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DIGITALIZATION IN SMALL AND MEDIUM ENTERPRISES: A REVIEW AND RESEARCH AGENDA

Abstract

Purpose: The main goal of the paper is to thematically cluster, identify, and present the most significant topics in the field of digitalization within small and medium enterprises. Additionally, the paper aims to propose guidelines for future research in this area.

Methodology: In the paper, a bibliometric analysis of the literature was carried out on a sample of 285 articles with a special focus on keyword analysis, co-occurrence network analysis and trend topics analysis.

Results: There has been a noticeable increase in interest in this topic since 2019, accompanied by a significant rise in the number of published articles and citations. Based on the analysis, five key thematic clusters were identified, which are related to the most frequently researched topics, and they are defined as follows: Digital technologies and Industry 4.0, Digital marketing and social media, COVID-19 and Innovation, Digital transformation, and Business models.

Conclusion: The topic of digitalization in small and medium enterprises is gaining significant importance within the academic environment. This paper provides comprehensive guidelines covering methodological, practical, and thematic aspects, along with proposed research questions for future studies in this field.

Keywords: Digitalization, digital technology, small and medium enterprises, Industry 4.0, review

1. Introduction

The modern business environment is characterized by numerous challenges. Rapid changes in technology and consumer habits, as well as unexpected events, such as the COVID-19 pandemic and the war in Ukraine, have caused many companies to reorganize their operations and change their approach to shaping a business strategy. With the onset of the COVID-19 pandemic and its consequences, almost overnight, companies were faced with disruptions in the supply chain, restrictions on movements and the inability to conduct regular business operations, and digitalization of business was imposed as a necessary solution to avoid a complete collapse of business (Interreg Europe, 2022).

Digitalization is often identified with the concepts of digitization and digital transformation, but in essence, these are not identical concepts. For this reason, it is necessary to highlight their differences. Digitization is a technical process of dematerialization of information and its conversion into digital form. Digitalization is described as a wider socio-techno-

logical phenomenon and the process of adopting digital technologies in a wider individual, organizational and social context (Legner et al., 2017). Autio (2017) defined digitalization in a similar way, pointing out that it represents the application of digital technologies and infrastructure in business, economy and society. It can be concluded that digitization is a tool supporting digitalization. Digitization can contribute to operational efficiency and reduce errors, but it does not change by itself the business or implement new business models and strategies, since that is the domain of digitalization (Gobble, 2018). Digital transformation refers to changes in the way companies operate and create new value, products and services using digital technologies (Gašperlin et al., 2021). In other words, digital transformation is a process in which organizations use digital technologies to change the value creation process and thus respond to changes in the environment (Vial, 2021).

Small and medium enterprises (SMEs) are key players in the business environment of numerous national economies, and their importance is reflected in the creation of new jobs and contribution to the gross national product. However, SMEs are lagging behind in the application of digital technologies. According to OECD (2021) data, small enterprises are less digitalized than medium-sized enterprises, while medium-sized enterprises are less digitalized than large enterprises. In 2021, only 55% of SMEs in the European Union have reached at least the basic level of adoption of digital technologies (European Commission, 2022). Although there is a positive trend in the digitalization of companies, the level of use of advanced digital technologies is still low. The importance of the development of digitalization in economic recovery, but also in new opportunities for business growth, was recognized by the European Union, which supports companies throughout the European Union in their adaptation to the digital world through various initiatives, policies and support schemes. Finally, within the framework of the Digital Decade policy programme, digital goals were defined according to which at least 90% of SMEs should achieve a basic level of digital intensity by 2030, while at least 75% should implement AI, cloud and big data technologies by 2030 (European Commission, 2023).

In addition to the real sector, industry and society, digitalization has been an important topic in the academic environment for the past several years. Previous literature reviews covering SMEs have been exclusively devoted to the following topics:

digital innovation in the SME sector (Ramdani et al., 2022), digital transformation (Egodawele et al., 2022; Gašperlin et al., 2021), digital transformation and sustainable development (Philbin et al., 2022), digital transformation and internationalization (Feliciano-Cestero et al., 2023), and technological transformation in SMEs and business model innovation (de Mattos et al., 2023). This paper joins previous research, and places special emphasis on the sector of SMEs, taking into account the wider spectrum of digitalization and related topics, such as digital technologies, innovation and transformation. The main goal of the paper is to thematically cluster, identify and present the most important topics in this research area, and to propose guidelines for future research. Furthermore, to support the achievement of the defined goal, the following research questions are defined:

Q1: What is the global trend in scientific publications in the field of digitalization in SMEs?

Q2: What are the main research topics and findings in this field?

Q3: What are the future avenues of research in this field?

A bibliometric analysis of literature on a sample of 285 articles was performed in the paper, using the software packages VOSViewer and R with Bibliometrix and Biblioshiny. The conducted analysis brings to light previously unexplored topics that could be of interest for future research and have potential implications. By employing quantitative bibliometric methods in conjunction with comprehensive reading and assessment of specific articles, a more comprehensive understanding of the existing literature endeavors is achieved. The paper follows a structured format. Section 2 provides a comprehensive explanation of the methodology used to identify pertinent articles. In Section 3, a bibliometric analysis of the co-occurrence of author keywords is presented, as well as a systematic review of identified thematic clusters. In Section 4, potential future research directions in the field of digitalization in SMEs are discussed and suggested. Lastly, the paper concludes with a summary and conclusions in the final section.

2. Methodology

Science mapping based on a bibliometric analysis of literature was applied in the paper. According

to Cobo et al. (2011), the purpose of science mapping is to create bibliometric maps that illustrate the conceptual, intellectual, and social organization of particular disciplines, scientific domains, or research fields. Using bibliometric methods, it is possible to investigate the connection between scientific disciplines, areas, certain specificities and individual articles.

This paper adopted the science mapping workflow method, considering the five steps followed by Zupic and Čater (2015). According to the authors, the five main phases of science mapping with bibliometric methods are as follows: research design, compilation of bibliometric data, data analysis, data visualization and data interpretation. Figure 1 shows the adopted methodology and its phases with the main activities.

Figure 1 Main phases of the methodology
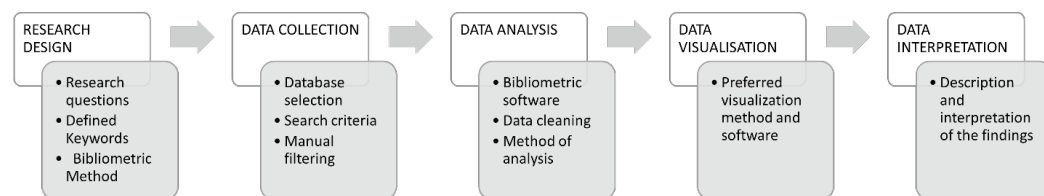
Source: Adapted from Zupic and Čater (2015)

As suggested in the workflow, the research questions were defined in the first step. The main keywords were defined based on the research aim and research questions. The search query was defined based on two main words – small and medium enterprise and digitalization, but it also includes all possible combinations of lexemes used in the papers, as well as Boolean operators "AND" and "OR" in paper titles, abstracts, and keywords. Thus, the search query was defined in the following way: "small and medium enterprise*" OR "SME*" OR "small and medium business*" OR "small and medium companie*" AND digitalisation OR digitalization OR "digital orientation" OR "digital technolog*" OR "digital capabilit*".

The data collection process was defined in the second phase of the methodology. The Scopus database was selected for the analysis because it includes a larger number of journals than the ISI Web of Science database (Anand et al., 2021; Casprini et al., 2020; Rovelli et al., 2021).

In the first phase, the analysis yielded 1,092 documents. The second phase included specific search criteria based on relevance to the topic. The criteria used in the search are a type of paper, a language and a scientific field. In terms of the type of paper, further search was based only on peer-reviewed scientific articles written in English, since the peer review process facilitates reliable scientific com-

munication, stimulates meaningful research questions, and provides accurate conclusions (Kelly et al., 2014; Secinaro et al., 2020). Based on the application of this criterion, 497 articles were obtained through the search. Finally, in the last step of the data search, criteria related to the scientific field were applied in which the articles were published. The following scientific fields were included in the data set: Business, Management and Accounting, Social Sciences, Computer Sciences, Engineering, Economics, Econometrics and Finance, Decision Sciences, Environmental Sciences, Energy, Psychology, and Multidisciplinary. Based on these search criteria, 419 papers were identified. Subsequent and deeper content analysis of titles, abstracts, keywords, and if necessary, complete papers, identified a total of 285 articles relevant to bibliometric analysis.

The database was extracted on January 21, 2023, and included documents published in the period from 2009 to 2022. To ensure a high-quality and methodologically correct analysis, it underwent a thorough cleaning process to address inconsistencies. These inconsistencies primarily pertained to abbreviated journal titles, incomplete references lacking journal issue numbers, and variations in the initials used to represent the authors of the articles. Table 1 presents the main figures related to descriptive statistics of the sample.

Table 1 Descriptive statistics of the sample

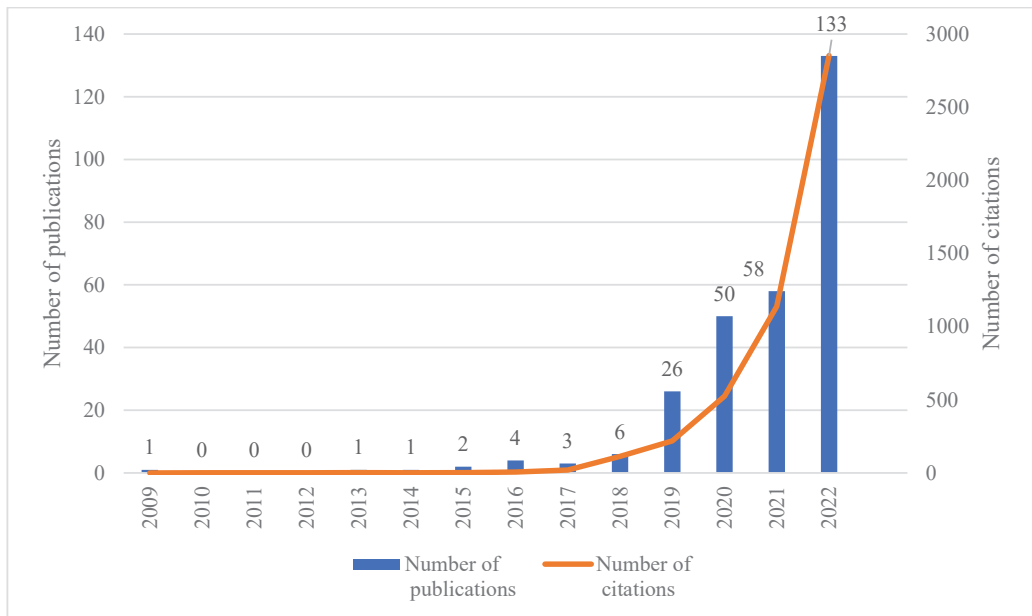| Timespan	2009:2022
Documents	285
Sources	177
Authors	877
Countries	73
Author keywords	908
Cited references	18,707

Source: Authors' elaboration based on Scopus

The sample included 285 articles written by 877 authors from 73 countries. The articles were published in 177 journals and cited 18,707 references. As previously mentioned, data analysis and data visualization were conducted by using two software packages – VOSViewer and R with Bibliometrix codes. In terms of data analysis, keyword analysis, co-occurrence network analysis, and trend topics analysis were applied.

3. Keyword analysis, trend topics and co-occurrence network analysis

In the analyzed sample, it is possible to identify that the earliest paper was published in 2009. More significant interest in this topic begins after 2019, and in the mentioned period, in addition to a significant increase in the number of published papers, a significant increase in the number of citations can also be observed (Figure 2).

Figure 2 Annual scientific production and the number of citations

Source: Authors' elaboration based on Scopus

The largest number of papers was published in 2022, as much as 47% of the total number of papers in the analyzed sample. Considering the growing number of papers published in the last five years, it can be concluded that there is interest in this topic and the trend of increasing the number of published papers can be expected to continue.

To gain a comprehensive understanding of field development, a keyword co-occurrence analysis was conducted, resulting in the identification of the main thematic clusters and the most relevant research topics. Analyzing the keywords used by authors in their publications is a crucial method for exploring current research topics and the focus of scholars in a particular field (Song et al., 2019). Figure 3 presents 50 frequently used author keywords in the data set. The total number of author keywords in the sample was 908. The most frequently used ten words and related occurrences were: small and medium enterprises (146), digitalization (92), digital transformation (42), digital technology (37), industry 4.0 (33), COVID-19 pandemic (28), innovation (24), sustainability (15), business models (13), and entrepreneurship (11).

Figure 3 Tree map and author keyword occurrences

Source: Authors' elaboration based on Biblioshiny

Furthermore, based on author keywords from the data set, the trending topics were also analyzed. This analysis gives further insight into the trending topics in terms of keyword occurrences in digitalization in small and medium enterprises over the years. While conducting the analysis, the following parameters were applied: timespan was set at 2018 to 2022, the word minimum frequency was set to 5, the number of words per year was set to 5, and the word label size was also set to 5. Within this analysis, words small and medium enterprises and digitalization were excluded. The filtering parameters used were applied with the aim of identifying more precisely the growing topics in the last five years in the observed period. Based on the analysis, it can be observed that the leading topics in the last two years were related to digital technology, Industry 4.0, digital transformation and the COVID-19 pandemic (Figure 4).

Figure 4 Trend topics in the last five years

Source: Authors' elaboration based on Biblioshiny

Author keyword co-occurrence analysis was performed in VOSViewer. Co-occurrence means that two or more keywords are used in the same article. If the same keywords co-occur in the documents, their meaning is closely related (Zupic & Čater, 2015). Based on the analysis results, it is possible to identify five different clusters that express the visual thematic map of the field overview (Figure 5).

The purpose of creating a thematic map is to gain an understanding of the present state of a field and what its future prospects may be. This analysis is beneficial for providing researchers and stakeholders with information about the potential areas of future research and development within a particular field (Agbo et al., 2021).

Figure 5 Keyword co-occurrence analysis

Source: Authors' elaboration based on VOSViewer

3.1 Digital technologies and Industry 4.0

The papers in this cluster primarily deal with the implementation of digital technologies of Industry 4.0. Ghobakhloo and Iranmanesh (2021) state that digital transformation within Industry 4.0 is complex and requires a significant investment of resources. The authors identified 11 determinants key to successful implementation of digital transformation of SMEs (for example, external support for digitalization is the first step in ensuring success of digital transformation, while the readiness of operational technology is the least available determinant of digital transformation success). Based on a sample of 163 SMEs from Italy, Poland, Germany, Austria and Hungary, Agostini and Nosella (2020) concluded that companies with stronger internal and external social capital have a greater tendency to adopt Industry 4.0 technologies. Garbellano and Da Veiga (2019) investigated how leading Italian innovative SMEs implemented Industry 4.0 technology transfer, while Nwaiwu et al. (2020) pointed out that strategy, organizational capability, competitiveness, operations and human resources are relevant factors for achieving a sustainable process management model in the implementation of Industry 4.0 concepts. De Lucas Ancillo et al. (2022) investigated relevant obstacles that need to be overcome to enter Industry 4.0 on a sample of 22 SMEs that operate within industrial production activities and are already exporting or planning their internationalization toward LATAM regions, while on a sample of five Portuguese SMEs that implemented Industry 4.0 technologies, Santos et al. (2022) sought to investigate the resources and capabilities needed by SMEs to successfully implement Industry 4.0. Sharma et al. (2022) arrived at the result that high implementations costs, market competition and resistance to adoption are obstacles that hinder the adoption of technologies associated with Industry 4.0.

Muhamad et al. (2021) state that Industry 4.0 is a challenge for SMEs that need to adopt it, especially in developing countries, and that the process of adopting the digitalization of Industry 4.0 varies significantly. The authors emphasize that by using cloud computing, big data, artificial intelligence, and the Internet of Things (IoT), SMEs could secure a new competitive advantage. Tamvada et al. (2022) state that manufacturing organizations around the world are embracing Industry 4.0 and related technologies (such as the Internet of Things, advanced

robotics, big data, and cyber security), but also that implementation involves significant financial, operational, business, technological and social risks. Kemendi et al. (2022) investigated the difference between Industry 4.0 and Industry 5.0, and the role of human resources management in the context of the necessary digital and computer competences of society for successful operation in Industries 4.0 and 5.0.

One part of papers within the cluster is thematically dedicated to digital technologies at the time of the COVID-19 pandemic. Papadopoulos et al. (2020) state that there is limited evidence of the use of digital technologies to address the consequences of extreme events such as the COVID-19 pandemic. In the paper, they defined potential research directions and considered the implications of using digital technologies within SMEs to address the consequences of COVID-19 and ensure business continuity. Based on a survey completed by 257 Italian SMEs and in-depth interviews with owners and/or managers of eight SMEs, Bettiol et al. (2022) came to the conclusion that increased use of information and communication technology during the pandemic had a direct positive impact on product innovation. Garcia et al. (2021) state that the COVID-19 pandemic encouraged manufacturing companies to adapt to dynamic and unpredictable circumstances in order to ensure the continuity of production. Khalil et al. (2022) concluded based on a sample of 96 SMEs in six countries that digital technology helped companies to survive the pandemic, become stronger, and ensure their survival. On a sample of six SMEs from southern Italy, Corvello et al. (2022) showed how all analyzed companies turned the crisis into a business opportunity by developing new products, investing in marketing and communications or establishing new collaborations.

3.2 Digital marketing and social media

In the modern business world characterized by increasing digitalization, social media as a marketing tool has an increasingly significant impact on business performance (Virglerová et al., 2022), bringing various advantages to businesses. David et al. (2018) state that social media has a positive effect on the sustainability of small enterprises because it helps create a brand image, loyal customers and customer satisfaction, and that effective use of social networks can help SMEs reach a wider audience, while

Khan et al. (2019) state that many successful SMEs have modernized their marketing tools by presenting their business through social networks with the aim of gaining greater attention from consumers.

Based on 8 semi-structured interviews, Othman et al. (2022) identified the main challenges of marketing on social networks faced by small traders of agricultural products in Malaysia. These include lack of knowledge required for the use of social networks within companies, agricultural products that are challenging to sell online due to maintaining quality and freshness, and human resources that still prioritize management and work on the farm over online communication with customers. Yousaf et al. (2021) conducted a quantitative study on a sample of 397 directors of SMEs in Pakistan with the aim of determining the impact of digital orientation, the Internet of Things and digital platforms on sustainable digital innovation. The authors concluded that digital orientation, the Internet of Things and digital platforms are precursors of digital innovation. On a sample of 338 respondents from SMEs in Indonesia, Sultoni et al. (2022) investigated the effect of digital marketing, digital orientation, marketing capability and information technology capability on marketing performance of Indonesian SMEs. The research results indicate a significant positive relationship between digital marketing and marketing performance, digital orientation and marketing performance, marketing capability and marketing performance, and information technology and marketing performance. David et al. (2018) investigated the advantages, disadvantages and integration of social media in small restaurants. Some of the research results are that small restaurants use email as the main promotional tool, that Facebook is the most popular promotional tool in social media, but also that social media has a significant impact on improving the image of restaurants. Based on research conducted on a sample of 150 respondents that include entrepreneurs, activists, students, consumers, bloggers and other professionals who are active on multiple social media (such as Facebook, Instagram, LinkedIn, YouTube, and Twitter), Khan et al. (2019) state that consumers are likely to perceive social media and pay attention to it if social media include specific cues (for example, visual, ethics, information, social and security).

3.3 COVID-19 and innovation

The first group of papers deals with the adaptation of SMEs to business changes brought about by the COVID-19 pandemic, as well as the impact of the COVID-19 pandemic on business results of SMEs. Iancu et al. (2022) investigated how SMEs cope with the disruptions caused by the COVID-19 pandemic. The authors indicate the importance of state measures to support SMEs during the COVID-19 crisis, and as the main obstacles to resilience of SMEs to the crisis, they cite limited access to liquidity, lack of strong state support, poorly prepared and motivated employees and low digitalization. On a sample of 11 Czech small and medium hotel enterprises, MacGregor Pelikanova et al. (2021) showed that the challenges faced by entrepreneurs in emerging economies at the time of the COVID-19 crisis are universal challenges that can serve as a basis for implementing digitalization and changing entrepreneurial strategies. According to Siahaan and Tan (2022), the institutional environment is a key driver of strengthening entrepreneurial orientation and developing digital capabilities of companies to adapt to disruptions caused by the pandemic. On the basis of research conducted on a sample of 48 restaurants in Baden-Wuertemberg, Ludin et al. (2022) state that the degree of digitalization is one of the factors of restaurant business success in the time of COVID-19, which is why restaurants should think about new and digitalized business models.

The second group of papers deals with innovative activities of SMEs during the COVID-19 pandemic, but also with innovative activities of companies in general. Using the example of SMEs in Kazakhstan, Bokayev and Issenova (2022) conclude that financial and administrative support measures by the state during the pandemic are emphasized, but insufficient attention is paid to encouraging innovation, including the use of digitalization in business. Based on secondary data collected in Romania in 2004-2018, Stanescu and Virjan (2020) analyzed the ability of Romanian SMEs to integrate elements of research, development and innovation within their usual activities. The results indicate that investing in innovation is a rather desirable direction for companies, and they state "customers and consumers, their own organization, and magazines and specialized magazines" as the main sources of information for innovative processes of companies. On a sample of 2,156,360 European SMEs, Scuotto et al. (2021) showed the importance of individual digital capabilities for growth and innovation of companies. Abudaqa et al. (2022) investigated how innovation affects the empirical relationship between digital facilitators, digital transformation

strategies and overall performance of manufacturing SMEs in the UAE. The results indicate a positive relationship between digital facilitators and overall performance of SMEs.

Based on the conducted research that included 102 SMEs from Indonesia, Astuti et al. (2020) indicated that organizational readiness, company characteristics, strategic orientation and conviction in innovation are determinants of digital technology for adoption of innovation. Furthermore, digital technology for the adoption of innovation has a significant impact on the performance of SMEs.

3.4 Digital transformation

Most of the papers in this cluster are focused on the topic of the process of implementing digital transformation in SMEs. On a sample of 510 Vietnamese SMEs, Hoa and Tuyen (2021) built a model for assessing the readiness of enterprises for digital transformation, while based on 421 respondents from 219 Turkish SMEs, Özşahin et al. (2022) developed and validated a scale for measuring the adoption of information and communication technology and digitalization for SMEs in the context of developing countries. Based on 53 responses from leading experts for SMEs as well as teachers and researchers, Sándor and Gubán (2022) developed a methodology that helps determine the position of SMEs in the life cycle of digital maturity. Based on a review of the existing literature on digital transformation and organizational competence as well as on interviews with six experts, González-Varona et al. (2021) developed a model of organizational competence for digital transformation that enables SMEs to identify and develop digital capabilities necessary for progress in digital transformation.

Omrani et al. (2022) used data collected from 15,346 SMEs from the European Union and outside the European Union to investigate the factors that determine the adoption of digital technologies in SMEs. The results show that the technological context (IT infrastructure and digital tools) together with the existing level of innovation are the main drivers of accelerating the process of digital technology adoption. Based on 127 semi-structured interviews with a sample of 15 family SMEs from Germany, Austria and Switzerland, Soluk and Kammerlander (2020) investigated how family SMEs deal with digital transformation of business. Based on the research, they propose three phases of digital transformation for family SMEs (digitalization of

processes, digitalization of products and services, and digitalization of the business model). Bouncken and Schmitt (2022) conducted research on a sample of nineteen managers from eight family SMEs from Germany, Liechtenstein and Switzerland with the aim of understanding the challenges at the strategic level faced by family SMEs during digital transformation. The results show that the investigated enterprises have a low level of focus on digital strategy, the top management has little expertise in the field of digital technologies, and enterprises in the sample tend to follow a reactive digital transformation. On a sample of 106 manufacturing SMEs in Guangdong province, Chen et al. (2022) showed that digital transformation and information technology play a key role in the digital transformation of enterprises in the sample, and the digital process and digital innovation are the main problems faced by enterprises.

On a sample of 8 managers of SMEs from South Africa, Jeza and Mpele Lekhanya (2022) showed that digital transformation significantly affects building relationships with clients and ensuring easy access to business, as well as that online sales and digital marketing are leading digital platforms successfully implemented by most South African SMEs.

In this cluster, too, it is possible to identify papers that included the context of the COVID-19 pandemic in the research. The results of the authors Abilova and Alijeva (2022) indicate that the COVID-19 pandemic had a significant impact on the acceleration of digital transformation in SMEs in Azerbaijan. On a sample of 246 SMEs in Latvia during the COVID-19 pandemic, Rupeika-Apoga et al. (2022) proved the positive effect of digital orientation and digital capability on digital transformation. On a sample of seven manufacturing SMEs from Indonesia, Priyono et al. (2020) proved that SMEs adopt different degrees of digital transformation depending on the contextual factors of the enterprise (accelerating transition towards digitalized enterprises, digitalization of only the sales function, finding partners that possess excellent digital capabilities).

3.5 Business models

The fifth cluster defines two primary topics to which the papers are dedicated. The first topic is related to the impact of adapting business models to digital transformation on the performance of SMEs. Based on a sample of 338 European SMEs

that actively use social media and big data to innovate business models, Bouwman et al. (2018) came to the conclusion that business model innovations stimulated by social media and big data positively affect business results. In addition to the above, the authors also conducted 4 in-depth case studies of companies implementing business model innovation, which showed that the driving force behind business model innovation is big data, not social media. Bouwman et al. (2019), on the other hand, state that digital transformation requires SMEs to change and innovate business models, but also that SMEs do not have the capacity to implement business model innovations. The authors conducted empirical research on a sample of 321 SMEs from Europe that actively use social media, big data and information technologies in the innovation of business models with the aim of determining the impact of the amount of resources used by enterprises when adapting business models to digital transformation on business results. The authors concluded that enterprises from the sample that allocate more resources to the adaptation of business models to digital transformation indirectly achieve better business results. Savastano et al. (2022) conducted an online survey involving managers of 162 SMEs operating in the tourism sector on five different continents to assess the relationship between the maturity of the digital business model and the sustainability of business results over time. They arrived at the conclusion that there is a statistically significant positive relationship between maturity of the digital business model and sustainability of business success.

The second group of papers deals with innovative business models as sources of competitive advantage of SMEs. Andersen et al. (2022) believe that digitalization of business is essential for the development of competitive advantage and new business models of companies. North et al. (2020) developed a framework (based on dynamic capabilities and digital transformation studies) that provides guidance to SMEs on how to take advantage of the growth opportunities arising from digital transformation of business, so as to remain competitive in a dynamic business environment. Chaudhuri et al. (2021) conducted in-depth interviews with four SMEs whose business models are based on circular economy and which have adopted digital technologies such as 3D printing and blockchain. They came to the conclusion that in order to create a competitive advantage, SMEs should have the ability to exploit, research and adapt to new technologies.

4. Discussion and recommendations for future research

The identified clusters enable a better understanding and overview of topics that have been specifically researched in the field of digitalization of SMEs. In the context of Industry 4.0 and the implementation of digital technologies, research was especially devoted to assessing the readiness and capability of SMEs to face the challenges and risks that Industry 4.0 poses to them (De Lucas Ancillo et al., 2022; Muhamad et al., 2021), as well as determinants and resources crucial for the implementation of digital transformation (Ghobakhloo & Iranmanesh, 2021; Santos et al., 2022). In the modern business world characterized by increasing digitalization, social media as a marketing tool is becoming increasingly important in company operations (Virglerová et al., 2022). Therefore, a number of authors focused their research efforts on the identification of challenges faced by SMEs in the application of social networks and digital marketing, as well as their impact on business sustainability (David et al., 2018; Othman et al., 2022). Digitalization of business is essential for the development of competitive advantage and new business models of companies (Andersen et al., 2022), and innovations of business models have a positive effect on business results of companies (Bouwman et al., 2018; 2019) and sustainability of business success (Savastano et al., 2022). In the context of digital transformation, authors have developed models for assessing the readiness of companies for digital transformation (Hoa & Tuyen, 2021), and models for assessing digital capability (González-Varona et al., 2021), and a smaller number of authors is dedicated exclusively to the process of digital transformation in family SMEs (Soluk & Kammerlander, 2020; Bouncken & Schmitt, 2022). The trend of increasing the number of papers in the last several years can be explained by a greater number of papers that observe digitalization through the COVID-19 disease pandemic. The pandemic had a significant impact on the acceleration of digital transformation in the economy (Abilova & Alijeva, 2022). Furthermore, increased use of information and communication technology during the pandemic had a direct positive effect on product innovation (Bettiol et al., 2022), and digital technology helped SMEs to become stronger and more resilient (Khalil et al., 2022). Although these papers represent a significant contribution, recommendations for future research are aimed at conducting research in the post-pandemic time to identify the best crisis survival strategies (Abuhussein et al., 2023).

Based on the analyzed papers, the guidelines for future research are defined, which are shown in Table 2. In the context of the methodology, a significant number of papers suggest increasing the number of companies in research samples, as well as including different geographical areas and industries in which companies operate. Future research should be longitudinal research that monitors changes and the relationship between the investigated phenomena and variables over the years (Kemendi et al., 2022). In the context of methodology, it is important to mention that a certain number of authors propose conducting research based on mixed methodology, i.e., combining quantitative and qualitative research (Khalil et al., 2022; Bettiol et al., 2022; Rupeika-Apoga et al., 2022), as well as the implementation of more complex research models that include moderator and mediator variables that would examine the presumed direct relationships between the in-vestigated variables (Muhamad et al., 2021). Based on the analyzed papers, research questions for future research were defined. Considering the variety of papers and researched topics, the questions are divided into two categories – internal environment of the company, which includes the company's resources and characteristics, internal culture and openness to digitalization, and external environment, which includes various market, environmental, regulatory, social and institutional factors. The research questions are shown in Table 2. With the aim of connecting science and industry and the real sector, it is proposed to involve regulators and collaborate with experts and partners from different industries in research processes in order to gain an understanding of the institutional context and further the development and validation of tools and methods for assessing digital maturity and readiness of companies for digitalization.

Table 2 Suggestions for future research

Methodological aspect		• Larger and more diverse samples of SMEs • Longitudinal research • Mixed methodology • More complex research models that include moderator and mediator variables
Thematic aspect	Internal environment of the company and company specifics	• Is there a connection between technological and soft skills of employees and Industry 4.0? • Is there a connection between digital orientation and sustainable digital innovation? • What are the obstacles to digital transformation in family SMEs? • How does socio-emotional wealth affect digital transformation in family SMEs? • Is there a connection between investments in the field of design and the adoption of 4.0 technologies? • Is there a difference in the digital transformation process in companies managed by female entrepreneurs compared to companies managed by male entrepreneurs?
	External environment of the company	• What is the role of state support in encouraging digital transformation? • What is the influence of market factors on the adoption of digital technologies in SMEs? • What is the influence of regulatory factors on the adoption of digital technologies in SMEs? • What is the influence of technological and environmental factors on the level of adoption of ICT technologies? • How do the characteristics of the domestic market influence business model innovations for resilient international growth? • Are and to what extent are digital skills of consumers, distribution channels and socially responsible business models drivers of digital transformation? • What are the key challenges to the resilience of companies in the era after the COVID-19 disease pandemic? • What is the influence of digital facilitators of Industry 4.0 on reducing the impact of the COVID-19 disease pandemic?
Practical aspect		• Further development and validation of tools and methods for assessing digital maturity and readiness of companies for digitalization • Involving regulators and industry experts in research to gain an understanding of the institutional context

Source: Authors' elaboration

5. Conclusion

Digitalization is a ubiquitous topic in today's business environment. The implementation of digital technology and tools provides companies with the opportunity for innovation, development of new products and services, and enables access to international markets and achievement of competitive advantage in a dynamic business environment. This paper joins the growing trend of research on the topic of digitalization in SMEs. The main goal of the paper was to thematically cluster, identify and present the most important topics in this research area and propose guidelines for future research. Based on the bibliometric analysis of literature conducted on a sample of 285 relevant articles, five key thematic clusters related to the most frequently researched topics were identified, and they are defined as follows: Digital technologies and Industry 4.0, Digital marketing and social media, COVID-19 and innovation, Digital transformation, and Business models. The largest number of papers is devoted to the identification of challenges and the analysis of key determinants for a successful implementation of digital technology and digital tools, and the implementation of digital transformation in SMEs. Furthermore, a significant number of papers focus on researching the impact of the pandemic on digitalization and innovative activities in SMEs, as well as on researching the impact of adapting business models to digital transformation on the business results of SMEs. Based on the analyzed papers, guidelines for future research were defined, which include methodological, practical and thematic aspects, with proposed future research questions. One of the main limitations of this paper is its restricted focus on a single database and its exclusive review of literature written in English. To overcome this limitation, future research should consider including multiple databases and exploring literature in various languages to ensure a comprehensive and more inclusive understanding of the topic.

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