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# THE DIGITAL TRANSFORMATION PROCESS IN THE SMALL AND MEDIUM ENTERPRISE (SME) SECTOR IN THE ERA OF THE-COVID-19 PANDEMIC: A STUDY IN POLAND AND CROATIA

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**ABSTRACT** This paper aims to explore the extent to which the pandemic has forced SMEs to accelerate their digital transformation efforts to remain competitive and adapt to the changing business landscape. The focus is set on three key research questions: (i) How did digitalization manifest itself in SMEs before the pandemic outbreak? (ii) how did SMEs' digital transformation evolve during the pandemic? and (iii) what business challenges do SMEs face in the post-COVID period due to the acceleration of digital transformation? For the empirical investigation, qualitative research methods are used as in-depth interviews in 10 SMEs in Poland (six) and Croatia (4). The main results emphasize three main findings. First, even before the pandemic, SMEs recognized and used various digital transformation technologies to improve their business processes and performance. Second, the development of digitalization processes in the observed SMEs during the pandemic was mainly driven by the need for remote work, e-commerce, virtual events, and automation of business relationships among all stakeholders. Third, the post-pandemic world confirms the need for SMEs to invest in cybersecurity, talent acquisition, infrastructure, customer engagement, and data privacy to remain competitive in the digital economy.

**KEYWORDS:** *digitalization, digital transformation, SMEs, COVID-19 pandemic, Poland, Croatia*

## 1. INTRODUCTION

The COVID-19 pandemic has brought unprecedented challenges to businesses across the globe, and small and medium-sized enterprises (SMEs) have been particularly affected. As the pandemic forced societies

into lockdowns and social distancing measures, SMEs faced immense pressure to adapt their operations to a rapidly changing business landscape. In this context, digital transformation emerged as a critical strategy for SMEs to overcome the challenges and ensure their resilience and continuity.

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Digitalization is using digital technologies to reorganize existing or create new business processes (Mahmood et al., 2019; Fitzgerald et al., 2014; Gobble, 2018). Thus, digitalization initiates the digital transformation process that creates customer value (Henriette et al., 2015; Morakanyane et al., 2017). The fourth industrial revolution forces all industries to undergo a complete digital transformation (Jones et al., 2021). It was promoted during the expert debate in Davos in 2016 as part of the annual economic forum. The topic "Mastering the Fourth Industrial Revolution" was discussed, and the consequences of the revolution for all economic actors (businesses, governments, and societies) were investigated (Schwab 2016). Industry 4.0 refers to the fourth industrial revolution. It is based on four leading concepts: cyber-physical systems, the Internet of Things, the Internet of Services, and the Smart Factory (Bartosik-Purgat et al., 2022). Industry 4.0 technologies, which represent both a goal and a challenge for SMEs, can be divided into three areas: the availability of digital data and Big Data analytics with cloud computing; robotization and automation with new machine-human relationships (hybrid workforces); and digitalization forcing business transformation (Villa & Taurino, 2019).

The COVID-19 pandemic triggered extraordinary changes in the global business environment. A deep recession followed: real economic activity declined dramatically and remained below the long-term average for over a year (Bilbiie & Melitz, 2021). The challenges of digital transformation and the implementation of Industry 4.0 strategies were accelerated during and after the coronavirus pandemic by the need to make new investment decisions that consider digital tools to support businesses (UNCTAD 2020; 2021; 2022). Deloitte experts estimate that the automation and digitalization of processes in retail have accelerated by at least 20 percent. In the long term, this rate is estimated to be as high as 90 percent (Deloitte 2022). New technologies, new software, and various digital platforms are increasingly being used, and digitalization has expanded to a range of services (Kowalski et al., 2021). For example, about 26.66 billion devices in healthcare are currently connected to the Internet of Things (IoT). By 2025, the installed base of IoT devices worldwide is expected to grow to nearly 75.44 billion (Aileni et al., 2020). Companies are embracing the digital approach to improve the value chain processes and meet customer expectations. Digital innovation, agility, and sustainable management are the leading concepts of the digital transformation process (Jones et al., 2021).

SMEs are key actors in the global economy. They account for 90% of businesses and more than 50% of jobs (World Bank, 2023). Compared to the big play-

ers, they do not have an advantage regarding their resources. Still, they have an advantage in terms of agile resource management, flexibility, and the ability to respond quickly to changes in the business environment (Joseph & Dhanabhakym, 2022). The sophistication of digital transformation in SMEs' value creation activities can determine their value and survival in global value chains (GVCs) (Oliveira et al., 2021; Ardito et al., 2021). Managers must adapt their business strategy to digital reality (Reis et al., 2018).

The level of digitalization in Polish and Croatian SMEs before the COVID-19 pandemic and the scope of digital transformation in these companies during and after the COVID-9 pandemic were investigated. The stability of digitalization acceleration in these companies after COVID-19 and whether this process will continue to accelerate were also investigated. Research studies on the advancement of the digital transformation process in SMEs usually focus on narrowly selected specific areas (Garzoni et al., 2020; Ragazou et al., 2022; Yang et al., 2023; Hulla et al., 2021; Battisti et al., 2022; Hadjielias et al., 2022; Wes-sels & Jokonya, 2022) and do not capture the digital transformation in its entirety.

Our study fills this gap by providing a broad overview of digital transformation. It deepens the knowledge about the digital transformation processes in SMEs during the pandemic.

## 2. LITERATURE REVIEW AND RESEARCH QUESTIONS

Digital transformation involves much more than just using digital technologies and demonstrates the radical changes in how people think and understand business processes. Digital transformation is not just about digital technology. However, digital transformation explicitly implies the use of digital technologies to drive significant changes in the SME's business model, and it implies that something transformative is happening in the organization (Fitzgerald et al., 2014). In general, through digital transformation, SMEs integrate digital technologies into their existing business to add new value to their market segment.

Digital technology has greatly changed the existing business models of SMEs by significantly impacting how SMEs conduct their business. Some related modalities of how digital technology has changed the business model of SMEs are explained in the following paragraphs.

Digital technology has made it easier for SMEs to establish an *online presence* through a website and social media platforms, reach a wider audience, and potentially increase their customer base (Rugova &

Prenaj, 2016; Foroudi et al., 2017). E-commerce platforms for online sales, such as Shopify, WooCommerce, or BigCommerce, have opened new markets for SMEs and, more importantly, lowered the barriers to entry for starting an online business (Lawrence, 2011; Hanell et al., 2020). Digital technologies such as chatbots, AI-powered customer service tools, and robotics have enabled SMEs to automate certain processes and indirectly reduce costs and improve efficiency (Lecerf & Omrani, 2020). Big Data Analytics and similar technologies have enabled SMEs to collect and analyze large amounts of data, providing them with insights into customer behaviour, market trends, and other important information that helps them make better business decisions (Liu et al., 2020).

Collaborative tools, such as Zoom, Microsoft Teams, and Skype, have made it easier for SMEs to cooperate/network with other businesses and individuals, which undoubtedly opens new opportunities for SMEs to grow and innovate (Dutta et al., 2020). Mobile technologies are considered a game changer for SMEs as they enable them to work more efficiently, increase their productivity, communicate better with their customers, and reach them where they are (Passerini et al., 2012). Cloud-based technology eliminates the need for SMEs to invest in expensive IT infrastructure and maintenance costs such as hardware and software costs, saves energy costs, and avoids the cost of hiring and training IT staff (Attaran and Woods, 2019).

Many case studies of digital transformation in SMEs illustrate how SMEs use digital technology to increase their competitiveness, improve their customer experience, achieve sustainable growth, and improve their marketing, sales, and product development processes. In addition, digital technology has drastically changed their respective business models over time, fostering their growth from smaller to larger market players. In addition, case studies provide insights into the various aspects of the digital transformation of business models, including mobile technology, cloud computing, digital marketing, and data analytics.

Marley Spoon is an online meal kit delivery service. Marley Spoon developed a website and mobile app that allowed customers to choose from various meal options, customize their orders and receive real-time delivery updates. Through digital transformation, Marley Spoon increased its revenue and built customer loyalty (Marley Spoon, 2023).

Canva, an Australian-based graphic design platform, realized it needed to invest in digital technology to scale its business and compete with established design platforms (Canva, 2023). Canva developed a cloud-based platform that allowed customers to access their designs from anywhere, collaborate with

team members, and use AI-powered tools to improve their designs. Digital transformation has enabled Canva to reach a wider audience and increase its revenue.

Rothy's is a U.S.-based sustainable fashion brand that makes shoes and accessories from recycled materials. To compete with traditional fashion brands, the company needed to adopt a digital-first approach (Rothy's, 2023). Rothy's invested in digital marketing, social media, and e-commerce. The company also used data analytics to gain insights into customers' behavior and preferences. As a result of its digital transformation, Rothy's has increased its revenue and expanded its product line.

C2FO is a U.S.-based fintech company that provides a platform for companies to optimize their working capital by offering early payment to suppliers (C2FO, 2023). The company recognized that it needed to adopt a data-driven approach to sales and marketing to scale its business. C2FO developed a predictive analytics model identifying the businesses most likely to benefit from its platform. The company also uses machine learning to optimize pricing and payment terms. As a result of its digital transformation, C2FO has changed its current business model and has been able to increase its revenue and customer base.

These case studies show how SMEs can leverage digital technology during their growth and development to improve their customer experience, sales and marketing processes, and financial inclusion.

\*However, the most important prerequisite for digital transformation is that the SME's leadership recognizes the importance of digital transformation and directs its vision and mission in that direction. The following is to transfer this vision and mission to the heads of the individual departments, who understand the benefits of digital transformation, and then systematically transfer it to all employees.

Therefore, an analysis of the extant literature suggested that the progress of digitalization in Polish and Croatian SMEs in the ICT sector should be analyzed before, during, and after the pandemic. It also investigated whether digital transformation has accelerated and what business challenges have arisen for these companies because of the digital transformation process. The following research questions were formulated:

- Q1: *How did digitalization manifest itself in SMEs before the pandemic outbreak?*
- Q2: *How did SMEs' digital transformation process evolve during the pandemic?*
- Q3: *What business challenges do SMEs face after COVID-19 due to the acceleration of digital transformation?*

### 3. DATA AND METHODS

In the empirical section, qualitative research techniques were used in the form of in-depth interviews conducted with a small number of respondents to explore their views on the digitalization processes and the impact of COVID-19 in this area. The in-depth individual interview, as a classic qualitative method, enables the research practice to capture those phenomena or changes that are difficult to observe from the outside. The in-depth interviews with selected companies provided an opportunity to discuss the areas affected by the change in digitalization before, during, and after the pandemic in the companies. The need for an in-depth understanding of digital phenomena related to the pandemic justifies the choice of the research method. The technique of in-depth interviews is widely used in research on companies (Szalavetz, 2019; Machado et al., 2021; Pozzi et al., 2023).

Following Johnson (2002), the research aimed to obtain detailed information and knowledge about the digitalization and digital transformation processes in Polish and Croatian companies. The interview had the character of a dialogue between two people, which provided an opportunity to understand the internal processes of different companies in the field of digitalization. To answer the research questions, the following questions were asked:

- Describe the digitalization in your company before the pandemic.
- What changes in the digitalization process were forced by the pandemic in your company?
- What challenges must the company face regarding digital transformation in the coming years?

The research was based on the non-probability sampling method and focused on companies experienced in digitalization. The self-selection sampling strategy was applied. This method is used since the authors selected the companies according to their size (i.e., belonging to the SME sector).

Polish companies in the Pomeranian Voivodeship belong to the Interizon cluster, including small, medium, and large companies and institutions from the ICT and related industries. The Interizon cluster<sup>1</sup> is one of sixteen key national clusters considered the driving force of the Polish economy in the coming years. The research aims, and the companies' selection criteria were discussed with the cluster coordi-

nator. Six companies were proposed to participate in the interviews.

Companies from Croatia are located in Split and Zagreb. They are among the leaders in implementing digital transformation in business processes, even though they belong to different industries in their main activity. The purpose of the study and the criteria for selecting the companies were discussed with representatives of Split TechCity<sup>2</sup>. The selection of four technologically advanced companies is justified because the aim was not to determine whether digitalization was progressing in the companies but how advanced it was. The aim was to show the progress and sophistication of these processes and the anchoring of these changes in the companies. It was possible to identify operational areas where companies are not returning to traditional solutions and those where a hybrid model is desirable. By selecting companies implementing digital processes, it was possible to show how intensively companies are engaged with digitalization (Table 1).

Online interviews were conducted in December 2022 using an online communication platform. The companies' respective managers moderated the questions during the interview. Each of the interviews lasted approximately 40 minutes. The interviews were conducted in national languages and recorded. The recording was followed by transcription and, finally, a translation. To maintain the coherent nature of the translation, the technical terms used during the interviews were discussed with companies' managers to decide which terms should be used for generalization in the analysis phase.

The analysis was divided into two processes. First, keywords were underlined in all interviews according to the information needed to be analyzed. The research team discussed the keywords and selected the exact parts from the interviews that were crucial for the analysis. Second, an analysis was developed for Poland and Croatia. Finally, the similarities and differences in the sample were discussed.

Focusing the research on two countries allows us to capture critical aspects specific to the national aspect of the business. The detailed description of the core businesses shows the heterogeneity of the companies in terms of their core activity. On the other hand, all companies are developing dynamically and are active in industries that are considered pioneers.

1 <https://interizon.pl/en/>

2 <https://en.split-techcity.com/>

**Table 1.** Overview of the sample

	<b>Industry (specialization)</b>	<b>Year of establishment</b>	<b>Category: Small or Medium</b>	<b>Position of respondent</b>
P_POL 1	Programming services	2015	Small	CEO
P_POL 2	ICT solutions	2015	Small	President
P_POL 3	Wireless communication systems	2002	Small	Co-owner/President
P_POL 4	Audio-visual equipment and design	2007	Small	President
P_POL 5	R&D company in the field of radio frequency	2015	Small	Director
P_POL 6	Augmented virtual reality	2020	Small	Co-owner
P_CRO 1	ICT sector: Real estate search engine present in 7 European markets	2007	Small	Co-owner
P_CRO 2	Tourism sector: E-commerce platform for buying affordable products and services	2007	Small	Co-owner
P_CRO 3	ICT sector: A robot that can prepare any dish from one pot	2016	Small/Micro	Co-owner
P_CRO 4	Insurance representation: Online service for purchasing mandatory car insurance	2016	Small/Micro	Co-owner

SOURCE: Authors.

#### 4. RESULTS

In Poland, six companies participated in the study. One was established in 2020 and immediately operated under pandemic conditions. Before the pandemic, the companies surveyed worked with the selected IT tools, such as accounting or simple office software. As many as four of the companies surveyed used virtual space in the cloud or servers for document exchange, archiving, data entry, and processing. All of the Polish companies surveyed used social media for marketing activities. However, sales were mostly made traditionally through direct contact with customers, e.g., at industry events such as trade fairs. In the case of the companies surveyed, this resulted from the need for a direct presentation of the products and services offered.

Polish SMEs use electronic documentation in their daily work, for example, in research and development projects with external funding. Various tools, such as Power BI, Microsoft Office 365, SLUG, and VPN, were already used in the pre-pandemic period. The Polish companies interviewed use the IoT concept to increase the efficiency of daily operational work and save time and money. One of the interviewed companies emphasized that it had implemented a busi-

ness automation process before the pandemic as a part of its core business by offering this type of solution to its customers. Three companies used tools for remote communication with domestic and foreign customers and customer service.

At the time of the pandemic outbreak, all the companies surveyed were forced to switch to remote work to complete 100% of the companies' regular activities. It is worth remembering that in Poland. There were initial restrictions on going to the office daily, creating a real need to convert stationary business activity to a digital model. The pandemic and lockdowns forced entrepreneurs to work in online teams.

*"The change to the tracks of a 100% online business; the need for joint teamwork and document exchange, data processing, data security or the use of video tools have occurred, which we now take for granted and without which we cannot imagine daily life. The lockdown just made us move from the office to home."* (P\_POL 1)

Businesses also introduced the regular circulation of electronic documents, such as electronic invoices, which were not common but the exception before the pandemic. One of the companies interviewed emphasized that documentation with customers has become paperless. In addition to instant

messaging and e-mail exchanges with customers, processes related to online meetings in the form of conference calls have also accelerated. All the companies surveyed emphasized that digital transformation has accelerated, particularly in sales and marketing. Social media, in particular, has expanded, and some companies have created dedicated teams for this area. This was a notable change, as, before the pandemic, these services were, in most cases, outsourced. In the case of the Polish companies surveyed, the social media channel became a sales channel.

*"The strategy in the face of COVID referred not only to the shift to social media-based marketing but also to the way information was communicated to potential customers more understandably and communicatively." (P\_POL 4)*

One company emphasized that it had reformulated its communications with customers and that promotional materials (e.g., videos) needed to be clearer and more transparent. Two of six companies pointed to automating mailings and online advertising to reach customers during the pandemic. Only one company indicated that recruitment processes had shifted to the digital realm.

All companies seem to be managing the impact of the digital transformation forced by the pandemic in different ways. First, one company emphasized that competition in the market has increased, which is one of the biggest business challenges. According to the Polish companies, this effect is exacerbated by disrupted global supply chains, which have not yet recovered in the ICT industry. As a result, companies are often forced to build up large inventories or, conversely, cannot fulfill orders continuously due to component shortages.

*"We have adopted a colloquial expression for the availability of ordered components from supply chains. This problem is still very relevant today. Large corporations buy entire batches of electronic components and receive them with long delays. In this context, small companies hardly have a chance to receive a delivery. This forces a return to large inventories of critical components, the quantity estimated based on often unconfirmed orders, negotiated online." P\_POL 3*

One of the companies surveyed stated that the internationalization process will be implemented in the future, but they need to prepare for it accordingly. The digital transformation that is taking place in the companies will present them with the challenges of cybersecurity. The interviews also mention the challenge of employees in three areas. Companies state that the *"use of cyber solutions in daily work or office or project work will relieve employees of simple tasks."* As a result of these changes, companies will look for employees who are accountants, analysts, or secretaries but who

have digital skills. Third, employees who combine expertise in a particular field with digital skills will be in demand in the labor market, and companies will have to compete for them in the coming years.

It is undeniable that digital transformation has a significant impact on Polish SMEs. Of the major changes in business operations mentioned earlier, the company's increased online presence mentioned found particular resonance. This is due to the barriers introduced and the lack of opportunities to conduct marketing activities directly. Companies plan to expand this business area dynamically, driven by the desire to reach new markets. At the same time, the pandemic nature of the lockdowns has led to increased use of collaboration platforms for internal and external contacts. The popularisation of remote work will support this future collaboration direction. The development of working with cloud-based technologies in everyday business is due to the increasing number of employees working from home. The pandemic has had a particular impact on marketing processes in both business-to-consumer (B2C) and business-to-business (B2B) markets, as it has caused problems in managing physical sales channels and interacting with customers (Kang et al., 2020; Wang et al., 2020). However, the business has been pushed into e-commerce. Polish companies declare a return to traditional prospecting and customer contact, emphasizing that products are not sold quickly in the high-tech industry. Selling is a process that takes several weeks, and direct contact is conducive to this process.

Four companies were analyzed in Croatia, all highly digitalized before COVID-19. Moreover, two analyzed companies were already 100% digital and highly automated, one being a very sophisticated digital tool, a "crawler" with their own "spiders," and the other having the digital technology of c.sharp.net and a Microsoft SQL database. As their founder said:

*"We were completely digitalized before COVID-19, everything was done through digitalized processes, and this level of digitization allowed them to be very efficient. New features are created daily, working according to an agile methodology. That means they collect new things daily, decide what to do with them, and then the prioritized things are completed, they go forward, some things go into the backlog, so when they have time, they do them." (P\_CRO 2)*

The high level of digitalization meant that the impact of COVID-19 on the Croatian companies studied was mainly related to the industries in which they operated. For example, during COVID-19, the demand for buying real estate decreased sharply, and the demand for travel arrangements was almost non-existent, reflected in the results of all companies from these industries.

*"Since we are fully automated, and software robots perform the activities, the business as such was not threatened."* (P\_CRO 1)

Full automation enabled the sample companies operating in these industries to survive COVID-19, and their business was not threatened.

*"We maintained the number of employees and the level of salaries because we were already fully optimized, which was made possible by the digital technology behind it."* (P\_CRO 1)

The labor shortage also became an issue during COVID-19. IT companies were first confronted with it, and now it is reflected practically in all segments of society. But again, due to the fully digitalized processes, the labor shortage did not impact the companies studied in COVID-19. This was particularly evident in one of the companies studied that uses robots, which even experienced a boost during lockdown.

All Croatian companies studied switched to remote work during COVID-19 without difficulties. In summary, all the Croatian companies studied survived the lockdown. However, some industries were almost without customers, and one of the companies managed to take advantage of this extreme turbulence from the environment to boost its business.

*"We managed to use this extreme turbulence from the environment to boost our business... because before COVID-19, we were fully digitalized and organized in a way that allowed us to adapt very quickly."* (P\_CRO 3).

After the COVID-19 lockdown, the analyzed Croatian companies either returned to normality regarding attendance and income or experienced growth. This depended mainly on the industry in which they operate, as the COVID-19 pandemic boosted some industries, such as online shopping, which experienced growth during the COVID-19 lockdown, allowing them to attract a significant number of new buyers who continued to use the service even after COVID.

## 5. DISCUSSION AND POLICY IMPLICATIONS

The COVID-19 pandemic can be seen as a manifestation of the strong instability of the environment, referring to Taleb's concept of black swans (Glenszczyk, 2021). An important concept in this perspective is the value created by the company, which is an important factor influencing the business model in terms of its resilience to turbulence in the environment and within the company. An important value attribute is anti-fragility, which can influence a company's resilience to various shocks (Glenszczyk, 2021). The companies surveyed are characterized by relatively high resilience and adaptability. Due to their core business, the companies focused on ongoing digitalization rather

than digital transformation before COVID-19 (Fitzgerald et al., 2014).

A company facing a crisis, especially one as severe as the COVID-19 pandemic, should be characterized by agility, flexibility, and quick learning. The companies studied stand out for their ability to accelerate change, enabling them to survive the most difficult period and significantly change how they operate in certain operational areas due to the pandemic.

The result of this research is consistent with the McKinsey survey of entrepreneurs, which found that some of the changes brought about by the COVID-19 pandemic are perceived to be permanent (Brdulak, 2021). This refers, among others, to changes in digitalization, to (i) the diversification of end-user pick-up points (e-commerce development, use of parcel vending machines and in-store pick-up points), (ii) the use of Big Data to analyze customer expectations in real-time, (iii) the increasing use of advanced technologies for operations, (iv) the use of cloud computing, and (v) the increase in remote working and collaboration. It has been observed that companies in the first phase of the pandemic adopted digital solutions to respond to the current situation (Penco et al., 2022; Vide et al., 2021). There are obvious differences between Polish and Croatian companies. It seems that the core business of Croatian companies was mainly digital, so the challenges of the pandemic affected these companies differently. They affected the business environment, especially the market demand for their services and products.

On the other hand, Polish companies had to modify their day-to-day business operations because of digitalization. Polish companies were much more likely to cite a hybrid business model combining digital solutions as their desired model for the future. Both Polish and Croatian companies surveyed regarding COVID did not cut staff. It seems that the Croatian SMEs moved their work online. Due to the nature of the industry that requires working in laboratories, Polish SMEs have been forced to take more sophisticated measures, such as introducing rosters so that fewer people are together simultaneously.

The development scenarios assume that a large part of the operational activity will take place using digital tools; however, the area of customer interaction will be hybrid. Companies see increasing competition and supply instability issues within GVCs as factors that increase their vulnerability to the changing global environment.

As for Croatia, the impact of the COVID-19 pandemic and the lockdown had different effects on the companies studied. The fact that all four Croatian companies were highly digitalized before COVID-19 helped them cope with the crisis that arose. The na-



ture and intensity of the impact were mainly related to the industry in which the company operated. Since all companies were already highly digitalized before COVID-19, they were best able to cope with the negative effects. However, the situation was more difficult in some industries because they were completely stagnant during the COVID-19 lockdown, and survival was the only goal they pursued. They were highly digitalized and automated and could overcome the difficulties caused by the COVID-19 lockdown and even continue to operate more successfully afterward. On the other hand, because of the specific industries in which they operate, some companies in the sample managed to take advantage of the changes imposed by COVID-19 to boost their business. For example, they used robots and online shopping to attract new customers who continued to use their services even after the COVID-19 lockdown.

Results related to the first research question generally show that some companies are fully digital and highly automated, while in some companies, digitalization mainly limits customer contact.

Different applications were often used to support customer relationship management and access to customer data. In summary, even before the pandemic, SMEs had already used various digital transformation technologies to improve their operations and achieve better financial and non-financial performance. The pandemic has only accelerated this trend, making digital transformation an even more important factor in SME success.

Results related to the second research question show that the COVID lockdown has led to increased adoption of digital technologies in SMEs as companies have had to quickly adapt to the changing business landscape and maintain customer engagement. The development of digitalization processes in companies during the pandemic was driven by the need for remote work, e-commerce, online events, and automation, among other things.

Results related to the third research question show that the acceleration of digital transformation poses several challenges for SMEs, including cybersecurity, talent acquisition, infrastructure, customer engagement, and data protection. SMEs must overcome these challenges to remain competitive in the digital economy.

## 6. CONCLUSIONS AND LIMITATIONS

To investigate the progress of digital transformation processes in Polish and Croatian SMEs before, during, and after the pandemic, ten companies were studied in the form of interviews. The interviews con-

ducted with companies in Poland and Croatia show that the outbreak of the pandemic was an accelerating factor for this transformation. It contributed to the digitalization of more operational areas of companies that were not previously digital or only to a limited extent, such as sales or marketing. Companies' growth prospects are closely linked to the increasing global digitalization of societies, which affects the volatility of GVCs. On the other hand, adopting digital solutions promotes adaptation to an unpredictable external environment. Companies in the post-pandemic period see the need to conduct some of their business in hybrid ways, such as contacting potential customers.

This study contributes twofold to the discussion and research on digitalization processes in SMEs. First, it contributes to the literature on digital transformation and the links between pandemic crises. Second, it shows that digitalization processes are not temporary and help improve companies' operational performance and competitiveness, especially in times of global turmoil. Overall, the research contributes to the literature regarding knowledge about digital transformation processes and the extent of pandemic digital change, including its enduring nature for business operations. The relatively small number of interviews allows extending the present study to other countries and companies. In addition, it is worth noting that the research focuses on a specific group of companies, e.g., the ICT industry, which the company's digital orientation may impact. The potential development of further research in this area, as the global economy is still in the post-COVID-19 era, and the topic of digital transformation needs to be further explored.

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## DIGITALNI TRANSFORMACIJSKI PROCES U SEKTORU MALIH I SREDNJIH PODUZEĆA (MSP) U ERI PANDEMIJE COVID-19: STUDIJA U POLJSKOJ I HRVATSKOJ

### SAŽETAK

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Cilj ovog rada je istražiti u kojoj mjeri je pandemija prisilila MSP-ove da ubrzaju svoje napore u digitalnoj transformaciji kako bi ostali konkurentni i prilagodili se promjenjivom poslovnom okruženju. Pozornost se usmjerava na tri ključna istraživačka pitanja: (i) Kako se digitalizacija manifestirala u MSP-ovima prije izbijanja pandemije? (ii) Kako se digitalni transformacijski proces razvijao u MSP-ovima tijekom pandemije? i (iii) S kojim se poslovnim izazovima MSP-ovi suočavaju u post-COVID razdoblju zbog ubrzanja digitalne transformacije? Za potrebe empirijskog istraživanja, koriste se kvalitativne istraživačke metode u obliku dubinskih intervjua s 10 MSP-ova u Poljskoj (6 MSP-a) i Hrvatskoj (4 MSP-a). Glavni rezultati ističu tri ključna rezultata. Prvo, čak i prije pandemije, MSP-ovi su prepoznali i koristili različite tehnologije digitalne transformacije kako bi unaprijedili svoje poslovne procese i performanse. Drugo, razvoj digitalizacijskih procesa u promatranim MSP-ovima tijekom pandemije uglavnom je bio potaknut potrebom za radom na daljinu, elektroničkom trgovinom, virtualnim događanjima i automatizacijom poslovnih odnosa među svim dionicima. Treće, svijet nakon pandemije potvrđuje potrebu da MSP-ovi ulože u kibernetičku sigurnost, zapošljavanje talenata, infrastrukturu, angažman korisnika i zaštitu podataka, kako bi ostali konkurentni u digitalnoj ekonomiji.

**KLJUČNE RIJEČI:** *digitalizacija, digitalna transformacija, MSP-ovi, pandemija COVID-19, Poljska, Hrvatska*

**APPENDIX I.** Citations from the selected parts of the interviews with Polish and Croatian companies' representatives

Company code	Observation period / research item		
	Before	In COVID -	Post
	COVID - 19	19	COVID - 19
	Digital solutions used the in company (Industry 4.0 technologies )	New processes of digital transformation	New business challenges/ stability of digitalization acceleration
<b>P_POL1</b>	The company used the cloud and virtual space for data storage and processing. Important for their activities was the Internet of Things (IoT) as all processes that could be performed online. They processed big data using the Power BI tool. Remote communication tools. Remote contact with clients.	Switching to the tracks of a 100% online business; the need for collaborative teamwork and document sharing, data processing, data security or the use of video tools have come to the fore now seem to be a matter of course, without which we cannot imagine everyday life; lockdown only made us move from the office to home.	Digitalization has increased the competition. Switching to a remote formula has allowed us to reach beyond the largest cities with our trainings. Online activity has also enabled us to reach abroad. Cyber security is a challenge for big companies. The cloud is becoming more prevalent and there is more and more data, that we also need to process in an understandable way. Excel is already taking up a notch and connecting with what's called artificial intelligence. Accountants, marketing teams, analysts or administrative back-office administrators attend IT training course.
<b>P_POL2</b>	Digital transformation of enterprises. Electronic document management. Automation of business processes. Industry 4.0. e-commerce. We focus on collecting and processing data so that the right decisions can be made on this basis.	Our customers attitude toward digitization has changed a bit. The number of tasks performed remotely by our customers' employees has changed significantly. Our customers have started to realise that digital transformation really makes sense and can be used not only for the most common applications such as cost accounting, but also for other areas that are important for the operation of the company. The exchange of information relating to purchases and contracting with contractors is moving into a purely electronic, paperless phase.	In our case, the pandemic has facilitated the acquisition of new customers and the further development of IT systems by accelerating the digital transformation. We gradually replace existing systems or IT subsystems and integrate them. We enable data exchange between areas that didn't know each other before in a simple way, and employees spent a lot of time on manual work.
<b>P_POL3</b>	Our development office is specialised in all wireless communication systems. Among the simplest ones, of course, is the Internet, which we have been using for many years to communicate with our customers. We use a cloud server as a secure solution not only for data storage and exchange, but also for archiving. The next step was the introduction of Office365	We have certainly introduced hybrid work. In summary, I can say we use teleconferencing with customers, with whom contact has absolutely moved online.	The availability of ordered components. Small companies have almost no chance of receiving delivery. This forces a return to large inventories of critical components, the quantity of which is estimated based on often unconfirmed orders, negotiated online.

<b>P_POL 4</b>	<p>We were present on social media, but we did not use it in a progressive way. Although we were on Facebook. We used design software like CAD. We also used traditional office software like accounting software. We have used virtual reality software to create products and will continue to do so. VR installation.</p>	<p>COVID made social media (SM) a primary marketing channel as it was the way to reach customers. Visualisation materials were created to show what VR means to the use of SM. The strategy in the face of COVID was not only related to the shift to social media based marketing, but also to the way information was communicated to potential customers in a more understandable and communicative way.</p>	<p>Sound and projection systems have changed a lot over the years due to the digital transformation. This also applies to the digital management of systems, digital control, digital signal transmission. Most processes end up at IT. Internationalization is an area with a promising future.</p>
<b>P_POL 5</b>	<p>In the area of marketing, we used social media from the very beginning. In the software area, traditional working methods such as SLUG tools for data exchange; VPN; server access. We use cloud-based software (remote customer access). Digitalisation mainly in relation to customers.</p> <p>In the area of sales and customer outreach, we were initially heavily involved in trade fairs. We used the customer base of the parent company.</p> <p>At HR, we used digital solutions to a limited extent, e.g., to outsource a testing task.</p>	<p>First, the elimination of face-to-face meetings in favour of online meetings. We moved from trade shows to the online world, a shift in brand promotion from traditional to online/webinars. There were COVID mailings to promote products. There was a complete digitalisation of online HR processes. Rather, we are in remote mode.</p> <p>We created an after-sales platform for reporting defects in the COVID period. Working in the cloud existed before, but we are using it more and more today. Since the pandemic, we have been storing documents in the cloud and working with clients.</p>	<p>Promoting energy savings in the context of the current situation is important. The company also sees increasing digitalisation among its customers, e.g., in production facilities (contactless input, process support, production automation).</p> <p>The supply chain has adopted these solutions, which we see in our customers. A digital transformation can also be seen in the administration of companies, e.g. in data storage, but also in office tasks, such as invoices via e-mail.</p>
<b>P_POL 6</b>	<p>N/A company established in 2020</p>	<p>The company works on the MS Teams 360 platform from Microsoft. We work with online planners. The nature of the product requires the team to work with digital tools, including design. We have a social media person who creates content for social media. A database is created in the CRM, and then we do the prospecting in Woodpecker. This is a tool for automating mailings, which means that an e-mail is written and sent to everyone, and we collect information about the open rate, and it is also possible to repeat this automatic mailing. Each offer consists of a video and a presentation.</p>	<p>In general, we believe that marketing and social media are better connected. We have found that the human factor is missing. The online form promotes anonymity and we remember the offer. This is a big undertaking, because to enter foreign markets with a digital product, you need to hire a person who speaks the language.</p>
<b>P_CRO 1</b>	<p>The company was already 100% digital and highly automated. It is a very sophisticated IT product (digital tool), a "crawler", with its own "spiders" that find, index and save adds from other websites in a smart way, so that users can easily search them.</p>	<p>Demand for the purchase of real estate declined, which was reflected in site visits and relationships with partners. As there was already full automatization (digitalization) and software robots were doing the work, the business as such was not threatened in the slightest. There were only 3 employees working remotely and their jobs were not threatened during the lockdown.</p>	<p>They returned to normal numbers, both in terms of visit and income. Apart from the lockdown itself, COVID-19 had no significant impact on them. The only thing that affects them are the general trends in the real estate industry. They expect that good locations will have even higher prices in the future and that the prices of other locations will be corrected.</p>

<b>P_CRO 2</b>	They were already digitized. They were working according to the agile methodology. The digital technology behind it is c.sharp.net, on their dedicated servers, the database (stuck) is Microsoft SQL...everything runs on the services that manage the "work" of this company.	It was greatly affected by the COVID-19 (lockdown). Since 70% of the business was related to tourism, it stagnated during the lockdown. Due to the digital technology already implemented, they were fully optimized and very efficient, so jobs and salaries were not affected, and employees could continue to work remotely.	After lockdown they managed to obtain bids for the entire season from partners who could not market their service outside Croatia. In June 2020, they thought they had achieved the best result ever. Interestingly, they then earned double that amount in July. The 2022 season was completely normal.
<b>P_CRO 3</b>	The entire process was digitalized, there are 5 robots that do all the work. There is a chef that teaches them how to cook and people who are responsible for filling and cleaning the robots.	In COVID-19 there was a labour shortage, and the IT companies were the first to face this. The use of robots helped them to overcome this situation. COVID-19 had no impact on them.	In the future, robots will take over repetitive tasks, and people will be left with the creative tasks. After the lockdown, they opened the restaurant (good thing they did not have it before). However, delivery is here to stay.
<b>P_CRO 4</b>	They are directly connected to the Croatian Vehicle Centre system and obtain information from there. In addition, targeted (direct) marketing was carried out. Even before COVID-19 they worked quite well, although Croatian customers were not so used to online shopping at that time.	It experienced a growth during the lockdown, since technical inspections were extended, but car insurance had to be purchased. In March 2020, this company had the best figures ever.	Many people continued to renew this policy because of the good prices and simplicity of the process.