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ORIGINAL PAPER

Adoption and performance outcome of digitalization in small and medium-sized enterprises

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Abstract

Digital transformation has a profound impact on businesses and various implications for firms. While some effectively navigate this digital shift, harnessing the benefits of modern technologies, many small and medium-sized enterprises (SMEs) struggle to seize the opportunities presented by this transformative process, despite its unprecedented potential. Decision-makers within SMEs often grapple with uncertainty surrounding the digitalization process, leading to hesitancy in embracing available technologies. This qualitative study endeavors to address this challenge by exploring the enablers and barriers of digitalization adoption within SMEs, while also assessing its impact on performance. In-depth interviews were conducted with SME managers, with the results revealing that several factors simplify the process of digitization in SMEs, including the appropriate technologies, and a workforce equipped with the right digital skills to use them. Conversely, we identified elements that pose barriers to digitalization, such as the risk-averse culture prevalent in many SMEs, and their reliance on outdated legacy systems. In summary, our research underscores the importance of a strategic interplay of these elements for effective digitization within SMEs. This study sheds light on the intricacies of the digitalization process, while also providing valuable insights into the factors influencing its adoption and the resulting performance outcomes in the SME context.

Keywords Digitalization · SMEs · Digital orientation · Digital transformation · Business performance · Digital skills · Digitalization competencies

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1 Introduction

Businesses and organizations are being fundamentally and quickly transformed by digitalization and the digital transformation phenomenon (Chatterjee et al. 2023; Jedynak et al. 2021). While some firms effectively manage digitalization and reap benefits from the use of digital technologies, others that are unable to go digital, or refuse to, face the risks of falling into an unfavorable market position, losing profit, and even going bankrupt (Becker and Schmid 2020). Even though digital technologies create the potential to optimize business processes, increase production efficiency, and reshape and expand value propositions (Kasych et al. 2019), the majority of small and medium-sized enterprises (SMEs) have been falling behind in digital transformation and adoption due to their inherent characteristics (Eller et al. 2020). With all of this in mind, digitalization remains an important topic of interest for research and practice (Barkema et al. 2002; Biggiero 2006; Parviainen et al. 2017; Lee et al. 2012).

As Felicetti et al. (2023) emphasize in their review, the realm of digital innovation in entrepreneurial firms is experiencing significant growth and transformation. Similarly, Isensee et al. (2020) shed light on the intricate interplay between organizational culture, sustainability, and digitalization in SMEs, revealing how these elements intertwine to shape the strategic landscape. Furthermore, Kraus et al. (2022) provide a comprehensive overview of the current state of digital transformation in the field of business and management research, highlighting the relevance and urgency of this topic. The research landscape is evolving rapidly, driven by the transformative potential of digitalization, which is perhaps most apparent in the service industry, where digitalization has a profound influence on business model design (Laudien and Pesch 2019).

The importance of information technology (IT) application in business management continues to grow, with digital technologies driving digitalization (Bouncken et al. 2021a, b). For instance, Legner et al. (2017) and Tilson et al. (2010) argue that digitization refers to the adaptation and utilization of digital technologies in an organizational setting (Lau and Höyng 2023). These technologies transform traditional processes into digital ones within organizations (Bouncken et al. 2021a, b). In this regard, Pascucci et al. (2023) claim that most enterprises, especially SMEs, are still in the second stage of Verhoef et al.'s (2021) three stages of digital transformation (DT): digitization, digitalization (which describes how IT or digital technologies can be used to change and improve existing business processes (Li et al. 2016; Verhoef et al. 2021)), and DT. Hence, firms can implement digital technologies to improve or innovate internal and external processes and integrate them into new business models (Bouncken et al. 2021a, b; Muñoz-Pascual et al. 2021).

The advent of novel digital technologies has indeed posed both opportunities and challenges for SMEs in the contemporary business landscape. Artificial intelligence (AI), with its capacity for automating tasks, enhancing decision-making processes, and providing personalized customer experiences, has the potential to revolutionize SME operations (Davenport and Ronanki 2018). Big Data analytics

enable SMEs to harness vast amounts of information to obtain insights, optimize operations, and refine their marketing strategies (Chen et al. 2012). The Internet of Things (IoT) facilitates real-time monitoring, predictive maintenance, and efficient resource allocation, contributing to increased productivity and cost savings for SMEs (Zhang et al. 2014). Chatbots powered by technologies like generative pre-trained transformers (GPT) offer SMEs scalable customer support solutions and improved engagement (Cordero et al. 2022). Data analytic algorithms may help SMEs extract valuable insights from their data, supporting better decision-making and innovation (Davenport and Harris 2018; Liu et al. 2020).

Although numerous digital technologies are available for business use in SMEs, managers often miss out on the opportunity to benefit from adopting these tools. This may be due to a lack of time, a shortage of financial or human resources (Mollet and Kaudela-Baum 2022), or the absence of a digital strategy (Becker and Schmid 2020).

However, the adoption of these technologies also presents challenges, including the need for substantial initial investments, data privacy concerns, and the necessity to upskill the workforce. Pfister and Lehmann (2023) take a closer look at the returns on digitization in SMEs, emphasizing the importance of understanding the various dimensions that contribute to the success of these initiatives. The scope extends even further, as Song et al. (2022) explore the digital transformation of traditional markets into entrepreneurial ecosystems. This dynamic shift points towards a broader societal transformation driven by digitalization.

SMEs need to catch up to the current digitalization trends, regardless of the position(s) they find themselves in. For an SME to stay viable, owners and managers must adapt their business models, processes, and infrastructure to the new digital reality (Becker and Schmid 2020).

The literature offers few insights into how digitalization might be incorporated into the business plans of SMEs to assist them in enhancing their financial performance, while also boosting other outcomes such as customer satisfaction, customer loyalty, productivity, and brand reputation. Additionally, the existing literature inadequately characterizes the digitization phenomena in the context of SMEs. Little is known about the many digitalization adoption scenarios for SMEs (Eller et al. 2020), including the adoption of technology, integration, application of digital skills, and knowledge management.

In light of the evolving digital landscape and its potential impacts on SMEs, the research question that emerges for this study is: How can SMEs leverage digital technologies to enhance performance in the face of potential barriers and challenges?

Acknowledging the complexity and novelty of our research, we adopted a qualitative research methodology (Eisenhardt 1989; Yin 2009). The exploratory nature of our research aims at better understanding intricate digitalization processes and their implications on productivity, clarifying the perspectives of SME managers. We aim to identify the patterns and critical factors in play here, examining the relationships between different facets of digitalization and productivity within the SME context.

This study shows that a variety of factors simplify digitization in SMEs, such as the presence of suitable technologies and digital skills. There are also elements that are barriers to digitization, such as a risk-averse SME culture, and the continued use of/clinging to legacy systems. In a nutshell, this study provides insights into the nature of digitalization, assesses digitalization adoption factors, and evaluates the performance outcome of digitalization in the SME context.

2 Theoretical background

Understanding the terminology and common language of the digitalization phenomenon is essential before any in-depth review and analysis of the literature. The terms *digitization*, *digitalization*, and *digital transformation* are often confused with one another (Bloomberg 2018). Digitization can be described as the "technical conversion of analogue information into digital form" (Autio 2017, p. 1) or the process of turning physical objects into digital ones (Rijswijk et al. 2020). Digitalization, unlike digitization, does not have a single, straight, obvious definition. Research states that digitization and digitalization are two conceptual expressions that are closely related and frequently used interchangeably in a wide spectrum of literature (Bloomberg 2018). To achieve digitalization, companies must link their services to the actual demands of their customers (Gray and Rumpe 2015). Digitalization is also regarded as the socio-technical processes related to the use of digital technologies that have an impact on social and institutional environments increasingly relying on digital technology (Tilson et al. 2010; Rijswijk et al. 2020).

Verhoef et al. (2021) offer a multidisciplinary reflection on digital transformation, emphasizing its significance and complexity. They argue that digital transformation spans across multiple facets, encompassing technological, organizational, and managerial dimensions. Moreover, Zamani's (2022) systematic literature review accentuates the evolving technological landscape in which SMEs operate. The study brings to the forefront the essential role of technology adoption in SMEs, emphasizing the challenges and opportunities they face in this era of rapid technological evolution.

Eller et al. (2020) suggest that digitalization is a multidimensional phenomenon involving numerous levels, including digital entrepreneurship, strategies, processes, and education. Digitalization is also viewed as the transformation of internal and external contacts, corporate processes, and even business models into digital ones in which information is digitally represented (Sahlin and Angelis 2019).

Although digital strategy is regularly discussed in the academic literature, there is currently no agreed-upon definition of digital strategy among scholars. The expressions *digitalization strategy*, *digital business strategy*, *digitization strategy*, and *digital transformation strategy* are frequently used interchangeably in this field (Schallmo et al. 2019).

2.1 Digital technologies and digital skills

Vial (2019) identified and grouped digital technologies into six categories: (1) social, (2) mobile, (3) analytics, (4) cloud, (5) the Internet of Things (IoT), and (6) platforms. Of note here is how overarching technologies such as the internet or software are taken for granted these days, and seldom viewed as factors that influence company development or direction. As outlined by Kane et al. (2015), firms aim to revolutionize their businesses by using digital technologies such as social media, mobile analytics, and cloud computing.

Digital technologies are constantly evolving, while new digital tools emerge every year, and outdated ones diminish over time. For example, according to Kriechbaumer (2019), one of the essential technologies today is mobile technology, which has given people on the go a new degree of communication potential that was previously only possible through desktop digital interaction on stationary personal computers [It is worth mentioning that these days, mobile internet users outnumber desktop internet users (Kriechbaumer 2019)]. Another important aspect is that every digital technology serves its distinct purpose and plays its role; it would be wrong to state that one technology is better or worse than the other. Instead, combining various digital technologies plays an essential role in a specific company's digital transformation (Vial 2019).

Although existing digital technologies constitute a necessary basis for innovation and performance improvement, a company's ability to innovate largely depends on its staff's digital skills and competencies (Lanvin and Passman 2008). The study conducted by Verhoef et al. (2021) stresses the multidisciplinary aspects of digital transformation, emphasizing the importance of developing digital competencies across various organizational functions. This not only enables companies to effectively exploit emerging technologies, but also fosters an environment where employees can thrive in a digital-first ecosystem.

Today's workplace necessitates employees with a wide range of abilities who can handle complex and collaborative tasks. Generally, 21st-century talents include (1) cooperation, (2) communication, (3) digital literacy, (4) civic engagement, (5) problem-solving, (6) critical thinking, (7) creativity, and (8) productivity (Voogt and Roblin 2012).

2.2 Key benefits of business digitalization

Multiple resources describe the substantial benefits of digitalization adoption for companies. Jeansson et al. (2017) identified the benefits of SMEs' digitalization expansion, naming eight digitalization perspectives: (1) knowing the customer, (2) offering value, (3) creating points of interaction, (4) finding new ways, (5) making money, (6) building networks, (7) managing information, and (8) optimizing resources. Kraus et al. (2021) stressed the benefits of business digitalization as encompassing low costs, less manual work, fewer errors, company spending visibility, control over finance, and data-informed solutions. Because of digitalization,

the workflows of companies are highly likely to become streamlined, leading to a decrease in human error (Ionica 2019).

Digitalization has been viewed as a crucial tool for today's business success. Its main goal is to help firms improve the efficiency of their operations and enable automation (Milani 2019). The use of modern technologies allows for waste/inefficiency reduction while optimizing the use of resources, decreasing losses and increasing staff productivity as a result. Digitalization is also paramount in the process of working with customers (Gorensek and Kohont 2019).

Analyzing the best practices for digitalizing businesses to help these organizations become more customer-centric and better performing is necessary when it comes to investigating the challenges of digitalization in small businesses. Taking a strategic view can be regarded as the first step in the process of company digitization (Bogoviz and Ragulina 2020), while identifying end goals helps determine how these can be achieved with the help of digitalization. When digitalization is initiated to automate legacy operations, the same problems with performance are very likely to remain (Bentalha et al. 2019). Gebauer et al. (2020) however found a "digitalization paradox" in which "companies invest in digitalization but struggle to earn the expected revenue growth" (p. 315).

2.3 Digitalization and SMEs' business models

Defined in EU recommendations (2003) as businesses that employ fewer than 250 employees, SMEs play a vital role in the European economy. They are considered engines of economic growth and often referred to as "the backbone of the EU's economy" (European Commission 2003).

As digitalization continues to proliferate in terms of its importance as a marketing tool and for other key communication strategies around the globe, addressing the ways in which digital transformation will need to be at the center of SMEs' business plans is becoming increasingly important (Becker & Schmid 2020). Sabatini et al. (2022) argue that one of the most important reasons why SMEs reshape and rethink their business models is the opportunity to embrace new technologies.

2.4 Digital orientation and digital strategy

Numerous transformations in society and in business organizations have taken place due to the global digitalization process (Berman 2012). Digital orientation is another important topic for understanding how SMEs are developed and how they interact with various factors. Digitalization has changed the ways in which today's customers approach available products and services. Compared to past generations, there has been a very significant shift in terms of how people shop and make decisions about what they will purchase and why (Berman 2012). The phenomenon of digital orientation plays an important role in the contemporary business environment, acting as a critical source of competitive advantage (Quinton et al. 2018). A recent study demonstrated that digital orientation has a positive direct effect on product and process innovation performance (Ardito et al. 2021), while an analysis of the

academic literature illustrates that a company with digital orientation prioritizes digital technologies and tools to integrate them into a variety of processes (Rha and Lee 2022).

2.5 Barriers to adopting digital orientation

Digital orientation is not merely an approach that could be taken by an organization to solve situational problems or take advantage of new opportunities. A company with a digital orientation needs to subject all of its organizational processes to the underlying philosophy of digital orientation; this is based on an attempt to leverage digital technologies and tools that maximize performance and deliver high value to customers (Kraus et al. 2021). The achievement of this goal, however, might be inhibited by a variety of barriers.

One of the most significant obstacles is the inability to experiment quickly (Kamaljeet 2021). A firm that is not capable of rapid experimentation spends a substantial amount of time assessing new digital technologies and innovations before integrating them into its processes (Kraus et al. 2021). The slow pace of digital innovation is incompatible with the spirit of digital orientation because it prevents organizations from leveraging digitalization into an important competitive advantage.

Another barrier to digital orientation is the absence of a consistent framework that combines the work of all teams and departments. The phenomenon of digitalization implies ensuring that all employees in an organization are committed to the goal of continuously implementing digital innovations in various fields while advancing innovation to increase customer value (McLaughlin 2020).

The prevalence of a risk-averse culture is a pertinent factor related to the issue under investigation here. A number of companies prioritize safety and security over potential rewards, thus refraining from taking risks in most situations (Brodny and Tutak 2021). This kind of risk-aversive culture is incompatible with the idea of a digital orientation because the latter implies regularly experimenting with new tools and integrating novel instruments.

Experiments with digital innovations inevitably translate into errors and losses, making the organizational environment unpredictable to a certain extent (Trittin-Ulbrich et al. 2020). Lack of funding is another well-known barrier to digital orientation: Evidence shows that early adopters of new digital technologies spend a substantial amount of money on integrating these instruments compared with firms that approach digitalization in a more responsive or reactive manner (Rachinger et al. 2018).

Considering that an SME could require several different programs such as customer relationship management systems, business planning and coordination applications, a business management system, AI-powered analytics based on big data, and many other tools, the monthly costs of all these instruments might skyrocket. Accordingly, a lack of funding could serve as a critical barrier to digital orientation.

Further barriers to digital orientation can also include employees; the most well-known barrier here is a lack of necessary competencies and skills. Some digital

tools require extensive training within a staff (Brodny and Tutak 2021), making it common to believe that companies with a digital orientation should have significant recruitment standards for new employees so that only workers with a significant level of digital literacy can be accepted (Trittin-Ulbrich et al. 2020). Another significant employee barrier to digital orientation is their resistance to change. The academic literature states that many employees might be unwilling to embrace organizational changes such as the introduction of new digital technologies (Kraus et al. 2021). Significant resistance to change acts as a critical obstacle for any organizational attempts at it, and forces companies to use sophisticated instruments to overcome it, such as the recruitment of change agents, the extension of training programs, the introduction of financial incentives, and other measures (Trittin-Ulbrich et al. 2020). Resistance to change among a staff is a crucial barrier that might undermine all digital transformation initiatives and interfere with a firm's digital orientation.

3 Research design and methodology

This study aimed to analyze the adoption of digitalization while answering the question of how digitalization affects performance in SMEs. The major characteristics and functions of this phenomenon were identified through a literature review (Kraus et al. 2023) of the application of digital technologies for streamlining business processes to the strategic orientation of SMEs. We subsequently developed a set of deductive codes relevant to data analysis such as digital orientation, skills, technologies, and the benefits of digitalization.

Given the complexity and the novelty of our study, this study built on a qualitative research methodology (Eisenhardt 1989; Yin 2009) to gain an in-depth understanding of how SMEs adopt digital technologies, and how digitalization affects SMEs' performance. A qualitative research design is useful in exploring digitalization and digital strategies in SMEs, which in this respect are still relatively new, mostly uncharted topics (Becker and Schmid 2020).

The nature of the research aim and research questions was exploratory, as the goal was to better understand digitalization processes and situations and their effects on productivity from the individual perspectives of SME managers. The main goal was to describe the patterns of various processes, identify the most critical factors, and explain and interpret the relationships between different digitalization factors and productivity in the context of SMEs.

Existing theory was used as a guide for developing research questions and goals, and to structure the initial codes. The collected data were examined for similarities and patterns in a flexible pattern-matching exercise to develop a comprehensive picture of the digitalization process as perceived by SME managers (Bouncken et al. 2021a, b). The topic was explored prior to moving on to more abstract generalizations and notions. The most prevalent concepts in reasoning were subjectivity and meaning throughout the research. The questions were open-ended and process-oriented (Merriam and Tisdell 2015). In establishing the reliability of the data and the credibility of sources, non-random samples were drawn using strict eligibility criteria (purposive sampling) (Patton 2002).

The study participants were managers with positions relevant to our study, and professionals with three to 22 years of experience who have obtained experience in multiple business situations, as well as those who possess valuable knowledge in the domains of digitalization and productivity. This means our sample was composed of elite informants (Solarino and Aguinis 2021). Seven in-depth, semi-structured interviews with an average length of 45 min were carried out across countries and industries from January to April 2022 (Table 1). The firms were selected based on the maximum variation criterion (Palinkas et al. 2015) to capture the anticipated heterogeneity of digitalization patterns and informant perceptions across different contexts. Data collection was carried out until data saturation was reached (Mariam and Tisdell 2015); this was assessed via researcher triangulation.

Because this research aimed to collect valuable insights from professionals with substantial experience in the fields of management and digitalization, the interviews were conducted with only a moderate amount of control by the researchers to obtain a better understanding of the phenomenon and gain new perspectives on the topic.

3.1 Data collection and boundary conditions

The data were collected from a review of relevant literature, as well as from in-depth interviews. The primary instrument of semi-structured interviews for data collection offered a structure with predetermined themes and questions, as well as the freedom to reply to and construct additional questions depending on the responses provided during the interview.

Semi-structured interviews frequently yield results that are useful beyond the immediate confines of the current research subject (Merriam and Tisdell 2015). The interviews were conducted either on-site, at the company's premises, or via video calls. Each interview was recorded and transcribed using Descript (for Mac) software to preserve the record and provide a comprehensive analysis of the data.

An interview guideline with open-ended questions was utilized during all of the interviews to guarantee direction and consistency. The script was created based on research questions and the literature. Questions were posed with the intent of eliciting the respondents' perspectives and worldviews, and not necessarily asked in the same order in each interview (Merriam and Tisdell 2015). The answers either supported and supplemented, or refuted and opposed the claims, themes, and ideas derived from the literature review. After the first three interviews, the interview guideline was slightly revised, as some new, relevant themes and concepts emerged during the initial data collection.

Because purposeful sampling was used, strict criteria for participation were applied (Patton 2002). First, the interviewee had to have at least three years of experience managing an SME or a department within one. Second, they had to have been exposed in one way or another to digitalization (such as a technical or organizational challenges requiring digitalization, e.g. POS or CRM) within their line of work, and had to be familiar with the key concepts and relevant definitions of terms. These criteria were checked with the interviewee at the start of the interview.

3.2 Interview process

The interview guideline is listed in Table 2, and embedded the themes from the literature review in the questions. Follow-up and clarifying questions were asked if the answer given appeared to be indirect or incomprehensible (Kallmuenzer et al. 2018).

3.3 Content analysis

We followed a conventional process of qualitative data interpretation during this research that was structured using literature-driven codes to identify key themes (Braun and Clarke 2006):

Step 1. The data was organized and prepared for analysis. This entailed transcribing the interviews and classifying and organizing the data into various categories.

Step 2. The data was read and examined. This initial stage gave an overview of the material and an opportunity to consider its overall significance. The notions discussed, ideas, and concepts were identified, and the overall breadth, reliability, and utility of the information were assessed.

Step 3. All data was encoded. Coding is the process of arranging data by bracketing chunks and putting a category-specific term in the margins (Rossman and Rallis 2012). It entailed segmenting phrases (or paragraphs) into groups and identifying those categories with a keyword, frequently based on the actual language of the participant.

Step 4. Descriptions and themes were generated, as well as categories for study. Description entails the detailed presentation of information about people, locations, or events in a context. Coding was used to generate a number of themes. These were essential findings of the research (and also used as section titles in the Findings section below). Several viewpoints from the interviewees were presented and supported by various quotations and concrete data (Creswell and Creswell 2017). Further investigation aimed at establishing intricate linkages between themes.

The qualitative data were divided into 154 quotes, with each quote identified by its source (the interviewee), and coded under 39 subcodes of similar fit, one for each concept that fit into 12 codes/groups of concepts and, eventually, five themes: (1) digital orientation, (2) digital skills, (3) digital technologies, (4) benefits and drivers of digitalization, and (5) barriers to SME digitalization.

ATLAS.ti, a qualitative data analysis application, was used to aid the data analysis. This software can incorporate text, data storage, and organization features, the search capacity to locate all text associated with specific codes, interrelated codes to make queries about relationships between codes, and the import and export of qualitative data.

The transcripts, clean and prepared for analysis, were uploaded into ATLAS.ti software. Codes and subcodes were created by two of the authors by reading the transcripts. The quotes from the interviews were labelled according to these codes. After that, the codes were closely examined to reduce overlap and redundancy within themselves and across coders, achieving a sound inter-rater reliability of

95 percent (Krippendorf 2004). Every code and subcode had to fit into one of the themes in a shared concept.

Several first-order codes (subcodes) were identified as a result of the data analysis, which were then grouped into second-order codes conveying the primary indicators of the textual data (Kallmuenzer et al. 2018). The most meaningful direct quotes derived from the transcripts of the interviewees were presented to substantiate the claims made. The codes were then aggregated into themes for a better organization of findings and analysis. Codes and themes were furthermore organized into a concept map for better traceability (Fig. 1).

4 Results

We structured our data in relation to the initial structure of relevant codes and themes developed in our literature review. Doing this allowed us to match the theoretical structure of the digitalization process (factors and barriers) with the structure emerging from the data (Bouncken et al. 2021a, b). This expanded prior literature to include additional insights, identifying elements missing in our data when compared to the theoretical patterns, while also identifying different takes on the elements that our informants reported. We started by capturing the perceptions of digitalization and technology adoption, continuing with its benefits, factors, and barriers to arrive at a more strategic outlook on digitalization.

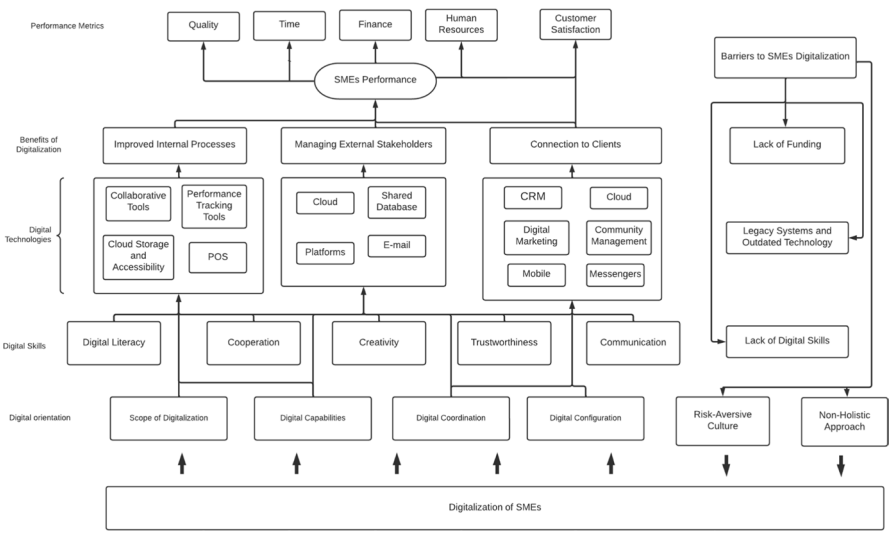

Fig. 1 Conceptual map of findings

5 Definition

The definition of digitalization is the basis for further research. Similar to the theoretical findings, different interviewees had slightly different views about digitalization. SME managers develop a practical knowledge of digitalization. Unsurprisingly, the SME managers gave their definitions and perspectives of digitalization based on the functions of this phenomenon, and by describing what it does for their company, with characteristics like speed and efficiency being the top benefits:

> The way I look at it, time is valuable, and digitalization helps us save time by streamlining our work, mostly by helping us connect with customers and storing the information (quote YP1; code "definition of digitalization").
> With digitalization, we automate the process of computing, which speed ups our operations, and therefore we can concentrate on other things like quality and strategy… (quote SK1; code "definition of digitalization").

Additionally, the distinction between the terms digitization, digitalization, and digital transformation remained unclear from a practical perspective. However, digitalization was in fact viewed as a process of digital technology adoption, remaining consistent with textbook definitions:

> For me, digitalization is basically replacing paper; we use information technology tools like different computer software or the internet to get the job done faster, more efficiently… (quote PH1; code "definition of digitalization").

To further investigate digital technology adoption, we took a closer look at various digital tools and applications, and the skills required to be efficient at using them.

5.1 Digital tools and skills

The theme of digital tools includes electronic devices such as computers or point-of-sale (POS) systems (hardware). It also includes the internet, cloud technologies, and applications such as collaborative tools, cloud-based CRMs, and other software. The tools described have their practical applications in SMEs. Despite being exposed to digitalization, the interviewed managers were not experts in the field of ICT, and their viewpoints had a purely hands-on nature. The participants described a variety of digital tools and relevant skills required from staff to be able to use these tools for a specific purpose:

> With staff members, the majority of our employees are salespeople, so they mostly use our CRM system, the marketers use analytical tools, and HR manager the Lucca (HR) software. We all use MS Teams for internal communications. Digital tools are becoming increasingly more specialized (quote PH2; code "digital tools and applications").

Each firm uses a mixture of digital technologies to a different extent, and the managers employ the technologies in combination with each other. Each firm

uses its own mixture of technologies that is unique and adapted for the needs of its business:

> We use our website to connect to our customers, display our products, and if we spark their interest, they act, either by leaving a request online, emailing, or calling us. In our company, we use IP telephone, WhatsApp, email, the chat-box, and social media to get ahold of the clients […] for the internal communication we use cloud applications (quote PH3; code "digital tools and applications").
> We use the Bitrix24 cloud application for managing our projects; I find it useful for collaboration and brainstorming ideas. This tool allows me to assess risks and get each of our team member's perspective on a given situation… (quote SK3; code "digital tools and applications").

Two of the SMEs' managers in the hospitality and retail sector actively use POS systems that have become indispensable for their business:

> Our whole business relies on the POS software; we have our customer database there, we receive payments, record transactions, manage our stock and inventory with this software (quote AP7; code "digital tools and applications").

Even microenterprises in the non-IT sector make use of digital tools. As the manager of a small café stated:

> We don't have departments in the conventional sense; we have a kitchen, dining hall, and a delivery guy. Our computer with the specialized software on it makes communication and record-keeping extremely easy and fast […] For clients, the software helps to make price quotations, invoices, and bills […] for our workers; the same software takes care of the inventory[..]. For me […] I can track the popularity and profitability of specific products, and based on that make business decisions (quote YP6; code "digital tools and applications").

In connection with the technologies used, the interviewees spoke about their own and their employees' skills needed for effectively using the digital tools:

> We hire lots of young people who are familiar with the technology. It means that you can use a phone, you can use a computer, then know how the internet works, how the search engines work. It's like basic knowledge required to work in our company. Almost everyone is required to know how to create, store, manage files, using spreadsheets and other applications… (quote PH4; code "digital skills").

A lack of digital skills may represent a significant obstacle for someone looking for employment, even in a small company. Learning may be a lengthy process for someone unfamiliar with digital technology:

> Being a small company, however, we cannot hire people who don't know how the software works. You can learn it, of course, but we can't provide computer literacy training here… (quote SK4; code "digital skills").

Digital skills are viewed as a necessary supplement to worker specialization, acquired through education and professional experience:

> As we hire salespeople, for example, the main criteria for successful candidates is the relevant work experience, then it may be a degree, and then the skills, which can be divided into soft skills like sales ability, assertion, the ability to learn, presentation skills […] and hard skills or technical skills, which will include digital skills (quote AP4; code "digital skills").

Surprisingly, the managers indicated the importance of an employee personality that uses digital technology for communication on behalf of the company:

> The services of our company are presented online, through our website. So, when we use ICT to connect to our customers, we don't see them, they don't see us, they don't know who we are […] An important role here is gaining trust in our company in the eyes of the clients. That can only be gained by the trustworthiness of our staff, if they as workers, and we, as a company, deliver on our own promises (quote PH6; code "digital skills").

The idea of accountability goes deeper when international trade is involved:

> We serve clients from all over the world, and we are constantly looking for potential customers; with the use of ICT, it is easier and harder at the same time. It is easy to locate a potential client but convincing him to make a deal is much tougher. We need to be able to evoke trust (quote SK6; code "digital skills").

Even in small companies, there are a variety of employee specializations, all of whom use different digital tools and focus on different activities:

> We have salespeople, marketers, managers, accountants. They all use different software, as they do different tasks. These different tasks also require different skills (quote EA6; code "digital skills").

It was also seen that workers have different abilities, and that tasks should be aligned with the employees' talents, abilities, and aspirations:

> We hire interns for the positions that will allow them to fully utilize their abilities, and tasks are given according to their preference. We believe that if the person likes what he or she is doing, they will be much better at the given task (quote PH7; code "digital skills").

However, in microenterprises, the roles are not specialized and more blurred:

> In our company, only one person is in charge of [digital] community management on top of other responsibilities, so he is unable to frequently create

high-quality posts. I take care of the organizational elements (quote RA5; code "digital skills").

5.2 Technology adoption

As an integral part of digitalization, technology adoption is the change and learning mechanism for entire companies. The interviewed managers viewed technology adoption as a difficult but necessary process for the overall success of their companies. The companies in our study were small and medium-sized, so the adoption of technology naturally came about through a market pull process:

In this company, we cannot create the need, we are a small company, we can only satisfy the need that is already there (quote EA2; code "technology adoption – market pull").

The market pull technology adoption process comes primarily from the customers:

Many of our customers use the newest technologies and expect us to do the same. For example, making cryptocurrency payments, or authorizing smart contacts […] we cannot do that yet, we do not have the means (quote PH9; code "technology adoption – market pull").

The market pull process can come from competitors as well:

We are always looking at what our competitors are doing, and trying to do the same, but better […] The competition is strong […]. We regularly schedule competitive research activities, so we can compare the quality of competitors' services, such as website functionality and presentation, good pictures, etc.… (quote PH8; code "technology adoption – market pull").

There are certain limits to the extent of technology adoption due to the size of the company:

As much as we would love to, we cannot afford the custom-made CRM software that would be perfect for us, […] so we have to use the cloud platforms, Birix24. It's far from perfect, but it helps a lot nevertheless… (quote SK7; code "technology adoption – market pull").

Although global technological development regularly produces new, improved versions of IT systems and solutions, the managers often find it challenging to quickly adopt new technologies, citing a lack of time and resources. Consequently, they prefer to continue using legacy systems:

There are new programs and computers released each year; I don't want to invest in a new computer when the old one works just fine (quote YP7; code "technology adoption – market pull").

5.3 Digitalization effect on performance

Although the question regarding the effect of digitalization on a company's performance was somewhat confusing for the participants, every respondent cited a positive effect of digitalization, even though it was challenging for them to distinguish and articulate a direct link between digitalization and performance.

Digitalization was viewed as a set of helpful tools and practices that drive the performance of an enterprise. The SME managers emphasized three key benefits of digitalization: (1) connection to customers, (2) streamlining internal processes, and (3) managing external stakeholders.

5.3.1 Connection to customers

The current study shows that for SME managers, the key benefit of digitalization these days is the ability to market their products effectively while achieving a solid reputation among potential clients:

> Our CRM system is the main tool that we use to get in touch with the clients, even if it is a one-way connection through our website [..] With available digital tools, we are able to scale customer management processes […] We categorize clients, and keep all the data about them so we can use it to more effectively engage with them […] We can also make personalized quotes, as our salesmen use back-end tools to modify the website (quote AP8; code "client connection").

Social media platforms play a key role in customer connection for the SMEs:

> Imagine I send someone a piece of information, a promotional text, or an image; usually it's both, and somebody looks at it. Now, social media allows us to send this information to a very large public. It's mind-blowing to see that thousands of people are reading our Instagram posts… (quote RA12; code "client connection").

Online presence and reputation have become one of the most important factors when the client is facing a choice between companies who provide similar services:

> Our firm has 4.8 stars on Google reviews, and it is often the first thing that we hear when the customer shows up at our door… (quote RA13; code "client connection").

Several analytical tools allow managers to determine their customer's persona and present personalized services:

> Most of the social media use comes from younger people, so we send our messages to them, using appropriate language and images (quote LP7; code "client connection").

5.3.2 Streamlining internal processes

In addition to the effective connections to customers, the respondents highlighted the benefit of digitalization in automating and rationalizing various processes inside the company.

This internal transparency requires strong trust from management, and a high degree of accountability from the employees:

> We are a small company, and don't hide things from our workers. On the contrary, I think that the more our workers know, including cross-department knowledge, the better they understand how our business works, so they can clearly see their own roles and importance in the company… (quote PH13; code "streamlining internal processes").

Managers employ different collaborative tools including MS Teams, Zoom, or other applications to streamline and organize information flow and communication within the company:

> Effective communication is extremely important; we constantly exchange messages, and use different software for different purposes; for example, a short question can be asked through Teams. If someone needs to talk to somebody in the company, they make a video call. For sharing files, we use MS Outlook (email). Everyone can also edit the client information for other team members' reference in our CRM system... (quote EA10; code "streamlining internal processes").

The Covid 19 pandemic was one of the strongest accelerators of internal process digitalization, with remote work becoming much more common:

> You can work from anywhere in the world; you don't need special software, just the browser and internet connection (quote PH15; code "streamlining internal processes").

Technologies allow managers to collect and analyze data related to the performance of departments and individual employees:

> I can regularly check how much every salesman brings to the company, and make my conclusions […] There are of course other factors, but still, I can see the big picture (quote EA12; code "streamlining internal processes").

5.3.3 Managing external stakeholders

The participants in this study viewed customers as the most important external group; effective communication with them can dramatically increase a company's performance. However, a company's digitalization can improve communication and engagement with other external stakeholders as well such as suppliers, banks, or competitors:

> Our company has access to the database of the suppliers, and the latest information about the price and availability of components helps us improve the production process (quote RA12; code "managing external stakeholders").

Communication with financial institutions was mentioned as a major benefit of digitalization:

> I understand that online banking is not a new thing, but it is worth mentioning, because it saves a lot of time with sending and receiving payments, tracking down expenses […] I don't remember the last time I went to the bank (quote YP11; code "managing external stakeholders").

The accessibility of the information makes it possible to carry out robust competitive analysis and benchmarking:

> All the offers [product description, prices, conditions] are online, and we can see them in real-time. Then we compare them to what we have to offer and try to do better [than the competitors]. Either lower the price or improve quality and presentation (quote PH17; code "managing external stakeholders").

5.4 Barriers to digitalization

The collected data suggests that, applied correctly, digitalization practices bring substantial benefits to a company. However, there are still numerous obstacles on the way towards SME digitalization. Lack of financial resources was cited as one of the major barriers:

> We sell our products through our website, and how we present these products is a decisive factor for the customers. I wish we could afford high-end technologies like VR, which could improve the customer experience […] as a small company, we have to work with what we have (quote EA21; code "barriers to digitalization adoption").

The insufficiency of required digital competencies and skills among employees was mentioned as one of the major hurdles to digitalization:

> Sometimes it's hard to believe that there are people out there who apply for a job but don't know how to use a computer. Digital literacy and basic knowledge of software are the essential skills for all of our employees (quote AP18; code "barriers to digitalization adoption").

The conservative, non-risk approach is prevalent at some businesses among SMEs, with managers continuing in their old ways as long as they produce acceptable results:

> My philosophy is simple: If it works, there is no need to fix it; I don't want to spend money on something that may or may not improve our business (quote YP19; code "barriers to digitalization adoption").

5.5 Strategic role of digitalization in the overall success of SMEs

The interviewed managers stated that, in their view, the role of digital in the internal organization of the company would most likely continue to grow:

> For our business use, as we went from [using] pen, paper and calculators to Excel spreadsheets stored in the cloud; it seems that more digital tools will appear in the future, and we'll have to adapt (quote AP21; code "strategic outlook to digitalization").

The importance of digitalization in external communication will likely develop as well:

> More and more people use the internet, and before coming to our store, customers check us out online. How we present ourselves online is a dealbreaker for us, so we'll continue to improve our image on the internet (quote RA22; code "strategic outlook to digitalization").

The scope of digitalization is limited due to the size and capabilities of SMEs. The disadvantages of SMEs such as limited financial and human resources shape the extent of digitalization strategy (Wuest and Thoben 2011).

> Of course, I consider digitalization as the new reality of how business is done, but my company is small, and it is not my priority to fully digitalize the operations… (quote YP18; code "strategic outlook to digitalization").

When more specifically discussing the scope of digitalization and the application of digital in communication, the managers emphasized the importance of the balance between digital and traditional communication methods:

> For a small company using digital, it's a great opportunity to communicate to a large audience. We can basically scale the communication, but for higher levels of coordination, human, face-to-face contact is vital. The information can be expressed with a gesture, a smile or a smirk, the tone of voice, or the look of a person. The message, sent through digital, on the other hand, can be lost, misinterpreted or ignored... (quote RA23; code "strategic outlook to digitalization").

The idea of creating a balanced combination of digital and human capabilities was expressed in terms of successfully managing internal processes:

> We try to automate our daily tasks as much as we can, but some responsibilities require purely human qualities: creativity, imagination, even intuition in some instances (quote AP23; code "strategic outlook to digitalization").

6 Discussion

The research question of digitalization adoption and the effect of digitalization on the performance of SMEs revealed itself as complex. First, no agreed-upon conceptual structure for the notion of digitalization was found (Verhoef et al. 2021).

Second, a multitude of concepts, themes, notions, and terms in the domain of ICT often overlap, with different experts having varying viewpoints, while often using different terminology when describing the same subject (Zamani 2022). Third, different types and levels of exposure to digitalization produce a large selection of ideas from researchers and business practitioners (Pfister and Lehmann 2023).

Nevertheless, extant research allowed a foundation for this research, building on the existing progress while developing current ideas further. The fundamental notions of this research were broken down into several smaller topics; these were then deconstructed into focused elements of the phenomena (Ramdani et al. 2022). During the data collection phase, these smaller pieces were identified, collected, and put back together, this time with the idea that the interviewees represented their own outlooks as managers of SMEs (Muñoz-Pascual et al. 2021). This is comprehensively summarized in Fig. 1.

6.1 Conceptualization of digitalization in the SME context

The managers interviewed for this study could not provide a unanimous, exact definition of the digitalization phenomenon. However, similar to extant research from the literature review (e.g., Eller et al. 2020), the collected data suggests that digitalization is perceived as a process of information and communication technology adoption.

On the other hand, the majority of participants in this research did not mention digital orientation when providing a definition of the digitalization phenomenon. This may be due to the fact that small companies do not generally prioritize digital transformation, instead using available technologies only when there is a strong need for them. In addition, SMEs are known for having relatively traditional cultures, are hesitant to experiment, and are very careful with their financial resources and investments. Nevertheless, managers are in fact well aware of available digital solutions, and their definition of digitalization was in line with the functionality of digital tools. In other words, the managers looked at what digitalization could do for their company and used their own descriptions to define the phenomenon.

6.2 Application of digitalization

The available digitalization literature provides several structured descriptions of modern digital technologies. Many of these such as AI, blockchain, IoT, 3-D printing, or VR are depicted as very innovative and promising (Cennamo et al. 2020). However, in the interviews, these technologies were mentioned only as probable future solutions for SMEs. Some of the participants had only heard of the existence of these technologies, and had no direct use experience with them. These digital tools are expensive for SMEs to adopt, and have yet to obtain widespread acceptance among managers. Moreover, some of these technologies have to date not seen practical use in small, specialized companies.

6.3 Individual level skills in digitalization

When discussing digital skills, the interviewed managers (as expected) named computer literacy as an indispensable ability for their workers. More surprising was that the participants unanimously stated that even profound computer knowledge, like any other digital skill for that matter, will not be sufficient for successful technology integration and operation. Soft skills such as creativity, teamwork, and the ability to learn and adapt were cited as being equally as important as the hard skills of computer knowledge. This position is similar to the perspective of Voogt and Roblin (2012), who also add problem-solving skills to this professional mix.

For larger companies that employ marketers and salespeople, digital and soft skills must align with their respective specialties. In this case, marketers should be somewhat more creative, and able to use content creation tools, while salespeople should be excellent communicators and diligent note-takers. In smaller companies, however, one person is often in charge of numerous digital tasks. As a result, this person produces a smaller outcome in the given digital channel. The data collected in our interviews complemented the theoretical findings with some insightful elements. First, digitalization was viewed as a "dehumanizing" factor of communication on both the internal and external levels. Digital means of communication often lack the emotions that are necessary for building strong customer relationships, and more generally the engagement of both internal and external stakeholders. This is certainly one reason that the importance of human, face-to-face contact, or at least phone conversations with clients, was mentioned. There is also the importance of integrity and accountability of employees, as well as the managers themselves. The internet is still a largely anonymous entity that allows people to operate globally and outside of the jurisdictions of many countries, meaning that the trust and trustworthiness of workers, managers, and entire companies are highly important for SME managers.

6.4 Digitalization strategy of SMEs

A digital strategy is often viewed as one of the key factors for successful digitalization. Even though the interviewed SME managers generally stated that they do not have a specific digital strategy, they were able to clearly indicate their strategic outlook on digitalization. The managers realize the scope of their digitalization practices and the limit of their digital capabilities. In addition, the data suggests that digital coordination and configuration are perceived as important factors in the digital strategy of SMEs. These findings align with the conclusions of Kindermann et al. (2021) about digital orientation domains. According to these findings, every company has its own unique way to achieve digitalization and configuration.

6.5 Benefits and the complexity of digitalization

The benefits of digitalization for business enterprises of any size are extensively presented in extant literature (Eller et al. 2020). From the many advantages described

in the literature, the interviewed SME managers were mostly focused on the benefit of the improved connection with clients. This kind of enhancement ultimately leads to customer satisfaction, which is also one of the most cited performance metrics. Another less prominent benefit is the streamlined communication with various internal and external stakeholders.

Every participant in this study mentioned that digitalization as a phenomenon positively affects a firm's performance within various activities; these were grouped into three main themes: (1) internal processes, (2) managing external processes, and (3) connection to the clients. The unique combination of the tools and skills, plus the digital initiatives of the management, were viewed as likely to make digitalization effective and capable of significant SME performance improvement. Managers can effectively observe the performance progress of their companies by observing/detecting higher customer satisfaction rates, increased ROI, and the amount of time saved while completing regular tasks thanks to improved and rationalized processes (Hudson et al. 2001).

6.6 Barriers to effective digitalization

Several barriers were revealed on every level of digitalization in the SME context (Fig. 1). Resource constraints, i.e. a lack of funding, was the most mentioned factor both in the literature and by interviewed industry professionals. SMEs are often characterized as entities with limited human and financial resources (Lee et al. 2012). On the level of technology adoption, the most significant barrier is the widespread use of legacy hardware and software systems. It was observed that managers often refuse to innovate as long as the technology in place is still working. The continuous use of outdated technology is furthermore connected to obsolete digital skills. Hence, technological path dependency appears to be a factor hampering digitalization, representing a major barrier in digitalization: SMEs managers are at the same time familiar with legacy systems, and unfamiliar with the characteristics and benefits of digital technologies. As a result, they may tend to underestimate the risk of sticking to outdated technologies, and overestimate the costs and time necessary to implement advanced digital technologies. By pointing out and perhaps even exaggerating barriers to digitalization, they systematically overlook their own role in this process.

As many SMEs managers do not prioritize digital elements in their operations, both current skills and old technology dramatically slow down the digitalization of some SMEs. The strategic outlook of managers is also often not in favor of digitalization. Many SMEs adopt and maintain a risk-aversive culture (Brodny and Tutak 2021), making it difficult to invest in digital innovations. The data also suggests that managers often view digitalization as merely a set of digital tools that allow certain activities to be performed. Although most of the managers we interviewed are unwilling to overhaul their entire business model to improve performance through digitalization, these factors appear even more relevant when considered together. Indeed, incremental investment in digitalization is not an option when considering

the legacy effect. As a result, digitalization appears to be a kind of discontinuity, requiring companies to drop legacy systems altogether, and move on with adopting ICT. Risk aversion and resources nevertheless appear to hamper these kinds of bold strategic moves.

7 Conclusions

Digitalization has become a popular topic among academics and professionals. Moreover, the growth of digital companies, and the variety of digital products and services stress the increasing importance of the subject. Companies that are more agile in adopting new technologies tend to gain a competitive advantage over firms that ignore digital trends or resist innovation. Literature and study findings show that digitalization brings unmatched benefits to the development of a firm. These come with the price of investing in technologies, learning relevant skills, and adopting a digital orientation. The context of SMEs adds extra conditions to digitalization as well (Eller et al. 2020; Kraus et al. 2022), such as relevant affordability, technology adoption simplicity, and efficient, specialized digital tools. There are many different ways to adopt digital technologies, and each firm has its own unique way of digitalization. Although the literature provides compelling evidence that general digitalization is beneficial for SMEs, our findings suggest that some firms may refrain or refuse to digitalize, and keep relying on legacy systems.

Multiple factors streamline digitalization in SMEs, such as the presence of the right technologies and digital skills. There are also elements that impede digitalization, such as some SMEs' risk-averse culture and the use of legacy systems. Study findings indicate that effective digitalization occurs when multiple elements come into play.

Several managerial implications can be drawn from this study. SME managers should most notably be aware of existing and relevant technologies. This study has shown that a multitude of digital tools and applications can significantly improve the performance of a company through mechanisms of streamlining internal processes, managing external stakeholders, and strengthening the connection with existing clients. Increased innovation can streamline a company's internal processes, making operations more productive. Companies that intelligently adopt new technologies are more likely to gain a competitive advantage in their fields of business.

SME managers are faced with a strategic issue when the multitude of available digital tools is added to the dynamics of technology. Here it is important that they develop a strategic, comprehensive, holistic view of digitalization that is embedded in the organization. This view may foster the formulation of digital strategies and generate growth. A viable recommendation for SME managers relates to digital abilities that are crucial in the digitalization process: Despite possible time constraints and scarcity of resources, it is imperative to focus on developing digital skills among and for employees.

Finally, we have identified several indications that digitalization is a very difficult decision for SME managers due to its inherent uncertainty. While managers

are familiar with legacy systems, the traditional skillsets of their employees, and the respective interaction with their customers, they might still lack expertise in digital technologies. It is also essential to be aware of the dynamics of this phenomenon, with technologies becoming outdated at an increasingly rapid pace. As a result, the situation often arises that incremental digitalization is simply not implemented, to say nothing of a radical digitalization ever occurring. Addressing uncertainty related to digitalization may help SMEs managers move towards investment risk assessment instead of relying on their own path-dependent judgement.

This study is not without limitations that, however, might also provide avenues for future research on the topic. The explorative research design of this study is qualitative and aimed at developing a comprehensive picture of digitalization in the context of SMEs, as seen by our interviewees. Our insights are restricted to these perceptions, and rather than allowing for generalizations, they encourage further scrutiny. The scope of this study did not allow a more in-depth level of individual analysis involving the personal characteristics and nuances of individual skills. Similarly, we did not focus on the micro-level of analysis that pertains to single decisions relative to digitalization. Inversely, a detailed picture of digital technologies would have allowed an industry-specific understanding of digitalization. In short, while we focused on the managers' view of the organizational level of analysis, we also opened pathways for examining other levels of analysis, and integrating them further into a multi-level picture of digitalization.

We opted for our sampling protocol to maximize heterogeneity. The resulting sample thus created a potential national asymmetry, with French businesses strongly represented. While this is consistent with our sampling strategy, we are aware that national context may in fact matter in digitalization processes. Therefore, we encourage further empirical studies that control for national and industry contexts, as well as large samples with a more extensive geographic and industrial coverage. Additionally, our sample size might restrict the depth of insights gained, encouraging replication studies on the one hand, and longitudinal studies on the other. We believe that limited samples offer the opportunity for in-depth examination, including temporal bracketing.

An in-depth interview data collection method entails further limitations in the sense that it provides data that is indirect in nature, representing the viewpoints of the participants. This information is provided in a setting that is different from a natural one, while the presence of a researcher may cause bias (Creswell and Creswell 2017). While it was assumed that the participants would provide honest answers to the best of their knowledge, at the same time, we are aware that the data collected is contextual and limited by the outlook of managers. Therefore, further research could use structured data collection tools such as surveys, and triangulate them with focused observations.

This study was based on interviews with SME managers, allowing a navigation of the multifaceted landscape of SME digitalization, which remains a critical area in contemporary business research. The current study can serve as a basis to further investigate digitalization adoption and its effect on SME productivity (Eller et al. 2020). For example, studies could more deeply explore one of the most important benefits of digitalization: the connection to customers. Other

work could focus on digitalization links and their characteristics between contemporary skills and technology, while further research could assess the dynamics of barriers to digitalization.

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