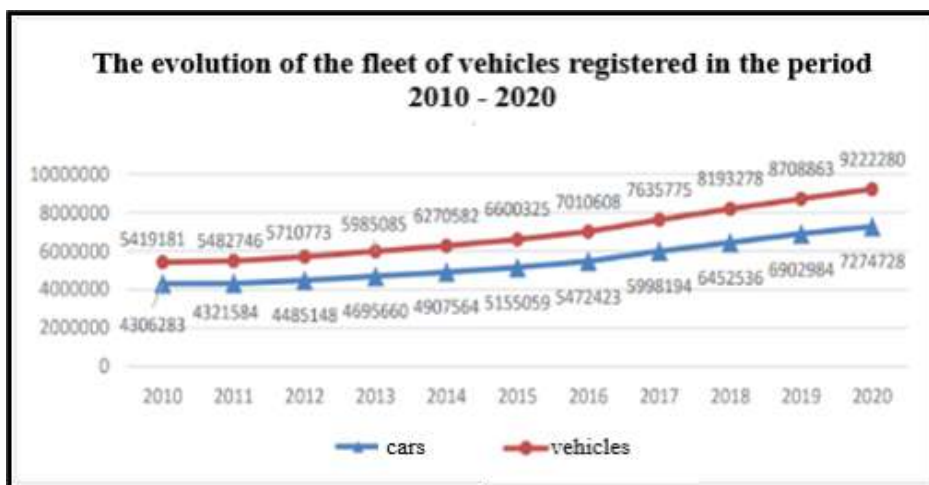


Figure 2. The evolution of the fleet of vehicles registered in period 2010 - 2020 (Ministry of Internal Affairs, 2021, p. 26).

2020 was a pandemic year, with restrictions, which the Romanian population faced besides health problems and financial problems. "At the end of 2020, Romania had 7.274,728 motor vehicles in its own park, of which 79% are cars." In 2020, (Ministry of Internal Affairs, 2021, p. 25) Romania recorded low sales of new motor vehicles, among the lowest in the E.U. Given the specialists' calculations, it appears that the share was 6.5 new motor vehicles per thousand inhabitants, which proves that we were almost on the last place in their ranking of them, ahead of Bulgaria which obtained a score of only 3.2 new motor vehicles per thousand inhabitants.

The last ten years illustrate a continuous increase in both the number of motor vehicles and vehicles in general. "Thus, at the end of 2020, the fleet of motor vehicles was 2.968,445 units larger (+68.9%) than at the end of 2010, and overall, at the end of 2020, the fleet of registered vehicles was 3.803,099 higher (+70.2%) compared to 2010" (Ministry of Internal Affairs, 2021, p. 25)

Based on the data shown in Table 4, we analyzed and found that the purchasing power of the population was high, with a total of 169,540 new road vehicles being purchased in 2020 and 173,885 new units in 2021. Between 2012 and 2017, the growth of the national road vehicle fleet was more pronounced, but after 2018, a slower growth followed. The justification for this aspect also results from the analysis of Figure 3, where we show the registration of road vehicles at a national level, by quarters.

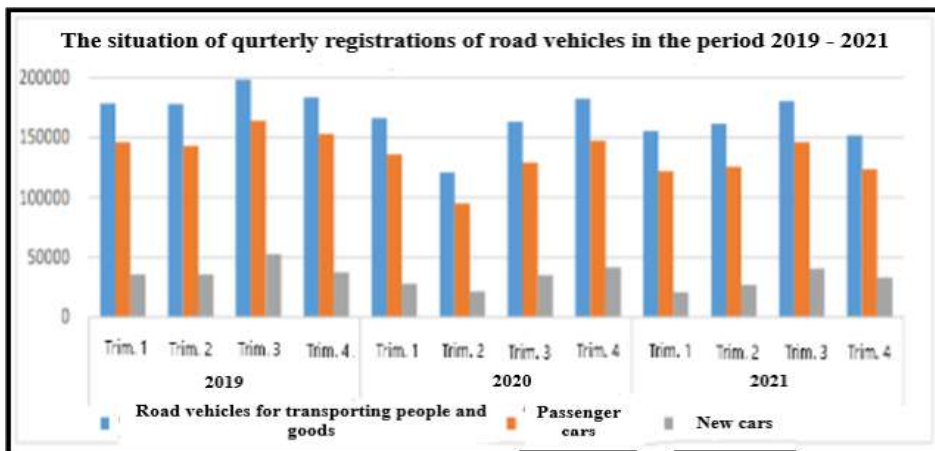


Figure 3. The situation of quarterly registrations of road vehicles in the period 2019 - 2021 (INS, 2022, p. 2)

Analyzing in terms of the distribution of motorized vehicles according to the fuel used at the end of 2020, (Table 5), we find that the number of diesel vehicles is higher than the one on petrol. The share is 53.8% of the total motorized vehicles. The high percentage is also determined by a large number of heavy-duty vehicles and diesel-powered trucks, but also by the attraction and appetite of the population for Diesel motor vehicles.

Table 5. Distribution of motor vehicles depending on the fuel used (Ministry of Internal Affairs, 2021, p. 26)

Fuel type	Number of vehicles (units)	Percentage of total motor vehicles
Gasoline	3.964.192	45,6%
Diesel	4.681.218	53,8%
Electric	6.407	0,1%
Hybrid	45.240	0,5%

Gasoline vehicles "have a share of 45.6%, and electric vehicles have a small share of only 0.1%". (Ministry of Internal Affairs, 2021, p. 26)

"They are fewer than hybrid ones that have a share of 0.5% of the total national fleet of vehicles" (Ministry of Internal Affairs, 2021, p. 26).

Here we see ecological vehicles' unattractiveness and the Romanian population's reluctance toward them. In this regard, it seems that our country has set targets and drafted a law through the Ministry of Economy, Energy and Business Environment, Romania's Energy Strategy 2020-2030, with the perspective of 2050, in which it provides that at the level of 2050 green vehicles will have a share of up to 60% of the total national park. Specialists appreciate that the gradual adaptation to electromobility will be made from 2030.

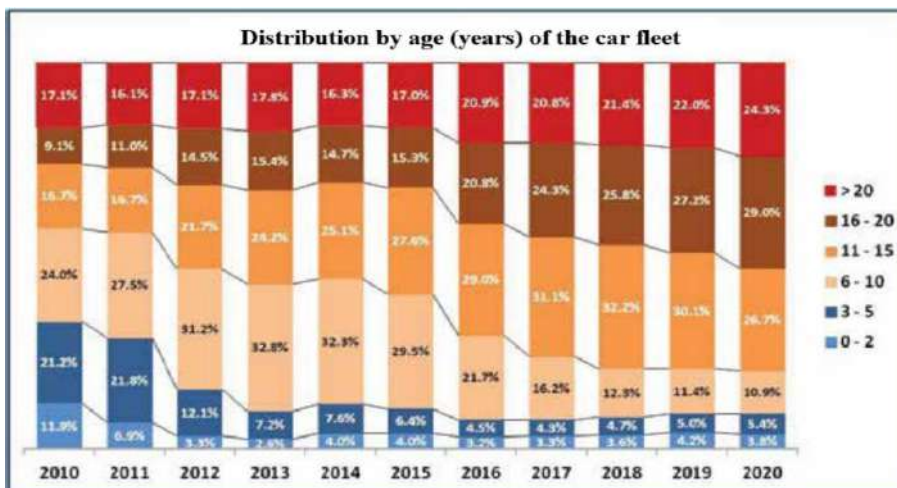


Figure 4. *Distribution by age (years) of the car fleet* (Ministry of Internal Affairs, 2021, p. 27)

"Of the 6,407 electric vehicles, 5,803 are electric motor vehicles, 223 electric motorcycles, 212 electric goods transport vehicles, 159 electric buses and minibuses, 7 electric mopeds and 3 electric vehicles for special purposes." (Ministry of Internal Affairs, 2021, p. 26). Figure 4 shows the age distribution of the national fleet of motor vehicles.

Analyzing the age of the fleet of motor vehicles in Figure 4 and the data from Table 6, we state that at this time Romania has the oldest fleet of vehicles in the European Union. Its average age "is 15.9 years, compared to the end of 2020". (Ministry of Internal Affairs, 2021, p. 27).

We are at the bottom of the ranking on this issue "along with countries like Estonia and Lithuania". (Ministry of Internal Affairs, 2021, p. 27)".

Regarding the registrations of new motor vehicles, our country is 16th out of 27, at the level of the European Union. Compared to what exists in our country from this point of view (Ministry of Internal Affairs, 2021), the European Automobile Manufacturers

Association specifies "At the opposite pole, newer fleets of motor vehicles are found in Luxembourg (average age of 6.5 years) and Austria (average age of 8.3 years)".

**Table 6. Distribution of cars from the national parks by age (years)
(Ministry of Internal Affairs, 2021, p. 26).**

Seniority (years)	Numbers of cars (units)	Weight (%)
0 - 2	277.676	3,8
3 - 5	391.785	5,4
6 - 10	793.042	10,9
11 - 15	1.938.806	26,7
16 - 20	2.107.040	29
> 20	1.766.397	24,3

The age of the motor vehicle fleet in Romania "has been accentuated from one year to another". (Ministry of Internal Affairs, 2021, p. 27)".

Also (the Ministry of Internal Affairs, 2021, p. 27) shows that: if in 2010, a percentage of 43% of the motor vehicle park was represented by motor vehicles with an age over 11 years, in 2020 we are in the situation that 80% of the motor vehicles are older than 11 years. The city of Bucharest has the youngest motor vehicle park (with an average age of 12.2 years), at the opposite pole being Mehedinți County, with an average age of 17.5 years.

According to sources provided by APIA (Agency for Payments and Intervention in Agriculture), cited by (the Ministry of Internal Affairs, 2021, p. 28) , the Road Safety Bulletin 2020, at the end of 2020, (Figure 5), included 376 motor vehicles per 1,000 inhabitants, Bucharest having the most motor vehicles per 1000 inhabitants (656) along with Timiș (406), Constanța (406), Arad (402) counties, and at the opposite pole, Vaslui (240), Călărași (243) and Botoșani (252) counties are characterized by the lowest motorization rates in the country.

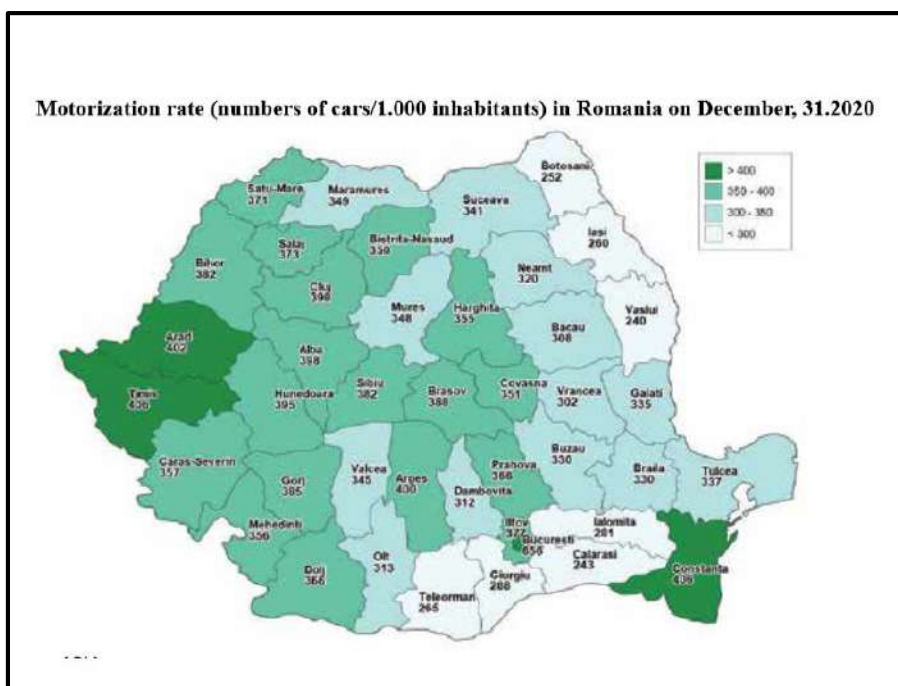


Figure 5. The motorization rate (number of cars/1.000 inhabitants) in Romania on December 31. 2020 (Ministry of Internal Affairs, 2021, p. 28)

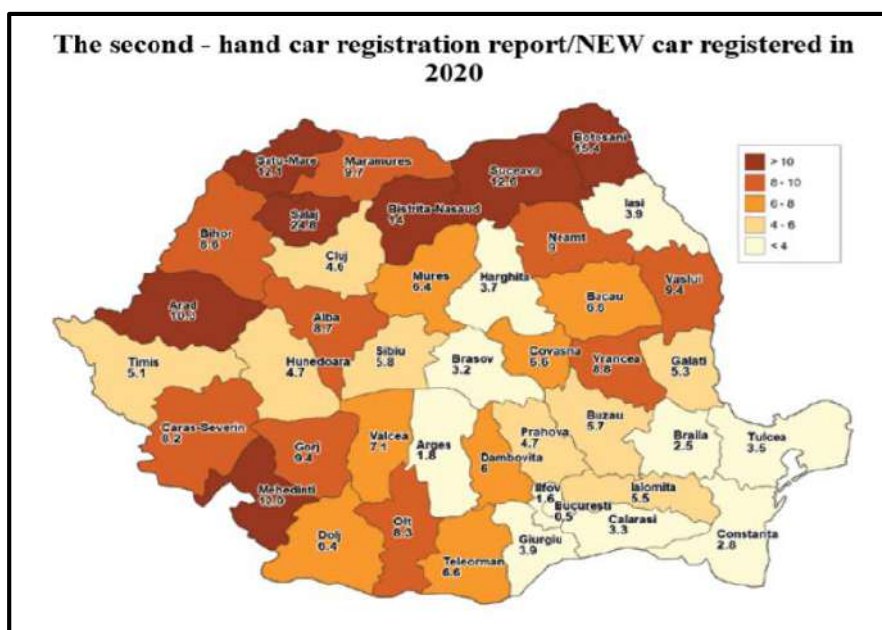


Figure 6. The second-hand registration report/new car registered in 2020 (Ministry of Internal Affairs, 2021, p. 29).

Analyzing the data shown in Figure 6 shows that in 2020, almost 30% of the total number of motor vehicles registered in Romania were new. The others are old, rolled-up cars brought from the west by the population.

The aging of the national fleet of vehicles was also noticed by the specialists of the Romanian Automotive Registry, on the occasion of periodical technical services within the ITP stations, or along the way.

The same (Ministry of Internal Affairs, 2021, p. 30) states that: of the 64,096 vehicles technically controlled in traffic in 2020, 35.3% were non-compliant regarding road safety.

Sustainability of road transport in Romania

The proposed objective is to increase the sustainability of all national transport systems by supporting the transition to electromobility and digitalization, through the development of a sustainable and environmentally friendly transport infrastructure, which will also contribute to the completion of the 'Trans-European Transport Networks (TEN-T)', (European Commission, 2022), resulting in the deagglomeration of urban nodes.

Table 7 shows the main reforms that Romania has proposed, as well as the financial funds necessary for developing the road transport system, through NRRP.

Table 7. Reforms established by the objective of developing the road transport system within PNRR (National Recovery and Resilience Plan, 2021, p. C4)

Reforms	Allocated budget (mil. euros)	Milestones/Targets
R1. Sustainable transport, decarbonisation and road safety.		1. Entry into force of the law for implementing a new charging system based on distance traveled for heavy goods vehicles and higher property taxes for the most polluting passenger vehicles.
		2. Entry into force of the law to electromobility for individuals and legal entities.
		3. New clean vehicles purchased by public bodies, at least 3% above the thresholds of Directive (EU) 2019/1161 of the European Parliament and of the Council of 20 June 2019 amending Directive 2009/33 / EC, in the period 2021-2025.
		4. Disposal of 250.000 polluting vehicles (Euro 3) between 2022 and 2026.

Reforms	Allocated budget (mil. euros)	Milestones/Targets
	10	5. Increasing the number of zero-emission vehicles by 2026 (29,500 units).
		6. Charging stations for electric vehicles (52 stations will have 264 charging points by 2026).
		7. Adopt the national road safety strategy.
		8. Entry into force of road safety legislation.
		9. Installed and functional equipment to improve compliance with speed limits and road safety regulations.
		10. Reducing the number of road accident.
R2. High – performance management for quality transport.	19	1. The entry into force of Law no. 50/2021 for the approval of Government Emergency Ordinance no. 55/regarding reorganizing some road management companies.

The latest report at the European Union level on the state of road transport infrastructure (European Transport and Infrastructure Board) in 2019, shows that "our country is the worst in this chapter, ranking it in last place, with a score of 2.96" (Romania T. G.-P., 2022, p. 18).

Table 8 shows the main investments that Romania has proposed, as well as the financial funds necessary for developing the road transport system, through NRRP.

Table 8. Investments established by the objective of developing the road transport system within PNRR [(National Recovery and Resilience Plan, 2021, p. C4)

Investment	Allocated budget (mil. euros)	Milestones/Targets
I1. Development of sustainable road infrastructure related to the TEN-T network, tolling, traffic	3.095	1. Signing of contracts for 100% of works regarding the environmental impact.
		2. Entry into force of the law to encourage the use of clean vehicles.
		3. New clean vehicles purchased by public bodies, at least 3% above the thresholds of Directive (EU) 2019/1161.

Investment	Allocated budget (mil. euros)	Milestones/Targets
management, and road safety.		4. Construction of new roads, 50% of the work completed.
		5. Construction of newly completed roads (TEN-T standards).
		6. Elimination of black spots / hotspots on road safety. The 267 road safety hotspots / hotspots in 2021 will be reduced by 129.

According to the data specified by the Romanian Government, both the reforms and the investments will be made in reciprocity with:

“Climate policies at the European level” (Commission, 2021);

“European Green Pact” (Commission, 2021);

“The European Union plan climate targets for 2030” (Commission, 2014);

“European strategy on sustainable and smart mobility” (Commission, 2020).

Conclusions

Despite all the efforts undertaken by the authorities in our country in the last 30 years, to modernize and restore the domestic transport systems, according to the previously analyzed data, it turns out that a large part of the public road network is in a mediocre or completely damaged state, insufficiently prepared to take over and cope with a high flow of vehicles.

At a national level, we have an outdated and aging fleet of vehicles, whose means of transport have advanced physical and moral wear and tear, have technical failures that endanger the lives and health of people and road users, and road safety is faulty.

"In 2020, for a new motor vehicle, two used motor vehicles were registered". (Ministry of Internal Affairs, 2021, p. 8). Due to these reasons, Romanian authorities, by their position in making decisions, must take into account and adopt new development strategies in this area to integrate the road transport system in Romania to the EU's requirements.

We argue that such a strategy consists in creating sustainable road structures, so that the road transport system in our country becomes more efficient, and safer, with a reduced economic, environmental, and social impact. Romanian Road transport can be considered sustainable only in such a conjuncture.

We believe that our country will have to invest considerable financial resources in developing the infrastructure and the fleet of existing road vehicles, because they are far behind compared to other European countries.

According to the estimates made by specialists in the Investment Plan for the Development of Transport Infrastructure for the period 2020 - 2030, our country needs at this time of day a budget of 70 billion EUR, exclusively to build and bring the road infrastructure to the standards required by the European Union. Romania, through the National Recovery and Resilience Plan (NRRP), has set itself as an objective of supporting all transport systems and has allocated through this plan the amount of EUR 7,620 million, which will cover only a part of the necessary investments in this field at a national level, not including VAT in this amount.

The degree of congestion and blockage of urban and interurban road traffic, and noise pollution in Romania, corroborated with the discomfort created by the vibrations produced by heavy vehicles, increases stress and reduces the efficiency of the population's work. The modification of the urban architecture, but also the occupation, and the monopolization of the public space is added to all this in a negative sense. All hypotheses formulated by the authors are confirmed.

The subsequent research directions can focus on achieving the technical and engineering targets specific to the road transport activity, through which the system has the capability to protect and remedy the damages produced to the ecosystems within which it evolves, in order to efficiently and effectively use the material, financial, human and natural resources, and finally to cover all the important human tasks and needs such as: satisfaction and comfort, health, safety and the provision of jobs for mankind.

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ESG IN THE BANKING SECTOR, TRENDS IN ROMANIA

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Abstract. *Recently, banks have increasingly perceived sustainability as a means to improve their reputation, and also promote trust and credibility. In a changing world with the pressure of climate crisis and geopolitical tensions, adopting Environmental, Social, and Governance (ESG) measures are now more relevant than ever for large organizations. New constant regulations and challenges need to be addressed rapidly and sustainable operations are linked with better economic performance. Moreover, the banks who activate on a globally interconnected financial market have understood that it is important to move towards integrating ESG across their business. Thus, this paper aims to understand how the ESG trends influenced the management strategies in the banking system in Romania. On the basis of a systematic literature review with the analysis of the top 10 banks' ESG activities in Romania, this study presents an examination and comprehensive summary of what kind of ESG strategies and actions are adopted by banks in the Romanian market. This includes the theory of ESG frameworks, ESG dimensions, and the role of ESG in banking. This paper further refines the characteristics of ESG in banking, reveals the actions and strategies of Romanian banks on ESG implementation, and proposes a focus for ESG research in the future on specific fields such as banking and finance.*

Keywords: *#ESG #sustainability #nonfinancial reporting #banking #impact #environmental #social #governance*

Introduction

In the last year globalization has boosted the interest in sustainability not only for managers and practitioners, but also for stakeholders and consumers. At present, the theme of sustainable and comprehensive development has, once again, become a hot topic of discussion worldwide (Li et al., 2021) due to the recent crises that humankind is facing: The covid-19 crisis, as well as the Ukrainian war and rise of geopolitical tensions. According to McKinsey (Perez et al., 2022), there has been a fivefold growth in internet searches for ESG since 2019, while searches for "CSR", which is seen as an earlier area of focus more reflective of corporate engagement, have declined.

The ESG principle is a framework system including environmental (E), social (S), and governance (G) factors. According to Beergi, (2022) Environmental, or 'E' in ESG, observes the impact of resource consumption of any business on the environment like

carbon footprint and wastewater discharge, among other environmental impacting activities. ‘S’ or Social criteria examines how a business interacts with communities where it operates. It also looks at internal policies related to labor, diversity, and inclusion policies, among others. ‘G’ or Governance relates to internal practices and policies that lead to effective decision-making and legal compliance. ESG facilitates top-line growth in the long run, attracts talent, reduces costs, and forges a sense of trust amongst consumers.

As Li et al. (2022) mentioned, ESG is usually a standard and strategy investors use to evaluate corporate behavior and future financial performance. As an investment concept for evaluating the sustainable development of enterprises, the three basic factors of ESG are the key points to be considered in the investment analysis and decision-making process. Moreover, ESG is an investment philosophy that pursues long-term value growth, and it is a comprehensive, concrete, and down-to-earth governance method.

EBA (European Banking Authority) states that ESG factors are “environmental, social or governance matters that may have a positive or negative impact on the financial performance or solvency of an entity, sovereign or individual”.

Table 1. ESG Factors (EBA Report, 2021)

Dimension	Environmental	Social	Governance
International framework	<ul style="list-style-type: none"> ▪ GHG emissions ▪ Energy consumption and efficiency ▪ Air pollutants Exposure to fossil fuels ▪ Water usage and recycling ▪ Waste production and management (water, solid, hazardous) ▪ Impact and dependence on biodiversity ▪ Impact and dependence on ecosystems ▪ Innovation in environmentally friendly products and services 	<ul style="list-style-type: none"> ▪ Workforce freedom of association ▪ Child labour ▪ Forced and compulsory labour ▪ Workplace health and safety ▪ Customer health and safety ▪ Discrimination, diversity and equal opportunity ▪ Poverty and community impact ▪ Supply chain management ▪ Training and education ▪ Customer privacy ▪ Community impacts 	<ul style="list-style-type: none"> ▪ Codes of conduct and business principles ▪ Accountability ▪ Transparency and disclosure ▪ Executive pay ▪ Board diversity and structure ▪ Bribery and corruption ▪ Stakeholder engagement ▪ Shareholder rights
European Framework	<ul style="list-style-type: none"> GHG emissions ▪ Energy consumption and efficiency ▪ 	<ul style="list-style-type: none"> Implementation of fundamental ILO Conventions ▪ 	<ul style="list-style-type: none"> Anti-corruption and anti-bribery policies ▪

	Exposure to fossil fuels ▪ Water, air, soil pollutants ▪ Water usage, recycling and management ▪ Land degradation, desertification, soil sealing ▪ Waste production and management (hazardous, nonrecycled) ▪ Raw materials consumption ▪ Biodiversity and protection of healthy ecosystems ▪ Deforestation	Violation of UN Global Compact Principles ▪ Inclusiveness/Inequality ▪ Exposure to controversial weapons ▪ Discrimination ▪ Insufficient whistleblower protection ▪ Rate of accidents and number of days lost to injuries, accidents, fatalities or illness ▪ Human rights policy ▪ Investment in human capital and communities ▪ Trafficking in human beings	Excessive CEO pay ▪ Diversity (unadjusted gender pay gap and board gender diversity)
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ESG has gained a greater importance among investors, policymakers, and other key stakeholders because it is seen as a way to safeguard businesses from future risks (Beergi, 2022).

In the banking sector there is growing pressure regarding the need to integrate ESG dimensions into strategies, processes, and financial instruments to generate value from medium- and long-term perspectives, but also to respect the European and national regulations regarding ESG. The objective of our research is to analyze the top 10 banks in Romania and understand how they integrate ESG dimension into their strategy and what activities they developed in this field to prove to consumers and stakeholders that their engagement in ESG is not just declarative, but is proved by facts and actions.

Literature review

In recent years, we have seen changes in fundamental social, technological, and ecological areas, and so much of what we took for granted has been lost. Resources have become increasingly expensive and difficult to access; peace has become a desire for many of us, and this speed of transformation calls for major changes. We need to build a regenerative economic and social model that will enable future generations to live better lives.

In this complex context, banks should afford the courage to be innovative, react flexibly, and pull together new alliances for a better future. They should invest in new digital approaches and build a network between sustainable organizations The banking system

should actively address the social changes of our time: the climate crisis and the negative changes brought by globalization. Environment protection has become an essential component in the management strategies of banks in Romania because environmental aspects are associated with bank risk (Neitzert & Petras, 2021). To minimize this negative impact on the environment, banks can implement lending practices that protect the environment and rethink how they use internal resources.

This ESG score shows a company's sustainability, an indicator of whether its level is low, high, normal, and the sector average. As Alam et al. (2022) mentioned “we find that overall ESG score has a significantly positive impact on the technical efficiency of conventional banks, supporting the stakeholder theory of ESG, but no significant impact on the technical efficiency of Islamic banks.”

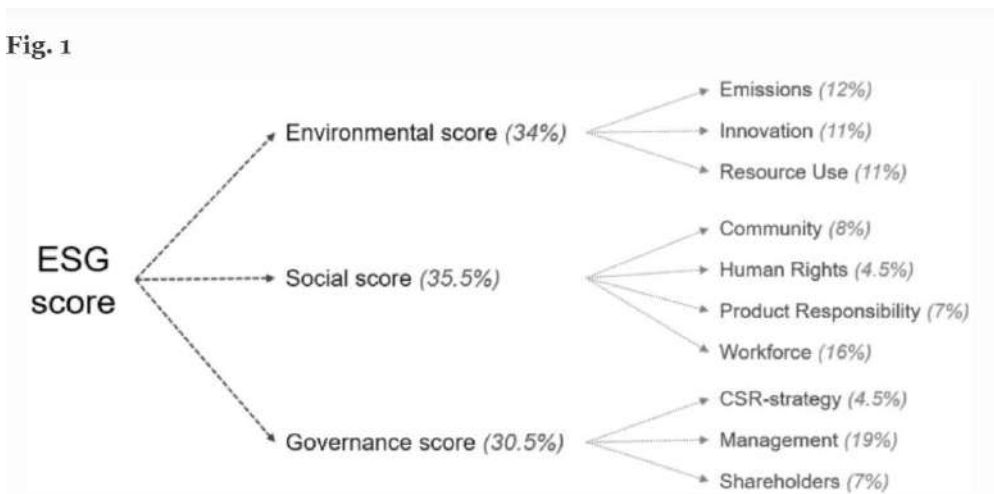


Figure 1. The composition of the ESG score (Neitzert & Petras, 2021)

According to the European Report for Sustainable Development (2022), Romania is on 30-th place from a total of 31 countries, with important and major challenges that must be addressed in the future. Therefore, there is a long way to come! As Samaniego-Medina and Giraldez-Puig (2022) mentioned “specifically, the lower the level of ESG controversies, the greater the probability of achieving the highest credit ratings.” and “European banks should take special care to avoid such controversies, as a source of reputational risk, when setting their policies so that their credit ratings would not be affected”.

Methodology

Considering the concepts and elements mentioned in this paper, we can assume the specialized literature based on highlighting the ESG strategies adopted by the banking

sector during the pandemic is constantly expanding, but studies in the area of the banking sector can be developed.

This paper aims to identify the main changes brought by the social context and to understand how the ESG trends influenced the banking system's management strategies, focusing on Romania. In this period, we are in the middle of a transformation process, and economic stability is closely linked to the health of the banking financial system in Romania. That is why it is important to understand the business approach adopted by the banks in Romania.

To achieve this goal, this research paper will answer the following questions:

R.Q.1: What are the main changes brought about by the ESG trends that are likely to persist in the banking sector?

R.Q.2: Which are the main ESG strategies adopted by the Romanian banking system?

The current economic situation is likely to have unpredictable economic and social fluctuations and banks need to be careful and understand how their current business model is affected. Banks that manage these new challenges most effectively will win. The banking sector is an important pillar of the economy, and the management strategies that the banks will adopt will influence the economy's recovery following the pandemic.

With the help of this analysis, we will identify the main research directions that include the most important trends to be studied in the ESG area. Therefore, in the research process, the papers dealing with the evolution of management strategies in the banking system during the pandemic were considered.

The ESG practices in the Romanian banking system

CSR projects help accelerate real sustainable change in the future. One challenge banks will face in the next few years is that savings are becoming more standardized, making exceptions difficult and expensive. All of this is aimed at creating a new cognitive network and innovative spaces for cooperation with several renowned experts in the framework of workshops and lectures. In Romania, companies, including the banking sector, implemented a series of measures to align to the ESG criteria. ESG reporting is very important and allows stakeholders to assess the environmental risks of banks and their sustainable financing. (Danila et al., 2022)

As Danila et al. (2022) summarized "for example, governance and reporting scores have been declining, since the results for 2020 show that 82% of the world's largest banks aligned transparency disclosure with ESG reporting, while in 2021 only 77% of them did so. In terms of adopted measures to ensure the transition to sustainable governance, 60% of the banks included in the study had implemented such measures in 2021, significantly fewer than in 2020, when 74% of them had taken such measures"

The most achievements in the ESG area of banks (Buzgure, 2022):

- On average, 66% of banks now include sustainability criteria in variable remuneration, compared to 41% last year.

- They identify environmental targets for their own activities, but only 24% of them have set targets for financing net-zero emissions practices, in line with the objectives of the Paris Agreement.
- Use varied approaches to assess their exposure to climate change risk.. Only 19% of banks disclose the materiality of climate risk through credit or market risk indicators.
- Implement sustainability reporting standards, mainly focused on climate goals

There is pressure from stakeholders to incorporate ESG factors in their corporate governance systems (Dicuonzo et al., 2022). On the other hand, as Moufty et al. (2022) emphasize “EU banks have carried out more sustainability disclosure compared with US banks, and banks in both regions are mostly interested in how their operations influence the society that banks operate in (direct social impact), followed by the indirect environmental impact of their products and services”. It is important to mention that ESG controversies have a negative effect on credit rating and it is an important part of rating of credit assessments. (Samaniego-Medina & Giraldez-Puig, 2022)

Today banks are in a moment in which they must act fast and with impact to the good of our society, of the environment, for a better future. That is why the banking system should accept the challenge to catalyze and support the ESG sustainability in Romania. It is simple: the daily activity has an impact on the environment (from the retail or corporate services to the energy efficiency of their offices and the transportation of their employees to work).

As climate change has an impact on nature and people, banks should focus more on the environment protection, with a responsible usage of resources and CO₂ emissions. The ecological sustainability is no longer just a CSR option, it is the way to take for less harming our planet.

For this paper, we conducted a research among 10 banks in Romania (according to the number of assets) (Medrega, 2022), to synthesize their actions in the ESG area.

Table nr 1

Bank	ESG actions
BCR	<ul style="list-style-type: none"> ● BCR recently launched the first issue of green bonds, with a total value of 500 million lei, this step being part of the strategy to expand financing sources and develop the capital market in Romania. (Turlan, 2021) ● It launched Casa Mea Natura, a new type of green mortgage, intended for the purchase of green homes, through which the bank's customers are supported to make smart choices with minimal impact on the environment. Currently, it represents approximately 30% of monthly requests for housing financing. (Turlan, 2021)

	<ul style="list-style-type: none"> ● BCR started the process of responsible transformation of the BCR card portfolio. Starting in October 2021, the BCR IKEA credit card and the George debit card are issued on environmentally friendly physical support of 85% recycled plastic. And our goal is to issue only environmentally friendly cards by the end of 2022 (Turlan, 2021) ● BCR has expanded its green financing projects for entrepreneurs. We recently launched a financing product dedicated to energy efficiency projects, which is addressed to private and state companies. (Turlan, 2021) ● Another important area on their focus is reducing environmental footprint, for example by finding ways to purchase as much green energy as possible
Banca Transilvania	<ul style="list-style-type: none"> ● Project financing for production and distribution of renewable energy (Banca Transilvania, 2021) ● Supporting companies for superior energy efficiency energy especially in the current national and global context of cost evolution (Banca Transilvania, 2021) ● Capital allocation for the area of sustainable mobility and transport, as well as related projects (charging stations etc.) (Banca Transilvania, 2021) ● Crediting projects that helps adapting to the climate change (Banca Transilvania, 2021) ● Supporting the projects that generate efficiency regarding water consumption and quality (Banca Transilvania, 2021) ● Financing real estate projects of green buildings (Banca Transilvania, 2021) ● Special environmental transactions (Banca Transilvania, 2021)
BRD	<ul style="list-style-type: none"> ● the group has decided to stop financing any kind of unconventional hydrocarbon exploration and exploitation activities or that take place in protected areas.(Roşca, 2021) ● Regarding direct emissions, they decided to reduce them by 50% by 2030 compared to the 2019 level (Roşca, 2021) ● BRD assumed at a strategic level that sustainability is an integrated part of all the bank's actions. This responsibility is expected also by their stakeholders

	<p>(investors, authorities, customers, suppliers, employees) and has an impact on their organization (Roşca, 2021)</p> <ul style="list-style-type: none"> ● Financing the energy transition for preventing/slowing down global warming (Roşca, 2021)
ING Bank	<ul style="list-style-type: none"> ● ING launched together with other banks the second issue of green bonds for NEPI. 500 million euros, money that goes towards improving energy efficiency in their buildings - shopping centers. ● The credit for electric cars ● Adding the principles of sustainability in various areas of the company ● Incorporating ESG into employees' lives
Raiffeisen	<ul style="list-style-type: none"> ● 37 young farmers took part in the Masterclass in Business of Agriculture executive training program (Raiffeisen Bank, 2021) ● financing class A : 40% of the mortgage loans granted by the Bank in 2021 aimed energy performance buildings (Raiffeisen Bank, 2021) ● Green projects: 14% of total loans to corporate clients targeted (Raiffeisen Bank, 20121) ● 27 trainees in the GreenFields program for farmers to transition to sustainable farming (Raiffeisen Bank, 2021) ● Sustainability course launched for all Raiffeisen Bank employees (Raiffeisen Bank, 20121) ● Energy intensity decreased by 2.32% compared to 2020 (Raiffeisen Bank, 2021) ● Scope 2 emissions decreased by 16.81% compared to 2020 (Raiffeisen Bank, 20121) ● Distance travelled by employees by plane decreased by 39.60% compared to 2020(Raiffeisen Bank, 2021).
CEC Bank	<ul style="list-style-type: none"> ● CEC Bank launched Casa Mea Verde, a new type of green mortgage, intended for the purchase of green homes, to support customers to move in houses more energy

	<p>efficient by providing lower interest rates (CECK Bank, 2022)</p> <ul style="list-style-type: none"> ● They do not provide extensive information on ESG activities, rather they focus on promoting their CSR activities which support education and health projects
<p>UniCredit Bank</p>	<ul style="list-style-type: none"> ● The local sustainability strategy includes a wide range of financial and non-financial products for corporate and retail customers. The business model implemented in Romania at the end of 2019 is based on three pillars - Impact Financing, Microcredit, and Financial Education, and up to now the loans granted have supported both micro-enterprises and projects with social impact in various fields, such as : health, palliative care, preservation of cultural heritage and food, while the financial education programs carried out had as beneficiaries entrepreneurs and students from dozens of technical, economic, tourism, agricultural and food industry high schools in Romania. ● Granted loans for sustainable energy for Greenvolt in partnership with Raiffeisen (Bursa, 2022) ● At a Group level, they have set sustainability targets to further reduce both its direct environmental impact through specific energy choices and its loan portfolio exposure to controversial sectors businesses. But it is unclear which objectives also apply to Romania (Unicredit Group, 2022) ● Plastic free by 2023. The bank is distributing reusable metal drinking bottles across the Group. Plastic bottles have been removed from break areas and plastic items from canteens. All single-use plastic will be removed from all UniCredit buildings by 2023. (Unicredit Group, 2022) ● In 2020, approximately 98% of copy paper used groupwide holds an environmental label; in particular, 80% of copy paper used groupwide is Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC) certified. (Unicredit Group, 2022) ● The bank targets 30 percent of women in our senior leadership roles by 2023. At the end of 2020, this representation in senior leadership has grown to 15 percent. This results in higher team member engagement and motivation, as well as enhanced risk

	<p>mitigation and management, which creates a more sustainable organization and long-term profitability (Unicredit, 2022)</p>
Alpha Bank	<ul style="list-style-type: none"> ● Alpha Bank Romania introduces to the local market three investment funds part of Alpha (LUX) Global Funds. Alpha (LUX) Global Funds incorporate environmental, social, and governance criteria (ESG) in the investment analysis and decision-making processes, offering amplified diversification for various types of assets, geographical regions, and currencies. (Romanian Journal, 2022) ● In 2021, a new Structure was developed at Group level governance covering ESG elements, demonstrating commitment to the Group's commitment to Sustainability issues. ● Alpha Bank Romania mentions in its non-financial declaration that it is actively involved in the market development of green/energy efficient financing in Romania and gives special interest to the ecological/energy efficient mortgage sector. (Alpha Bank, 2021)
OTP Bank	<ul style="list-style-type: none"> ● OTP Bank's ESG strategy will focus on three main pillars: product, planet, and people, described by 3 areas of responsibility: ● Responsible supplier: with the aim of financing the gradual transition to a low-carbon economy and offering a range of sustainable products and balanced financing options. This strategic direction does not only refer to the growth of the green credit portfolio, but also to the continuation of investments in digital products and channels, while maintaining the traditional services available in branches for the categories of customers who cannot use advanced digital tools. ● Responsible employer: aiming at the development of active ESG management tactics, integrated into the governance model and continuous investment in the well-being and development of employees, in inclusion and diversity, as well as in their involvement in decisions. ● Responsible social actor: by establishing ambitious environmental objectives in terms of ecology within the organization and reducing greenhouse gas emissions generated by own operations. Creating a positive social

	<p>impact, not only through offering responsible products and channels but also through the continuation of CSR activities and through the educational project of the OTP Bank Romania Foundation. Thus, value is created for the community, with measurable impact and aligned with the UN Sustainable Development Goals</p> <ul style="list-style-type: none"> ● OTP Asset Management Romania launched OTP Innovation, the first fund in Romania that offers international exposure to companies that allocate a significant share of their revenues to research and development (R&D). The investment program of the OTP Innovation fund aims to have a long-term strategic allocation of at least 85% of the fund's portfolio in investments aligned with E/S characteristics, that means investments in shares issued by companies with a medium or low sustainability risk
EximBank	<ul style="list-style-type: none"> ● Exim Bank mentions the introduction of a management system of waste which includes paper management and plastic materials ● Initiatives on abandoning food plastic (PET, plastic cups, etc.) until 2023 ● Replacement of 40 advertisements lights existing at the level of the agencies EximBank-BROM, with LED lamps until 2024 ● Replacement of a number of 10 old thermal power plants, with condensing power plants until 2024 ● Modernization of a number of 20 agencies through the introduction of LED lamps until 2023 ● Replacing the existing lamps at the Central level Exim/BROM with LED lamps until 2024 ● Introduction of EU taxonomy in credits classification, in accordance with the calendar of regulation ● Development of green products for the segment retail and SBB/SME in 2023-2024 ● Use of public programs, financing from EU funds, IFI, in in order to increase the share of projects environment in the bank's portfolio by creating guides and doing ecological education ● Promotion of diversity policy at EximBank Group level and implementing strategies for wellbeing of employers and continuous development

In Romania, the green component of ESG is more present in the communication materials and public appearance of banks. Green or socially responsible investment has become one of the trends of the modern economy. Investors have become more interested in companies that operate with the principles of the ESG and thus most important banks in Romania focus on offering green products whether we are referring to mortgage loans for greenhouses, green bonds, or investment funds that focus on ESG criteria.

This green trend is here to stay. Banks will continue to put special emphasis on green products in retail banking, such as green cards, green car loans, green mortgages etc.

Also, zero gas emissions will continue to be a huge desiderate of banks until it will become reality. According to Science Based Targets initiative (2021), an organization that promotes best practices in reducing greenhouse gas emissions (GHG), 1,045 companies globally have set targets aligned with the goal of limiting any rise in global warming to a maximum of 1.5°C.

Conclusions and discussion

ESG is the answer to the dramatic changes our planet and society go through and business as usual is not a sustainable choice.

Doing everything possible to live more sustainably in this period is the first step to building a better future for people, especially future generations. It is essential to encourage everyone's involvement in this regard to make things better. All actions help and banks need to invest more in renewable energies and in educating the people because these are the keys to a better society where we can thrive. Change has always been a constant in our lives, whether we want it or not and banks from Romania started to include the ESG area in their strategic actions. Therefore, there is a long way to go.

Analyzing their public communication (press releases, articles, interviews), most of the banks in Romania decided to communicate this year their strategy and the actions that they intend to implement until 2023-2025, few of them, mostly the biggest 4-5, mentioned specific actions related to their business and the products and services they offer, their employees and the governance and transparency strategy.

According to Egorova et al. (2022), the relevance of sustainable development is in the attention of literature and the public, but simultaneously there are very few papers dedicated to the study of the development and impact of ESG on a specific industry. So new research on the banking field in Romania is expected and necessary in order to see how banks actually put into practice the strategy they assumed and how this is going to impact the economy and its transition to a green economy.

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THE ROMANIAN CONSUMER ATTITUDES AND AWARENESS LINKED TO SUSTAINABILITY IN THE FAST FASHION INDUSTRY

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Abstract. Sustainable fashion has been gaining more and more attention in the last few years. The fast fashion industry is raising many questions regarding the demand and real need for collections and clothes purchases yearly. Although some companies are starting to take a call of action regarding these issues, at the other end of the purchase chain lies the consumer's attitude and awareness of the topic, as consumers play a significant role in reaching a more sustainable future in the fast fashion industry. Considering this, more and more academicians have started researching more and more the possibility of achieving sustainability in the fashion industry in the last decade.

The investigation's purpose is to understand better the level of sustainable awareness and attitudes of Romanian consumers regarding fashion purchases. Other objectives are to identify the perceived barriers regarding adopting sustainable purchase behavior and the potential triggers/motivation to adopt a more sustainable behavior from the consumer's point of view. As for the methodology, a qualitative study was developed, aiming for both fashion-passionate and non-passionate respondents, where the research instrument was the focus group.

The element of originality lies in the fact that the study will take place in Romania. In this ex-communist country, the consumer mentality focuses more on price than ethical reasoning. Interestingly enough, we discovered that some Romanian consumers working as fashion specialists had little to no idea about the effects of the fast fashion industry from a sustainability point of view. The main barriers for Romanian consumers were the prices, design, and quality of sustainable items, the absence of legal regulations, and education towards sustainability. This research contributes to providing more awareness regarding the Romanian consumer's awareness level, attitudes, and behavior regarding sustainable fast fashion.

Keywords: consumers, consumer behavior, fast fashion, sustainability, sustainable consumption, sustainability attitude.

Introduction

The fast fashion industry is one of the most polluting industries on the planet, the second largest after the big oil industry (Niinimäki et al., 2020; Quantis, 2018). More than 500\$ billion is lost yearly because of the lack of utilization and recycling of clothing (Ellen MacArthur Foundation, 2017). By 2030 approximately 102 million tons of apparel consumption will be wasted (Global Fashion Agenda & The Boston Consulting Group, 2017). Moreover, fast fashion leads to air and water pollution by using toxic chemicals, packaging, ozone depletion, and soil erosion (Niinimäki et al., 2020; Noh & Johnson, 2019).

When discussing sustainable development, we usually refer to the three dimensions or pillars: environmental, social, and economic (Barbier, 1987). While other scholars and thinkers have added other pillars, such as technical, institutional, or political (Hill & Bowen, 1997), the concept of the three pillars is still broadly accepted. It has been continuously developed through the triple bottom line of sustainability as an assessment tool, which John Elkington first enounced in 1994. The model of the triple bottom line took off in late 1990, also referring to 3 dimensions of corporate sustainability: profits (economic pillar), planet (environmental pillar), and people (social pillar). Also, we may refer to three different perspectives: the demand side (the consumers), the supply side (fashion brands), and the regulatory environment (government and other non-governmental organizations) (B, Zhang et al, 2021). This research will mainly focus on the demand side, the consumer perspective, their awareness regarding sustainability, and what they perceive as barriers coming from both fashion brands and the regulatory environment that will lead them to become more sustainable citizens.

According to fashion research conducted in Romania by Glami, 40% of respondents did not know what a garment's sustainability means, and 55% said that clothing production should not harm the environment. Half the respondents did not know which brands offer sustainable options (Glami, 2019). 78% of the respondents thought that cotton was the most sustainable material. However, it requires a high amount of water and many pesticides to grow; therefore, understanding the barriers, drivers, motivation, and the actual level of awareness of the Romanian consumer is essential for a better and more sustainable future.

In today's world, consumers must face the decision between choosing fast fashion products that imply a more negligible cost, lower quality, and generating a tremendous amount of waste and environmental degradation (Brewer, 2019) compared to slow fashion, which implies a higher cost, better quality, and environmentally consciousness (Bourland, 2011). Consumers have yet the option to choose and develop sustainable practices regarding their fashion choices and further usage of those. This leads us to why the research is highly interesting from an academic and practical point of view. From a practical point of view, we want to see if Romanians can learn to "value and know the object" (Conell, 2010) and learn about the potential barriers and triggers they face regarding adopting this behavior from an academic perspective.

Our research will focus on consumers' awareness levels and attitudes towards this problem in Romania using a model elaborated by McNeill & Moore (2015), which presents four stages of attitudinal change toward sustainability in the fashion industry, which will be further presented. The next objective will be to investigate the barriers and drivers of consumers adopting more sustainable behavior.

Fast fashion and fast consumption

Fashion retailers use "fast fashion" to refer to clothing collections manufactured after the latest fashion trends inexpensively and concisely (Roozen & Mariet, 2020). Although consumers are becoming increasingly aware of the possibility of choosing ethical and sustainable fashion, this is not always reflected in their purchase behavior (Collins, Bray, & Burgess, 2010). With the efforts coming from companies to provide sustainable fashion in both fast and slow departments, we must question the attitudes and

awareness level of the consumers. Consumers buy clothes, only wear them while they are in trend, and throw them away after (Haines & Lee, 2021). As a result, fashion brands are now producing twice the amount of clothes produced before 2000 (Remy & Speelman, 2016). Therefore, the drastic increase in fashion consumption by the consumer and the mass textile production reflected in the fast fashion industry has led to a concerning problem regarding sustainability, mainly because many unsold clothes are being thrown away (Niinimäki et al., 2020).

Usually, the consumers buying from fast fashion stores are aware that the clothes they purchase are not of a high standard or quality, but they get them cheaply (Sun et al., 2020). The cheap price has led to social and environmental factors like low wages, terrible working conditions, waste, and pollution. At least partially, these problems could be approached with the help of consumers. Although the general view is that buyers care about environmental problems, they do not act. According to Kim et al. (2013), increasing value perception of the fashion item is attached to the ethical factors of the consumer's purchase and the environmental consequences of their decisions. Furthermore, the literature shows that nowadays consumers tend to be more aware of the consequences of their purchases (Sun et al., 2016). However, the rising question is if it is the same in Romania and if they are willing to choose better options. As Roman et al. (2015) found, in this ex-communist country, the consumer mentality is more focused on price than ethical reasoning.

Sustainability in fashion and sustainability attitude stages

Industrial activities are one of the main problems that lead to global environmental degradation and resource depletion (Sachs, 2015). Therefore, sustainability has become one of the main issues discussed about fast fashion. The fast-fashion business model has gained more and more popularity because of the low prices and fast production according to every trend, but sadly is leading to overconsumption (Siege, 2021). Although we can notice a strong push from authorities and companies in the fast-fashion industry to adopt more sustainable behavior (Gordon, 2015), we are still wondering if Romanian consumers are aware of this problematic topic and if the sustainability aspect impacts their fashion purchases.

Studies focused on systematic literature review found that sustainability in fashion knowledge has advanced only after 2006 and is still exponentially increasing. It has been pointed out that studies in different countries will have very different findings as developed and developing markets have different sustainability dimensions and contexts. In developed countries, consumers will view sustainability as a life choice. In contrast, in developing countries, consumers may see sustainability more as legal compliance or corporate philanthropy, although their awareness levels might be similar (Yang et al., 2017).



Figure 1 - Web of Science, Sustainability in fast fashion

Filter by year

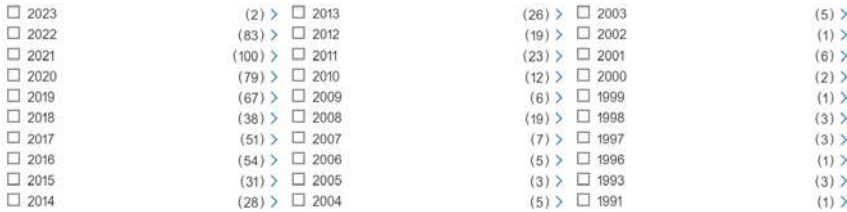


Figure 2 - Scopus, Sustainability in fast fashion

Sustainability is one of the significant problems we face in the 21st century, and the fashion industry is one of the most polluting industries nowadays. Although sustainability as a theoretical concept has many definitions, the first time the term was widely accepted was in 1987 in the Brundtland Report on corporate social responsibility, being referred to as "the human ability to ensure that the current development meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). Later in the mid-1990s, a new framework was developed that has been extended to a three perspectives model named the "Triple Bottom Line" incorporating three dimensions: economic, social, and environmental value (Slaper & Hall, 2011). The three dimensions are also called the 3P of sustainability: people, planet, and profits (Hacking & Guthrie, 2008).

Redclift (2005) talks about the underlying needs, commitment, and attitudes of every day patterns the people approach to achieve sustainability. People tend to define their needs by excluding others from satisfying theirs, affecting long-term sustainability. Therefore, to attain sustainable development, we need to answer why people pass from one group to another and the environmental costs of their purchase choices in society. This is leading us to research their attitudes and behaviors.

In the case of fast fashion, sustainability has many dimensions and challenges at every stage of production and from both industry and consumer perspectives. Although some research models have been developed, like the Framework for sustainability regarding personalized fashion products which focuses on the mass customization of sustainable fashion items (Black & Ekert, 2010), or more general models regarding ethical values and attitudes of the consumer's drivers for buying sustainable items (Shaw & Connolly, 2006), none of these models are considering sustainable fast fashion consumption.

We can point out through an adapted version of a sustainable model created by McNeil and Moore (2015) that has its roots in the Robins and Greenwald (1994) model of

environmental attitudes, which suggests the existence of 4 stages and the capacity of the individual to move through stages as they are making psychological progress (Piaget & Rosin, 1978).

Sustainable fashion consumption and the fast fashion conundrum

L. McNeill and R. Moore

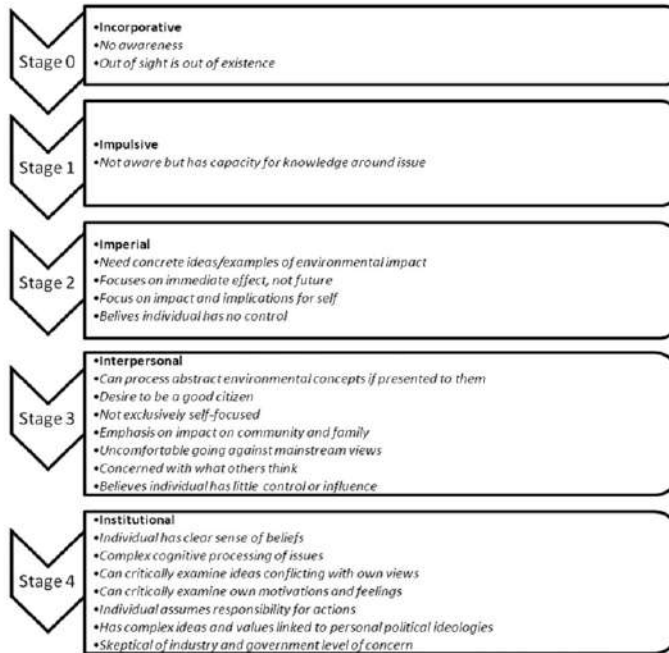


Figure 1 Sustainability attitude stages.
Source: Adapted from Robins and Greenwald (1994)

Sustainable fashion consumption and the fast fashion conundrum

L. McNeill and R. Moore

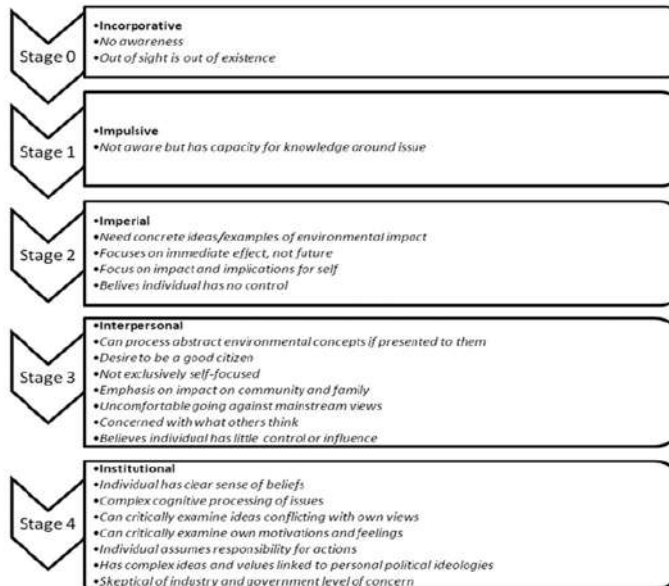


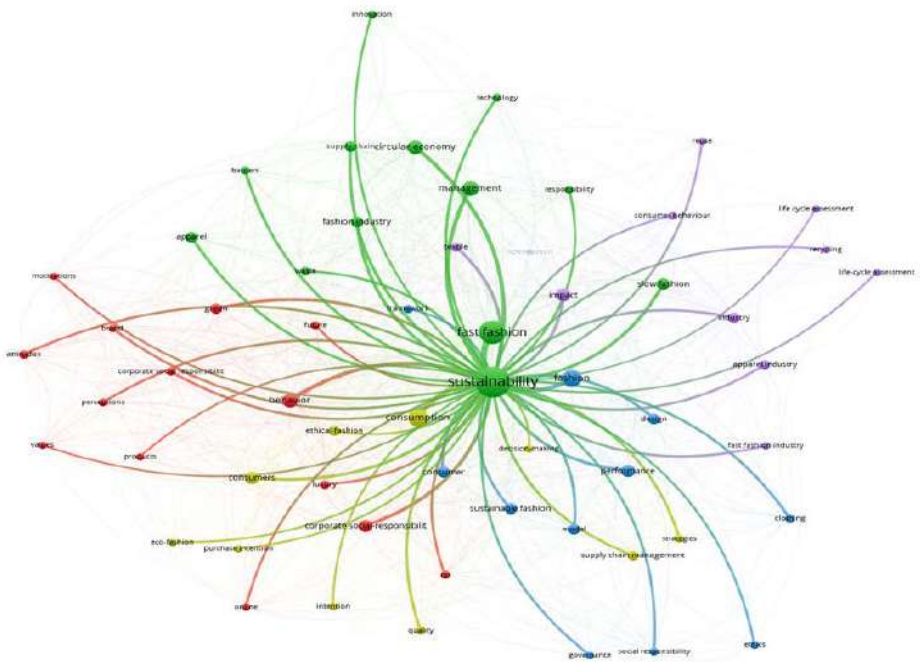
Figure 1 Sustainability attitude stages.
Source: Adapted from Robins and Greenwald (1994)

Figure 3. Sustainability attitude stages (McNeill & Moore, 2015, p.216)

As can be seen in the diagram, the first stage of attitude level in the fashion industry refers to the consumer with no awareness of environmental problems at any level or dimension. In contrast, stage 1 can acknowledge a sustainability problem but has no call for action or a genuine desire to change. The second stage refers to an individual who thinks they have no control over sustainability issues on an individual level; they blame the companies and focus on the short-term implications. The third stage refers to the desire of being a good citizen by understanding the impact of sustainability on communities and families. This refers to not being exclusively self-focused but caring about another human being and choosing sustainable purchases. The last stage, which is the desired one, refers to an individual with a clear set of beliefs regarding fashion sustainability issues, assuming his actions and comprehending his role in a potentially more sustainable future, and overall is skeptical towards the genuine concern of the government.

Theory of Consumer Behavior in the fashion industry

When mapping through the Web of Science database by using Vos viewer, sustainability in fast fashion, one of the main approached subjects are consumer, consumption, and behavior of consumers, therefore next, we will approach the Consumer Behaviour Theory and how sustainability can be a factor in this process.



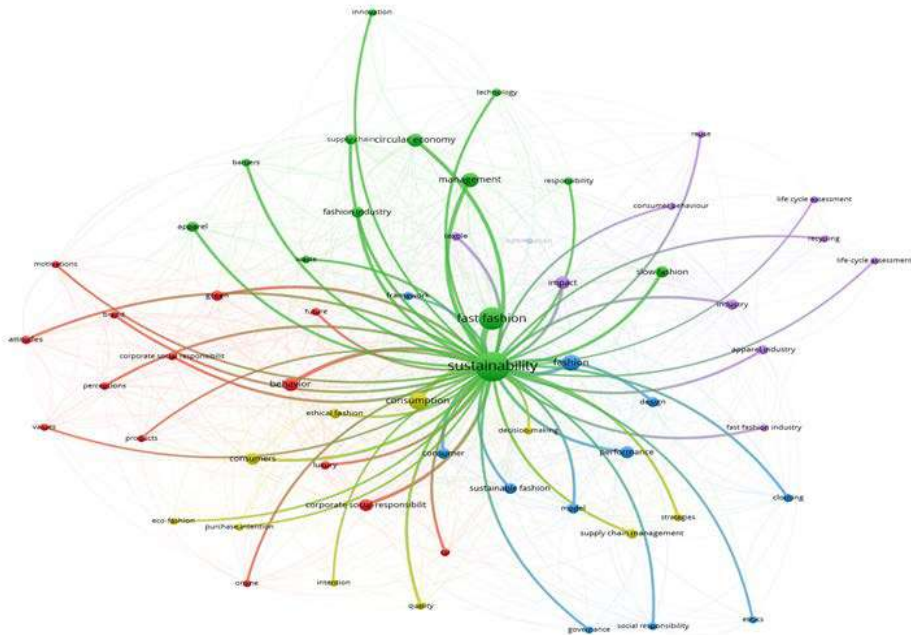


Figure 4 – Web of science sustainability in fast fashion

Consumer behavior theory explores how consumers make purchase decisions. Sustainability should be a factor that contributes to this decision and a product attribute to be considered (Zhang et al., 2021). With the development of the modern era, shopping has become an activity done by both old and young to support the appearance, self-identity, and association of the customer with fashion (Sari & Asad, 2018).

One of the first purchases we make independently from a young age is represented by clothes purchase. Consumers spend part of their income buying certain products as they have different demands, wants, and needs. Although traditional economic consumer behavior does not consider the emotional aspect of purchasing, consumers nowadays tend to focus on this aspect. From a psychological point of view, the Maslow hierarchy categorizes our needs into three groups, physical needs (for food, clothing, safety, and warmth), social need (for affection and belonging), and individual needs (for self-expression and knowledge) (McLeod, 2007). Sustainability can be easily found in social needs such as love, affection, and belongingness cause being aware and ethical of our choices is proof of caring about society's future (Zhang et al., 2021). As Kotler, Kartajaya and Setiawan (2019) state, marketers cannot affect these needs, as they were not created by them and are a part of human nature. Because nowadays we have so many products, especially in the fast fashion industry, it translates into a selection and evaluation phase that can be found in the decision-making process. The main stages of the decision-making process are: (1) recognize or identify the problem, (2) collect information about alternative solutions, (3) evaluate the alternatives, (4) choose the best alternative, and (5) evaluate the decision (Rath, Bay, Gill, & Petrizzi, 2014, p.287).

Consumers usually purchase a product based on perceptions representing a process that occurs consciously or unconsciously when the individual is exposed to different

stimuli. In this process, the new information is interpreted individually. Therefore, two different people can have different perceptions of the same product, and once the perception is formed, it can be hard to change it (Schiffman & Wisenblit 2015). In our context, sustainability will most likely affect product prices and, therefore, consumer preferences (Zhang et al., 2021). Although more and more customers are in stage 2 or 3 of the sustainability attitude model, therefore, aware of the environmental consequences, choosing eco-friendly clothes that are more expensive may be avoided because of the cost aspect. On the other hand, some customers may prefer natural, eco-friendly materials and durable materials (sustainable fashion) compared to fast fashion non-biodegradable materials that can translate into a lower price. *The geographic factor and culture may impact the research results, as the mentality of the Romanians plays a significant role in this matter, highlighting our research gap, as studies in Romania regarding this matter couldn't be found.*

One of the most exciting characteristics of fashion products is that they can improve the consumers' image and grant them recognition in their social environment. "These specificities also lead the shopper to search for information about the products before deciding to buy them" (Rath et al., 2014, p.47). Therefore, customers may value and research sustainability and socially responsible corporate implication of the brand before purchasing in the future.

Methodology

The research problem is that nowadays, too many clothes, either new or very little used, are being thrown away after very little wear time. Therefore, we will research if the consumers are more responsible from a sustainable point of view with their fashion purchases. Something that needs to be further addressed is if, after the pandemic, consumers tend to be more preoccupied with money and, therefore, not buying as many clothes anymore.

Our research objectives are: (1) identify at which attitude stage towards sustainability the Romanian respondents are according to McNeill & Moore's (2015) model (2) identify the perceived barriers regarding adopting sustainable purchase behavior; (3) identify the potential triggers/motivation to adopt a more sustainable behavior.

We developed a qualitative investigation. The measurement instrument was the focus group. The general directions for the focus group grid contain questions about general information regarding fashion purchase behavior, fashion purchase factors, what sustainability means for respondents, the awareness level of the customers, the main disadvantages when buying sustainable clothing, the barriers of being a more responsible consumer, whether the sustainability lays in the hands of consumer or brand and the potential triggers into adopting sustainability. The focus group was held in August 2022.

The research questions that we linked to our research direction were: (1) What is the level of sustainability achieved by the group respondents according to McNeill & Moore's (2015) model? (2) Which are the barriers of being a more responsible consumer from a sustainability perspective? (3) What is the potential trigger/motivation that would make our respondents and consumers, in general, adopt a more sustainable behavior in the future?

Table 1. Information about respondents and consumers

Respondents	Genre	Age	Profession	Sector
R1	Female	42	Recruitment Specialist	Fashion Industry
R2	Female	45	Trainer	Fashion Industry
R3	Female	32	Recruitment Specialist	Fashion Industry
R4	Male	63	NaturalResources Director	Packaging sustainability
R5	Male	25	IT Manager	IT
R6	Female	60	Sustainability Director	Packaging sustainability
R7	Female	25	Recruitment Specialist	Fashion Industry
R8	Female	34	Project Manager	Fashion Industry

We held a focus group of 8 people approaching the three research directions. The first direction was to identify the attitude level achieved by the Romanian respondents. The second and third direction was to identify the perceived barriers to adopting sustainable purchase behavior and the potential triggers/motivation to adopt a more sustainable behavior. Our respondents were questioned as consumers of different ages and professions although the majority were working either in the fast fashion industry or sustainability. Five respondents were working in HR, 2 were Sustainability directors from the packaging industry, and one was from the IT sector. All respondents had medium to high incomes from urban areas.

Results and discussions

For our first direction regarding the sustainability attitude stage identification, according to McNeill & Moore (2015), we noticed that 5 out of 8 respondents were not even aware of the sustainability problems that the fast fashion industry was raising, and they needed concrete examples from other respondents. Therefore, they were placed between stage 1 to stage 2 on the sustainable Attitudinal Model. R3 mentioned: "I thought that the stores are already very sustainable. I have seen a lot of sustainability campaigns and sustainable products," which is an alarming sign as other respondents agreed on the campaigns and marketing communications, which have misled half of the respondents on believing that the fashion industry is indeed green. Although 3 respondents (R3, R7, and R8) mentioned a Fashion Days campaign where you could bring used clothes, they also said that it was not promoted enough and that they did not bring clothes to be recycled. They were also more focused on short-term impacts and did not believe that they, as consumers play an active or essential role. Another study linked to ecological packaging in Romania showed that 65% admitted that they didn't have enough information about ecological packaging and questioned the entity that should inform and educate consumers (Orzan et al, 2018).

The other 3 respondents (R4, R6, and R2) were very aware of the environmental issues that the fashion industry raises, but they were working in the sustainability industry or

as a trainer in the fashion industry, and they were actively taking responsibility for environmental protection, therefore, they were placed between stages 3-4. Since we had 2 respondents that happened to work in the natural resources area and 1 trainer for the fashion industry, we obtained great insights and value with specific examples,

The second direction that we approached was the perceived Barriers regarding Sustainable Development. In a study where both perspectives of environmentalists and fashionists were debated, the main barriers against the popularization of sustainable fashion were limited knowledge about the issues from the fashion consumers, limited supply sources for sustainable fashion, economic issues (referring to sustainable products prices being higher than the usual products) and products design being not as appealing (Moon et al, 2015). Therefore, designers may find good opportunities to develop better designs and even specialize in green design. Also, in Romania, there is a problem with finding sustainable products in stores, as there is a small number of outlets/second-hand and not many possibilities. But probably, the most significant barrier in Romania from a consumer perspective is the price difference. Research showed that younger Romanian consumers prefer fast-fashion brands because of the low prices, which is the main factor when purchasing products (Nistor, 2019).

Our respondents mentioned the following facts: high prices are the main factor against Romania's sustainable development and the uncertainty of the legal environment. The industry should have legally introduced sustainable targets as other industries already have. They also discussed the Romanian mentality and that they tend to shop very frequently and keep changing their clothes based on trends and not a necessity, especially the medium and high-income consumers. Redirecting the shop's alcoholism into something more sustainable as a sport that would lead to fewer purchases also represents a barrier to reaching sustainability. Therefore, the respondents concluded that the fashion industry does not necessarily have an impact, but more fashion trends leading the market. Not following fashion trends was another barrier to achieving more sustainable behavior. R4 mentioned, "Trends are leading the fashion industry and are short-term concepts, while sustainability is linked with long-term objectives. Fashion items do not expire, and they can be used in the long term, as long as they are not damaged, and this is a call that should come from companies. Every time the tendency is to buy something new, and even if we recycle the object, the quality will be lower."

In the third and last direction, correlated to the potential triggers/motivation to adopt a more sustainable behavior, respondents mentioned awareness campaigns, companies promoting the option to keep an item longer, and sustainable education for the younger generation. R2 mentioned that "those methods have no impact and that there should be legal sanctions for the fashion brands that do not respect these rules, and that the prices should be more affordable or alternative options to be found like sales, vouchers, etc". Another motivation would be that fashion companies should explicitly announce that the fashion items do not expire and can be used long-term.

Other interesting aspects that may require further studies are that R1, R2, R3, R6, R7, and R8 bought fashion items at least once a week. The majority agreed that they prefer offline shopping because they can feel the material, and only two respondents preferred online shopping because it is faster. R4 and R5 were the only respondents buying fashion items only when they needed new items. They were the only male respondents; therefore, gender may significantly impact the shopping frequency.

Almost all respondents mentioned the price as the main factor when purchasing fashion items, the quality, and the material. Only one respondent, R4, mentioned the necessity of the fashion item as the primary purchase factor. No response mentioned sustainability as the main purchase factor. Two respondents (R5 and R2) thought that sustainable fashion items have better quality and are more expensive, and they were aware of some sustainable fashion brands. R6 thought quality is lower for sustainable materials and the industry's road towards sustainability is just beginning. The rest of the respondents have not tried products from sustainable fibers/materials or are unaware. They should start investing more towards reaching sustainability, and sometimes it is only declarative, as a marketing campaign.

Some of the recurrent themes that were observed are the fact that the consumers lack awareness regarding sustainability in fashion and the need for education, the limited recycling options and limited sustainable purchase stores like outlets and second hands in Bucharest, the fact that any big brand that sells sustainable items is more expensive, and the idea that they as consumers indeed buy way too many clothes and are not buying according to their necessities anymore but trends, without being even aware of the consequences.

Table 2. Main Themes and Research Directions

Directions	The Sustainability Attitude stage of the Romanian respondents	Perceived Barriers regarding Sustainable Development	Potential triggers/motivation to adopt a more sustainable behavior.
Main Themes of discussion	<ul style="list-style-type: none"> -lack of awareness regarding sustainability issues in the fast fashion industry from consumers and specialists -marketing sustainability communications 	<ul style="list-style-type: none"> - price importance - legal regulations - sustainable targets -shop alcoholism -Romanian culture and mentality - fashion trends -necessities and possibilities -limited recycling options 	<ul style="list-style-type: none"> - more education - legal sanctions -shopping education -fashion companies responsibility vs consumer responsibility and role

Conclusions

On average, fast-fashion stores like Zara, H&M, and Nike are introducing new clothing designs in stores every three to five weeks (Hu et al, 2014). This does not only translate into a huge negative environmental impact, but also a social impact. While on a social level, we are talking about long working hours, low wages, and child labor in less developed countries, from an environmental perspective, we are looking at chemical pollution, textile waste, CO2 emissions, energy, and water use (Niinimäki et al., 2020). Authors are already talking about changing the consumer's awareness level linked to sustainable and eco-friendly fashion products as a step toward a circular economy transition in the fashion industry (Mishra et al, 2020). Nevertheless, sustainability is still not a priority for consumers in Romania when purchasing fashion items, and about half of them are unaware of the sustainability issues. As for further studies, the research can be extended to a comparative study between more countries.

Sadly, during our study, we also noticed that the consumers not working in the sustainability area had little to no environmental education. However, some of them were working in the fashion industry, and surprisingly had little to no idea about the environmental, social, and economic impact that this industry still has. Marketing communication has created this illusion that many sustainability measurements exist, and the lack of education is due to living in a developing country where the price is a big differentiator factor. Still, sustainability is not a choice or priority for them as the prices overall have increased. As for the barriers, the main ones noticed were the tendency to shop very frequently, prices, fashion trends, and legal regulations. The main drivers toward a more sustainable behavior were more education, transparency of the subject from fashion companies, self-control when shopping, legal regulations, and ways to redirect shop alcoholism to more benefic outcomes.

One of the main limitations is that qualitative studies and researchers" are often accused of reading into text, things that are not there, or are not being specific enough, making interpretations and having subjective opinions, etc" (Berger, 2018, p.28) or not choosing a representative group, therefore, a quantitative study may be further developed. In the future, it would be interesting to study the income groups other than the average, the urban vs rural area, and the differences between genders. As R4 stated: "There are more categories of consumers in Romania, we are talking about the poor people from rural areas that mainly buy second-hand products to reutilize them, then the medium income category, which does not buy by the trend but by necessity, and the high-income people that don't usually care about sustainability". Therefore, the study should be extended to these categories. We also saw a big difference between the frequency of purchases in men and women.

In conclusion, the managerial implications for countering the effect of fast fashion regarding sustainability are linked more to consumer education (Long & Nasiry, 2022), legal measurements, potential promotions, price reductions, and more awareness and communication from brands regarding these issues. Developing consumer education should not necessarily be focused on consuming less, but rather on changing the consumption patterns towards reducing waste and shifting the perspective from quantity to the quality of the item (Jung & Jin, 2016) by all means.

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SUSTAINABILITY-ORIENTED ARCHITECTURE: ADAPTIVE REUSE OF RELIGIOUS HERITAGE

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Abstract. *The growing demand for sustainable practices in all domains and the need for change in how we use resources, have been reflected recently in a larger body of research dedicated to sustainability. The construction sector is often perceived as one of the most important raw materials and waste generators consumers. Today, when reflecting on what makes a culture sustainability-oriented, we need to consider what activities the decision-makers and other stakeholders are developing into a community. Architects are among the most important stakeholders in building sustainable communities and cultures. Sustainable architecture seeks to minimize the negative impact of buildings on the environment through efficiency and low-carbon footprint materials, energy sources, and at large, all the elements of the ecosystem necessary for building development. Nowadays, many architects and constructors integrated sustainable practices into their processes, and adaptive reuse of existing buildings is such a practice, embodying some circular economy practices. The conservation of such buildings has multiple economic and environmental benefits. Within this context, religious heritage buildings hold a unique advantage for positive impact on communities when it comes to building a sustainability-oriented culture through preservation works and adaptive reuse. However, specific recommendations for the sustainable repurposing heritage religious sites derived from adaptive reuse have not yet been formulated. This study outlines positive adaptive reuse practices and opportunities for sustainable development of communities hosting old religious buildings. Currently, the literature dedicated to repurposing religious sites is scarce and does not clearly present positive circular economy practices when it comes to adaptive reuse. Through a mixed methods study of 23 papers, studies, and dissertations related to repurposing religious sites, published in the past thirty years, the research identified multiple adaptive reuse practices, positively impacting the environment and communities, and opportunities to develop sustainability-oriented communities. The findings can serve as a guide to creating a framework for the sustainable development of communities with old religious sites. This research is part of a two-stage study dedicated to opportunities and challenges in the adaptive reuse of religious heritage buildings within the context of the circular economy.*

Keywords: *adaptive reuse, heritage buildings, religious buildings, repurposing, sustainability-oriented culture, sustainable development, sustainability-oriented architecture.*

Introduction

Today, we seek to reduce the number of resources extracted and waste through sustainability-oriented strategies which we employ in various domains. The architecture and construction sectors are often seen as some of the most important raw materials and waste generators consumers. In this context, heritage religious buildings are uniquely positioned in the urban and rural landscape by embodying cultural and historic features that define communities. Preservation works to conserve such sites hold economic and environmental advantages and benefits (Arlotta, 2018).

When reflecting on what makes a culture sustainability-oriented, we need to consider what activities the decision-makers and other stakeholders are developing in the community. Architects are among the most important stakeholders in building sustainable communities and cultures. Sustainable architecture seeks to minimize the negative impact of buildings on the environment through efficiency and low-carbon footprint materials, energy sources, and all the elements of the ecosystem necessary for building development. Nowadays, many architects and constructors integrated sustainable practices into their processes, and adaptive reuse of existing buildings is such a practice, highly appreciated for embodying circular economy practices. Within this context, religious heritage buildings hold a unique advantage for positive impact on communities regarding preservation works and adaptive reuse.

This study aims to understand the practices and opportunities for sustainability-oriented architecture arising from the adaptive reuse of heritage religious sites. Romania has about 5,700 protected religious sites, under which 24 are UNESCO flagships (Future for Religious Heritage, 2021). We know that at least 150 religious heritage buildings based in the south-east Transylvania region, in Romania, are five hundred years old, and are waiting for a new purpose. We seek to validate the hypothesis that adaptive reuse techniques for religious sites employ multiple environment-beneficial practices and therefore present opportunities for growing sustainability-oriented communities, and cultures that we should study and promote. The results aim to prove that is possible to positively associate preservation and efficient waste management, opposite to preservation and waste generation, most often associated with architecture projects. No previous research has compiled a list of positive-impact practices when repurposing religious buildings and has not formulated potential opportunities to develop sustainability-oriented communities.

To serve this purpose, the authors performed a literature review of what is done in religious sites revival with adaptive reuse. Through a review of 23 papers, studies, and dissertations published in the past 30 years, the authors seek to present a picture of the opportunities for building sustainable-oriented cultures in those communities where religious sites are being repurposed. The study will also emphasize which environmentally positive practices embody circular economy practices.

The research was organized into four parts: first, the literature review establishes for the reader the status quo of research related to the adaptive reuse of religious heritage buildings. Second, the authors present the methodology employed to identify the practices and opportunities of adaptive reuse, focusing on what is being said and done, how much is being said and done, and who is part of the adaptive reuse process. Third, the authors analyze the data collected by dividing the positive-impact practices

identified into six categories and diving into each. A series of positive environmental and community impact opportunities were further identified. Last, recommendations for developing sustainability-oriented architecture repurposing projects related to religious sites were formulated.

Literature review

Resource consumption and waste generation in architecture and construction were stimulated by globalization, a linear consumption-based model. Both domains need innovative and sustainability-oriented practices, as they consume raw resources and contribute to waste creation (Arlotta, 2018; Davey, 2021). Rethinking what value is and how to seek it, and encouraging reuse is vital for waste reduction and resource depletion. To adapt to the circular economy environmental-economic factors, stakeholders such as policymakers, investors, architects, and others explore the circular economy processes and redesign buildings within a circular framework for materials use and reuse (Rose, 2019; Haroun et al., 2019).

The heritage buildings are rich in waste reduction efforts. When engaging with heritage places revival, there are a few directions to follow: preservation, which is rehabilitation to maintain a building and all the changes incurred during its lifetime, opposite restoration, which returns a building to its form at a certain time. Apart from these two directions, conservation is another practice that involves an intervention into a building's design to ensure structural integrity related to new foundations, brick repointing, and the reassembly of scattered or fractured pieces. Adaptive reuse is a process of using an old building for a new, different purpose, by changing interior design plans and new construction, and as a result, a new form and function will be integrated into the community. For example, an important characteristic is maximizing the reuse and retention of existing materials and structures (Foster, 2021; Shahi et al. 2020; Arlotta, 2018; Plevoets & Van Cleempoel, 2011). Based on these premises, adaptive reuse could support the development of more sustainable material supply chains: local renewable materials, and recirculation of existing materials (Rose, 2019; Arlotta, 2018).

In architecture, the sustainability-oriented concepts associated with the adaptive reuse approach encourage the reuse of architectural elements and materials in site preservation. However, the relationship between the concept of a sustainability-oriented economy and the reuse of architectural elements can be further developed by examining the literature connected to the existing practices in the field, and its advantages and challenges. Adaptive reuse faces multiple challenges: first, limited engagement in heritage and preservation literature has been noticed with topics connected to the circular economy (Haroun et al., 2019). Second, decision-makers lack knowledge of adaptive reuse environmental and economic benefits and are not equipped with the tools to implement these projects. Third, the recent European Union Green Deal strategy asserts the need for architecture, engineering, and construction to develop more sustainable practices to address economic and environmental challenges through better building material reuse. Fourth, designing or redesigning for the circular economy encounters multiple challenges: lack of innovative features of architectural solutions, absence of adequate standards, ineffective new business models, longer design phases, and additional costs (Kozminska, 2020). Even though the conservation of such buildings has multiple economic and environmental benefits, recommendations

for the sustainable development of heritage religious sites derived from adaptive reuse have not yet been formulated.

Methodology

The research draws from a comparative approach. The paper reviews the literature on the architectural preservation of religious heritage buildings where the adaptive reuse technique has been employed. To identify relevant literature, the researchers have collected papers and studies identified through extensive research of papers and studies where topics such as: adaptive reuse, repurposing of old buildings, religious sites, heritage sacred places, and repurposing were discussed. The inquiry was done in Web of Science, ScienceDirect, Directory of Open Access Journals, and JSTOR, Sustainability - An Open Access Journal from MDPI. The search for relevant publications was initialized with no period limits. However, after entering the keywords, the search results produced literature from 1991 to 2022. Therefore, to get insight in the scholarly literature on the adaptive reuse of religious and cultural buildings, we reviewed contemporary literature published in the past thirty years (figure 1).

As can be seen in figure 1, the most important body of literature was published within the past eight years, which may coincide with the development of the circular economy concepts and practices.

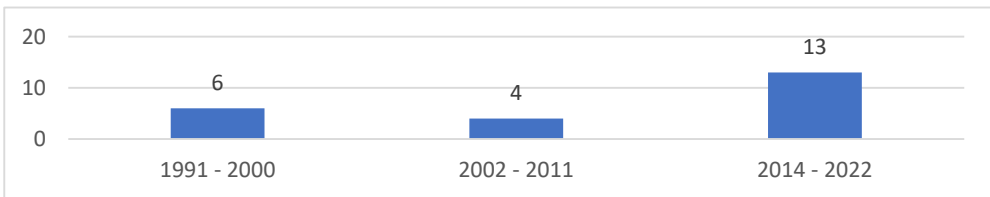


Figure 1. The body of literature related to architectural preservation of religious heritage: number of works and publishing timeline (Authors' own research)

Additional title screening, abstract, and keywords were conducted in the body of literature selected, and studies relevant to this study and objectives were selected. After the screening, a total of 23 publications met the criteria. Moreover, we made this inventory, where we characterized the literature by country of origin of the university where the researchers are affiliated, and the publishing year, to identify who is treating the subject and in which areas of the globe (table 1).

Table 1. Literature related to adaptive reuse of religious heritage (Source: Authors' own research)

Author(s)	Paper, dissertation, report title	Country of researcher(s)'s university	Year of publication
The European Network for historic places of worship	Adaptive Reuse of Fortified Churches in Transylvania: Challenges and Opportunities	Belgium	2022

Vaida, E.	Report on the restoration of historic roofs of church monuments Saxon fortifications from Transylvania	Romania	2022
Interreg Europe	Adaptive reuse of religious heritage	Europe	2021
Gholami, G., Heidari, S., Hanachi, P.	Conservation and reuse of architectural heritage, an approach based on energy efficiency	Iran	2021
Foster, G. and Saleh, R.	The Adaptive Reuse of Cultural Heritage in European Circular City Plans: A Systematic Review	Austria, Belgium	2021
Dongez, N., Manisa, H., Basdogan, S.	Tendency to Circular Economy: Reuse of Architectural Elements	Turkey	2021
Akande, O.	Improving Environmental Sustainability in Reuse of Some of England's Churches: Challenges and Options for Sustainable Practices	Nigeria	2021
Huuhka, S. and Vestergaard, I.	Building conservation and the circular economy: a theoretical consideration	Finland, Denmark	2020
Iodice, S., De Toro, P., Bosone, M.	Circular Economy and adaptive reuse of historical buildings: an analysis of the dynamics between real estate and accommodation facilities in the city of Naples (Italy)	Italy	2020
Lo Faro, A. and Miceli, A.	Sustainable Strategies for the Adaptive Reuse of Religious Heritage: A Social Opportunity	Italy	2019
Haroun, H., Bakr, A., Hasan, A.	Multi-criteria decision making for adaptive reuse of heritage buildings: Aziza Fahmy Palace, Alexandria, Egypt	Egypt	2019
Rose, C.	Systems for reuse, repurposing, and upcycling of existing building components	United Kingdom	2019
Arlotta, A.	Locating Heritage Value in the Reciprocal Relationship Between Preservation and Waste Management	United States of America	2018
Amayu, E.	New Uses for Old Churches: An Examination of the Effects of Planning Regulations on the Adaptive Reuse of Church Buildings	Canada	2014
Lueg, R.	Approaches to the Adaptive Reuse of Churches in Germany and the United States	United States of America	2011
Ahn, Y.	Adaptive reuse of abandoned historic churches: building type and public perception	United States of America	2007
Park, SC.	Respecting Significance and Keeping Integrity: Approaches to Rehabilitation	United States of America	2006
Douglas, D.	Building Adaptation	United Kingdom	2002
Latham, D.	Creative Re-use of Buildings	United Kingdom	2000

Sharp, D.	Modern Architecture's Place in the City: Divergent Approaches to the Historical Core	United Kingdom	1998
Byard, PS.	The Architecture of Additions	United States of America	1998
Murtaugh, W.	Keeping Time: The History and Theory of Preservation in America	United States of America	1997
Denslagen, W.	Architectural Restoration in Western Europe: Controversy and Continuity	the Netherlands	1994
Robert, P.	Adaptations: New Uses for Old Buildings	United States of America	1991

Most of the literature resources have origin in Europe, followed by the United States and the United Kingdom, Egypt, Iran, and Canada. Moreover, this characterization points out the geographical areas where adaptive reuse is not being discussed yet: Latin America, Australia, and Asia. Each source in table 1 was read by both researchers, followed by a classification of the data from each source, mainly the researchers retained the positive practices of adaptive reuse related to the impact on the environment and people considered as opportunities for sustainable growth. The data was roughly introduced in an excel file, as it was presented in each piece of the body of literature selected. After a second reading of the data collected, sub-categories emerged, and the researchers continued to rearrange the data into sub-categories according to what was specifically said.

In terms of positive practices, six sub-categories were identified (figure 2) and further analyzed.



Figure 2. Practices identified for adaptive reuse of heritage buildings: division into sub-categories (Authors' own research)

Results and discussion

When looking into positive practices related to adaptive reuse, the choice of location for the religious site where adaptive reuse was done, was given to buildings located in popular, safe, tourists-preferred areas. So, in areas perceived as travel destinations, repurposing the religious site for a new function to serve the tourists (table 2) was a clear choice. Moreover, functional infrastructure is an important factor when making the choice to repurpose an old religious site.

Table 2. Adaptive reuse of religious heritage practices: location, function and form, standards
(Source: Authors' own research)

Areas of concern	Practices	Literature
Choice of location	monuments located in popular and safe travel destinations for foreign and domestic tourists;	The European Network for historic places to worship (2022);
	infrastructure in place (roads, electricity, gas, water, sewage, healthcare services, schools, telephone reception and internet);	The European Network for historic places to worship (2022);
Function and form	community centre, charitable uses - most preferable, civic roles, recreational uses, commercial uses, and residential use; university campus; order defined by the extent of a church's association with the public as well as its original spatial characteristic; mountaineering facilities and restaurants;	Latham (2000); Douglas (2002); Lueg (2011); Interreg Europe (2021); Ahn (2007);
Standards for rehabilitation	minimal alteration and compatible use as ways to keep the integrity; architectural integrity: style, workmanship, setting or location, materials, building type or function, and continuity; the original integrity should not be impaired when new additions;	Ahn (2007); Murtagh (1997);
	preservation of the building's distinctive architectural styles;	Ahn (2007);
	the examination of historic properties (e.g. significant materials, cultural characters, time periods, and physical features and conditions) is part of the decision-making process;	Park (2006);

When readapting the function of a religious site, it has noted in the literature that the new functions preferred are community center, charitable enterprise, a civic function,

or recreational use, commercial use, residential use, university campus, or mountaineering facilities and restaurants (table 2).

In terms of standards for rehabilitation, the literature sources have mentioned several opportunities concerning the development of standards so these can support minimal changes so that the integrity and originality of the building should not be altered (table 2): preserving the architectural integrity of the site, of the building's style. Some recommendations are as follows: original integrity should not be impaired with new additions, and the examination of historic properties should be part of the decision-making process.

Stakeholders are key for generating opportunities for the adaptive reuse of religious heritage buildings. The literature review related to stakeholders connected to the topic, allowed us to conclude that stakeholders want, within the process of adaptive reuse, to minimize the material use and energy waste, to employ old techniques with the support of local manufacturers with positive effects on the local economy (table 3).

Table 3. Adaptive reuse of religious heritage practices: stakeholders and incentives (Source: Authors' own research)

Areas of concern	Practices	Literature
Stakeholders	the minimization of material use and energy waste; produce missing materials using the old techniques with local manufacturers, support the local economy;	The European Network for historic places to worship (2022); Interreg Europe (2021); Vaida (2022);
	common collaborative living and working; engaging local entrepreneurs in the design of the new uses of the fortified churches (using local and regional craftspeople for the furnishings, amenities and décor of the apartments;	The European Network for historic places to worship (2022); Arlotta (2018);
	municipality influence and support adaptive reuse (Responsibility for changing the buildings' function in the zoning plan, keeping a digital database of heritage sites, providing financial support;	Interreg Europe (2021);
Incentives	Tax reductions;	Lueg (2011); Arlotta (2018);

Moreover, we have observed that there are opportunities of involving local entrepreneurs in rethinking and design of the new scope through adaptive reuse. It is important to include the municipalities in the process since they have the responsibility and means to change the zoning plan and even provide financial support (table 3). As for incentive opportunities, it has been mentioned that tax cuts can contribute to adaptive reuse.

With the adaptive reuse concept, preserving religious heritage buildings is pulling the circular economy practices to light (table 4). The opportunity to align to circular economy practices is given by reusing various materials and natural processes adapted to serve the new building scope. Minimal interventions and efficient, green processes are recommended: natural ventilation solutions, environmentally friendly wastewater management, energy-saving solutions, and campaigns targeting the building users (table 4).

Table 4. Adaptive reuse of religious heritage practices: circular economy practices (Source: Authors' own research)

Areas of concern	Opportunities	Literature
Design: circular economy practices	designing a non-conflicting and non-invasive use;	The European Network for historic places to worship (2022);
	the use of traditional materials, reused materials, natural ventilation solutions, environmentally friendly wastewater management, minimal intervention on the natural landscape, etc;	The European Network for historic places to worship (2022); Interreg Europe (2021); Lo Faro and Miceli (2019); Arlotta (2018);
	actively engage users and visitors in an energy saving campaign, introduce energy management systems and making building services such as heating and lighting more efficient;	Akande (2019);
	Integrating building management systems into any proposed retrofitting projects (monitoring and controlling the heating, cooling and lighting systems as well as ventilation systems); movement or occupancy sensors as part of a wider building management system; behavioral change of the users should be targeted by making real time information about energy use available; employees energy behavior change (training); on-site energy from renewable (e.g. air-source heat pumps, ground source heat pumps, biomass boilers, etc.); the professionals involved in heritage buildings retrofitting projects, such as architects, installation engineers, building surveyors etc., should include services such as analysis of whole life costs and carbon savings in services they provide to support the justification of the investment	Akande (2019);

	keep old materials in use and produce the needed materials with local manufacturers who ancient techniques	Vaida (2022);
	all types of approach require a respect for the existing fabric and a “cautious approach of changing as much as necessary but as little as possible”	Lueg. (2011);
	reusing existing buildings is already becoming economically attractive due to the optimization	Lo Faro and Miceli (2019);

An important focus is put on developing solutions for efficient building management solutions. To conclude, reusing existing buildings is part of circular economy practices (Lo Faro and Miceli, 2019). Nowadays, the acceleration of urbanization and the increase in building production and utilization, has accelerated gas emissions which have increased by 45% in the past thirty years (Ahmed Ali et al., 2020).

Last, a list of opportunities (figure 3) for sustainability-oriented activities can be derived from positive practices in adaptive reuse.

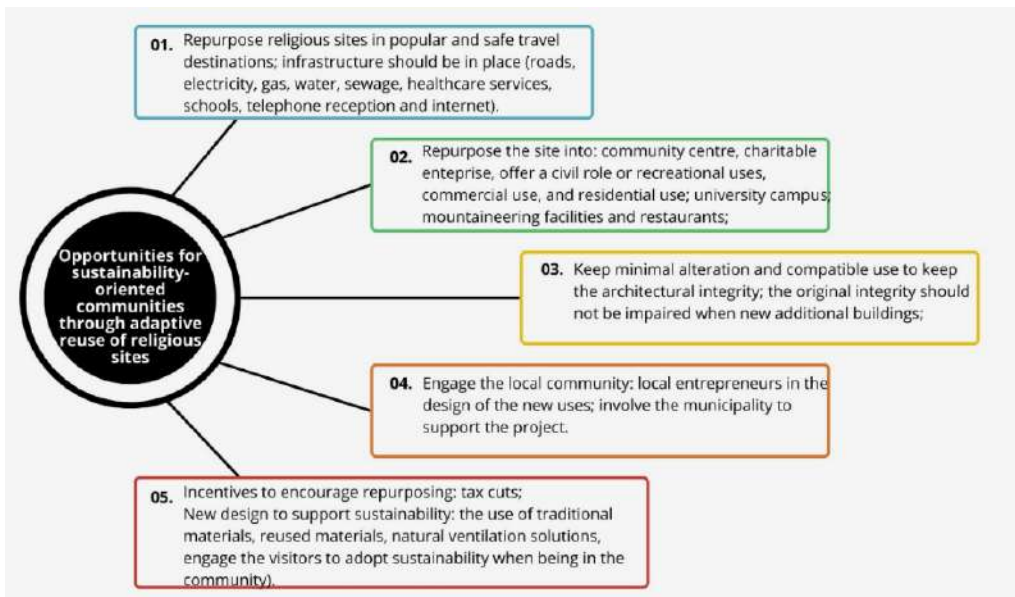


Figure 3. Opportunities for sustainability-oriented communities through adaptive reuse of religious sites (Authors’ own research)

The authors conclude that in practice, we have already validated activities from adaptive reuse which positively impact the environment and, therefore, within the communities where these projects are hosted.

Conclusions and recommendations

Many papers recognize that adaptive reuse of religious heritage presents challenges and opportunities. In this paper, we discuss only the environmentally positive practices with adaptive reuse, with the aim to formulate a list of opportunities related to repurposing heritage buildings, which should be followed to stimulate the creation of sustainability-oriented communities. To sum up, stakeholders from a community hosting a heritage religious site should pay attention to a few subjects when repurposing old religious buildings: the choice of location, what the new function given through repurposing, how is new design corroborated with the new function, and architectural features, how to engage stakeholders to benefit the project and what incentives to offer to stimulate sustainability-oriented results.

This study is not without limitations; thus, the limitations concern the number of papers and studies analyzed, and the databases investigated for data collection. Second, 22 of the 23 documents analyzed were published in English, and one in Romanian. There might exist some publications in the field of adaptive reuse outside the English language which, if identified and considered, could contribute to the research's perspective.

Future research directions should investigate circular economy policy instruments set out in the European Green Deal, the European Union's framework for a circular economy for religious site preservation. The authors recommend expanding the body of knowledge for further analysis by including all literature on adaptive reuse, not only adaptive reuse for religious sites, to identify an expanded list of positive practices related to sustainability-oriented buildings and communities. However, the study presents a detailed methodology for the selected documents.

Developing a framework for sustainability-oriented communities based on sustainability-oriented architecture is necessary for this age where efficiency and reuse are key for developing sustainability-oriented communities and cultures.

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PLANNING SMART CITIES FOR URBAN FUTURE

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Abstract. *Cities are rethinking future urban development, adopting a smart vision for urban growth, and improving citizens' quality of life. Following a smart approach to urban development, cities are designing and planning a smart community to transform the city favorably. Investing in the smart city helps to identify a sustainability-oriented pathway, addressing and developing smart and intelligent solutions to urban problems that rely on information technology as a source that enables cities to develop innovative processes and drive sustainable urban growth. Romanian and Italian cities are adopting a smart vision for the urban future, developing collaborative frameworks to drive innovation in services and knowledge to support urban development. Smart city projects and visions are necessary means to drive the pathway leading to smart and sustainable development that is still in the initial stage. A smart city view helps to support urban change and innovation.*

Keywords: *smart city, urban sustainability, smart city projects, smart communities.*

Introduction

Cities of the future are rethinking a smart vision for urban change and growth, developing and implementing smart city projects. A smart city view should enable the city to improve the quality of life of people living within sustainable urban communities.

Smart city-based development is emerging as a potential model for cities within the information and knowledge era (Yigitcanlar, 2015). Making a smart city without embracing a smart vision leading to sustainable urban development is not simple (Neirotti et al., 2014).

While designing a smart approach to urban development is well documented in the literature, few studies elucidate how cities develop the smart city as a project for urban community development, combining social, economic, institutional, technological, and environmental aspects (Camboin et al., 2019).

The aim of this study is to elucidate how Romanian and Italian cities are rethinking the future of urban communities, embracing smartness as a project-oriented vision for urban growth. Cities are rethinking a smart and project-oriented approach (Gil-Garcia, Nam, and Pardo, 2015). Smart cities rely on using information technology to improve human capital and increase urban sustainability and the future (Angelidou, 2016), and

optimize all city functions (Baltac, 2019) in order to support local growth (Bătăgan, 2012). Smart city projects and vision help construct a people-centered approach to urban development. Building smart cities involve promoting urban governance and bringing together human collaboration and technological systems (Meijer et al., 2016). Cities aim to achieve sustainable development by using information technology to support urban growth, knowledge, and an innovation-led economy, improving living conditions for citizens (Angelidou, 2015; Bătăgan, 2011).

Smart city initiatives help explore future scenarios of contemporary cities (Andreani, Kalchschmidt, Pinto, and Sayegh, 2019), fostering urban innovation through multi-level public-private partnerships and cooperation (European Commission, 2017).

A smart city project is an effective urban management model to help cities progress toward long-term urban development (Yigitcanlar, 2015). Cities plan a smart future, promoting the smart city and community projects (Camboin et al., 2019). Cities design a pathway to design organizational processes that enable cities to evolve as smart-driven inclusive urban communities (Kummitha & Crutzen, 2017; Ahad et al., 2020).

The paper is structured in the following way. After an introduction, understanding smart and sustainable cities for driving urban development is presented in the second section. In the third section, smart city projects and strategies aim to shape the urban future. In the fourth section, the issues of Florence's smart city planning and Brasov's smart city projects are described in order to define a future-oriented landscape. Finally, the discussion and conclusions are outlined.

Smart cities as drivers of sustainable urban human development

Cities embrace a smart vision to rethink and plan urban futures, providing human capital development to foster knowledge and creativity to improve citizens' and communities' quality of life (Camboin et al., 2019). Smart cities contribute to socio-technical urban development (Gil-Garcia et al., 2015). Smart cities promise the ideal future for urban communities and support sustainability-oriented pathways that open up to knowledge and innovation (Angelidou, 2015; Angelidou, 2016). Smart city solutions as a conscious choice help to support sustainable urban development (Bătăgan, 2011; Alberti & Susskind, 1996).

Community, technology, and policy drive smart cities, enabling productivity, sustainability, well-being, and liveability (Yigitcanlar *et al.*, 2018). A smart city view shapes guidelines for transforming the city, stressing the human features of city life (D'Auria et al., 2019). Cities promote smartness as a vision that enables the city to modernize urban services and infrastructures (Giffinger *et al.*, 2007), shaping a smart change-driven community (Deakin, 2014). Sustaining smart growth relies on designing smart cities and communities promoting innovation processes (European Commission, 2012), enabling the city to develop the potential of their knowledge sources to drive sustainable urban development (Knight, 1995). Smart city solutions support community innovation and improve urban functions and contexts (Allwinckle and Cruickshank, 2011; Stratigea, 2015).

Technology helps cities as social systems to improve the quality of life and contribute to sustainable development (Bătăgan, 2011). A smart city strategy combines global trends

and local aspects related to local culture and citizen involvement (Dameri et al., 2019). Cities adopt a smart strategy for engendering continuous urban development (Nam and Pardo, 2011a). According to Gil-Garcia et al. (2016) «a smart city should be seen as a continuum in which local government officials, citizens, and other stakeholders could think about the initiatives that attempt to make the city a better place to live» (p. 5). In particular, smart cities develop innovation, technology, and knowledge to promote effective services and growth policies (Komninos, 2013; Paskaleva, 2011).

Cities follow a smart approach to shape collaborative processes between people, business, and governments within urban communities as organizational spaces that enable urban public value and innovation by involving all the urban stakeholders (Hollands, 2008; Paskaleva, 2011). Cities select a smart approach using the potential of information technology in order to enhance systems, services, and capabilities in an organic network (Albino et al., 2015).

Smart cities contribute to sustainable innovation (Cocchia, 2014), enabling the urban stakeholders. Smart cities ensure technological excellence and provide a better urban space for a sustainable economy and society (Yigitcanlar, 2015). Developing a smart city vision relies on long-term urban planning and helps design truly smart cities and communities that improve the quality of life, promoting urban innovation in management, governance, and policy (Yigitcanlar et al. 2018, Chang et al., 2018; Nam & Pardo, 2011b).

Driving cities of the future through smart city projects

It is difficult to rethink the city as a smart community becoming smart without considering a planning and project view of urban design and strategy. Designing a smart city relies on a long-term process that concerns local contexts and views of urban sustainability (Ibrahim et al., 2017).

Cities need to have a long-term mindset to make a smart city (Camboin et al., 2019), following a project-driven view to transforming the city in favorable ways for supporting initiatives of urban sustainability (Eger, 2005), shaping inclusive urban communities (Osborne et al., 2013), developing the city's technological potential to support urban innovation and growth (Kollar et al., 2018).

Smart and community city projects challenge the ideas and visions of urban development (Baltac, 2019), by enhancing both collaborative and organizational dimensions of the city of the future (Camboin et al., 2019).

Smart city projects train the cities to identify a smart-oriented pathway, mobilizing the urban stakeholders to develop human-centered, collaborative, and technology-enabled processes for urban innovation (Angelidou, 2014; Andreani et al., 2019).

Developing smart city projects helps support smart urban innovation and entrepreneurial ecosystems (Ardito et al., 2019), enabling the citizens as key stakeholders and drivers of urban growth (Engelbert et al., 2019), and placing the city as a smart and inclusive community that drives urban regeneration and development (Allam & Newman, 2018). Smart cities and communities empower citizens and urban

stakeholders to promote social and technological advancements (Kummitha & Crutzen, 2017).

The role of technology is to support user-driven innovation, and collaborative and citizen-centered projects (Schaffers et al., 2011). Cities become smart communities improving some urban areas (Angelidou, 2014). Designing a smart strategy relies on technological infrastructures and connectivity platforms for new digital services and systems (European Economic & Social Committee, 2015). A smart city strategy relies on promoting technological and social innovations and infrastructures to improve urban quality of life sustainably (Angelidou, 2016; Bifulco et al., 2016). Citizens' quality of life is the main issue of smart cities and communities. Planning human and intelligence-driven smart cities relies on some elements: technological advancements, knowledge, and innovation networks (Angelidou, 2015). Smart city strategies tend to enhance the role of information technology in advancing knowledge transfer and innovation processes, failing to stress both bottom-up vision and citizen awareness (Angelidou, 2017). Driving smart city projects helps cities to face urban uncertainty and complexity, developing urban innovation for improving urban environments, following an integrated public and private governance (Meijer & Thaens, 2018, Camboin et al., 2019).

Methodological section

The study employed a qualitative, descriptive, and exploratory methodology to analyze how cities rethink their future development as inclusive, smart, sustainable communities. While cities are planning to transform urban environments into smart cities as an urban policy priority, they are rediscovering the smart city as an inclusive community. Some European smart strategy frameworks are reported and described below. Within European documents and reports, the need to drive sustainable growth relies on cities developing information technology to build smart, inclusive, and sustainable cities and communities as engines of urban innovation and socially inclusive growth. The study focuses on two case studies, Florence and Brasov, which refer to cities rethinking their urban future and redesigning the urban development planning by adopting a smart strategy to drive the city as a sustainable urban community. The cities' sample was selected by considering how certain historically and culturally different European cities address smart urban development. Two smart cities and their development planning for the urban future were selected to make illustrative and exploratory examples concerning a smart and human-driven framework to improve urban competitiveness, quality of life, and prosperity of urban communities. The study follows a multiple-case study methodology (Yin, 2009). The research methods involved case selection and data collection from policy documents in order to investigate how some European cities are rethinking and planning their urban future development. A descriptive case study research was employed to qualitatively analyze the smart city strategy adopted by municipalities (Angelidou, 2017; Angelidou, 2014; Mora & Bolici, 2017; Sancino & Hudson, 2020). Investigating strategic choices regarding smart city strategy design helps understand the pathway cities follow in building their urban future (Angelidou, 2014).

Promoting smart city projects and view for sustainable future and urban growth

Planning Florence as a smart inclusive and integrated city

In the document *Firenze Smart City Plan (2015)*, the city of the future is will be a smart, intelligent, and sustainable community that answers to contemporary and future challenges to urban growth, by identifying cooperative and collaborative frameworks for urban governance, thus shaping a smart and sustainable future. The city of the future is a smart community that supports technological and social infrastructures to ensure a high quality of life within urban environments, putting the citizen first, and searching for inclusive spaces of collaboration, dialogue, and co-design that involve all urban stakeholders.

In the *Firenze Smart City Plan*, cities are living organisms made of people within the context of urban transformation through intelligent communities. Citizens play a proactive role in identifying the pathway of urban development by improving the quality of life for citizens living in an urban metropolitan environment. In particular, planning a smart urban vision helps the city as a community of people create meanings and produce culture, supporting creativity and thinking by putting the people as the first drivers of civil and social growth.

Promoting Smartness relies on using technology to make more innovative and sustainable cities. A smart city is changing and constructing new social, urban, and economic responses to environmental and historical pressures, reinforcing social relationships within the urban community. A smart city strategy develops an open innovation view to ensure the stakeholders' involvement by embracing the four *Is*.

A smart city master plan helps the city to drive continuous urban innovation, promoting the *integration* of competencies and background in charge of a municipality, *innovation* by developing innovative services, the *involvement* of stakeholders to identify a long-term vision, and providing *information* as a way to reinforce the relationships between municipality and citizens. The smart city plan is an open space for debate, confrontation, and exchange of information and knowledge among all urban stakeholders who contribute to urban, social, and economic development.

Planning the future of a Romanian smart city. Brasov

In Romania, a smart city is still planning for the future and is not yet implemented in reality. Smart city design is still in its infancy stage. Romanian cities are still in the first step of social and technological evolution and innovation (Bătăgan, 2012). Romanian cities believe in embracing a smart approach to promote the urban development of communities. Smart and intelligent solutions help cities to go into the future.

Technology's use has three possibilities for smart city implementation (Bătăgan, 2012): the use of facilities, and open data in areas that individuals have identified as basic (administration, education, health, and transport). This variant is aimed at an integrated operations center. This can facilitate access and sharing of information, coordinate city resources, and predict and solve problems faster. The use of efficient solutions for producing electricity using wind power and photovoltaic solar panels capture solar energy, free energy, clean and green. In this variant, monitoring and reducing carbon dioxide emissions and the efficient use of natural resources are important results. The

investments are made in a number of elements that create a high standard of quality of life for citizens and visitors, and tourist areas - parks, museums, and historical centers.

Brasov's smart city view develops the city as a social ecosystem by using the potential of information technology and focusing on community development. Smart governance's aim is realized in the future of high-efficiency services, a leadership community, using a wide range of mobile applications, and continuous evolution through innovation. Smart governance involves the use of technologies for streamlining decision-making and administrative processes. The "Smart City" strategy must be adopted in the context of an ecosystem, by a partnership that includes citizens, the business environment, organizations, and public authorities, which must share a common vision, starting from the community's needs and its active participation. A "Smart City" is a city that uses society's technological tools to provide community services at higher standards, for the benefit of its inhabitants - a "system of systems" operating in an integrated way.

Brasov smart city – projects concern: smart lighting; municipal Wi-Fi network; Intelligent public transport system: e-ticketing; Public safety: video surveillance in the municipality and educational institutes; Integrated technical dispatch; Geographic information system. SMART strategies concern: sustainable development strategy; integrated urban development strategy; sustainable Development Strategy 2030; sustainable urban mobility plan; an action plan for sustainable energy 2010 – 2020.

E-Administrative services concern: electronic portal services; geoportal; CRM platform; the e-learning platform. Smart lighting. Brasov Smart city – public illumination - inteliLIGHT®. There were installed 11500 lighting poles with 200 transformation posts. Their advantages are: rapid intervention. Announce any dysfunction by issuing app warning alarms; streamlining the intervention in the case of a dysfunction; monitoring and controlling from a distance.

Future projects concern: the purchase of 238 modern means of transport (buses); the construction of a Park & Ride; the creation of an integrated infrastructure for cycling and pedestrian traffic; the realization of special lanes dedicated to public transport in the entire city; Brasov Railway Station transport terminal; extend the Electric vehicle charging system in the entire city.

Conclusions

Driving smart city projects rely on a long-term horizon to support initiatives that open up to urban change. Promoting smart city projects helps identify potential urban development trajectories for social growth. Building smart, inclusive, and sustainable cities and communities rely on planning and developing technological and social innovations within urban spaces.

Florence's smart city planning focuses on the potential of information technology to improve the information needs of urban stakeholders and ensure integration within the urban community, to support citizen and community involvement to drive urban innovation. Developing smart inclusive cities relies on fostering stakeholders' participation and engagement, thereby shaping an inclusive urban community. Smart inclusive cities bring together integration, innovation, involvement, and information.

Technology enables citizens and the community to participate in processes that drive urban value creation, innovation, and sustainability.

In Romania, the smart approach helps modernize urban spaces and environments to improve citizens' quality of life. A smart strategy design is still in its infancy age. In particular, rethinking a smart city vision relies on promoting a top-down and techno-centric orientation that fails in driving social and economic urban growth. A smart city view should contribute to building urban intelligence and inclusive and sustainable communities, opening up to participatory and collaborative-oriented frameworks between city governments and urban stakeholders.

Cities are experimenting with new ways to develop urban innovation in services and functionalities. Following a smart urban development cities redesign urban planning coherently with a long-term horizon within livable urban environments.

Limitations emerge in the study. The Romanian case study shows how smart solutions help drive urban growth and development. This study sheds light on cities that aim to plan a smart-driven urban future. Further research would focus on smart city projects that enable both citizen participation and social innovation as issues of smart city strategies that open up smart urban environments as collaborative and organizational spaces for urban value creation and innovation.

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MUSEUMS AS COMMUNITIES DRIVING INNOVATION BY TECHNOLOGY

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Abstract. Museums drive innovation in services and processes through information technology within social and cultural ecosystems. Museums develop innovation using information technology to foster audience involvement and user participation, enabling museum professionals as user-centered mediators to build a bridge between information and knowledge. As innovation-led organizations contribute to knowledge and value creation, strengthening technology, organization, and human resources, museums engage users and audiences, leading to social and public innovation within social and cultural ecosystems.

Keywords: *museums, innovation, information technology, user participation.*

Introduction

As production-centered, intensive-information, and knowledge-oriented organizations, museums collect, preserve, research and display cultural heritage, connecting the past with the present (Marty, 2007a; Freedman, 2000; Gilmore & Rentschler, 2002; Bonacini, 2012). Museums are using the potential offered by information technology in order to drive innovation for value creation to achieve the traditional mission of education, knowledge, and culture dissemination (Vicente, Camarero, and Garrido, 2012), promoting audience involvement for cultural heritage knowledge and innovation (Kelly, 2010; Schweibenz, 2011; Bakhshi & Throsby, 2010).

Museum is emerging as a community that strengthens the relationships with audiences as a source of information, knowledge sharing, and creation within cultural ecosystems (Borin & Donato, 2015).

Museums develop technological innovation in order to increase organizational performances and achieve cultural and social objectives (Camarero & Garrido, 2008), driving value co-creation processes (Antòn et al., 2018), and following an audience-centered orientation (Consiglio et al., 2017).

Visitor orientation helps to foster technological innovation within museums (Camarero & Garrido, 2012). Museums contribute to constructing service experiences, enabling the audience to actively contribute to the definition of cultural heritage contents, strengthening the relationships between technology, the public, and the museum as an innovation-driven organization (Schweibenz, 2011; Camarero & Garrido, 2011; Garrido & Camarero, 2010; Camarero et al., 2015).

As agents and spaces of social and cultural innovation (Castells, 2001), museums develop user-led innovation, strengthening the cultural participation of users in creating and sharing museum content and knowledge (Russo, 2011). Innovation helps engage the audience, and develop and improve the organization, business model, and management (Bakhshi & Throsby, 2010) even if a clear definition of what innovation is is lacking.

This study helps identify the trajectories that museums are following, using the potential offered by information technology to drive innovation by involving the audiences as users in cultural heritage and developing the museum as a community. In transitioning from being custodial and collections-driven institutions to becoming audience- and cultural heritage production-oriented institutions, museums contribute to a social, economic, cultural, and public value within cultural ecosystems (Borin & Donato, 2015; Freedman, 2000; Gilmore & Rentschler, 2002; Bonacini, 2012).

Museums contribute to developing and sharing knowledge and information about heritage within cultural ecosystems (Borin & Donato, 2015). Technologies help museums to build a shared authority with the active audience on cultural heritage contents definition. Museums develop technologies to encourage user participation, involving potential visitors to take part in the production and value creation regarding cultural heritage (Anderson, 1999). Museums embrace technology to cede authority, enabling staff and users to develop interactive-collaborative processes for knowledge transfer and information sharing (Kelly, 2010; Schweibenz, 2011).

The study is structured in seven sections. Following the introduction and methodological section, in the third section museums emerge as communities. The fourth section elucidates how museums drive innovation by using the potential offered by technology to involve the users to contribute to cultural knowledge issues. In the fifth section, technologies drive museums to develop innovation: technology enables museum professionals to deal with information and knowledge as advocates and user-centered mediators. Technology helps museums to develop a shared authority on cultural heritage with the public. Finally, the discussion and conclusions are outlined.

Methodological section

This study aims only to provide an interpretive and qualitative framework. The research is based on archival and qualitative considering the literature related to the role of the Internet, and virtual and interactive technologies as a means that enables museums to contribute to driving innovation for creating social and cultural value by opening up to increasing user involvement and participation in the definition of cultural heritage contents. The analysis tends to elucidate how museums support and drive innovation by using the potential offered by information and digital technology as applied in the cultural heritage field. Referred journal articles were selected from *Google scholar* as the main web source and database. The selected contributions are summarized and interpreted (Denyer and Tranfield, 2006) in a narrative synthesis that accommodates differences between the questions, research design, and the context of the studies to develop new perspectives on emerging issues and advance theoretical models (Dixon-Woods et al., 2004).

Museums as communities that deal with information and knowledge

Museums are memory institutions and information-driven utilities (Bagdadli, 1997; MacDonald & Alford, 1991; Marty, 2007a). As a community of stakeholders and knowledge municipality, the museum legitimizes processes of information and knowledge acquisition, creation, and dissemination (MacDonald & Alford, 1991; Marty, 2007b; Freedman, 2000). Museums acquire, conserve, research, communicate and exhibit for study, education, and enjoyment, serving society (ICOM, 2004), enabling knowledge and critical reflection on the past (Hooper-Greenhill, 1995).

Museums drive innovation to rethink the museum as an audience-oriented, knowledge-oriented, and information-based institution. Museums play a social role for citizens, truth, and rights (Knell, 2019). Museums support social and public value creation because they contribute to an enlightened society. They contribute to social capital and value for society, driving visitors to assume informed behaviors in an increasingly globalized world (Burton & Scott, 2007; Kelly, 2006).

Museums increasingly involve visitors and communities in many ways, fostering participation and involvement in cultural projects (Simon, 2010), promoting future and sustainable development engaging the public within communities (Crooke, 2007). The audience is an active agent influencing how museums act and represent what a museum examines (Karp, 1992). As a community space, museums promote technological and organizational innovation (Camarero & Garrido, 2012). Museums contribute to building social capital within a community whereas museums and users share the same interests and goals (Rounds, 2012).

Museums of the future contribute to empowering local communities (Greffet et al., 2017), strengthening relations and exchanges within social and cultural ecosystems (Sabiescu and Charatzopoulou, 2018), building partnerships, and involving the audience (Scott, 2006). As knowledge-oriented and information-driven organizations, museums open up to flexible and multiple interpretations of knowledge and understanding, rediscovering constantly meanings when the truth is dependent on context (Davies, Paton, and O'Sullivan, 2013).

Museums use the information as what can be communicated to people and knowledge as the result of the interaction (Orna & Pettit, 2010). As information-based organizations, museums contribute to creating information and knowledge (Bagdadli, 1997; MacDonald & Alford, 1991; Marty, 2007a; Freedman, 2000), providing new and authentic knowledge cultural knowledge education to their audience (Russo & Watkins, 2007).

Museums driving innovation by information technology

Innovation is a key source that helps drive museums towards strategic and organizational changes for value creation (Camarero & Garrido, 2012). Innovation supports the value chain within cultural organizations, strengthening interaction and communication among providers and users of cultural services (Bakhshi & Throsby, 2010). Innovation refers to new systems, technologies, and processes that change the museum's relationship with visitors and communities. (Vicente et al, 2015).

Museums contribute to democratizing knowledge about cultural heritage contents, driving user and community innovation within cultural ecosystems (Von Hippel, 2005; Bautista, 2014), and engaging the audience as an active agent influencing how museums act and represent meanings and understanding (Kelly, 2010; Schweibenz, 2011; Russo and Watkins, 2007). Museums develop innovation by adopting a technology-driven, visitor-oriented, and organization-based view to change and value-creation processes (Vicente et al, 2012).

Museums tend to promote innovation, creating a new public sphere of knowledge, innovation, and learning (Weibel, 2018), engaging with a working audience to support innovation-driven and value-creation-oriented processes (Balogun, Best & Lê, 2015), and communication (Hooper-Greenhill, 2007).

Museums develop technological innovation in services or production processes to achieve cultural and social objectives, support visitor orientation (Camarero, Garrido, and Vicente, 2011) and increase organizational performance (Camarero & Garrido, 2012; Camarero & Garrido, 2008), promoting value co-creation processes (Antòn et al, 2018), and improving social and financial performances (Garrido & Camarero, 2010).

As social agents of change and spaces of cultural innovation (Castells, 2001), museums engage and involve the public in defining cultural heritage contents and creation (Antòn et al, 2018). Museums promote innovation, engaging the public and encouraging the building of partnerships within the community (Søndergaard & Veirum, 2012), achieving social or economic purposes, using processes and techniques (Holden, 2006). Museums achieve a positive impact with regard to the relationships with the audience, by adopting digital technology applications and innovative services (Tsaih et al, 2014).

Driving innovation by promoting a 'shared authority' on cultural heritage

The advent of information technology helped museums to drive innovation in providing information sources accessible to users (MacDonald & Alsford, 1991). Technology helps museums to redefine cultural authority within a changing society, opening up to user participation and partnership with an audience, driving the visitor as an active participant in knowledge creation (Mancini & Carreras, 2010; Bautista, 2014), empowering the museum visitors as producers of knowledge and active contributors in value creation processes (Schweibenz, 2011; Simon, 2010; Scott, 2010).

Museums promote innovation by developing the potential of technology, sharing authority on cultural heritage, and enabling staff and users to develop cultural experiences and interactive-collaborative processes that rely on knowledge transfer and information sharing within the museum community. In embracing interactive technologies, museums are changing moving from being consumption-centered/custodial and collection-driven institutions to becoming increasingly production-centered/audience-driven institutions that support bidirectional-participatory, dialogic interaction and bottom-up communication (Gilmore & Rentschler, 2002; Bonacini, 2012; Capriotti & Kuklinski, 2012).

Technology helps museums drive innovation by democratizing knowledge in the cultural heritage field. Engaging the public helps support the museum as a knowledge-oriented community. Museums contribute to innovation by encouraging dialogue and

conversations through information technology by strengthening user involvement and audience participation.

Technology helps provide an emotional space by empowering visitors to re-understand the objects (Bearman & Gebra, 2008). Museums construct a *shared authority* on cultural heritage contents involving the audience, and ceding authority by developing the potential of interactive technology and sustaining a two-way communication with visitors, driving the active participation of users as producers of knowledge (Kelly, 2010; Schweibenz, 2011; Russo et al., 2008).

In particular, information technology helps museums enhance the importance of sharing authority with the audience on cultural heritage knowledge by encouraging active participation and sustaining visitors' learning experience (Hazan, 2007).

Museums build social capital and awareness about cultural heritage and community development, leading toward a shared authority between the museum and the public (Schweibenz, 2011; MacDonald & Alford, 1991).

As a platform for creating culture and knowledge, museums use virtual and digital technologies to support the interaction and communication between the visitor and museum information and knowledge sources (Styliani et al., 2009).

Virtual environments enable cultural institutions to involve the audience in cultural production by interacting with digital objects (Carrozzino and Bergamasco, 2010). Web applications contribute to interactive information sharing and user-centered design and collaboration, leading to a shared authority between staff and communities experimenting with user-led cultural content generation, focusing on the value of the museum community (Kelly, 2010; Schweibenz, 2011).

Museum professionals as user-centered mediators

Museums develop the potential offered by information and communication technologies to enable museum professionals to meet changing user needs (Marty, 1999). Technology is enabling museums to become a key source for information acquisition. In particular, information technology has redefined the museum's role as an environment where information professionals must manage knowledge (Marty, 2007a). Technologies enable museums as knowledge and intensive information organizations that contribute to creating new knowledge about cultural heritage (Freedman, 2000; Marty, 2007b).

Museum professionals are acting as user-centered mediators meeting the needs of visitors. New advanced technology and museum informatics enable museum information professionals to act as user-centered mediators that help design and implement interactions between museums and users, making information resources available and meeting the information needs and coherently responding to expectations of museum information resource users (Marty, 1999; Marty, 2007b).

Technologies enable museum information professionals to develop new methods of information organizing and accessing collections in order to generate new knowledge for their audience (Marty, 2007a; Freedman, 2000). As repositories of knowledge and service-oriented information organizations, museums improve the organizational processes, strengthening the work and skills of museum professionals as curators and

educators, and encouraging collaboration among museum professionals and museum users (Marty, 2011).

The Internet and interactive technologies enable museums as information-based organizations (Marty, 2006; Marty, 2007b), leading museum professionals to use information technology to meet and support the changing needs and expectations of visitors, improving the museum experience for users by focusing on digitization technologies, information policy, and collaboration initiatives (Marty, 2011).

Technology is leading museum professionals to develop new capabilities and take the advantage of new capabilities. Technology helps museum professionals to serve as user-centered mediators, enabling the users as active participants in the co-construction of digital knowledge and cultural heritage to interact with museum information resources (Marty, 2006; Marty, 2007a; Marty, 2011).

Discussion and conclusions

Today, museums as organizations play a social role within the contemporary world, driving innovation by employing and valuing the potential of new internet, virtual and interactive technologies applied to the interaction between objects, information, users, museum, and communities.

Innovation helps shape sustainable and people-centered museums that improve the quality of life within communities. As a bridge between information and knowledge, museums select an innovation-driven orientation in order to promote social and technological changes within the organizational infrastructure, rediscovering a pathway for strengthening the relationship with audiences, fostering user involvement, and engaging visitors.

As audience-centered and visitor-oriented institutions, museums promote innovation by sharing knowledge and communication on cultural heritage content. Driving innovation for value co-creation processes helps museums to bring together technology, people, and organization. As organizations museums develop the potential offered by information technology, strengthening museum professionals in order to support participatory engagement by involving the users to contribute to knowledge and meanings in cultural heritage.

The contribution of this study is to elucidate how museums aim to identify a pathway for driving innovation by using technology to employ museum's professional and human resources, opening up to the users as active participants and co-producers of knowledge as sources for driving value co-creation processes as shown in figure 1.

Fig. 1. Towards museums driving innovation: a framework of analysis

	From recipients	To user participation
From providing information	Museum as information-led organizations	Museums promoting communication as innovation
To meeting users	Museums driving Innovation by involving	Museums as Communities
	from Organization	to Ecosystem

As information-oriented institutions, museums provide information focusing on organization. Museums drive communication-led innovation, enabling museum professionals as user-centered mediators. Museums provide information in order to support user participation. They behave as communities, strengthening the role of museum professionals as user-centered mediators, and opening up to active user participation and involvement. The user acts proactively to interact with museum information and knowledge.

Technology is driving museums to drive innovation for value co-creation processes in cultural heritage, meeting the changing needs of users and designing the virtual museum, developing the role of museum information professionals as users-intermediates between the public and the museum's knowledge and information source, and, opening up to the participation of the audience to cultural meanings creation.

As audience or collection-driven organizations museums select a different pathway, sharing and combining authority and participation in cultural heritage contents, developing the capabilities of museum professionals, and strengthening the opportunities provided by new virtual and interactive technologies for leading to a participatory museum as a learning-oriented and educational institution.

There are some limitations. The study aims to provide a theoretical framework to understand how museums develop as community-based organizations living as innovation-led institutions within cultural ecosystems. The study is descriptive and exploratory. Further research should investigate how museum innovation enabled by the use of information technology leads to arrangements and redesign in the organizational structure and human resource management within museums.

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DEVELOPING SUPPLY CHAIN MANAGEMENT “AS-A-SERVICE” IN CLOUD PLATFORMS

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Abstract. *The purpose of this paper, is to introduce the concept of a cloud supply chain, a business model based on the networking of some physical and digital assets from third parties in the cloud for the purpose of designing and managing a supply chain network. The "supply chain as a service" model combines Industry 4.0 principles and technology with new digital platforms. For this aspect, the cloud supply chain is conceptualized as a fresh and original field of study where certain generalized properties of the cloud supply chain are determined by analysis of real-world situations.*

Keywords: *Supply chain integration; Cloud technology; Cloud supply chain; Supply chain-as-a-service; Industry 4.0; Digital supply chain*

Introduction

Global innovation networks have emerged due to the “fine slicing” and dispersion of innovation processes to various businesses worldwide (Ambos et al., 2021). Research and development dispersion has been viewed positively for innovation by some academics since it gives businesses more access to a variety of knowledge hubs worldwide (Perri et al., 2017). Others have argued that it increases a firm's operational complexity because innovation activities are interdependent, resulting in managerial bandwidth limitations (Scalera et al., 2018) and more difficulties with internal or external firm boundaries (Ambos et al., 2021).

Advanced supply chain management principles and digital technologies are used to create a cloud supply chain based on the dynamic, situational composition of physical services into networks. The cloud supply chain combines concepts of flexible, reconfigurable supply chain formation by outsourcing with the goal of transforming the supply chain from some static, long-term, and fixed allocations of processes, products, and data to some firms towards dynamic reconfigurable services, such as forming the supply chain as a service (Ivanov et al, 2022). Integrating all digital manufacturing and logistics fulfillment processes, including material, financial, and information flows, into the cloud-based collaboration platform enables the creation of dynamic services focused on the client’s needs. This mix of manufacturing, purchasing, distribution, warehousing, and after-sales activities creates a physical supply chain network that is constantly (re)designed and operated as a customer-centered unit. Blockchain, the Internet of Things, Industry 4.0, cloud computing, 5G, and edge computing are examples of digital communication, collaboration, identification, and modeling technologies (Ivanov et al,

2022). These technologies create a technological framework for implementing the cloud supply chain.

Different network structures and their interactions are covered by the supply chain structural dynamics control theory. In Wang et al. (2015), a thorough assessment of the literature on service supply chains is offered. Supply chain networks are becoming more flexible and adaptable thanks to digital technologies like the cloud, Industry 4.0, Internet of Things (IoT), big data analytics, Blockchain, artificial intelligence (AI), edge computing, and additive manufacturing (Choi et al., 2022). Supply chain networks can be made more flexible and adaptable with the help of digital technologies like the cloud, Industry 4.0, Internet of Things (IoT), big data analytics, Blockchain, artificial intelligence (AI), edge computing, and additive manufacturing (Brintrup et al., 2020). The available research put up some compelling reasons in favour of end-to-end visibility to enhance the effectiveness of decision-making in manufacturing, logistics, and sales operations. (Yang et al., 2019).

Services are essential to supply chain management schemes. Many researchers have reviewed and discussed the various definitions of service supply chain management and service supply chain systems. A "product" that is produced by "the points of origin" and transported to "the sites of consumption" must exist in a supply chain system by definition (Wang et al., 2015). This "product" could be a service or something more concrete. Two different types of supply chain systems—the Service Only Supply Chains (SOSCs) and the Product Service Supply Chains—arise in the field of service supply chain management (PSSCs) (Wang et al., 2015).

The subject of supply chain outsourcing has become more complex with the rise of "as a service" platforms and providers. Outsourcing of logistics is no longer the only concern now, services for manufacturing, planning, warehousing, and other tasks are available (Barret & Higgins, 2021). Organizations must pick which components they will provide internally and which ones they will outsource. Because they don't have a solid outsourcing strategy in place, supply chain leaders frequently outsource for the wrong reasons (Barret & Higgins, 2021). Organizations should create an outsourcing strategy for their supply chains that strikes a balance between the significance of cost, service delivery, risk mitigation, and the duration of relationships in order to be future-ready (Barret & Higgins, 2021).

These diverse arguments call for a systematic analysis of innovation in cloud services applied in supply chain management. In this article a conceptualization is offered that allows to analyze and advance the literature on innovation in and how can supply chain management services can be provided as SaaS business model through platforming model and integration of various state of the art technologies. Despite growing practical interest, cloud supply chain research is still lacking. This paper seeks to conceptualize the cloud supply chain as a fresh and original topic of study. Several conceptual and formal generalizations will be presented about the cloud supply chain through examination of practical situations case studies, and we explore potential lines of future research.

Literature review

Software as a Service (SaaS)

Software-as-a-service (SaaS) is a cutting-edge method for distributing software applications that uses cloud computing (Chou & Chou, 2007). For consumers to order based on their needs and pay for the services in accordance with actual consumption, SaaS providers host software applications on cloud servers (Armbrust et al., 2010). This "on-demand" service delivery model is comparable to the utility service mode in that a user subscribes to an application without purchasing, installing, or maintaining the software, much like using the grid for power instead of a personal generator. Additionally, SaaS improves software service quality through automated application upgrades and data backup (Xin & Levina, 2008).

SaaS enables businesses to outsource many of their applications, including business and generic tools (such as email, antivirus software, and office suites) (e.g. accounting, customer relationship management – CRM, enterprise resource planning – ERP). Based on cloud computing, businesses can also outsource their IT platforms (such as databases and business intelligence) and infrastructures (such as storage, backup, and computation) in the form of Platform as a Service (PaaS) (Vaquero et al., 2009). SaaS is seen as the most promising of the three because of its numerous real advantages to business clients, including decreased IT expenses and enhanced IT performance (Catteddu, 2010).

SaaS companies use cloud computing to divide up IT resources and capacities among customers in accordance with their in-the-moment needs. A dynamic approach to managing instances and data partitions is advantageous for economies of scale. Organizations can save a ton of money and concentrate on productivity because they don't have to bother purchasing and maintaining their software applications (Yang et al., 2015).

Existing research on SaaS adoption includes a qualitative analysis of the impact of IT infrastructure maturity and result uncertainties by Xin and Levina (2008). Similar findings were made by Wu et al. (2011) who discovered that businesses consider known and unknown risks when assessing the long-term effects of adopting SaaS. The influence of perceived values, uncertainties, and impacts on attitudes toward SaaS adoption were quantitatively studied by Benlian et al. (2009). Wu (2011) also determined the significant effects of relative benefit, ease-of-use, security, and trust using the attitude toward the innovation as the dependent variable. Benlian and Hess (2011), on the other hand, gathered data on perceived cost advantages and security issues and identified how these affect the choice to embrace SaaS.

Digitalised Supply Chain

A digital supply chain is an intelligent, value-driven network that uses cutting-edge technology and analytics to generate new revenue and business value. It does this by utilizing a centralized platform that captures and makes the most of real-time data from various sources (Kinnett, 2015).

Another definition given by Büyüközkan and Göçer (2018) is an intelligent best-fit technological system based on the ability of massive data disposal and excellent cooperation and communication for digital hardware, software, and networks to support and synchronize interaction between organizations by increasing the value, accessibility, and affordability of services with consistent, agile, and effective results.

On the other hand, the primary characteristics of the DSCs, referring to the operational management of the fundamental elements, as shown in Figure 1, and the proposal

dimensions, distinguish them from the traditional SCs. These characteristics include accelerated, adaptable, smart, real-time data gathering, transparent, globally-connected, scalable and clustered, breakthrough, inventive, and sustainable (Garay-Rondero et al., 2020).



Figure 1 – proposed essential SCM elements (Garay-Rondero et al., 2020)

Impact of industry 4.0 technology on Supply Chain Management

While a supply chain can increase performance using traditional ICT technologies like enterprise resource planning (ERP) and transaction processing systems to reduce transaction costs and increase coordination effectiveness (Yao et al., 2007), the emergence of cloud technology (Marston et al., 2011) presents difficulties in making the switch to more effective cloud-based technologies.

Except for the research published by Wu et al. (2013), the literature discloses little empirical studies to date. An "ICT-enabled service model where hardware and software services are given on-demand to end-user consumers over the Internet in a self-service fashion fairly independent of devices and locations" is what the term "cloud technology" refers to (Marston et al., 2011, p.177). According to Jede and Teuteberg (2015), cloud technology is still in its infancy, especially in the supply chain. This calls for an empirical inquiry to help managers better appreciate its potential in the integration of cross-firm logistics processes. Since many businesses are becoming increasingly interested in using

cloud technology but it has not yet entirely permeated industry norms, this study focuses on the intention to adopt rather than analyse the actual efficacy of the technology.

In terms of operational efficiency (e.g., inventory sharing, order status and tracking, demand forecasting), time compression, higher IT-performance (e.g., high-speed data access, add-on services, customizability, latest hardware and software, as well as service bundles), and with a medium to low security level (e.g., data access and data networks), cloud-based technology adoption is thought to provide advantages over conventional ICT-enabled SCI (Jede & Teuteberg, 2015). In order to maintain the connections among manufacturers, suppliers, retailers, and customers for the integration of the logistics process, cloud services—specifically SaaS—are likely to revolutionise the game. Shee et al. (2018) suggest a concept from the RBV perspective to expand the conventional ICT-enabled SCI to build a cloud capability, which is likely to enable improved SCI and so increase performance in the supply chain and the company.

Technologies like CPSs, IoT, BDA, and Cloud are regarded as the primary drivers of Industry 4.0. When smart embedded systems are integrated and networked with one another and the Internet in an environment that is supported by Industry 4.0, the physical and digital worlds converge, creating CPSs (cyber-physical systems) (Fatorachian & Kazemi, 2020). CPSs are intelligent systems that bring together computing, communication, and engineering systems. They consist of a number of digital and physical assets whose purpose is to carry out a number of specified tasks (Poovendran et al. 2012). According to Leitao et al.(2016), CPSs are one of the main forces behind Industry 4.0 and can connect the physical and virtual worlds by enabling a high level of connectivity between software and hardware. This can result in advanced communication between people, machines, processes, and products (Babiceanu et al., 2013). Computing components of a CPS allow for communication with sensors and actuators. This enables all of the environment's scattered intelligence to be connected. A smart production line with an intelligent machine capable of carrying out numerous tasks through communication with components is an illustration of CPS (Fatorachian and Kazemi 2020).

Another important enabler, the Internet of Things (IoT), describes a global ecosystem where all linked and intelligent processes, systems, and objects are connected to it (Fatorachian and Kazemi 2020). This technological advancement, which is an extension of the Internet, is characterised by a world of pervasive connectivity in which intelligent, Internet-connected devices continuously interact and provide useful information to help decision-making (Fatorachian & Kazemi 2020). IoT enables the integration of smart technologies like sensors, actuators, and other intelligent systems. By completely changing industries and organizations, it introduces a new paradigm in how businesses operate (Agrifoglio et al., 2017). This is made possible by cloud computing, which has enabled a paradigm shift in information systems management through the convergence of technologies such as networking, computing, and management systems (Helo & Hao, 2017).

Cloud technologies enable remote communication between systems, devices, and products. They can also enable the transmission of data produced by various processes and systems to central data warehouses for later aggregation and analysis (Brousell et al., 2014). In other words, cloud systems can offer large amounts of storage and fast computing, allowing for independent and quick access to data from any location (Schuh

et al., 2014). Given the importance of responsiveness and visibility in supply chain management, this capability can significantly aid in planning and decision-making and lessen the bullwhip effect in the supply chain (Tan et al., 2017).

Methodology

This research paper undertook a systematic literature review approach, successfully identifying each field's present state of research (Fettke, 2006). Furthermore, the classification stage of each individual manuscript adhered to the framework developed by Dibbern et al. (2004). The pursuit of systematic knowledge development is directly related to the articles that have been published.

Case study research is regarded as a reliable way to find contextual information that is practically applicable (Wu & Choi 2005). Ivanov (2021b) demonstrates that visualizing new, emergent research streams in order to generalize their characteristics is a particularly effective use of case study analysis. In order to determine the general characteristics of the cloud supply chain paradigm, the target was to highlight its practical context through the case studies in this section. Secondary data, particularly the companies' websites, was used to gather the information for the case-study development.

Three case studies have been identified that match the research direction, relevant enough to portray a clear view of how cloud technology is implemented in various supply chains and the implications of cloud computing across the globe.

Results and discussion

Case Studies

Case1: Amazon FBA - Let Amazon pick, pack, and ship your orders

Key elements of Amazon's business model FBA (fulfillment by Amazon) are summarised as "Let Amazon pick, pack, and ship your items" (2022). The main goal of Amazon FBA is to enable outside businesses to utilize Amazon's logistical networks. Companies can ship their goods to Amazon fulfillment facilities. When a consumer orders, Amazon takes care of the order's receiving, packing, shipping, customer service, and returns. In other words, the FBA business model employs a form of the supply chain "renting" (Ivanov et al., 2022).

An "end-to-end solution for inventory storage, shipping, and returns, together with handling customer care on those purchases" is what the Amazon FBA offers (Amazon 2022). Additionally, FBA uses multi-channel fulfilment. Customers can place orders for the company's goods through their "website, Amazon, social media, or elsewhere." Additionally, drop shipping through Amazon's Merchant Fulfilled Network can extend FBA (MFN) (Ivanov et al., 2022). Drop shipping entails outsourcing the majority or all of the supply chain process, from product sourcing or production through fulfilment, according to Amazon (2022). Production, storage, shipping, and delivery to clients could be handled by a manufacturer or other entity (Ivanov et al., 2022).

Amazon has observed that established e-commerce businesses with sizable sales volumes and a range of products and sales channels can gain the most from the FBA model (Ivanov et al., 2022). Through a developed digital supply chain, FBA may assist in

ensuring end-to-end visibility over all fulfilment activities, including returns. According to Bigcommerce (2022), the FBA platform is used by around two-thirds of Amazon's third-party retailers. In conclusion, Amazon offers supply chain as a service by outsourcing storage, shipping, customer service, and returns operations through FBA (Ivanov et al., 2022).

Case2: Industry 4.0 and cloud manufacturing – Manufacturing-as-a-service platforms

"A methodology for offering ubiquitous, accessible, on-demand network access to a shared pool of configurable manufacturing resources that can be promptly deployed and released with minimal management effort or service provider contact," according to the definition of cloud manufacturing (Xu, 2012). Cloud manufacturing uses the manufacturing-as-a-service paradigm, as demonstrated in (Zhang et al., 2011), will be exemplified with two cases.

First, the Industry 4.0-based MindSphere cloud-based manufacturing platform from Siemens can be mentioned, which employs advanced analytics to digitally manage interconnected systems and machines throughout physically dispersed physical facilities (Ivanov et al, 2022). "MindSphere drives Internet-of-Things (IoT) solutions from the edge to the cloud with data from linked products, plants, and systems to optimise operations, generate better-quality goods, and implement new business models," according to the company (Siemens, 2022). Second, the open manufacturing platform (OMP) developed by BMW and Microsoft embodies key Industry 4.0 concepts of cross-enterprise digital communication of machines and people. Supporting collaboration and data transparency in Industry 4.0 networks is the main goal of OMP. The OMP's goal is to make manufacturing more intelligent by utilising open standards and data analytics to solve practical issues as efficiently as possible while maximising the use of available resources (Ivanov et al., 2022).

Case3: Different regional implications of using cloud computing in SCM

Regional differences in terms of technology, culture, politics, and economy may have a big impact on how CC usage develops within SCM. In addition, we have demonstrated through quantitative analysis that the factors influencing implementation are complex and not generally applicable. As a result, we looked into all papers for country-specific prerequisites in each country to determine the relationships between implementation factors and CC adoption premises. Most of the conclusions listed below are based on empirical surveys (Jede & Teuteberg, 2015).

Due to China's restricted financing options for small and medium-sized businesses, management is reluctant to invest significantly in IT infrastructure and software (Li et al., 2012). The Chinese logistical infrastructure, in particular, suffers from a low level, so the renting model of CC can improve the usage of the newest IT without capital expenditure and give transparency across SC processes (Li et al., 2012). Given that logistics organizations have a low beginning security level, the Chinese authors underline the possible increases in data security from using CC (Jede & Teuteberg, 2015).

In order to create a well-functioning SaaS market system in South Korea, the government also forced the SaaS market there through strict laws and SaaS quality certifications (Jede & Teuteberg, 2015). However, neither the introduction of the SaaS marketplace nor the certificates did much to promote development. Lee et al. (2013) determined that South Korea has changed from a policy-led to a customer-driven market, in which reduced costs and quick deployment options strongly influence companies implementing SaaS. They reached this conclusion using an analytical hierarchy process and a survey. They conclude that the widespread mistrust of security remains a significant obstacle to CC markets expanding.

However, the CC provider market is firmly established in Central Europe (Repschläger et al., 2012). But when it comes to data security, European businesses are more risk-averse than those in the US and China (Benlian, 2009). Adequate data protection guidelines established by the European Union would improve CC dependability, especially for SMEs (Tarzey, 2012). Benlian & Hess (2011) found that security concerns outweighed performance and economic risks as the main determinants of CC implementation in a sizable cross-sectional study of German enterprises. On the other hand, they address costs, followed by strategic flexibility and quality improvements as the strongest SaaS opportunity factors. According to experts, there is generally little difference between the average knowledge of European businesses and the information found in the most recent body of scientific literature (Jede & Teuteberg, 2015).

The influence of the CC elements in American businesses is more nuanced than those in CC markets in less developed countries, which are mostly cost-driven. These factors include business process complexity, functionality, compatibility, and company culture (Wu et al., 2012). Furthermore, empirical studies (Cegielski et al., 2012) highlighted the significance of CC for inter-organizational SC performance inside US-based organizations. Furthermore, most of the largest CC providers, such as Salesforce.com and Amazon, are US-based. However, due to their poorer IT performance, US companies face next-level problems due to the advanced use of CC services (Compuware, 2011). Again, the national government is in charge inside a nation since the US government is one of the greatest Community- and Hybrid-CC adopters, making efficient use of various specialized services and responding to citizen requests. Additionally, a smartly created hybrid-CC system connects the federal, state, and local US agencies (Gupta, 2013).

Despite the fact that the examples provided only cover a small portion of the sample, the literature's overall evidence supports the fact that North America and Europe presently hold the top positions in the underlying field's science and application (Jede & Teuteberg, 2015). No matter the region's degree of development, all mention that the possibility for cost reduction is a significant influencing element. This suggests that before further advances in CC enable multi-dimensional benefits like increased flexibility and inter-organizational supply chain connectivity, this element may serve as a fundamental baseline (Jede & Teuteberg, 2015). Additionally, governments undoubtedly play a fascinating and significant dual role in the CC-ecosystem. On the one hand, users anticipate them to assume the regulatory role and serve as a standard-setting body that ensures strong data security, particularly in Central Europe. On the other hand, by deploying, offering, and utilising their own CC services, governments attempt to act as a catalyst that forces CC development (Jede & Teuteberg, 2015).

Conclusions

Supply chains are no longer constrained by technologies and what they can achieve, but rather by the creativity of those who use them and professionals today must reinvent business models, organisational structures, and operations to flourish now and in the future as businesses around the globe deal with a perfect storm of upheaval (Barret & Higgins, 2021). Determining a digital supply chain road plan to improve present performance and investing in capabilities that drive competitive advantage will be essential for any future supply chain organisation to succeed. Future supply chains will need to be far more adept at identifying customer cues, analysing data, segmenting markets, figuring the cost of service, and managing partners and knowledge. As a result, brand promise will be driven by new roles, such as supply chain architects.

Future market leaders will excel in modelling the "voice of the customer," enabling a supply chain that is service-oriented, comprehending the cost of complexity, managing new types of partner networks, and boosting supply chain autonomy, among other critical competency areas (Barret & Higgins, 2021). Apart from developing the structure of the digital supply chain, an important factor in developing such a project is the fact that employees exhibit more inventive behaviour when working inside a framework of transformational leadership style because they feel valued, empowered, and have a lot of autonomy and competence (Stanescu et al., 2020). Leaders could have a larger positive impact on employees' levels of innovative work behaviour by fostering a greater sense of empowerment (Stanescu et al., 2020), which in turn provides for a better prepared organisation in adopting complex systems such as a cloud integrated supply chain.

The cloud supply chain paradigm presents fresh and possibly significant research directions at several levels of decision-making. Only a few examples of research topics where novel and significant contributions can be made include contracting in the context of platforms, supply chain design with consideration of outsourcing possibilities, cost/benefit analysis of creating one's own supply chains vs. borrowing a supply chain, inventory management, and multi-channel logistics optimization.

In order to maintain the ties among manufacturers, suppliers, retailers, and customers for the integration of the logistics process, cloud services—specifically SaaS—are likely to revolutionize the game. Therefore, from the standpoint of RBV (resource-based view), we suggest a model expands the conventional ICT-enabled SCI in order to establish a cloud capability that is likely to enable improved SCI and thus increase performance in the supply chain and the company (Shee et al., 2018). The findings demonstrate that cloud-enabled SCI (such as the exchange of demand information, inventory status, production, and delivery schedules) has a favorable, considerable impact on supply chain performance, which therefore enhances the sustainable performance of the company (Shee et al., 2018). According to the findings, top management initiative increases the possibility that cloud services would be adopted and used.

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ANALYSING THE LANDSCAPE OF TELEWORK IN THE ROMANIAN PUBLIC SECTOR

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Abstract. *The pandemic has changed the entire world, but it has also changed the world of work forever. Millions of people and activities worldwide had to change and adapt overnight to the new reality.*

The overall objective of the paper is to capture a comprehensive and genuine image of telework in the public sector in Romania and to evaluate the impact of telework activity at the level of central and local government.

Specific objectives relate to studying telework in the public sector in Romania and presenting the results of a questionnaire on telework in central and local government, thus identifying practical solutions for the effective development of telework activity in the public institutions and authorities, designing the strategies of implementation of telework for a public organization, identifying the main advantages and disadvantages of this phenomenon.

The research questions are: How does telework impact central and local government in Romania? Will telework become the new normal in the public sector?

The paper explores telework's state of the art at the international, European, and national levels, by presenting the realities and main trends.

The key findings of this paper highlight that telework in the public sector fosters sustainability, and a green and digital transition. It has main implications for public policy by considering work-life balance, enhancement of digital competencies, and work flexibility. Implementing and adopting telework within a public institution represents a profound change in the organizational framework, in view to preparing the structures and people involved in implementation, so that the process represents a success.

The research methodology comprises the qualitative method by using the research of scientific literature on flexible ways of working in the public sector and their impact, as well as the quantitative analysis based on a questionnaire applied to civil servants from central and local government.

The contribution brought by this research consists in presenting the realities and trends for telework in the public sector as well as the perception of public employees concerning the accomplishment of telework activities and the evaluation of the impact of telework activity in central and local government.

Keywords: *digitalization, public administration, teleworking, the world of work*

Introduction

The pandemic has changed the entire world, but it has also changed the world of work forever. Millions of people and activities around the world had to change and adapt overnight to the new reality, having to switch from office work to working from home, and the interactions that normally took place in person were replaced with interactions, mainly online. This change probably could have taken decades if it had been planned. Such situations always require quick adaptation to change and finding the best solutions. As one of the main measures imposed around the world, in the context of the COVID-19 pandemic has been social distancing, all organizations had to find solutions and adapt to these requirements, taking into consideration the safety and health of employees. Therefore, a solution has been to make the working methods and time more flexible by introducing telework.

In the 1970s, telework represented a new topic for researchers and practitioners considering the wide spread of digital networks and computers. (Vilhelmson & Thulin, 2016).

In the 1980s, telework was considered “the work arrangement of the future” (Illegems et al., 2001).

However, telework was used “mostly as an occasional work pattern” until the COVID-19 pandemic (European Commission, 2020).

Telework had to be accepted in Romania as well, even if shy, many specialists considering that a step forward is being taken on the path of modernization and digitalization. Due to the consequences caused by the COVID-19 pandemic, telework, where possible, has become a necessity.

The public sector in Romania was no exception to these requirements and had to quickly adapt to the new changes and trends regarding how to carry out activities, having no previous experience in the flexibility of work. However, the staff's health and the activities' continuity had to be ensured. The classic organization of work processes was quickly replaced with new methods, which "forced" the flexibility of the employees' activity, creating new dynamics and mobility in labor relations. Although already implemented in the public system in other European countries, telework represents a new concept for public administration in Romania, known to be a very rigid field, full of outdated concepts and reluctant to change.

The paper attempts to capture a comprehensive and genuine image of telework in the Romanian public sector and to evaluate the impact of the telework activity at the level of central and local government.

The research questions are: What is the impact of telework on central and local government in Romania? Will telework become the new normal in the public sector?

In this context, the paper explores the state of the art of telework at the international and European levels by presenting the realities and main trends.

The paper achieves the analysis of telework in the Romanian public sector, presenting the main realities and the results of a questionnaire on telework in central and local government, thus identifying practical solutions for the effective development of telework activity in the public institutions and authorities, designing the strategies of implementation of telework for a public organization, identifying the main advantages and disadvantages of this phenomenon.

State of the art of telework

Society, and implicitly the labor market are in a continuous and dynamic process of transformation and consolidation. This process implies a change at the level of each institution, a change in the working methods of employees while capitalizing on their potential. The labor market has experienced strong development in the last decade and continues to globalize. Teleworking, tele-activities, tele-socialization represent modern activities, characteristic of a knowledge-based society.

The concept of telework has been defined, as an activity that “includes all work-related substitutions of telecommunications and related information technologies” (Collins, 2005).

According to the International Labour Organization (2020), telework involves “workers who work in their own residence. Similar to remote work from home, the physical location where the work is carried out is the worker’s own home, that is, an alternative location to the default place of work, but in addition, the worker uses personal electronic devices as part of carrying out the work”.

Teleworking and other terms, such as “homeworking, telecommuting, remote working, virtual work, e-homeworking have been used inter-changeably” (Golden et al., 2017).

Also, the International Labour Organization (2020) states “the lack of statistical standards defining different concepts” and the fact that “countries are using slightly different and sometimes overlapping definitions, while different terms are being used inter-changeably”.

According to Eurofound (2020), “almost 40% of those currently working in the EU started to telework in a full-time mode due to the pandemic”.

The report of the Joint Research Centre of the European Commission and Eurofound (Sostero et al., 2020) has presented “the large differences in the prevalence of telework across EU Member States, sectors and occupations”. “The preparedness for telework at a large scale is higher in ICT and knowledge-intensive sectors, and generally for high-skilled workers, although with big differences across the EU countries”.

The same study estimated “25% of employment in teleworkable sectors in the EU. Considering that before the outbreak, just 15% of the employed in the EU had ever teleworked, large numbers of workers and employers alike are, in all probability, facing challenges in dealing with the sudden shift to telework. However, the extent of these difficulties is likely to vary considerably, depending among other factors on the level of prior experience with telework” (Sostero et al., 2020).

“The share of regular or frequent teleworkers was above 30% in a range of knowledge-intensive business services and in education and publishing activities. It was also high of 20% in telecommunications, finance, and insurance.

On the other hand, the share of teleworkers was low in the public sector” (Sostero et al. 2020).

The adoption of telework can be influenced by the presence of similar organizations that have done the same before within the same regional or national context. This means that imitation, competition, and learning from others can influence the adoption of telework (Nasi et al., 2015).

Teleworking is fostered by several factors such as dynamics of ICTs development, inter institutional-dynamics, legislative factors, political, social, economic, environmental factors, and demographic factors.

According to Taskin and Bridoux (2010), other factors related to “work-life balance, the trend of outsourcing activities, changes in employment types, less commuting time, pressures in the business environment, unpredictable changes resulting from global competition”.

In the communication on the 2020 country-specific recommendations, the European Commission emphasizes the important role of telework.

“Digitalisation, e-commerce, E-government, e-health, developing new business models, home-work arrangements, and teleworking at a larger scale may increase productivity. However, the benefits may not be available to the unskilled or the untrained. Investment in digitalization of business and the public sector, the development of data digital services in the public and private sector can enable teleworking, virtual learning, and homeschooling” (European Commission, 2020).

In this context, there are essential challenges that “countries, institutions, companies, employers, and employees have to face in view to adapt to telework” (European Commission, 2020).

EUPAN survey (2022) states that in “several administrations, the use of remote working has led to changes in the regulatory framework. Before the pandemic, most EUPAN members already had regulations for remote working/teleworking: 20 out of 27 Member States had such regulations. Nevertheless, the massive use of this type of organization has often required a modification of the regulatory framework. In March 2021, 17 of the 27 EU Member States had already revised their legislation or were in the process of doing so”.

In addition to regulations, many tools have been developed, especially in view to train employees in remote work and to support managers in order to adjust to this new “hybrid” organization of work.

At the same time, the measures have also aimed to contribute to the the well-being of employees, by preventing the risks of digital overload telework.

While these developments have significantly impacted the organization of work, they have not fundamentally changed the professions and careers of civil servants.

Within the competition between Europe, the United States, and East Asian countries, the telework program of the European Union constitutes an important component of public policies, the European Parliament considers telework as a major direction of research and action.

For the time being, telework is, on multiple levels, linked to economic, social, and political development. The progress of telework is supported by the development of the market and economic policies, and at the same time, it contributes to solving some economic and social problems. If until the pandemic, in the public sector, no kind of flexibility in the way and time off work was considered, the public sector had to quickly adapt to the new changes and come up with solutions for the introduction of new concepts such as telework in view to able to comply with the recommendations aimed to combat the COVID-19 pandemic.

In countries where telework has been in force, the COVID-19 pandemic has determined an intense debate on this topic, both at the level of theory and social dialogue, revealing the fact that telework will become an increasingly popular option.

The Great Reshuffle phenomenon has led many employees to resign and look for work elsewhere, while others have pressured employers to allow a hybrid work schedule.

Teleworking has a positive impact and boosts productivity and creativity, reducing costs. According to the studies accomplished in the US and Europe, “if telework is applied correctly, it could bring benefits such as: it provides safety and protection, an increased level of employee motivation, it reduces the institution's expenses, it develops autonomy and digital skills of employees, an increased level of concentration and increased productivity” (National Institute of Administration, 2020).

The remote work statistics (Wise, 2022) provide relevant facts and information concerning telework and working from home, as follows:

“5% of brands around the world offer opportunities for remote work.

18% of the workforce telecommuted full-time during COVID-19.

77% of people telecommuting consider that they are more productive.

16% of companies globally are fully remote.

30% of telecommuters save almost \$5000 per year.

80% of remote workers say that remote work is less stressful.

74% of of companies plan to permanently transfer some of their workers to remote work.

23% of remote workers say that their employer covers the cost of a co-working space.

54% of IT professionals believe remote workers pose a bigger security risk than conventional workers. Remote workers depend on technology and the Internet to do their job, which means they are always at risk of being cyber-attacked. Therefore they should be provided training in cyber security.

70% of remote workers get training regularly from their company.

19% of people consider that they feel lonely as a result of working from home.

74% of remote workers believe that being able to work remotely made them less likely to leave a company.

64% of recruiters believe that offering remote work enabled them to find high-quality talent.

85% of managers think that having remote workers will be the new normal”.

Statistics indicate that “remote work isn’t just good for employers and employees, it is also really good for the planet. As people work from home, they don’t have to drive their car every day, which means there are fewer cars on the road, and pollution levels can go down”.

“69% of millennials consider sacrificing specific work benefits to have a more flexible workspace as professionals value flexibility and freedom. Over half of the millennials consider that they would be willing to give up other benefits, if this meant that they could work from home, and have a much more flexible work-life balance.

Remote work is more prevalent in cities with higher-income levels.

Currently, 15% of the health care industry works from home, 10% of the technology industry works from home and 9% of the financial services industry works from home”. Thus, it reveals that no matter the activity, it is always worth searching for telework opportunities.

Analysis of telework in the public sector in Romania

Teleworking can benefit both employees and employers due to the integration of work and responsibilities, increased productivity, and increased employee commitment to work. But many employers remained skeptical of facilitating access to this type of employment, especially because of the uncertain benefits. Opinions differ on how much the institution's performance and productivity will increase. Some question whether the gains outweigh the losses due to difficulties in supervision and communication and the isolation of employees.

Teleworking is “the form of work organization in which the employee, on a regular and voluntary basis, performs the duties specific to the position, occupation he/she holds, in a place other than the workplace organized by the employer, at least one day a month, using information and communication technology” (Parliament of Romania, Law no. 81/2018).

Even though in Romania telework has been regulated since 2018, the public sector has been reluctant and resisted this type of activity. The COVID-19 pandemic has imposed and accelerated the development of telework for the public sector. In this context, telework has proven to be a very useful tool in ensuring the continuity of activities, the existence of a telework policy being an essential part of any operational continuity plan.

In 2020, the percentage of those who could work remotely in Romania was around 20% while in Europe the percentage reached 37% (European Commission, Joint Research Center, 2020).

A study carried out in 27 countries at the level of the European Public Administration Network (EUPAN) and published by the Federal Ministry for Public Service and Sport (“New ways of working in public administration”) in 2018, shows that “work flexibility in Europe varies between 2% and 40%, depending on the country, sector, and occupation”.

In Romania, according to the report of Eurofound and the European Commission (2020), the evolution of telework has been insignificant in recent years, with a percentage of 0.6% of employees who worked from home from time to time in 2019, a situation valid also for the private sector. But in 2020, due to the need to quickly adapt to the changes determined by the COVID-19 pandemic, the percentage increased to 24% of employees who worked only remotely.

Employees can work more and more often outside the institutional framework, the work schedule becoming thus much more flexible, and the dynamics of labor relations are changing. At the same time, the element of novelty is also provided by the Governing Program 2021-2024 where, as part of the measures provided for employees in Romania, the digitalization of labor relations is approached, focusing on the use of electronic signatures in documents and the simplification of the mechanisms for the development of telework (including health and safety at work).

In recent years, new technologies have become widespread in all fields, whether economic, social, or legal. This series of transformations that occur in society, made the relationship and the form of service provision different from those we were used to, which means an adaptation to the new context or form of organization with an impact on various aspects of social life. Because it cannot be otherwise, the public administration is part of this transformation process and should implement a series of measures and actions in view to be able to adapt to the new reality.

Telework has represented one of the main lessons of pandemics, a difficult experiment, but which has also generated a series of benefits for employees and, above all, for the institutions which had to make efforts to comply with the new context.

Before COVID-19, some organizations were reluctant to work remotely, fearing a decrease in their productivity, and the impossibility of controlling the quality of the employees' activity. "Very fast switching from one working mode to another, made almost overnight, highlighted the differences between the organizations/institutions that had already digitized part of their activity and those that had not yet taken this step. Productivity, employee motivation, and administrative cost reduction represent three reasons teleworking is a viable and future model. It is a flexible way of organizing the activity, the employee fulfilling his/her job duties through IT technologies" (National Agency of Civil Servants, 2020).

In 2018, when the law on telework was adopted in Romania, only 3 employees had telework contracts and all worked in the private sector. At the end of 2019, there was an increase in the number of those who worked remotely, reaching 13,744 people in the private sector and 91 employees in the public sector. In February 2020, at the beginning of the COVID-19 pandemic, approximately 15,000 employees were on telework in the private sector, and in March their number increased to over 53,000. The increase was even higher in the public sector, from only 171 employees to 5,679 employees. At the end of 2020, the number of employees working remotely increased to over 300,000 in the private sector and over 31,000 in the public sector (Economedia, 2019).

The research methodology focused on the mixed research method, more precisely, the qualitative method, involving the analysis of specialized publications, reports, and

statistical yearbooks, and the quantitative method by designing and applying a questionnaire.

The questionnaire aims to explore the perception of managing and executive civil servants regarding the accomplishment of telework activity, and to identify measures to improve the telework activity in central and local government.

We consider the quantitative approach through the questionnaire to be appropriate in this research as through the statistical data obtained we could establish numerical results that allow us to compare the answers statistically.

The questionnaire was applied to management and executive civil servants at the central level (General Secretariat of Government and 7 ministries) and at the local level (8 city halls). The questionnaire ensured the anonymity of the respondents. The condition imposed on the respondents to complete the questionnaire was to work for two years minimum in the institution to ensure that they know the working mechanisms and tools of the organization during the pandemic.

As limitations in research from a methodological perspective, we mention the impossibility of applying face-to-face questionnaires due to restrictions in public institutions, which has led to incomplete responses to questionnaires and implicitly to the invalidation of some questionnaires. Also, applying online without an operator could sometimes lead to a different understanding of the questions. Another limitation was the lack of response to the questionnaire from the authorities. The questionnaire was sent to several public institutions, and many did not respond.

Data collection was achieved online during March - April 2022, by email.

The questionnaire comprised 35 closed and open questions. Also, some questions had multiple answers. There were 146 valid questionnaires.

Regarding the public institution and its size, most respondents (74.6%) work within the central government, and only a percentage of 25.4% work in local governments.

The largest percentage is represented by employees in large institutions with over 250 employees (50.8%), followed by those working in institutions with between 150 and 250 employees (17.5%). Regarding the structure in which they carry out their activity, the highest representativeness is in specialized structures (54%), those who operate in support structures such as procurement, legal, economic, and administrative departments, representing a percentage of 46%.

The executive positions were represented by 58.7% and the management positions were represented by 41.3%. Regarding the age group, most respondents belong to the 36-45 age group (47.6%), followed by those from the 45-55 age group (38.1%). A high proportion was of female respondents (54%), the male respondents having a representativeness of 46%. Regarding experience within the institution, there was an experienced workforce, with most respondents having experience between 5 and 10 years (38.1%), followed by those with more than 10 years of experience (36.5%). Most respondents (39.7%) have incomes between 5001 and 6500 lei, 36.5% have incomes between 6500 and 8500 lei, 22.2% earn below 5000 lei, and those with earnings over

10,000 lei correspond to 1.6%. We should not be surprised that public employees did not carry out their activities remotely at all, prior to the COVID-19 pandemic, representing an overwhelming percentage of 98.4%. The respondents worked for the first time in this way during pandemics, but the majority only occasionally (28.6%) or in a hybrid mode (23.8%).

Concerning the legal regulations related to telework activities, 52.4% of the respondents know these provisions, but the segment that does not know these regulations is equally representative (47.6%). Regarding the differences between the two types of flexible work in Romania (work from home and telework), a fairly large percentage of study participants (55.6%) declared that they did not know those differences, with 44.4% of them knowing them. Therefore, 87.3% of respondents believe it is necessary to be informed about the legislative aspects. At the same time, the need for a procedure to regulate teleworking activity at the level of each institution was identified, with 82.5% of respondents considering it necessary, even if there are legislative regulations. Regarding the degree of availability of public employees in order to carry out their professional activities in a telework regime, 52.5% of the respondents are very willing to carry out their activity in this form.. Consequently, the public sector should consider the activities that allow telework applications to be carried out in this form.

Regarding the period considered being the most beneficial for carrying out telework activities, this was indicated by a percentage of 36.5% of respondents as being between one week and 4 weeks, 31.7% considering the period as beneficial between a week and 2 weeks, and 23.8% choosing the interval of more than a month. Regarding the alternation of teleworking activities with periods of physical presence at the institution's headquarters, 84.1% of respondents consider this alternation beneficial and necessary. 49.2% of the participants in the study did not work overtime, and 11.1% declared that it was necessary to work overtime, but to a very small extent. To a large extent, those who worked extra hours in carrying out their telework activity represent a percentage of 7.9%. Although the percentage of employees with digital skills necessary to carry out telework activities is very high (84.1%), the study shows that 68.3% of respondents believe that the institutions where they work cannot provide the minimum equipment for carrying out activities in this form.

Regarding the most suitable communication channels in the case of telework activities, 76.2% of respondents consider platforms dedicated to online meetings (zoom, Webex, Google meet, etc.) to be the most suitable channel of communication, 66.7% e-mail, 42.9% phone calls, 41.3% the institution's internal network and 39.7% instant messaging applications (WhatsApp, messenger, etc.). Regarding the monitoring of the activities of those who work remotely, 60.3% of the study participants do not consider monitoring necessary, the emphasis is on the delivery of results and not on additional reports that would only make the activity more difficult.

However, with a percentage of 15.9%, the most effective monitoring method was weekly or monthly reporting. Performance indicators for this type of activity are considered necessary to be established by 39.7% of respondents, 30.2% considering that they are not necessary. At the same time, planning the activities was identified as necessary by a percentage of 82.5% of respondents, a very small percentage (6.3%) considering that planning is not necessary. Concerning the efficiency of carrying out professional activities remotely, 38.1% of the respondents consider that they are more efficient than

when physically present at the workplace, and 27% consider that it depends a lot on the situation. A percentage of 22.2% believe that they are equally effective in both cases. Regarding the costs of the equipment necessary to carry out this type of work, the majority of respondents (98.4%) declared that they did not receive from the institution amounts intended for the purchase of goods, only a percentage of 1.6% receiving amounts for the purchase of a computer/laptop. 87.3% of respondents consider that they have a favorable environment at home so that they can perform their tasks in optimal conditions. Even if the lack of communication with colleagues is considered to be one of the major disadvantages of telework, when asked about the duration of telework activities and the impact it can have on communication with colleagues, a percentage of 34.9% believe that it has been affected to a small extent, 30.2% moderately, 22.2% to a large extent, 12.7% not at all.

With regard to the income obtained as a result of carrying out professional activities in a telework regime, 36.5% of the respondents believe that their income was affected to a small extent, 15.9% to a large extent, 9.5% not at all, and 38.1% of them do not know how their income was affected, a rather large percentage due to ignorance of the legal provisions in force and their application differently from institution to institution. Regarding the effects of telework activities on the institution, 66.7% of the respondents declared that they did not know how the institution was affected due to the introduction of telework, thus indicating the lack of studies on this aspect and the lessons that could be learned. Only 25.4% believe that the institution in which they work has been positively affected by the implementation of telework. Do you think telework can be effectively applied in public administration? The answers to this question were mostly positive, with the study participants considering that telework can be applied successfully in the public sector, of course respecting certain rules and under certain conditions. The respondents believe that there is a need for more accurate identification of the activities in the public sector triggering telework and for designing and implementing pilot programs in public institutions that measure the efficiency of this type of work. The need to change outdated mentalities regarding the classical accomplishment of professional activities and embrace new working methods is also important.

According to the respondents, the main advantages of telework activities in the public sector have been identified as follows:

- Saving commuting time to and from the workplace;
- Reduction of costs in terms of fuel expenses;
- Reduction of pollution and crowding of public transport during peak hours;
- Traffic reduction;
- Savings and significant improvement in nutrition and health, due to the consumption of home-cooked food;
- More flexibility regarding the schedule;
- Reducing stress;
- Lack of stress caused by certain hierarchical superiors;
- Elimination of acoustic and visual stress from the workplace;
- Optimal balance between professional and personal life;
- Greater productivity in carrying out activities due to the limitation of interruptions caused by colleagues/phones without purpose, which can translate into an increased performance of the institution;

- Improving family ties due to physical presence at home and in other social spaces;
- Efficiency of the activity by carrying it out in personal comfort;
- Health protection;
- A more comfortable working environment;
- The opportunity to acquire new skills;
- Better organization of work tasks;
- Faster solving the work tasks;
- The opportunity to digitalize the institution;
- Flexibility, independence, increased responsibility;
- Reduction of the employer's costs in terms of space;
- Control and permanent follow-up of the progress of the scheduled activities by means of technological tools;
- Improving the recruitment process due to the fact that highly qualified personnel can be hired;
- Using the employees' own equipment, thus reducing the institution's costs;
- Total control over the "virtual office" and the flow of information;
- Inclusion in the active labor market of the vulnerable population (persons with disabilities, geographical isolation, etc.)
- Improving the quality of life.

The main disadvantages of telework activities in the public sector have been identified by respondents as follows:

- Lack of socialization;
- Lack of teamwork;
- Lack of suitable digital infrastructure;
- Increasing the level of sedentarism, which can cause serious physical problems;
- Increasing the level of "disconnection" and working more than normal;
- Defocusing, in the domestic environment, from the problems of the institution;
- Installation of a psychological comfort unfavorable to the professional act;
- Lack of data protection;
- Difficult flow of documents, lack of programs dedicated to this type of work;
- Lack of direct interaction with peers, lack of interaction with collaborators, less access to the information channels;
- Difficult flow of documents;
- The need to purchase the electronic signature from own funds;
- Gaps and bottlenecks in communication;
- Increasing the feeling of isolation from the institution and colleagues;
- Employee productivity control is much more complex;
- Reduction of interpersonal relationships;
- Increasing social differences due to the existence of a gap in access to ICT.

Even if there is a regulatory framework on telework, as mentioned by respondents, there is a need to develop work procedures that establish the workflow at the level of each public institution. Work procedures for institutions with certain specificity can be considered, as well as standardized procedures that can be applied uniformly at the level of the entire public administration. Work procedures should facilitate the digitalization process of labor relations. The legislation in the field must be revised and adapted to the new context, emphasizing the distinction between the two forms of remote work existing in Romania (telework and work from home) which are often confused and not

applied correctly. Data security represents another crucial aspect. Working with state documents is sensitive, and their transmission through insecure channels represents a real danger. In order to be able to benefit from total security in the drafting and transmission of documents, a secure, encrypted network must be created through which data can be transmitted safely even from home. Considering the fact that the development process of digital tools is very fast, special attention should be paid to training civil servants in terms of the use of new communication technologies, through courses dedicated to employees with management and executive positions.

Studying the good practices of other countries and taking into account the results of the questionnaire, we have identified five stages of the implementation and adoption of the telework process at the level of a public institution:

1. The commitment of the public institution regarding the implementation of the process, a commitment that clarifies the objectives and the will of the management team regarding the implementation of the telework process and the communication of this decision to all stakeholders: the implementation of the telework process at the level of an institution represents a strong transformation of the organizational culture, starting from the work modality to the evaluation modality. Without the management team's commitment and involvement in the change process, telework will not achieve the objectives and generate the expected benefits.
2. Planning the implementation of the telework process, through defining and establishing objectives, the stages and ways to achieve the objectives, the resources necessary, the action plan, establishing key performance indicators, and identifying the risks regarding implementation.
3. Analysis of the institution: To identify the opportunity to implement the telework process at the level of a public institution as well as the best methodology, the institution will have to make an analysis of the current situation. The purpose of the analysis is to identify whether the institution has the capacity to adapt to new organizational changes. This can be done by considering the legal, technological, and organizational aspects.
4. Conducting a pilot program in light to measure the degree of adaptability and acceptance by the public institution and employees in view to introducing telework. Such a pilot program should be conducted between 4 and 6 months in order to be able to provide conclusive information on the results, on the identification of possible ways of improvement, on costs, risks, and the application of the program in general.
5. Adopting the telework process, work policies, and procedures, as a continuous way of carrying out activities.

Perhaps, in Romania, it would help to develop and implement a National Strategy for the regulation of remote work, a strategy that would focus on four fundamental aspects:

1. Creating the necessary prerequisites for a favorable environment for the implementation of remote work - as remote work represents a new way of life, new and diverse measures are needed to support its development. Changes to how people work and where they work will impact several different aspects such as the rights and responsibilities of employers and employees, legislation

- on health and safety at work etc. All activities carried out are likely to support both the employer and the employee;
2. The development and capitalization of telework by creating the necessary infrastructure for carrying out professional activities;
 3. Maximizing the benefits of remote work and disseminating good practices to achieve the strategy's objectives;
 4. Evaluation of the impact of the introduction of telework activity at the central and local government level.

Summarising, in view to being able to adapt to a constantly changing environment and to be able to adopt the new "normal", the public sector should consider aspects such as:

- Elaboration of a public policy regarding telework activity at the public sector level, a public policy that takes into account the lessons learned in this field during the pandemics and what can be improved;
- Development and implementation of pilot programs;
- Investment in the purchase of new digital technologies and equipment in order to facilitate the implementation of the process of carrying out telework activities;
- Evaluation of the specificities of the activities carried out by public institutions in order to be able to determine exactly which of them can be carried out in a telework regime or in a hybrid regime;
- Permanent training of employees regarding the use of new digital technologies;
- Training of staff with executive functions on change management.

Conclusions

Work flexibility represents a genuine reality in the public sector.

Although in Romania, there was no previous experience in the flexibility of work, the public sector had to face the changes with speed and to adapt quickly, understanding that in such moments the continuation of the activity is the main goal.

In order to make the way and time of work more flexible in the public sector (telework, individualized work schedule, unequal schedule, etc.) the following are necessary: amendments to the Administrative Code, the Labour Code, and other regulations, an adequate IT infrastructure, the promotion of results-oriented management, information/training regarding digitalization and management change in public institutions, as well as the development of digital skills for public employees.

In the future, telework is important for work productivity, efficiency by capitalizing on digital technology, and a flexible option to balance professional life with personal life. The big challenges are information security and communication. The first depends on technological solutions to reduce the risk of cyber-attacks on less protected home networks. The second relates to the need for employee networking and the fact that no social platform can replace direct relationships between people, no matter how sophisticated. The key to solving lies with the management team, which, even in the case of remote work, must preserve the organization's values and find a solution to keep all team members together.

The Romanians place more and more emphasis on the balance between personal life and work and on the possibility of working flexibly. Among the benefits they seek in a

job, we have found a more pleasant working environment, the possibility to work remotely, more free time, and commitment to the organization's values.

The transition to telework activities has fostered technological and logistical challenges, with many institutions using the technology they already had, and others having to supplement capacity and acquire new equipment and services. It has changed the entire organizational culture, it has raised multiple questions in areas such as human resources and increased cyber security threats. But it has also led to increased productivity and efficiency and it has accelerated the process of digitalization and modernization. Public employees can function just as well, if not better, working remotely. This meant governments' new ideas in terms of labor recruitment. While face-to-face interactions are important, expanding recruitment efforts could help governments attract and retain talent. The COVID-19 pandemic has questioned the traditional notion that public employees must always be in an office.

Implementing and adopting telework within a public institution represents a profound change in the organizational framework, in view to preparing the structures and people involved in implementation, so that the process represents a success.

Summarising, telework in the public sector fosters sustainability, and a green and digital transition, and it has main implications for public policy by considering work-life balance, enhancement of digital competencies, and work flexibility.

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8

Knowledge Networks and Sustainability

B2B STRATEGIES AND MANAGEMENT PRACTICES IN BUSINESS INTERNATIONALIZATION IN THE DIGITAL TRANSFORMATION ERA

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Abstract. *Nowadays special attention must be attached to B2B management strategies and practices in order to expand businesses internationally, considering the new elements of global interest that have appeared with the post-COVID-19 period and the recent digital transformations.*

This research paper is a preliminary theoretical approach. More specifically, draw on the theories of different strategies and practices that will support small and medium-sized enterprises (SMEs) which intend to grow in international markets and strengthen their strategic relationships with partners and stakeholders from converging industries. The focus is especially on the methods and practices studied in order to internationalize businesses, whether we are talking about joint ventures, direct acquisitions, or strategic alliances. Moreover, the research aims to be a theoretical point of reference for managers, strategists, researchers, and organizations seeking solutions to accelerate business internationalization and push the business toward new profitable markets. At the macroeconomic level, when we refer to the internationalization of business, an area of interest in the competitiveness and expansion of B2B relations is represented by the role of emerging technologies such as artificial intelligence (AI), blockchain, the new 5G and 6G technologies that aim to bring a new dimension to the world we currently know.

The technological process will generate huge differences in the efficiency of global organizations regarding the implementation of solutions based on artificial intelligence and edge computing. From this point of view, this research also approaches novel relationships, less studied in the specialized literature - the impact of these new technologies on the competitiveness of the business and on the expansion of businesses on the international markets.

Keywords: *B2B strategies, competitiveness, cross-border businesses, digital transformation, interconnectivity, internationalization, managerial practices, new technologies, organizational performance, SMEs;*

Introduction

Increasingly, research on internationalization and cross-border development of businesses has become imperative for organizations that aim to maintain their competitive advantage (Vătămănescu et al., 2019) and specialized literature examined these firms from a more holistic perspective (Efrat et al., 2017; McHenry & Welch, 2018; McQuillan & Scott, 2015). For small and medium-sized enterprises (SMEs), going beyond national borders and adopting a global open position come as challenges that need to be addressed wisely (Colombo et al., 2018; Griffith & Hoppner, 2013;

Vătămănescu et al., 2017, 2019, 2020a, 2020b, 2022). Firms that seek to internationalize activities and penetrate new markets often adopt growth strategies and improve B2B international relationships. Literature has extensively examined when and why some growth management strategies improve or harm firm performance (Chakrabarti et al., 2007; Montgomery, 1994).

Internationalization may take the form of cooperating with prospective allies as a part of a deliberate managerial strategy that helps companies reduce excess capacity through combining resources or complementary skills and facilitate the development of new skills and the penetration of new markets by providing management of know-how, technology, and financial resources to local partners (Andrade et al., 2018; Păduraru et al., 2016; Vătămănescu et al., 2019).

The present internationalization process research examines a new chapter regarding digital transformation. Digital transformation is defined as a change process involved in employing digital technologies or developing new digital business models that create and appropriate more value for a firm (Fitzgerald et al., 2013; Hapenciuc et al., 2015; Kane et al., 2015; Vătămănescu et al., 2018a; Verhoef et al., 2021). Recent studies have found that digital transformation actions include applying digital technologies to promote internal and external collaborations (Singh & Hess, 2017; Vătămănescu et al., 2018b), renewing business models (Hess et al., 2016; Westerman et al., 2011) and changing the organizational culture for improved performance (Li et al., 2017; Vial, 2019; Warner and Wager, 2019). These technologies mainly include big data, artificial intelligence (AI), cloud, blockchain, and the Internet of Things (IoT) (Jean et al., 2020). This research proposal examines how firms transform themselves during internationalization when digital transformation stems as a strategic imperative for many traditional firms (Hess et al., 2016; Sebastian et al., 2017).

The research aims to understand how B2B strategies and practices impact SMEs' internationalization in different markets and how the telecommunication industry can support other industries' internationalization, focusing especially on the influence of digital transformation. Digital applications can increase the information availability and connectivity to the international world (Brynjolfsson & McAfee, 2017) – interaction of humans and robots from distance; the appearance of interconnectivity for all the machines, mobile devices, and automobiles; use of blockchain and cloud in order to become more efficient with resources, reducing relevant costs and to get performing results for the organization. However, these positive effects are also associated with challenges (Lanzolla et al., 2021) by facing huge investment costs in new technologies and the lack of developed infrastructure (Internet) worldwide.

Conceptual framework

Although researchers and managers have examined various B2B strategies applied in the internationalization process of a business, the literature offers little insight into how firms could cultivate digital innovation and transformation in regard to the firm internationalization, or globalization process. International expansion has been identified in the literature as one of the most crucial strategic decisions confronted by a firm, as it involves significant investment and bears comprehensive consequences for firm performance (Vătămănescu et al., 2014, 2015, 2016a, 2016b, 2017, 2019, 2020a, 2020b, 2022; Song, Makhija, & Kim, 2015).

The academic literature identifies several models of SMEs' internationalization. The number of approaches varies widely - all the more so as the topic is consistently investigated both in the case of SMEs and multinationals. For instance, Perlmutter (1969) divided multinationals in three segments, considering their managerial mindsets: ethnocentric (home country-oriented), poly-centric (host country-oriented), and geocentric (world-oriented) (Vătămănescu et al., 2017). SMEs could adopt these approaches by expanding on foreign markets, considering their specific contexts of internationalization and the relational capital they already possess. In all cases, the relationships between the branches and the flow of information are extremely important.

The study of internationalization within an organization using B2B strategies is not a new topic, but this research aims to focus on how digital transformation influenced and affected organizational behavior, on how the organizations (especially SMEs) should cope with the changes and challenges faced and how human, structural and relational resources are modified in order to improve the performance of the organizations and pushing them to become more agile. The role of digital transformation has been introduced to existing internationalization process research (Monaghan et al., 2020). Digital technologies have been demonstrated to have profoundly impacted international learning and networking due to lower communication and transaction costs (Alcacer et al., 2016; Oviatt & McDougall, 2005). Big data may also inform decisions and improve the efficiency of exploiting known opportunities (Brynjolfsson & McAfee, 2017).

In SMEs internationalization, a pivotal role is played by resource availability, and knowledge/learning in particular (Autio et al., 2000; Casillas et al., 2009), especially in business-to-business (B2B) settings (Karlsen et al., 2003; Lindsay et al., 2017). SMEs need different kinds of knowledge (Johanson & Vahlne, 1977). In order to understand internationalization knowledge managers should have the ability to understand and pursue multiple international opportunities (Blomstermo et al., 2004).

From a strategic standpoint, SMEs would benefit from managers' proactive and interactive conduct and consistent communication with international parties. Irrespective of the relationship stage or cycle-exploration, initiation, maintenance, development, or maturation - the importance and leverage of tenable offline and online interactions should be properly acknowledged by all the key actors within the organization. The capitalization of both channels should be treated as a competitive advantage all the more so as one supports another and both account for the internationalization effectiveness (Vătămănescu et al., 2017).

SMEs' internationalization answers the imperative for competitiveness in a globalized market (Vătămănescu et al., 2017). In Porter's opinion, competitiveness is usually defined as the engine of the market economy: the core of a firm's success or failure (Porter, 1990). The existing literature defines competitiveness as the capacity to approach new markets, targets, and business networks (Hilmersson, 2014; Sandberg, 2014). At the same time, competitiveness can be viewed as a condition for the survival and adaptability of businesses of different sizes and sectors (Sandberg, 2014; Song et al., 2015).

Building on this idea, in order to engage in international operations and develop competitive strategies in new markets, a firm must acquire general and specialized knowledge about the characteristics of the new international context (Flecher et al., 2013). In the management literature, the resourced-based view has been employed to understand the effect of such growth strategies on firm performance (Lieberman & Dhawan, 2005). A firm can adopt a diversification growth strategy and aims to extend its resources into new markets. In order to make sure that the organizations they lead not only survive but thrive within the global matrix, managers are dared to embrace and assume a global mindset (Cohen, 2010) and to take into consideration a global perspective over the organizations they manage.

According to theorists, there are four different B2B strategies that SMEs tend to use for internationalization: controlled-expansion strategy, resource-seeking strategy, hub-reaching strategy, and serendipitous resource-leveraging strategy, each of them comprising other components. In this way, controlled-expansion strategy is focused on gradual expansion to international markets, leveraging a centralized and geographically focused organizational structure to be able to ensure and customize high-quality service delivery for local customers (Vanninen, & Kuivalainen, 2017); resource-seeking strategy concentrated on acquiring critical resources that are needed to develop the best products in the market, leveraging decentralized and geographically dispersed organizational structure to be able to access new talent, customer inputs, and market insights from different locations as swiftly and efficiently as possible (Cerrato et al., 2016); hub-reaching strategy with the key purpose to access industry clusters that host several key stakeholders in one location, and it leverages an organizational structure that is centralized in domestic markets but uses a few geographically focused functions in key target locations to be able to afford a physical presence in expensive competing industry hubs; and serendipitous resource-leveraging strategy, which refers to focus on the cost-effective use of limited resources and leverages a decentralized and relatively person-dependent organizational structure to be able to capture emergent opportunities within employee's personal networks with minimal costs (Vanninen & Kuivalainen, 2017).

Nowadays, the biggest challenge regarding the internationalization of an SME is to face the economic impact resulting from the pandemic era (Covid-19 era), the new adaptation of businesses after the Brexit, a collapse in world trade in 2020 as a result of the US-China trade war, a global economic picture influenced by the war between Russia and Ukraine with all the economic restrictions involved for a part of international SMEs with Russian capital or investors, a global gas crisis and the economic inflation resulted from the first half of 2022. Moreover, it could be challenging for the SMEs which intend to penetrate other international markets to find solutions, to adapt themselves to all these limits of expansion and digital transformation with possible cyber-attacks, data breaches, and digital-related regulatory multiplicity and variance across countries during their digital transformation (Luo, 2022). This research suggests that managers of traditional manufacturing SMEs may wish to consider strategic digital transformation as an important tool for internationalization.

In conclusion, organizations that want to preserve their competitiveness and internationalize their activities should understand the need for different kinds of knowledge, have the capacity to approach new markets, targets, and business networks,

and choose a good B2B strategy based on their internal resources and capacity of adapting to the new markets.

Looking into all these aspects brings to the forefront the importance of digital transformation in B2B practices to get the organization on the international markets will get a new dimension and has provided a potentially new perspective for this future research. It, raises a couple of research questions: How does the heritage from previous internationalization models affect and influence the choice of this new digital transformation era? Will this change the big data, collected in blockchain and cloud databases, the models of using unlimited resources, and which organizations will survive? Are the organizations that transform their present business models the only ones which may become competitive?

Conclusions

This study aims to be a conceptual model and a theoretical point of reference for managers, strategists, researchers, and organizations that seek solutions to accelerate the internationalization of businesses and to push the business toward new profitable markets, using B2B strategies and innovation offered by new technologies such as artificial intelligence (AI), blockchain, the new 5G and 6G technologies. The impact of digital technologies on business internationalization is an emerging yet underexplored topic in multi-nationalization research. In addition, there is an interest in determining how the various SMEs' internationalization occurs and whether there are common exogenous conditions that would explain why firms choose some specific B2B strategies. Those being said, this study attempts to answer the following questions: 1) How is digital transformation changing the business model of SMEs? 2) How is digital transformation changing SMEs' B2B internationalization strategies? How will the new technologies impact the competitiveness of business? In addition to the theoretical implications, this study will provide managerial directions to embrace the digital transformation of SMEs operating internationally.

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MANAGING SIMILARITY ATTRACTION BIAS IN THE HIRING PROCESS. A THEORETICAL OVERVIEW

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Abstract. *The current study aims at investigating and exploring how similarity attraction affects hiring decisions in various selected multinational financial organizations. The existence of cognitive biases has become a significant challenge as well as the subject of extensive research, and managers at all levels are making every effort to understand the causes, effects, and methods for removing their influence on the decision-making process. In addition to the foregoing, businesses try to create diversity in the workforce, which is prone to being reduced due to cognitive biases and, especially, similarity attraction in hiring procedures. The concept of "similarity attraction" refers to a general similarity between a candidate and a hiring responsible personnel, founded on either attitudinal characteristics or similarities of demographic attributes. Hence, the primary objective of the research paper will be to preliminarily examine the fundamentals of the similarity attraction bias and how it affects the hiring managers' decisions of selection, with particular attention paid to selection criteria, selection criteria choices, selection rationales, reasons for similarity attraction, consequences of similarity attraction, impact on diversity, and overcoming similarity. Simultaneously, the study will theoretically tackle how hiring responsible employees could manage and might reduce the influence of the similarity attraction bias on their hiring-related decisions, specifically what type of knowledge should be necessary and what strategies or tactics could be employed to overcome the aforementioned cognitive prejudgment.*

Keywords: *similarity attraction bias; hiring process, workforce diversity; decision making; recruitment.*

Introduction

The similarity attraction bias that frequently arises throughout the hiring process, more specifically when selecting the applicant for a job position, represents the main phenomenon in this study (MacLean, Brimacombe, & Lindsey, 2013, as cited in Lieberman, Rock, Halvorson, & Cox, 2015). The organizational setting implies that the selection of employees is primarily based on procedures that necessitate human

assessments, which are frequently subject to cognitive biases (Lee, Pitesa, Thau, & Pillutla, 2015).

The similarity attraction bias, according to Garcia, Posthuma, and Colella (2008), represents a generic resemblance between a recruiter and a candidate based on either demographic factors or attitudinal features. In this sense, a wide range of studies have demonstrated that similarity in demographic characteristics between people can lead to more favorable attitudes and favoritism (O'Reilly, Caldwell, & Barnett, 1989; Jackson, Brett, Sessa, Cooper, Julin, & Peyronnin, 1991; Tsui, Egan, & O'Reilly, 1992; Riordan & Shore, 1997; Goldberg, 2005; Vătămănescu, Alexandru & Gorgos, 2014; Vătămănescu, Alexandru, & Andrei, 2015; Vătămănescu, Andrei, & Pînzaru, 2018). Recruiters may assume that applicants share the same values, views, and outlook on life because of similar demographic characteristics (Goldberg, 2005).

Following this line of reasoning, studies indicated that it is highly essential for recruiters to be aware of such beliefs and behaviors that might risk their ability to manage the recruitment process and establish a diverse workforce, as the current global marketplace demands distinctive talent to provide competitive goods and services (Vătămănescu et al., 2015; Vătămănescu & Constantin, 2015; Chamberlain, 2016). Substantial research shed light onto the fact that the diversity in the workforce has benefits that go well beyond being essential to a company's ability to succeed. Indicators of profitability as sales revenue, number of clients, vast amounts of trade are closely correlated and compatible with increased variety (Sip, Bavel, West, Davis, Rock, & Grand, 2017). Despite important financial investments being allocated for diversity initiatives with the goal of enhancing the status of varied employment, the current labor force still experiences the diversity gap (Herring, 2009; Pratt, 2015, as cited in Sip et al., 2017).

Conventionally, biases limit the pool of talent that is available in the market and fail to take into consideration the most qualified job prospects (Sip et al., 2017). Cotter (2011) indicated that high degrees of resemblance can also inspire confidence and trust in a prospective employee and, as a result, may signify a promise of a productive working relationship, but it can have significant negative implications for the hiring process (Cotter, 2011). Equally important, gender stereotypes in recruiting practices are a hot topic that has been the subject of extensive research. To illustrate, a study conducted in Spain demonstrates that recruiting managers frequently discriminate against women (González, Cortina, & Rodriguez, 2019).

An additional study on the subject of racial stereotypes was carried out in Ireland in 2009. It revealed that natives are often twice as likely to receive an invitation to a job interview as non-natives (McGinnity, Nelson, Lunn, & Quinn, 2009). In addition, there it is a meta-evaluation study on racial discrimination that was conducted in nine nations and included 200,000 job applications and 97 field experiments. In all countries, the study indicated severe discrimination against indigenous non-white people, which is consistent with the findings. However, it has been shown that there it is little discrimination against white non-natives (Quillian, Heath, Pager, Midtben, Fleischmann, & Hexel, 2019).

The majority of the studies mentioned in the previous paragraphs have focused on racial, ethnic, and age disparities in hiring practices. According to the literature reviewed above, these traits speak to the idea of similarity attraction and have a skewness in the decision-making of hiring personnel. Additionally, the aforementioned studies have recently been theoretically refined and make a significant contribution to the ongoing research.

The primary objective of the research paper will be to preliminary examine the fundamentals of the similarity attraction bias and how it affects the hiring managers' decisions of selection, with particular attention paid to selection criteria, selection criteria choices, selection rationales, reasons for similarity attraction, consequences of similarity attraction, impact on diversity, and overcoming similarity. Simultaneously, the study will theoretically tackle how hiring responsible employees could manage and might reduce the influence of the similarity attraction bias on their hiring-related decisions, specifically what type of knowledge should be necessary and what strategies or tactics could be employed to overcome the aforementioned cognitive prejudice.

The paper will further explore what knowledge should be necessary and what additional techniques could be employed to defeat this cognitive partiality. Consequently, the outcomes could significantly aid in determining if applicants are qualified for a certain job position, which further contributes to a stable job market. Since no other study of this kind has been conducted in specific contexts, the study looks to be novel and welcome.

Theoretical framework: a preliminary overview

To begin with, the similarity attraction bias, in which human resource professionals choose applicants who seem to be similar to them in certain respects, has received a significant amount attention from researchers (Diaz, Ramirez-Marin, & Diaz, 2019). The main driver for the increased interest in this particular topic could be explicated by the popularity and the status of the similarity attraction relation, the consistency and the reliability with which the phenomenon has been explored, and last but not least, the ease with which shared attributes could be fairly controlled and measured in an experimental setting (Byrne & Griffitt, 1973).

Interpersonal attraction has been compared by Batool and Malik (2010) to convergences in attitudes, social groups, ideals, and convictions. According to the authors, when people learn that others have similar attitudes and not distinctive ones, they express positive and good feelings towards them.

Since the early 1970s, Byrne has developed the similarity attraction paradigm, which is connected with the social identity theory, which, in turn, establishes how people perceive an individual based on group belongingness (Byrne, 1971, as cited in Goldberg, 2005). In essence, this theory indicates that people who are similar to one another are interpersonally drawn or attracted to one another and may therefore be given priority over people who belong to a group with distinctive traits (Goldberg, 2005).

In addition to the social identity theory and the attraction paradigm, the relational demography theory asserts that individuals who share referents' demographic

characteristics may produce favorable employment outcomes (Goldberg, Riordan, & Zhang, 2008). Wells and Aicher (2013) also recognize that the core concept of the abovementioned relational demography theory is the degree to which members of various groups have comparable demographic characteristics.

Towards an in-depth comprehension of the phenomenon of similarity attraction, the conceptual framework should encompass the Social Identity Theory, the Relational Demography Theory and the Attraction Paradigm, which will design the foundation for appraising the similarity attraction and delineating how shared characteristics affect the decision-making process of recruiters and most importantly, the workplace diversity in organizations.

The brief conceptual framework is represented in Figure 1, which is shown below. This framework offers theories about the similarity attraction bias, its causes, how it affects judgment, and methods for managing the bias.

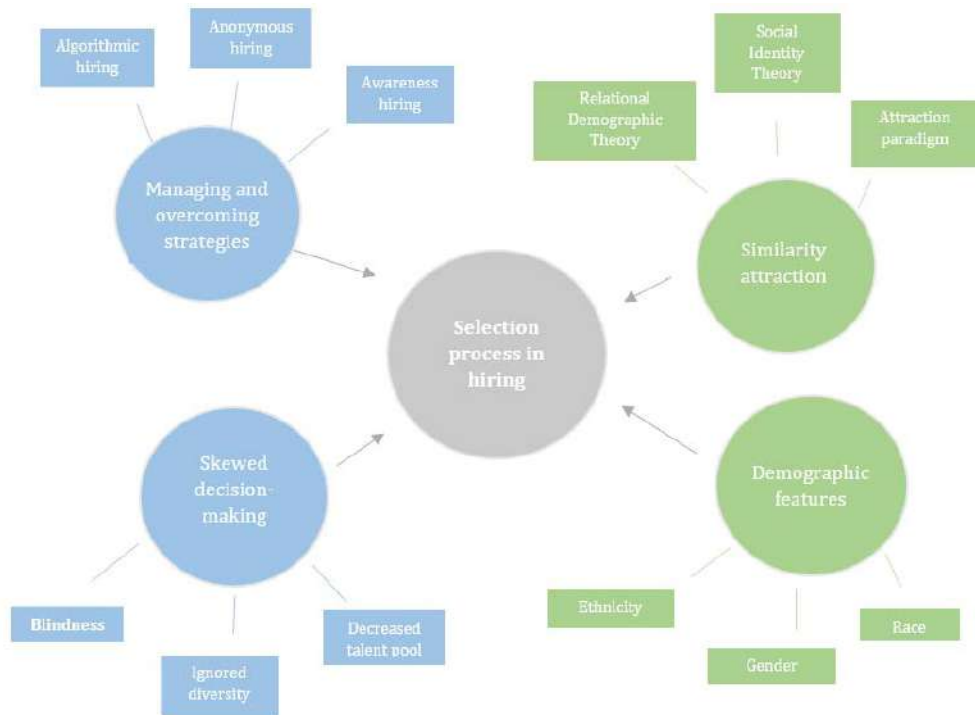


Figure 1. Theoretical framework

Additionally, the relational demography theory (often referred to as RDT), which contends that people are more likely to view others favorably if they share similar demographic characteristics, provides support for the current study (Goldberg, Riordan, & Zhang, 2008).

Despite having been developed in the 1970s and 1980s, Tajfel and Turner's social identification theory (abbreviated as SIT) continues to serve as the groundwork for this study on the phenomenon of similarity attraction. People typically define their own

social identity by classifying themselves and joining specific social groupings (Tajfel & Turner, 1986, as cited in Goldberg, 2005). Furthermore, extensive range of studies examine the attraction paradigm, which claims that a person's equivalent attributes make them attractive and implies a relationship between attraction and a person's combined personal traits (Byrne, 1971, as cited in Díaz, Ramirez-Marin, & Díaz, 2019).

It is clear from the theories' publication years that scholars were already interested in the phenomenon since back in the early 1970s and 1980s. Nevertheless, despite the attraction paradigm's age, academics still highly value it today, and they have used it as a foundation for subsequent studies on candidate recruitment and selection.

In their research, Lee et al. (2015) employed the attraction paradigm to explain why decision-makers, particularly hiring managers, use prejudice against applicants during the pre-assessment or screening procedures. According to the study, people connect with others more frequently and lean toward positive reinforcement when they have similar traits. As a result, it is certain that decision-makers might favor one applicant over another due to the substantial number of similarities (Lee et al., 2015). In this spirit, according to Bogen and Rieke (2018), making a hiring choice should not be seen as a single action but rather as a series of related actions that are concluded by an employment offer or rejection.

It is important to mention that biases are generally thought of as subconscious elements that affect how people perceive the outside world and divert attention from more logical or rational explanations (Lieberman et al., 2015). Cognitive biases could be compared to invisible air particles that a person inhales into his or her lungs and which have a significant impact on a person's behavior without the respective person even being aware of it. Hence, when faced with complexity and uncertainty, the human mind has a straightforward protective reaction that involves making an immediate decision that will have positive outcomes and judging with the least amount of psychological and mental effort for the person in question (Lieberman et al., 2015; Bratianu, Vătămănescu, Anagnoste, & Dominici, 2021).

It is worth highlighting that cognitive biases do not necessarily have a negative connotation and should not be seen exclusively negatively for the decisions being made (Sip et al., 2017). Due to the fact that it enables the human brain to get through a day filled with complicated and difficult decisions, unconscious partiality may play a very helpful function in decision-making. In other words, a prejudice provides a way to avoid delving too deeply into the root of the issue (Sip et al., 2017). According to Lieberman et al. (2015), the prejudice makes recruiters use a form of cognitive shorthand and causes them to make decisions with less effort, which supports the bias' favorable meaning. Consequences of unconscious prejudices might include preventing people from properly evaluating a wide range of possibilities when making a big and responsible decision by blinding them to additional information that is available at a particular time (Sip et al., 2017).

People have always attempted to make decisions consistently, albeit the extent of consistency varies based on the situation, motivation, and requirements (Collisson & Howell, 2014). High consistency people could spend significant amounts of time and

energy trying to make the decision-making process less uncertain. The primary goal is to reduce the degree of stress, strain, and pain; as a result, people frequently focus on achieving and maintaining the cognitive balance in their thoughts. Individuals with a low level of consistency, on the other hand, think about giving everything they have so as not to compromise the decision-making process. In this way, the responses with a similar level of consistency may be preferred by the people with a strong precedence for consistency, first and foremost, revealing a stronger similarity attraction effect (Collisson & Howell, 2014). The balancing theory, as named by Collisson and Howell (2014), may provide an explanation for why people favor responders who are similar to them and give them less weight than those who appear to be different from them.

More recently, in 2014, West, Magee, Gordon, and Gullett concluded that similarity can develop mutual understanding, encourage information sharing, and help find a middle ground in settling conflicts. It can also act as a "barrier" for possible connections. People view similarity as a relational defense tactic in an established or developing relationship. By choosing the most fortunate candidate, people ultimately prefer to save much more moral and psychological work and hence embrace similarity attraction as a modest mental and cognitive investment.

Notably, being aware of the discussed theories is essential in managing these possible threats, as the diversity in corporate practices may boost team engagement, productivity, and cohesion while lowering the likelihood of conflicts and misunderstandings. Similar to this, diversity might promote innovation and creativity by encouraging a wider range of ideas and innovative solutions (Hunt, Layton, & Prince, 2015).

The key component of an organization's added value is its employees, which functions in tandem with diversity (Chamberlain, 2016). When an organization focuses on support future development, it should consider and hire individuals with diverse personalities, according to the outcomes that department managers and recruiters have aligned and agreed upon. Workforce members must constantly communicate with one another since the workplace serves as a battleground for encounters. Thus, it is clear that communication affects team performance and that diversity and communication go together. According to Hunt, Layton, and Prince (2015), variety has a number of advantages. First of all, diversity tends to encourage higher employee happiness, lower the possibility of disputes and misunderstandings among team members, raise team cohesion and productivity, and foster more loyalty among team members. Subsequent, diversity often encourages invention and creativity by providing a greater range of responses to problems that arise.

According to Schaffer (2018), businesses may benefit from forming heterogeneous groups and integrating their global vision with their strategic goals. These various groupings possess distinctive qualities resulting from a variety of psychological, political, intellectual, and demographic traits. In order to enhance and sustain the degree of diversity, corporations and their owners should place a strong emphasis on the ongoing implementation of diversity trainings and development programs. However, one should keep in mind that the relationship between a company's success and its

commitment to diversity is not one-to-one, as the latter is more beneficial (Sip et al., 2017).

In this respect, scholars have agreed that a major obstacle to closing the diversity gap is consequently the hiring bias specified by researchers as "similarity attraction" (Sip et al., 2017). As the human brain is predisposed to rely on cognitive leanings in decision-making, which are largely unconscious and may sabotage the recruiting process, the diversity gap still exists (Banaji, Greenwald, & Martin, 2016).

Conflating the research directions mentioned above, at this stage, a potential conceptual model may be proposed. In line with this, Figure 2 depicts the relationships between variables and their influence on each other. As detailed below, the model presumes that the similar demographic traits and similar attitude traits positively influence the skewed decision-making in the hiring process; the hiring process negatively influences personnel diversity. Algorithm hiring, Anonymous hiring and Awareness hiring negatively moderate the relationship between similar demographic traits and similar attitude traits and the skewed decision-making in the hiring process.

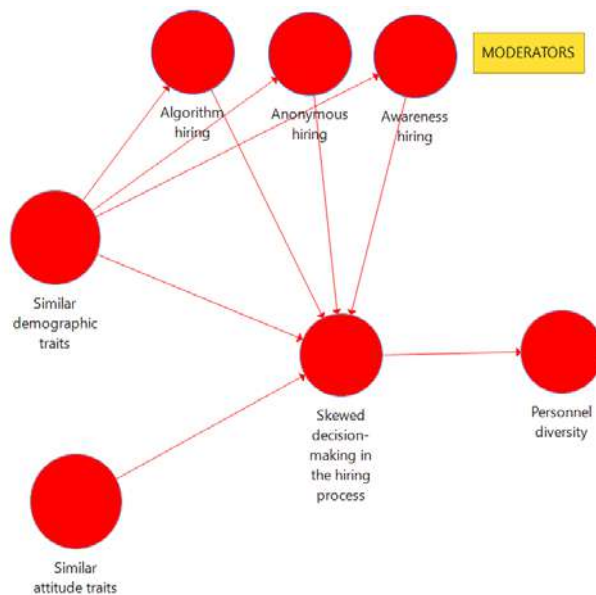


Figure 2. A potential conceptual model

Final considerations and implications

The current endeavor set out to preliminary examine the fundamentals of the similarity attraction bias and how this might affect the hiring managers' decisions of selection, with particular attention paid to selection criteria, selection criteria choices, selection rationales, reasons for similarity attraction, consequences of similarity attraction, impact on diversity, and overcoming similarity. Adjointly, the theoretical approach covered how hiring responsible employees could manage and might reduce the influence of the similarity attraction bias on their hiring-related decisions. In this

respect, the approach intended to provide some theoretical cues regarding the beliefs and actions that the recruitment professionals must be aware of, as they could compromise their capacity to attract, create and establish a diverse workforce, especially when the current global marketplace context demands distinctive and diversified talent to provide competitive services or products.

Unfolding such an analysis would have relevant organizational and managerial implications. The study may be particularly useful for corporations working in the financial sector by enhancing workplace diversity and identifying the best applicants, as well as identifying patterns of behavior whether they are controlled, presented in a particular manner, or unintentionally guided. More specifically, recruitment stakeholders who are involved in the selection of candidates, such as the hiring agent, recruitment team, head-hunters, and managers, may directly benefit from the findings derived from the current research because they will explain and reveal the effects of similarity attraction in the hiring process, its impact on diversity, and offer room for self-reflection on the objectivity and fairness of the selection. The aforementioned parties may get approaches designed to lessen the influence of similarity attraction during the decision-making process. The associated findings could help employers in offering greater focus on ethical hiring processes and conserve the most precious resources, including time and financial rationales, while searching for the best, or most suitable, candidates.

Nevertheless, despite the potential benefits of conducting a thorough investigation on the topic, the present endeavor emerges only as an introductory theoretical framework for a future in-depth scrutiny, as a synopsis of current scholarly and practical preoccupations regarding this area of interest.

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SUSTAINABILITY, INNOVATION AND EFFICIENCY AS DETERMINANTS OF PERFORMANCE IN THE ENERGY FIELD

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Abstract. *By protecting the environment through renewables, society makes an important step towards protecting future generations. Bioenergy, as a particular type of renewable energy, is being hailed as an alternative to fossil fuels, due to its main characteristics: renewable, sustainable, and environmentally friendly. The need to support this shift to green energy arises from studying performance in the bioenergy field in particular (and in the renewable energy field in general). This paper focuses on presenting three determinants of performance in the bioenergy field and discussing their influence from a macroeconomic perspective. An econometric model with panel data is used in this regard for countries in European Union. The analysis enables comparisons among countries and shows which determinant influences performance (given the highest number of positive relationships established between each independent variable and the level of performance). Negative relationships that appear may reveal influences that need to be further studied to understand what leads to them. Limitations of this research are explained in the last part of the conclusions.*

Keywords: *bioenergy; efficiency; innovation; performance; sustainability.*

Introduction

Since the industrial revolution in the early 19th century, countries across the globe have paid more attention to economic growth and development. From the advent of the steam engine to the development of internal combustion engines, all global economic activities have developed and diversified (Wu et al., 2022, p. 1). In this way, international demand for goods has undergone major changes, with a direct impact on production and the industrial environment as a whole. The pressure to develop international trade under conditions of economic performance has culminated in the neglect of environmental objectives, leading to the use of non-renewable energy sources. Over time, the effects have been observed: increased greenhouse gas emissions and environmental degradation (Shayanmehr et al., 2020, p. 1; Bölük & Mert, 2014, p. 439). The question

that arises is: what is the value of the costs that we have to bear today due to environmental degradation? Do the benefits obtained over time through polluting activities outweigh the costs incurred by present and future generations?

Worldwide there have been various initiatives to reduce the environmental impact of industrial activities (Kyoto and Paris climate agreements), with notable targets such as reducing greenhouse gas emissions by up to 40% by 2030 compared to the 1990 baseline year (Wu et al., 2022, p. 1). The energy sector is considered to play an essential role in referring to global challenges related to sustainability (Zaharia, Popescu & Vreja, 2016). While at the European level the European Commission directives are already transposed into national legislation and are being respected, the key factors for economic growth in BRICS economies (Brazil, Russia, India, China & South Africa) are fossil fuels (Wang & Zhang, 2020, p. 2; Zhao et al., 2022, p. 316). In this way, governments are betting on increasing income at the expense of reducing emissions, which means that progress is conditional on an increase in energy consumption, ultimately leading to an increase in CO₂ emissions (Wu et al., 2022). Undoubtedly, there is a strong connection between innovation and economic development (Cicea et al., 2021). For this reason, it is imperative that innovation in renewable energy sources be a strategic activity worldwide, as they guarantee the rebalance between economic growth and environmental quality (Karimi et al., 2021, p. 1; Usman et al., 2021, p. 2). In other words, performance in renewable energy today is the guarantee of a future that is favorable for efficient and sustainable operations. Not to mention that renewables are also related to a relatively new concept and are considered to have a salient role in the transition to bioeconomy (Cîrstea et al., 2019). Bioenergy, as a specific type of renewable energy, represents this research paper's principal focus. The present study aims to present three determinants of performance in the bioenergy field and discuss their influence from a macroeconomic perspective. As related to it, the concept of performance in the field is highlighted and studied in accordance with three factors of influence: innovation, efficiency, and sustainability for countries members of the European Union. The present work is structured as follows: the *introduction* outlines the context related to bioenergy, as a specific type of renewable energy; the *Literature review* has been designed to analyze other publications that have covered the same topics; the analytical *Methodology* applied presents all needed assumptions characteristic to Least Squares method application, three research hypotheses are formulated - the relationships among mentioned factors and performance are described using a multiple regression analysis; the *Results and Discussion* section presents the results in the context of the current framework and comprises the core of the present study - in this section of the paper, the assumptions are either validated for some countries either rejected for another one, while influences of each independent variable (proxies for the determinants of performance) are revealed; the *Conclusions* section provides final observations related to bioenergy performance.

The multi-objective methodology is based on an econometric model with panel data, used in this regard for countries in European Union. The first step was the collection of data related to bioenergy characteristics; the second step was the choice of dependent and independent variables; the third step was defining the econometric model; the fourth step involved testing the seventh assumption about the model, independent variables, and errors.

Literature review

The countries ranking in the international market depends on their economic performance. Economic performance means how efficiently a country's economy performs (Zhang, 2022, p. 1). There are many advantages for countries with high economic performance, such as increased income, and higher volumes of goods and services. This way, the performance stabilizes economic growth by reducing inflationary tendencies, current account deficits, and environmental problems. Thus, in performing economies, the emergence of opportunities makes these countries desirable to their citizens (Basseti et al., 2021, p. 21).

Economic performance is significantly influenced by energy production and consumption. In high-performing economies with opportunities and a focus on innovation, improved human capital, healthy living, and resource management, renewable energy is the path to sustainable development (Nishitani & Kokubu, 2020, p. 156). Renewable energy leaves no waste or pollution behind, and its use helps to maintain the quality of the environment, and provide inputs for economic activities, while human development relies on it (Pîrlogea, 2012, p. 497). According to Rehman et al. (2019, p. 21760), economic performance plays an important role in sustainable economic development. Of course, the issue of energy performance must be analyzed in any area, no matter the source of energy: wind energy (Zavadskas et al., 2022), solar energy (Suehrcke & McCormick, 1992), ocean energy (Sequeira & Man, 2019) or thermal energy (Gadalla & Ahmed, 2013).

Over time, a considerable number of methods have been used in order to examine efficiency and efficiency change in industries or organizations. As a result, parametric, non-parametric, and other productivity indices have been developed and used to measure efficiency and productivity (Abdulwakil et al., 2020, p. 2; Coelli et al., 1998, p. 69).

Several studies have applied the non-parametric data envelopment analysis (DEA) on diverse datasets to investigate the efficiencies of various firms and industries. With the DEA method, specialists can calculate a firm's income, expenses, and efficiency based on input and output data (Abdulwakil et al., 2020, p. 2; Han et al., 2019, p. 350). Moreover, a notable advantage of the method is the ability to quantify information using different units of measurement (Demirbag et al., 2007, p. 419; Reddy, 2013, p. 403). Based on the DEA method, there have been a number of papers that have examined renewable energy development (Aldea & Ciobanu, 2011), bioenergy performance (Alsaleh et al., 2017, p. 1335), respectively that have attempted to examine efficiency and performance determinants (Alsaleh et al., 2017, p. 1336; Wahab & Rahman, 2013, p. 34; Cicea et al., 2022, p. 1; Mardani et al., 2017, p. 1299; Gong et al., 2017, p. 466).

The multivariate statistical regression method is one of the widely used data-driven methods for analyzing the efficiency of a particular objective. According to Zhu et al. (2021, p. 2), this is used in many cases to assess energy efficiency, providing a perspective demonstrated by many researchers. The method's main advantage is that it can be used to analyze the correlation between multiple variables involved in different processes. Among the most commonly used methods for building econometric models are the principal component regression (PCR) and the partial least squares (PLS), which are successfully used on a large scale (Geladi & Kowalski, 1986, p. 2; Abdi & Williams, 2010, p. 444; Zhu & Chen, 2019, p. 815; Zhang et al., 2017, p. 462).

Findings revealed that capital, labour, GDP, Inflation, and interest rate significantly affected the technical efficiency of bioenergy. Moreover, in developing countries, the efficiency of resource allocation is higher than in developed countries. However, technical efficiency in developed countries is higher than labor in developing countries, with influences on financial resources and innovation capacity (Alsaleh et al., 2017, p. 1336; Cicea et al., 2022, p. 8).

Recently, a multidimensional analysis of bioenergy performance has been conducted, reflecting three dimensions: innovation, efficiency, and sustainability, and developing, in the end, a new performance index in the bioenergy field (Cicea, Marinescu & Pintilie, 2021, p. 2). The analysis reveals countries outperforming in the bioenergy field, but also non-performers. At the same time, the authors explain that the index's three dimensions are dominant components for a country, meaning that each country can have a higher score for a specific dimension. Innovation, efficiency, and sustainability have been described before as having a major role in bioenergy field development (Cicea et al., 2019, p. 2405; Marinescu, Cicea & Colesca, 2019, p. 33). For this reason, within the present paper, these three dimensions are seen as determinants of performance in the bioenergy field, being included in a specific analysis that reveals their influence on performance.

Methodology

In order to build the econometric model with panel data, it is necessary to make a preliminary choice of the variables that will shape it. Thus, those variables were chosen to capture aspects related to performance, innovation, efficiency, and sustainability, characteristics of bioenergy. Related to these, the most difficult task was data collection; the lack of data (either for certain countries or for certain years) meant that the analysis had to consider the time period 2006-2016 for 14 EU member countries. Collecting the data and obtaining the indicators used (three of the four were obtained from their own calculations) was very time-consuming, as the IRENA database does not provide them free of charge, as it is one of the sources used for each of the four variables. In the end, we selected the following variables, whose recorded values in the 2010-2016 period (for the countries considered in the analysis) led to the graphical representations in figures 1-4.

The chosen dependent variable is Avoided emissions (tonnes CO₂ equivalent) per GWh generated (IRENA, 2019) - a proxy for bioenergy performance (coded in the econometric model as PERFORM).

The chosen independent variables are: (1) Number of patents (IRENA, 2019) - innovation component (coded in the econometric model as INOV); (2) Bioenergy supplied per capita (IRENA, 2019) (MWh/capita) - sustainability component (coded in the econometric model as SUST); (3) Bioenergy productivity (IRENA, 2019) (dollar per capita / GWh)- efficiency component (coded in the econometric model as EF).

Emissions avoided through bioenergy are obtained as a value through a tool available on the IRENA website (avoided emissions calculator). It shows for each country that can be selected from the list, a fuel mix characteristic of that country (see Table 1), which can generate a certain amount of CO₂ emissions through consumption. If the country produces and uses bioenergy, it avoids pollutants with each GWh produced and used.

Apart from the number of patents, all other variables are derived from calculations based on data collected from the mentioned sources.

Table 1. Fossil fuels mix (Source: IRENA, 2019)

No.	Country	Coal	Natural gas	Oil
1	Austria	45,3%	49,5%	5,2%
2	Denmark	79,2%	18,8%	2,0%
3	Finland	67,2%	31,7%	1,1%
4	France	55,8%	38,6%	5,6%
5	Germany	79,4%	18,6%	1,9%
6	Italy	28,1%	63,0%	9,0%
7	Great Britain	57,4%	41,6%	0,9%
8	Poland	95,2%	3,6%	1,2%
9	Czech Republic	96,1%	3,8%	0,1%
10	Romania	63,3%	34,5%	2,1%
11	Spain	37,5%	50,4%	12,1%
12	Sweden	51,9%	32,3%	15,9%
13	Netherlands	32,8%	65,7%	1,5%
14	Hungary	53,3%	46,2%	0,5%

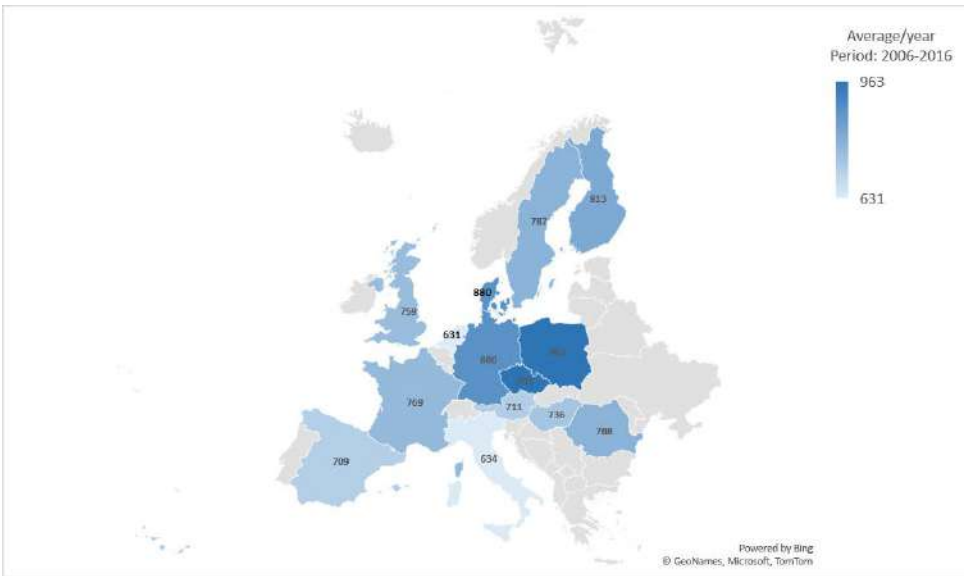


Figure 1. Annual average for avoided emissions (tonnes CO2 equivalent) per GWh generated (authors after IRENA, 2019)

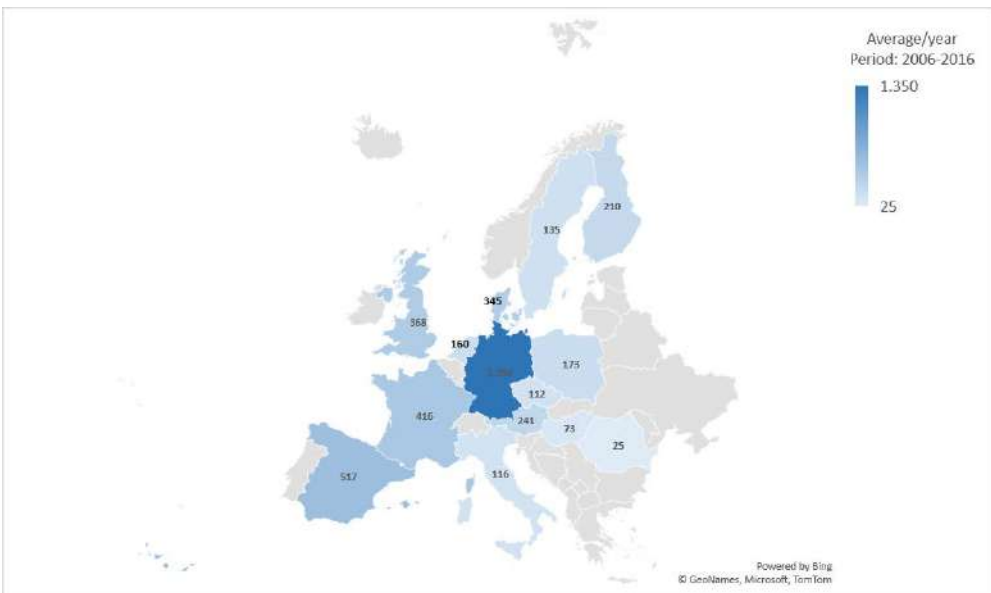


Figure 2. Annual average for number of patents in the field (proxy for innovation) (authors after IRENA, 2019)

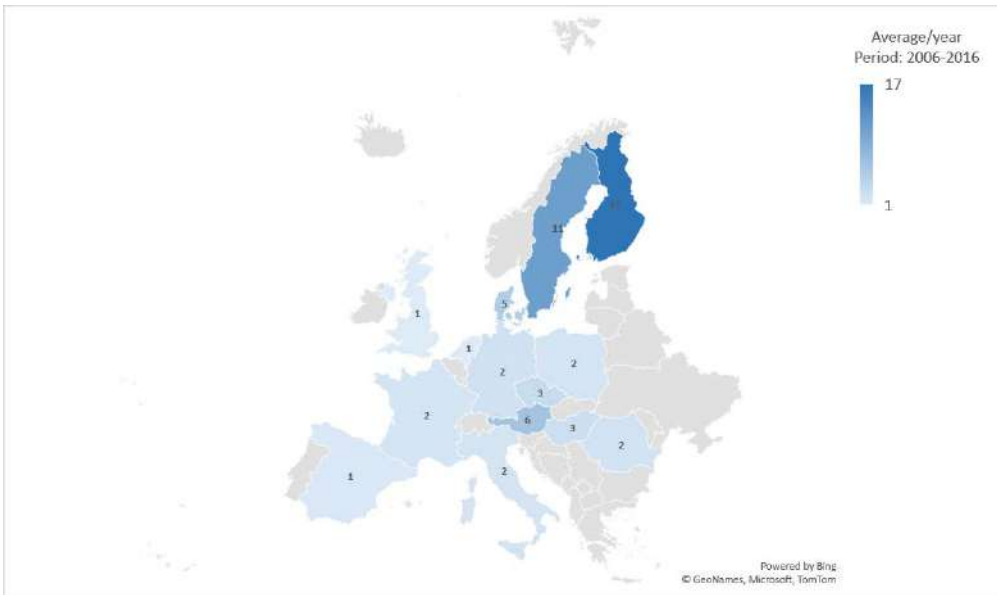


Figure 4. Annual average for bioenergy supplied per capita (proxy for sustainability) (authors after IRENA, 2019)

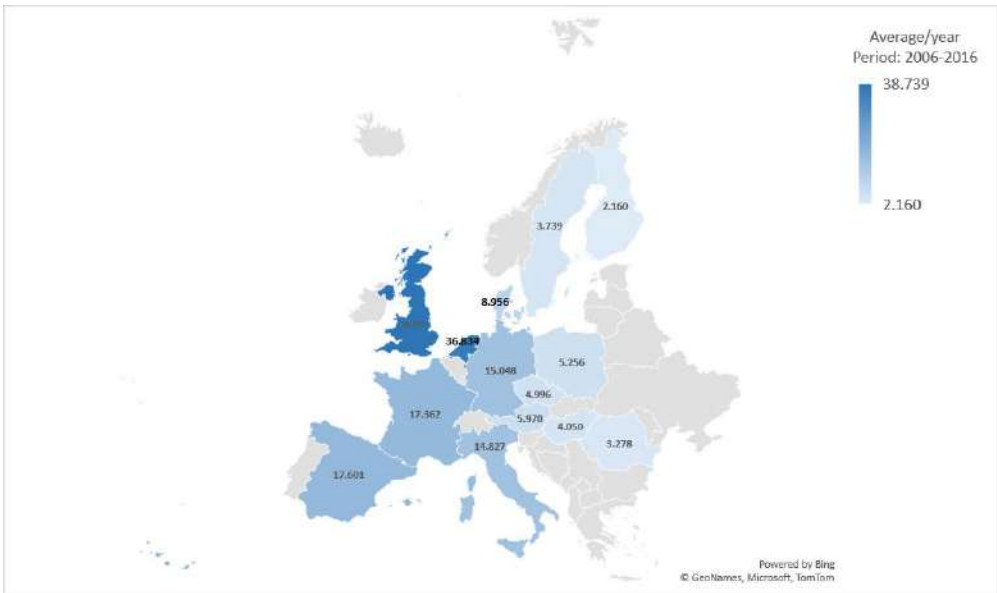


Figure 5. Annual average for bioenergy productivity (proxy for efficiency in the field) (authors after IRENA, 2019)

The econometric model to be proposed in this research has the following characteristics: (1) It is a linear multiple regression model (comprising one dependent variable and three independent variables); (2) It uses panel data (with two dimensions, temporal and geographical); (3) The time period for which the data was collected is 11 years, from 2006 to 2016.

The European Union Member States included in the analysis are (abbreviations used in the model are in brackets): Austria (AUT), Czech Republic (CEH), Denmark (DNK),

Finland (FIN), France (FRA), Germany (GER), Italy (ITA), Hungary (UNG), Poland (POL), Romania (ROM), Netherlands (TJOS), Spain (SUE), Sweden (SUE), Netherlands (TJOS), Romania (ROM), Spain (SPA), United Kingdom (UK);

Last, but not least, it is a fixed effects model, so for each country, a constant will be estimated. This is intended to add a small part of those elements that influence bioenergy performance that were not included in the model, bringing in country-specific characteristics.

The econometric model will be of the following form, given by the equation:

$$Y_{it} = \alpha_i + \beta_{i1} * X_{1it} + \beta_{i2} * X_{2it} + \dots + \beta_{ik} * X_{kit} + E_{it}$$

The notations used in the model mean:

- Y_{it} - the dependent variable of the model;
- α_i - constant (varies per cross-sectional unit);
- 1...k - range of variation for the independent variable;
- β_{ik} - coefficient to be estimated for the independent variable k;
- X_{kit} - the independent variable k, with time-varying values at each cross-sectional unit;
- ε_{it} - error term;
- i - cross-sectional unit;
- t - time unit,

In this particular case, the econometric model will be written in the form given by the equation:

$$PERFORM_{it} = a_i + b_i * Innov_{it} + c_i * Ef_{it} + d_i * Sust_{it} + E_{it}$$

To estimate the coefficients of this econometric model, the Least Squares Method (LSM) will be used. This intrinsically involves testing the following seven assumptions about the model, independent variables, and errors, shown in Table 2. Within the same table, the validation of each hypothesis is also presented, given that the model involves the use of panel data and that for the ease of estimation of the coefficients, the software EViews 8,0 will be used. The program's LSM for panel data is called Pooled EGLS, an acronym for Pooled Estimated Generalized Least Squares.

Table 2. Intrinsic assumptions to the application of LSM (Source: authors)

No,	Gauss-Markov hypothesis	Hypothesis validation	Validation procedure
1	The model created is a linear one	✓	Presentation of the model shape (see equation 2)
2	Independent variables have non-zero dispersion	✓	Checking histograms of independent variables for dispersion or variance values other than 0

No,	Gauss-Markov hypothesis	Hypothesis validation	Validation procedure
3	The number of observations is higher than the number of parameters	✓	The number of observations is 616 (4 variables for 11 years and 14 countries)
4	No multicollinearity between model variables	✓	The correlation matrix of the independent variables is studied for each country, observing the degree of collinearity between the variables. If there is collinearity, to avoid looking for other variables, wait for the estimation of the model coefficients and check the values of the standard errors associated with the estimated coefficients. If the errors have small values, then multicollinearity is also reduced
5	Model errors have zero mean and normal distribution	✓	The plots of the residuals are studied to see that they are concentrated around zero. In order to influence the errors and validate the hypothesis, different constants per country are used in the model
6	No serial correlation between errors	✗	The residuals correlation matrix is studied. Since the correlation is present, the White Cross Section option will be used (from EViews when all conditions for applying the Least Squares are set). Thus, the correlation is allowed between cross-sections, and by estimating on the model with panel data, it is much reduced
7	Homo-scedasticity assumption (evolution of independent variables does not influence errors)	✗	The covariance matrix of the residuals is studied, which gives values of the variance and covariance. The observations do not have the same variance of errors, so the hypothesis is not validated. It is thus necessary to assign equal weight to each cross-sectional unit in the regression (Cross Section Weights option in EViews)

Regarding the hypotheses to be validated or rejected by the multiple regression model with panel data, they will follow whether:

H1: there is a direct positive link between the degree of innovation and the level of bioenergy performance;

H2: there is a direct positive link between the level of efficiency and the level of bioenergy performance;

H3: there is a direct positive link between sustainability and bioenergy performance levels,

To estimate the coefficients of the multiple regression model with panel data, the time series were imported into an EViews worksheet. The coding for countries, as specified above, was used, as well as the coding for the four variables also mentioned above.

Results and discussion

After applying the LSM to the panel data we had in hand (with all the options explained above, cross-sectional fixed effects, White cross-section to allow for correlation between sections and the Cross Section Weights option to also allow for heteroscedasticity) the following regression equations were obtained (1-13):

$$\begin{aligned} \text{PERFORM_AUT} &= -100,56 + 811,66 - 0,000127 * \text{INOV_AUT} + 0,0000325 * \text{EF_AUT} + 0,0063 * \text{SUST_AUT} & (1) \\ \text{PERFORM_CEH} &= +65,66 + 811,66 - 0,0021 * \text{INOV_CEH} + 0,000239 * \text{EF_CEH} + 0,487 * \text{SUST_CEH} & (2) \\ \text{PERFORM_DNK} &= +0,87 + 811,66 + 0,000228 * \text{INOV_DNK} + 0,000004 * \text{EF_DNK} - 0,0161 * \text{SUST_DNK} & (3) \\ \text{PERFORM_FIN} &= -41,93 + 811,66 + 0,000158 * \text{INOV_FIN} - 0,000307 * \text{EF_FIN} - 0,029 * \text{SUST_FIN} & (4) \\ \text{PERFORM_FRA} &= +70,20 + 811,66 - 0,00021 * \text{INOV_FRA} - 0,000053 * \text{EF_FRA} - 0,459 * \text{SUST_FRA} & (5) \\ \text{PERFORM_GER} &= -177,32 + 811,66 + 0,00007 * \text{INOV_GER} + 0,0000064 * \text{EF_GER} - 0,097 * \text{SUST_GER} & (6) \\ \text{PERFORM_ITA} &= -53,31 + 811,66 - 0,000517 * \text{INOV_ITA} + 0,000027 * \text{EF_ITA} + 0,285 * \text{SUST_ITA} & (7) \\ \text{PERFORM_POL} &= +149,98 + 811,66 - 0,000422 * \text{INOV_POL} + 0,000012 * \text{EF_POL} + 0,162 * \text{SUST_POL} & (8) \\ \text{PERFORM_ROM} &= +150,67 + 811,66 + 0,0019 * \text{INOV_ROM} - 0,000054 * \text{EF_ROM} + 0,192 * \text{SUST_ROM} & (9) \\ \text{PERFORM_SPA} &= +272,9 + 811,66 + 0,064 * \text{INOV_SPA} - 0,00535 * \text{EF_SPA} - 178,7 * \text{SUST_SPA} & (10) \\ \text{PERFORM_SUE} &= -59,63 + 811,66 - 0,2834 * \text{INOV_SUE} + 0,0231 * \text{EF_SUE} - 8,1116 * \text{SUST_SUE} & (11) \\ \text{PERFORM_TJOS} &= -25,55 + 811,66 - 0,00031 * \text{INOV_TJOS} + 0,0000064 * \text{EF_TJOS} + 0,246 * \text{SUST_TJOS} & (12) \\ \text{PERFORM_UK} &= -180,81 + 811,66 - 0,000026 * \text{INOV_UK} + 3,1841 * \text{EF_UK} + 0,158 * \text{SUST_UK} & (13) \\ \text{PERFORM_UNG} &= -71,41 + 811,66 + 0,0151 * \text{INOV_UNG} - 0,000428 * \text{EF_UNG} - 1,328 * \text{SUST_UNG} & (14) \end{aligned}$$

In the regression equations obtained the following can be observed:

Table 3. Regression equations observations (Source: authors)

No.	Regression equations observations
1	The value of 811,66 appears each time, representing the average of the constant values for the 14 countries.
2	The first value (negative or positive) in each equation represents the deviation from the mean value for the 14 countries.
3	In this case, the constant of a regression equation is calculated as the sum of the average for all constant values and the deviation from that value. For example, in the case of Romania, the equation's constant is 962,33.
4	Regardless of the regression equation, the constant is positive, indicating that there are certainly other factors not included in the analysis that can greatly

No.	Regression equations observations
	influence bioenergy performance. The highest value of the constant term is for Spain, 1084,56, indicating that for Spain there are a number of variables that need to be found and validated as influencing performance. At the opposite pole is the UK with a constant in the regression equation of 630,85
5	The sub-unitary values (either positive or negative) of the coefficients associated with the representative variables for efficiency and innovation indicate a low influence of these on bioenergy performance.
6	Values close to unity or superiority are obtained for the coefficients associated with the sustainability variable, showing a high influence of the independent variable on performance. For example, the highest positive influence on performance is found in the Czech Republic, where a one-unit increase in the level of sustainability given by bioenergy production per capita means an increase of about 0,5 in the level of performance. The smallest positive influence is found in the case of Austria, only 0,0063.
7	Regarding the relationship between sustainability level and bioenergy performance in the case of Spain, the estimated coefficient for the sustainability variable is statistically significant at a 95% confidence level (resulting from the probability analysis displayed by EViews after estimation). Thus, to the extent that the level of sustainability increases by one unit, the level of performance decreases by 178,7 units. The situation needs attention, since the hypothesis assumes that a high level of sustainability positively influences performance.

We looked for explanations, among the component aspects of the two proxy variables for sustainability and performance. Thus, we observed that the main consumers of bioenergy in Spain are domestic consumers, followed by industry and transport, and the main use is for heating. The results can be correlated with other well-known studies which present similar situations: the bioeconomy actions are quite significant in Spain; biomass represents over 90% of renewable heat production and biomass applications in the residential sector are growing quite rapidly in this country as they offer great potential to achieve the goals of the European strategy for climate and energy (Paredes-Sanchez et al., 2019, p. 561; Las-Heras-Casas et al., 2018, p. 591). Bioenergy is considered CO₂ neutral. Indeed, the amount of carbon dioxide released during biomass combustion is less than or equal to the amount of carbon dioxide sequestered from the atmosphere during biomass growth.

Given this, the issue is likely to be related to the efficiency of energy conversion, the way heating is achieved, and the performance of the appliances used; all of which play a role in achieving energy savings in residential, commercial, and industrial areas. Therefore, failure to do so can affect the sustainability of the activities carried out and thus the performance in the field.

Table 4 is particularly useful in observing the influences of each of the three variables on the level of bioenergy performance, According to Table 4, for none of the 14 countries can all three assumptions made at the beginning of the analysis be validated.

Table 4. Influences on performance levels (Source: authors, with EViews)

No.	Country	Level of innovation	Level of efficiency	Level of sustainability
1	Austria (AUT)	-	+	+
2	Denmark (DNK)	+	+	-
3	Finland (FIN)	+	-	-
4	France (FRA)	-	-	-
5	Germany (GER)	+	+	-
6	Italy (ITA)	-	+	+
7	Great Britain (UK)	-	+	+
8	Poland (POL)	-	+	+
9	Czech Republic (CEH)	-	+	+
10	Romania (ROM)	+	-	+
11	Spain (SPA)	+	-	-
12	Sweden (SUE)	-	+	-
13	Netherlands (TJOS)	-	+	+
14	Hungary (UNG)	+	-	-

In the case of France, all three hypotheses are rejected, as the results show only negative influences of the three variables on performance. However, the level of efficiency (through the proxy variable) helps to confirm hypothesis 2 in 9 out of 14 cases, while the level of innovation (represented by the number of patents) and the level of sustainability (represented by Emissions avoided (tonnes CO₂ e) per GWh generated) help to confirm hypotheses 1 and 2 respectively, six and seven times respectively.

Conclusions

Based on the performed analysis, the econometric model with panel data (with Least Squares Method estimation) offered the possibility to observe the relative performance in the field of bioenergy in several countries of the European Union. Observing each regression model and constant term, one can conclude that at the basis of bioenergy, performance stays a combination of factors, in addition to those chosen by us in the model (innovation, efficiency, and sustainability). Even if the subunitary values (either positive or negative) of the coefficients associated with the representative variables for efficiency and innovation indicate a low influence of these on bioenergy performance, we have to take into account that the basis of development is knowledge, and innovation is the activity through which knowledge is combined producing synergy. Through innovation, great solutions to important problems are achieved, and even if the results do not lead directly to performance in the econometric model, this does not mean that efforts to increase bioenergy performance should not occur. Moreover, the use of bioenergy as a renewable energy source comes as a result of innovation activities. The fact that we are still at the beginning with this type of energy may be a reason for this research results. Bioenergy performance is closely linked to the concept of sustainability, but we highlighted that in order to achieve sustainability we need to focus not only on how bioenergy is produced but also on how it is used in different activities: the use of low-energy devices helps to increase overall performance, with a direct impact on sustainable development.

Of course, the evolution of mankind over the last 100 years has led to environmental degradation, but we cannot ignore the results regarding living standards. The fact that we have succeeded in finding and perfecting methods of using renewable energy sources is a major step towards correcting past mistakes. In other words, it is possible that without the last century's work, mankind would not have focused on renewables in the absence of need. Mistakes have been made in terms of environmental protection, but perhaps the most appropriate economic option for Europe at the moment is a mix of renewable energy, fossil fuels, and nuclear power, with a very big interest in developing the bioenergy sector.

Based on the results obtained, it is confirmed that in some European countries, there is a direct link between the degree of innovation, the degree of efficiency, the level of sustainability, and the level of performance in the field of bioenergy, with further research focusing on the use of updated data sets, taking into account other possible factors such as the level of education, the human development index, the level of investment in renewable energy targets. Using updated databases and considering other countries outside the European Union (Switzerland, Norway) can help us shape a broader framework in which bioenergy plays an essential role in the lives of communities.

Major limitations: Due to the fact that the paper is based on data between 2006-2016, we also considered Great Britain as a European Union member country. As far as we know, starting on 31.01.2020, the Brexit process has been completed and Great Britain has decided to leave the European Union.

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The effects of social media addiction on the relationships and self-presentation in the case of young users from the Z generation

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Abstract. *The distinctive feature of the Z generation is that its members grew up while digital communication technologies developed and had large access to more complex devices. Therefore, the users from the Z generation are constantly connected (Turner, 2015) and at the same time are emotionally attached to the digital devices that they own (Palley, 2012). The paper aims to explore some of the effects determined by social media development in regard to the social behavior of users (emotional reactions, relationship with friends, and the tendency to project an improved self-image in online social networks). The previous academic studies (especially in the USA and China) discussed the influence factors and the methods to diminish the dependency on the internet. At the same time, in Romania, no recent studies depict the characteristics of the relationship of users from the Z generation with the internet and social media technologies. Thus, in order to explore the aspects above, an online survey has been launched, resulting in over 100 valid responses. The results revealed that more than half of respondents have negative emotions when they cannot connect with their familiar digital environment. At the same time, they tend to initiate relationships with a large number of users even if they haven't met these users in real life, while they might have only a few friends in real life. The findings of this research are useful in raising awareness of the potential negative effects of social media consumption and developing strategies for prevention in case of internet dependence.*

Keywords: *social media, addiction, effects, internet dependence, generation Z.*

Introduction

The Z generation presents some distinctive features in comparison with other users, such as the tendency to constantly communicate via digital devices. In a study from 2012, almost half of the respondents from the Z generation felt more comfortable communicating online, and 33% felt that online friends understood them better than

friends from daily activities (Palley, 2012). Also, the Z generation members are more centered on multitasking and absorbing information from multiple sources, but at the same time, they can be characterized by shallowness and lack of focus (Desai & Lele, 2017). Another characteristic is the instant gratification mechanism, created due to the use of digital devices that offer instant reinforcing factors to users (Turner, 2015). Therefore, generation Z members have a lower capacity to relax, build aspirations, prioritize issues, and focus on the most important ones (Turner, 2015).

According to a recent digital report using worldwide data (We are social and Hootsuite, 2022), 58.4% of the world population use social media, while in Romania 69.7% of the total population is active on online social networks.

The use of social media determines an increase in social comparisons. Several studies demonstrated that users compare with other users while using Facebook (Jan et al., 2017) and that their wellness state and self-esteem are affected by their self-evaluation as the result of social comparison (Vogel et al., 2014).

At the same time, there is a strong connection between social media use and building self-identity. Social media strongly impacts teenagers, becoming a „resonance box” for developing and validating their identity (Valkenburg & Piotrovski, 2018).

Since the academic studies on this topic collected data on users from generation Z in other countries, few studies in Romania explore the impact of social media use on shaping online and offline relationships and, at the same time, the display of self via online social networks. Therefore, using the emotional reactions to the lack of online connection as an intermediate variable, this study focuses on the impact of social media addiction on social relationships and on the presentation of self as an expression of self-identity.

Literature review

Although the development of the online environment determined several positive consequences by connecting individuals and organizations, also negative consequences have been identified. Thus, internet addiction can be defined as an uncontrollable wish to use the internet, the sense of lack of value during the time spent without being online connected, intense nervousness and aggressiveness when a person lacks internet access and the progressive degradation of social and family life (Bahrainianet al., 2014).

Even if it is studied for over 25 years, internet addiction is still not understood at the level of mechanisms of influence. Internet addiction is different from other addictions because apparently, users have benefits while using the internet (such as internet banking, access to libraries, holiday planning, online shopping, etc.) (Hoeg & Parisi, 2021). These behaviors reach the sphere of addiction in several situations: when they are actions with negative consequences as pornography or online gaming, or when they are performed in a compulsive manner (such as online shopping, online gaming, online conversations, etc.).

Several negative consequences of internet addiction have been identified in academic studies: lack of effectiveness and sleeplessness (Spitzer, 2020), unhealthy lifestyle (Kim

et al., 2010), sleepiness during the day (Lemola et al., 2014), loneliness (Whang, Lee & Chang, 2003) and depression (Morisson & Gore, 2010).

Several studies showed a significant correlation between depression, self-esteem, and internet addiction. Moreover, some studies consider self-esteem a very important factor that can predict internet addiction (Bahrainian et al., 2014). In this perspective, the internet offers teenagers a psychological compensation mechanism for their low self-esteem and self-perceived deficiencies (Griffiths, 2000). By creating a different person via online social platforms or online gaming platforms, they gain power and a different social status (Aydin & Sari, 2011).

Social media addiction is considered a subcategory of internet addiction. Similar to the previous definition, social media addiction is characterized by an uncontrollable impulse to connect online and use social media for large periods of time, so that important life sectors are affected (Hillard & Parisi, 2021).

Although similar in regard to the psychological mechanisms of development, social media addiction determines some negative consequences as the intensification of cyberbullying phenomenon (Mesch, 2009; Hinduja & Patchin, 2014). Further, the spreading of fake news contributes to the intensification of racism, and anxiety and presents important threats to the health and safety of users (Pulido, 2020). Also, other studies revealed the connection between social media intensive use, self-aggression, and suicide tendency in the case of American teenagers (Swedo, 2020).

The excessive use of online social networks is associated with unsatisfactory bodily self-perception, low self-esteem, and a higher frequency of eating disorders (Santarossa & Woodruff, 2017). Social media enables comparisons through the intensive use of idealized pictures, while users post only pictures that show them in a positive light (Tiggemann & Slater, 2014; Tiggemann & Anderberg, 2019). Instagram, Pinterest and Facebook, especially, present a focus on pictures and by using this feature, the apps impact the self-perceived image of users (Pepin & Endresz, 2015).

In this context, the present study proposes the following objectives of the research: (1) to identify the relationship between access to the Internet and the emotional states of Generation Z respondents, (2) to find the main motivations and perceived benefits for using social media apps of Generation Z respondents, and (3) to identify the relationship between social media use and self-presentation of body image on social media.

Methodology

For the purposes of this research, the quantitative method was used, specifically the survey. An online questionnaire was employed to collect the responses of the Generation Z participants from this study. The questionnaire included pre-coded and open-ended questions based on previous studies investigating the same research topic. The instrument included dichotomous questions, single-answer, and multiple-choice questions, as well as Likert scale questions. A filtering question was added at the beginning of the survey to make sure the respondents correspond to the Generation Z age range, and the rest of the sections investigated topics such as: internet and social media consumption (Facebook, Instagram, TikTok, YouTube, and LinkedIn), social media effects, and socio-demographic characteristics such as education and living

environment. The data collection process was conducted online, for a week in May 2022. 128 responses were collected, and 126 were valid and included in the analysis.

Internet addiction is the relationship between time spent online and how the individual feels when connected to the Internet compared to when they do not have access to the Internet.

As far as the sample is concerned, a convenience sample included individuals born between 1995 and 2012, representing members of Generation Z (Bonchis, 2021), both Internet and social media users. The online questionnaire was distributed in social media groups where Generation Z users interact. According to the results, on average, participants from the research sample spend almost 3 hours online and 2 hours and 30 minutes on social media applications. The age range of the respondents varies between 13- and 27 years old, and the average is 23. For most of the participants, the last graduated program is the bachelor’s program (32%, n=41), then high school (29%, n=37), and master’s program (27%, n=35). More female respondents (77%) participated in this study than male respondents (23%). Most of them live in the urban area (85%), compared to the rural area (14%).

Results and discussion

As far as the emotional benefits of spending time on the Internet are concerned, the research results show that most of the participants feel relaxed (76%), followed by satisfaction (25%), freedom (18%), and belongingness to a community (18%). Ultimately, the lowest percent is dedicated to happiness (12%) (see Fig. 1 Emotional benefits of spending time on the Internet).

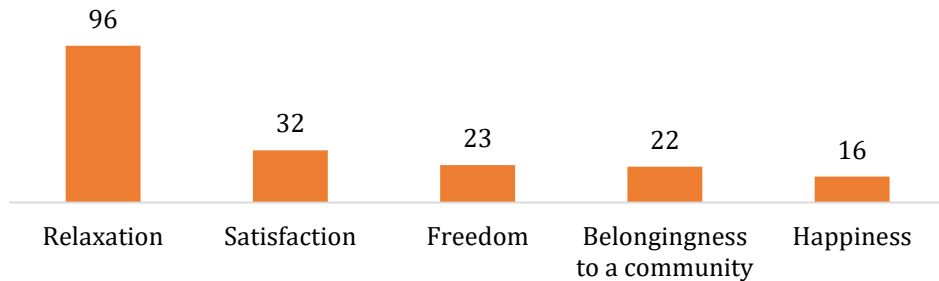


Figure 1. Emotional benefits of spending time on the Internet (Source: Authors’ own research results)

In the contexts in which Internet access is not available, the respondents face negative emotional states such as: restlessness (26%), agitation (20%), worry (7,9%), nervousness (4,8%), sad (3,2%), or depressed (2,4%). At the same time, respondents also experienced positive emotional states when they do not have access to the Internet: they feel stress-free (13%), peaceful (11%), or relaxed (7%) (see Fig. 2 Negative emotional states of lack of internet). Even though this was a multiple-choice question, the respondents were consistent with their answers and none of them chose both positive and negative states in the selection process.

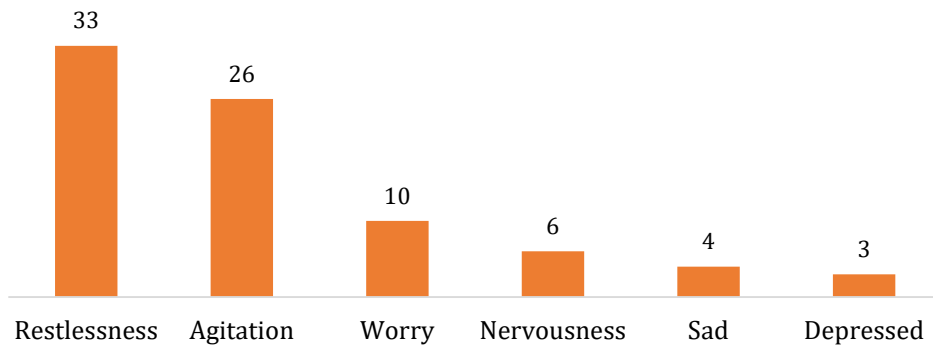


Figure 2. Negative emotional states of lack of internet (Source: Authors' own research results)

In order to identify what are the most prominent responses of users when they do not have access to the Internet, the respondents were grouped according to the different emotional states (positive, negative, or neutral) they selected. As seen in Fig. 3 (Grouping of respondents according to the emotional states felt when they don't have access to the internet), the largest group belongs to respondents manifesting negative emotional states (42%), followed by the neutral group (respondents who selected „Not influenced“) (36%), and the ones manifesting positive emotional states (22%). However, according to the Pearson correlation coefficient, there is no significant relationship between time spent on the Internet and emotional states when there is no access to the internet (see Table 1 Pearson correlation coefficient between the variables “Time spent on the Internet in a day” and “Emotional states when there is no internet access”).

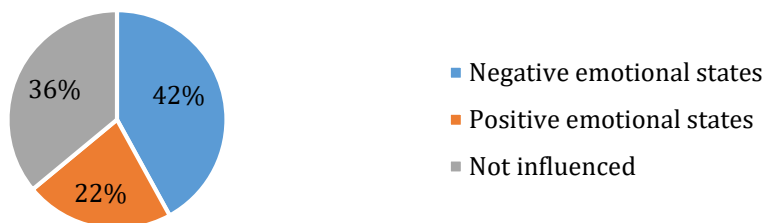


Figure 3. Grouping of respondents according to the emotional states felt when they don't have access to the internet (Source: Authors' own research results)

Table 1. Pearson correlation coefficient between the variables “Time spent on the Internet in a day” and “Emotional states when there is no internet access” (Source: Authors’ own research results)

		Time spent on the Internet in a day	Emotional states when there is no internet access
Time spent on the Internet in a day	Pearson Correlation	1	0,127
	Sig. (2-tailed)		0,157
	N	126	126
Emotional states when there is no internet access	Pearson Correlation	0,127	1
	Sig. (2-tailed)	0,157	
	N	126	126

From a gender perspective (Fig. 4 Gender distribution for each group of states felt when an individual does not have access to the Internet), most of the female respondents present negative emotional states when they do not have access to the internet, whereas only a third of the male respondents face the same feelings. On the other side, 41% of men are not influenced by lack of access to the Internet, which is the case for 34% of women. 31% of men and 19% of women have positive emotions when they do not have access to the Internet. Nevertheless, gender does not influence the respondents’ emotional states when they don’t have access to the Internet, according to the Pearson correlation coefficient.

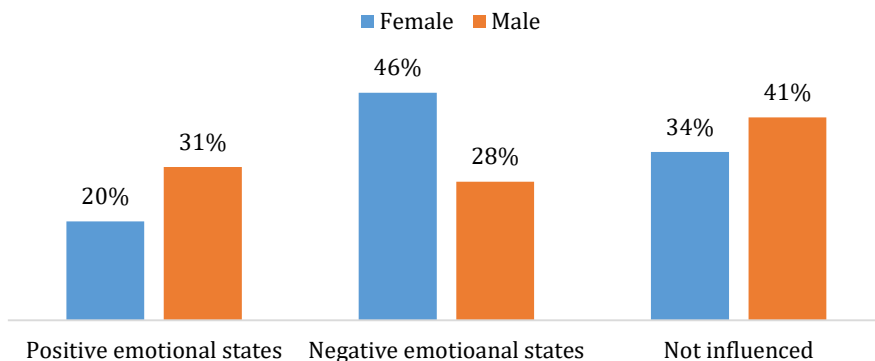


Figure 4. Gender distribution for each group of states felt when an individual does not have access to the Internet (Source: Authors’ own research results)

The main reasons why the Generation Z respondents use social media are: communicating with family and friends (24%), for relaxation (23%), keeping up with the news of my acquaintances (19%), news (16%), meeting new people (8%), sharing opinions (8%). The social media application that is most preferred by respondents is Instagram (98%), YouTube (93%), and Facebook (87%), followed by TikTok (14%) and LinkedIn (11%).

Regarding the perceived negative effects of Internet consumption, most of the respondents (94%) confirmed that they did not lose a significant relationship, a job or a career, or an educational opportunity because of the time they spent using the Internet.

When the respondents do not spend time on social media, most spend time with friends (28%) and family (27%). Almost half of the respondents play sports or spend time in nature (18%), and some prefer relaxing with other types of activities (reading, painting, dancing) (27%). Other activities mentioned were studying, playing on the computer, exploring new places, or watching films or TV shows. When going out with friends, most of the respondents rarely check their phones (46%), followed by moderate checking (38%), not at all (9%), and very often (6%).

Facebook use

As far as their self-presentation on social media is concerned, most of the respondents agree that it is important for them to look as natural as possible in the pictures they post of themselves. As seen in Table 2 (Respondents' behavior on Facebook – mean, median, mode, and standard deviation), respondents mainly agree that editing photos, using brightness and highlighting colors, is important to a high degree ($M=3,64$, $SD=1,463$), but they do not edit their body to appear thinner ($M=1,12$, $SD=0,400$). However, the respondents do consider it important to highlight only the good parts of their bodies in the photos they post ($M=3,21$, $SD= 1,421$). Regarding their Facebook friends, the respondents neither agreed nor disagreed that they share the same friends in real life ($M=2,55$, $SD=1,130$), and they must accept the friend requests of the people they know ($M=3,94$, $SD=1,160$). Even though 87% of the respondents used Facebook in the past week, more than half spend less than an hour on Facebook daily (57%). A third of the respondents have between 501 and 1000 friends (36%), followed by the 1001-2000 friends range (27%), and then more than 2000 friends (13%).

Table 2. Respondents' behavior on Facebook – mean, median, mode, and standard deviation (Source: Authors' own research results)

Affirmation	Mean	Median	Mode	Standard Deviation
Facebook friends are my friends in real life too	2,55	3	3	1,130
I only accept friend requests from people I know	3,94	4	5	1,160
I spend a lot of time choosing which photos to post	3,27	3	3	1,374
Before I post on Facebook I edit the photos	2,86	3	1	1,404
I usually just edit the brightness and highlighting colors	3,64	4	5	1,463
I usually edit my body to be thinner	1,12	1	1	0,400

I use face filters in the posted photos	0,39	1	1	0,814
I want to look as natural as possible in the pictures I post	4,15	4	5	0,950
I want to highlight only the good parts of my body in the photos I post	3,21	3	4	1,421

Instagram use

Almost all of the respondents used Instagram weekly, while most of them spend between one hour (26%), 2 hours (27%) and 3 hours (21%) per day. As opposed to Facebook, respondents agreed to a lower extent they follow only people they know (M=2,71, SD=1,195) and follow influencers to a higher degree (M=3,24, SD=1,290). An important perceived benefit is the inspiration they obtain from using Instagram, because they choose specific accounts to provide them with that type of content (M=4,02, SD=1,074). Even if the respondents follow more accounts of the people they do not know, the chat is mainly used for those they know (M=1,56, SD=1,030). Like Facebook, respondents spend more time choosing photos to post (M=3,34, SD=1,312) and editing their own photos (M=3,19, SD=1,422). For almost half of the Instagram users, likes are important to some extent (44%), followed by to a high extent (25%), and to a low extent (19%). Most respondents have less than 1000 followers on Instagram, and only 3,2% have over 2000 followers.

YouTube

The second most used account in this sample is YouTube, with more than 93% of the respondents using it daily. Most of the respondents spend between 1h/day (30%) and 2h/day (20%) on this app, while 15% spend more than 3h/day (15%). The respondents prefer fun (M=3,86, SD=1,446) and educational (M=3,59, SD=1,316) content. However, most respondents use YouTube to listen to music (M=4,36, SD=0,975). They typically do not create content to post on their personal channel (M=1,10, SD=0,478).

TikTok

Almost a third of the respondents spend 1h/day on TikTok (30%), while 20% spend 2h/day on the app, and 22% spend less than 1h/day. Respondents follow influencer content to some extent (M=3,15, SD=1,363), and their friends' content to a low extent (M=1,85, SD=1,136). They spend most of their time on TikTok for fun (M=4,29, SD=0,899) and inspiration (M=3,5, SD=1,355), and for educational content to some extent (M=3,35, SD=1,219). Even though they spend their time on TikTok, they do not create content for their own profile (M=1,35, SD=1,068).

LinkedIn

The less-used social media app is LinkedIn, as it is accessed by 41% of the study participants, who spend less than 1h/per day on this app (84%). The respondents mostly want to connect with people who work in the same domain (M=3,79, SD=1,226), and less with people they know (M=1,96, SD=1,120). They connect with everyone

sending invitations to make as many connections as possible ($M=3,29$, $SD=1,377$). Regarding the interaction with other users of the platform, the respondents prefer chatting in private with anyone connecting with them ($M=3,04$, $SD=1,400$) to commenting on posts ($M=1,71$, $SD=1,143$).

Discussion

Almost half of the participants spend 3 to 4 hours on the Internet daily. When they do not have access to the Internet, more than 40% feel negative emotions such as: restlessness, agitation, worry, nervousness, sadness, and even depression. However, 22% of the respondents have positive feelings such as: lack of stress, peace, and relaxation, while 35% believe the lack of access to the internet does not influence their emotional state. However, statistically speaking, there is no significant relationship between time spent on the Internet and emotional state, so this topic can be further investigated in future research. Neither gender nor age does not influence the respondents' emotional state when they spend time on the Internet.

As far as the motivations for using social media apps is concerned, respondents typically choose Facebook for connecting with friends and family, while on Instagram they seek inspirational content, from both people they know and people they don't know, so they tend to follow accounts of people they do not personally know. Even though they follow their content, they do not usually chat with the people they do not know, as they keep their private discussions for friends and acquaintances. On TikTok, respondents prefer influencers and TV stars, as opposed to people they do know. On the other hand, on LinkedIn, they seek connections in order to extend their professional social network, so they accept invitations from people they do not personally know in real life.

For most respondents, authentic and natural self-presentation on their personal accounts is important. Editing photos before posting is somewhat important, as they pay attention to lighting and colors, whereas using filters and editing body parts are important to a low extent. However, even though they do not edit their photos for perfection, the respondents want to highlight the best parts of their bodies to some extent. On Instagram, even though they spend more time choosing the photos for posting, that does not necessarily imply editing for self-improved appearance. Most respondents prefer presenting themselves as authentic, highlighting the best parts of their bodies.

Research limits

A convenience sample was used, so extending the research findings to the population at large is not recommended. 77% of respondents are females, so extending specific characteristics to gender is impossible. Regarding age, 56% of the respondents are between 23 and 27, whereas 7% are between 13 and 17. This age difference can influence respondents' understanding of social media effects or their perceived benefits. Also, the background and the respondents' education level are disproportionate, which leads to the difficulty in identifying whether these elements influence the relationship between the Internet and social media consumption.

Furthermore, the selective self-presentation topic should be further explored, as the respondents might be aware of the social online stigma related to photo editing.

Conclusions

The results show no correlation between the time spent on the internet and the respondents' emotional state, which is why we cannot say that they are addicted to the Internet. Indeed, the time overspent on the internet and social media have a series of negative effects on them, especially since almost half of the respondents have negative moods when they cannot access the internet. Strictly related to the studied sample, we note that the Z generation, also known as the digital generation, can detach from the digital environment in specific contexts.

Even if the respondents have hundreds or thousands of friends on social media, they can only trust 3 or 4 friends in real life. So, there is a difference between friends on social media and everyday life, each fulfilling a different role. The individuals in the sample do not want to display an ideal body image on social media. Still, they want to be as natural as possible, even if they only post photos that highlight their body.

Although the results of this research refer to a small sample, they can provide a starting point for future studies. Several aspects and correlations between Gen Z's internet and social media consumption and how they influence social behavior can be identified. To analyze the previously mentioned aspects in depth, applying qualitative research methods will provide much more relevant results.

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IMPACT OF DIGITAL TRANSFORMATION ON IT JOBS. A SECTORIAL APPROACH.

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Abstract: *Technology is changing at an exponential rate. As a result, it does have a disruptive life on society and our lives. It changes our personal lives, socialization, and interaction with people and businesses. Technology has changed and does continue to change the way we work. Along with the four industrial revolutions, many jobs have disappeared, more jobs have been created, and almost every job was transformed by automation. The 4th industrial revolution leading to Industry 4.0 is powered by artificial intelligence, robotics, and the Internet of things. The Information Technology (IT) industry and professionals primarily drive this transformation. While information technology specialists contribute with the technology they build to change their world, technology is transforming the profession responsible for this transformation. The paper looks at how digital transformation impacts the transformation of IT jobs, how government policies and managerial strategies impact the transformation of IT jobs, and how employees and organizations are responding with investment in skills development. The research relies on a questionnaire-based survey with 132 Romanian IT professionals, students, and computer science professors representing small and large organizations. The data supported seven of the nine hypotheses, confirming that digital transformation impacts the transformation of jobs, particularly IT jobs. This drives the need to build new technical and soft skills.*

Keywords: *Information Technology (IT); transformation of IT jobs; skills development; work automation.*

Introduction

"We are shaping the world faster than we can change ourselves, and we are applying to the present the habits of the past." (Rowe & Laura, 2011).

We experience an accelerated rate of technological change (Benedikt et al., 2016; Vătămănescu et al., 2018). New technologies are changing all industries (Hapenciuc et al., 2015; Vătămănescu et al., 2016, Piccarozzi et al., 2018). Technology is also changing the way we work, our jobs, and our overall

behaviors (Vătămănescu et al., 2018; Păduraru et al., 2016; IMF, 2018). Starting with Industry 1.0, driven by mechanization and steam power, and ending with the hi-tech Industry 4.0, our lives and work have changed significantly. Many occupations we perform now, such as software engineers, big-data specialists, and even virtual-world designers, were not conceived forty years ago. WEF believes that 65% of students entering primary school today will work in occupations that have not yet been created. Some occupations have entirely disappeared. For example, nobody works as a lift operator or lamplighter (*Jobs That Have Disappeared in the 21st Century*, 2020). McKinsey (Manyika et al., 2017) estimates that 250 million jobs will be created by automation by 2030. Since the work of IT personnel contributes to the IT revolution, the question is how their careers will likely be affected.

In the particular situation of Romania's IT industry, Sanandaji, (2020) shows that the share of brain jobs not susceptible to automation is below 4%, putting many jobs at risk. Furthermore, from a digitalization perspective, the European Union Digital Economy and Society Index places Romania as the last country in the EU to integrate into the digital economy (Wilkinson & Barry, 2020a). Furthermore, Romania is the last country in the EU in the rank of people with digital skills (Eurostat, 2019). The country's IT sector is aided by a law that exempts software developers from income tax, preventing brain drain (Manelici & Pantea, 2019a).

Research hypotheses

According to Manyika (2017), the possibility of automation replacing labor is considerable consideration. The change in the workforce results from rising productivity, quality, and GDP growth. Between 0.8 percent and 1.4 percent of global GDP each year, can be added to the global economy's productivity due to automation. This is accomplished through labor cost reduction, operational cost reduction, large-scale customization, and increased speed and scale. "Technological change, especially digital transformation, intensifies the ongoing structural changes on the labor market, sometimes even in a disruptive manner" (Frey et al., 1990, p. 123). In this vein, the first hypotheses infer that:

H1a: Digital transformation positively impacts work automation.

H1b: Work automation positively impacts the transformation of IT jobs.

According to the EU's Digital Enterprise Score Index (DESI), Romania scores relatively low among EU nations (Wilkinson & Barry, 2020b). In terms of human capital, Romania comes second to last. The indicator comprises the proportion of persons with basic digital capabilities and the number of ICT graduates and experts with advanced skills.

H2: The macro policies positively impact the transformation of IT jobs.

Management practices are constantly changing with new work models being introduced. An example is the gig economy. The movement of permanent employees toward contractual resources (Behrendt & Nguyen, 2019) is a reaction to the accelerated rate of market change, moving toward a gig economy (International Organisation of Employers, 2020). More and more IT firms are embracing the Scrum approach for project delivery. Scrum, is a component of Agile management approaches.

H3a: Digital transformation positively impacts new managerial strategies.

H3b: The macro policies positively impact new managerial strategies.

H3c: The macro policies positively impact work automation.

H3d: New managerial strategies positively impact the transformation of IT jobs.

Bughin et al. (2018) are some of the authors who link the skills gap and the change in abilities required for the job of Industry 4.0 and future jobs. (Zbucnea et al., 2020). By 2024, the number of jobs needing digital skills will increase by 12% (Accenture, 2017). Bughin et al. (2018) also point out that automation accelerates skills shift, and advanced and basic technological skills will substantially increase demand.

H4a: The transformation of IT jobs positively impacts soft skills development.

H4b: The transformation of IT jobs positively impacts technical skills development.

According to the previously described theoretical models and the proposed hypotheses, this paper will address the impact of digital transformation on IT jobs based on the following research model (Figure 1):

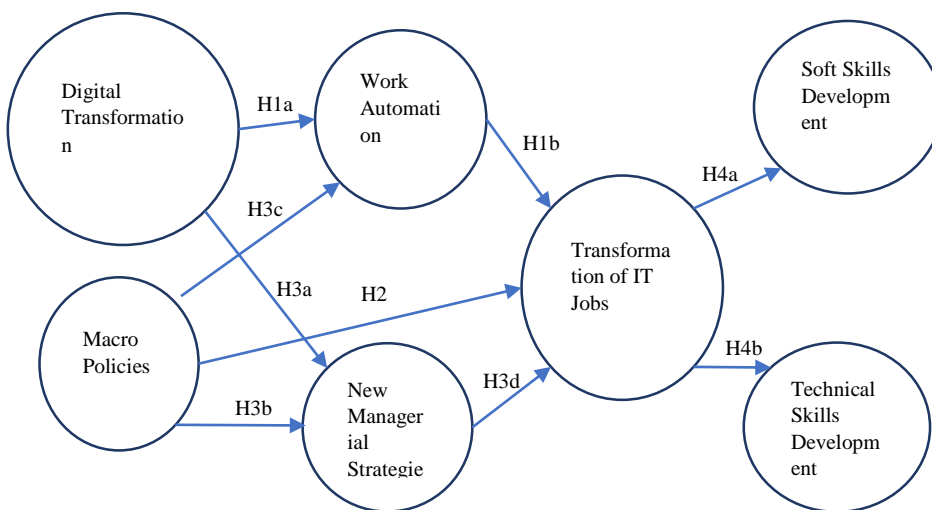


Figure 1. Research model

Material and methods

Research design

The questions addressing the research variables are based on a unipolar Likert scale (Khalid et al., 2012), with a scale of five representing the respondents' agreement with the particular question. This type of answer is based on an ordinal data type. The data will be analyzed in a frequency distribution, mode and median, and range. In ordinal data without normal distribution, only the non-parametric cross-tabulation chi-squared test can be applied (Martin, 2004).

Structural equation modeling (SEM) will also be applied in a multivariate statistical analysis technique to analyze structural relationships. SEM allows a multivariate statistical analysis technique to analyze structural relationships (Stein et al., 2017) SPSS¹ will be used for variable coding and computing the statistical information. SmartPLS² is used for structural equation modeling.

Data collection and sample

Sampling is based on a *stratified random* method combined with a snowball technique (Khalid et al., 2012). This method involves splitting the population into subgroups based on the defined independent research variables. This approach enables us to analyze the data from the perspectives of IT professionals. Professionals have significant IT job experience and are most likely impacted by the increasing frequency of technology changes.

The quantitative research was performed by sending the Google Forms questionnaire to 150 IT specialists, students, and teachers. The convenience sample focused on colleagues at work, industry partners, members of the IT professional organization, and projects the author is involved in. As a result, 132 people responded to the questionnaire, yielding a response rate of 88% from the persons.

Measures

The questionnaire items focused on views and attitudes about the impact of digital transformation and macro policies on IT job transformation, as they were previously conceptualized. Questions are divided into major categories corresponding to the model's multi-item structures (as presented in Table 1).

¹ <https://www.ibm.com/ro-en/products/spss-statistics>

² <https://www.smartpls.com/>

Table 1. Constructs and items

Construct	Variable	Item	References
Digital Transform ation		<i>Please rate the following technology items in terms of impact on society's digital transformation:</i>	(Schwab et al., 2020)
	DTA1	3D printing	
	DTA2	Augmented and Virtual Reality	
	DTA7	Machine Learning	
	DTA8	Quantum Computing	
	DTA9	Robotic Process Automation	
IT Jobs Transform ation		<i>Please rate the degree to which the following technologies are likely to impact IT jobs:</i>	(Manyika et al., 2017)
	DTI5	Internet of Things	
	DTI6	Machine Learning	
	DTI7	Quantum Computing	
	DTI8	Robotic Process Automation	
	PUR1	Income	
	PUR2	Meaning	
	SCEN1	Augment jobs	
	SCEN2	Replace jobs	
	SCEN3	Create new jobs	
Work Automatio n		<i>Which is the technology most likely to replace your current job?</i>	
	REP1	Machine Learning	
	REP2	Robotic Process Automation	
	REP3	DevOps automation	
Soft Skills Developme nt		Please rate the degree to which the following soft skills are important for your future career	(Nania et al., 2019) (Tytler et al., 2019) (Schwab, 2018) (Stanescu et al., 2020)
	SKL2	Agility	
	SKL3	Creativity	
	SKL4	Cultural Awareness	
	SKL6	Emotional intelligence	
	SKL7	Leadership	
	SKL10	Empathy	
Technical Skills Developme nt		<i>Please rate the degree to which the following technical skills are important for your future career</i>	(Nania et al., 2019b)
	TKL10	Java/Software Development	
	TKL5	Big Data	
	TKL7	RPA (Robotic Process Automation)	
	TKL9	Quantum Computing	

Construct	Variable	Item	References
Macro Policies		<i>Please rate the impact to which the following policies may support the future of the IT industry in Romania</i>	(ANIS, 2022)
	POL1	Building digital skills	
	POL2	Continuous learning	
	POL3	Education reform	
New Managerial Strategies		<i>Please rate the degree to which the following managerial strategies may support the future of the IT industry in Romania</i>	(Hess et al., 2016) (Schwab et al., 2020) (Nania et al., 2019) (Soto-Acosta et al., 2016) (Oztemel & Gursev, 2018) (Hargitai et al., 2021)
	MAN1	Develop human resources strategies for enhancing the employees' soft skills	
	MAN2	Develop human resources strategies for enhancing the employees' technical skills	
	MAN5	Develop strategies for working with project and platform workers	
	MAN6	Develop strategies for long-term digital transformation	
	MAN7	Develop social and environmental sustainability strategies	
	MAN8	Invest in IT infrastructure and re-technologization	

The age of the people responding to the questions covers multiple age groups. 15% are in the 18-24 range, covering the students, junior engineers, and graduate hires. 23% are in the 25-34 range. The largest category is in the 35-44-year-old range. 20% are between 45 and 54 years old. That matches the age demographic of the IT industry.

Results

The exploratory aspect of PLS-SEM (SmartPLS in this case) was favored (Bharati et al., 2015). By using loadings and cross-loadings of the indicators on their reflective constructs, average variance extracted (AVE), composite reliability (CR), and reliability (Cronbach alpha), the author evaluated the convergent validity. The reflected item factor loadings were significant and more considerable than 0.65, and the AVE values were more significant than 0.60, as shown in table 2.

Cronbach's alpha values of all indicators surpassed the acceptable level of 0.6 (Nunnally & Bernstein, 1994), and the reflective construct measure loadings were over the recommended threshold of 0.70 for composite reliability following the recommendations offered by (Yi & Davis, 2003) In this study, CR values varied from 0.83 to 0.92, but AVE values ranged from 0.60 to 0.80.

Table 2. Psychometric properties of reflective constructs

	Cronbach's alpha	Composite reliability*	Average variance extracted (AVE)
Macro Policies	0.710	0.828	0.618
Soft Skills Development	0.820	0.870	0.528
New Managerial Strategies	0.828	0.875	0.538
Digital Transformation	0.829	0.879	0.594
Transformation of IT jobs	0.824	0.883	0.656
Technical Skills Development	0.840	0.892	0.676
Work Automation	0.872	0.922	0.797

*Composite reliability (CR) = (square of the summation of the factor loadings)/[(square of the summation of the factor loadings) + (square of the summation of the error variances)]; AVE = (summation of squared factor loadings)/(summation of squared factor loadings) (summation of error variances)

To further evaluate the advanced structural model following (Hair et al., 2022), we have estimated the R², beta, and t-values. In this regard, adopting a bootstrapping approach with 5000 resamples enabled us to provide a more comprehensive analysis of the results, including reporting on effect sizes (f²) and predictive significance (Q²). Following Fornell and Larcker (1981), the reported value (0.263) demonstrates that the model has a moderate to substantial predictive significance for the hypothesized endogenous component.

Table 5. R Square

	R-square	R-square adjusted
Transformation of IT jobs	0.334	0.318
New Managerial Strategies	0.453	0.445
Soft Skills Development	0.191	0.184
Technical Skills Development	0.334	0.324
Work Automation	0.110	0.096

As seen in table R2, it exceeds the 0.35 threshold (Cohen, 1977) only for technical skills development with 0.35 and for the new managerial strategies with 0.46.

Table 6. Results of the structural model analysis (hypotheses testing)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics* (O/STDEV)	P values	Decision
Digital Transformation -> New Managerial Strategies	0.335	0.337	0.072	4.668	0.000*	Supported
Digital Transformation -> Work Automation	0.336	0.346	0.076	4.439	0.000*	Supported
Transformation of IT jobs -> Soft Skills Development	0.250	0.250	0.099	2.534	0.011*	Supported
Transformation of IT jobs -> Technical Skills Development	0.322	0.324	0.076	4.231	0.000	Supported
New Managerial Strategies -> Transformation of IT jobs	0.405	0.418	0.121	3.352	0.001*	Supported
Macro Policies -> Transformation of IT jobs	0.132	0.123	0.117	1.127	0.258	Not supported
Macro Policies -> New Managerial Strategies	0.496	0.498	0.068	7.276	0.000*	Supported
Macro Policies -> Work Automation	-0.021	-0.022	0.078	0.264	0.810	Not supported
Work Automation -> Transformation of IT jobs	0.222	0.218	0.069	3.229	0.001*	Supported

** $p < 0.01$, * $p < 0.05$.

We performed the analysis considering R2 showing that two exogenous dimensions are extracted from the proposed model. In addition, table 6 shows that 2 out of 9 relationships reject the null hypothesis. One has a small effect of 0.06, while three have a large effect with an f squared off of more than 1.6 (Cohen, 1977) (Table 7).

Table 7. f square

	Transformation of IT jobs	New Managerial Strategies	Soft Skills Development	Technical Skills Development	Work Automation
Digital Transformation		0.189			0.117
Transformation of IT jobs			0.236	0.349	
New Managerial Strategies	0.155				

Macro Policies	0.017	0.415			0.000
Soft Skills Development					
Work Automation	0.071				

Discussion of the findings

Figure 2 shows the PLS structural model applied in the context of digital transformations and macro policies impacting work automation. New managerial strategies are changing the future of IT jobs and how we prepare for these changes by building technical and soft skills.

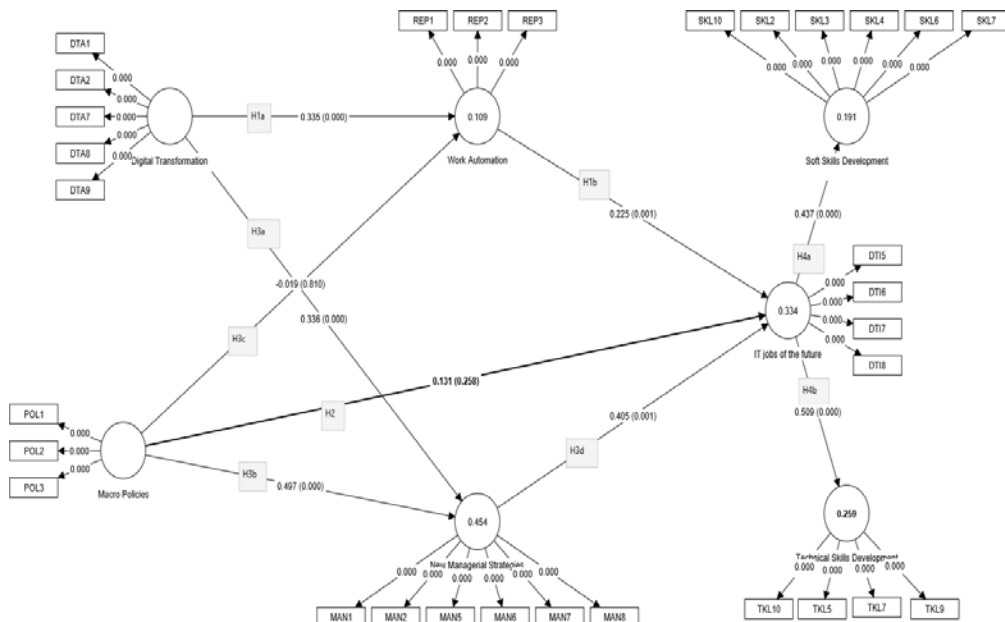


Figure 2. PLS test of the proposed structural model

Testing H1a - *Digital transformation positively impacts work automation* -, the p-value is smaller than 0.0001 and β of 0.34. An f-square of 0.12 shows a small to medium effect size. Although that clearly rejects the null hypothesis, the two independent variables (i.e., Digital transformation and Macro policies) explain 11% of the changes in work automation. That is consistent with the literature review (Cassard et al., 2018), showing that work models are impacted by other factors, such as demographics, globalization, environment, and urbanization. However, the hypothesis is confirmed.

Focusing on H1b - *Work automation positively impacts the transformation of IT jobs* -, the R2 for the dependent variable is 0.334, with the highest effect from work automation with an f-squared of 0.071. The patch coefficient β is 0.22, and a p-value of 0.001 does reject the null hypothesis. Thus, the hypothesis is confirmed. That validates the fundamental assumption of the study that automation developed by IT engineers is impacting the very profession developing that automation. While that is true, the most significant impact on the transformation of IT jobs comes not from work automation but new managerial strategies (H3d).

Regarding H2 - *The macro policies positively impact the transformation of IT jobs* - a p-value of .26 does not reject the null hypothesis. Manelici and Pantea (2019b, p. 28) concluded that the tax exemption policy for software developers effectively supported the IT sector's development. The same is concluded by ANIS (2022, p. 59) The current study removed the tax deduction load factor with only .599 from Macro policies. While in the Melinci and ANIS studies, the tax deduction was considered the main factor positively affecting Romania's IT policy, this may explain the different results. The hypothesis is thus rejected.

Focusing on H3a - *Digital transformation positively impacts new managerial strategies* - a p-value of less than 0.0001 β of 0.34, a 0.02 medium f-square value, and a large R2 of .45 show a strong correlation. Therefore, management must find new strategies and models to adapt to the increasing technology change rate and digitalization's impact. For this study, the impact of digitalization on the organization is considered a baseline assumption to research the impact on the jobs. The result is aligned with all the conclusions in the literature (Bejinaru, 2013). The hypothesis is hence confirmed.

Moving to H3b - *The macro policies positively impact new managerial strategies* - a strong positive effect on managerial strategies with a p-value smaller than 0.0001, a high patch coefficient with β of 0.5, and a large f-square of 0.41 was observed. The hypothesis is thus confirmed. H3c - *The macro policies positively impact work automation* - was not supported, with a p-value of 0.81, a negative β of -0.02, and no impact on work automation shown by a 0 f-square. Consequently, Macro policies do not have any impact on work automation. Romania has little influence on global policies and industry trends. Petcana (2019, p. 1) showed how that 600.000 jobs in Romania would be impacted by automation, but we could find no study to show how Romania in any way induces the digitalization trends. The result is consistent with the literature, and the hypothesis is not confirmed. Further, H3d - *New managerial strategies positively impact the transformation of IT jobs* - a p-value of 0.001 rejects the null hypothesis. A medium f-square value of 1.56 shows and a big patch β coefficient of 0.4 is an expected result that management impacts the jobs being created in the IT industry. The hypothesis is therefore confirmed.

Regarding H4a and H4b – *The transformation of IT jobs positively impacts soft skills, respectively technical skills development*. Both relations are statistically relevant. The p-values for these relationships are lower than 0.01. The β patch coefficient for soft skills development is 0.25 and 0.32 for technical skills development. R2 is low, with 0.19 for soft skills and 0.26 for technical skills development. This is an expected result, consistent with the literature (Little, 2004; Schwab, 2018; Singlehurst et al., 2020), in that changes in job requirements will impact new skills development. At the same time, people are not only developing new skills to become competitive in the job market. They can learn because they are curious, to develop a hobby, or simply for the pleasure of learning, items not part of this research. Both hypotheses are hereby confirmed.

To conclude, seven out of nine hypotheses were supported, confirming that digital transformation impacts the nature of the jobs, particularly IT jobs, and that this drives the need to build new technical and soft skills. However, the research did not show any positive influence of Romania's government policies on the new managerial strategies and the transformation of IT jobs. The results are consistent with the ones found in the literature, except for the IT impact the Romania tax deduction for IT employees has on the local legislation.

Conclusions

On the one hand, the research results from 132 Romanian IT professionals, students and teachers confirm the results of international studies on the impact of digital transformation in automating the workplace, making jobs redundant, creating new jobs, or changing the nature of existing jobs. While this does not bring new information, with fewer studies done for Romania, it shows that the perception of Romanian IT workers is consistent with what we have seen in more general studies.

The study looks at the specific impact of the Romanian government on work automation, new managerial strategies, and IT jobs. The only statistically significant correlation is the one with the new managerial strategies. That is not a surprise, knowing that government policies are expected to influence management policies. The research did not find a statistically significant relationship between macro policies and work automation. Considering previous studies (ANIS, 2022; Manelici & Pantea, 2019b), the expectation was to find a correlation between government policies and the future of IT jobs in Romania. Failing to find an impact may be because the policy is limited to IT tax exemption legislation and lacks a holistic strategy. That will have to be further investigated.

This paper focuses on understanding the transformation of the jobs responsible for building new technologies. The survey results show that work automation, government policies, and management strategies are responsible for 34% of the

factors transforming IT jobs. That is three times more than the impact of the same factors on work automation in general.

Considering the research findings, the study will mainly benefit from the following: a. making a follow-up study on the impact of the local policies on the evolution of the IT professions. The available data for tax exemption loading was too small to be included in the model. At the same time, as discussed by Manelici & Pantea (2019b), this is the single piece of policy supporting the country's IT industry; b. add other factors influencing work automation to the research.

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STUDY ON HYDROGEN'S ROLE IN THE TRANSITION TO A CLIMATE NEUTRAL EUROPE

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Abstract. *The phase-out of coal, oil, and gas and switching to environmentally friendly fuels will increase the demand for electricity compared to today. The corresponding amounts of electricity can be covered mainly by solar and wind energy in Europe, and if we follow the costs of energy produced from these renewable sources, we see that they are decreasing. Hydrogen will play a key role in hard-to-decarbonize sectors (such as maritime and air transport), with it expected to contribute more than a third of road sector decarbonization. Hydrogen participates in creating products and applications necessary for a modern and sustainable society. It is an important pawn in climate neutrality but is limited for economic and technical reasons. In the paper, a study was carried out on obtaining hydrogen. We differentiated the hydrogen produced from renewable energy from the hydrogen produced from oil or gas. As a methodology, we used the Sankey diagram to visualize the energy flow in Romania. The paper includes data taken from specialized literature and is designed to provide an overview of the role that hydrogen plays in the energy system, the reduction of greenhouse gas emissions, and the global economy.*

Keywords: *climate neutrality, CO₂ emissions, hydrogen, renewable resources, the transport sector*

Introduction - The challenge

The European Union has set itself the goal of being climate neutral by 2050. The commitment to climate neutrality requires that applications and products with greenhouse gas emissions be replaced by emission-free alternatives.

Mark & Delucchi (2009, p.60) explains that the maximum power consumed worldwide in 2009 was approximately 12.5 trillion watts (terawatts or TW), with an estimated 16.9 TW of energy power needed globally in 2030.

Figure 1 shows us, on the left side, four scenarios for the decarbonization of the energy system between the years (2015-2050) and on the right side the resources available at the European level to realize these scenarios. If we look to the future, most of the energy system will be renewable, so it will have to deal with seasonal imbalances and, simultaneously, satisfy consumer preferences and be friendly to the environment.

In this context, industry, commercial and residential buildings, and transport will have to transition to energy with low carbon emissions. We have renewable energy in various forms, but these present a smaller and smaller percentage untapped, so it will be necessary to consider the role of hydrogen in the energy mix. According to the 2020

Energy Technologies Perspectives report of the International Energy Agency (p.25), in the sustainable development scenario, electricity, hydrogen, renewable resources, and synthetic fuels could provide more than 70% of total energy, with a share like that of fossil fuels.

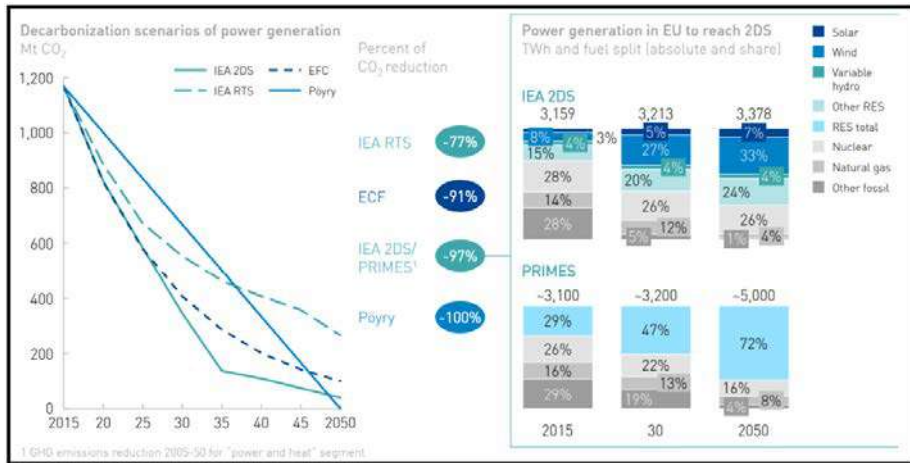


Figure 1. Decarbonization targets and power mix (Fuel Cells and Hydrogen, 2019, p.20)

Hydrogen can be used in different forms. It can represent the raw material, act as fuel, or participate in energy transport and storage processes. This variety of roles that hydrogen can fulfill can be used in sectors that are more difficult to decarbonize such as industry, transport, and construction. Figure 2 shows the most important functions that hydrogen can have in the energy mix.

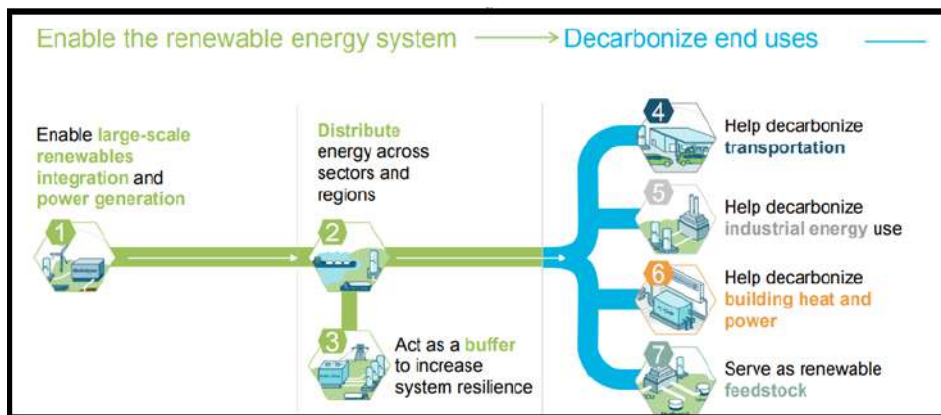


Figure 2. Functions of hydrogen in the energy transition (Hydrogen Council, 2017, p.17)

The most important aspect of hydrogen could be considered to provide the clean raw material for the economy by acting as a buffer in increasing the resilience of the energy system. Therefore, meeting the climate neutrality objective in 2050 of the European Green Deal can only be achieved by considering the role of hydrogen. Failure to fulfill this pact would have a major impact on the climate, expressed through extreme temperatures, continued flooding from rising sea levels, and significant biodiversity loss.

Methodology

The aim of this paper is to provide an overview of the functions that hydrogen has in the process of moving towards climate neutrality, highlighting, at the same time, its technical and economic limits. An analysis of the final use of energy in Europe carried out by Eurostat (Database European Commission) in 2018 shows “three dominant categories: transport (30.5%), households (26.1%) and industry (25.8%)”. At the European level, transport is the largest energy consumer produced from fossil fuels and the most difficult to decarbonize. At the level of Romania, if we look at the diagram in figure 3, we notice that transport is the second main consumer with 6461 KTOE/year, after households with a consumption of 8008 KTOE/year of energy.

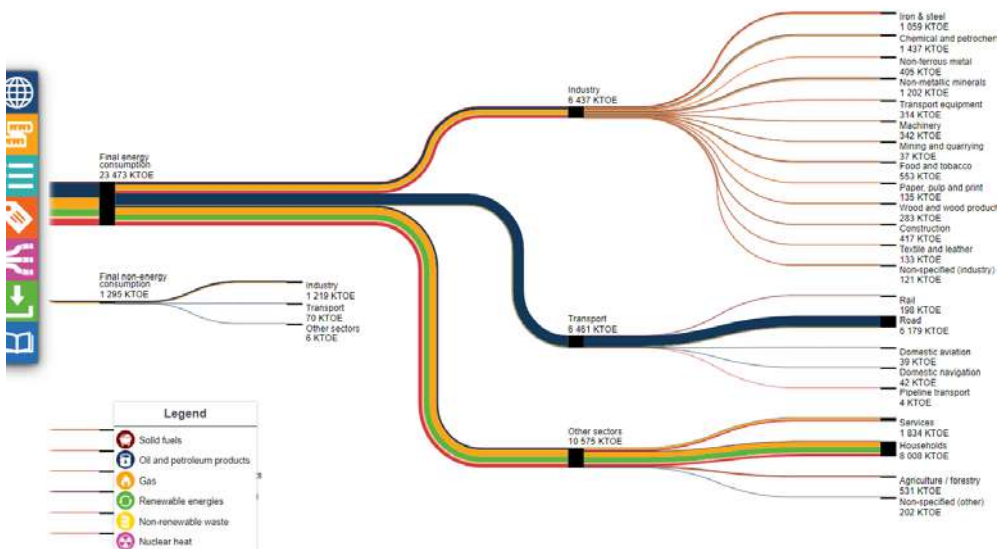


Figure 3. Energy balance of Romania with Sankey Diagram (Eurostat Database, 2020)

The energy flow presented in figure 3 shows us that transport in Romania is mostly based on petroleum products. The shift from petroleum products to renewable resources for transportation is not just about changes to cars, but at the same time, it is about a paradigm shift in addressing this challenge. When we refer to this transition, two aspects will be pursued: the storage of a large amount of energy, with low weight in a small space, and the modification of the infrastructure for fueling vehicles.

“In terms of road transport, in June 2022 the European Parliament backed a proposal to reach zero emissions from new cars and vans in the EU by 2035.” (EU responses to climate change, 2022)

In the report presented by the Hydrogen Council (2017, p.8) it is specified “that in the transport sector, hydrogen-fueled vehicles are commercially available and that in the next five years medium and large cars of the type: buses, trucks, vans to be powered by hydrogen.”

In this context, I studied from the specialized literature, the main methods of obtaining hydrogen. Hydrogen is a chemical element with many abilities. It rarely occurs in pure form; it must be extracted from compounds with other elements. This is an energy-consuming process.

In figure 4, the primary energy sources of hydrogen production processes can be grouped into 3 categories: fossil fuels, nuclear energy, and renewable energy. Renewable energies are derived directly (solar energy) and indirectly (biomass and wind) from the Sun. Similarly, hydrogen feedstock comes from 3 categories: fossil fuels, water, and biomass. While fossil fuels and biomass can serve as both an energy source and a raw material, water is only used as a raw material and another energy source is required to power the process.

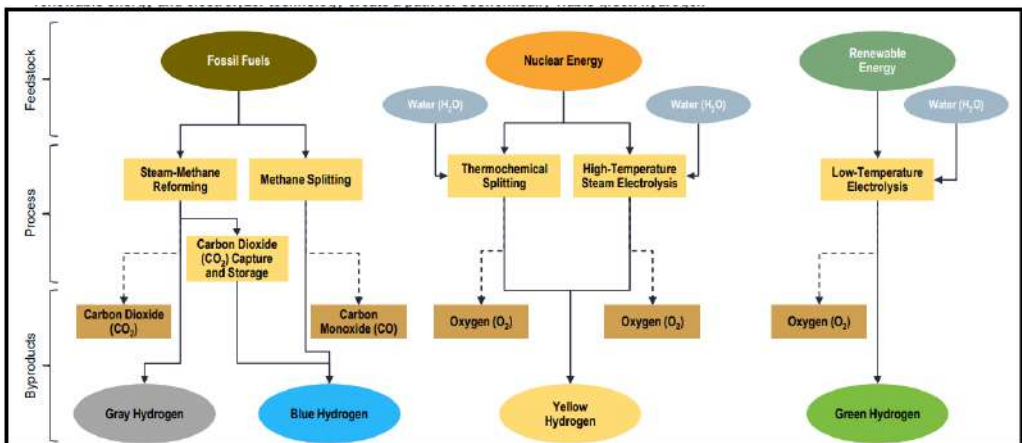


Figure 4. Hydrogen production technologies (LAZARD, 2021)

In figure 4 we observe five fundamental chemical and biological processes to produce hydrogen: thermo-chemical processes of fossil fuels, biomass and biofuels, electrolysis, thermal water splitting, photo-electrochemical processes, and biological processes. The hydrogen produced is divided into 4 large categories: gray hydrogen, blue hydrogen, green hydrogen, and yellow hydrogen.

“Hydrogen itself is colorless.” (Groll, 2021) The different colors of hydrogen depend on the source from which it is obtained and the impact they have on the environment.

Green hydrogen is hydrogen produced by the electrolysis of water (in electrolysis, with electricity) and electricity produced from renewable sources. The greenhouse gas emissions generated by hydrogen production from renewable sources over the entire life cycle are close to zero. Even if this resource is limited, as shown (Howarth & Jacobson, 2021, p.1677) in their paper, green hydrogen is an important pawn in the transition to zero CO2 emissions.

Blue hydrogen, a relatively new concept, is based on the gasification of natural gas or fossil fuels with carbon capture, but here the greenhouse gases emitted in the process are captured and stored. Multiple studies have demonstrated that the gas emissions resulting from obtaining hydrogen with fossil fuels as raw material are higher when the carbon capture process is not used, but the capture process presents multiple variables that lead to an efficiency of a maximum of 90 %. Regarding the production of blue hydrogen from natural gas, using renewable sources, the methane emissions associated with producing natural gas to obtain hydrogen are not considered. "Methane is a powerful greenhouse gas; it is estimated that 25% of global warming is due to methane". (Howarth & Jacobson, 2021, p.1677)

Currently, most hydrogen is produced from fossil fuels called gray hydrogen. Greenhouse gas emissions generated by the production of hydrogen from fossil fuels throughout the entire life cycle are high and are eliminated directly into the atmosphere. Yellow hydrogen is obtained through the electrolysis process carried out at high temperatures.

Results and discussion

Transport and aviation have limited resources for using low-carbon fuels. In Romania transport is the second main consumer with 6461 KTOE/year, after households that consume 8008 KTOE/year of energy.

Green hydrogen is used as a fuel for various modes of transport; being a natural substitute for several existing fossil fuels (eg. natural gas, petrol, diesel, coal and oil). As a result of its versatility, it represents a potential solution for reducing carbon emissions in traditional "hard to reduce" sectors such as transport/mobility, heating, oil refining, ammonia and methanol production and power generation.

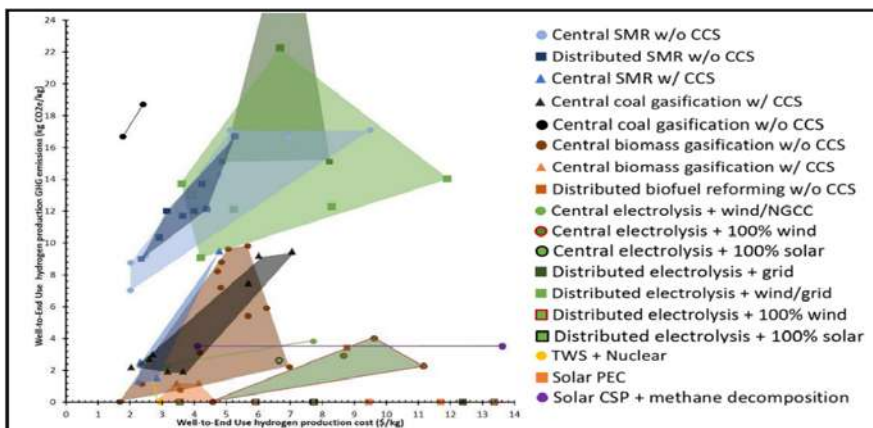


Figure 5. Estimates of production costs and gas emissions of hydrogen production methods (Tong et al, 2017, p2)

What is the principle behind these performances?

“Hydrogen contains more energy per unit mass than natural gas or gasoline, which makes it attractive as a transportation fuel.” (IEA, 2021, p.34)

The process of transforming hydrogen into electricity is as follows: The electrolyzer contains an anode and a cathode separated by an electrolyte. This water decomposition process removes oxygen (a non-polluting element), and hydrogen is captured and stored in special tanks. Through electrolysis, oxygen (O₂) is formed at the anode, and hydrogen (H₂) at the cathode.

The process of transforming H₂ hydrogen into electricity uses the "hydrogen fuel cell" principle. This process is done with the help of electrochemical cells that produce energy, water, and heat in contact with hydrogen. The current obtained is continuous and can be controlled with the help of converters.

The vision presented regarding the inclusion of hydrogen in the energy mix to decarbonize various sectors seems attractive, but what are the costs to make it a reality?

Figure 5, is the graphical representation of the estimates, from the specialized literature, regarding the production cost and greenhouse gas emissions for 1 kg of high-purity hydrogen delivered to the end use.

Both direct and indirect emissions related to the delivery of hydrogen to fuel pumps are included in the calculations. The cost of production comprises the cost of purchasing equipment and the costs of replacement, operation, and maintenance. From the graph, we can see that there are methods with gas emissions close to zero and low production costs (ex-central biomass gasification) but they are not sustainable in the medium and long term. In each situation shown in figure 5, hydrogen production costs remain high, or the technology is still in the early stages of being implemented on a large scale.

Conclusions

The phase-out of coal, oil, and gas and switching to environmentally friendly fuels will increase the demand for electricity compared to today. The corresponding amounts of electricity can be covered mainly by solar and wind energy in Europe, and if we follow the costs of energy produced from these renewable sources, we see that they are decreasing. Hydrogen participates in creating products and applications necessary for a modern and sustainable society. It is an important resource in climate neutrality, but it is limited for economic and technical reasons.

Hydrogen could be produced in areas with high-capacity factors for both wind and solar energy because it needs electricity to be obtained.

The basics of hydrogen synthesis “have been known for decades; hydrogen technology is not new. The world already produces and consumes more than 55 Mt of hydrogen annually in a wide range of industrial processes”. (Hydrogen Council, 2017, p.18)

On the climate protection side, the process has gained momentum in recent decades and numerous demonstration applications have been built.

Nuclear reactors are ideal for hydrogen production, but in the last two decades, there has been no significant progress in their research and development. Biological methods are still in their scientific infancy. To become viable pathways at scale, these technologies must demonstrate long-term hydrogen production and increase the production rate to an acceptable threshold.

These sustainable transport options are developing in countries with a high standard of living. The change is less visible in developing and poor countries. To avoid this gap between countries on the decarbonization of the transport sector, financing, affordable technologies, and decarbonization strategies that also extend to countries with a low standard of living are needed. Local authorities are crucial in decarbonizing the transport sector by providing incentives, and encouraging public transport and active travel.

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A THEORETICAL PERSPECTIVE ON THE RELATIONSHIPS BETWEEN INTELLECTUAL CAPITAL, ORGANIZATIONAL PERFORMANCE, AND AGILITY

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Abstract: *Organizations nowadays are directed towards a sustainable development, that is prepared to respond to unpredictable changes through continuous improvement of managerial approaches. In this way, one of the most important intangible resources of organizations that intend to develop a sustainable and competitive advantage is represented intellectual capital, which classically consists of human capital, structural capital, and relational capital. This research proposal aims to address the role of intellectual capital (focusing on its three dimensions) in the performance and agility of organizations. The present research aims to confirm that intellectual capital has the power to influence the development of organizations in diverse ways, such as increasing organizational performance, increasing the competitive advantage in the fast-changing market, and increasing the skills of the employees; thus, the interest of SMEs is justified in the development of the intellectual capital, in augmenting the quality of the human capital (through the process of attracting talents into the company), by investing in the development of human capital as it has on its turn a significant influence on both social and relational capital, as they are closely linked to people. Moreover, the research is intended to tackle how organizations could fasten their knowledge exchanges, agility, and competitiveness via intra and inter-organizational interactions. It aims to settle a reference point for managers, scholars, and public and/or private institutions looking for answers and solutions.*

Keywords: *intellectual capital; organizational performance; agility; human capital; relational capital; structural capital.*

Introduction

If we look at the past, we can observe that the economy had been shaken from time to time by different events and there was always the need for improvement in organizational performance. Coming back to the present time, 2020 was a difficult year and an unexpected crisis hit the whole world, making it difficult for many organizations (especially SMEs) to survive or to adapt, particularly for the ones that were not agile and innovative. In order to learn how we can cope with the changes, we should understand what the needs of the organizations are during and after the pandemic, what were the companies' weaknesses before the COVID-19 crisis, and what should be improved in order for the economy to recover. The study of intellectual capital within an organization is not a new topic, but this research aims to bring something new and is focused on how the pandemic influenced and affected the economic sector and organizational behavior, on how organizations (especially SMEs) should cope with the changes and challenges faced and how human, structural and relational capital are helping to improve the performance of the organizations and pushing them to become more agile. The research will focus on the role of the intellectual in organizational agility and performance, focusing mostly on Romanian SMEs.

Our world is under a continuous transformation. One of the most important changes in the life of an organization is "the transition from focusing on the development of the tangible assets to the development of the intangible assets" (Todericiu, 2021, p. 1). Thus, due to globalization, the rise of the knowledge economy (Quintero-Quintero et al., 2021), and other unexpected events (such as the COVID-19 economic crisis), the researchers focused on how organizations can become more agile, ready to cope with new challenges and be able to reach higher performance (Barbu et al., 2021; Brătianu, 2021). Back in the past, researchers used to focus majorly on the external environment and how it affects the organizations, on identifying the opportunities (Radjenovic & Krstic, 2017) and the threats faced by them, on analyzing the strengths and the weaknesses, and on trying to find the right strategies that respond to the needs of the organization (Porter, 1980; Vătămănescu et al., 2019; Brătianu & Bejinaru, 2021). However, nowadays, intangible resources can be seen as a weapon that helps organizations to achieve better performance when compared to tangible resources.

Thus, organizations started to create value and obtain a competitive advantage through intellectual capital, which has become "the one indispensable asset" (Serrat, 2017, p. 1) and through knowledge (Vătămănescu et al., 2015, 2016a, 2016b; Shumik et al., 2021), which is another "strategic resource and a key factor for an organization's performance for its sustainability" (Todericiu, 2021, p. 199). Al-Omouh (2022, p. 549) supports that knowledge intangible assets "are closely connected with entrepreneurship strategy in heightened competitive environments, enabling the capitalization of a business's intellectual capital and turning it into innovation and agile responses to opportunities and threats, thus gaining superiority over other competitive organizations". However, both intellectual capital and knowledge are "offering greater power and an increased advantage to the knowledge-based society growth and development" and have the power to influence the environment and the competitiveness of a company, creativity, communication, the business models, and the job satisfaction (Mercader et al., 2021, p. 3).

Starting from these arguments, the current undertaking provides a theoretical approach to the role of intellectual capital within the organizational setting by tackling the issues of organizational performance and agility and the main relationships among the three constructs.

Theoretical background

Intellectual capital

In the present, the concept of “intellectual capital” has progressively caught the eyes of scholars, as it represents one of the main resources of an organization (Brătianu, 2018; Stratone & Vătămănescu, 2019) , that can be used in order to gain a competitive advantage (Vătămănescu et al., 2019; Chahal et al., 2020; Vătămănescu et al., 2020a), to become more sustainable and innovative (Vale et al., 2022) and to increase job satisfaction (Nemțeanu et al., 2022). According to theorists, intellectual capital is made up of three principal components (Ali et al., 2021; Tran et al.2021): human capital, structural capital, and relational capital, each of them comprising other components and it “is based on various intangible resources such as employees, competence, knowledge, skill, intellectual agility, brand name, customer relation, and organizational structure” (Mohtar et al., 2015, p. 16).

Human capital is described often as “the cumulative capabilities and engagement of an organization’s personnel” (Serrat, 2011, p. 2), here including the education, the skills and competences of the personnel, their experience, their creativity and innovation and their emotional intelligence and it represents an important “source of innovation, strategic renewal of a company and the company can thus realize and create value in the knowledge-based economy” (Williams & Kelechi, 2021, p. 129); structural capital “consists of intellectual capital (patents, copyrights, trademarks) as well as infrastructural assets (organizational culture, strategies, management processes, IT systems)” (Szelagowski, 2019, p. 208); and relational capital, which refers to the “organizational association with the internal and external stakeholders of a firm” (Lenart, 2014, p. 19), including here the employees, the suppliers, the stakeholders, the business partners and the customers, and being defined as the ability of the company “to create and strengthen the relationship of the organization with the stakeholders and encase it for the benefit of the organization” (Weqar, 2022, p. 172). Furthermore, Dindire and Dugan (n.d.) are underlining that the difference between the market value and the value of the companies` assets can be analyzed in terms of the intellectual capital; the most important indicators being the customers, the processes, the innovation, and the human capital (Cretu, 2017).

Intellectual capital, organizational performance, and agility

The question that arises is whether, in the current context, intangible resources can be considered strategic resources and whether a certain combination of these resources might lead to a strategy that gives a company the necessary competitive advantage in terms of agility and performance. What is for sure is that, however, investing in the intangible assets of a company, in the case of the SMEs, is less expensive than investing in the tangible ones, this being one of the reasons why intellectual capital became a topic of interest nowadays (Tran et al. 2021).

In compliance with Williams and Kelechi (2021), “economic development and competitive authority of an organization and country are derived from knowledge” (p. 1), and all the intangible assets are imitable and non-substitutable. At the national level, according to a report made by the World Bank (World Bank, 2020), Romania was ranked 67th in the Human Capital Index, reaching the value of 0,584 in 2020 and it was also ranked as having the lowest percentage of the population attending training education after completing basic education (Paszko, 2020). Thus, Romania’s ranking underlines the “need for urgent improvements in the health and education systems” (Chirileasa, 2020). Another idea that should be underlined is that intellectual capital is closely related to the agility and performance of organizations, no matter their kind. In this way, companies (especially SMEs) were affected directly by the pandemic (Stratone, 2021; Stratone et al., 2022; Vătămănescu et al., 2022b), and most of them needed to rethink their strategies, to replan their budgets and to move their activity online (Vătămănescu et al., 2017; Brătianu et al., 2020). This can be seen as an advantage, forcing the companies to become agile.

According to Stoica, Mircea, and Ghilic Micu (2013), the agility of a company is not only a necessity, but a condition for the organization to be able to survive in the market, being the only way to adapt nowadays to the customers’ requests, to enhance the opportunities and to cope with the unexpected challenges. From this point of view, Romania has a low level of agility among companies, which is worrying, especially from the perspective of an economic recovery plan in the near future, as well as the survival of companies in the current situation (Oancea, 2020).

According to a study made by PwC Romania, at the top of the list of benefits of having an agile organization, the respondents mentioned: “increased capacity of the entire organization to adapt to change (47%), teams that adapt more easily to new conditions (41%), teams that are better able to create and offer valuable solutions for customers (41%), innovative teams (38%), improving product quality (36%) and better-informed decisions (29%)” (Bumbăcea, 2020).

While agility became a concept worldwide known, it still represents a very difficult construct to measure. In this way, in the last years, many measurement approaches have been suggested (Dove, 1995; Gill & Sellers, 2006; Yauch, 2011; Akkaya, 2020). Dove (1995) states that an organization’s agility should be measured based on the following metrics: cost, time, robustness, and scope. Yauch (2011) suggested that in order to measure if an organization is agile, the environmental turbulence, the organizational success, and agility as a performance outcome (which combines the previous two) should be analyzed. On the other hand, Akkaya et. al (2020) support that the best way to analyze agility is to consider the behavior of the leaders. However, until nowadays, the best method was not found; thus, this research paper aims to analyze some of the measurement approaches suggested in the past and to find a way to improve them.

The performance of companies worldwide also lowered in the last few years, especially after the beginning of the COVID-19 pandemic. On this front, Mansion and Bausch (2020, p. 727) contend that SMEs “which successfully diversify into contested export markets, are generally considered to be a major source of socioeconomic prosperity”. Furthermore, as Koch and Schermuly (2021, p. 1265) emphasized, the “COVID-19 pandemic is accelerating change on many levels, impacting organizations, societies and populations worldwide at scale”, meaning that companies were forced to become more

agile and to innovate. Moreover, the COVID-19 pandemic created the opportunity to build new types of organizations characterized by virtualization, which is conducted through the creation of virtual teams or hybrid teams, that built the concept of digital leadership (Stratone et al., 2022). In this way, some articles (Nicolescu & Nicolescu, 2020; Streza, 2020; Făgădar, 2021; Popovici, 2021) support that, in Romania, the performance management of the companies is an inefficient process. Besides the fact that people and companies were not prepared to move entirely to the virtual world (Vătămănescu et al., 2018), once the pandemic started as they were not having enough financial resources, there was also a psychological pandemic, which led to the interruption of the interpersonal relationships, the installation of the feelings of fear and uncertainty (Brătianu, 2020; Javed et al., 2020; Morin & Carrier, 2020; Thakur & Jain, 2020; Parkitna & Urbanska, 2021).

Performance is a topic approached since the beginning of the first companies, when different tools were created to measure it. Friedman and Kass (2018, p. 19) are stating that organizational performance should be measured by taking into account the following metrics: “proper maintenance of infrastructure; customer satisfaction; retention of creative employees; providing meaningful work; increasing employee engagement; building a strong, positive reputation; and corporate social responsibility”. Calli and Calli (2021) support that an organization’s performance (especially SMEs) should be tackled by measuring their agility and digital maturity.

Barbu et al. (2021) are supporting that when the performance of an organization is evaluated and monitored, there should be taken into consideration the “financial dimension, innovation, management experience, quality, continuous improvement, and business excellence” (p. 2). Measuring the organization’s performance is a topic approached in this research paper, as it represents a vital part of monitoring the progress.

When it comes to measuring intellectual capital, Pulic (2000) is proposing the VAIC (value-added intellectual coefficient) model, which “concerns the efficiency of three types of capital: human capital (HC), measured by the cost of employees; structural capital (SC), equal to the difference between the value added generated by the firm and human capital; and physical and financial capital employed (CE), i.e., the amount of financial capital available to the firm (Marzo, 2022 p. 1). Shortly, VAIC represents a “tool used to measure a company’s intellectual capital performance” (Junita Sari & Putri, 2022, p. 17) and through this tool, “intellectual capital is measured by value-added generated by capital employed (VACA), human capital (VAHU), and structural capital (STVA)” (Iqbal et al., 2019, p. 3). Moreover, this model allows the managers, stakeholders, and shareholders of an organization to be able to monitor and evaluate the total efficiency of the resources and their composition by providing “an insight into the effectiveness of the value creation process” (Van et al., 2022, p. 3) and to obtain a glasslike understanding of the cause and effect relationship between the intellectual capital and the performance of an organization (Chen et al., 2021; Faria et al., 2021; Sujati & Januarti, 2021). Due to the fact that it was said that the VAIC model cannot measure the relational capital, Tran, Doan, and Tran (2021), suggested a modified value-added intellectual coefficient (MVAIC), in which the “value of relational capital is obtained from the number of expenses incurred for marketing” (Tran et al., 2021, p. 5).

Final considerations

In the last decades, the synergy of the intellectual capital and the success in the performance of an organization and its ability to be agile emerged as a recurring theme, since companies are pushed by globalization, increased competition, and the changing technologies to innovate (Hapenciuc et al., 2015; Păduraru et al., 2016; Vătămănescu et al., 2014, 2018; Papíková & Papík, 2022). Niwash et al. (2022) describe innovation speed as a company's rhythm of progress when innovating and commercializing a new product/service.

In this competitive environment, all companies need to adjust the flexibility of their policies and strategies and to use more efficiently both their tangible and intangible resources (Van et al., 2022) and be aware that intellectual capital "facilitates economic competitiveness and sustains long-term economic growth" (Sardar et al., 2021, p. 300). Looking at SMEs enterprises, we can observe that intellectual capital has an important role, as most of the time the resources of these types of companies are limited, which does not allow them to invest in tangible resources, so they prefer investing in the intangible ones, which as less expensive, but deliver more advantages (Tran et al. 2021).

As Hilkenmeier et al. (2021, p. 2) are supporting in their research, "SMEs have a high economic and social importance and traditionally contribute substantially to the innovativeness and competitiveness of the whole economy". Within Europe, according to the European Commission (2021), SMEs "are the backbone of Europe's economy", representing 99% of all businesses in the European Union. According to the last statistics, in 2018, Romania had a number of 485.757 SMEs (Sava, 2021). However, even if 485.757 looks like a good number, according to an Annual Report about SMEs that was published in 2019 by the EU (Executive Agency for Small and Medium-sized Enterprises, 2019), Romania ranked last, reaching only 29 SMEs/1000 habitats and being well below the European average of 58 SMEs/1000 inhabitants (Zamfir, 2019).

Due to the Covid-19 virus and the crisis it left behind, the number of SMEs opening in 2020 dropped off and many businesses were bankrupted. As it may be concluded from this situation, the number of SMEs is again very small compared to other countries from European Union; given this, SMEs are expected to further learn how to improve their performance and agility, and they should be more researched and studied, so they may surpass the economic crisis and arise more powerful and more able to adapt to drastic changes.

In conclusion, organizations that want to preserve the benefits that they have gained through the opportunities and challenges that were brought by the pandemic (such as faster decision-making, a better vision, adaptability, the need to increase creativity, digital leadership, and digitalization, the resistance to change, etc.) should shift toward an operating model that is agile and that help them reach a better performance (Filip et al., 2020; Nastacă & Năstăseanu, 2021) through better leverage of intellectual capital.

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THEORETICAL APPROACH ON CURRENT CHALLENGES OF HUMAN RESOURCES IN HYBRID WORK ENVIRONMENTS. RETHINKING LEADERSHIP TOWARDS EMPLOYEE ENGAGEMENT AND WELLBEING

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Abstract. *The year 2020 changed work forever, impacting every person and organization across the globe. Remote work has created new job opportunities for some people, offered more family time, and provided options for when and whether to commute. However, this brought up new challenges because teams have become more siloed and digital exhaustion has become a real threat. The paper proposal examines the effects of human resources leadership - primarily oriented towards business productivity - on higher attrition rates, subsequently enhancing disengagement and burnout. To this end, the focus will be on investigating whether the hybrid environment generated by the COVID-19 pandemic created a leadership style oriented more towards productivity (task-oriented) or, on the contrary, a leadership style oriented towards the employee (human centric). Further, it will be explored whether and to what extent, each of the two leadership styles influences the engagement vs. disengagement, and the well-being vs. burnout of the employees. The analysis is intended to unfold within organizations performing in hybrid work environments, thus combining online and on-site work and interactions with colleagues and the leadership team. The main assumption is that the leadership style significantly influences employee engagement and well-being, respectively their disengagement and burnout when not in line with the current work challenges. In the context of the COVID-19 pandemic, employees are expecting their leaders to empathize more with the novel challenges in the work environment*

Keywords: *burnout, disengagement, engagement, hybrid work environments, human resources, leadership style, wellbeing.*

Introduction

The topic of this paper is concerned with the way the leadership style impacts the employees' engagement and well-being, respectively the disengagement and burnout issues, especially after pandemics when the workforce has started to change dramatically, and the hybrid model work has become critical for leaders looking to attract and retain talented human resources. It is a preliminary theoretical paper on an emerging topic, a work in progress meant to bring forward some tendential issues in hybrid work environments. In what concerns the search of relevant papers, I have considered the usage of keywords by exploring the international database EBSCO and I have selected the relevant papers considering their abstract while including various recent official reports of the professional services companies trying to define the broader implications of the future of work under pandemic context.

In their research, the COVID-19 crisis, as explained by Brătianu & Bejinaru (2021), "came like any other natural disaster, finding people and organizations unprepared for

disruptive power and social power nexus. The unthinkable became a reality, and people realized that organizations and governments have no strategies to fight against such a pandemic". The COVID-19 crisis proved that we are managing in an uncertain world. This new uncertainty "landscape induced emergent knowledge strategies and imposed and integration process of deliberate and emergent knowledge strategies. Thus, managers could incorporate critical knowledge into deliberate strategies and explore new opportunities for knowledge creation and reducing chronic business uncertainty" (Brătianu & Bejinaru, 2021, p. 15).

Today, the chronic uncertainty dominating business organizations generates emergent thinking and probabilistic models for creating solutions (Murgatroyd, 2015; Brătianu & Bejinaru, 2021), which determine even authentic leaders to adhere to different leadership styles. This is mainly because they need to redefine the company's critical dynamic capabilities based on new knowledge structures and knowledge competencies (Brătianu et al., 2020). To support this idea, Deloitte has shown in one of its studies from July 2020 that the social and economic crisis caused by the current pandemic is an extreme but relevant example of the challenges leaders face today. Mastering crisis management requires a leadership style that would be perceived as an overly directive, actionist one-leader show during business as usual. In times of uncertainty, quick decisions are essential; these exceptional circumstances call for a more human-centric and radically driven leadership style. From the theoretical point of view, most researchers agree that leadership style significantly influences the level of employee engagement, respectively disengagement. Employees are more likely to be engaged and perform in their work when their leadership is characterized by some of the following features: a leader shows resilience, consistency, trust, and competence (Kahn, 1990); the leader is engaged (Welbourne, 2007) and committed to the organization (CIPD, 2006); leader provides care and support (Kahn 1990) and recognition for a job well done to employees (Wellins et al., 2005), and has an interest in the worker's wellbeing (Tower Perrin, 2003). The effects of authentic leadership in the workplace can result in trade-offs between the dimensions of well-being, which may strengthen and weaken the level of engagement among employees. To understand how perceived authentic leadership translates into work engagement, Vui-Yee and Ho's paper (2020) explains that authentic leadership will happen only if the actions of the leaders will be perceived as authentic by the employees (Hsieh & Wang, 2015).

Employee work engagement is considered today a key force for organizational success and many organizations increase their employee motivation through employee engagement strategies one of the key strategies to getting employees engaged is through leader behavior. Undoubtedly, the well-being of the employees is one of the key factors that indicate high return value for both the individual and the organizational growth and productivity. To support this, the paper published by Mohd et al. (2020) reveals that the positivity of authentic leaders indirectly influences employee well-being through financial rewards and meaningful work. It also suggests that financial and non-financial rewards should be measured separately considering current socio-economic conditions and employees' motivational needs. From the organizational perspective, authentic leaders can foster the growth of authenticity in the employees, which consequently contributes to their well-being and performance (Avolio & Gardner, 2005). The reason why this happens is that authentic leaders are good listeners and responsive to the employees' needs, whereby these behaviors make employees feel important and appreciated. They also know how to reward their employees and foster pride and

mutual loyalty between co-workers. And on top of that, this relationship between the authentic leader and employees is suggested to lead to a positive experience in employees' meaningful work.

COVID-19 has significantly changed the world of work, disrupting how organizations manage their businesses and especially leaders engage with their teams. A critical issue right now when most organizations plan to return their workforce to the workplace is understanding how organizations are coping with the new normal in working and keeping their employees engaged. Companies are reimagining work and establishing a hybrid approach to work that supports their people today and in the future. This topic is extremely new considering that we are currently facing a pandemic and there are not enough studies to support how to act or approach employee engagement and well-being. We currently have limited knowledge of the implications of flexible and remote working and hybrid arrangements call for in-depth studies that would explore various scenarios for organizations. We will need to first identify the benefits and drawbacks of remote working during the pandemic from both the employee and leadership perspectives and then map the potential scenarios to work for a sustainable work environment. This paper is trying to understand the viability of remote working in a post-pandemic setting while rethinking employee experience to compete for the best and most diverse talent. The choices leaders make in this next wave of hybrid work will impact the organization's ability to drive innovation and collaboration and to create an inclusive work environment for years to come. For example, Ernst & Young (EY) is working with leading global organizations to support a range of transformations related to reimagining work. EY commissioned the Physical Return to Work Reimagined (PRWR) survey and JAM analysis (from an interactive crowdsourcing event) using the MilionYou platform in June and July 2020. 3683 employees were involved, including 708 employers, and included US, UK, and Germany data. This report could be a starting point in understanding how to enable new ways of working efficiently within the current context.

We can also use the 2021 Work Trend Index: Annual Report launched by Microsoft as a way forward in understanding this new hybrid workforce. This report outlines findings from a study of more than 30,000 people in 31 countries and analyses of trillions on productivity and labor signals across Microsoft 365 and LinkedIn. It also includes perspectives from experts who have studied collaboration, social capital, and space design for decades. Even though many leaders acknowledge the disruptions caused by the COVID-19 pandemic at the behavioral level, more substantial changes are expected in order to adapt to the new context. The leadership style should be properly adjusted to meet the challenges of hybrid work environments to limit employees' burnout and disengagement. Therefore, the present paper intends to address the interconnections between the leadership style and employees' responses as a premise to develop insightful recommendations for professionals and managers

Literature review

To better understand the complexity of the COVID-19 crisis, Brătianu paper (2020), highlights the fact that the key element in all these crises is people's behavior because human nature is not fully rational. Emotions, personal experiences, beliefs, and values are dominated by the unconscious cognitive processes, and thus it is very hard to understand the psychology of decision-making adequately, especially in times of crisis, when the irrational aspects are more important than the rational ones (Ariely, 2011;

Baron, 2000; Blake, 2008; Kahneman 2011; Sutherland 2013). COVID-19 generated high uncertainty about what is happening due to the absence of critical knowledge to understand and fight against it (Chang & Velasco, 2020; McKibbin & Fernando, 2020; Surico & Galeatti, 2020). “The current disruption will change how we eat, work, shop, exercise, manage our health, socialize, and spend our free time at an unprecedented rate of change” (Mey & Ridders, 2020). After this pandemic, there is no way to return to the old way of living and working. There will be “a new normal” life and a new way of thinking. Staying home and working from home also created a new way of doing things and communicating. The knowledge dynamics change by reducing the emotional contribution and increasing the rational role (Brătianu & Bejinaru, 2021). The transition to a new way of working, either in business as usual or in response to interruptions, changes both the employment contract and the psychological contract between companies and employees (Jaakson & Kallaste, 2010). If companies do not recognize the change in these dynamics, the potential effectiveness of teleworking may be limited (Eckhardt et al., 2019). In a review of the literature conducted by Moroşan-Dănila, Grigoraş-Ichim & Bordeianu (2021), challenges of telework have been extracted, which are reflected in possible technological challenges in the work environment, communication, and management, which are interconnected and, without paying attention to these areas, telework can have negative effects, such as isolation, work from home conflict, and work intensity (as also highlighted by Bentley et al., 2016; Eddleston & Mulki, 2017). And, in return, these can have a negative effect on well-being (physical and mental health) and work performance (Eurofound & ILO, 2017). From this, companies must not forget that human resources are the most important resource they have at their disposal and can always adapt (with the right impulse).

Organizing employees in telework was necessary for 2020, but it has become a long-term solution to the company’s cost-cutting needs and efficiency. In this context, companies must always look for solutions and methods for organizing employee work, supervision, motivation, and evaluation of telework. Brower (2020) forecast that mental health and leadership will grow during the crisis, company culture will become more focused, working from home will be the new norm, greater work-life balance disparities, more frequent team engagement, vast flexibility, and significant use in technology. Companies will increase their speed, reduce bureaucracy, standardize practice, and reduce unnecessary systems, increasing employee empowerment. The current pandemic appears to be an ultimate test for leadership worldwide. Organizational leaders rely on human resources professionals’ instincts and insights to ensure their organization and employees feel supported (Dirani et al. 2020). Losing good employees means losing knowledge and experience (Ramllal, 2004). Many organizations also try to reduce the number of employees to minimize their costs during the crisis and simultaneously expect greater resilience from the remaining employees (Naude, 2012). On the other hand, employees respond differently during crises and discrete individuals behave differently to change with reactions varying from acceptance to change, minor discomfort, fear, anger, frustration, and even full resistance (Smollan, Sayers, & Matheny, 2010). Data extracted in Microsoft 2021 Work Trend Index provides a clear snapshot of the new normal brought about by the COVID-19 pandemic in the work environment. Extreme flexibility and hybrid work will define the post-pandemic workplace. Employees want control of where, and how they work and expect their leaders and organizations to provide options. Business leaders’ decisions in the coming months to enable flexible work will impact everything from culture and innovation to how organizations attract and retain top talent.

The role of leaders in employee engagement has been the highlight of many studies throughout the years. As defined by Skalkon et al. (2010), leadership can play an important part in shaping and defining an organization's psychological work environment. Leadership, directly and indirectly, influences employee engagement and psychological well-being (Hetland, Sandal & Johnsen, 2007). As Wakabi (2016) highlighted in his research on leadership style and staff retention in organizations, managers adopt different leadership styles depending on their orientation. Any leadership style adopted by a particular manager impacts staff motivation, performance, and organizational commitment, which leads to employees' decision to leave or stay in the organization. One of this paper's major findings is that leadership style influences organizational staff retention. Ng'ethe (2012) has studied the influence of leadership style on academic staff retention in public universities, arguing that employees are more likely to remain with an organization if they believe that their managers show interest and concern for them, if they know what is expected from them, if they are given a role that fits their capabilities and if they receive regular positive feedback and recognition. As Bakker & Costa (2014) also demonstrated in their research article on chronic job burnout and daily functioning, employees with a high level of burnout need help structurally changing their work conditions and health status. It has been proved that chronic burnout strengthens the loss cycle of daily job demands, exhaustion, and self-undermining. It weakens the gain cycle of daily job resources, daily work engagement, and daily job crafting. As described by Maslach, Jackson, and Leiter (1996), "Burnout is a syndrome characterized by chronic exhaustion, cynicism, and lack of personal accomplishment". It is a state of "exhaustion in which one is cynical about the value of one's occupation and doubtful of one's capacity to perform. Burned-out individuals experience chronic fatigue and distance themselves emotionally and cognitively from their work activities".

As indicated by the study conducted by Microsoft in 2021, over 40% of the global workforce considers leaving their employer this year, therefore a very in-depth approach to hybrid work is critical for leaders looking to attract and retain diverse talent. Now more than ever, people expect their employers and leaders to empathize with and understand their current challenges. As per the same study, self-assessed productivity has remained the same or even higher over the past year, but at a human cost. Nearly one in five global survey respondents say their employer does not care about their work-life balance. Fifty-four percent feel overworked. Thirty-nine percent feel exhausted. The digital intensity of workers' day has increased substantially, with the average number of meetings and chats rising since last year. Furthermore, this paper has also shown that workers are feeling the pressure to keep up despite meeting and chat overload, 50 percent of people respond to team chats within five minutes or less which proves that the intensity of the workday and what is expected of employees during this time, has increased significantly. Another study developed by Ernst & Young (2020) highlights that employees want to return to the office for social contact but do not view working at the office and working remotely as a binary choice. They want flexibility and a greater mix of work from home in the future. They want to return to the office for social contact and are looking to their employers to enhance digital tools for remote working. Therefore, tools to support a greater connection and virtually collaborate are critical. On top of the current context, competition between companies becomes vaster and vaster and managers need to keep up with new ideas and strategies for the future. As explained by Drosos et al. (2021) in their research, the permanent search for flexibility changes patterns in employment as well. On the one hand,

organizations are not looking to offer permanent employment to all employees, but only to a small elite, considered the multi-skilled core group and provides flexibility because of its ability to perform various tasks. The rest of the workforce tends to be more part-time, temporary, seasonal, contractors, or self-employed. At the time of crisis, as we live, the leader's main focus would be to reopen, recover the business, and begin crisis management mode. As a result, employees might be at the most risk in several ways. They might go through traumatic experiences, need to learn how to deal with complexity, adapt to the new reality of work, and need emotional and interpersonal support. In this sense, leaders can support supervisors by boosting motivation and frequent employee engagement. It is essential for business leaders and supervisors to become more flexible as employees are, also, unprepared and need to adjust to the new situation. All these trends and research need more reflection and exploration since we are all facing something extremely new regarding workforce change. It is a big mental shift, one that will require leaders and organizations to fundamentally reexamine and rewire their operating mode and must put employee well-being, diversity and culture at the center of a reimagined workplace where most probably working and collaborating with others remains a key element of the overall employee experience

Conclusions, limitations, and future research area

The purpose of this paper is to explore if and to what extent, each of the two leadership styles has an influence on engagement vs disengagement, wellbeing vs burnout of the employees. There are many papers that present different aspects of the way COVID-19 impacted organizations and leadership but few of them are doing the research in an integrative way and are investigating dichotomously the relations between concepts. The present paper proposal intends to address the interconnections between the leadership style and employee responses to develop insightful recommendations for professionals and managers in a hybrid work environment. The main assumption is that the leadership style significantly influences employee engagement and well-being, respectively their disengagement and burnout when not in line with the current work challenges. One of this paper's major findings is that leadership style influences organizational staff retention. Leaders need to think, act, and behave in new ways. Now is the time for leaders to lead in a human-centered way. People are questioning who they are and what matters to them and, in many cases, they're finding new confidence to show up as themselves and live their true lives. Understanding human-centered leadership and why it is a required paradigm shift is an important first step. HR will play an important role in this and, as we emerge from the pandemic, it will be critical to developing new leadership mindsets, capabilities, and behaviors. Social learning, caring for people and their well-being, and connecting with the team in the new reimagined workplace, will be the key elements for the overall employee experience.

The limitations of the present paper come from the fact that the search explored full-text articles published in peer-reviewed academic journals retrieved via the exploration of EBSCO Business Source Complete and to a larger perspective, additional online databases could have been considered. A bibliometric analysis could come up with significant relevance for practitioners and researchers as we continue to understand the challenges of hybrid working environments. To meet the theoretical exigencies of the literature review it will be necessary to study the most relevant theoretical developments and research directions on understanding the complexity of the crisis generated by COVID-19, especially in the business environment, to understand the

implications of a hybrid work environment and teleworking in general and then to see how it impacts the leadership styles and employees. Official reports from various institutions will be added and analyses of engagement surveys that organizations themselves applied to their employees

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Knowledge Management

APPLICATIONS OF KNOWLEDGE STRATEGIES IN BUSINESS THEORY AND PRACTICE: BIBLIOMETRIC ANALYSIS

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Abstract. *Within this paper, we performed a structured exploration of “knowledge strategies” in business theory and practice due to the acceleration and blaze of opinions that flood the academic media and several other media. The concept of “knowledge strategy” has been clearly defined in theory as the type of strategy referring to an organization’s mechanism of using its knowledge as a strategic resource, from an economic and competitive point of view. In practice, knowledge strategies differ for each company, domain, or context, depending on internal and external factors. For this exploration, we used a bibliometric analysis realized with VOSviewer software in order to systemize the data from the Web of Science and obtain relevant datasets and outputs to debate. First, we shall present and discuss the evolution of knowledge strategy during the last decade. This step provides the necessary arguments for choosing this subject as a topical one. Secondly, we bring to light the composition of clusters according to keywords co-occurrence analysis in order to comprehend the perspectives of the theoretical approaches in the extant scholarly literature. Thirdly, we closely examine the overlay analysis to have a holistic view of the topic’s chronological evolution and to speculate the trend of discussions on this topic in the next years. Our findings reveal both homogenous and heterogenous clusters of keywords regarding “knowledge strategies”. Even if the concept has a straight theoretical framework, it is depicted differently by case study research and independent practical experiences. Our results show the core definitions and the trends of discussions for the analyzed concept of “knowledge strategies”.*

Keywords: *bibliometric analysis; co-citation analysis; co-occurrence analysis; exploitation strategy; exploration strategy; keywords clusters; knowledge strategy.*

Introduction

The importance of knowledge-based strategies is increasingly activating the interest of companies worldwide. The success of strategies in general is due to the key components they contain and the key processes through which they are implemented. In the course of time, managers, entrepreneurs, and businessmen have resorted to various resources, methods, techniques, or procedures to carry out their plans and thus achieve their objectives (Bratianu & Lefter, 2011; Baesu & Bejinaru, 2020). In some cases, these working methods or plans have become specific strategies for achieving certain types of objectives. We consider it interesting to underline the idea that business strategies can be both generalized and specific, which leads us to the idea that every time implementation of a strategy can also generate innovation.

The standard structure of the paper offers an accessible reading and understanding of the presented issues. First, we present throughout the *Literature review section* the main

conceptual ideas that we consider necessary to connect knowledge strategies to the traditional theories of strategy, strategic thinking, and strategic planning. Secondly, we describe the *Methodology* applied for the bibliometric analysis including some specific and technical information. It follows the *Results and discussion* section, including discussions over three types of analysis. The subsequent section is *Conclusions* which comprises the synthesis of the debate, the summary of results, final comments, and future perspectives.

Literature review

We can think of strategy as a high-level plan designed to achieve one or more objectives under risk and uncertainty. The importance of the strategy derives especially from the consideration of limited resources. Thus, in a complex context, the strategy specifies the objectives, determines the actions, and mobilizes the resources to achieve the objectives (Bratianu et al., 2020). A strategy can describe the course through which the objectives will be achieved by using certain resources. The creation and implementation of a strategy can be premeditated actions, carried out with intention, or they can proceed naturally, and spontaneously, as the organization adapts to the competitive environment and fights for survival (Bejinaru, 2017). In this context, in-depth concepts such as strategic planning and strategic thinking arise (Bratianu & Lefter, 2011; Bratianu & Bejinaru, 2021).

In order to highlight the contrast with the concept of planning, Mintzberg (2000) defined strategy as "*a pattern in a stream of decisions*". Thus, it amplifies the complexity of the strategy and at the same time its dynamics. Max Mckeown (2011) defines human empowerment as shaping the future and achieving the desired objectives through available resources. Vladimir Kvint (2009) proposes a more philosophical definition, considering strategy as a mechanism for identifying, formulating, and developing a vision that will lead to long-term success if strictly applied. The distinction between strategic planning and strategic thinking has been intensely debated, and there are scientific arguments for simultaneously supporting the interdependence and difference between the two. Thus, F. Graetz (2002), explains that strategic thinking and planning are distinct but complementary and support each other for effective strategic management. From this author's perspective, strategic thinking has the role of exploring innovation and creating the future in new and different ways that will cause the company to reshape its basic strategies and even transform the industry. Through strategic planning, the strategies developed through the strategic thinking process that is a nonlinear and entropic process (Bratianu, 2019; Bratianu, 2020; Bratianu & Vasilache, 2009) and they are realized and supported, and integrated into the business (Bejinaru, 2021).

"Strategic thinking operates in the opportunity space of the organization" states Bratianu (2022, p.1) in a remarkably updated definition. Strategic thinking is based on exploiting the "knowledge" resource and is a mental process of understanding and creating the future to look for practical ways to obtain a competitive advantage in the market. Thus, knowledge has always been a strategic resource for the organization and its effective use certainly leads to the acquisition of sustainable competitive advantage (Bejinaru & Iordache, 2010). In the conclusion section, we shall reveal what Knowledge strategies are considered in theory and practice research and how they evolved over time.

Methodology

For this research paper we employed a bibliometric analysis with several components. The method of bibliometric analysis emerged in order to replace the traditional method of statistical bibliography which gradually became outdated and unsuitable for research based on books, journals, and other media of communication (Pritchard, 1969). In recent years, bibliometrics represents a fashionable and reliable instrument to evaluate and describe the state of science in various fields (Zupic & Cater, 2015). In the current research, bibliometric analysis is used to map and systemize the body of scientific literature related to the “knowledge strategies” subject by means of quantitative parameters that characterize the connections between the publications in this area (Alayo et al., 2021; Diez-Martin et al., 2021; Ellegaard & Wallin, 2015; Glinyanova et al., 2021; Hillmann, 2021; Vogel & Güttel, 2013; Zhao & Strotmann, 2014).

The software provides more options for analyzing the database. We chose the co-occurrence analysis of keywords to identify and filter the most relevant items on the investigated topic (Zupic & Cater, 2015). Co-occurrence analysis is the software option that allows mapping the most used concepts, phrases, or keywords in the analyzed field. The function of the co-occurrence analysis is to search within the content of the sampled papers and identify the keywords most frequently cited together. The result of this analysis is important for targeting the conceptual focus of the analyzed papers and revealing the main scholarly perspectives on certain topics (Agostini et al., 2020; Callon et al., 1983). The co-occurrence analysis can be interpreted based on 3 outputs: network map, overlay map, and density map. The first mentioned one, the keywords network shows the colored clusters of terms and the links between them. The higher the number of occurrences, the larger the item symbol and the thicker the lines representing the links. The second-mentioned overlay map shows a chronological evolution based on a different color for each year. Thus, according to the color in this map, we can identify the publication year of the papers that the keywords belong to. The third-mentioned, density map shows the keywords as highlighted bulbs on a blue canvas. The brightest the bulb is means it represents the core of the investigated issue. The closer other yellow bulbs are, the stronger is their link and thus their number of occurrences (Feng & Chen, 2020, p.5-6). According to these technical details, we shall discuss the outputs of this research.

For the sample selection, we decided to search the Web of Science (WOS) database to cover a wider area of scholarly discussions included in conference proceedings, articles in Social Sciences Citation Index journals, book chapters, editorial editorial reviews, and others. We performed the search using the specific key phrase that describes the focus of this research paper and that is “knowledge strategies” but used the codified form “knowledge strategy*” in order to obtain also the related variations like: knowledge strategy, knowledge strategist, knowledge strategies, or knowledge strategic vision and other similar terms (Durst & Runar Edvarsson, 2012). The first filter applied for the query was the “title” and then refined the search for Business & Management fields and thus the search retrieved a number of 138 papers for the analysis database. The data collection was performed in August 2022 according to the following query:
[<https://www.webofscience.com/wos/woscc/summary/c4e76738-d854-4ee0-8bcc-30dcbd129a6c-4d1d9bb6/relevance/1>]

Results and discussion

In order to highlight right from the start the scope of publications in the field of knowledge-based strategies, we chose to graphically present the evolution of the number of publications and the number of citations in the last twenty years. We consider that figure 1 is representative of the ascending evolution of publications, but especially an exponential evolution of citations on the key topic analyzed, taking into account that all these works contain the key term "knowledge strateg*" right in their title. In figure 1 we can observe a general upward evolution, although in certain years there are also obvious decreases in the number of publications and citations. A peak of publication (violet column) can be observed in 2011 with 16 articles, followed by 2012 with 11 articles. An interesting aspect is that although in the years 2016, 2018, and 2019, the number of publications is considerably lower compared to the peak years, the number of citations is higher and with an increasing trend (purple line). An explanation could be the emergence of a new trend in academic writing, namely that of highly well-documented research based on a rich list of references. This approach requires intensive work for authors in order to gather the appropriate sources to be cited in their research paper and thus can be partially argued the exponential increase of citations. In this sense, we can say that it explains a large number of citations of already prestigious or recently published articles, these being two important criteria according to which the authors choose the references used in their research (Kwiek, 2016).

However, after analyzing the database, we could say that multicultural collectives of authors could be another factor in these upward trends of publications and citations. Furthermore, the research and development funding programs that are implemented by the world's major universities represent another stimulating factor in this equation, certainly with applicability in other research fields as well (Zaqout & Abbas, 2012). At this point, it is worth mentioning the *"accumulative advantage theory"* developed by Robert K. Merton (1968) which implies that academics who have a productive activity of researching and publishing will become even more productive in the future while those academics who have low performance will continue to decrease. Later, Cole and Cole (1973, p.114) presented the *"reinforcement theory"* stating clearly the fact that *"scientists who are rewarded are productive, and scientists who are not rewarded become less productive"*. This type of institutional strategy has an enormous impact, generating a wide gap in rapport with organizations that fail implementing it (Bejinaru & Prelipcean, 2017).

Another basic aspect worth mentioning is that more and more academics have begun to truly recognize the veracity and usefulness of the sources provided through online journals. Let's not forget that this transition of scientific research from inside the reading rooms of large libraries to the study of virtual sources was a long and difficult one in certain cultures with higher skepticism (Yang & Li, 2015, p. 13). In this context, we can appreciate that the effects of validating online publications are already noticeable (McGuigan & Russell, 2008). We limit ourselves to these minimal findings because distinct research can be carried out on the factors, motivations, and mechanisms that lead to increased academic publications and citations.

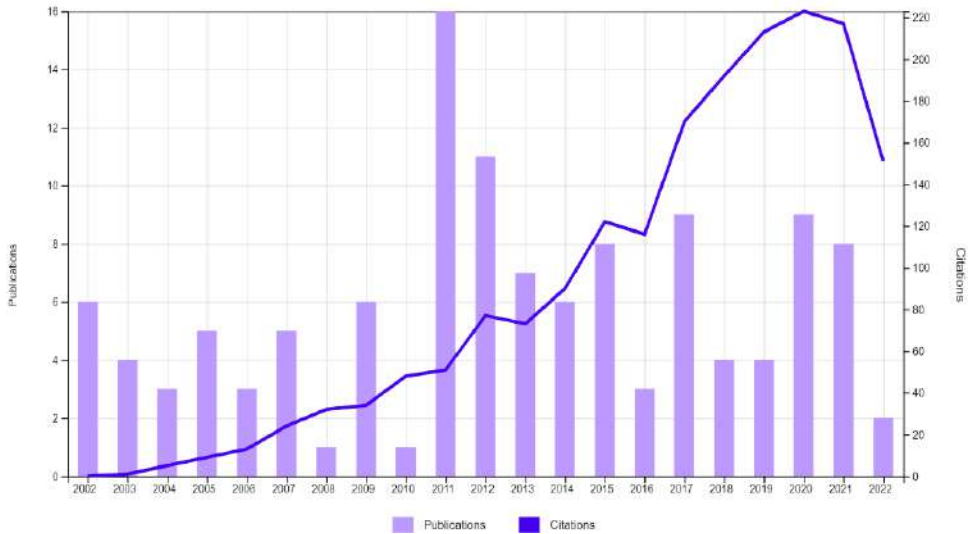


Figure 1. Evolution of “knowledge strategy” field during 2002-2022

Source: (own elaboration from WoS)

Following we present the outputs of VOSviewer co-occurrence analysis of all keywords to the end of identifying all clusters and links, in figure 2. In order to generate the network in figure 2 we applied the standard sequence of commands. The network in figure 2 clearly shows the most relevant issues approached by researchers in relation to the investigated phrase of “knowledge strateg*”. The reading of the network must be done according to simple principles, namely: - the dots in the center and with larger sizes are representative of the keywords most frequently found (together) in the analyzed database; - dots of the same color form a cluster, which means that they are most strongly interconnected and appear most frequently used together in the analyzed articles; - the dots towards the extremities, which are also smaller in size, are used less often and in a smaller number of works, which means either that they describe problems indirectly connected to the central topic, or that they are insufficiently debated, or that they are barely at the discovery stage. Regarding the curved lines between the dots, we must mention that their thickness shows the strength of the connection between those terms, that is, how frequently they are used together in the analyzed articles. We can see that the dots in the center are connected with thick curved lines, and as we look at the dots from the edges of the figure, we can see that they become finer, as if they are erased in terms of color intensity, which shows a weaker connection.

In order to have a detailed approach regarding the clusters we structured the information offered by the software, which is not visible in figure 2, in table 1 below. To start with, we clarify that there are three clusters among which the red one is the largest and carries a lot of significance according with all the keywords included. The composition of the RED Cluster is not a surprise as it clusters the core issues about knowledge strategy, as: knowledge management, knowledge sharing or organizational performance.

The GREEN Cluster brings some novelty to the discussion due to its composition: absorptive capacity, capabilities, competitive advantage, knowledge strategies, and technology. This cluster conveys that knowledge strategies are important for achieving competitiveness and sustainable advantage in the market. It includes also technological support.

Even if the smallest, the BLUE Cluster is the most scattered and combines interesting concepts: exploitation, exploration, innovation, networks, and performance. This combination of keywords sends the message that organizational efforts should be made in order to generate optimal knowledge strategies. The papers behind these keywords approach the organizational processes and models necessary for obtaining performance through implementing knowledge strategies.

Although they are simple and homogeneous, these clusters convey clear and strong messages about the importance given by the analyzed publications to the key concept of "knowledge strategies". Moreover, the analyzes of the VOSviewer program clearly show the chronological trend of the scientific discussions on the subject; thus, moments, results, and information relevant to a particular subject can be identified (figure 3).

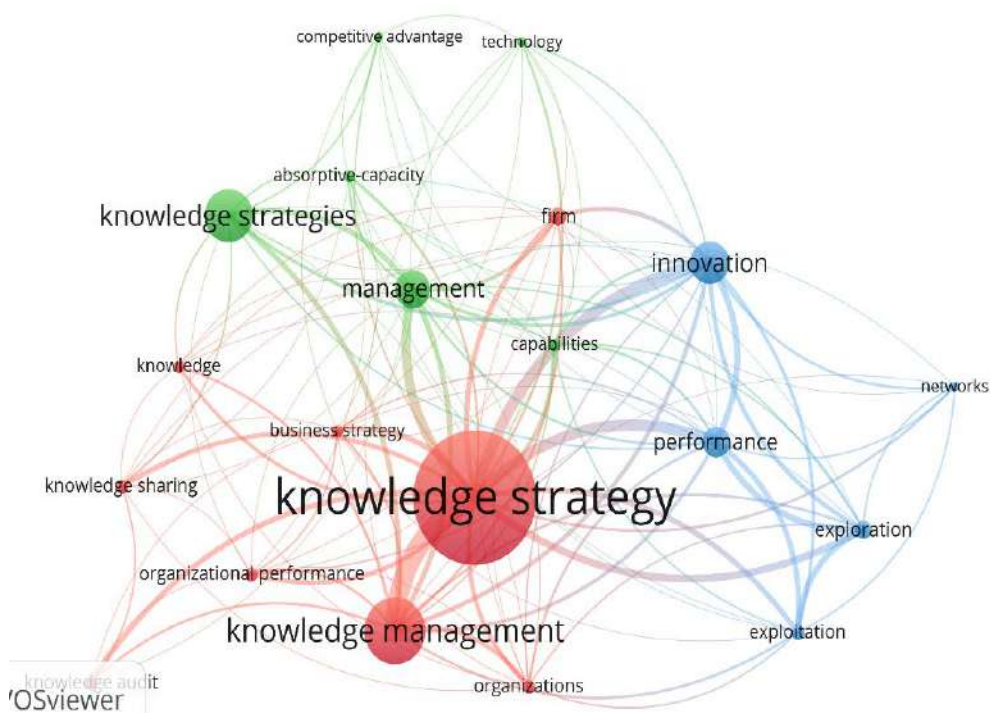


Figure 2. Co-occurrence analysis of all keywords

Source: (own elaboration from VOSviewer)

Table 1. Co-occurrence keywords clusters (Source: elaboration based on VOSviewer)

Cluster	ITEMS	Occurrences	Link strength
RED CLUSTER	business strategy	6	23
	firm	9	27
	knowledge	6	15
	knowledge audit	7	14
	knowledge management	33	74
	knowledge sharing	7	17
	knowledge strategy	66	126
	organizational performance	7	20
	organizations	7	27
GREEN CLUSTER	absorptive-capacity	6	17
	capabilities	6	27
	competitive advantage	5	11
	knowledge strategies	26	30
	management	19	50
	technology	5	13
BLUE CLUSTER	exploitation	7	35
	exploration	9	40
	innovation	21	62
	networks	5	15
	performance	15	55

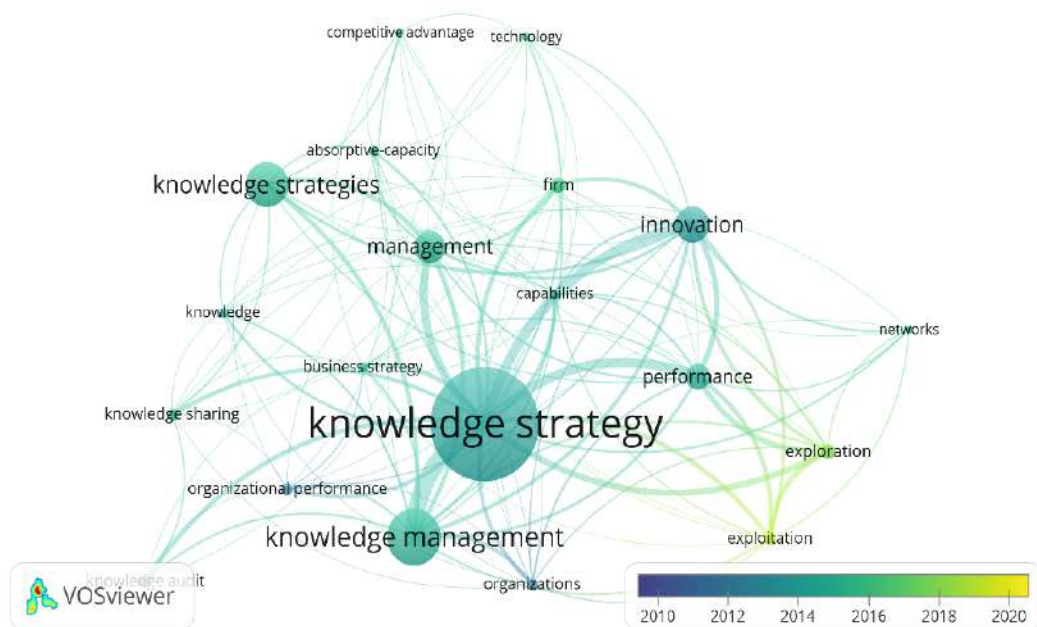


Figure 3. Overlay network for 2010-2020

Source: (own elaboration from VOSviewer)

According to the overlay map, in figure 3, it is interesting to observe that there is a concentration of publications during 2014-2016 corresponding to the blue-turquoise colors that predominate. A slight colorful variation is given by years 2018-2020 in yellowish nuances emphasizing key terms like: exploration, exploitation, and networks. This clue reveals a new trend of discussions towards a more practical dimension of knowledge strategies, not only conceptual models, definitions, or theories but also pragmatic business issues of how to benefit from knowledge throughout exploration, exploitation, and networks.

For example, according to the database, we identified that the “exploration” keyword on the overlay map is common for a set of papers that focus their research on exploring the knowledge strategies in fields like ICT-information and communication technology (Hartono et al., 2022), in digitalization of healthcare (Zhao & Canales, 2022), or emergent knowledge strategies in business education in a time of crisis (Tomé & Gromova, 2021). It must be pointed out that, as the map indicates, these are recently published papers, in 2021 and 2022.

Another example of researchers’ intentions on providing solutions for increasing business performance is revealed by papers including the “exploitation” keyword. For instance, Revilla & Rodriguez (2011) present how knowledge strategy influences the team vision regarding product development in their paper. The authors developed complex research on 87 companies and discovered that the organizations’ knowledge strategy greatly influences teams in achieving product development. The results show that low exploitation results from a low ambidexterity strategy whereas high levels of exploitation were achieved based on a high ambidexterity strategy. The authors state

that “*this result illustrates the strong cumulative nature of scientific knowledge*” (Revilla & Rodriguez, 2011, p.18).

In recent years, there has been an increased awareness and interest regarding exploiting strategies with the knowledge to obtain a competitive advantage in various fields of activity. Thus, research in the field of tourism has channeled its attention to the efficient exploitation of organizational capital for high financial performance through strategies based on knowledge (Martínez-Pérez et al., 2021). The research of Martínez-Pérez (et al., 2021) shows that the companies analyzed in the field of tourism should implement “*a knowledge exploration strategy rather than a knowledge exploitation strategy*” (p.1). According to their findings, exploitation strategies have a negative effect on bridging the organizational capital and financial performance compared to knowledge exploration which reduces the negative effects in the process.

Conclusions

This research paper aimed to investigate the literature available in the WOS database and pin up the main scholarly streams under the umbrella of the “knowledge strategies” topic. We chose for this scope the bibliometric analysis also supported by a literature review on traditional theories - like strategic planning and thinking accumulative advantage theory, and reinforcement theory - and emergent approaches - like knowledge exploitation and exploration. The results obtained throughout the bibliometric analyses led to several concluding ideas. First, we reiterate that literature on the explored topic has certainly an ascendent trend and a number of citations. Secondly, the composition of the clusters revealed two contrasting research behaviors/preferences of the authors collectively. In this sense, we explain that there were two homogeneous clusters, including semantically very similar keywords, meaning that the respective research papers also presented similar approaches. However, there was one cluster with rather heterogeneous keyword composition, meaning that some novel research directions are emerging in relation to the “knowledge strategies” concept. Finally, the paper’s theoretical contribution provides an insightful perspective on the “knowledge strategies” literature indexed in WOS.

From a practical point of view, these discussions could be further exploited by other researchers and businessmen in order to guide their own work in the field of knowledge strategies. Still from a technical view, we believe we provided the necessary details about the implementation and interpretation of bibliometric analyses, which could also be useful for other researchers. The limitations of this research work refer to the bibliometric restrictions and filters, like: the use of a single database (WOS); the restricted query used to filter the papers’ title, and the limitation of the domain to Business & Management. This type of research could be extended by including also another major database as Scopus, and adding to the query other keywords in order to immerse into more specific approaches.

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KNOWLEDGE STRATEGIES AS AN INTEGRATED PART OF BUSINESS STRATEGIES

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Abstract. *The purpose of this paper is to explain knowledge strategies and what is their role in designing business strategies. Knowledge strategies represent a new concept in knowledge management systems. It became more important during the COVID-19 crisis when managers were confronted with the absence of knowledge and the lack of understanding of how to design them. Knowledge strategies do not replace business strategies; they constitute an integrated part. Thus, understanding the essence of knowledge strategies and their impact on business strategies is necessary for managers and stakeholders. We will discuss the generic knowledge strategies that can be implemented in any organization due to its vision and mission. These knowledge strategies can be conceived from the known-unknown matrix. We will discuss the following knowledge strategies: knowledge exploitation, knowledge exploration, knowledge acquisition, and knowledge sharing.*

Keywords: *knowledge dynamics, knowledge management, knowledge strategy, knowledge exploitation, knowledge exploration, knowledge acquisition, knowledge sharing*

Introduction

The concept of “knowledge strategies” is relatively new in the literature dedicated to knowledge management systems (Bratianu, 2022; Grant, 1997; Nonaka & Zhu, 2012; Spender, 2014). It integrates strategic thinking (Bratianu & Lefter, 2011) with knowledge management (Nonaka & Takeuchi, 1995, 2019). Knowledge strategies do not substitute business strategies but they are an integrated part of them. In the knowledge economy, knowledge strategies are at the core of business strategies that aim to reduce uncertainties (Spender, 2014) and increase the organizational knowledge entropy (Bratianu, 2019).

Strategic thinking is crossing the borders of an organization and looking for the opportunity space that is defined as “the company’s market potential given its environment, including such factors as the demand for its products, the cost and availability of inputs, and the legal and legislative climate” (Spender & Strong, 2014, p. 10). Strategic thinking focuses on the business’s future, but the future does not exist in operational management. Future does exist only in the mind of managers. It exists if the thinking mode is based on entropic, nonlinear, probabilistic, intelligent and creative thinking models. Entropic thinking is the most complex perception of time and of its direction from the past toward the present, and from the present toward the future. It allows changes to happen. Nonlinear thinking is opposing linear thinking that almost invaded our life and way of seeing entities and events. Nonlinear thinking is necessary

because knowledge and strategies are nonlinear entities and cannot be understood and measured in a linear framework. Probabilistic thinking is the answer to decision-making under the pressure of uncertainty. The future is unknown, and its major characteristic is the absence of knowledge. "Both uncertainty and absence of knowledge increase with the distance from the present time, making *strategic work* (Spender, 2014) more difficult. Logical thinking designed for a state of certainty cannot provide solutions for such a future. It must be integrated with imagination and creativity to yield better support for *strategizing*" (Bratianu, 2022, p. 1).

This is a conceptual paper. The aim of this paper is to explore the meaning of the knowledge strategy concept and to search for some generic knowledge strategies, strategies that can be applied to any organization. Also, we will argue that knowledge strategies constitute an integrated part of business strategies. Thus, the research question we try to answer is the following:

RQ: What are the main generic knowledge strategies and how are they perceived with respect to business strategies?

The structure of the paper is as follows: after this short introduction, we will present a critical literature review. It follows the methodology we used and the discussions. Finally, we present briefly some conclusions and the list of references.

Literature review

The classical way of explaining the concept of strategy is to consider the future as an extension of the present and strategic planning as an extension of the operational planning following a deterministic approach. "Here, strategy is a rational process of deliberate calculation and analysis, designed to maximize long-term advantage. If the effort is taken to gather the information and apply the appropriate techniques, both the outside world and the organization itself can be made predictable and plastic, shaped according to the careful plans of top management." (Whittington, 2001, p. 3). However, the environment is not static and does not advance in time according to a well-established formula. It is changing in an unpredictable way and very fast. Today managers discuss the volatile, unexpected, complex, and ambiguous (VUCA) world that induces many changes in organizations that should adapt continuously. The COVID-19 crisis demonstrated the difficulty in anticipating events (Bratianu & Bejinaru, 2021; Taleb, 2007; Thompson & Strickland III, 2001). The most important issue is uncertainty which is perceived differently by different people, in concordance with their education and culture. "Whereas in 'the West' uncertainty is usually considered a source of grief to be contained, in Confucianism uncertainty is a desirable quality. The most precious thing in life is its uncertainty, said Yoshida Kenko. In China, traditional ink drawings are valued for their fuzziness; in Japan, people love the asymmetrical features of traditional pottery" (Nonaka & Zhu, 2012, p. 34).

Whittington (2001) classifies all business strategies into four clusters on a bi-dimensional framework defined by processes and outcomes. For simplification, we present these clusters within a matrix shown in Figure 1.

		Outcomes	
Processes		Profit maximization	Plural outcomes
	Deliberate	Classical	Systemic
	Emergent	Evolutionary	Processual

Figure 1 – The matrix of business strategies
(Adapted after Whittington, 2001)

Classical strategies are based on deterministic thinking and the simple idea that the future is just an extension of the present time. The aim of those strategies is to maximize the company’s profit and to increase the shareholders’ return on investment. We get systemic strategies when we extend the deliberate strategy to embrace several outcomes. They are much more complex, yet based on the time metaphor of moving observer like in the previous case. *Evolutionary strategies* are designed based on the idea that time comes over us and we must respond as quickly as possible. They have only one outcome – profit maximization. Their evolution is determined by the changes produced in the external environment. *Processual strategies* are emergent but they are not restricted to profit maximization. They aim at creating sustainability within the external environment and with the community where the business is performed.

Porter (1985) developed the competitive advantage theory, focusing on analyzing the external market. From his perspective, there are some business strategies that can be considered by any organization. They are called generic strategies. Porter (1985) defined two clusters of strategies for the wide industry perspective: overall cost leadership and differentiation strategies. *Cost leadership* strategies imply mass production and measures to cut costs such that the company can achieve the lowest possible production cost for one product or category of products. That offers an immense competitive advantage. *Differentiation strategies* focus on the psychological needs of customers and on unique attributes to be identified for each product and service. That uniqueness is associated with some premium costs contributing significantly to the company’s profit.

For Nonaka and Zhu (2012), strategies should be designed pragmatically, for real and specific situations to create value for the community. “Strategy is the art of accomplishing what we want to achieve. It is about situated judgment and collective justification, skillful persuasion and timely maneuver, decisive decision making and muddling-through, amid complexity, ambiguity and uncertainty” (Nonaka & Zhu, 2012, p. 79). The authors apply the wuli-shili-renli (WSR) logic from Confucian wisdom to design strategies. *Wuli* refers to the material-technical infrastructure while *still* reflecting the cognitive-mental framework. *Renli* represents the social-relational structure. Thus, “Pragmatic strategies based on WSR generate value efficiently, creatively and legitimately by getting fundamentals right, envisioning a valued future and realizing common goodness” (Nonaka & Zhu, 2012, p. 165).

Mintzberg (2000) explains that any realized strategy is composed of a deliberate component designed from the very beginning based on the available knowledge at that

moment, and an emergent component that is developing in time due to the changes produced in the external environment. The author remarks on the different schools of thought concerning business strategies, and schools that used different paradigms in designing them. Thus, Mintzber (2000) and Mintzberg, Ahlstrand, and Lampel (1998) consider the following strategy schools: the design school, the planning school, the positioning school, the entrepreneurial school, the cognitive school, the learning school, the power school, the cultural school, the environmental school, and the configuration school.

Knowledge strategies have the same general characteristics based on the same thinking models and business outcomes. However, they differ from business strategies because they are created based on the known-unknown matrix (Bratianu, 2022; Dalkir, 2005). We will discuss this basic matrix in the next sections.

Methodology

This is a conceptual paper. The methodology is based on a critical literature review, extraction of the most interesting ideas and build on them. We will analyze the known-unknown matrix and starting from it we will define the generic knowledge strategies to reduce uncertainty and the absence of knowledge. We will analyze the potential of these knowledge strategies and their limitations.

We will use induction and deduction to define the knowledge strategies starting from the known-unknown matrix, and abduction in evaluating the potential and limitations of each strategy.

Discussions

It became famous the answer formulated by Donald Rumsfeld, the former Secretary of Defense of the USA in a press conference in 2002, concerning news about the war in Iraq: "Reports that say that something hasn't happened are always interesting to me, because as we know, there are *known knowns*; there are things we know. We also know there are *known unknowns*; that is to say, we know there are things we do not know. But there are also *unknown unknowns* – the ones we don't know we don't know" (Rumsfeld, 2002, Press conference, italics added). These expressions "known unknowns" and "unknowns unknowns" generated many discussions and debates from journalists, writers, language experts, philosophers and people involved in economics, business, and politics. However, these expressions reflect the known-unknown paradox obtained when combining the level of awareness of what we know with the degree of knowns in the external world. The paradox can be understood if we enlarge the combinations by adding the concept of unknown-knowns and creating the known-unknown matrix (Dalkir, 2005). The known-unknowns matrix is constructed considering what an individual thinks he knows against what is known in his social context. The matrix is presented in Figure 2.

On the upper line, the concepts describe the situation of a given quantity of explicit knowledge and how an individual is aware of how much he knows. By difference, he will appreciate how much he does not know. These situations are very familiar because both are a result of our education. The bottom line of the matrix is more difficult to be understood because it combines explicit and tacit knowledge. The *unknown-knowns*

constitute the state in which an individual knows he has some experience in solving a certain problem (i.e. tacit knowledge), but he does not know how much this experience is. The most difficult situation is when thinking about the future and how unpredictable events can be. There is a clear absence of knowledge and the whole state of knowing can be described by the concept of *unknown-unknowns*.

	Known ▼	Unknown
Known	Known - Knowns	Known - Unknowns
↕	Unknown - Knowns	Unknown - Unknowns
Unknown		

Figure 2 – The known – unknown matrix
(Adapted from Dalkir, 2005)

Analyzing each situation through the knowledge absence and the possibility of reducing it through a smart strategy, we propose the following generic knowledge strategies: knowledge exploitation, knowledge acquisition, knowledge sharing, and knowledge exploration. They are presented in Figure 3.

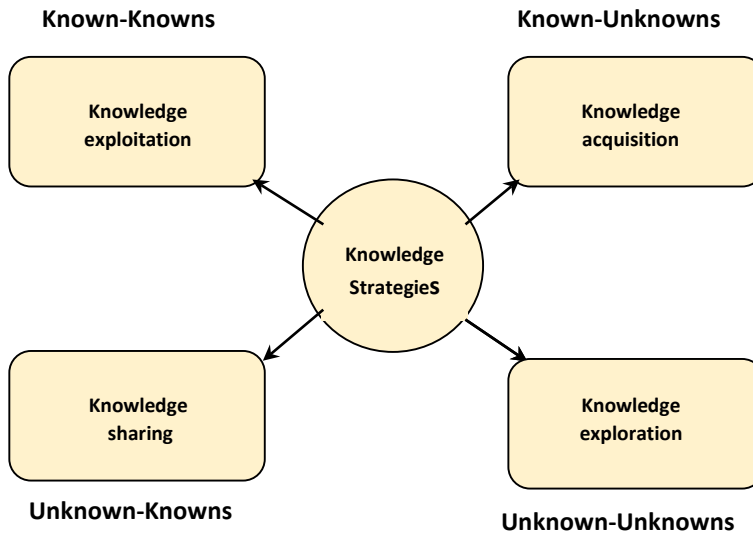


Figure 3 – The structure of knowledge strategies
(Author’s own research)

Knowledge exploitation is the simplest strategy and it should be designed such that managers think of the best methods to use intangible resources efficiently. Many authors discuss intellectual capital that contains all those intangible resources. Knowledge exploitation will refer to Intellectual capital exploitation (Andriessen, 2004; Bratianu,

2007, 2014; Edvinsson, 2002; Sveiby, 2001). The main barrier to understanding knowledge as a strategic resource and deploying it efficiently is that knowledge is a nonlinear entity, and many managers consider it linear. Nonlinearity requires different methods of exploitation and efficient use (Bratianu & Vasilache, 2009). Also, when we think of knowledge from a managerial perspective and decision-making events, we should consider it a spectrum of rational, emotional, and spiritual knowledge (Bratianu, Prelipcean & Bejinaru, 2020; Bratianu et al., 2020; Damasio, 2003, 2012).

Knowledge exploitation strategy works very well if and only if there is a nonlinear integrator able to integrate individual knowledge into a whole we call organizational knowledge (Bolisani & Oltramari, 2012; Davenport & Prusak, 2000; Kodama, 2011). These integrators can be managers, organizational culture, and leaders because they can deal with all three fields of knowledge (i.e., rational, emotional, and spiritual). The knowledge exploitation strategy creates a common understanding of available knowledge through codification. "Knowledge codification implies transforming cognitive, emotional, and spiritual knowledge into messages that can be understood by all employees of a certain organization. It occurs inside the organization, but its consequences should be observed in internal and external environments" (Bolisani & Bratianu, 2018, p. 153).

Knowledge exploitation strategy requires managers a good understanding of the knowledge distribution throughout the company, and its impact on knowledge entropy (Georgescu-Roengen, 1999; North & Kumpta, 2018). Managers can use knowledge mapping to know who knows what in the organization. "A knowledge map portrays the sources, flows, constraints, and sinks (losses or stopping points) of knowledge within an organization" (Liebowitz, 2005, p. 77).

Knowledge acquisition strategy constitutes the answer to the situation of *known unknowns*. Knowing what they know, and evaluating the knowledge gap between what is known and what it should be known, people decide to buy knowledge through different procedures such that they can bridge the gap. Knowledge acquisition is an alternative to knowledge creation because it is fast and sometimes easier to implement in the organization (Chaston & Mangles, 2000; Hoe & McShane, 2010). When SMEs do not have enough time or financial resources to create their own knowledge in concordance with their needs, knowledge acquisition is used mostly by SMEs.

Knowledge acquisition refers only to explicit knowledge because emotional and spiritual knowledge cannot be purchased. They can be generated only inside the organization due to the nonlinear integrators (Nussbaum, 2001; Simon, 1987). Knowledge acquisition can be done by purchasing books, journals, experts' reports, software programs, databases, patents, and other documents needed to increase the knowledge level in the organization. Also, knowledge acquisition can be done by purchasing services from consulting companies, training programs from specialized companies, and hiring experts and talented people with a high level of explicit and tacit knowledge (Liu, 2020; Massingham, 2020; Milton, 2007).

Knowledge acquisition can be realized in organizations by extracting knowledge from experts, especially those who leave the organization due to retirement. They leave the organization with a high level of expertise concentrated in their explicit and tacit knowledge. That leads to a knowledge loss that may have an important impact on the

business's evolution. Extracting knowledge from their expertise is called in literature *knowledge capturing*, a procedure used also for creating expert systems (Clark et al., 2008; Eucker, 2007).

Knowledge loss can be critical when a significant percentage of people retire or leave the company almost simultaneously. DeLong (2004) describes a knowledge critical situation at Boeing when there was such a situation and there was no strategy for knowledge retention. "After Boeing offered early retirement to 9,000 senior employees during a business downturn, an unexpected rush of new commercial airplane orders left the company critically short of skilled production workers. The knowledge loss from veteran employees combined with the inexperience of their replacements threw the firm's 737 and 747 assembly lines into chaos" (DeLong, 2004, p. 19). A similar situation happened at NASA due to bad top management decisions for early retirement plans (Mahler & Casamayou, 2009).

Knowledge sharing is one the most used strategies to stimulate the conversion of tacit knowledge into explicit knowledge through externalization (Nonaka & Takeuchi, 1995), and to share that knowledge with other employees. Knowledge sharing results from a personal willingness to offer the other employees something out of our experience and expertise (Cyr & Choo, 2010; Jashapara, 2011; Morone & Taylor, 2004; Nesheim & Gressgard, 2014). Although it looks very simple and attractive, knowledge sharing is a process that depends on the psychological climate of the organizational context. If a company stresses individual competition, people will be reluctant to share their knowledge, preferring the knowledge-hiding attitude (Bai, 2020; Ruparel & Choubisa, 2020). If an organizational culture is based on collaboration, like in Japanese companies, then the knowledge-sharing strategy is developed up to its upper limits (Nonaka & Takeuchi, 1995, 2019). Regardless of the capacity of organizational culture to stimulate knowledge sharing there is an inertial effect mixed up with some other psychological beliefs that create the stickiness phenomenon (Szulanski, 2000; Szulanski & Jensen, 2004).

Intergenerational learning is a useful method of performing knowledge sharing (Bratianu & Leon, 2015; Bratianu et al., 2011). This method is indicated especially in those organizations where employees can be structured into age layers. One good example is a university, where there are such age layers because of the academic promotion pyramid: university assistants, lecturers, associate professors, and full professors. Knowledge sharing between age generations is a very efficient method of knowledge transfer and improving knowledge distribution throughout the organization. The knowledge-sharing strategy does not lead to knowledge creation, but to a change in knowledge distribution such that an increase in organizational knowledge entropy (Bratianu, 2019).

Knowledge exploration strategy is designed to answer the unknown-unknowns situation. It is a strategy for stimulating knowledge creation, reducing the absence of knowledge during economic crises, and for the desirable future when defining strategic objectives. "The essence of exploration is experimentation with new alternatives. Its returns are uncertain, distant, and often negative" (March, 1991, p. 85). Knowledge creation should be considered at the individual, team, and organizational levels. Nonaka and Takeuchi (1995) developed the SECI – Socialization, Externalization, Combination, Internalization – model by considering the conversion of tacit knowledge into explicit

knowledge, of explicit knowledge into tacit knowledge, and sharing knowledge in both forms.

Knowledge exploration leads to innovation, which is a key process sustaining a competitive advantage for firms and countries (Khazanachi et al., 2007; Newell et al., 2009). As Florida (2007) demonstrated, knowledge creation impacts not only organizations but also society and its social structure: "I call the age we are entering the creative age because the key factor propelling us forward is the rise of creativity as the prime mover of our economy. Not just technology or information, but human creativity" (p. 26).

Conclusions

This paper aims to identify the most adequate knowledge strategies to answer the specific situations described by the known-unknown matrix. Based on a critical literature review and a conceptual analysis, we could define four generic knowledge strategies, i.e. strategies that knowledge managers can implement in any organization. For the situation of *known-knowns*, the best strategy is *knowledge exploitation* that can make use efficiently of all organizational knowledge and organizational intellectual capital. The success of this strategy consists in knowing the importance of different fields of knowledge and their distribution within the whole organization – who knows what. On the same logic, if managers know what they know, they could know what they do not know regarding some objectives. To answer this known unknown situation, managers should develop *knowledge acquisition* strategies.

Is more difficult to answer the situation of unknown-knowns because we have to consider both explicit and tacit knowledge here. Access to tacit knowledge is much more difficult due to its unconscious nature and manifestation. The best strategy for this situation is *knowledge sharing*. However, knowledge sharing results from a personal decision based on people's willingness to share their experience and expertise without a clear economic gain. Knowledge sharing depends on the organizational culture and the pressure of competition in a given company. When competition is fierce, people tend to hide their knowledge to not lose their professional power.

The most complex situation is for *unknown-unknowns* when managers have almost no knowledge about the objective they want to create in the future. That is a situation associated to economic crises when the absence of knowledge is high. The best strategy for such kind of situations is *knowledge exploration*. The knowledge exploration strategy stimulates knowledge creation and innovation. Knowledge creation reduces the absence of knowledge and of uncertainty. Innovation in its newer form of open innovation contributes to new product development, thus achieving a competitive advantage.

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ORGANISATIONAL CULTURE AS KNOWLEDGE INTEGRATOR IN ROMANIAN KIBS

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Abstract. *The present study addresses theoretical and practical aspects of Romanian KIBS and the way organizational culture acts as a knowledge integrator in such companies. The relevance of the research topic is supported by the KIBS' widely agreed-upon contribution to innovation and sustainable development. This study aims to identify how three different Romanian KIBS acquire, document, share, store, and apply knowledge based on their organizational culture specificities. The research applied a qualitative method by analyzing data acquired following 12 interviews with members of three selected Romanian SMEs categorized as KIBS. As a result of the research, the authors found that KIBS favour organizational cultures (clan and adhocracy models) which facilitate collaboration, engagement, and knowledge integration. This exploratory research adds to the topic of knowledge management in KIBS and its relationship with the organizational culture.*

Keywords: *knowledge-intensive business services (KIBS); knowledge management (KM); organizational culture (OC); knowledge integration.*

Introduction

In the Knowledge Economy (KE), knowledge is one of the currencies helping organizations outrun their competitors and take the lead in globally interconnected markets. Furthermore, organizations activating in the Knowledge Intensive Business Services (KIBS) sector often play a strategic role in innovation and sustainable development due to accumulating knowledge and technical expertise, which is then shared with or transferred to their clients.

Introduced by Miles et al. nearly two decades ago (1995), the KIBS notion has a powerful connection with knowledge. Miles et al. (1995) highlight knowledge's role in KIBS in their report. According to them, professional knowledge is instrumental for enterprises in both their internal and external activities targeted at clients. Despite a lack of consensus in the KIBS literature, it is generally agreed that knowledge stays at the heart of KIBS, enabling them to contribute to the innovativeness and development of different market areas (Amancio et al., 2021; Grandinetti, 2018; Martinez-Fernandez & Miles, 2006; Zieba & Kończyński, 2019). As emphasized by Miles et al. (1995), technical and professional KIBS (t-KIBS and p-KIBS) are not only users but also producers and carriers of new technology, often following aggressive innovation strategies" (1995, p. III).

The present paper aims to develop knowledge of the KIBS segment by implementing a qualitative study focused on three Romanian small-medium enterprises (SMEs) activating in this field. The key findings are relevant for knowledge management (KM) academic and business environments as they contribute to a better understanding of organizational culture (OC) 's impact on knowledge acquiring, sharing, disseminating, storing, applying, protecting, etc., within KIBS.

According to Isac, Dobrin, Raphaelalani, and Sonko (2021), numerous studies have demonstrated the critical role that OC plays in shaping organizations. Additionally, in the specific context of the present study, it is also important to note that different types of organizations are defined by different levels of knowledge entropy. According to Bratianu (2019), the concept of knowledge entropy presents the potential allocation of knowledge in an organization at a given moment: "although we consider organizational knowledge as being like a field, in reality, knowledge resides with individual people which leads to a certain distribution of individual knowledge, at a specific moment of time" (Bratianu, 2019, p.363).

The structure of this paper is as follows: after this introductory section, a literature review covering the key concepts of OC, knowledge management, and KIBS is presented. Next, the study methodology is explained in the third section, followed by a discussion of the main findings and implications. Finally, the study ends with the presentation of conclusions.

Literature review

Organisational culture

An organization's culture affects how a collectivity behaves. Therefore, it has to be considered as a contingency factor in any program for developing organizations and human resources policies.

From a sociological perspective, organizational culture is a characteristic that enables tight relationships inside organizations, relying on "taken-for-granted values, underlying assumptions, expectations, collective memories, and definitions (Cameron & Quinn, 2011, p.19). As the authors assert in a widely utilized model that builds on a framework proposed by Schein (1990), organizational culture includes elements ranging from unobservable to observable, i.e., implicit assumptions (about how things are done), conscious contracts and norms (rules and procedures for human interaction), artifacts (such as office style, clothing, goals, logos, etc.) and explicit behaviors of that

culture's members. Cameron and Quinn (2011) stress organizational culture and climate differences. While the latter is temporary in nature and comprises attitudes, feelings, and perceptions, the first is durable and change-resistant.

Starting from the competing values framework developed by Quinn and Rohrbaugh (1983), which posits a model for assessing organizational effectiveness based on the analysis of three value dimensions (control vs. flexibility, internal vs. external, and means vs. ends), Cameron and Quinn (2011) identified four types of organizational culture: clan (collaborate), adhocracy (create), market (compete) and hierarchy (control). The clan culture enhances cohesion and hence participation and involvement; the adhocracy culture provides opportunities for the employees' development and well-being; the market culture stresses competition while the hierarchical culture is bureaucratic, and both are conducive to dissatisfaction at work (Bianchi, Tontini & Gomes, 2021). Following empirical research in t-KIBS, Bianchi et al. (2021) concluded that market culture positively affects the individual propensity to innovate. At the same time, the employees' perception of organizational culture impacts their subjective well-being.

Schein's model explains cultural processes that support organizational innovation (Hogan & Coote, 2014). Organizational culture has a deep impact on a variety of organizational processes, performance, the employees. Thus managers and leaders are recommended to develop a strong organizational culture to improve business success (Shahzad, Luqman, Khan, & Shabbir, 2012).

KIBS and organizational culture

KIBS can play various roles in the innovation process in collaboration with their clients, with whom they engage in interactive learning processes (Santos-Vijande, Gonzalez-Mieres, & Lopez-Sanchez, 2013). They can be sources, facilitators or transmitters of innovation. Within KIBS, organizational culture plays a positive role in promoting the process of knowledge sharing in two ways: directly, through offering the people the right instruments to learn from each other, and indirectly, through a series of mediators, such as formal knowledge governance tools, autonomy, job satisfaction, knowledge-sharing opportunity, organizational commitment, sense of well-being, subjective norms, and trust (Sawan, 2021). Moreover, a series of factors impact how the knowledge-sharing process is performed within a company, organizational culture being one of the most significant elements (Alexandru et al., 2020; Farooq, 2020; Vățămănescu et al., 2015, 2020, 2021).

Cho, Kim, Park, and Cho (2013) have investigated the linkages between organizational culture and KIBS service quality by employing the lenses of the organizational learning values – the commitment to learning, open-mindedness, and shared vision – asserted by Sinkula, Baker, and Noordewier (1997) and the SERVICEQUAL assessment model proposed by Parasuraman, Zeithaml, and Berry (1988). SERVICEQUAL puts forward a framework for the evaluation of service quality on five dimensions: tangibles (appearance of facilities, equipment, personnel, and communication materials), reliability (dependability and accuracy of services), responsiveness (willingness to provide prompt services to customers), assurance (knowledge and courtesy of employees) and empathy (individualized attention to customers) (Parasuraman et al., 1988). Cho et al. (2013) concluded that various types of organizational culture affected

differently the learning orientation. At the same time, the learning orientation values influenced organizational learning behaviors, positively impacting service quality in KIBS.

Studies that focused on the role of organizational culture in KIBS showed its positive influence on firm performance and innovativeness. Bomm, De Montreuil Carmona and Gomes (2022) found empirically that leadership styles also impact organizational culture and learning, positively affecting service innovation and performance in t-KIBS. Santos-Vijande, López-Sánchez, and González-Mieres (2012) established that a firm's organizational learning and innovative culture affect innovation and competitiveness. The authors assert that organizational learning is a predictor of innovativeness as a form of organizational culture and, simultaneously, an indicator of organizational values that promote openness to new ideas and change. In a related work concerning KIBS, Santos-Vijande et al. (2013) tested and confirmed the mediating effect of customers' appraisal and front-line employees' participation in new service co-creation in relation to the organisational innovative culture.

Knowledge management and organisational culture

Leaders of successful organizations are consistently searching for better ways to improve performance and results. Knowledge Management (KM) is a broad, multi-dimensional concept and covers most aspects of the enterprise's activities. Enterprises must create and sustain adequate intellectual capital resources to be competitive and successful. They must set priorities and integrate the goals of managing intellectual capital and effective knowledge processes. The knowledge embedded in the corporate culture is part of an organization's structural capital (Edvinsson & Sullivan, 1996).

Knowledge management is promoted as an important and necessary factor for organizational survival and maintenance of competitive strength. To remain at the forefront, organizations need a good capacity to retain, develop, organize, and utilize their employees' capabilities. Knowledge and the management of knowledge appear to be regarded as increasingly important features for organizational survival (Mårtensson, 2000). Brătianu, Vatamanescu, Anagnoste, and Gandolfo (2021) highlight the importance of decision-making within organizations and in managerial work from a KM perspective.

Knowledge has come to be considered a valuable strategic resource that can provide competitive advantages. Individual knowledge is integrated at the organizational level through leadership, management, technology, and organizational culture (Brătianu, 2022). Knowledge is a fundamental resource for developing dynamic capabilities such as organizational learning (Brătianu, 2022), and is paramount in organizational decision-making (Brătianu & Bejinaru, 2019). In the KM research tradition, knowledge is mainly analyzed from Newtonian philosophy ground bases, defined by linearity and tangibility. Nevertheless, a paradigm change has been introduced when knowledge began to be understood through the energy field metaphor, characterized by nonlinearity and intangibility (Brătianu & Vasilache, 2009).

Methodology

This research was conducted between May and July 2022 with regard to three Romanian KIBS. The concerned companies are active in IT development, digital marketing and PR, and advertising, respectively.

The interview method has been chosen in accordance with the goals of the research. The twelve interviews with top managers from three KIBS companies took place online via Google Meet and Zoom, lasted up to one hour each, and were recorded with the consent of the participants, for research purposes. The discussions between the researchers and the interviewees were based on a semi-structured interview type.

According to Saunders and Townsend (2016), the common practice indicates a number between 6 and 12 participants as appropriate to achieve saturation in qualitative research with relatively homogenous samples. A thematic qualitative data analysis ensued (Oxford Handbook, 2014).

Results and discussions

KIBS Company A

KIBS company A is an SME activating in the Romanian advertising industry for 16 years. It had a little over 30 employees at the end of 2021.

According to the respondents, knowledge stays at the core of their business activity, ensuring that the creative process reaches the strategic purposes: "creation without knowledge is art, not advertising". Through OC lenses, this affirmation can easily be understood as an organizational metaphor specific to the field of activity and the enterprise. Moreover, to highlight the self-assumed organizational mission of knowledge integration, the respondents revealed that KIBS A is considered an advertising specialists' incubator in their activity segment. This points to the higher mission assumed by the company, which we notice is closely related to knowledge sharing and development in the sector.

When asked whether they consider that knowledge sharing is encouraged at their company's level, all respondents confirmed. At the same time, some of them highlighted their opinions by adding terms like "100%" or "totally" to their responses. Furthermore, in Company A, a "*stellar configuration of knowledge sharing, from everyone to everyone*", emerged early in the interviews and transpired towards the end as a fundamental value and an organizational enabler of knowledge integration. This essential organizational norm is materialized through specific actions, such as frequent creative brainstorming sessions, and instant communication tools, such as WhatsApp, on top of face-to-face and e-mail conversations. According to one of the interviewees, the need to create viral campaigns in the disruptive advertising industry transforms even "memes" into potential strategic knowledge resources. According to the Oxford Languages online Dictionary, a meme is "an image, video, piece of text, etc., typically humorous in nature, that is copied and spread rapidly by internet users, often with slight variations" (Oxford Languages).

Acting in accordance with the declared values, KIBS A manages to access a wide range of knowledge fragments, from employees' technical know-how and specific market information and consumption statistics to cultural references and personal hobbies insights. According to an interviewee, "since our industry is so eclectic, inspiration can come from anywhere: Netflix, art exhibitions, anything". Next, a thorough and qualitative knowledge creation process unfolds, focused on developing relevant knowledge from existing fragments. According to another respondent, "it is not enough to gather data, rather comprehend, analyze and use data you obtain through research".

Second, at the client-related level, the respondents indicated that they have a specific knowledge-sharing ritual for the clients, where they prepare and present the theoretical backgrounds of the decisions taken in developing the services. According to an interviewee, "Mainly, clients pay us to solve their business problem. What we do at the beginning of each presentation is to include a theory section that we include in the fees in order to align our knowledge".

During the interview of one respondent, a myth about the clients' expectations relative to industry knowledge was presented. This can be an idea that the advertising agencies have drawn based on their professional experience, which has been tested and confirmed until it became a popular belief or a myth within the industry, as mentioned by our interviewee. The mythological meaning of the tale was supported by a mix of verbal and non-verbal messages: "there is an obsession in the industry for an agency to provide perfect information, in no time and with little to no knowledge about the industry", as explained.

Based on the most relevant components identified as knowledge integrators, KIBS A can be considered as a company with a solid knowledge-sharing culture, strongly manifested within the organization but also present in the clients' relationship layer. For KIBS A, the research findings reveal that knowledge is a critical asset, and a significant part of the company's OC revolves around integrating knowledge within the company. It appears that the company endorses a clan cultural model, by stimulating collaboration and staff involvement.

KIBS Company B

Firm B was established in 2012. The investigated company is a small KIBS organization with 35 employees, a flat hierarchy, and flexible work processes, which avoids unnecessary structures and formal procedures. It provides consultancy primarily in the area of digital marketing and PR. The firm's website states as essential organizational values: the opportunities for continuous learning, the friendly organizational culture, and its openness to flexible working arrangements. According to the four associates, the company encourages a genial organizational culture. New employees benefit from hands-on assistance from a 'task force' comprising members across the organization. At the same time, such an environment allows for quickly transferring valuable information. In addition, such exchanges encourage informal knowledge sharing. These processes facilitate new staff's fast integration and equip them with the necessary knowledge to quickly become productive.

Knowledge management in the company is the primary responsibility of the heads of departments since various departments manage specific types of knowledge. At the

organizational level, the associates nurture the overall KM activities. Even though the associates and the heads of departments are in charge of or oversee a variety of knowledge processes like knowledge identification, acquisition, documentation, storage, sharing, and application, whenever knowledge gaps or opportunities to fill them are detected, the employees can also contribute new information, ideas, and proposals. Creative initiatives are welcome. They are tested and implemented if successful and seen as learning opportunities for the entire organization, too. As stated by one of the co-founders, "We do not normally impose specific ways of doing things, as long as the results are as expected. Individuals are encouraged to take responsibility for their work".

The acquired knowledge is then shared openly among the staff members. The other co-founder stressed that KM-related difficulties are much less related to knowledge identification but more to developing soft skills and person-to-person communication. The organizational culture promotes collaboration to stimulate the employees to share relevant knowledge. The staff members help each other and constantly inquire how they could improve things. Consequently, people share even more profound knowledge and insights to benefit the common organizational objectives, despite the usual reservations in their sector in such cases.

When applying knowledge, criticizing other people's ideas during discussions is discouraged, and open-mindedness is encouraged. There are instances when some employees cannot absorb new knowledge or break up with routines quickly. Even in those cases, the leadership avoids exerting too much pressure as long as the targets are reached.

As a result of the acquired data, company B promotes an organizational culture that is open, flexible, and inclusive. At the same time, the organizational culture allows informal knowledge sharing and integration. Furthermore, this supportive cultural framework stimulates staff engagement in knowledge creation and application. It could be concluded that the company endorses practices valued in the clan model but go further towards an adhocracy model, which has staff development and well-being at the core. The associates can thus see the advantages of KM practices "reflected in the staff and organizational growth, as well as in client retention".

KIBS Company C

KIBS Company C was founded in 2015 by a Romanian entrepreneur and has only one associate, the founder being the firm's owner. It is presented as a Software Engineering company that provides IT services, covering the entire software development circle, from defining the idea, to implementation and maintenance, and support. The company is industry agnostic and has experience and expertise in various fields, such as healthcare, retail, fintech, food tech, pharma, etc. The organization employs the latest technologies to deliver high-quality services to its most international partners. The company has a flat organizational structure, with departments working with each other and the power of the team being the scaling instrument. With a 40% growth year to year, the firm is considered one of Romania's fastest-growing IT companies.

KIBS C develops custom solutions and provides professional coverage of the full application lifecycle (planning, design, development, testing, deployment, and

maintenance). The company is at the forefront of software innovation, implementing projects with a versatile technology stack in a continuous expansion, within the latest trends, most suitable for the client's systems and business models. Innovative custom solutions include: robo-advisory fintech applications, mobile healthcare applications, business intelligence applications and data warehouse, real-time API (application programming interface) for self-care banking channels, mobile applications that integrate state of the art image and video processing algorithms.

The organizational culture is one of the main differentiators of the present company, along with its top-quality services and expertise in software development. The vision is to be a community shaping global Software Engineering by being a partner of choice for its customers and its people. As stated on the website, the core of the culture lies in its values: professional, partner of choice, authentic, and team. The company encourages an intrapreneurial component, where people can design their roles and participate in different projects and initiatives to promote lifelong learning and development. The company supports a nomad way of working, encouraging people to work from anywhere by offering flexibility, trust, and accountability.

Knowledge sharing was definitely the area all four interviewees were the most excited about. Even though the KIBS C doesn't possess a clear knowledge-sharing strategy, many instruments, tools, and processes are in place to ensure the knowledge dynamics transformations. This can be noticed in the benefits that one interviewee mentioned when talking about the importance of knowledge sharing "We use several methods as it is very crucial: an important element is the monthly meeting with all people where we bring relevant input for the respective month about projects, business, we share information from all knowledge categories; we also have various specific methods, such as <<meet our projects>> in which our colleagues can present specific details about the implementation of a certain project. Also, we have different communities that facilitate access to information at the team level". The knowledge-sharing process takes place both within the same teams, "very naturally", and across teams, when the company still tries to find the right instruments to facilitate it, as "it is a very qualitative process, not quantitative".

It has become clear after all four interviews that the most important and prominent challenge of the organization KIBS C is the accelerated growth and the process of scaling. "We register 40% growth year to year". The main focus of top management is to find ways to keep the people-oriented culture in place without losing its essence with more and more people coming into the organization. Organizational culture is considered to be "one of our most important competitive advantages" hence much time is invested in creating a new context for knowledge sharing as "what worked for an organization seven years ago might not work for now" and "Growing from 100 to 200 people in a year which came with transformational effects on how we are doing things" as stated by the respondents.

Accelerated growth and scaling up organization culture without diluting it are important challenges for the KIBS C. Still, they are perceived as important sources of innovation and opportunities. From a KM perspective, rational knowledge is transformed into emotional and spiritual knowledge, as people's mindset is oriented towards growth and positive impact rather than concern or uncertainty regarding how the organization will look in the following years. A clear goal is defined, namely reaching 1000 people by

2025. Using non-linear thinking to promote innovation and positive change can further the organization, providing that KIBS C will have more structure and a clear strategy for KM practices. This company develops an organizational culture that appears to put staff development and well-being at the center, embracing the adhocracy model.

Conclusions

For KIBS A, the research findings reveal that knowledge is a critical asset, and a significant part of the company's OC revolves around integrating knowledge within the company. Following the same approach, KIBS C confirmed the importance of KM practices scaling up organizational culture and facing accelerated growth for an extended period of time. Using non-linear thinking and promoting innovation within the organization has proved to be important factors that help the KIBS C to evolve over the years and preserve its organizational culture elements. Overall, the organizational culture in KIBS company B nurtures open communication and collaboration, which are conducive to knowledge integration.

Per Cameron and Quinn's (2011) framework, it can be concluded that the investigated KIBS favors two types of organizational culture: the clan model, which stimulates cohesion, collaboration, and engagement, as well as the adhocracy model, which provides opportunities for the employees' development and well-being.

Implications

Organisational culture proves to be a significant aspect in supporting the definition of KM strategy in organizations and a helpful instrument in implementing the strategy. A healthy organizational culture enables knowledge acquisition and sharing, promoting innovation, encouraging new working methods, and challenging the status quo. Hence, top managers should promote organizational culture models that support staff cohesion, engagement, development, and well-being. In addition, the analysis reveals that organizational culture creates the context for knowledge transformation, offering people the opportunity to employ rational, spiritual, and emotional knowledge and consequently nurture performance and growth.

Limitations

The research findings reflect the practices in the Romanian KIBS sector and cannot be generalized, considering the limited number of participating companies and managers. Further research could attempt to involve more companies and interviewees.

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PROGRESS, TRENDS, AND UPDATES OF KNOWLEDGE MANAGEMENT RESEARCH IN THE CONTEXT OF DIGITAL TRANSFORMATIONS: A BIBLIOMETRIC ANALYSIS

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Abstract. *The intensified global Knowledge Economy is frequently reshaped under continuous disruptive technological advancements. Robotic process automation, artificial intelligence, machine learning, the internet of things, and big data analytics are only some of the hot topics on the agendas of organizational decision-makers in strategic development. The quest for knowledge management can no longer be separated from continuous tech transformations and innovations: knowledge mining, application, dissemination, and protection activities have grown connected to digital technologies. The present study offers a detailed insight into the knowledge management literature focused on digital transformations. As such, the relevant timeframe for the analysis starts from 2006 to 2022, as indicated by our findings. Working within a sample of 159 documents, the authors enable VOSviewer software 1.6.17 and R coding language features to identify the main research trends and updates for the selected topic. The endeavors cover countries' contribution analysis, review of academic interest evolution across short to medium timeframes (overlay analysis), and identification of potential future research directions which would enrich academic knowledge of the selected research segment. The main contribution of the present bibliometric analysis research is the visual mapping of knowledge management literature in the context of digital transformation.*

Keywords: *artificial intelligence; big data; bibliometric analysis; digital transformation; knowledge management; industry 4.0; innovation; VOSviewer; R coding language.*

Introduction

Like other socio-economical revolutions, the digital transformation phenomenon “is disrupting society, generating widespread concern about its impact across a broad range of issues including jobs, wages, health, resource efficiency, and security” (WEF, 2016). According to the World Economic Forum white paper on “Digital Transformation of Industries” (2016), developed in cooperation with Accenture, digital transformation impact on employment is expected to cause anywhere between 2 million to 2 billion job losses between 2016 and 2030, contributing to the sense of accentuated uncertainty. Nevertheless, the same study findings indicated that, at the moment of the research, up

to 6 million jobs were estimated to be created globally by the same transformational phenomenon until 2025.

The post-COVID-19 pandemic environment and the Eastern Europe conflict are increasing the workforce and supply chain challenges that organizations face at the beginning of the second decade of the 21st century. According to PwC's "Digital Factory Transformation Survey" (2022), only the *Digital Champions* have successfully navigated the contemporary global market, marked by key resource shortages. *Digital Champions* are represented by those companies that successfully implemented end-to-end production technologies and factory automation. At the same time, up to 64% of the surveyed companies have only started integrating digital and technological solutions into their workflows.

Furthermore, from the recently published research "Orchestrating Workforce Ecosystems" (2022) implemented by MIT Sloan Management Review and Deloitte with the help of over 4,000 leaders and managers, we find that in the post-COVID-19 environment, the main management challenge is represented by orchestrating internal and external resources, including contingent workers, consultants, and technological solutions. In the external resources category, we can include the knowmad type of workers (Moravec, 2008; Iliescu, 2021a, 2021b), as well as artificial intelligence, or robotic process automation on the other hand, as solutions for the workforce crisis.

In this way, strategic organizational knowledge and knowledge management strengthen their interdependencies with the firms' technological capabilities and potential development. Therefore, we consider that the radiography of the knowledge management (KM) and digital transformation (DT) fields of literature would prove highly relevant in the current business context and contribute to academic research by identifying current trends and updates, relevant gaps, and future research direction. As the first step in our endeavor, in the next section of the paper, the *Literature review*, we will introduce the relevant concepts for the paper.

The authors opted to implement a bibliometric literature review with the help of VOSviewer software and R language code development (Allaire, 2012; Gandrud, 2018; Verzani, 2011) on the KM in the DT context niche of literature. According to multiple authors (Akhavan, Ale Ebrahim, Fetrati & Pezeshkan, 2016; Ponce & Lozano, 2010), the ability to mix tools, frameworks, and methods to explore publication and citation patterns has been enabled by bibliometric analysis. When dealing with voluminous amounts of data, bibliometric analysis becomes essential for comprehending and presenting the conceptual structure of specific scholarly disciplines and monitoring the progress of particular subjects. (Van Eck & Waltman, 2010, 2011, 2020, 2021; Zupic & Cater, 2015). The third section, Methodology, will provide more details about data sampling and collection and analysis principles.

Four research questions have been formulated to guide the analysis:

RQ1: What is distribution per document type in the established field of literature?

RQ2: Which are the most proliferate countries in the established field of literature?

RQ3: What are the strongest co-authorship relations in the KM and DT literature?

RQ4: Which are the most robust conceptual relationships in the KM and DT literature, and which have been the interest trends in the field over the past years?

In the fourth section *Results and discussion*, we present our analysis's main results. Finally, the *Conclusions* section will close the paper by summarizing the most important findings against the proposed research objectives.

Literature review

When analyzing KM literature, we establish the context as the Knowledge Economy (KE), understood as the unique set of circumstances emphasizing individual and organizational innovation and competitiveness. The KE's main processes are knowledge and information generation, dissemination, and application (OECD, 1996). As such, economies based on knowledge transactions face specific challenges that bring knowledge management to the attention of organizational strategists and decision-makers. According to Tomé (2020, p. 453) in the KE, "the most important task is to use knowledge assets as the driver of both innovative ways of creating and delivering new products and services as well as understanding a much more quality and value-orientated market".

The complexity and richness of KM academic literature are supported by its transversal and cross-disciplinary relevance (Davenport & Prusak, 2000; Nonaka & Takeuchi, 1995, 2019). According to Bratianu (2015), knowledge management pervades other management specializations due to its inherent purpose of enhancing organizational knowledge dynamics.

Traditionally, KM literature developed on the ground basis of understanding knowledge from a Newtonian perspective. Nevertheless, this approach had a set of downsides defined by the limits it poses to a nonlinear and intangible phenomenon, as knowledge is (Bratianu & Vasilache, 2009). The importance of knowledge management was evidenced during the COVID-19 crisis when the absence of critical knowledge led to many economic, social, educational, and cultural problems (Bratianu, 2020; Bratianu & Bejinaru, 2021). According to Zbucea and Vidu (2018), the attention in the KM research field progressively evolved from nonprofit and public organizations towards nongovernmental organizations, focusing on specific research sub-directions, summarized in Table 1.

According to Pinzaru, Zbucea, and Vitelar (2018, p. 447), "the KM theories identify four key components: knowledge, people, processes and technology". Specifically, as regards the early adoption of new technologies, this adds to organizational competitiveness. In the mature KE, KM activities such as knowledge acquisition, application, distribution, protection, etc., are connected with the technological performance of the company and organizational knowledge entropy dynamics (Bratianu, 2019; Zbucea & Vidu, 2018).

Table 1. KM literature attention areas evolution (Source: adapted from Zbucea and Vidu, 2018 and Pinzaru, Zbucea, and Vitelar 2018)

Phase	Academic focus domain	Sub-directions
I	Nonprofit and public organizations	Management and leadership style
		Organizational culture and intelligence
		Organizational development and innovation
		Technology
		Intellectual capital
		Knowledge sharing
		Stakeholder management
II	Nongovernmental organizations	Relationships between KM and technology
		Flexibility
		Stakeholders' needs
		Beneficiaries' needs

The intensified global KE is constantly reshaped under the forces of continuous disruptive technological advancements. On the one hand, basic access to global digital knowledge resources is impossible outside of the digital technologies' infrastructure. As indicated by Zbucea and Vidu (2018), this idea points to the KM literature segment focused on the logistics value of digital technologies. Also, it is important to understand the mechanisms of decision-making based on the knowledge field dynamics (Bratianu et al., 2020).

On the other hand, Ebert and Duarte (2008) focus on a specific meaning of the digital transformation concept, which they abbreviated as DX, when analyzing the effects of integrating novel, disruptive technologies within organizational practices with three essential purposes: enhancing productivity, increasing value creation, and emphasizing social welfare. In other words, DX covers the meaning of social and organizational transformation due to digital technology adoption.

Methodology

This paper aims to explore the research progress, trends, and updates in the KM field, in the context of DT. The authors opted to implement a data science analysis to serve the research objective best. First, the data was collected on the 24th of August from Web of Science (WoS) and Scopus databases, two of the most reliable sources of data (Van Eck & Waltman, 2010, 2011, 2020, 2021; Janik, Ryszko & Szafraneic, 2021), following a unified search and extraction methodology, detailed in the following paragraphs.

The structure "knowledge management" AND "digital transformation" has been searched on both databases. Furthermore, the search was limited to the publications indexed in the business and management fields. As such, the search revealed 88 documents on Scopus and 104 documents on WoS. Next, the two databases have been corroborated, and 29 duplicated publications have been removed with the help of an in-house programming code in R language enabled within RStudio (Allaire, 2012; Gandrud, 2018; Verzani, 2011). As regards the geography and timeframe of the publications, no restrictions have been imposed in the initial search phase because the country affiliation

and timeframe evolution of academic interest will represent analysis areas in this research project.

Next, a first data cleaning process was implemented for the 163 obtained documents. First, three documents have been removed for being in German, Russian, and Spanish. Next, the authors revised the data lake, and an additional document was manually eliminated from the 160 English documents due to relevance issues.

Consequently, 159 relevant documents have been selected for the bibliometric analysis, implemented with the help of VOSviewer software 1.6.17 (Van Eck & Waltman, 2010, 2011, 2020, 2021). Within them, a total of 930 keywords have been identified.

The following types of analysis have been run over the collected data:

- Publications analysis per database (Scopus and WoS) and combined publications distribution per type of document.
- Analysis of most frequently associated countries in the research on KM in the DT context.
- Co-authorship relationship analyses with VOSviewer.
- Key-words co-occurrence analysis emphasizes conceptual relationships, overlay analysis, and density interpretations.

Results and discussion

In Figure 1 we present the document type distribution after combining the two databases' extractions and eliminating the duplicated and non-relevant documents.

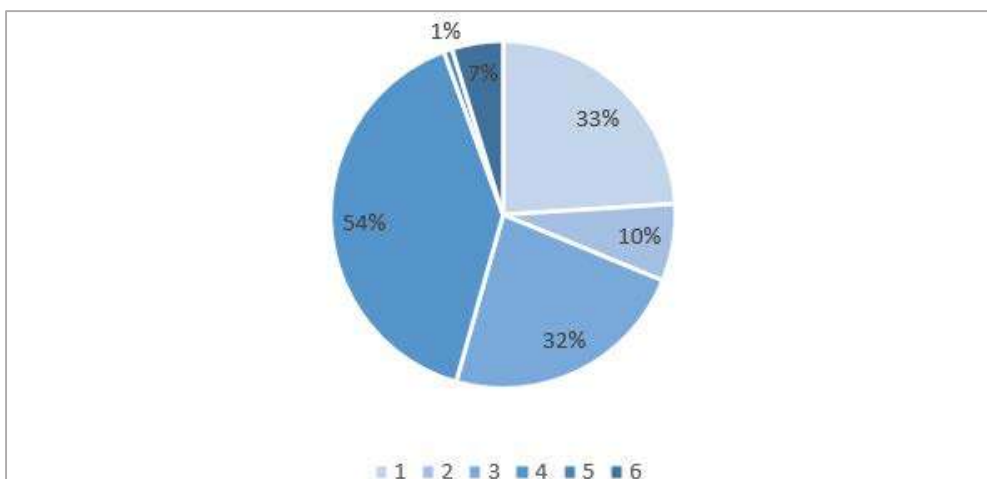


Figure 1. WoS and Scopus publication distribution per type of document after R coding and data cleaning (Authors' own research)

As such, out of the total 159 relevant documents for our bibliometric analysis, 64 are articles (1 – 33%), 9 are books or book chapters (2 – 10%), 29 are conference papers

and reviews (3 – 32%), 50 are proceeding papers (4 – 54%), one is an editorial material (5 - 1%), and 6 are reviews (6 – 7%).

As supported by data presented in Table 2 below, the search structure *"knowledge management"* and *"digital transformation"* findings describe the continuous growth of academic interest for KM and DT, especially starting with 2017 up to 2021 for both Scopus and WoS databases publications. The continuous positive trend over the complete temporal interval supports this research's relevance and the selected topic for bibliometric analysis.

Even though the percentages of 2022 for WoS (12%) and Scopus (13%) are less significant than the ones for 2021 (30%, respectively 29%), indicating a potential decrease of activity in this niche of KM literature, we must consider the moment of the research (August 2022). The authors suggest that revisiting the topic a few months after December 31st, 2022, will help grasp a better understanding of the academic activity of 2022 in the targeted research area.

Table 2. Scopus and WoS publications analysis (Source: authors' research)

Database/ filters	Oldest publication	Newest publication	Total findings	Weight per year
Scopus/ Business, Management and Accounting	2006	2022	88 publications with abstract and keywords in English	2022 – 13% 2021 – 29% 2020 – 34% 2019 – 11% 2018 – 15% 2006 – 2017 – 5%
WoS/ Business; Management.	2007	2022	104 publications with abstract and keywords in English	2022 – 12% 2021 – 30% 2020 – 24% 2019 – 10% 2018 – 13% 2017 – 9% 2007 – 2016 – 3%

In addition, the authors have illustrated in Figure 2 the map of publications based on the affiliation of the prominent authors. As such, out of a total of 51 countries, the top 10 countries according to the number of publications reverted by WoS and Scopus databases when using the search structure *"knowledge management"* AND *"digital transformation"* at the date of the research are:

- Italy (24 publications);
- United Kingdom and Russia (13 publications per country);
- Germany (11 publications), France (10 publications), Australia (8 publications), Austria, Colombia, and the USA (7 publications per country), Finland and India (6 publications per country).

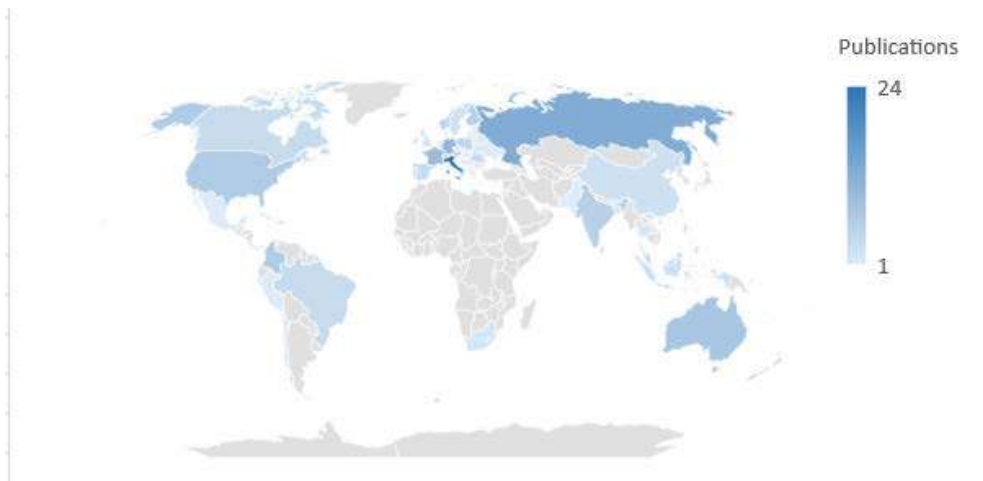


Figure 2. Map of publications distribution, based on the affiliation of the first author (authors' own research)

As regards Romania, our country closely follows the top 10 countries, being placed in the 12th position with four publications indexed in WoS and Scopus, at equality with countries like Brazil, Canada, Malaysia, and Spain. This indicates that the Romanian academic field is part of the active ones in the field of KM in the DT context, leading in front of many other countries. It is important to note that in our analysis, there are only 17 countries better positioned than Romania, while 33 follow regarding academic activity and the number of publications.

To further develop our understanding of the selected academic field dynamics, we implemented a co-authorship analysis with the help of VOSviewer software, and the findings are coherent with the map of publications distribution. As such, in Figure 3, we see the 14 countries that meet the minimum number of 5 publications and the co-authorship relationships developed between authors from these countries. We notice how the best-represented countries are associated with the most prominent circles on the VOSviewer map (England – purple, Italy – yellow, France – blue).

Moreover, from the links displayed by the software based on collected data analysis, we understand how the collaboration relationships are established between the most important map connectors: Switzerland, Italy, France, and England, followed by the USA, Russia, India, and Germany, forming semi-independent groups of countries, based on their further regional connections. For example, England is closely connected with Norway, while Germany's publications are connected to those of Austria, Finland, and Sweden.

The above findings help us understand how scholars in the academic field collaborate toward developing knowledge in the KM and DT fields. These activities can be supported by organizational collaborations, cultural proximity, or congruent development policies. Undoubtedly, the universal facilitator of academic cooperation toward knowledge

development is the digital environment which eliminates time and space limitations and facilitates instant knowledge co-creation, sharing, and distribution.

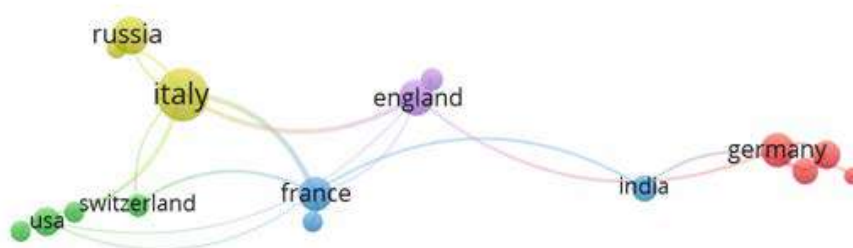


Figure 3. Network visualization of top 14 countries co-occurrence analysis obtained within VOSviewer 1.6.17 software (authors' research)

Additional significant findings on the trends, progress, and potential future research directions in the KM and DT field are obtained when implementing an intellectual review with the help of keyword co-occurrence analysis (Van Eck & Waltman, 2010, 2011, 2020, 2021). In our case, working with the previously described collected data and enabling VOSviewer-specific features, we obtained 40 keywords with a minimum of 5 occurrences, grouped in 5 clusters, with 430 links and a total link strength of 251.5.

In Figure 4 below, we can visually identify Cluster 1, represented by innovation (red), Cluster 2, represented by knowledge management (green), Cluster 3, represented by information technology (blue), Cluster 4, represented by industry 4.0 (yellow) and Cluster 5 represented by digitalization (purple). A first observation relates to the map's density, indicating the relevant and robust relations established between the top 40 concepts of the intellectual map of KT and DT.

On the one hand, KM and DT (both parts of cluster 3) are not placed in the center of the map but more in the middle-right area. This aspect emphasizes the segregation of clusters and the complex relationships established within and between the clusters, described further in this paper. On the other hand, the central concepts of every other cluster (highest value items) are polarized in the proximity of the map epicenter: innovation (cluster 1), industry 4.0 (cluster 4), big data (cluster 3), and digitalization (5).

These findings indicate that the scholarly interest in this niche of literature has been complex and divergent, covering multiple intellectual connections. This allows us to understand the KM in the DT context, without having any blind spots on our map (fully missing critical associations). At the same time, this type of distribution can indicate the

need for further development of the research on specific points of interest, across different periods of time.

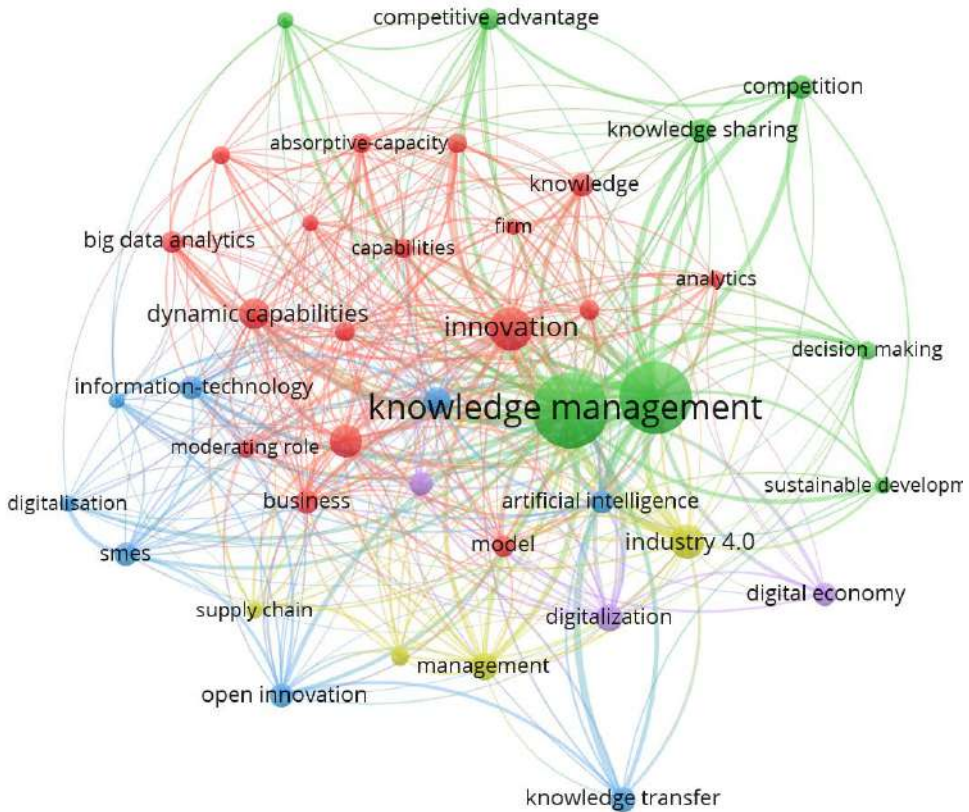


Figure 4. Network visualization of top 40 keywords co-occurrence analysis obtained within VOSviewer 1.6.17 software (authors' research)

The clusters and associated values are also represented in Tables 2-6 below. First, in Table 3, we present the keywords, occurrence values, link values, and link strength values of Cluster 1 (red) created by VOSviewer. The cluster is formed by 16 items relatively equally distributed at the top center of the map. Of course, we notice certain polarizations of items next to the top 4 items. These differentiate themselves from the rest of the cluster items: “innovation”, “performance”, “dynamic capabilities” and “knowledge”.

Nevertheless, the rest of the cluster items also have strong connections between themselves and the other clusters' items, and they complete the visual map of the KM and DT analysis. As such, we mention “business”, “big data analytics”, “model”, “absorptive-capacity”, “capabilities”, “impact”, “systems”, “firm performance”, “moderating role” or “networks” as concepts completing the intellectual distribution of Cluster 1.

Table 3. Keywords co-occurrence analysis breakdown – Cluster 1 (red)

Keyword	Occurrences	Links	Link strength
Innovation	30	34	121
Performance; dynamic capabilities; knowledge	18; 15; 10	31; 27; 21	92; 72; 35
Business; big data analytics; model	9; 8; 8	32; 23; 20	62; 43; 42
Absorptive-capacity; capabilities; impact; literature review; systems	7; 7; 7; 7	25; 22; 26; 23	40; 40; 49; 41
Firm performance; moderating role	6; 6	21; 21	37; 34
Analytics; firm; networks	5; 5; 5	14; 18; 23	23; 24; 35

Next, in Table 4, we present the keywords, occurrence values, link values, and link strength values of Cluster 2 (green) created by VOSviewer. This consists of 8 items: 2 central items and six additional items, connected with the central two in a radius distribution. As such, cluster 3 has the shape of a fan opening toward the top right part of the map. This means that the conceptual relationship between cluster 3 items is more powerful between the ones in proximity (e.g.: “knowledge sharing” and “competition”), and weaker between distanced ones (e.g.: “digital technologies” and “sustainable development”). As such, the authors consider that increased academic attention could benefit sustainable development in digital technologies.

The dominant items, “knowledge management” and “digital transformation”, have the highest values across all clusters (93-39-298, respectively 83-39-256). A causal explanation for this phenomenon is that two combined items represented the search structure. As such, the VOSviewer analysis findings prove the internal coherence of the research methods mix. The value 39 in the Links column associated with both items indicates that each is related to all the other 40 keywords in our co-occurrence analysis. That is why corroborated with the occurrence’s values, KT and DT have the heaviest link strengths on the map, visually represented as the most prominent spheres.

Table 4. Keywords co-occurrence analysis breakdown – Cluster 2 (green)

Keyword	Occurrences	Links	Link strength
Knowledge management	93	39	298
Digital transformation	83	39	256
Competition; knowledge sharing	9; 9	10; 19	30; 37
Competitive advantage; decision making	8; 6	17; 16	38; 26
Digital technologies; sustainable development	5; 5	13; 9	22; 16

In Table 5, we present the keywords, occurrence values, link values, and link strength values of Cluster 3 (blue) created by VOSviewer. Cluster 4 is formed of 8 items and is

located on the top left side, mirroring the visual distribution of cluster 2. A similar fan shape can be distinguished, with the center associated with the “big data” item, radiating towards “information technology”, “digitalization”, “SMEs”, “open innovation”, “knowledge transfer” and “artificial intelligence”. Out of the items with the highest values, we mention “big data”, “knowledge transfer”, “artificial intelligence”, “information technology” and “open innovation”. With lower values, “SMEs”, “digitalization” and “industry 4” are part of the same cluster.

Table 5. Keywords co-occurrence analysis breakdown – Cluster 3 (blue)

Keyword	Occurrences	Links	Link strength
Big data; knowledge transfer	12; 11	32; 10	61; 29
Artificial intelligence; information-technology; open innovation	10; 10; 10	19; 24; 20	39; 47; 44
SMEs	9	21	37
Digitalization; industry 4	5; 5	15; 27	18; 25

In Table 6, we present the keywords, occurrence values, link values, and link strength values of Cluster 4 (yellow) created by VOSviewer. In cluster 4 VOSviewer software grouped only four items with relevant connections with items of all other four clusters. “Industry 4.0” is the most prominent item in the cluster (19-34-85), followed by “management”, “supply chain” and “sustainability”. Cluster 4 brings together key concepts related to managing knowledge in the DT context, as big data analytics and knowledge transfer represent some of the critical challenges of the era.

Table 6. Keywords co-occurrence analysis breakdown – Cluster 4 (yellow)

Keyword	Occurrences	Links	Link strength
Industry 4.0	19	34	85
Management	13	23	54
Supply chain	5	15	24
Sustainability	6	15	19

Finally, in Table 7, we present the keywords, occurrence values, link values, and link strength values of Cluster 5 (purple) created by VOSviewer. In cluster 5, there are three items: “digitalization”, “digital economy” and “transformation”. We can assign to cluster 5 the role of the context cluster, grouping together the main pre-conditions and forces enabling the emergence of DT.

Table 7. Keywords co-occurrence analysis breakdown – Cluster 5 (purple)

Keyword	Occurrences	Links	Link strength
Digitalization	12	23	52
Digital economy	9	9	14
Transformation	9	22	41

Generally, the low values items of the clusters received less scholarly attention, distributed closer to the extremities of the map and further from the center. In order to grasp a better understanding of recent research trends and potential future directions, it is essential to run an overlay analysis. In Figure 5, *Overlay visualization of top 40 keywords co-occurrence* we notice how the most common intellectual links have been approached by scholars over time, in the timeframe 2019 – 2021.

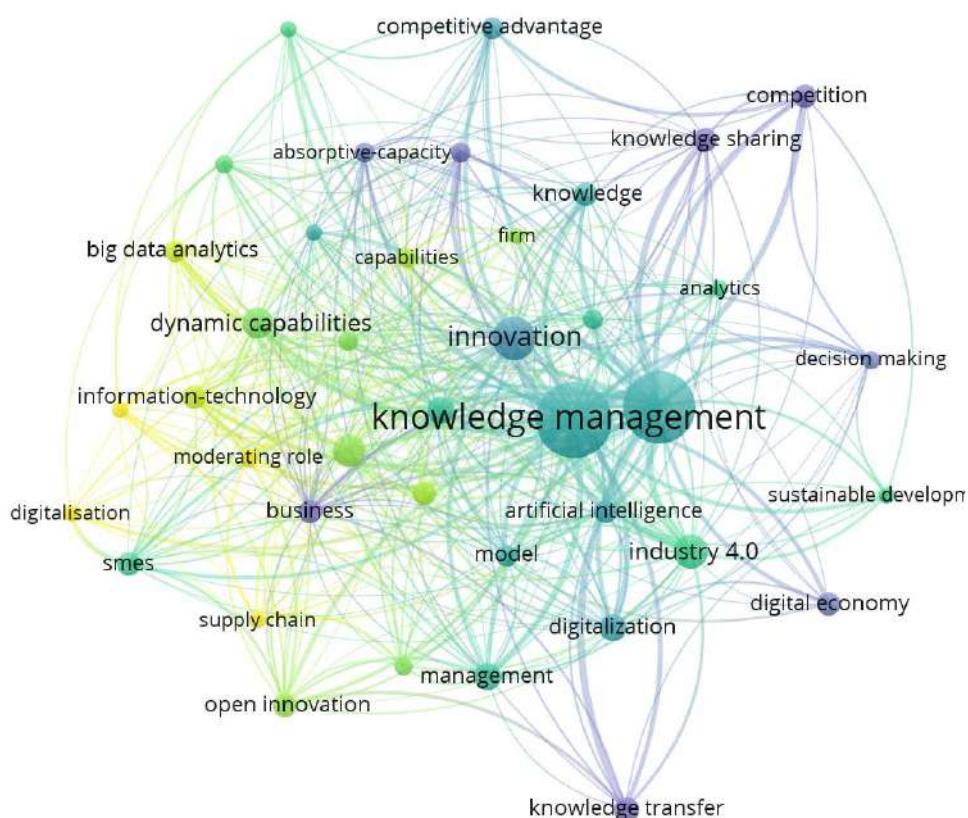


Figure 5. Overlay visualization of top 40 keywords co-occurrence analysis obtained within VOSviewer 1.6.17 software (authors' research)

First, publications on KM in the DT context dated 2019 are creating important intellectual links with “knowledge sharing”, “knowledge transfer”, “competition”, “digital economy”, “business” and “decision-making” (purple) and “innovation”, “knowledge”, “competitive advantage” or “artificial intelligence” (darker blue). Second, towards 2020, the attention shifts, and we identify significant interest in “dynamics capabilities”, “sustainable development”, “open innovation”, “SMEs” in the context of “Industry 4.0” (lighter blue and green). Third, as of 2021, scholars' interest developed towards “big data analytics”, “mediators”, “firm capabilities”, “supply chain” and “digitalization” (yellow).

Given the restricted timeframe of only three years of our overlay analysis, we consider that all topics on the map can be further investigated and developed within the literature. Nevertheless, research concerning big data, artificial intelligence, sustainable development, and supply chain digitalization will require increasingly more attention considering the business market trends.

Conclusions

In the post-COVID-19 crisis, digital transformations and the adoption within organizations are attracting interest and attention. If, traditionally, the objectives associated with digitalization were targeting *innovation* or *competitive leaps*, over the past two years, DT increased its strategic role and became instrumental in securing a *market presence* in a socially distant reality.

This study aimed to identify the main intellectual fabric of KM literature in the DT context. With the help of bibliometric analysis, the authors identified the most active countries associated with this research field. Furthermore, a detailed intellectual map has been developed with the help of VOSviewer software, composed of five different clusters. The visual map and associated bibliometric values are indicating towards a robust and sophisticated sub-segment of academic literature, covering several areas of interest. At the same time, the literature niche is very novel and under constant development. As such, we could not identify distinctive focal points in the literature. Rather, a set of divergent attention points have been identified.

Nevertheless, as virtual realities are gaining increasingly more territory, it is expected for the KM literature to continue developing in areas such as: sustainability and sustainable development, artificial intelligence, or big data analytics. Other interesting points of interest that might be studied further are represented by the main challenges of managing digital knowledge, such as solutions for instant knowledge sharing between different platforms, knowledge retention and protection interfaces, or knowledge protection in front of new security threats.

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BANKS' KNOWLEDGE-BASED INNOVATIVE CAPACITY – THE EMPIRICAL APPROACH

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Abstract. *The banking sector is known as a knowledge-intensive business. For years banks have used knowledge as a strategic resource for building competitive advantage. During the last decades, the development of new technologies and increasing competition from new market players such as FinTech companies have caused the need to develop their knowledge-based innovativeness. Thus the question arises of what builds banks' innovative capacity enabling them to support the implementation of innovations, which helps maintain their competitiveness. Based on an in-depth literature review, the banks' knowledge-based innovative capacity was defined as embedded in the bank's organizational culture, relationship with customers, and organizational characteristic ability to create, adapt and implement innovations helping to achieve banks' competitive performance. This multidimensional term was operationalized using 13 factors constituting the banks' organizational culture, banks' customers' knowledge management, and banks' structural features. The paper presents the exploratory research results conducted among banks operating in the Polish banking market. The contribution of particular factors to banks' knowledge-based innovative capacity was measured using the relative importance index (RII) and box plots constructed using positional data descriptive meters. The results show that the most important factors for building banks' knowledge-based innovative capacity contributing to competitive performance are organizational culture, cooperation with nonbank institutions (as FinTechs), and managing knowledge from and about customers. The research results have significant practical implications as they may help in the process of knowledge-based assets' application to the creation, implementation, and adoption of innovations. The results also develop the methodology to measure the banks' knowledge-based innovative capacity.*

Keywords: *innovative capacity, innovativeness, knowledge-based assets, banks' competitiveness, relative importance index*

Introduction

Dynamic changes in banks' environment influence established paradigms of their market behaviour and performance. Today knowledge-based innovative capacity resulting in innovativeness becomes a fundamental factor in creating value for banks and their customers. It enables banks to react flexibly to environmental changes or even create them. During the last decades, the increasing competition of new market players such as FinTech companies has caused the need to develop their knowledge-based innovativeness. Answering what builds banks' innovative capacity, which enables them to support the implementation of innovations and build their competitive advantage, should be of up-to-date and key importance. Thus, the paper aims to analyze what factors contribute to banks' knowledge-based innovative capacity, influence their innovativeness, and support their competitive performance.

Based on the in-depth literature review, the banks' knowledge-based innovative capacity is defined in this paper as embedded in the bank's organizational culture, relationship with customers, and organizational characteristic ability to create, adapt and implement innovations helping to achieve banks' competitive performance. It has three main dimensions – the bank's organizational culture, the bank's customer knowledge management, and the bank's structural features.

Most research on innovativeness and innovations is conducted in the industry sector. The studies analyzing entities operating in the banking market mostly focus on selected aspects of process innovations such as electronic distribution channels or product innovations (Eriksson et al., 2014; Norden et al., 2014; Akhisar et al., 2015; Mullan et al., 2017; Salampasis & Mention, 2018; Priya et al., 2018). None explored banks' knowledge-based innovative capacity as a foundation for building their innovativeness and competitiveness. As a result, the research in this field is original and fulfills this gap. The paper addresses what elements of banks' knowledge-based innovative capacity can support building their innovativeness. The analysis of previous research on innovativeness and innovations findings was also helpful for designing the tool (questionnaire) for measuring factors contributing to innovative capacity dimensions.

The paper presents the exploratory research results conducted among banks operating in Poland between 2018 and 2019. The data was retrieved from empirical research among commercial bank managers. It develops the theory and research in knowledge management and organizational innovation. To the best Authors' knowledge is one of the first attempts to empirically analyze factors contributing to banks' knowledge-based innovative capacity and innovativeness. The research results have significant practical implications, and they may help in the process of knowledge-based assets' application to the creation, implementation, and adoption of innovations. The results also develop the methodology to measure the banks' knowledge-based innovative capacity.

The term bank's knowledge-based capacity was operationalized using 13 factors constituting the banks' organizational culture, customer knowledge management, and structural features. The contribution of particular factors to banks' knowledge-based innovative capacity was measured using the relative importance index (RII) and box plots constructed using positional data descriptive meters. Multiple box plots allowed for assessing the average level, differentiation, and asymmetry of considered variables distributions.

The structure of the paper is as follows: the second section presents the literature review on banks' innovative capacity and innovativeness. It constitutes the foundations for defining terms used in the research and shows terms definitions, research questions, and hypotheses. It is followed by the research design section, including the methodology, variables description, and sample characteristics. Next, the results are presented. The paper concludes with a summary and the implications for theory, further research, and practice.

Literature review

Increasing competition forces banks to seek competencies that will enable the acquisition and effective use of knowledge-based resources and determine their competitiveness in the markets, which means an increase in their innovativeness and value (Klimontowicz, 2019).

Innovativeness is a multidimensional term. From a macroeconomic perspective, it refers to the economy, branches, or industries. From a microeconomic standpoint, it may be analyzed based on individual items such as companies (organizational innovativeness) or customers (customer innovativeness) as well as different fields and results of their activity (Table 1). It results from the innovative capacity, understood as an ability to act innovatively, and is a company's feature. It can also be perceived as a product or personality trait. Product innovativeness is a measure of its novelty (Schumpeter, 1960; Carneiro, 2007; Bowen et al., 2014), while in the case of a person, it is a derivative of creativity (de Jong & Den Hartog, 2007).

Table 1. The selected definitions of innovativeness (Source: Utterback, 1974; Subramanian & Nilakanta, 1996; Dobni, 2008; Dolińska, 2010, p. 24; Kraśnicka & Ingram (ed.), 2014, pp. 17-18; Sankowska, 2009, pp. 95-97)

Autor	Definition
J. M. Utterback (1974)	A capacity to implement innovations earlier than most companies operating in a given industry.
A. Subramanian, S. Nilakanta (1996)	A constant organizational feature that enables an organization to keep innovative behavior sustainably over a long time.
E. Daneeels, E. J. Kleinschmidt (2000)	An ability to introduce new products to the market, opening a new market through combinations of strategic orientation with innovative behaviors and processes.
A. Pomykalski (2001)	An ability to constantly search for, implement and disseminate innovations
W. Janasz, K. Koziół (2007)	The willingness and ability to develop and absorb new or improved products, services or technologies.
C. B. Dobni (2010)	Willingness (propensity) to be innovative and the ability to introduce new products, services, or ideas and their implementation to improve business results.
M. Pichlak (2012)	The tendency to generate (adapt) innovation, the ability to create innovation, and the willingness to take risks related to implementing innovations.

The innovative capacity is created in the context of the strategy, organizational structure and culture, key competencies, including technical capabilities, relations with customers and suppliers, the existing competitive advantage (or lack thereof), and the identification (anticipation) of the changes in the international, national and local environment. Those factors can impact the organization's current and future competitiveness (Tidd et al., 2005; Dobni, 2008; Terziovski, 2010; Janasz, 2012). Today organizational knowledge distribution given by knowledge entropy and new technologies play a primary role here as they support the continuous learning process and organizational culture (Bratianu, 2019).

The innovative capacity is defined multi-dimensionally. First, it refers to the company's characteristics. It incorporates the willingness to develop the company's innovativeness, the infrastructure supporting creating and implementing innovations (creating conditions for developing employees' creativity, generating new ideas and solutions), and operating behaviors necessary to apply the market and value-creating orientation. According to Dobni (2008), innovative capacity includes strategic, product, and technological capacity. It results from structural features that characterize an organization as size, centralization, formalization and specialization, and resources (Subramanian & Nilakanta, 1996; Tidd et al., 2005). Centralization refers to the hierarchization and the employees' engagement in decision-making (Sciulli, 1998; Subramanian & Nilakanta, 1996; Schwartz, 2004; Liu et al., 2018), while formalization concerns competencies and responsibility for the performance of specific tasks. It includes the formal descriptions of duties, responsibilities, and employees' management policies and procedures (Sciulli, 1998; Subramanian & Nilakanta, 1996; Liu et al., 2018). Specialization determines whether highly specialized employees are in the organization's structures (Subramanian & Nilakanta, 1996). An innovative organizational culture is one of the organizational competencies enabling the creation of competitive advantage (Helfat et al., 2007; Klimontowicz, 2019). In contemporary banking, creating a competitive advantage requires cooperating with banking and non-banking competitors (FinTechs), referred to as coopeitition. Such a capacity may be one of the most important determinants of a bank's innovativeness (Dapp, 2014; Walker, 2018). Coopeitition has not been analyzed in previous studies, but the specificity of banking innovations causes the necessity to include it in this study. The innovative capacity is strictly connected with managing customer knowledge (Taherparvar et al., 2013; Taghizadeh et al., 2018), which consists of the knowledge about customers, the knowledge from customers, and the knowledge for customers (Garcia-Murillo & Annabi, 2002; Rowley, 2002; Gibbert et al., 2002; Gebert et al., 2003). The knowledge about customers includes the history of cooperation, transactions, knowledge of purchasing habits, motivations, and other information helpful in a better understanding of their needs (Smith & McKeen, 2005). The knowledge from customers relates to product, competition, and market evaluation. This knowledge helps better understand the bank's competitive environment (Garcia-Murillo & Annabi, 2002). It enables the improvement of innovation and development competitiveness by appropriately modifying existing products or introducing new ones. Social media and internet forums can be used to collect such knowledge, where customers share their opinions, problems, and doubts (Maswera et al., 2006). In turn, knowledge for clients includes everything that can help the client meet his knowledge needs, including finance and banking, for example, information about the products, all conditions, and possible risks associated with using these products. Providing knowledge to clients influences the perception of service quality (Gebert et al., 2003). It is delivered through various types of materials, leaflets

or applications and is aimed at helping to make better financial decisions (Lopez-Nicolas & Molina-Castillo, 2008).

Based on the above literature review, in this paper, *banks' knowledge-based innovative capacity* is defined as embedded in the bank's organizational culture, customer relationship, and organizational characteristic ability to create, adapt and implement innovations. Such a capacity does not equal innovativeness. It shows a potential that may be used or not. However, having it enables a bank to decide about a kind, a number, a place, and a time of innovations' implementations. Thus the innovative capacity may be or not be converted into innovativeness. Consequently, the *banks' innovativeness* is the result of the ability to use the bank's innovative capacity reflected by the implementation of innovations that are appropriate by the type, number, place, and time to provide value for banks and their customers, and thus enable the bank achieving a competitive position in the market. A bank's innovative capacity includes organizational culture, the ability to manage customer relations, and structural features (Table 2).

Table 2. The dimension and elements (variables) of the bank's innovative capacity

Dimension	Variables	Source
Bank's Organisational Culture	Decisions' centralization	Subramanian & Nilakanta, 1996; Nobel & Birkinshaw, 1998 Dobni, 2008; Liu et al., 2018
	Formalisation of processes and decisions	
	Employees' specialization	
	An organizational culture focused on innovations	
	The ability to cooperate with banking competitors	
	The ability to cooperate with non-banking competitors as, e.g. FinTechs	
Bank Customers' Knowledge Management	Managing knowledge about customers	Dobni, 2008; Taherparvar, et al., 2013; Smet, et al., 2013
	Gathering and managing knowledge from customers	
	Delivering knowledge for customers	
Bank's Structural Features	Size.	Subramanian & Nilakanta, 1996; Nobel & Birkinshaw, 1998; Liu et al., 2018
	The time of operating activity in the banking market.	
	Strategic market position	
	IT and products' development budget	

Methodology

With the intention to fulfill the research gap, the paper addresses the question of what elements of banks' knowledge-based innovative capacity can support building their innovativeness.

Achieving the main purpose required realizing the following specific objectives (SO):

- operationalization of research constructs (SO1),
- designing a methodology for measuring the bank's innovative capacity (SO2),

- measuring the dimensions of constructs and assessing the scales' reliability and accuracy (SO3),
- assessing the importance of specific banks' innovative capacity factors for banks' innovativeness (SO4).

The main research hypothesis (H) is that, from the perspective of innovativeness and competitiveness, the most important factors relate to banks' organizational culture and customer relationships.

Bank's innovativeness is a complex and multidimensional feature that is unobservable. Measuring such conceptual categories (latent concepts) requires determining a set of variables describing them. Based on the literature review, 13 variables (elements of banks' innovative capacity) were chosen to operationalize the concept (Table 2). Constructing this type of scale involves checking the extent to which individual statements or questions, called scale items, relate to a specific, single latent concept (e.g. organizational culture of banks, customer knowledge management, or the characteristics of banks). Using scales to measure innovative capacity and innovativeness is associated with the risk resulting from the subjectivity of individual assessments. Still, it is a common practice used in empirical research of this type (Khazanchi, Lewis & Boyer, 2007) due to companies' reluctance to disclose all data (Boyer et al., 1997; Ward & Duray, 2000). Senior managers are assumed to know these data and can reliably and accurately assess the variables using the scales (Choi & Eboch, 1998). In addition, using quantitative data can make it difficult to compare the results between organizations due to differences in how they are aggregated and converted (Dess & Robinson, 1984; Porter, 1979). Considering the above arguments, banks' managers and experts were the target group in this research, and measurement scales were used to measure banks' innovativeness. Responders were asked to assess the influence of specified variables on the level of a bank's innovativeness using a 7-point scale where one meant a definitely negative and seven significantly positive influence on a bank's innovativeness.

The scales used in the questionnaire adopted the scales used in the research conducted in the service sector, including banking (Subramanian & Nilakanta, 1996; Wang & Ahmed, 2004; Dobni, 2008; Liu et al., 2018; Anning-Dorson, 2018). In previous studies, the accuracy of the scales (understood as the relationship of the measurement tool with the theoretical construct - the latent variable that the scale is to measure) was confirmed with the use of confirmatory factor analysis (Wang & Ahmed, 2004; Dobni, 2008; Vicente, Abrantes & Teixeira., 2015). Scales used in the questionnaire were assessed using Cronbach's α , which measures the scale's internal consistency (Cronbach, 1991). It is assumed that in exploratory studies which explore a given phenomenon, such as banks' innovative capacity, the ratio should exceed 0.6 (Nunally & Bernstein, 1994). Similarly to previous surveys, in this research, all scales reached the minimum value, significantly exceeding this level. (Table 3). It proved the validity and reliability of questionnaires. Thus the research data allowed verifier factors constituting the bank's innovative capacity.

Table 3. The analysis of scales' reliability

Dimension	α-Cronbach
Bank's Organisational Culture (BOC)	0,7153
Bank Customers' Knowledge Management (CKM)	0,8189
Bank's Structural Features (BSF)	0,7271

The relative importance index (RII) was used to determine the relative ranking of the factors determining banks' innovative capacity. The composition of the index is as follows:

$$\text{RII} = \text{sum of weights (W1 + W2 + W3 ++ Wn)} / A \times N$$

where: W = weights given to each factor by the respondents (from 1 to 7 where '1' is less significant and '7' is extremely significant); A = highest weight (i.e. 7 in this case; N = total number of respondents). Additionally, box plots were constructed on the basis of positional data descriptive meters. They allow for assessing the average level, differentiation, and asymmetry of the considered variables' distributions. The calculations were made using the R software.

The data was retrieved from empirical research conducted between 2018 and 2019 among commercial bank managers. The general research sample consists of 61 commercial banks. The sample size caused that, in the first step of the research, all of them were invited by the Polish Bank Association to participate in the survey as all were members of the association. In the second step, a procedure similar to random sampling was applied. Such a sampling procedure was used in research on the banking market (Salampagis & Mention, 2018). Finally, the research sample comprised 16 banks (26% of the general sample). The banks represent 77% of total banking sector assets. Altogether 71 managers and experts responded to the questionnaire.

Results and discussion

Based on the literature review, *banks' knowledge-based innovative capacity* was defined as embedded in the bank's organizational culture, customer relationship, and organizational characteristic ability to create, adapt and implement innovations. The 13 variables constituting those dimensions were assessed by banks' managers and experts based on their influence on banks' innovativeness.

According to respondents, the key ones are an organizational culture focused on innovativeness (RII=0,88) and the ability to cooperate with the nonbank institution (RII=0,87). They were also consistent that those factors are innovativeness drivers. Half of them assessed that those factors influence banks' innovativeness positively. The next drivers were gathering and using knowledge from customers (RII=0,82) and managing knowledge about customers (RII=0,82). Again half respondents agreed on the positive influence of those determinants. The distribution of answers showed that 25 percent of respondents (upper quartile) considered them as factors of significant importance, and 25 percent of respondents (lower quartile) considered them as influencing banks'

innovativeness slightly. Figures 1 and 2 present the RII values for all variables and distributions of answers accordingly.

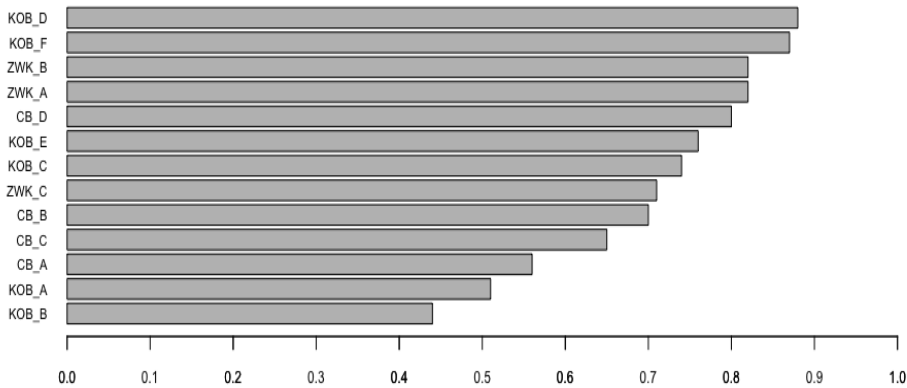


Figure 1. The RII value of banks' innovative capacity variables

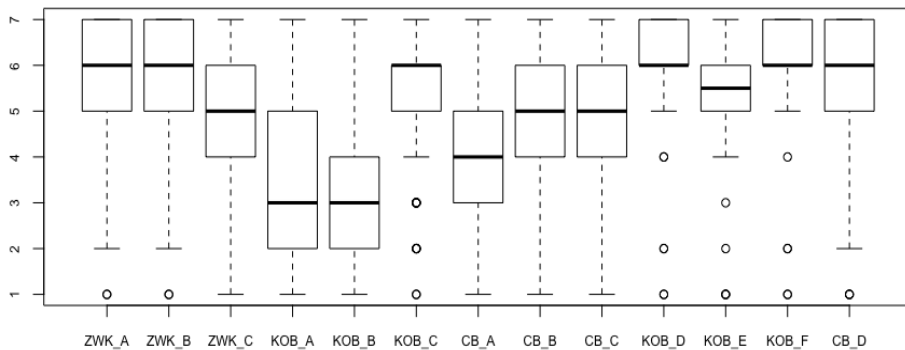


Figure 2. The distributions of answers

Legend for figures 1 and 2:

Bank's Organisational Culture:

- KOB_A Decisions' centralisation
- KOB_B Formalisation of processes and decisions
- KOB_C Employees' specialisation
- KOB_D An organisational culture focused on innovations
- KOB_E The ability to cooperate with banking competitors
- KOB_F The ability to cooperate with non-banking competitors as, e.g. FinTechs

Bank Customers' Knowledge Management:

- ZWK_A Managing knowledge about customers
- ZWK_B Gathering and managing knowledge from customers
- ZWK_C Delivering knowledge for customers

Bank's Structural Features:

- CB_A The time of operating activity in the banking market
- CB_B Strategic market position
- CB_C Size
- CB_D IT and products' development budget

Among the factors assessed above the average importance (amounted to 0,70) also are:
 - the budget for IT and new products development (RII=0,80),
 - the ability to cooperate with competitors – cooperation (RII=0,76),

- specialisation (RII=0,74),
- delivering knowledge to customers (RII=0,71).

The same distribution of answers relates to the budget for IT and new products' development and managing knowledge about customers. Among other factors, the average assessment of specialization was graded at the highest level (at least 75 percent of respondents pointed out 6 or 7). The centralization and formalization achieved the lowest grades (at least 25 percent of respondents pointed out 2 maximally). Half of the respondents assessed the influence of the ability to cooperate with competitors (coopetition) and specialization as positive or slightly positive choosing 5 or 6. They were not so consistent in the case of delivering knowledge to customers.

The next group of factors includes the bank's features as market position (RII=0,70), bank size (RII=0,65), and the length of the bank's market activity (RII=0,56). Respondents did not agree with assessing those factors. The distribution of answers for the bank's size was symmetric. The distribution of responses was equal for the market position and the bank's market activity length. At least half of the respondents granted them at least 4. It means that some respondents assess them as slightly positive, but according to others, they do not influence banks' innovativeness or even influence it negatively. The formalization and centralization obtained the lowest RII value. At least 75 percent of respondents thought formalization negatively influences banks' innovativeness. However, they did not agree on the case of centralization.

Summarising the assessment of factors influencing banks' innovative capacity, it is worth indicating which of them are drivers for and barriers to developing such a capacity. According to responders, the first group consists of an organizational culture focused on innovativeness, the ability to cooperate with nonbank institutions, especially FinTech companies, the ability to gather and use customer knowledge about customers, specialization, and the ability to collaborate with competitors (coopetition). The centralization and formalization were considered barriers to banks' innovativeness development. In the case of other factors, respondents presented different opinions. It is worth mentioning that most drivers are factors that constitute organizational culture.

Conclusions

Banks' innovativeness is a relatively new field of research that requires designing the scientific framework for further research. This study attempts to prepare a foundation based on previous research and theory in organizational innovations, knowledge management, and resource-based competitiveness.

The paper aimed to find internal factors influencing banks' innovativeness. Defining *banks' innovative capacity* and *innovativeness* allowed us to operationalize those multidimensional terms (objective SO1) and design research methodology (objective SO2). The data gathered during the field research enabled us to measure of the dimensions of constructs and assess the scales' reliability and accuracy (objective SO3) and the importance of specific banks' innovative capacity factors for banks' innovativeness and competitiveness (objective SO4). As a result of achieving specific objectives, the general purpose, specifying elements of banks' knowledge-based innovative capacity that can support building their innovativeness and competitiveness, was achieved.

The results show that among banks' innovative capacity drivers are an organizational culture focused on innovations, the ability to cooperate with non-banking institutions, the ability to manage knowledge about and from customers, employees' specialization, and the ability to cooperate with competitors. The highest value of the relative importance index (RII) of banks' organizational culture focused on innovations and managing knowledge from and about customers helped positively verify the research hypothesis. It is worth mentioning that cooperation as a factor not analyzed in the previous research was also pointed out in the group of highly assessed factors. On the contrary, innovative capacity is negatively influenced by the centralization and formalization of decisions and processes. Taking into account the rest of the elements, responders' opinions differed.

The research results have significant practical implications as they may help in the process of knowledge-based assets' application to the creation, implementation, and adoption of innovations. The results also develop the methodology to measure the banks' knowledge-based innovative capacity.

The limitation of the research results from the methodology. Even if it is commonly applied in such studies and there are positive substantive arguments in the literature to use it, there are still some risks connected with the possible subjectivity of individual assessments.

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UP-SKILLING AND RE-SKILLING FOR DIGITAL AGRICULTURE IN ROMANIAN BIG CROPS FARMS: EXPLORATORY CONSIDERATIONS

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Abstract. *This paper aims to elevate the interest in the academic, professional, and policy-making circles to the need for a large-scale re-skilling and up-skilling effort for the management and the workforce in Romanian farms in light of the large-scale deployment of the Agriculture 4.0 technologies. The Romanian agricultural sector is a major contributor to the EU agricultural output and the aim of such an effort would be to secure and enhance its competitiveness by future-proofing the performance and sustainability of the Romanian farms in the context of yield growth imperative, sustainable exploitation of land and water resources and efficient and fast decision making enabled by digitalization. A review of the most influential papers and the bibliometric mapping (using VOSviewer) of Web of Science articles on digital agriculture was enriched with several expert interviews with executives involved in deploying digital technologies to Romanian farmers. The literature review illustrated that like in Industry 4.0, Agriculture 4.0 requires training and deployment of new skills. Expert interviews added extra perspectives from practitioners and highlighted that these new skills are needed at all farm work levels. The digitalization of agriculture is a structural change that will happen even if adoption rates seem still slow and it will affect all actors in the farm from owners/managers to operators giving a very important role to agricultural experts, engineers, and financial planners. It is the hope of this article to bring academic support to the conversation about the skills needed for Agriculture 4.0 and induce the operationalization of large-scale grassroots activities needed for the migration of today's agricultural practitioners to digital technologies.*

Keywords: *Agriculture 4.0, Change Management, Digital Agriculture/Digital Farming, Knowledge Management, Precision Agriculture Skills.*

Introduction

The Precision Agriculture concept emerged more than 30 years ago and given its scope (agricultural sciences, management, tools & machinery, information systems), it had many definitions circulating. In 2019 The International Society of Precision Agriculture (ISPA) following a very rigorous and broadly consultative process adopted the following definition of precision agriculture (ISPA, 2019):

„Precision Agriculture is a management strategy that gathers, processes and analyzes temporal, spatial and individual data and combines it with other information to support

management decisions according to estimated variability for improved resource use efficiency, productivity, quality, profitability and sustainability of agricultural production.”

In a position paper of the European Agricultural Machinery Association (CEMA) (CEMA, 2017), digital agriculture/digital farming is defined as an evolution of precision agriculture (considered Agriculture 3.0) to what is known as Agriculture 4.0. In this new production system, the farms gather information through inter-connected devices (intelligent networks of sensors) producing data that is processed in real or near-real time with data management tools to generate knowledge that helps the management of resources and works making possible timely and accurate decision making. Furthermore, digital farming based on data collected via sensors and other on-farm sources (soil composition, humidity, etc.) as well as off-farm data (weather conditions and forecast, pest alerts, satellite maps, etc.) make precision agriculture work even better by using Variable Rate Technology (VRT) deployed based on variable rate maps. These maps could also be improved by improving the algorithms that generated the maps. The algorithm improvement would rely on machine learning (ML) and artificial intelligence (AI) tools using data from the farm and benchmarking pools.

Agriculture 4.0 is a term that is similar and was inspired by the term “Industry 4.0” (Kagermann et al., 2013), and its foundational pillars are according to Albiero and his colleagues (Albiero et al., 2020): the interconnectivity of devices that is made possible through Internet of Things (IOT), the cloud computing as both storage medium for information and repository of scalable computational power, as well as the Big Data and the power that machine learning (ML) and artificial intelligence (AI) are giving to data. Similarly to Industry 4.0, it will require new skills for all participants. According to Klerkx and Rose (2020), Agriculture 4.0 already comprises operational technologies such as robotics, nanotechnology, protein synthesis, cell agriculture, genetic editing technology, AI, blockchain, and ML whereas in the CEMA position paper (CEMA, 2017) robotics and advanced AI will be the hallmark of Agriculture 5.0.

In a United Nations’ Food and Agriculture Organization (FAO) briefing paper its authors (Trendov et al., 2019) affirmed that digitalization will impact the entire agrifood chain allowing the optimized and anticipatory management of resources, adaptability to changes, even climate changes, permitting the monitoring and traceability of crops and leading to more food security, better profitability, and enhanced sustainability. They also identify two conditions required for a large-scale deployment of digital agriculture. The first category includes mandatory conditions such as: solid connectivity infrastructure (coverage at sufficient bandwidth also in the rural and arable areas), affordability of the services as well as digital literacy. In their argumentation, Trendov and his colleagues (Trendov et al., 2019) state that digitalization will significantly alter the nature of work in agriculture, the demand for labor, and the required skills set. Digital literacy will be a requirement in the competence profile for agricultural jobs. The second category of factors enabling digitalization deployment takes the digital skills requirement to the next level and considers digital entrepreneurship as a favoring factor driven especially by young farmers.

Importantly, next to the great news of digitalization being the panacea of future agriculture they also identify a potential danger in the uneven distribution of the benefits of digitalization, a phenomenon that could lead to creating a digital divide between the highly vs. scarcely digitalized farms and farmers generating potentially

undesirable social tensions. Rose et al. (2021) reported that the Agriculture 4.0 narrative has been predominant in terms of productivity improvement and environmental protection, and this fact has generated significant positive as well as negative social effects, underlining that beyond strict performance considerations, there is a need to include people and social matters in the full assessment of the impact of digitalization.

Literature review

The literature review started with an extended keywords search in the Web of Science database for either one of the following terms “agriculture 4.0”, “digital agriculture”, “digital farming” “precision agriculture”, “precision farming”, “smart farming”, “smart agriculture” by using the logical connector “or” among them. The resulting corpus comprised 14 057 articles from the agricultural sciences and technology-related categories (figure 1 and figure 2) and was published mostly in the past 5 years (figure 3). This illustrates that the academic focus on agriculture 4.0 is rather recent and follows a similar pattern to the pattern of the digital transformation literature (Markovits, 2022) with a similarly significant increase in the past five years. It is important to note that in the case of the analyzed corpus of articles, we do notice a “long tail” that goes back almost another 20 years, a situation that could be explained by the earlier use of the “precision farming”/ “precision agriculture” concepts.



Figure 1: Top 10 categories for the articles containing either one of the key words “agriculture 4.0”, “digital agriculture”, “digital farming” “precision agriculture”, “precision farming”, “smart farming”, “smart agriculture”
Author’s visualization Web of Science September 20th, 2022

Out of the 14057 articles, 846 were review articles that were used for mapping with VOSviewer (figure 4a and figure 4b) to illustrate the focus of research and publishing years through a mapping of keywords co-occurrence of 5 and above. The obtained maps illustrate the centrality of precision agriculture and the recent development of the

agriculture 4.0 cluster that comprises the Internet of things, big data, and cloud computing.



Figure 2: Top 25 categories for the articles containing either one of the keywords “agriculture 4.0”, “digital agriculture”, “digital farming” “precision agriculture”, “precision farming”, “smart farming”, “smart agriculture”
Author’s visualization Web of Science September 20th, 2022

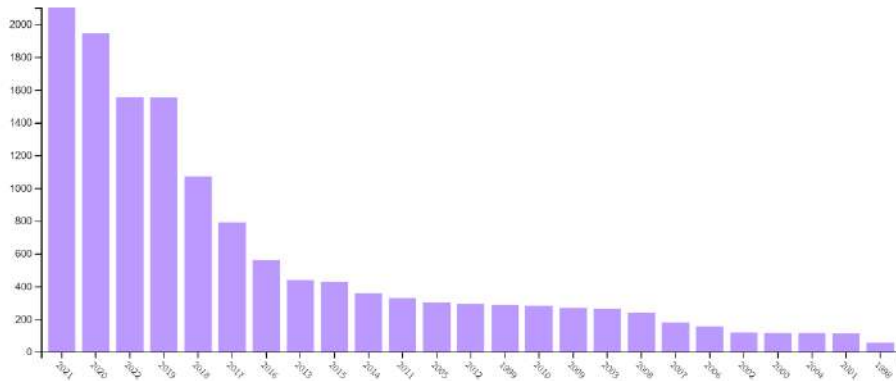
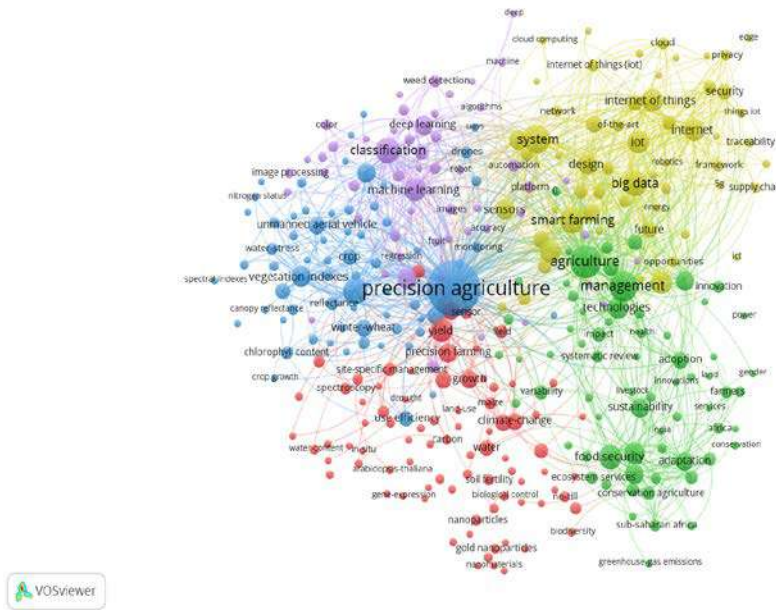


Figure 3: Number of articles with either one of the key words by publishing years
Author’s visualization Web of Science September 20th, 2022

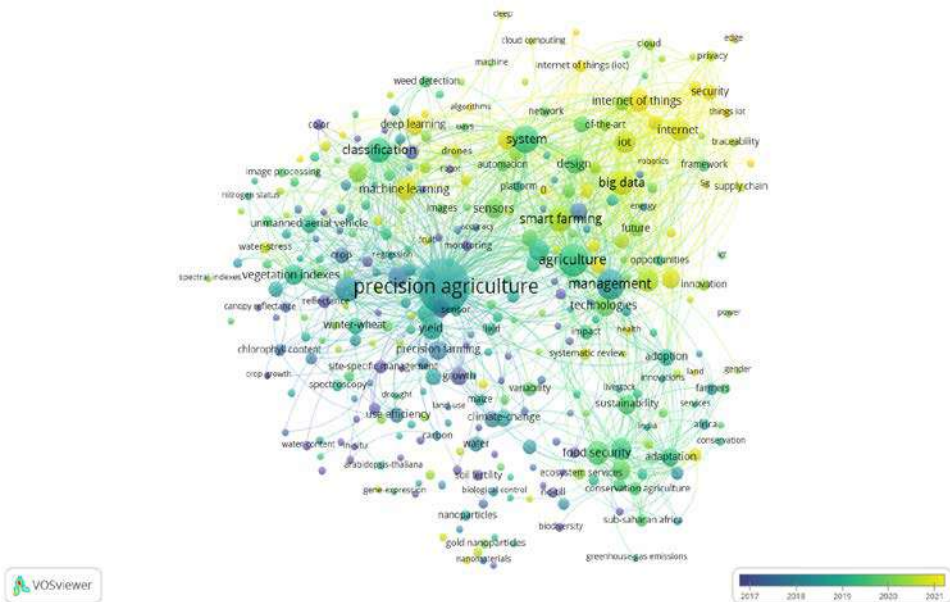
After restricting to the business categories, a corpus of 341 articles was obtained which was mapped for keywords co-occurrence (10+) and it revealed a rather strong interest for precision agriculture and its adoption (figures 5 and 6).

Klerkx and his co-authors (Klerkx et al, 2019) in their review of extant social science literature on digitalization in agriculture have identified five thematic clusters: 1) Adoption, uses, and adaptation of digital technologies on farms; 2) Effects of digitalization on farmer identity, farmer skills, and farm work; 3) Power, ownership, privacy, and ethics in digitalizing agricultural production systems and value chains; 4)

Digitalization and agricultural knowledge and innovation systems (AKIS); and 5) Economics and management of digitalized agricultural production systems and value chains.



*Figure 4a : Mapping of the “agriculture 4.0”
Author’s visualization, Web of Science September 20th 2022*



*Figure 4b : The overlay map of the “agriculture 4.0”
Author’s visualization, Web of Science September 20th 2022*

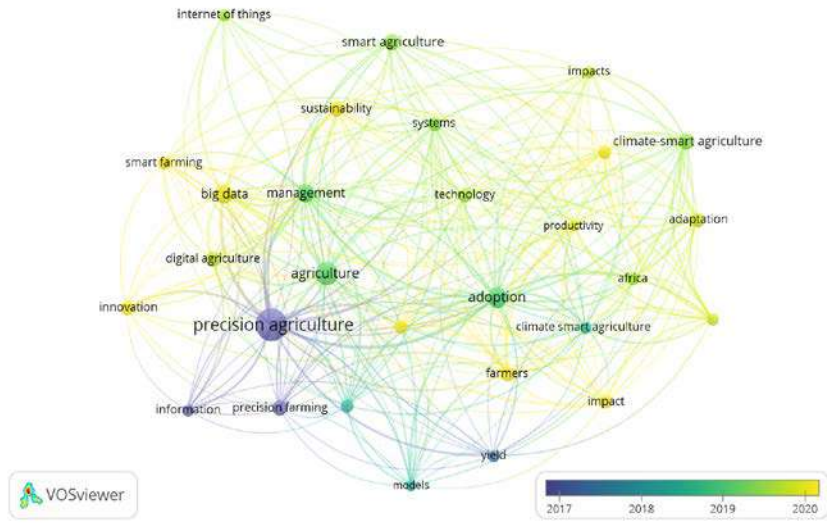


Figure 5: The overlay mapping of articles in the business categories keywords co-occurrence (10) in the corpus of the 341 articles clustered by years of publication. Author’s visualization Web Of Science September 25th , 2022

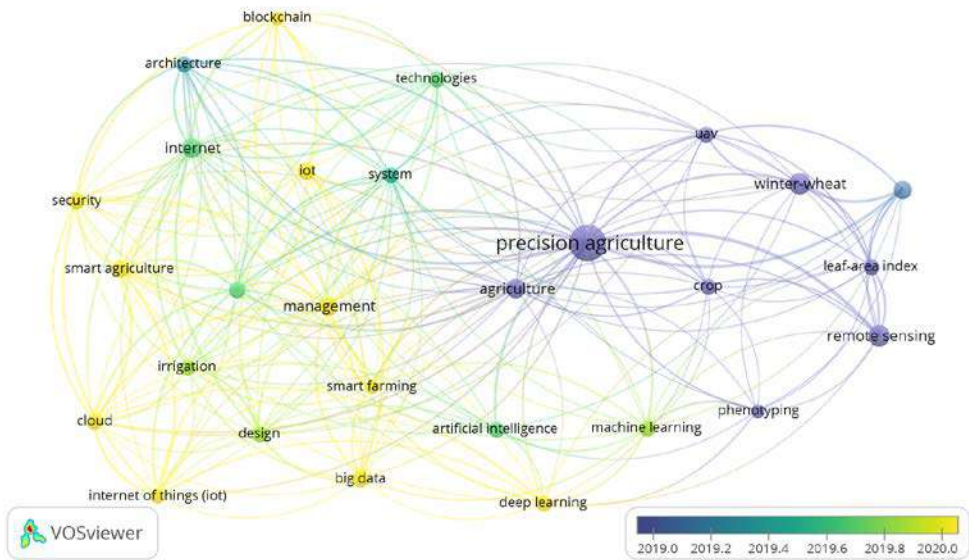


Figure 6: The overlay mapping of keywords co-occurrence (5) in the most influential review articles (a corpus of 68 articles) clustered by years of publication. Author’s visualization Web Of Science September 25th , 2022

The leap from Agriculture 3.0 to Agriculture 4.0 was made possible by the introduction of the smart machine that connected (CEMA, 2017). The use of the Internet of Things (IoT) and data analytics (DA) step changed the operational efficiency and productivity in the agriculture sector (Elijah et al, 2018). This also made a paradigm shift possible from using wireless sensor networks (WSN) as a major enabler of smart agriculture to using IoT and DA. The IoT integrates several existing technologies, such as WSN, radio frequency identification, cloud computing, middleware systems, and end-user applications. In one of the most influential papers about the role of Big Data in smart farming, the authors (Wolfert et al, 2017) state that its usage impacts the entire value chain in the agrifood supply chain not only in agriculture. In smart farming, it provides real-time operational decisions and enables predictive insights into farming operations (Kamilaris, 2017). On a more strategic level, it could help redesign business processes and even business models.

Machine learning developed and its use gained traction through the accumulation of agricultural big data leveraging high-performance computing power (most often cloud resident software). With the application of machine learning on-farm (sensor data e.g. humidity) and off-farm data (weather, satellite imagery), farm management systems evolved to be real-time and near-real-time advisory programs that provide more substantiated recommendations for farmers' decision-making and action (Liakos et al, 2018). Data becoming the key element of contemporary agriculture, it is important to be efficiently managed and preferably coming from objective sources (e.g., sensor data). This way its full value could be benefitted from increased efficiency by avoiding the misuse of resources and the pollution of the environment. Data-driven agriculture, with the help of robotic solutions incorporating artificial intelligent techniques, sets the grounds for the sustainable agriculture of the future already heralded as Agriculture 5.0 (Saiz-Rubio & Rovira-Más, 2020)

Bucci and her colleagues in their review of the precision agriculture literature (Bucci et al, 2018) identify the following factors affecting the adoption of precision farming: the size of farms, farmer's experience with technology and their awareness of the precision agricultural practices as well as (the high) cost of the initial investment. Further introspection into the factors affecting the adoption of precision farming techniques reveals other internal factors such as farmers' age and education and farmers' perception of the advantages of the new technology (the potential to get better profit per ha). External factors that were found to play an important role include: the cost of labor and cost of land, the regulatory and market (clients) pressure for sustainability as well as the availability of consultants. In fact, it is the analysis of the complete cost of adoption (investment cost, comfort/discomfort with technology, and efficiency gains) vs the complete cost of non-adoption (loss of competitiveness vs adopters, regulatory pressure) that will tilt the balance. is key to adoption or non-adoption.

Farmers' age and education is mentioned more in the context of knowledge and comfort with technologies; however, it would be important to note that if we consider the fact that precision agriculture is made possible by a digitally enabled decision support system, it becomes also an appropriate angle to analyze the adoption phenomenon through the lens of decision-making processes and differences between young and old farmers.

Methodology

Key words search aiming to identify a corpus of articles in the Web of Science database that would simultaneously fulfill the co-occurrence of any of the digital agriculture aliases and key word “change management” have yielded no results. The same results were obtained when pairing digital agriculture and its aliases with “skilling”. However, a handful of articles have been identified when pairing digital agriculture with key word “training” (Medvedev & Molodyakov,2019, Sousa & Rocha, 2019).The main skills identified (Spöttl & Windelband,2021, Rotatori et al, 2021) were generically linked to the frequent 4.0 technologies : artificial intelligence, robotization, Internet of things, augmented reality to be learned preferably through tablets, and smartphone applications (Knihova & Hronova,2019).

Therefore a number of 5 expert interviews were done, as semi structured qualitative exploratory interviews. The purpose of these interviews was to explore the kind of new skills needed to be developed by the farmers, based on the experience of practitioners involved in the deployment of digital agriculture tools.

Results and discussion

In one of the first expert interviews (Dimcea, 2022) when probing for the persuasion techniques employed in the enrollment of farmers to utilize the digital platform for farm and farm works management, the use of demonstration sessions and testimonials were mentioned as very effective tools. This reconfirmed some of the barriers identified in the precision agriculture literature (Bucci et al, 2018) as well as the decision making (Bratianu et al, 2021), complexity of the problems (Bratianu & Vasilache, 2009), and knowledge management (Bratianu, 2022; Bratianu & Bejinaru, 2019) literature. A very important new angle to understand the adoption process of precise agriculture was also expressed by Bucci (Bucci et al, 2018) when underlining the fact that by adopting precision farming techniques in fact farmers move from an experiential decision-making to a data-driven decision-making. This move generates uncertainty and discomfort for those who do not feel confident with use of technologies generating and interpreting the data (e.g. weather forecast, satellite images, pest alerts, NDVI maps) or when the investment does not seem to generate efficiency gains big enough to pay out fast. In this context, the use of demos and testimonials (with other farmers already enrolled) as uncertainty reductions tools became natural.

Further interviews with practitioners (Dobre,2022; Radoi,2022) validated the approach found in the work of Saiz-Rubio & Rovira-Más (2020). The resulted activities map (figure 7) served as base to identify the required new skills. In the case of crop nutrition products, the first activity is soil analysis done through collection of soil samples for analysis using a randomization map to make sure that the result could be extrapolated to the entire analyzed plot. The farm manager or owner is therefore required to have a basic understanding of the sampling algorithm as well as a good understanding of the soil configurations. In all cases the next phase implies the availability of agronomical advice either through a consultant or an assisting AI enabled digital companion (chat bot, AI enabled benchmarking).

Digitally enabled precision agriculture (Agriculture 4.0) activities map



**Figure 7: The precision agriculture activities map by type of input (seeds, crop nutrition, crop protection)
Author's visualization, expert interview (Dobre, 2022)**

The next two phases are the determination of the appropriate product (seed, fertilizer treatment or protection product) and creating the digital variable rate seeding plan or application/treatment map. This might also be performed through the services of a consultant, or an AI-enabled digital companion/software in the farm management suite of tools. Again, the farm manager/owner in her/his capacity of decision maker must possess enough product and agricultural knowledge to create and/or understand what criteria should/could be used for a proper decision.

The final two stages are about executing the works and here besides the manager/owner of the farm and the agronomical expert a new actor joins in the process, the Agriculture 4.0 operator (tractor driver, agricultural implement operator (e.g. precision seeding machine/variable rate sprayers/weeding machine). The operator will be required to upload the variable rate maps, install the correct implements and execute the variable rate seeding/spraying. The complexity of this phase is augmented by the fact that operating UAVs (Unmanned Aerial Vehicles), commonly known as drones, could be required besides tractor-powered activities. This is a completely new skill set that requires also formal credentialing (permit to operate and pilot a drone). Most of the digital platforms available to date, focus on the agricultural mission of the farm, i.e., obtaining the maximum yield and managing the farm works (field access planning, fleet management, etc.). A platform that digitalizes the farm's relations with its suppliers (input distributors, financial services institutions, authorities (e.g. APIA) and beneficiaries (plot owners, traders) would have a competitive advantage (Tatar, 2022). This might also function as a multi-user application with specific access rights to parts of the platform.

The Romanian Farmers' Club for Performing Agriculture (CFRO, 2022) is a farmer lead think tank created in December 2018. Its mission is to promote sustainable agriculture development in Romania. As part of its core activities, it organizes training programs for young farmers (Young Leaders in Agriculture-TLA) and experienced ones (Antreprenor

4.0). The course curricula include dedicated sessions for digital agriculture and sustainable agriculture observing the EU standards. This is a grassroots effort (Ciolacu, 2022) financed by the Club from private donations. Enticed by the learnings from the courses several TLA alumni have already implemented digital technologies on their own farms. “Antreprenor 4.0” is a program for practicing farm managers with 5+ years of experience. It already has a successful first series of alumni and is a premiere in Romania.

Conclusions

Digital literacy and proficiency and the farmers' belief in the advantages of precision agriculture are key factors favoring the adoption of digital agriculture methods. However, having a business case in which benefits outweigh the investment and operating costs is essential. Therefore, a key factor for the success of the effort to deploy digital agriculture methods will be the digital and agricultural up-skilling and re-skilling of the owners, managers, and farm workforce (Medvedev & Molodyakov, 2019). This should be done by leveraging knowledge-building and sharing methods (Bratianu et al., 2011; Bratianu & Leon, 2015), also adapted to the generational situation (Ciolacu, 2022) and shift happening today in the Romanian farms (Pinzaru et al, 2016, Germain, 2020).

This is an exploratory study, its purpose being to start the conversation about reskilling and upskilling the farm personnel. Future work should concentrate on identifying and benchmarking the skill development needs of the Romanian farm actors (owner/manager, technical experts, operators) with farms in other countries. The focus of the exploratory work was on arable farms, future works could include livestock farms or other types of farms.

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DIGITAL LEADERSHIP IN THE POST-COVID NEW KNOWLEDGE MANAGEMENT ENVIRONMENT

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Abstract. *This research aims to bring up a systematic literature review, demonstrating the roots of knowledge dynamics and cultural intelligence as the main drivers for digital leadership. While the internet was created in 1983, according to (Minaev, 2021), nowadays, 5.1 billion people use it daily, generating almost 4 trillion dollars of sales of products and services annually. In this context, digital transformation (DG) must be a significant part of any organizational culture. Digital leadership (DL) is the discipline of driving an organization towards DG in order to maintain competitiveness and agility in a rapidly evolving digital and social landscape. Digital leaders understand the importance of inbound data and are willing to explore how information technology can help an organization become more reactive and receptive to customer needs and changing business conditions and requirements. They value their cultural intelligence (CQ), creativity, communication, and inclination to explore how new emerging technology and digital information can be applied to support business development. The research intends to present a systematic literature review and a bibliographic analysis performed with Nvivo and VOSviewer software, focusing on knowledge dynamics (KD) and CQ as main drivers of digital leadership. Ultimately, our research, rooted in the Web of Science Core Collection database, visually presents a direct and explicit link of the fields related to KD and CQ to the ones related to digital leadership. While digital leadership is becoming the norm in multicultural business contexts, this bibliometric analysis can provide global leaders, researchers, and students with appropriate tools to understand and influence its dynamics via knowledge dynamics and cultural intelligence while underlining the impact of agility and ambidexterity.*

Keywords: *digital leadership; multicultural leadership; knowledge dynamics; knowledge management; cultural intelligence; agility; ambidexterity; knowmads.*

1. Introduction

While the expression of digital leadership started to be popular in 2015, the last two pandemic years: 2019 and 2020, fundamentally changed almost all existing businesses and fueled the digital transformation at an unseen pace. The phenomenon of working from home and everywhere became the norm while job redesigns were booming due to AI-needed enhancements. Education moved to online and hybrid systems, doctors

offered virtual medical consultations, and fashion design houses started to produce medical masks. According to Satya Nadella, Microsoft's CEO, as cited by Lystra (Lystra, 2021), "Fundamentally, we are moving from a mobile and cloud era to an era of ubiquitous computing and ambient intelligence, a new era which will experience more digitization over the next 10 years than the last 40" (p. 1). In this context, the challenge of digital transformation will, obviously, not be the availability of technology but the development of new adapted and agile leadership competencies (Bratianu & Anagnoste, 2011; Szillat & Breuer, 2019), where according to Paiuc, KQ, and CQ play a pivotal role (Paiuc, 2021b).

The COVID-19 pandemic (Bratianu, 2020; Bratianu & Bejinaru, 2021) quickly challenged the company's business and operating frameworks and models. Everything was revisited: from working patterns and locations, customers' engagement channels, to ranges of offered products and services. On a positive note, being under pressure to adapt fast to new requirements, most organizations gave up their traditional processes and bureaucracy (Handscomb et al., 2020) in exchange for agility, creativity, and individual well-being – all under an increased knowledge entropy (Bratianu, 2019) and generic safety approach.

Many steps were taken since the knowledge creation model, based on the iceberg (explicit - rational knowledge and tacit - experiential-learning knowledge) and flow metaphors, and popularized by Ikujiro Nonaka in 1994 (Nonaka, 1994) and the conservative learning metaphor of the mind as a container (Bereiter, 2002). As the fluid flows, metaphors associated with knowledge induce a limitation of tangibility and linearity for knowledge. Bratianu and Bejinaru (2019) explain the new metaphor of knowledge as an energy that overcomes those limitations. Knowledge is conceived and structured as a field that is composed of three main forms: rational knowledge (RK), emotional knowledge (EK), and spiritual knowledge (SK), while each form of knowledge can be transformed into another through specific dynamics. Rational or explicit knowledge is based on reflection and logical thinking and justified by true belief, while emotional knowledge is subjective and controlled by unconscious thinking (Bratianu & Bejinaru, 2019). Spiritual knowledge is grounded on values and beliefs that are the base of cultural intelligence, and further building on these concepts, we will try to demonstrate within further studies that its role in decision-making (DM) within digital leadership is primordial.

Ang Soon introduced and popularized the cultural intelligence concept (Ang Soon & Linn Van Dyne, 2015) and referred to relating and working effectively in culturally diverse contexts and situations. It is the capability to cross boundaries and prosper in multiple and diverse cultures. Being a multi-dimensional concept framed on cognitive, metacognitive, motivational, and behavioral dimensions (Earley & Ang, 2003), cultural intelligence, according to Jyoti (Jyoti et al., 2019), positively affects cross-cultural adjustments that drive the psychological comfort level that a person has in a working host different culture (Black & Stephens, 1989).

While our analysis goal is to perform a systematic literature review and to identify the main drives of digital leadership and how DG expanded in the post-COVID environment, the research questions are:

RQ 1: Are knowledge dynamics and cultural intelligence the main drivers of digital leadership?

RQ 2: Are agility and ambidexterity representatives for digital leadership in the post-COVID new knowledge management environment?

After this brief introductory part and explanations regarding the applied methodology, we will perform a systematic and bibliometric literature review using VOSviewer (van Eck & Waltman, 2014), discuss the results, and share the conclusions and limitations of our present research.

2. Literature review

According to Euler (Euler, 2015), there are three dimensions of digital leadership: the digital tools, the digital natives, and the company's digital transformation. Regarding digital tools, we live in unprecedented times where the COVID pandemic forced almost all companies to develop and adopt adequate software to transform a working face two face industry into a work-from-anywhere platform. Digital natives have grown up under the direct influence of the internet and other modern information technologies. They think, acquire knowledge, and understand the world through technology. Accounting for 27 percent of the global population or about 2 billion people, Millennials are the most representative category of digital natives. Digital transformation is mainly the adoption of digital technology by a company, with common goals for its implementation to improve efficiency, value, or innovation. The four principal areas of digital transformation are Process, Business Model, Domain, and Cultural Transformation. While the total enterprise spending on digital transformations in 2019 was \$2 trillion, the estimated value of direct investments in the digital transformation between 2020 and 2023 is \$6.8 trillion (Eira, 2021). So, if in the beginning, the digital leaders are driving the digital transformations, in the next stages, they are leading the organizations in a digital environment (Klein, 2020).

In this digital, media-saturated world, digital leaders are informing, inspiring, and leading digital transformations and taking the consequences, both benefits and limitations. They ensure the company's economic success and analyze the importance of workforce well-being and rebuilding processes from scratch based on an updated company's culture and three critical areas of action: sustainability, digitalization, and reliability (de la Boutetière, 2018). According to Szillat (Szillat & Breuer, 2019), the main characteristics of a successful digital leader should be: digital vision, customer-centricity, agility, high-risk management, and traditional business acumen. Based on Corbin's work (Corbin, 2011), Klein is adding a new characteristic to the digital leadership panel: ambidexterity as the balance between new and old businesses area, between modern paths and traditions, and between innovation and integration (Klein, 2020).

In order to lead the digital transformation, leaders should understand digital technology and, besides cultural intelligence (Bratianu & Paiuc, 2022), a digital leader is also expected to have digital intelligence (Klein, 2020), as the sum of social, cognitive, and emotional abilities that allow individuals to face the challenges and to adapt to the digital world work demands.

DL overlaps with authentic, transactional, and transformational leadership styles. The authentic leadership style of a digital leader drives employees to adopt and develop innovations; the transactional approach reinforces early adoption procedures, while a transformational attitude directly influences digital strategies (Eberl & Drews, 2021).

This is possible only in a context where trust is the main driver and winning formula for new digital leaders (Mugge et al., 2021).

While, according to (KPMG International, 2021), 25%–30% of the workforce will be working from home in 2022, Pieter Levels predicts there will be a billion digital nomads, early adopters of remote work over the past decade, by 2035 and 50% of those will be freelancers (Levels, 2015). This will make up 1 in every 3 employees – from actually already 35 million digital nomads worldwide that continuously combine global travel with online businesses and careers (Malik, 2022). DL should adapt to knowmad's' (Bratianu et al., 2021) new trends: work from anywhere; subscription living and housing-as-a-service; home-schooling and home-education (Razavi, 2020), but also to their most common problems: no “*unplugging after work*”, loneliness, lack of motivation and collaboration, distractions at home (Mukhopadhyay & B.K.Mukhopadhyay, 2021).

The employee experience philosophy concentrates on the workplace as an experience and mixes domains such as public relations and marketing with human resources. Employees' expectations transpose and evolve over time. If work compensations and tangible benefits were the major interest for employees in the past, nowadays, *how it feels to work for the organization* is the motivational trigger to change jobs or to join a new company (KPMG International, 2021).

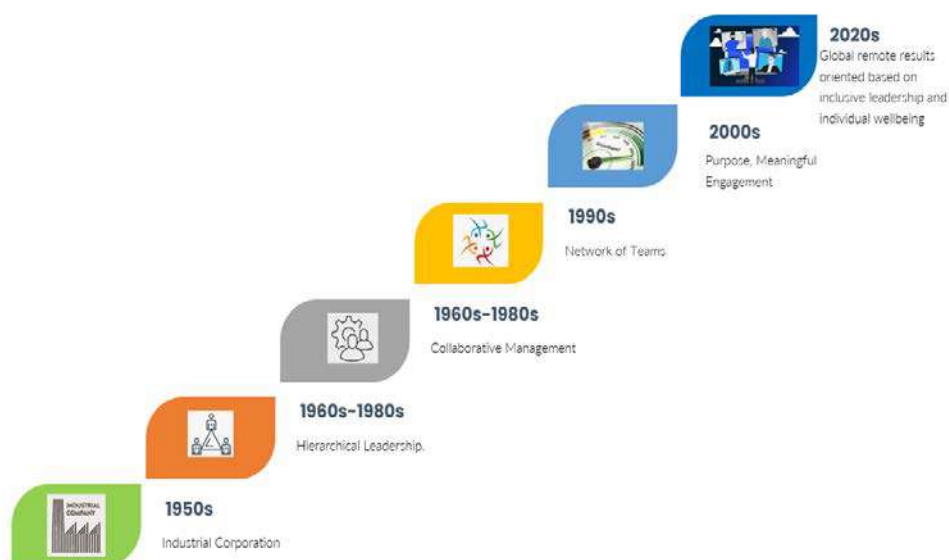


Figure 1. The employee experience philosophy – adaptation after (KPMG International, 2021) Global Mobility Forecast: Trends in risk, talent and digital—2021 report, pp 17 and author’s own analysis.

While 71% of employees are more productive since the 2019 switch to remote work (Wadhvani, 2022), *leader distance theory* indicates that the physical distance and the perceived interaction frequency between managers and their teams could affect the leadership process by reducing the opportunities for support, collaboration, knowledge transfer, and ultimately, influence (Carsten et al., 2021).

Digital leadership, in this post-COVID new knowledge management world, should be an agile and iterative process that addresses a full spectrum of aspects, from employee needs and team and knowledge dynamics to business values.

3. Data sources and methodology

The base of this data retrieval is represented by the Web of Science (WoS) core collection, the world's leading analytical information platform, and scientific citation search (Li et al., 2017). The retrieval was done on February 05, 2022, via an advanced search model, while the retrieval time span was the standard one: 1975-2022. We utilized the default values of WoS on all the rest of the retrieval settings, while in terms of the document typology, we have not excluded any.

We have primarily searched our core article expression "digital leadership", followed by a secondary, more extensive search on the broader "multicultural leadership" area. Bellow's results show that the first publications containing "digital leadership", first introduced in 2004, are best represented by 2021 with a 25% share of all-time DL publications. Also, 1996 is the first appearance year for "multicultural leadership" or "multinational leadership", while 15% of publications are concentrated in 2021.

Researched labels	The first year of appearance on WoS	Total number of publications to date - on WoS	Weight of 2021 publications with the selected theme within all years - on WoS
"digital leadership"	2004	83	25%
"multicultural leadership" or "multi-cultural leadership" or "multinational leadership" or "multi-national leadership"	1992	25	8%

Table 1. Main concepts frequencies and weight for DL and ML on WoS
 [Source: author's own research]

The above analyses show the extreme actuality of our research as DL, which, in 2021, is at its maximum academic shared visibility.

The literature format for all searches was defined as "all types". The most frequent document type for DL is the article: 53 publications (64%). We have the proceeding's paper at the second position: 26 (31%). The table below lists the numbers and proportions of various mentioned document types while all data were downloaded on February 05, 20221, in tab separator format.

Digital leadership

Type of Document	Frequency	Share in total
Article	53	64%
Proceeding's paper	26	31%
Others	4	5%
Total	83	100%

Table 2. Types of retrieved documents for "digital leadership" on WoS

[Source: authors' own research]

Regarding literature origins, the main analyzed DL's publications came from the United States (14, 17%); however, our study has a global approach relying on the digital leadership published literature from 37 countries.

A summary of the research protocol is presented in table 3:

Research protocol	Description
Search expressions	"digital leadership"; "multicultural leadership" or "multi-cultural leadership" or "multinational leadership" or "multi-national leadership"
Search database	Web of Science
Search fields	All fields
Type of publications	All types of publications indexed in the Web of Science database
Subject Areas	All subject areas included in Web of Science, up till mid-February 2022
Timespan	1975-2022
Language	All languages
Techniques for bibliometric analysis	Research field mapping (descriptive and performance matrixes via advanced search model) rooted in network analysis.
Software for bibliometric analysis	VOSviewer

Table 3. Characteristics and types of the research samples

[Source: authors' own research]

The WoS exported records contain rich and abundant information (full record and cited references exported to Other Reference Software) such as title, abstract, authors, publication year, subject, source, and references.

The bibliometric software VOSviewer (Visualization of Similarities), conceived by van Eck and Waltman, was used to process the systematic literature review and to analyze and visualize the co-occurrence of keywords by generating a map rooted on the above-mentioned bibliographic data based on a full counting method.

4. Results and discussions

As the query DL+CQ+KD is not returning any direct result, we will use in this analysis DL as starting point (processed via VOSviewer) in order to try to answer our two research questions.

The keyword's co-occurrence for digital leadership reflects the research hotspots in the discipline field, while, analyzed via VOSviewer, the 83 DL-related publications provided 423 keywords altogether. Among them, 14 keywords appeared a minimum of 5 times and met the threshold, accounting for 3.30%, but 57 appeared a minimum of two times.

Search d expressi on	Results [WoS]	Number of keywords [VOSviewer]	Keywords meeting the threshold for a minimum number of occurrences of a keyword of 5	Keywords meeting the threshold for a minimum number of occurrences of a keyword of 2
DL	83	423	14	57

Table 4. DLs' keywords meeting the threshold

[Source: authors' own research]

VOSviewer software was used to process and construct the keyword co-occurrence network of each main expression. Regarding all the below figures and tables, the size of the nodes and words represents their weights. The greater the node and word frequency, the larger the weight. The distance between the 2 nodes reflects the strength of their relationship. A shorter distance describes a more substantial relationship. The line between two keywords shows that they have been shown together. The thicker this line is, the more co-occurrence they have. The nodes with the same color are regrouped under a synthetic cluster.

VOSviewer portrays the keywords of DL-related publications into eight clusters – while using the version with 423 keywords, from which 57 meet the threshold of 2. The red cluster (Figure 2, cluster 1, Central-right down, 11 items) focused on the main concepts of “technology”, “digitalization” and “innovation” and enhanced on their “model” and “capabilities”. Bellow table 5 presents this first cluster, colored in red, to acknowledge the structure and relevant information provided by VOSviewer.

Terms	Links	Total link strength	Occurrences
technology	29	44	11
digitalization	17	21	6
digital strategy; strategies	7; 12	7; 12	2; 2
digital age	4	4	2
model	17	20	5
innovation	13	18	6
capabilities	12	15	4
ambidexterity	8	9	2
ecosystem	7	7	2
disruption	5	5	2

Table 5. DL: Cluster 1: most relevant 11 items (expressions) by VOSviewer
 [Source: authors' own research]

The green cluster (Figure 2, cluster 2, up-left positioning, 10 items) is focused on the “performance” of the “digital culture” and “digital literacy”, while the blue cluster (Figure 2, cluster 3, center-up right, 7 items) enhance on “e-leadership matrix as a result of “education”. The yellow cluster (Figure 2, cluster 4, center-down, 7 items) builds on “leadership” with a spotlight on” digital leadership” and “transformational leadership” while the purple cluster (Figure 2, cluster 5, right positioning, 6 items) combined “communication”, and “creatives practice” with “design research” concepts. The sapphire blue or light blue cluster (Figure 2, cluster 6, left-down, 6 items) focuses on “digital space” “business” “capability” while the seventh cluster in orange (Figure 2, cluster 7, left, 5 items) emphasizes on the “digital transformation” and “digitalization” as main sub-drivers of DL. The last cluster in brown (Figure 2, cluster 8, up-right, 5 items) is centered around “knowledge” and knowledge management and dynamics.

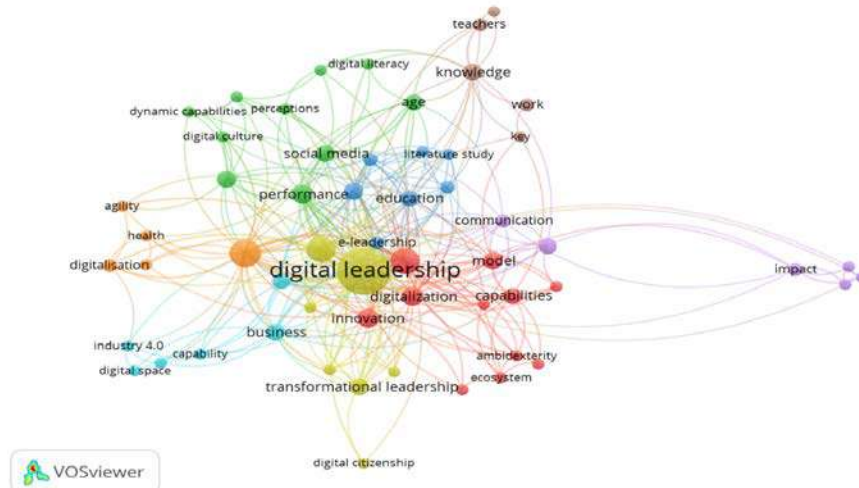


Figure 2. DL: Keyword's co-occurrence network-related publications - by VOSviewer - 57 items meeting the threshold of 2 occurrences of keywords. [Source: authors' own research]

Bellow the detailed presentations of the clusters as a result of our products query in VOSviewer:

Cluster number:	1	2	3	4
Cluster colour:	RED	GREEN	BLUE	YELLOW
Cluster position:	Central-right down	Up-left	Center-up right	Center - down
Cluster content:	<p>Cluster 1 (11 items)</p> <ul style="list-style-type: none"> ambidexterity capabilities digital age digital strategy digitalization disruption ecosystem * innovation model strategies technology 	<p>Cluster 2 (10 items)</p> <ul style="list-style-type: none"> age digital culture digital literacy dynamic capabilities environments information-technology perceptions performance self-efficacy social media 	<p>Cluster 3 (7 items)</p> <ul style="list-style-type: none"> e-leadership education information-systems literature study organizations strategy structural model of 	<p>Cluster 4 (7 items)</p> <ul style="list-style-type: none"> digital citizenship digital leadership implementation leadership skills styles transformational leader
Cluster number:	5	6	7	8
Cluster colour:	VIOLET	LIGHT BLUE	ORANGE	BROWN
Cluster position:	Right	Left-down	Left	Up- right
Cluster content:	<p>Cluster 5 (6 items)</p> <ul style="list-style-type: none"> antecedents communication creative practice design research impact research by design 	<p>Cluster 6 (6 items)</p> <ul style="list-style-type: none"> business capability digital space industry 4.0 management trends 	<p>Cluster 7 (5 items)</p> <ul style="list-style-type: none"> agility digital transformation digitalisation health index 	<p>Cluster 8 (5 items)</p> <ul style="list-style-type: none"> key knowledge students teachers work

Figure 3. DL: presentation of the 8 clusters
 [Source: authors' own research]

At first analyses, we can see that, as expected, DL has main direct connections with auto-related concepts such as “digital transformation” (Links 32; total link strength 54; occurrences 13); “leadership” (Links 24; total link strength 40; occurrences 11); “technology” (Links 29; total link strength 44; occurrences 11) and “digitalization” (Links 17; total link strength 21; occurrences 6).

The word “performance” has the highest individual non-auto-related link strength to DL (Links 19; total link strength 26; occurrences 6). Alternatively, as demonstrated by (Paiuc, 2021a), “performance” is the most representative predictor and outcome of cultural intelligence as presented in bellow table 6, developed by (Paiuc, 2021a). Backed by “digital culture” (Links 8; total link strength 9; occurrences 2), we have demonstrated that CQ is a main driver for digital leadership.

The "knowledge" expression (Links 13; total link strength 14; occurrences 5), backed by "information-technology" (Links 12; total link strength 14; occurrences 5) and "information systems" (Links 11; total link strength 15; occurrences 3) are the basis of the "digital transformation" (Links 32; total link strength 54; occurrences 13). As below table 6, presented by (Paiuc, 2021a), this also underlines KD as an important is and leading facilitator of DL. Digital Leadership is directly connected with "knowledge" but also with capabilities ("capability", "capabilities", "dynamic capabilities") and "education" – which are KD's attributes (Pavlidou et al., 2021).

First item:	Second items:	Link strength:	Cumulated links strength:
Cultural intelligence	▪ performance	128	184
	▪ job performance; job-performance; firm performance; team performance; task performance; expatriate performance; creative performance	56	
	▪ knowledge; information	26	54
▪ knowledge sharing; knowledge transfer	28		

Table 6. Keyword's co-occurrence network of CQ-related publications / Direct links to CQ - by VOSviewer

[Source: authors' own research "Cultural intelligence as a main competency for multinational leadership and global management" published in STRATEGICA – International Academic Conference/ Knowledge Economy Section / Bucharest -2021]

The Density visualization map portrays in a more visual mode the importance of KD and its predictors in the DL by putting it in the focal area of representativity:

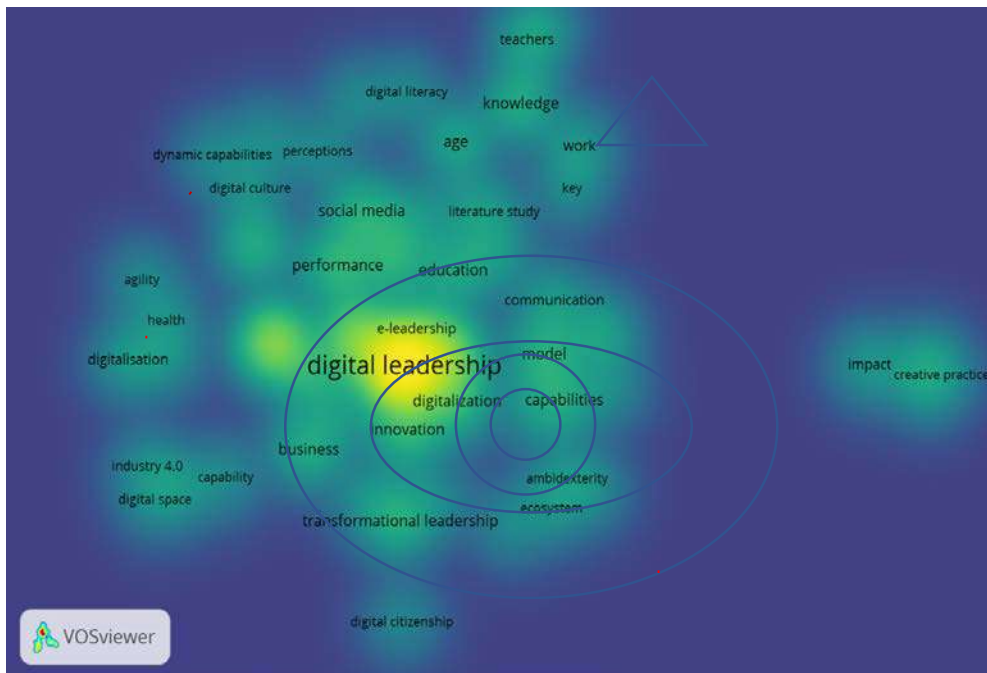


Figure 4. DL- Density Visualization Map – by VOSviewer
[Source: authors' own research]

This confirms our first research question that knowledge dynamics and cultural intelligence are the main drivers of digital leadership.

The below overlay visualization enhances the more actual researched themes from 2020 linked to the knowmads phenomenon (Bratianu et al., 2021) that was reinforced by the pandemic years 2019-2020 with a major focus on: "digital citizenship" and "digital space". Also, the 2020s brought "ambidexterity" or "dynamic capabilities" that enhanced the development of new businesses while running existing ones in parallel. The expression prevailed in the 2018th popular "agility" (Kumkale, 2022) as the capacity to deal with uncertainty while rapidly adapting and pivoting the company's core business to a changing conditions market. The below graphical presentation worked by (Ohr, 2020) is mapping the co-existence and the intersection of the two concepts that, in principle, can co-exist, overlap, or be independent:

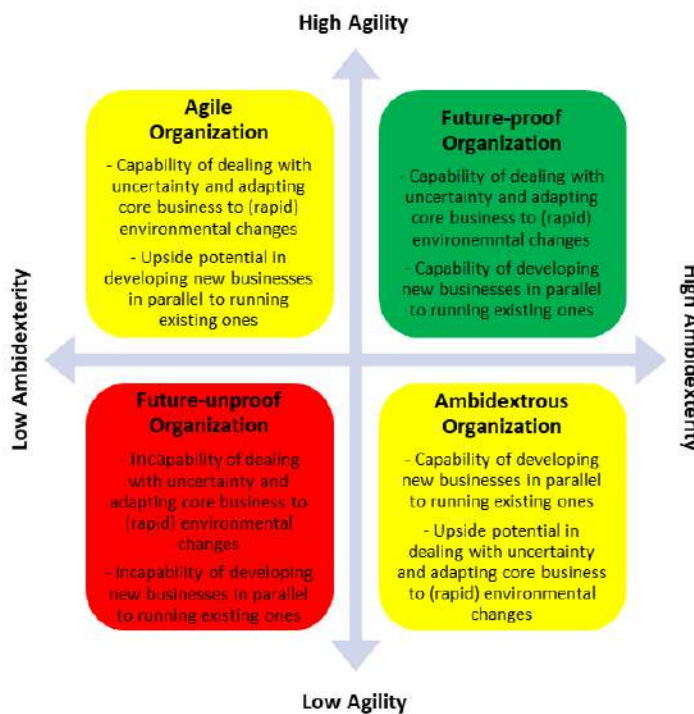


Figure 5. DL: Agility- Ambidexterity mapping
 [Source: Ralph-Christian Ohr; Future-proof Companies: Combining Agility with Ambidexterity; 2020]

However, the COVID period (2019-2020) reinforced the "ambidexterity" skills, in addition to the "agility" ones from 2017-2018 – as presented in the – timed-framed overlay visualization map of DL:

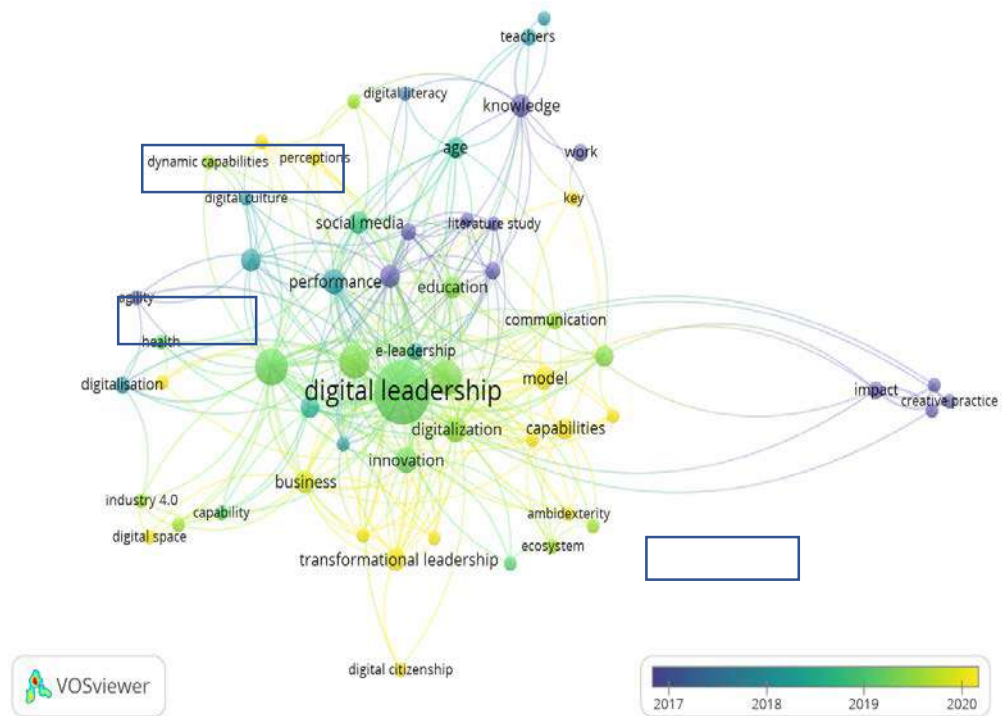


Figure 6. DL - Overlay Visualization Map by VOSviewer
 [Source: authors' own research]

Our second research question was also answered: agility and ambidexterity are both representatives of digital leadership in the post-COVID new knowledge management environment, and work flexibility must be “business as usual” and not just a commodity to use in times of crisis (Zhan et al., 2020).

5. Conclusions and limitations

After these descriptive and performance studies and network analyses, the two research questions were answered, and cultural intelligence and knowledge dynamics were identified as the main drivers of multicultural digital leadership; while both agility and ambidexterity were demonstrated to be representatives of digital leadership in the post-COVID new knowledge management environment.

These research clusters help us visualize the connection between the keywords and central notions' attributes used in the mentioned sources and visually demonstrate a comprehensive overview of CQ and KD's fields as DL's main drivers. However, despite the keen interest in digital leadership among researchers, the concept is still evolving at the same pace as technology, and "work from home/ anywhere", "augmented reality," and "AI" (Smith & Green, 2018) are shaping every day the new shape of DL (Harari, 2019).

Agility and *ambidexterity* in conjunction and combination, as reflected by VOSviewer's analysis and backed by (Ohr, 2020), permit organizations and companies to

successfully protect core businesses (*Defensive approach*) while reaching and engaging with future businesses meant to extend or replace existing ones (*Offense approach*).

Despite the efforts to perform this research most accurately, it still has some limitations. The analysis relies on the WoS database and does not consider other data sources like Scopus or Google Scholar. Also, besides the number of publications, future studies should focus more on the quality and impact of the sources. The number of digital leadership-related publications is also expected to increase exponentially in the following years, so the presented results might soon become relatively obsolete.

However, this bibliometric analysis provides a valuable reference for researchers and practitioners in digital leadership, cultural intelligence, and knowledge dynamics, and by linking the three notions within a clear relational concept, and could also be presented to students as part of their multicultural leadership program.

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DECODING THE DIGITAL LEADERSHIP PERSONA: KEY COMPETENCES IN TODAY'S DISRUPTIVE WORLD

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Abstract. *In the past decade, technology has enabled digitalization to become a global phenomenon that reshaped how organizations build their competitive advantage and how leaders empower their people to face the disruptive changes generated by digital transformation. Navigating novel challenges in a digital world calls the leaders to augment their skillset and develop new competencies to better guide people through uncertainty and a high speed of change. In the quest to identify the key competencies of digital leaders, the present paper employed a qualitative research method based on building a statistical bibliography map out of 109 publications. The research results emphasize four essential competencies a digital leader should cultivate to drive innovation, provide purpose, and bring clarity: digital literacy and knowledge, a strong set of power skills, transformative vision, and being an agent for change.*

Keywords: *digital leadership, digital leader, digital transformation, technology*

Introduction

Today's reality cannot be imagined without the disruptive change technology brought to life in the past century, irreversibly shaping humankind (Wolff, 2021; Millar et al., 2018; De Cremer & Kasparov, 2022). The emergence of cutting-edge digital technologies stimulates organizations to challenge the status quo and embrace digital transformation to secure their competitive advantages (Păduraru et al., 2016; Vătămănescu et al., 2016, 2017, 2020). Not only the business needs to change under the power of digitalization, but also the leaders should acquire new knowledge, transform themselves and develop new competencies to be able to promote innovation and drive change under the umbrella of Industry 4.0 (Hapenciuc et al., 2015; Oberer & Erkollar, 2018). Digital Leadership (DL) comes as a natural step in the development journey of traditional leadership, defining itself as the meeting point of conventional leadership practices and novel competencies (Kane et al., 2019; Gray, 2018). The organization should prepare the digital leaders to bravely face uncertainty and new challenges, inspire transformative vision, and adapt quickly, provided that in a world marked by technology, fast-changing trends, and devices, how you lead people will make a significant difference (Stratone & Vătămănescu, 2019; Stratone et al., 2022; Vătămănescu et al., 2022a). Being able to master knowledge dynamics and employing non-linear thinking become essential for digital leaders to keep up with the intrinsic dynamism of digital transformation (Bratianu, 2019; Bratianu & Vasilache, 2009).

The main purpose of the present paper is to analyze the fundamental characteristics of a digital leader starting from the cornerstone of traditional leadership and propose a

framework of the key concepts a digital leader should possess to lead people through digital transformation. Hence, the following research question arises:

RQ1: What are the key four competencies of a digital leader?

The paper employs a qualitative research approach to comprehensively answer the above-mentioned research question. Using the VOS Viewer, a specialized tool to examine high numbers of research papers, all available keywords correlated to digital leadership were analyzed to create a bibliometric map (van Eck & Waltman, 2017). The paper's originality may be understood by integrating traditional leadership characteristics with the novel competencies a digital leader should develop, covering a wide range of business challenges on both operational and strategic levels.

The present paper is organized as follows: after the introduction, a theoretical analysis will be developed, whose main target is to underline the literature review with regard to the main concepts, focusing on Digital Leadership, its main characteristics, and DL in correlation with traditional leadership. Once this section is finalized, the research continues by presenting the methodology and data sources in more detail. This part is followed by emphasizing the results. Lastly, the paper focuses on the reached conclusions, including the research limitations and other directions that can be considered for further developments.

Literature review

Digital Leadership

The exponential expansion of digital transformation in the global business environment set the foundation not only for creating new strategies and processes, but also for developing leaders who can inspire, guide, and empower others to navigate through the challenges generated by digital disruption (Stratone et al., 2022; Vătămănescu et al., 2018, 2022a,b). Klus and Müller, 2021 found a series of specific challenges that digital leaders are bound to face in today's world, including information overload transmitted on multiple digital communication channels, high speed of change, shifting to a digital mindset, implementing new digital solutions, and remote leading (Klus & Müller, 2021). Fearing the lack of human interaction and face-to-face communication being replaced by virtual encounters was identified as a challenge in the digital world of leadership by Jakubik and Berazhny (2017), who found that in order for digital leaders to manage the challenges associated with digitalization and technology evolution, they should have social intelligence and empathy, an open mindset with high creativity skills, being able to empower others and collaborate, have critical thinking and delegate power (Jakubik & Berazhny, 2017).

Digital leadership is a novel type of leadership naturally developed in the context of exponential technology advancement and the context designed by Industry 4.0, which requires a new way of building leaders to successfully face new challenges and innovations. The concept may be an interconnection between transformation leadership (Bratianu & Anagnoste, 2011) and digital technology (De Waal, van Outvorst, & Ravesteyn, 2016). Another research places the digital leader at the confluence point between digital competence and digital culture, allowing them to look at the challenges as opportunities in the context of constant change driven by technology evolution

(Mihardjo et al., 2019). Also, digital leaders are boundary spanners, meaning they not only possess a high level of technical knowledge and expertise but also show great business literacy. They make sure that the synergies implied by digital transformation and Industry 4.0 are communicated through boundary-crossing networking and are well-understood throughout the organization (Gudergan et al., 2021; Vătămănescu et al., 2017, 2020, 2022b).

Numerous authors from the literature have been interested in studying the digital leadership framework for the past two years, ironing out various competencies and skills a leader should possess in the digital age. Oberer and Erkollar, 2018 found that digital leadership is cross-hierarchical and fast, with a strong focus on innovation and creating a team-oriented and cooperative context (Oberer & Erkollar, 2018). Studying the digital leader role in architectural practice and design, Zupancic, Achten, and Herneoja, 2016 consider integrative knowledge and digital domains should be part of the leadership skillset in today's world (Zupancic, Verbeke, Achten, & Herneoja, 2016). Moreover, the more digital literacy and competencies a leader possesses, the higher their psychological well-being is (Zeike et al., 2019). Establishing a conceptual connection with the values of the leader and the attributes of a person's social status, Karpova and Gurenko, 2021 stated that a digital leader is characterized by resourcefulness, a high degree of consciousness while choosing an independent path, having strong values of love, family, and health. This highlights the importance of correlating spiritual knowledge with emotional and rational knowledge.

Embracing digital transformation implies switching from industrial management to knowledge management, hence digital leaders need to learn how to employ a non-linear way of thinking in order to be able to convey the organization's vision and generate innovation. Digital leadership is an essential integrator of individual intelligence and organizational values, having the power to positively influence people to organically adopt new ways of working to sustain digitalization. In today's world, it is not sufficient for a leader to use only rational knowledge in the decision-making process but integrate spiritual and emotional knowledge to cover specific technological and generational challenges (Bratianu et al., 2021; Pînzaru et al., 2016).

Digitalization should not be perceived only through the lenses of a traditional process which can be planned, implemented, and monitored, a perspective characterized by linear thinking – digitalization should be recognized as a mindset that correlates new technologies, agility, and knowledge to navigate ambiguity and uncertainty, turning challenges into opportunities. (Nepomuceno Carvalho, 2020). Moreover, if we are to look at digital leadership through the lenses of VUCA (volatility, uncertainty, complexity, and ambiguity), an important component of Agile, which plays a significant role in digital transformation and digital economy, the leader should demonstrate the ability to master an integrated approach of different leadership styles to ensure a holistic fashion when facing a challenging environment: agile leadership, translating into the capacity to think outside the box and have a solution-oriented approach in challenging environments), participative leadership (involving all the people they are working with to take part in the decision making and facilitating the process), network leadership (which goes hand in hand with participative leadership and implies connecting the right people to the right resources), open leadership (being able to provide honest and clear feedback and act as a objective facilitator in discussions to ensure that everyone is openly share their opinions), and trust-based leadership (being able to build trust-based

relations with the employees and act as a true supporter in their work). Nevertheless, it is essential for a digital leader to not only adapt the traditional approaches to the new context of digital transformation, but also find the right balance of integrating agile business methods (Petry, 2018).

Traditional Leadership as an Inherent Part of Digital Leadership

We live in an era where leadership is no longer hierarchical; people need to feel listened to, involved, and included in the decision-making process. Turbulent and challenging times have always required strong, well-equipped leaders to lead people through uncertainty and change (Vătămănescu et al., 2015). With digitalization and technology generating disruptive changes, leaders must build a set of new skills on their traditional foundation to better manage the specific contemporary challenges. Kane, Philips, Copulsky, and Andrus (2019) found out that many of the core leadership skills remain as a healthy foundation (communicating the value which will be driven by the change, owning the transformation, and equipping employees to succeed) while new skills should be developed to enhance the digital leadership practice: transformative vision and forward-looking perspective, digital literacy and adaptability (Kane et al., 2019).

There is a high number of knowledge-intensive companies (KIBS) that entered the market in fast-growing industries such as software development, artificial intelligence, machine learning, etc., organizations that are paying a lot more attention to knowledge management strategies to ensure competitive advantage and generate innovation through intangible resources and intellectual capital (Alexandru et al., 2020). Adopting dynamic, non-linear, and probabilistic thinking becomes quintessential when it comes to switching from traditional leadership to the one which is modeled by digitalization because the decision-making process is more complex, obtaining a strategic competitive advantage is harder as it necessities more innovation, and dealing with uncertainty and its risks becomes a norm (Bratianu & Lefter, 2011).

Digital leaders confront a much more intense business pace, where creativity, life-long learning, and risk-taking play an important role in digital transformation and new technology challenges. Therefore, it's essential for today's leaders to have a high degree of digital literacy and knowledge, master interpersonal skills (power skills), such as adaptability, empathy, creativity, and courage, and convey a transformative vision as change agents (Kane et al., 2019). That impacts on the organizational intellectual capital (Bratianu, 2007).

Methodology

When it comes to qualitative research, it is important to notice the rising interest generated around bibliometric research in the past years, which came to a conclusion as novel communication technologies that allow huge amounts of data to be analyzed and visualized in the shape of bibliometric maps (Maniu et al., 2021). The present paper employs this type of bibliometric research, known in the literature as statistical bibliography. The aim is to have access to and analyze enough research from the literature to allow us to answer the formulated research question: What are the main key competencies of a Digital Leader?

Data were retrieved on Monday, August 31st, 2022, from the Web of Science (WoS) Core Collection, which is considered the most valuable option for gathering research data thanks to the variety of publication types, the quality, and a very good filtering system in place which gives the user the permission to select various bibliographic parameters (Goksu, 2021). When it comes to the chosen time period of the research, all publications were selected from 1975 to 2022. All documentation types were considered: Articles, Proceedings Papers, Review Articles, Book Chapters, Editorial Materials, and Early Access.

The term “Digital Leadership” was the search keyword, from 1975 to 2022, and 109 results were obtained. It can be noticed that the first publication to mention digital leadership reached the research world in 2004, while over 50% of the publications available were published between 2020-2022, indicating an exponential rise in the interest in digital leadership amplified also by the COVID-19 pandemic. Over 57% of the total publications 109 were in Business, Management, and Educational Research, while most of the publication types were articles: 74 out of 109. The below table presents the types of publications, including their share in the total number.

Table 1. Main concepts frequencies distribution and Share in Total on WoS

Documentation Type	Frequency	Share in total (%)
Articles	74	67,89%
Proceedings Papers	29	26,6%
Book Chapters	6	5,5%
Total	109	100%

Source: Authors' own research

Once the results were narrowed down, the next step was to export all the available information. Therefore, data were exported in “Plain Text Format”, .txt format, in one batch of 109 records. Considering that the Record Content filter was set at All information, the export included complex information, from the title, authors, and abstract to publication year and subject. This allows us to use the records in the VOS Viewer application to visually create the bibliometric map.

It is essential to name the steps followed to create the bibliometric map: first, we chose the option to create a map based on bibliographic data. The next one was to select the option to read the data from the bibliographic database files, which allowed us to upload the .txt export we retrieved from WoS. Then, when we reached the “type of analysis” section, we chose Co-Occurrence, as a Unit of Analysis, we selected All keywords and Counting Method was set at All Counting. Lastly, the minimum number of occurrences of a keyword was set at 3, which concluded in 37 keywords that met the threshold out of 557.

Results and discussion

Using the Co-Occurrence option, the keywords were grouped in visual clusters to create the bibliometric map. The keyword co-occurrence network of Digital Leadership (see

below map: figure 1) was designed, processed, and built using the VOS Viewer software application.

An aspect worth mentioning is that the size of the words and the corresponding nodes highlights their weights, while the distance between two nodes outlines the strength of the connection or relation between them. These observations allow us to identify how the concepts are related and connected, because the longer the distance, the weaker the relation, and vice-versa. Also, a line between two words simply referred to as a connection, indicates that the words appear together in a publication. If we want to understand how often they appear together, we may look at the line thickness: the thicker the line between the two words, the more appearances they have together. Looking at the digital leadership map, it can be observed that the strongest relation and appearance is represented by leadership and digital transformation, showcasing the inherent part of both concepts in what digital leadership implies. Technology, innovation, and digital strategy also play an important role.

The clusters are words grouped around a common concept. From a visual point of view, they are marked with different colors. The red cluster (Figure 1, cluster 1, top left, 12 items) is built around “leadership”, which indicates the traditional link between leadership practices and digital leadership. “Education”, “knowledge”, and “capability” can be noticed due to their co-occurrence and direct links between them, indicating the importance of digital literacy and knowledge. Also, “communication” also stands out as a direct link to digital leadership, indicating its immanent value to digital leaders.

The green cluster (Figure 1, cluster 2, top right, 11 items) gravitates around the essence of digital leadership: “technology” and “digital transformation”. Their essential impact on digital leadership can be observed through their co-occurrence strength. The link with “business” indicates that digital leaders are now growing and developing in the business sector first, keeping in mind that private enterprises are the ones facing the digital disruptive changes first. “Transformational leadership” also appears here, indicating the importance of interpersonal skills for digital leaders and the connection with traditional leadership practices.

The blue cluster (Figure 1, cluster 3, center bottom, 6 items) is the one containing “Digital Leadership”, having a strong link with trust, impact, and behavior, an aspect which suggests the behavioral component of digital leadership, including the importance of building trust among the people that are led. Generating innovation and impact is part of a digital leader’s day-to-day activity, and its appearance confirms this aspect.

The yellow cluster (Figure 1, cluster 4, bottom right, 5 items) reveals a strong connection between “digital strategy” and digital leadership, which implies the ability to communicate a clear vision while having a forward-thinking. “Implementation” suggests that digital leaders not only formulate the strategy but are also responsible for leading people to implement it and help them adapt. Lastly, “care” comes to close the circle of interpersonal skills, showcasing the importance of human components.

The purple cluster (Figure 1, cluster 5, center up, 3 items) reiterates different word forms for digitalization and digital strategy, namely “digitalization” and “strategy”, reconfirming the direct link between digital leadership and these concepts.

Table 2. Keyword's co-occurrence network of PS-related publications / Direct links to PS - by VOSviewer

Item 1	Item 2	Direct DL link strength (sum)	
Digital Leadership	Name <ul style="list-style-type: none"> ● Information Technology, Technology, digitalization (95) ● Digital transformation (66) ● Education (18) ● Knowledge (10) ● Capability, dynamic capabilities (7) 	Category Digital Literacy and Knowledge	196
	<ul style="list-style-type: none"> ● Leadership (43) ● Transformational Leadership (28) ● E-leadership (14) ● Communication (14) ● Behavior (14) ● Trust (7) Health (8)	Power Skills (adaptability, communication, empathy, courage, trust)	128
	<ul style="list-style-type: none"> ● Digital Strategy, Strategy (37) ● Model (21) ● Management (18) ● Business (17) 	Transformative Vision	93
	<ul style="list-style-type: none"> ● Innovation (27) ● Performance (32) ● Impact (11) 	Agent for change	70

Source: Authors' own research

With a cumulative direct of 196 with digital leadership, digital literacy, and knowledge stands out as the most important competence for digital leaders to be equipped to face the speed of change of today's business environment and understand the implications of digital transformation. Knowledge brings clarity and allows the digital leader to employ credible resorts to help people navigate digital transformation and its novel concepts and challenges. This result aligns with other research from the literature, which states the importance of digital literacy for digital leaders (Abbu et al., 2022).

The analysis confirms the importance of interpersonal skills, called power skills by Runyon, 2022 in the economy of a digital leader (Runyon, 2022). From the traditional leadership foundation and transformational leadership to a deep focus on the behavioral side of leadership highlighted through trust, empathy, courage, and

communication, the power skills play an essential role in preparing the digital leader to have a people-centric approach in the digital transformation. Moreover, high adaptability is required when dealing with constant change and uncertainty, which is in line with the literature. (Kane et al., 2019; Newman, 2017).

The ability to inspire and communicate a transformative vision is crucial for digital transformation, and our analysis confirms that digital leaders should have the competence to translate the ambiguity of digitalization into a clear vision backed up by a strong strategy and provide direction. Developing strategic thinking rooted in clear purpose is not only an essential competence for a digital leader but for anyone interested in constantly transforming risks into opportunities and impacting the organizational level through innovation.

Lastly, shaping itself as a correlator of the abovementioned competencies, our analysis reveals that a digital leader should be an agent for change to encourage people to embrace the evolution of digital transformation and adopt new processes and technologies. A digital leader should create the context for people to experiment change and build bridges between the fear of trying and the value of adopting new methods and working methods. Being a change agent is the essence of transformational leadership, which is a component of digital leadership (Rosfeldt Lorentzen, 2022).

Conclusions

Digital Leadership has proven to positively influence the success of digital transformation within an organization. (Gudergan et al., 2021). To ensure a smooth process and navigation through all the changes and innovation, an organization must train and grow its leaders to develop new competencies required in the digital environment. They can then work on catalyzing digitalization and leading people to embrace change.

Using VOSviewer to perform the bibliometric analysis, we found that the four key competencies of digital leadership are digital literacy and knowledge, transformative vision, and strong power skills, including adaptability, communication, empathy, and empathy trust, and acting as a change agent. The present paper contributes to the literature by showcasing the areas managers can develop and grow to better respond to digital challenges and make sure they drive innovation to maintain the organization's competitive advantage. Knowing that a digital leader should have the ability to understand the digitalization components, firms can invest in training and workshops to enhance this knowledge and equip leaders better for the future. Also, it is important for organizations to acknowledge the importance of the human side of digital leadership, implying the constant development of interpersonal skills.

Considering the methodology, which was employed to develop the qualitative research, there are limitations that need to be taken into account: the concept of digital leadership is quite novel and the number of publications available cannot allow us to generalize for all business segments and industries when it comes to having the right skillset. Moreover, the language for the research publications searched in WoS was English, implying that there might have been other valuable articles in other languages that were omitted because of the language barrier. Also, the present study covers mostly the private sector. A further direction for research might involve the insights from public

organizations and focusing on a specific industry to understand if the niche components change or not the way the digital leadership framework comes together.

Digital Leaders will continue to be at the helm of digital transformation, being themselves on a transformative journey modeled by constant change and new challenges. Continuing to lead with kindness, providing clarity and direction, showing the capacity to quickly adapt to a new context, and possessing a high level of digital knowledge will make digital leaders build bridges between people and purpose.

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