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THE ROLE AND IMPACT OF DIGITAL TRANSFORMATION ON THE DEVELOPMENT OF SMALL AND MEDIUM-SIZED ENTERPRISES IN HAJDÚ-BIHAR COUNTY

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Abstract: *In our survey-based research, assessed the opinions of 39 small and medium-sized enterprise (SME) leaders in Hajdú-Bihar County on digitalization, how they evaluate their employees' digital skills, what digital best practices they apply, and how familiar they are with current trends in digital best practices. In the literature review, we touch on the concepts and significance of digitalization and digital transformation, the characteristics and types of best practices, benchmarking as a tool for identifying them, and the steps involved in their implementation. We introduced four currently popular digital best practices: optical character recognition, homomorphic encryption, robotic process automation, intelligent process automation. The advantages and impact of these practices on corporate efficiency are highlighted. Based on the results, we reached the following conclusions:*
The findings show that most Hungarian companies view digitalization as an opportunity, but there are deficiencies in strategic planning and commitment. Although leaders theoretically support technological progress, 93% of companies do not have a developed digital strategy, and leaders also rate employee engagement as low. The resources allocated for digitalization investments are also low, with most companies spending only between 0-10 million HUF. The application of artificial intelligence (AI) technologies is still in its early stages, though there are positive examples. Dissatisfaction is evident regarding employees' digital competencies, particularly in problem-solving and data security. The lack of knowledge of modern digital technologies also hinders innovation. Companies' digital maturity is low, with most having only taken initial steps in this area. Often, the perceived digital intensity of the industry does not reflect reality, which can hinder development.

Keywords: *best practices; digital best practices; digitalization; artificial intelligence; efficiency*
(JEL code: O33)

INTRODUCTION

In this research, we surveyed the opinions of companies handled by an accounting firm in Hajdú-Bihar County about digitalization, how leaders evaluate their employees' digital skills, what digital best practices they use in their workflows, and whether they are familiar with current trends in digital best practices. The literature review will cover digitalization and its importance, and we will present the literature on best practices, where in addition to introducing definitions, we will discuss the steps for introducing best practices and benchmarking as one of the most suitable methods for identifying them. We also consider it important to mention change management literature, as the introduction of a best practice in a company will bring about some changes. Many digital best practices are used in business, and in our publication, we will present four practices in detail, highlighting the positive effects of their application on corporate efficiency. A separate section will be devoted to presenting the economic role of domestic small and medium-sized enterprises (SMEs) to emphasize and draw attention to the fact that these businesses play a key role in Hungary's economy. We will then present the results of our research, from which we will draw conclusions.

Digitalization

Digitalization refers to the partial or full conversion of processes, objects, or content that previously existed in physical or analog form into digital form. This process can help increase the efficiency and customization of processes (Fichman et al., 2014). It is worth clarifying the difference between digitization and digitalization. The former refers to converting analog data into electronic form, while the latter involves performing operations with already digitized data and utilizing them (Éltető, 2021). Most domestic SMEs are still in the digitization phase and are mostly compelled to take advantage of digitalization opportunities due to some government measure. A similar situation occurred with the introduction of the e-invoicing system. It is also important to mention digital transformation as a key concept. This primarily refers to exploit-

ing digital technologies and integrating them into corporate processes, often affecting the entire company and requiring strategic decisions to implement (Brávecz and Krebsz, 2021). According to Matt et al. (2015), any organizational change that alters a company's products, processes, structure, or business model using digital technologies is considered digital transformation.

Digitalization can offer numerous benefits for a company, such as increasing sales volume, improving productivity, fostering innovation in value creation, and introducing new forms of interaction with customers and other business partners. In some cases, digital transformation can lead to a complete overhaul of a company's business model. These organizational changes pose continuous challenges for businesses (Brávecz and Krebsz, 2021). The Fourth Industrial Revolution, also known as digital transformation, is described by Szalavetz and Somosi (2019) as a set of rapidly spreading new applications and foundational technologies. These technologies, such as robotic business process automation, AI-based decision support systems, simulation, virtualization, cloud-based solutions, autonomous vehicles, and smart infrastructures, are deeply embedded in various segments of the economy and daily life. We are currently in the midst of a digital revolution that is fundamentally reshaping economic processes. The advancement of digitalization enables companies to organize and execute their activities electronically. Thus, businesses can trade without physical presence in any part of the world (Pajor, 2019). The concept of the digital economy is closely linked to digitalization, which refers more narrowly to a subfield of the information and communication technology sector and more broadly to all activities related to digital data. In modern economies, it may encompass an entire country's economy (IMF, 2018). The expansion of the digital economy brings numerous new economic and social opportunities, encouraging innovative activities and increasing productivity. The key players in economic development are the government, businesses, and the population, who together determine the level and pace of digitalization. These actors collectively determine the level and pace of digitalization within a given country (Brávecz and Krebsz, 2021).

In our opinion, successful digitalization requires the organization to have a comprehensive digital strategy, strong leadership support, and adequate digital competencies among employees.

Digital Strategy

A commonly mentioned requirement in the literature during digital transformation is the existence of a digital strategy, which is considered the starting point for digital transformation efforts (Hess et al., 2016). A documented strategy aligns IT and business strategies and extends across the entire organization. Furthermore, it plans organizational changes and defines those integrated business capabilities and value streams that are driven by new technologies and are able to adapt to rapidly changing market conditions (Berghaus & Back, 2016; Hirte & Roth, 2018). The digital strategy outlines and defines the vision and roadmap that the company aims to follow. Key elements in developing the vision include setting specific and measurable digitalization goals and developing the related actions (Wade & Shan, 2020). The action plan details how to reach the desired future state, who the participants are, what steps are needed, and how much time is required for implementation (Patel et al., 2018). According to some studies, communicating the digital vision is essential (Ivancic et al., 2019). It is necessary to align the vision with the corporate strategy so that both internal and external stakeholders understand the critical role they play in the transformation. Moreover, it is crucial to communicate why IT tools are needed and what gaps they are intended to fill (Kadir & Broberg, 2020). Companies must recognize that a digital strategy needs to be continuously reassessed. It requires ongoing adaptation to the dynamically changing technological environment, new opportunities, markets, and customer needs (Matt et al., 2015; Kääräinen & Teppola, 2017).

According to Kissflow (2025), 70% of companies worldwide already have a digital transformation strategy or are currently working on one. In addition, digital transformation is considered a top priority for 74% of organizations. Furthermore, 89% of companies have already adopted a so-called "digital-first" business strategy or plan to implement one (Kissflow, 2025). “Digital First” is a business strategy that places digital technology at the center of corporate operations and customer relations. This means the company prioritizes digital channels, operates a flexible and data-driven business model, and fosters a corporate culture with a digital mindset (Savciuc, 2023). As emphasized by the literature, global trends also indicate that digital transformation holds increasing strategic importance for a growing number of companies.

Leadership Support and Role Modeling

Top management support and commitment are critical success factors in digital transformation (Fischer et al., 2020). A lack of leadership engagement can become a major obstacle during the transformation, often manifesting as resistance (Brock and von Wangenheim, 2019). Many companies establish a Chief Digital Officer (CDO) position responsible for coordinating digital initiatives. The CDO operates at the intersection of business and IT, and their role is to develop, communicate, and align the entire digital strategy across the organization (Singh & Hess, 2017). In addition to communicating the vision, leaders must also serve as role models for employees (Diener and Špaček, 2021). This is especially important when facing resistance or reluctance to adopt new methods (Bach et al., 2018). A proven method is for leaders to raise awareness of the benefits of digitalization projects (Silverio-Fernández et al., 2021). The literature recommends proactive leadership, where leaders support, motivate, and inspire teams while also listening to and incorporating employee insights (Ebert and Duarte, 2018).

Digital Skills

Technological changes compel people and businesses to

acquire new digital skills and competencies. The EU's goal is that by 2030, at least 80% of adults should possess basic digital skills. To have at least basic digital skills, a person must be able to perform at least one activity in five different competency areas: 1. information and data literacy (e.g., searching the internet), 2. communication, 3. digital content creation (e.g., writing code), 4. security and data protection (e.g., protecting personal and company data), 5. problem-solving (e.g., installing software). According to EU research, nearly half of EU citizens lack basic digital skills, while close to 90% use the internet at least once a week. A 2021 survey revealed that only 54% of residents had basic or higher digital skills. Among EU countries, in 2021, Finland and the Netherlands had the highest proportion of people with basic or higher digital skills (both 79%), followed by Ireland (70%) and Denmark (69%) (Eurostat, 2023).

Best Practices

First, let's look at some definitions of best practices. According to Bretschneider et al. (2005), the term "best practice" implies that a particular practice is superior to other alternatives and is aimed at achieving a specific goal. Andrews (2012) defines "best practices" as those practices that certain groups believe produce better results more effectively than other practices, and these more effective practices are used as examples to follow. In our opinion, one of the most comprehensive definitions was created by Hayes (2022). Best practices are a set of guidelines, ethical standards, or ideas that represent the most effective or preferable course of action in a given business situation. These practices can be developed by authorities (e.g., regulatory bodies), governing bodies, or even companies themselves (Hayes, 2022). Best practices vary widely by industry and sector but also differ by area (human resources, finance, etc.) and the nature of the problem being addressed. A best practice has the following characteristics: it has been tried and tested, delivers the best results according to benchmarking criteria, is recognized and rated as excellent by others (customers, suppliers, experts, etc.), and its outputs can be offered for sale and are valuable to others (Németh, 2015). Best practices generally come about in two ways. Organic best practices typically develop naturally after years of trial-and-error show that certain procedures are better than others. "Designed" best practices are created by an organization or manufacturing company based on research and serve as guidelines or benchmarks for other companies. Organic best practices emerge naturally as employees carry out their tasks and discover that some working methods produce better results than others. These may originate from an individual or a group as employees exchange ideas and experiences. "Designed" best practices are created by a governing organization after research is conducted on the best way to perform a task. The governing organization could be governmental, an industry group, an original equipment manufacturer (OEM), or a software company, or a company could develop a best practice for internal use. These are often similar to standards but following them is optional. They can serve as benchmarks by which an organization compares itself to another company (Wright, 2022).

Steps for Identifying and Applying Best Practices

First, it’s necessary to research what best practices are being used by companies in the given industry, particularly in the area that needs improvement. Once these practices have been successfully identified, communication with key individuals in the company is essential. It's important to define different metrics to track progress and increase accountability. Introducing a best practice will bring about changes in certain workflows, so it's crucial to prepare for employee resistance and develop a strategy to manage it. It is important to involve the relevant individuals and ensure that all necessary information is available. To fine-tune best practices, it’s worth seeking help from other companies or getting feedback from your own customers. Periodically reviewing best practices is also recommended to ensure they still align with organizational changes (Hayes, 2022).

Change Management

Change is often confused with adjustment, but the two do not mean the same thing. Adjustment occurs at a specific moment and results in a new state, whereas change is a process that leads to new alternatives in the structure, behavior, culture, or perspective of the organization (Gál, 2020). Based on the extent of the change, two major categories can be distinguished: incremental and radical change. Incremental change involves changes in one or a few essential organizational characteristics. The degree of change is small, and these changes are noticeable at only a few levels within the organization. It is important to emphasize that this is a gradual, step-by-step change process, making it less dramatic and, consequently, relatively slow. Radical change, on the other hand, is the complete opposite of incremental change (Farkas, 2014). Organizations are constantly affected by internal and external environmental factors. Internal elements include human resources and processes, while external factors involve market demand or national culture, which forms the basis of organizational culture (Berde and Pierog, 2018; Bogdán and Popovics, 2023). Lewin’s classic model is an essential reference in change management. Lewin divided the change process into three stages. The first is unfreezing, where detachment from the previous practice takes place. The second is changing, during which the necessary modifications are made, representing an unstable transitional state. Finally, refreezing occurs, where the focus is on solidifying the new practices (Kiss, 2021).

Based on everyday life experiences and psychological and sociological research, we can state that people naturally avoid change. Resistance can be of two types: personal or organizational. Personal reasons can be traced back to behavioral, cultural, or psychological factors. Among the psychological factors, the most significant is uncertainty avoidance, or the fear of the unknown. Transitioning to a new process requires more mental effort than performing already known, practiced operations. Among the behavioral factors, the "outsider" effect is primary. Here, the employee thinks, "You came up with this, so you deal with it alone." This completely hinders the work of external experts (Bakacsi, 2015).

According to Hofstede's national culture model, Hungarians have a significantly higher Uncertainty Avoidance Index (UAI) than Anglo-Saxon countries. In a study conducted in 2005, Hungary scored 82 points in this dimension, which is considered exceptionally high. Such countries maintain rigid codes of belief and behavior, are less liberal in their thinking, and require rules. The research examined 74 countries (Falkné Bánó, 2014).

The GLOBE study reveals that Hungarians have a lower Uncertainty Avoidance Index than the countries studied in the research. According to the survey, our Uncertainty Avoidance Index is 3.12, but it should be 4.66. The survey examined 61 countries (Bakacsi, 2014; Falkné Bánó, 2014). It can be said that the GLOBE study also confirms Hofstede's typology regarding Hungary.

However, Bogdán and Popovics (2022) observed the opposite in their research conducted in the HR department of a multinational company based in the United States but operating in Hungary. They found that the employees had so fully identified with the parent company's national and organizational culture that they did not exhibit a high degree of uncertainty avoidance.

In the following section, we will introduce four digital best practices that are gaining increasing popularity in the business world.

Digital Best Practices

Homomorphic Encryption

The goal of homomorphic encryption is to enable operations to be performed on encrypted data, allowing the data to remain encrypted while being processed. This allows tasks to be executed in an environment that cannot be fully trusted. An increasing amount of data is outsourced to cloud storage, often unencrypted, requiring significant trust in cloud storage providers. Traditional encryption avoids this issue, but the user cannot perform operations on the data unless it is downloaded to a local machine for computation (Armknecht et al., 2015). There are three types of homomorphic encryption: Partially homomorphic encryption allows only one type of operation, which can be performed an unlimited number of times. "Somewhat homomorphic" encryption allows a few types of operations but only a limited number of times. Fully homomorphic encryption allows an unlimited number of operations to be performed any number of times (Acar et al., 2018). How does the encryption process work? First, the data owner encrypts the data with a public key and sends it to the other party. The other party receives the encrypted data, performs operations on it, and sends the encrypted result back to the data owner. The owner then decrypts the data with a private key and obtains the result of the mathematical operation, which is identical to the result that would have been obtained with unencrypted data (Dilmegani, 2024).

Optical Character Recognition (OCR)

Optical Character Recognition (OCR) is an electronic or mechanical process that converts typed, handwritten, or printed text images into machine-readable text, whether from a scanned document, a photo of a document, or a "scene photo." OCR systems typically consist of two modules: text detection and text recognition. The goal of the first module is to identify all text in the image. The second module aims to interpret the text's visual content and transcribe the visual symbols into a natural language format (Li et al., 2023). An OCR system primarily relies on extracting features and distinguishing/classifying them based on patterns (Memon et al., 2020). Applying OCR software significantly reduces the need for manual data entry and retyping. Manually copying a typical document containing 300-500 words takes about 10 minutes, while OCR completes the task in 10 seconds, reducing paperwork time by 75%. The accuracy rate of OCR can reach up to 99.8%, which is much higher than that of humans. Physical documents are more prone to being lost, stolen, or damaged, while digitized documents can be stored more securely. These solutions ensure accurate data collection and efficient digitization, reducing the risk of costly human errors that can disrupt or halt processes and lead to financial penalties (Hristova, 2024).

Intelligent Document Processing (IDP)

Intelligent Document Processing (IDP) is a technology that enables the automated, direct processing of documents by capturing, extracting, and processing the data embedded in business documents. IDP uses the previously mentioned optical character recognition (OCR) to convert printed or handwritten text into machine-readable formats. It employs artificial intelligence and machine learning techniques to read, understand, and process structured, semi-structured, and unstructured data in documents like invoices or contracts, just like a human would. The use of IDP offers numerous advantages for employees and customers alike. It enhances efficiency, saving significant time, especially in industries with high volumes of paperwork, such as financial services, healthcare, logistics, and legal sectors. The processing time of invoices can be reduced by up to 90%, resulting in a 400% increase in employee productivity. This was the case at the Metro wholesale store, where the ABBYY intelligent document processing software reduced the turnaround time from 1-2 days to just a few hours. Data management becomes more accurate, processing time decreases, and customer inquiries can be responded to more quickly, resulting in an enhanced customer experience. The fast processing of documents and extraction of information allows for quicker decision-making. This is especially beneficial in industries where timely decisions are crucial, such as finance and customer service. Its scalability is another key advantage, as IDP solutions can handle a larger volume of documents without proportionally increasing labor costs as the company grows (Hristova, 2024).

Robotic Process Automation (RPA)

Robotic Process Automation (RPA) is a technology that mimics how humans interact with software to perform large-scale, repetitive tasks. RPA technology creates software

programs or bots that can log into applications, enter data, perform calculations, execute tasks, and copy data between applications or workflows. Software robots access enterprise systems and perform tasks similar to how humans do. For example, a software robot might open a new Microsoft Excel sheet, navigate to a specific worksheet, change certain cell values, save the worksheet, and close the application (Gillis and Lawton, 2024). RPA tools can be combined with artificial intelligence to extract more context from the worksheet being worked on. Using optical character recognition (OCR), it reads text or handwriting, and natural language processing (NLP) extracts entities such as names, invoice terms, or addresses, or even creates an automatic estimate of a damage claim's value based on a picture.

RPA technology can help companies in their digital transformation processes in several ways. It enables better customer service processes, increases task accuracy as bots perform repetitive tasks, reduces costs due to fewer manual and repetitive tasks, and dramatically decreases processing time. Overall, significant efficiency gains can be achieved by digitizing and auditing process data (Gillis and Lawton, 2024).

Intelligent Process Automation (IPA)

Intelligent Process Automation (IPA) is a combination of technologies used to manage and automate digital processes. IPA is designed to assist employees in completing the manual, repetitive, and routine tasks they previously performed. The technologies combined in IPA include Robotic Process Automation (RPA), Artificial Intelligence (AI), Machine Learning (ML), and Digital Process Automation (DPA). With these technologies, particularly through AI, IPA can learn how to adjust and improve process flows, creating an intelligent process capable of learning and improving over time.

IPA plays an important role in automating a significant portion of corporate tasks and processes. The goal of IPA is to increase operational efficiency, enhance employee performance, and improve the responsiveness of customer interactions (Gillis, 2023).

In our opinion, the aforementioned best practices have highlighted the importance of artificial intelligence, as most of the tools mentioned are already connected to AI in some way. Furthermore, we believe that those who do not leverage the advantages of AI will soon suffer significant competitive disadvantages. After discussing digital best practices, we will explain the role of small and medium-sized enterprises (SMEs) in the Hungarian economy, emphasizing why it is crucial to support these companies and why it is so important for them to develop, especially in terms of digitalization.

MATERIALS AND METHODS

In the course of the research, we used a self-designed questionnaire based on knowledge found in the academic literature. The questionnaire consists of two parts: the first includes questions related to digitalization, while the second focuses on digital best practices. We used a five-point Likert scale, multiple-choice questions, and mostly simple yes/no questions. In cases where we believed a term might be unfamiliar to respondents, we provided a brief, one-sentence explanation to avoid misunderstandings. Additionally, we aimed to include as many examples of digital tools as possible to make it easier for respondents to complete the questionnaire. We created the questionnaire using Google Forms, which was sent out to companies handled by an accounting firm via their mailing system. The accounting firm exclusively deals with small and medium-sized enterprises, specifically 100 in total. During the available time for completion, 39 responses were received, representing a 39% response rate. It is important to note that the results of the questionnaire cannot be considered representative!

Company Information

Firstly, we will present the general information of the companies, which we asked about at the beginning of the questionnaire. The vast majority (82%) of respondents hold executive and/or ownership roles within the company. Most of the companies were founded in the early 2000s, with a dominance of those registered in 2003, but there were also newer companies, including one established in 2022. In terms of company type, most responses came from micro-enterprises, specifically thirty. Additionally, six small enterprises and three medium-sized enterprises participated in the research. In terms of company structure, the majority operate as limited liability companies, with the number matching the count of micro-enterprises. The majority of companies are active in the trade and construction industries, with eleven from the former and six from the latter sector represented.

RESULTS AND DISCUSSION

The first question concerned their perspective on digitalization. Nearly 75% of the responses view this process as an opportunity. 21% of companies considered themselves neutral, while 5% perceived it as a threat. Despite the majority of companies viewing digitalization as an opportunity, they do not have a corresponding strategy in place. 93% of organizations do not have a detailed digital strategy. In the absence of a digital strategy, there is no defined vision for the future, which leads to digital developments being implemented on an ad-hoc basis. This lack of consistency can easily result in fragmented operations. Without a strategy, it becomes difficult to recognize the potential of digital technologies, which in turn hinders innovation activities. The lack of innovation can quickly lead to a competitive disadvantage. Based on the responses, more than half of the company leaders consider themselves fully committed to digitalization. However, 30% were more critical, considering themselves neutral, and 18% did not consider themselves committed at all. The majority of leaders were more critical of their employees, with nearly 50% considering their workers neutral and 25% believing their employees are not committed to digitalization at all. Only 28% of leaders felt that their subordinates were fully committed. In our opinion, there is a slight contradiction in the fact that while the majority lack a digital strategy, most

leaders are committed to digitalization processes. However, this supports our view that digital developments are carried out on an ad-hoc basis. We believe that employee engagement is influenced by which generation is in the majority within a company. Most members of Generation Y and Z tend to be more open to adopting new technologies.

We also asked how much companies spend on digitalization. Based on the responses, it can be said that they spend relatively little on this process. 97% of the responses indicated spending between 0 and 10 million forints, and only 3% reported spending between 10 and 50 million forints. No responses were received for the 50-90 million and over 100 million categories. We received similar results when asking how much they had spent on digitalization since the outbreak of the coronavirus pandemic. 95% of companies remained in the 0-10 million forint range. One standout company spent over 100 million forints on digitalization since the onset of the pandemic. Only one company from the respondents won a state grant supporting digitalization, and that was fifteen years ago. The coronavirus pandemic triggered a form of "forced digitalization," where quick and efficient solutions had to be found in a short amount of time and at the lowest possible cost. Examples include enabling remote work, conducting sales through digital platforms, and managing customer relationships digitally.

Only 13% of companies use some form of artificial intelligence-based software or service. In this regard, there is no significant lag compared to European SMEs, as only 7% of companies use AI-based technology. According to the EU survey, 3% of Hungarian SMEs use such technology, placing Hungary at the bottom alongside Greece, Cyprus, Estonia, and Poland, just ahead of Romania, where only 1% of companies use AI-based technology. Among those companies that use such technology, nearly all use Chat GPT, and there is one company that uses multiple AI software for work purposes, including Claude AI and GitHub Copilot for coding assistance. We asked the leaders how satisfied they were with their employees' digital competencies, which the EU has designated as target areas for development by 2030. Based on the responses, 51% of leaders are completely satisfied with their employees' skills in information and data literacy, which includes internet searching, while 23% expressed dissatisfaction. A similar result was observed in online communication, with 46% satisfied and only 25% dissatisfied. The least satisfaction was expressed regarding digital content creation, with only 15% satisfied. As for security, including measures for protecting corporate and personal data, 41% of leaders were not very satisfied, while nearly 30% were completely satisfied. The last area was problem-solving, where leaders were the least satisfied. More than half (51%) expressed dissatisfaction with this skill, while only 23% were satisfied with their employees' digital problem-solving abilities. Overall, the responses indicate that leaders are generally dissatisfied with their employees' digital skills.

The questionnaire also included a question asking whether leaders had heard of any of the above-mentioned digital best practices. Respondents were provided with a brief definition for each method. Only 5% of respondents had heard of homomorphic encryption, and the same proportion was familiar with intelligent process optimization. A larger percentage knew about robotic process automation with 9%. The most well-known techniques were optical character recognition (46%) and intelligent document processing (44%). We also asked if they would consider using these methods if they learned about their practical benefits. The majority of respondents (54%) were undecided, while 31% clearly stated they would consider it, and 15% expressed opposition to these procedures. We asked the leaders which tools they considered indispensable for the company in terms of digitalization. We will list the top five tools in ascending order. In fifth place, tied, were the use of a custom domain name and office software suite (46%). This was followed by antivirus software (49%), then the possibility of electronic payment with 54%. The top two were having a company website and issuing online invoices, which is not surprising, as the majority of the respondents were from the trade sector. We also asked how frequently they use these digital tools. Daily used tools included the company email address, some office software suite, messaging platforms, and the electronic invoicing system. Despite having their own company website being one of the most indispensable tools, a significant portion of companies use it less frequently than monthly, as is the case with digital knowledge bases, intranet portals, enterprise resource planning software, online advertising, online sales, VPNs, custom applications, and any artificial intelligence-based software. Social media platforms are used daily by 33% of companies, while 51% use them less frequently. A similar ratio was observed for cloud-based services, with 48% using them daily and 35% occasionally. A similar situation exists with online/electronic payments, where 35% use this option daily, and 35% use it much less frequently. During the research, we asked which internal barrier they considered the most significant in hindering the use of information and communication technologies.

The use of information and communication technologies is hindered by both internal and external factors. In their publication, Tarute and Gatautis (2014) identified the barriers that SMEs may face. Internal obstacles include the characteristics of the owner/manager, the attributes of the company, the cost of implementation and application, and the return on investment. External factors mentioned include infrastructure, social and cultural limitations, as well as political, legal, and regulatory constraints. According to the majority of leaders (38%), the implementation and application costs are the biggest barriers to using these technologies. 31% mentioned company characteristics, and 18% saw the return on investment as the most significant barrier. We also asked which external barriers they considered most significant. According to the responses, leaders see infrastructure as the most critical external factor, with 31% expressing this view. The second most important external factor was social barriers (23%), followed by political, legal, and regulatory barriers (18%). In our opinion, among the internal barriers, employee resistance to change is particularly significant. In addition, a lack of knowledge regarding technologies among employees can also present challenges. This implies that the human factor is unavoidable when it comes to the adoption of digital technologies. External barriers are

mostly determined by the macro-environment, to which companies can adapt, unlike internal factors, which can be more easily changed.

We were interested in how the company leaders viewed their own company's digital maturity. Respondents could choose from five categories, which were based on the framework by Sándor and Gubán (2021): Entry-level: Start-ups or companies that have not paid attention to digital development to the expected level. Pathfinder: Digital development needs are recognized, and initial steps have been taken, but there is no clear concept for implementation. Advanced: Companies are at an acceptable level of digital maturity but still lag behind well-performing competitors. Leader: Companies have an acceptable level of digital maturity, though several competitors outperform them. They are aware of their shortcomings and are working to address them. Optimizer and Feedback: This is the highest level, where companies monitor environmental changes to ensure they do not regress to a lower maturity level.

Most leaders (44%) believed their company was still in the pathfinder phase. 26% classified their company as entry-level, while 23% ranked themselves in the advanced category. Only 8% considered their company to be at the leader maturity level, and no leader selected the highest level of digital maturity. Based on the information presented earlier, we also believe that companies are still in the exploratory phase.

We also aimed to assess how digitally intensive leaders consider the industry in which their company operates. Leaders could choose from five categories: low, moderately low, medium, moderately high, and high. The majority of respondents (39%) believed their company operates in a medium-intensity industry. 26% ranked themselves in the low category, which is surprising given that most companies were from the trade sector, which We believe belongs more to the moderately high or high digital intensity industries. Both the moderately high and high categories received 13%, and the moderately low category barely reached 10%.

CONCLUSION

Based on the responses, most companies view digitalization as an opportunity (75%), yet the majority do not have a developed digital strategy (93%). This indicates a lack of strategic planning, despite leaders' theoretically positive stance toward technological advancement.

While more than half of the leaders are committed to digitalization, they remain skeptical of their employees' attitudes. According to the responses, half of the leaders feel their workers are indifferent or uninterested in this regard. This could indicate a lack of internal motivation among employees and/or insufficient training, as well as a lack of integration of digital transformation into the organizational culture.

The vast majority of companies (97%) spend between 0 and 10 million forints on digitalization, which is relatively low. Even with the forced digitalization caused by the COVID-19 pandemic, this amount remains modest. This suggests that resources directed towards digitalization are limited, or increasing the level of digitalization does not hold a high priority in the budget.

The use of artificial intelligence technologies is low among SMEs in both Hungary and the EU. However, there are positive examples of the use of Chat GPT and other AI-based tools. That said, the implementation of AI is still in its early stages, and Hungarian SMEs rank near the bottom within the EU in this regard.

Leaders are generally dissatisfied with their employees' digital competencies, particularly in problem-solving, digital content creation, and security. This dissatisfaction highlights the lack of education and training available to employees within companies, or perhaps employees are uninterested in training, or the training provided is not effective. It seems that there is a general dissatisfaction among leaders regarding their employees' digital skills, leading to the conclusion that they are far from implementing any of the currently popular digital practices. First, they need to familiarize themselves with basic technologies and learn how to apply them properly.

The vast majority of leaders still view their companies as being at the "pathfinder" or "entry-level" stages of digital maturity. This means that many companies have only taken initial steps on the path to digitalization, implying that significant developments still need to be made, which will likely require considerable time and effort.

Most respondents believe that the digital intensity of their industry is medium or low. This is interesting, as the trade sector, where most respondents operate, is much more digitally intensive. This suggests that companies do not fully recognize the potential of digitalization within their own industries.

Recommendations

First and foremost, it is essential to develop a digital strategy. While a company can create this strategy internally, it may be beneficial to involve a professional consulting firm.

To increase the use of artificial intelligence-based tools, it is important that leaders communicate their benefits to employees—particularly how these tools support daily work processes. This requires leaders to take on a proactive role. They should ensure employee involvement in the implementation process, which can increase interest in the technology. Organizing practical training sessions is also advisable, along with recognizing those employees who actively use these tools. A similar approach should be taken when developing digital competencies.

To develop employees' digital skills, the current knowledge level should first be assessed, followed by the provision of level-appropriate, hands-on training. It is useful to involve internal mentors, establish an incentive system, and integrate learning into daily work routines.

It is also recommended to consider introducing underutilized or currently unused tools, as all of them could support the company's operations. A digital knowledge base can ease the onboarding process, enterprise resource planning (ERP) software can support data-driven operations, and the use of VPNs can enhance cybersecurity.

Summary

In our research, we surveyed 39 leaders of small and medium-sized enterprises in Hajdú-Bihar County to gauge their views on digitalization, how they evaluate their employees' digital skills, what digital best practices they apply, and how familiar they are with current trends in digital best practices. In the literature review, we discussed the concept of digitalization, digital transformation, and its significance. We introduced the literature on best practices, explaining the definitions and the steps for implementing them. We also considered the literature on change management, which we believe is closely related to the application of best practices. We presented four popular digital best practices and their benefits, particularly focusing on their positive impact on business efficiency.

In summary, the research results indicate that while companies have a positive attitude toward digitalization, they lack strategic planning, resources, and adequate digital competencies. To fully leverage the opportunities offered by digitalization, companies need stronger commitment, increased financial investment, and training programs, as well as better understanding and application of modern technologies.

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