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IMPACT OF COVID-19 PANDEMIC ON SMES DIGITAL TRANSFORMATION JOURNEY – SLOVENIAN AND HUNGARIAN EXPERIENCES

A COVID-19 VILÁGJÁRVÁNY HATÁSA A KIS- ÉS KÖZÉPVÁLLALATOK DIGITÁLIS ÁTALAKULÁSÁRA – SZLOVÉN ÉS MAGYAR TAPASZTALATOK

This article investigates patterns in SMEs' digital transformation journey during the COVID-19 pandemic and whether the lessons learnt from this crisis have influenced their future digital transformation objectives. Following a multiple case study design, semi-structured interviews were conducted with SME owners/managers in Slovenia and Hungary. The analysis within and across cases revealed that the majority of participating SMEs were not digitally ready but still managed to overcome various challenges by adopting or intensifying the use of digital technology. The usefulness of these technologies convinced them to engage more in digital transformation. Although they dealt with similar challenges, their response differed depending on the size and sector. This study contributes to current research by providing a more comprehensive understanding of SMEs' COVID-19 related challenges, their responses to these challenges, and future digital transformation objectives, specifically, their future efforts towards a higher level of digital maturity.

Keywords: digitalization, SME, digital transformation, COVID-19 challenges, case study

A cikk áttekintést ad arról, hogy a KKV-k milyen utat jártak be a COVID-19 járvány alatt a digitális átalakulás terén, valamint, hogy a tanulságokat hogyan használták fel a jövőbeli, digitális átalakítási célkitűzéseik meghatározására. A szerzők a többszörös esettanulmány-tervezés (multiple case study design) módszertana alapján 13 szlovén, illetve magyar KKV cégtulajdonosával/menedzserével készítettek féligstrukturált interjúkat. Az esetek egységes, összehasonlító vizsgálata feltárta, hogy a KKV-k többsége nem volt ugyan felkészülve a digitális technológiák használatára, azonban ezek bevezetésével, intenzívebb használatával sikerült leküzdeniük a különböző kihívásokat, illetve a jövőben is ezen az úton terveznek haladni. A vállalatok reakciója a hasonló kihívások ellenére iparágtól és vállalatmérettől függően eltért. A cikk két ország vonatkozásában, átfogóan mutatja be, hogy a KKV-k hogyan látták a digitális technológia szerepét a kihívások legyőzésében és ez hogyan befolyásolta azokat a jövőbeli célokat, erőfeszítéseket, amelyek egy magasabb digitális érettségi szint eléréséhez vezethetnek.

Kulcsszavak: digitalizáció, kis- és középvállalat, digitális átalakulás, COVID-19 kihívások, esettanulmány

Funding/Finanszírozás:

The authors did not receive any grant or institutional support in relation with the preparation of the study. A szerzők a tanulmány elkészítésével összefüggésben nem részesültek pályázati vagy intézményi támogatásban.

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The article was received: 19. 07. 2023, revised: 03. 11. 2023, 15. 03. 2024 and 11. 04. 2024, accepted: 08. 05. 2024.

A cikk beérkezett: 2023. 07. 19-én, javítva: 2023. 11. 03-án, 2024. 03. 15-én és 2024. 04. 11-én, elfogadva: 2024. 05. 08-án.

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One of the important drivers of business productivity and competitiveness is accelerated digital transformation (Llopis-Albert, Rubio & Valero, 2021). Digital transformation is more than just a technological shift. It can be broadly defined as “a fundamental change process, enabled by the innovative use of digital technologies accompanied by the strategic leverage of key resources and capabilities, aiming to radically improve a business and redefine its value proposition for its stakeholders” (Gong & Ribiere, 2021, p. 12). Intensive and innovative use of digital technology brings opportunities to reduce operating costs, increase work efficiency, strengthen innovation capacity, improve consumer engagement, and provide new opportunities to expand the business to a new market (Ko et al., 2022).

In 2020, during the COVID-19 pandemic, many enterprises experienced supply chain disruptions, declining demand for their products and services, a shortage of inventory, decreased development investment, and government-ordered closures (Mishra & Singh, 2023). However, the enterprises were not affected by the COVID-19 pandemic equally; the hospitality and tourism industries were influenced most severely (Fernandes, 2020). Furthermore, larger enterprises were better able to withstand the challenges posed by COVID-19 as they tend to have access to more resources and have more technological, managerial, and human capabilities. In this respect, SMEs are much more vulnerable (Martin, Romero & Wegner, 2019; Pelletier & Cloutier, 2019). However, due to their small size and structure, SMEs can be much more flexible than larger enterprises. Nevertheless, it takes longer for SMEs to return their business to their state before the crisis (Jeansson & Bredmar, 2019). This vulnerability became apparent after the global crisis in 2008 when SMEs experienced a sudden drop in demand and found themselves in financial difficulties due to lower incomes (OECD, 2009). The effect of the COVID-19 was similar to the 2008 global crisis. According to Juergensen, Guimón & Narula (2020), 71% of Italian SMEs were directly affected by the crisis, while 50% of German SMEs expected longer adverse effects.

Many SMEs responded to the COVID-19 pandemic by making more use of digital technologies (Fehér et al., 2022) as they found that digital technologies enable business continuity even in times of crisis by supporting their key activities such as sales and marketing (Penco, Profumo, Serravalle & Viassone, 2022). In particular, smaller enterprises have begun to use digital technologies that they did not perceive as essential for their business before the crisis, thus allowing them to continue operating even during the lockdowns (Barile & Secundo, 2022). Digital technologies have been used for interaction among employees, with customers, and suppliers, and for work from home, etc. (Alvarez-Torres & Schiuma, 2022). In some cases, digital technologies have even influenced the change in SMEs’ value propositions and business models (Priyono, Morin & Putri, 2020). Unfortunately, some micro and small enterprises had not taken advantage of digital technology as their business only operated in per-

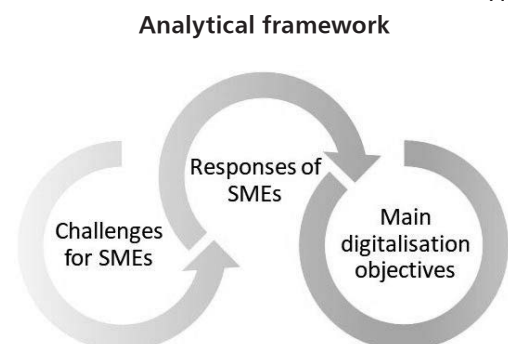
son or did not have the necessary digital infrastructure and skills (Klein & Todesco, 2021).

Digitalization among SMEs is generally lower than that of large enterprises (OECD, 2021). This is not only related to their lack of financial resources, digital skills, and digital competencies but also to their less clear ambitions for digital transformation (Barann, Hermann, Cordes, Chasin & Becker, 2019; Marolt, Zimmermann & Pucihar, 2022). To foster the uptake and use of digital technologies among SMEs various initiatives exist at European and national levels. These initiatives can be divided into financial (tax reduction, financial support), technological (upgrading safety), and human (skills development) (Stamatopoulos et al., 2022). Furthermore, national SME organizations, such as the Chambers of Crafts and Small Businesses, Chambers of Commerce, and digital innovations hubs share know-how on the various aspects of digitalisation with SMEs

In recent years several studies (Humphries, Neilson & Ulyssea, 2020; Klein & Todesco, 2021; Priyono et al., 2020; Mishra & Singh, 2023) have focused on the challenges posed by COVID-19 and how SMEs respond to these challenges. Even though the advancements in digital technologies provide unprecedented opportunities for SMEs, little is known about how they adopt and leverage digital technologies to cope with the consequences of COVID-19 (Winarsih, Indriastuti & Fuad, 2021). Furthermore, the findings are fragmented, neglecting the Eastern European perspective. In addition, although micro enterprises account for over 90% of the total business population in the European Union (OECD, 2021), they are usually overlooked in these studies.

The research aimed to provide insight into what challenges Slovenian and Hungarian SMEs faced during the COVID-19 crisis, how SMEs reacted to these challenges from digitalization and non-digitalization perspectives to ensure business continuity and planned to continue their digital transformation journey. Our analytical framework was built on three pillars presented by Figure 1.

Figure 1



Source: own compilation

Researchers investigated these aspects separately or in pairs but not within a framework (see in Section 2). The bibliometric analysis of 135 papers with the same focus also showed that technology was considered more as a barrier than as part of a sustainable business strategy

(Sharma, Kraus, Talan, Srivastava & Theodoraki, 2023). Based on the 13 cases this article provides a deeper understanding of how SMEs in different type of sector and countries responded to the challenges that emerged with the COVID-19 pandemic and how this reflects in their future digital transformation endeavours. With insights from a more Eastern European perspective and taking into consideration the micro-enterprise point of view, we shed some light on aspects of the topic that have not yet been extensively explored.

Theoretical background

COVID-19 and SME challenges

According to the recent literature, SMEs faced various challenges during the crisis caused by COVID-19. The most prominent issue of environmental turbulence, considered in the literature was related to supply chain disruptions (Mishra & Singh, 2023). The fragility of the global supply chains (e.g., delays in delivery, inability of orders fulfilment, excess orders, obstacles in procurement, and difficulties with maintaining inventory) to small businesses are mentioned and analysed in recent literature (Hossain, Akhter & Sultana, 2022; Pratama, Santoso & Mustaniroh, 2021; Semerádová, Weinlich & Svermová, 2022). Hossain et al. (2022) discussed several reasons for supply chain disruptions, e.g., restrictions on goods carrier movements, stricter commodity inspections, air-flight control, and the significant drop in ocean freight demand. Another environmental turbulence refers to how customers responded to the COVID-19 situation. Hossain et al. (2022) listed the prolonged periods of lockdown, movement control, and social and physical distancing as reasons for changes in shopping and consumption patterns. Pratama et al. (2021) observed that customers have begun to stock up on essential commodities and, simultaneously, cut on consumption of non-essential goods and services. Also, a growing body of literature is related to environmental turbulence and how government restrictions have challenged SMEs during the COVID-19 pandemic. Barragan-Quintero, Pareti & Ovalle-Osuna (2021) described how government measures have affected the operations of small enterprises.

The lack of resources is another challenge, and it is mentioned mainly from two aspects in the literature: limited access to capital and lack of human resources (Hossain et al., 2022). Cash flow shortage was the biggest challenge in the survival of SMEs during the pandemic (Hossain et al., 2022; Klein & Todesco, 2021). Besides the decline in cash flow, SMEs also encountered problems with access to government support (Humphries et al., 2020; OECD, 2020). Concerning the lack of human resources, Humphries et al. (2020) and Klein & Todesco (2021) concluded that skill gaps and labour shortages were among the main challenges faced by SMEs during the COVID-19 pandemic.

Various digital technology-related challenges of SMEs are also reported in the literature (Klein & Todesco, 2021; Priyono et al., 2020). While SMEs have access to various digital tools that can support their busi-

ness functions, like cloud applications, and mobile apps or payment solutions, they struggle with their limited resources and digital knowledge gaps that slow down their digitalization (Dethine, Enjolras & Monticolo, 2020). This is exacerbated that SMEs do not properly map their business needs to information technology (IT) needs and there seems to be a strategic misalignment of their business objectives (Pelletier & Cloutier, 2019). Additionally, SMEs are more vulnerable in the context of the IT skills gap and the growing complexity of information ecosystem (OECD, 2021).

SME responses to COVID-19

Business continuity (business survival) has been widely addressed in recent literature. It can be said that traditional business models were challenged during pandemic times (Semerádová et al., 2022). Adam & Alarifi (2021) advocated that innovation practices are key for the business survival of SMEs. Abed (2021) added that the role of technology in business continuity and business survival is crucial, based on his study of COVID-19 crisis.

External financial support schemes – such as loan guarantees, grants and subsidies, deferred payments, and incentives to commercial banks to expand lending for SMEs were offered during COVID-19 situation (Hossain et al., 2022). Adam & Alarifi (2021) analysed the effectiveness of external financial support on business survival and found that external financial support schemes have a strengthening, moderating impact on business survival. However, one issue, regarding the effectiveness of financial support is the SMEs capability to apply for these grants and subsidies. Khlystova, Kalyuzhnova & Belitski (2022) further emphasized that support policies might have had a very narrow focus and excluded certain sectors or sizes of SMEs.

To better adapt to the changes posed by COVID-19, SMEs also responded by making changes in their organisation. They have digitalized various organizational functions to adapt to COVID-19 situation (Priyono et al., 2020). Fletcher & Griffiths (2020) highlighted the importance of digital maturity as those enterprises are more flexible, hence able to implement the necessary changes more successfully. Furthermore, they have reorganised and digitalized their work to manage productivity and improve team communication, especially during severe COVID-19 restrictions. Technology is an essential facilitator for the organization of remote work (Barabaschi, Barbieri, Cantoni, Platoni & Virtuani, 2022), but the adoption of work from home requires changes in leadership style and change of mindset of the enterprise as a whole (Stoker, Garretsen & Lammers, 2022). To improve productivity, managers must communicate business objectives and regularly meet employees to engage them and receive feedback (Barabaschi et al., 2022).

Supply chains were also affected by the lockdowns and restrictions caused by the Covid-19 pandemic. Marconatto, Teixeira, Peixoto & Faccin (2022) emphasized the importance of supplier and customer diversification before and during the COVID-19 pandemic. In the context of cus-

customer relations, Penco et al. (2022) investigated how entrepreneurial orientation (innovativeness, proactiveness, risk-taking, competitiveness) can influence the adaptation to situations forced by external stimuli e.g., COVID-19 pandemic. They observed that all enterprises turned to digital transformation as a reactive or proactive response. In the context of supplier relations, Ramanathan, Aluko & Ramanathan (2021) suggested that to mitigate supply chain disruption, SMEs need to collaborate with other small businesses in the supply chain to meet the demand and look for alternative business opportunities.

SMEs' digital transformation objectives

Digital transformation plays a crucial role in responding to the challenges of the COVID-19 pandemic. It is unclear what the state of the economy and society will be after this crisis as new digital technologies have been introduced to businesses (Akpan, Soopramanien & Kwak, 2020). The lessons and experiences could influence SME business continuity and resilience (Bai, Quayson & Sarkis, 2021). Unfortunately, SMEs face many challenges when dealing with digitalization. Although many SMEs are keen to adopt new digital technologies, they often lack clear digital transformation objectives aligned with their business needs and investment capabilities. Investment in digital infrastructure (hardware and software) alone is not enough to enhance the digital capabilities, or the business performance of enterprises (Matarazzo, Penco, Profumo & Quaglia, 2021). ICT savviness of employees (Priyono et al., 2020;) and adequate ICT skills that drive innovation (Alam et al., 2022) are critical requirements for successful ICT investments and digitalization projects (Endrodi-Kovács & Stukovszky, 2021).

Methodology

A qualitative research approach was used to gain insights into the phenomenon under study (Yin, 2009) as limited literature has been published on this specific topic (Myers & Newman, 2007). Hence, to explore the challenges, responses, and future goals of digital transformation, a multiple case study was conducted. Moreover, as the purpose of the study was also to explore whether there are certain patterns in the digital transformation journey of SMEs, case studies are more appropriate than quantitative approaches (Doern, Williams & Vorley, 2018).

Yin (2009) suggests a case study protocol as an important component in asserting the reliability of the case study research. The Case study protocol is used as the main guideline for conducting case studies involving multiple researchers from different countries participating in the research (Malmqvist, Hellberg, Möllås, Rose & Shevlin, 2019), in this case researchers from Hungary and Slovenia. The Case study protocol defines the focus of the case study, the means of data collection, the case selection criteria, the questions and the report's structure, and the analysis of the results. The protocol serves as a guideline for researchers to collect data, especially in multiple-case studies systematically.

Case study design

First, an interview instrument was developed according to the theoretical considerations. The semi-structured questionnaire was developed to capture the SME background, COVID-19 challenges, COVID-19 digital and non-digital response, and the main future digital transformation objectives. The researchers from both countries met for three sessions, extensively discussing the clarity and order of the questions (see general interview questions in the Appendix). The final version of the interview instrument was translated into Slovenian and Hungarian. The interview guideline was developed with the interview instrument to inform the interviewer on how to prepare and conduct the interviews.

Then the SMEs sample was determined. The sample included relevant cases from micro, small, and medium-sized enterprises as defined by the European Union based on (1) number of employees and/or (2) turnover or balance sheet total (in million euros). In Slovenia and Hungary, the manufacturing and service sector enterprises from different industries that are not primarily ICT oriented and had successfully adapted their business during the COVID-19 crisis were considered. At least six cases were selected per country, with at least one SME from the manufacturing sector and one SME from the service sector per SME size (micro, small and medium-sized enterprises). Annex 2 in the Appendix provides details on the SME selection criteria.

Data collection

Only researchers who participated in the case study design were involved in the data collection. Upon scheduling an appointment for an interview, the researcher informed the interviewee about the topic and sent them an invitation letter and an outline of questions in advance. Each researcher had to prepare for the interview. This included going through the questionnaire again and collecting available information about the SME under study. The following sources were of particular interest: (1) enterprise websites; (2) annual reports; (3) other material available online about the enterprise. Based on the interview guideline, the semi-structured interviews were conducted with high-level SME decision-makers via online collaboration tools or in person where possible. The interviews were conducted between May and August 2021 and involved 13 SMEs from both countries, following Miles & Huberman's (1994) recommendation not to exceed 15 cases as this may complicate the analysis. The presentation of the participating SMEs can be found in Annex 3 in the Appendix.

The interviews were audio taped, and the researchers also took notes on observations during the interviews. Immediately after the interview, a clean verbatim transcript was made based on the audio file. Participants were encouraged to provide feedback on the transcript of their interview. The interview transcript, the material collected before the interview, and the researcher's notes made in Slovenian or Hungarian helped the researcher involved in the case to prepare a comprehensive report in English. This approach allowed us to have a better overview of all the cases and a cross-case analysis.

Data analysis

Since the reports were written in English and the rest of the text was either in Slovenian or Hungarian, two researchers from each country participated in the coding process. A mixed procedure of deductive-inductive content analysis was used. Based on theory and previous research, the categories and subcategories were determined in advance. First, the researchers carefully reviewed all the reports and then met to discuss whether the reports contained text passages relevant to the defined categories and to create a coding scheme. Based on their initial impressions, the researchers decided to carefully read the material written in their mother tongue (transcripts, other available material) to minimise the possibility of researcher bias in writing the report. Then they met again and updated the coding scheme by adding coding rules if there were problems in delineating between categories. Then two researchers from each country carefully read the case narratives and started coding based on the coding scheme. After a week, they met again to discuss new codes that emerged inductively from the data. Several interactions and modifications occurred before the coding scheme was finalised.

Two case narratives were selected to test the coding scheme, one Slovenian, coded by two Slovenian researchers, and one Hungarian, coded by two Hungarian researchers. To ensure objectivity and accuracy in coding, each pair of researchers worked independently on the same case and then compared and discussed their classifications. Once the pair had reached a coding consistency the coding scheme was applied by one researcher from the pair to all case narratives from the respective country. The coding results were then quantified in the form of tables for each country and finally merged from both countries to compare and interpret the data.

Findings

Challenges posed by COVID-19

SMEs have experienced different challenges during the pandemic time. The challenges are detailed in Table 1, where the number of asterisks indicates the number of SMEs.

First, the SMEs challenges related to environmental turbulence were identified. Several SMEs had to close temporarily in the first wave of COVID-19 pandemic. When they could open again, they faced additional challenges. Among others, they had issues with keeping the proper physical distance between the customers. Insurance-Brk spent too much time on cleaning and disinfection. Issues with closed borders, travelling restrictions, and managing the related administration caused additional problems for manufacturing SMEs. Fruit-and-Veg highlighted difficulties in importing seasonal workers, while Food-Supl stressed problems in procurement from neighbouring countries. Furthermore, Food-Supl severely struggled from supply chain interruptions by its European partner's Asian subcontractor due to closed borders, while delays in procurement of materials and raw ingredients were less severe in the case of Alu-Treat, and Choco. Gate-and-Parking experienced slowdown and failures in their partner processes due to the home-office administration. In the case of Fruit-and-Veg the closed borders resulted in wasted/spoiled food and additional costs as the food had to be disposed of in accordance with the legislation. Fruit-and-Veg experienced an increase in online sales during lockdown, but it decreased after the lockdown when customers returned to their routine and started shopping in supermarkets again. Reverse-Vending experienced that environmental awareness for bottled drinks was intensified by the pandemic. Furthermore, some products or services were more required than before, for example, health-related products to boost the immune system at Food-Supl and caskets at Wood-Proc. Loss of customers affected fewer SMEs. For instance, Fashion pointed out that the demand for elegant clothes decreased due to the pandemic.

Second, the findings show that COVID-19 increased SMEs' vulnerability due to the lack of resources. For example, Choco reported financial reserves available to cover salaries for only two months as their revenue had decreased significantly while the Reverse-Vending reported an additional financial burden, as they needed to increase salaries to avoid employee churn. The lack of human capital was also found to be a challenge for SMEs.

Table 1

Challenges posed by COVID-19

Code	Sub-code	Number of SMEs compared by			
		Type of sector		Country	
		Manufacturing	Service	Slovenia	Hungary
Environment turbulence	Government regulations and guidelines	***	****	****	***
	Fragility of the supply chain	***	**	****	*
	Changes in customer buying pattern	*****	*****	*****	*****
	Loss of customers	**	**	*	****
Lack of resources	Financial	***	****	**	****
	Human capital	*	**	**	**
Digital technology issues	Lack of digital skills & knowledge	**	**	**	**
	Inadequate digital technology	*	**	**	*
	Underutilization of digital technology	*	***	***	*

Source: own compilation

The reasons were various for SMEs, including employee's absence due to illness or quarantine, seasonal workers could not come back after they went home, or employees leaving as they were not feeling valued during the lockdown.

Third, we observed that SMEs had problems with digital technology use. Several SMEs have admitted the lack of digital skills and knowledge. For example, Reverse-Vending reported a lack of digital skills in managing online interactions, while Choco in the areas of digital marketing and cybersecurity and Fruit-and-Veg in IT skills in general. SMEs were quite specific about concerns regarding inadequate digital technologies. Choco mentioned an outdated webstore, while Fruit-and-Veg the need for a new ERP system as the existing one does not meet their needs anymore. The underutilization of digital technology was also noticeable in the daily operations of the SMEs. For example, decision-making in Beauty is still based mainly on intuition, despite having their software for data analytics and data collection from the webstore, salon customers, and social media. Similarly, Food-Supl has all the necessary digital technologies in place but noticed the insufficient use of the digital technologies for reporting and monitoring their operations. At Fashion, the communication with partners took place in person or by phone before the pandemic.

The Slovenian interviewees mentioned additionally maintaining employees' perception of being valued during lockdown was one of the main challenges for Beauty

salon and Fruit & vegetable distributor managers. Food supplement producer had difficulties in directing employees' attention toward the generation of new and useful ideas. Even though they have had regular online meetings they noticed the decline in the innovativeness of their employees during the time they worked from home. Two SMEs noticed reduced employee enthusiasm during an uncertain, unprecedented period. Motivating employees for learning was also difficult for Fruit & vegetable distributor who reported that even with pre-paid registration fees the employees were not willing to take a digital marketing course.

Lack of financial resources was more prevalent in micro-enterprises than in larger SMEs. The changes in customer buying patterns affected both. The other challenges mainly concerned the larger SMEs. When comparing SMEs by country and sector type, we also encountered some differences in the way they experienced different challenges. The first difference relates to environmental turbulence. Here we only noticed differences between countries. We found that supply chain problems were related to the international movement of goods. Slovenian SMEs saw themselves at risk mainly because they relied on a just-in-time inventory system. In addition, the shortage of raw materials led to increased competition for scarce resources. Hungarian SMEs, on the other hand, were not as affected by the supply chain fragility but struggled with the loss of customers to a greater extent. Customers left three SMEs due to the issues in the automotive sector.

Table 2

Types of SMEs response to COVID-19

Code	Sub-code	Number of SMEs compared by			
		Type of sector		Country	
		Manufacturing	Service	Slovenia	Hungary
Internal operational changes	Adaptation of processes that were not possible to execute at home	***	**	****	*
	Work from home	*****	****	*****	****
	Work in a more agile way, employees self-organizing	***	*	**	**
	Implementation of technological innovations (non-digital)	*	*	**	-
	Change of internal business processes (digital, except for remote work)	****	*	**	***
	Management support (culture, motivation, ...)	***	-	*	**
Digitalization of customer touchpoints	Intensify digital marketing campaign	***	***	****	**
	Intensify communication via social media (Facebook, ...)	***	***	****	**
	Establish/intensify online sales (web store, specific websites, ...)	**	***	****	*
	Intensify communication via online communication channels (Zoom, Teams)	***	**	*	****
Non-digital changes in supplier relations	New/additional suppliers (also partnership with a competitor for effective order delivery)	**	***	****	*
	New ways of collaborating with existing partners	*	-	*	-
Changes in value proposition	Entering new market segment (addressing new market opportunities)	*	****	****	*
	New/optimized offerings	***	****	****	***
Take advantage of government support	Applying for government assistance programs	***	***	****	**
	Asking for additional support from various government bodies	**	**	**	**

Source: own compilation

The demand decreased for spare parts produced by CNC, moulded plastic components, and car or travel insurances. Another difference concerns human resources. According to the results, it was more pronounced in the service sector. While the SMEs in the service sector faced prolonged closures or restrictions on their operations, their employees felt useless. In addition, businesses that relied on international or seasonal labour faced challenges due to travel restrictions and the unavailability of foreign labour. Insufficient use of digital technology is also a challenge where differences were identified. While in Slovenian service SMEs pandemic served as a catalyst for digital transformation, Hungarian service SMEs were satisfied with the digital solutions already implemented. In addition, management related challenges were found in Slovenian SMEs.

Responses to COVID-19

Even though the SMEs dealt with different combinations of the above-identified challenges, they tried their best to continue their business. Their responses are detailed in Table 2, where the number of asterisks indicates the number of SMEs.

First, we identified several internal operational changes that enabled SMEs' continuous work. This includes setting up a working environment that was adapted to the COVID-19 restrictions by either adapting the existing working environment in the premises of SMEs or enabling work from home. SMEs also reported more agile ways of working to react to changes in customer behaviour as well as enhance communication or collaboration among employees or partners. For instance, Reverse-Vending reported changes in organizational structure, resulting in a less hierarchical organisation, to simplified and more effective communication. Another response that needs to be mentioned is the role of management support. Even though Food-Supl engaged employees in regular meetings, a decrease in creativity and innovative thinking was noticed which resulted in a hybrid mix of remote and on-site work arrangements as soon as it was possible. Digital technology was not used by SMEs just for establishing remote work but also to change other internal business processes. For example, CNC-Proc has intensified the use of SharePoint and Reverse-Vending has started to use a collaborative version of project management software to promote collaboration. Implementation of technological (non-digital) innovations of organizational functions was also evident. For instance, Choco upgraded its production process and integrated energy-saving equipment.

Second, we encountered the digitalization of customer touchpoints as another response to challenges situation emerged from customers' side. According to our findings, SMEs have predominantly focused on customer relations as they are of crucial importance in SME digitalization and due to drastic changes in customer buying behaviour. By intensifying the use of digital technology, SMEs have started to promote their brand more extensively online, were able to sell their products/services online, and intensify online communication via social media and other

online communication channels. For example, Fashion started to advertise the enterprise via social media daily, Beauty started to engage its customers by posting live videos, and Therapist offered live individual or group online training for end customers. As a response to Covid-19 related challenges, two SMEs have managed to establish a webstore and the other three intensified online sales via their existing webstore.

Third, we discovered that the digitalization of the supply chain was not needed as it was already at a satisfactory level and thus was not drastically affected by the COVID-19 situation. Nevertheless, other, non-digital responses were evident in relations with suppliers, including searching for an alternative source of supply and collaboration with other enterprises to meet the demand. For instance, Food-Supl ran out of jars, and they were not able to order them from a supplier from Italy. Therefore, they found a new supplier who was able to deliver very similar jars and inform customers that their products would be packaged differently but with the same content. On the other hand, Alu-Treat had a lot of problems finding additional suppliers. Therefore, they bought the missing material from competitors and vice versa.

Fourth, we encountered changes in the value proposition. SMEs have either entered a new market segment or introduced new/optimized existing offerings. For example, Fashion has started to sell face masks and medical clothing while Therapist started to offer online counselling services that help enterprises to improve the mental and physical health and well-being of their employees. On the other hand, Food-Supl and Wood-Proc only changed their offering. For instance, Food-Supl developed a new line of food supplements designed to treat Covid-19 symptoms (vitamin D and C, etc.).

Finally, some small and medium-sized SMEs have taken advantage of government support, mainly to cope with the lack of resources. Two different government supports were identified. Besides applying for financial government support, SMEs have also asked for non-financial government support. For example, Fruit-and-Veg and Food-Supl have asked the Chamber of Commerce to speed up customs procedures at the borders.

Looking from the country and sector perspectives we encountered several differences in the response of SMEs to the COVID-19 situation. First, there are differences in the internal operational changes they have made. Slovenian SMEs reorganised their operation with prolonged work hours, newly created employee groups, and investing in production technology. Hungarian SMEs were more focused on reorganizing non-production processes such as planning, development, etc. Some operational changes were more pronounced in production SMEs. For example, production SMEs gave their employees more autonomy in managing their work schedules and tasks and enabled them to communicate more effectively across functions. They have also digitalized their internal processes to better support their day-to-day activities and the management also provided better support. This indicates that the nature of on-premises work required from produc-

tion SMEs more adaptability of their internal processes. The digitalisation of the customer touchpoints is another response where we found differences. While Slovenian SMEs have intensified their online marketing, Hungarian SMEs have started to use online communication channels to interact and provide their services through these channels. Dysfunctionalities of the automotive sector spilt over the life of three SMEs, so they were pushed to acquire new customers and make contracts with them online due to governmental regulations. Slovenian SMEs have sought new suppliers and partners to a greater extent which makes sense as the vulnerability of the supply chain was more evident in this group of SMEs. Slovenian SMEs have also entered new markets to survive and attract new customers. This also explains why they did not highlight the loss of customers as a challenge. SMEs in both countries also reacted differently to government support. This was expected as each country took its approach to providing support for SMEs. Surprisingly, none of micro enterprises was able to apply for government support.

Main digital transformation objectives

Based on experiences during the pandemic, SMEs have also acknowledged opportunities for digital transformation in the future as highlighted in Table 3 (the number of asterisks indicates the number of SMEs).

product or service experience in line with customers' needs while Hungarian SMEs are lagging in this respect. However micro enterprises struggled to raise the financial resources, majority of examined micro enterprises wanted to increase its spending in digital technology and more than half of them aimed to improve digital skills as well. Despite their small size, they want to go one step further in digitalisation.

Discussion

Our research findings show that Slovenian and Hungarian SMEs face similar challenges as the rest of SMEs in other parts of Europe. Our findings support Barragan-Quintero et al. (2021) by highlighting the difficulties in complying with ever-changing government regulations. Furthermore, our findings provide additional support for challenges related to the fragility of the supply chain highlighted by Hossain et al. (2022). Moreover, our findings in relation to changes in customer buying behaviour mirror the examples mentioned by Pratama et al. (2021). As in the literature, we also found that the lack of financial resources (Hossain et al., 2022; Klein & Todesco, 2021) and the lack of human capital (Humphries et al., 2020; Klein & Todesco, 2021) remain important challenges for SMEs survival. We also observed that SMEs had problems with

Table 3

SMEs main digital transformation objectives

Code	Sub-code	Number of SMEs compared by			
		Type of sector		Country	
		Manufacturing	Service	Slovenia	Hungary
Digital transformation objectives	Increase spending on digital technology	*****	*****	*****	*****
	Improve digital skills	*****	*****	*****	****
	Explore possibilities for improved value proposition	***	****	*****	*
	Foster digital culture	**	***	***	**

Source: own compilation

According to our findings, several SMEs are planning to increase spending on digital technology and improvement of digital skills. For instance, Beauty is planning to invest in the digitalization of supply chain processes, Fruit-and-Veg identified the need for a new ERP system, while Fashion wants to extend their monitoring processes. All SMEs that are planning to invest in new digital technology also pointed out the need to continuously develop digital skills as they are required to leverage digital technology to a greater extent in the future. For example, Beauty pointed out that openness for data-driven decision-making needs additional data analytics skills, Gate-and-Parking aims to improve managerial digital skills.

When identifying differences in SMEs future digital transformation objectives we observed the major difference between Slovenian and Hungarian SMEs in exploring opportunities to improve the value proposition. It seems that Slovenian SMEs see the potential in digitalising products or services and consider offering a richer

digital technology use (Klein & Todesco, 2021; Priyono et al., 2020), mainly because of their limited digital skills, inadequate use of digital technology, and the use of inappropriate digital technology.

The above-mentioned challenges triggered a number of responses. These include creating a work environment adapted to the COVID-19 restrictions by either adapting the existing work environment in the premises of SMEs or enabling work from home (Barabaschi et al., 2022) resulting in a hybrid mix of remote and on-site working arrangements (Faulds & Raju, 2021; Pataki-Bittó & Kapusy, 2021). The digitalization of customer touchpoints is another response to drastic changes in customer buying behaviour (Franco, Godinho & Rodrigues, 2021). SMEs have started to increasingly promote their brand online, were able to sell their products/services online and intensify online communication via social media and other online communication channels, which has also been emphasised in the recent literature (Barragan-Quintero et

al., 2021; Penco et al., 2022). Due to the change in customer buying behaviour SMEs have changed their value proposition by either entering a new market segment or introducing new/optimised existing offerings. To cope with the lack of resources, our findings further emphasize the importance of government support offered to SMEs (Anwar, Tajeddini & Ullah, 2020; Wang, Goh, Sornette, Wang, & Yang, 2021).

During COVID-19 situation the participating SMEs were pushed to make several changes that they probably would not have made otherwise. For most participating SMEs the lessons learned and experiences gained during the COVID-19 situation have influenced their future digitalization endeavours. Nevertheless, they all agree that the pace of their digital transformation is slowing down. This slowdown is worrying and requires new approaches to boost progress. In this context it is crucial to highlight heterogeneity of SMEs which should be taken into account by policymakers and other stakeholders when developing strategies, initiatives, and solutions. Our findings underscore the significance of considering factors such as size, sector, and digital maturity. Micro-enterprises constitute a substantial segment of the business landscape, yet their distinct characteristics and challenges often receive less attention. This study points out that the assumption that policies and strategies designed for small and medium-sized enterprises are universally applicable to micro-enterprises may not be accurate. The findings of the comparison between manufacturing and service SMEs reveal a lack of insight into the supply chain among manufacturing SMEs. To avoid disruptions in the flow of goods the use of digital technology to improve inventory tracking should be one of the priorities when promoting digital transformation in this sector. Regarding digital maturity, less digitally mature SMEs could benefit from accessible training programs, financial incentives, and simplified regulations to encourage essential digital adoption. In contrast, more digitally advanced SMEs could thrive with the creation of an innovation-friendly ecosystem to accelerate the adoption of advanced technologies.

Conclusion

This article provides a deeper understanding of how SMEs' response to the challenges of the COVID-19 pandemic is impacting their future digital transformation efforts. By analysing SMEs using the more complex framework, our study reveals that while SMEs have taken some steps towards digitalisation during COVID-19 and expressed their willingness to invest further, they do not intend to do as intensively as during COVID-19. Therefore, our findings not only highlight the importance of implementing tailored strategies and support measures for SMEs but also the need to consider other specificities such as size, industry, and digital maturity to accelerate the digitalisation process.

Furthermore, we found that the unexpected events have created a very uncertain environment for most SMEs. The way SMEs responded to the uncertainty depended on their organisational readiness, reflected in

managerial support, accessible financial resources, and skilled employees. Unfortunately, SMEs have shortcomings in all of these areas. Their response also depended on the level of their familiarity with digital technology. More digitally mature enterprises were quicker to implement the necessary changes. Due to the various restrictions related to COVID-19, the digital response prevailed over the non-digital response. In terms of digital response, two general digitalisation patterns were observed. The majority of SMEs focus on the digitalisation of customer relations by increasingly using digital channels and setting up e-commerce platforms to improve customer accessibility. In addition, these SMEs have also digitalised some internal business processes, mainly by introducing cloud-based collaboration platforms and setting up digital document management systems for a seamless exchange of documents and information across departments. Only more digitally mature SMEs have taken more concrete steps by automating repetitive and time-consuming tasks with digital tools and software or have started to collect and analyse data to make more informed decisions.

Given the complexity of the phenomena under the research, we shed some light only from the perspective of the 13 SMEs. As the participating SMEs do not represent all industries and sectors, further research can be conducted to extend these findings. In addition, to increase data coverage and validity, the range of the interviews can be expanded to different job positions in enterprises. Even though the insights from two countries are provided, and some general digitalization patterns are identified, the findings from other countries are needed to understand better SME practices that may lead to better future resilience. Finally, the generalizability of the identified SMEs' digital transformation journey patterns during the pandemic should be tested.

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Appendix

Annex 1

Main interview questions

1. How and why did the Covid-19 pandemic affect the performance of the company?
2. What were your biggest digitalization challenges posed by COVID-19 pandemic?
 - a. Which IT did you mis or underutilise in your company?
 - b. What digital knowledge and skills have you found lacking your company?
 - c. To what extent did you have problems keeping track of customers behaviour patterns?
 - d. How did you deal with limited access to capital?
 - e. To what extent have you been aware of government assistance programs?
3. How did COVID-19 pandemic accelerate the digitalisation of your business?
 - a. To what extent did you switch to working at home – remote work - during the pandemic COVID-19?
 - b. How has the COVID-19 pandemic changed the way your business engages and interacts with customers?
 - c. How has the COVID-19 intensified online sales (via social media, special websites ...)?
 - d. How has the COVID-19 pandemic triggered a race for new strategic partnerships to adapt to supply and demand?
 - e. To what extent did you intensify data monitoring and analysis during COVID-19?
4. Based on your experience during COVID-19, what are your main business digitalization objectives?
 - a. How do you think increased spending on digital technology can facilitate the digitalisation of your business?
 - b. How do you think digital skills and knowledge can facilitate the digitalisation of your company?
 - c. How do you think new organisational structures and management styles can enhance digitalization of your company?
 - d. How do you think digital technologies can enhance and improve the value proposition of your business offering?

Annex 2

Required SME selection criteria

SME size	Slovenia	Hungary
Micro enterprise (<10)	manufacturing industry ≥ 1 and service industry ≥ 1	manufacturing industry ≥ 1 and service industry ≥ 1
Small enterprise (10-49)	manufacturing industry ≥ 1 and service industry ≥ 1	manufacturing industry ≥ 1 and service industry ≥ 1
Medium-sized enterprise (50-249)	manufacturing industry ≥ 1 and service industry ≥ 1	manufacturing industry ≥ 1 and service industry ≥ 1
Σ	≥ 6	≥ 6

Source: own compilation

Annex 3

Overview of SMEs

ID*	Case SME	Employee number	Annual sales	Founded	Target market	Customer segment	Industry
S1	Beauty (Beauty salon)	20-25	616.717,26	2012	Local and national	B2C and B2B	service
S2	Fruit-and-Veg (Fruit & vegetable distributor)	125	29.595.751,00	1990	Local and national	B2B and B2G	service
S3	Choco (Chocolateria)	9	403.781,82	1992	Local and national	B2C, B2B, and B2G	manu-facturing
S4	Food-Supl (Food supplement producer)	71	14.517.436,00	1954	Local, national, and global	B2B and B2C	manu-facturing
S5	Alu-Treat (Aluminium surface treatment provider)	16	725.433,40	1993	Local, national and EU level	B2B	manu-facturing
S6	Therapist (Therapeutic training provider)	0	100.221,64	2016	Local	B2C	service
H1	Insurance-Brk (Insurance broker)	5	364.122	1994	Local and national	B2B, B2C	service
H2	Reverse-Vending (Manufacturer of reverse vending machine units)	16	1.628.861	2006	Local, national and global	B2B	manu-facturing
H3	Gate-and-Parking (Gate and parking & central vacuum technology services)	12	923.650	1995	Local and national	B2B, B2C	service
H4	Wood-Proc (Wood panel processing)	6	364.192	2000	Local and national	B2B	manu-facturing
H5	Plastic-Inject (Plastic injection moulding)	248	21.704.504	1985	Local, national and international	B2B	manu-facturing
H6	Fashion (Clothing service provider)	58	593.423	1996	Local, national and international	B2C	service
H7	CNC-Proc (CNC metal processing)	7	572.043	2010	Local, national and international	B2B	manu-facturing

Source: own compilation