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DIGITAL OR NOT DIGITAL? KEY FACTORS AND BENEFITS OF SMEs' TRANSFORMATION: A SYSTEMATIC LITERATURE REVIEW

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Abstract:

Within the contemporary corporate landscape, the digital transformation process has emerged as a crucial facilitator for organizations' long-term viability and competitive advantage Although bigger organizations have readily adopted digital technology, small, and medium-sized enterprises (SMEs) must carefully evaluate certain variables and understand the benefits of implementing digital transformation efforts. This systematic review aims to provide a thorough and inclusive examination of the elements SMEs consider as they embark on their digital transformation path. The analysis of 418 Web of Science (WoS) and Scopus-indexed articles published between 2014 and 2024 served as the basis for this review. The results suggest that the elements influencing the adoption of digital transformation include environmental, organizational, and technological aspects. One of the key benefits related to adopting digital transformation for SMEs is the potential reduction in operational costs. This study undertakes a comprehensive examination and evaluation of scholarly literature to identify significant subjects and gather data that will influence future research and practical strategies for SMEs aiming to thrive in the digital realm.

Keywords:

Benefits, Digital, Factors, SMEs, Transformation

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Introduction

Digital transformation refers to adopting digital technology into all areas of corporate operations, leading to substantial modifications in organizational processes, strategies, and consumer interactions (Ismail et al., 2017). Despite their significant impact on the global economy, SMEs must carefully evaluate certain issues before embracing digital transformation. SMEs are adopting this new age of hybrid retail, characterized by the coexistence, overlap, and interaction of physical and digital channels. Nonetheless, adopting a hybrid approach or expanding sales channels has obstacles, including heightened competition, diminished profit margins, and higher operational complexity in managing various channels as mentioned in the MSME Insight 2022/23 report (SME Corp, 2024).

Small and medium-sized businesses (SMEs) now strategically need digital transformation if they are to stay competitive in the developing digital economy. Particularly among SMEs, which constitute the backbone of many economies, the need to embrace digital tools and technology has grown even more after the COVID-19 epidemic. With 97% of all businesses in Malaysia, SMEs make up 38.4% of the GDP (SME Corp, 2024). Regardless of this, many SMEs still battle with complete digital adoption because of limited resources, lack of knowledge, and change aversion. The Malaysia Digital Economy Blueprint and several governmental initiatives have been established to facilitate the digitization of SMEs, providing organized programs and financial assistance to foster innovation and sustainable development (MDEC, 2023).

Furthermore, there is potential to enhance the digital preparedness of SME merchants to proficiently use digital tools and services, especially in the realms of digital marketing management and increasing SME knowledge of digital risk (SME Corp, 2024). MSME Insight 2022/23 also mentions that in the last decade, the digitalization of SMEs has been a fundamental element in several public policies, including the Malaysia Digital Economy Blueprint, the nation's primary long-term digital strategy. The strategy, initiated in February 2021, aims to enhance prospects for SMEs in local, regional, and global development via digitalization. The strategy aims to assist 800,000 SMEs in digitalization and 875,000 SMEs in adopting e-commerce by 2025. Among the six drives, 22 strategies, and 48 national initiatives in the strategy, some specifically cater to the needs of SMEs.

A study by Zhu et al. (2021) presents a systematic review of digital transformation research across various domains, including strategy, management, innovation, and informatics, utilizing bibliometric analysis. It recommends that future research should focus on exploring the area of “driving factors”. Furthermore, a study by Ko et al. (2021) introduced a conceptual model explaining the elements driving digital transformation, and it is anticipated that it will stimulate more studies in the domain of digital transformation. These issues highlight the need for a comprehensive understanding of the factors influencing digital transformation and the tangible benefits that SMEs can accrue.

To address the previously identified research gaps, we undertook a comprehensive analysis of the relevant academic literature on digital transformation and SMEs, aiming to contribute to the continuing discourse by focusing on two critical areas. (1) ascertain the primary determinants that SMEs should consider before embracing digital transformation, and (2)

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evaluate the advantages of implementing digital transformation in the business operations of SMEs.
Our research aims to address the existing academic literature on digital transformation and SMEs by focusing on two critical areas: (1) to ascertain the primary factors that influence SMEs' decisions and processes before and during digital transformation, and (2) to evaluate the benefits of implementing digital transformation in the business operations of SMEs.

The objectives of this study are therefore:

1. To identify and categorize the key factors that influence the adoption of digital transformation in SMEs.
2. To synthesize the reported benefits that SMEs have realized through the adoption of digital technologies.

Various theoretical frameworks may guide the investigation of digital transformation in SMEs. Alongside the previously mentioned Technology Acceptance Model (TAM), the Diffusion of Innovations (DOI) theory (Rogers, 2003) provides understanding into the processes, drives, and pace of new technology dissemination within a social system. The DOI highlights the attributes of an invention (e.g., relative benefit, compatibility, complexity, trialability, observability) as critical determinants of its acceptance. This idea is essential for comprehending the adoption of diverse digital technologies by SMEs with differing attributes and circumstances.

According to the Resource-Based View (RBV) (Barney, 1991), a company's competitive advantage stems from its unique, valuable, scarce, and non-replaceable resources and skills. Digital technologies may be considered strategic assets that, when used successfully, provide distinctive capabilities for SMEs, leading to enhanced performance and competitive advantage.

In the methodology section, we describe the methodology used to perform the SLR, which is based on the guidelines of Tranfield et al. (2003). We looked at the previous research that was published in the literature, through this SLR, concentrating on the issues related to the adoption factors and benefits of digital transformation for SMEs. In the results section, we present the results of our research, which proposes categorizing these barriers. Next, in the summary of the findings section, we provide an overview of the findings addressing the research issues. In the conclusion section, we review the implications and directions for future research on adopting digital transformation.

Methodology

The three steps of an SLR method suggested by Tranfield et al. (2003) were as follows: search strategy, inclusion criteria, and data extraction.

Search Strategy

The search method was used by taking advantage of the Scopus database's advanced search function. Conducting an advanced search in the WoS database using like phrases constituted an additional measure. Advanced search efforts and resource selection were conducted from April to May 2024. The search was limited to articles published in English. The initial search period spanned from January 2014 to December 2024 to capture recent developments in the field. No specific restrictions were placed on the publishing area, year, or topic matter during the advanced search efforts. The search efforts yielded 418 distinct documents.

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All prior literature evaluations about the reasons and advantages of implementing digital transformation were compiled to structure the review. A matrix table was subsequently created (Table 1). This allows researchers to support our results that there is now no comprehensive assessment that systematically examines the causes and advantages associated with the adoption of digital transformation in SMEs. An in-depth examination of the reasons and advantages of implementing digital transformation in SMEs was not conducted. Secondly, the researchers compiled a comprehensive list of keywords from previous analyses of causes and advantages associated with digital transformation and used them in their study. Upon reviewing more articles, the keywords were compiled into a table, and subsequently, more keywords were included until the researcher achieved an enormous list and attained keyword saturation (i.e., qualitative data).

Electronic databases such as WoS were thoroughly searched. A range of keyword combinations, such as "SMEs," "digital transformation," "benefits," and "factors," would be used to locate pertinent research.

Inclusion Criteria

The identified records underwent a two-stage screening process. First, titles and abstracts were reviewed against predefined inclusion and exclusion criteria to assess their relevance. Studies were included if the study was from the last 10 years (2014-2024), worth of English-language studies that demonstrate the difficulties and roadblocks SMEs face when undergoing digital transformation. The study would consider peer-reviewed literature, conference papers, and prior research. Studies rejected were those not published in English, not peer-reviewed, for example, conference papers and editorials, or those that did not address the link between digital transformation and SMEs. Full texts of possibly qualified papers were obtained and carefully evaluated against the inclusion criteria after the title and abstract screening.

Data Extraction

When extracting data, predefined criteria such as research design, sample size, significant findings, and methodology will be considered. A systematic data extraction form was created and pilot-tested to guarantee uniformity in data collection. The retrieved data comprised: author(s), publication year, study goals, methodology, discovered key elements of digital transformation, and stated main advantages of digital transformation. The gathered data were then integrated thematically to identify throughout the included research recurrent trends, common themes, and important conclusions. A matrix was developed to methodically arrange and evaluate the results of the chosen papers, thereby enabling a thorough review of the body of current knowledge. Researchers worked through differences in data extraction via agreement and conversation.

Table 1: Keywords Used in Research

Database	String
Scopus	TITLE-ABS-KEY (digital transformation AND in AND SMEs) AND (LIMIT-TO (PUBYEAR, 2024) OR LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014)
Scopus	TITLE-ABS-KEY

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	(digital transformation AND benefits AND in AND SMEs) AND (LIMIT-TO (PUBYEAR, 2024) OR LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014)
Scopus	TITLE-ABS-KEY (digital transformation AND factors AND in AND SMEs) AND (LIMIT-TO (PUBYEAR, 2024) OR LIMIT-TO (PUBYEAR, 2023) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2014)

Results

Identified Factors and Reasons

The elements that may impact the adoption of digital transformation in SMEs may be categorized into two types: positive factors and negative aspects. Park et al. (2015) first defined the fundamental components of digital adoption in the context of Korea. Subsequently, they developed three distinct types of adoption factors, including environmental, organizational, and technical, based on the findings.

Industry 4.0 Technologies

According to Battistoni et al. (2023), it is essential to comprehend each technology's function within the overall digitalization of the company to help the integration of Industry 4.0 technologies. To emphasize the significance of deploying technologies in an orderly manner, several authors offered several categories that not only allocate each technology to a certain layer but also outline the links among various levels.

Organization Growth

According to Scuotto et al. (2021), organizational growth is a critical activity that requires overcoming resource inadequacies induced by newness and smallness. Growth may be quantified using a variety of metrics, including market share rise, revenue growth, return on investment, and client count. Firm revenue and employment are typically used to assess a company's growth since they are readily available metrics. Employment, as a variable, is unaffected by inflation and may be used equally in cross-cultural studies and time series. Overall, organizational growth is a process that involves a variety of things to be successful.

Exploiting Opportunities

A study by Scuotto et al. (2021) mentioned that SMEs were specifically taking advantage of opportunities to compete on an equal footing with giant corporations. Existing research indicates that SMEs are a dynamic and important element of the economy in most nations as reported in the Annual Report on European SMEs 2016/2017 (Muller et al., 2017). SMEs make up more than half of all firms and employ more than half of the labour force in industrialized nations. According to Alam and Noor (2009), digital technology adoption is 'a method to enable firms to compete on a global scale, with greater efficiency, and tighter customer and supplier

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ties'. To stay competitive, SMEs must create new business strategies and procedures that include digital technology (Ferrari, 2012).

E-commerce

Revolution in business methods due to the emergence of the internet economy, electronic commerce, and social media. The Internet facilitates the execution of routine business activities and enables online communication, hence exerting a significant influence on local economies (Ulas, 2019). E-commerce, as defined by the World Trade Organization, refers to the process of producing, distributing, selling, and delivering items and services via telecommunications. The digital revolution enables small enterprises to become "born global" by enhancing their competitiveness in both home and international markets via innovation and improved production practices.

Labour Problem

According to Khin and Kee's (2022) study, the labour scarcity in Malaysia may encourage firms to embrace Industry 4.0 because the challenge of labour shortage has been addressed by employing international workers, and the cost of foreign workers has lately risen. Similarly, in other nations with labour challenges, the value of Industry 4.0 in replacing humans with robots must be considered when implementing Industry 4.0 since it eliminates labour concerns. Meanwhile, a study by Khin & Kee (2022) also stated that, the predicted advantages, market prospects, labour issues, customer requirements, competitiveness, and quality image were the six main factors that developed as sub-themes for the adoption of digital transformation. These factors include new findings that have not been acknowledged by earlier studies (Stentoft et al. 2020; Mogos et al., 2019; Müller et al., 2018), which were carried out in the manufacturing industry of Western nations such as Denmark, Norway, and Germany, respectively. These new findings include the labour problem, customer requirements, and quality image. Similar to how Jain and Ajmera (2020) and Subramanian et al. (2021) did not include these aspects in the eastern setting. Therefore, these specific motivating elements may be related to the study's national environment. Since recruiting foreign workers has been a solution to Malaysia's labour shortage problem, and since the cost of hiring foreign workers has lately increased, this might force firms to embrace Industry 4.0. Similar to other nations with labour issues, Industry 4.0's ability to alleviate labour issues by replacing humans with machines must be carefully studied before it is adopted.

Table 2: Factors of Digital Transformation Adoption

Author	Factors of adoption
Battistoni et al. (2023)	Integration of Industry 4.0 technologies
Scuotto et al. (2021)	Organizational growth SMEs taking advantage of opportunities
Alam and Noor (2009)	Digital technology allows SMEs to compete on a global scale
Ferrari (2012)	New business strategy
Ulas (2019)	Influence of e-commerce
Khin and Kee's (2022)	Labour scarcity
Stentoft et al. (2020); Mogos et al. (2019); Müller et al. (2018)	Labour problem
Jain and Ajmera (2020) and Subramanian et al. (2021)	Labour shortage problem

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Benefits of Adopting Digital Transformation

Adopting digital transformation in SMEs' business activities can offer several benefits:

Cost Reduction

Decrease in manufacturing and marketing costs, lower maintenance needs, cost-effective transactions, fewer requirements for transportation, and decreased purchase and procurement expenses (Pfister & Lehmann, 2023). Albukhitan (2020) also mentions an advantage regarding cost, since it involves the collection and analysis of data across all phases of the manufacturing process, including machine data, production line, transportation, and logistics. This research enables the identification of the potential for cost reduction and enhanced inventory management to fulfil demand. Furthermore, the machines provide a high degree of flexibility, enabling rapid product changes.

After years of prioritising heightened production, cost-effective goods, and enhanced accessibility, companies and customers could need fewer items. This tendency is seen in the collaborative economy. In the future, intelligent, interconnected objects will provide us with the independence to purchase just what is necessary, exchange items we do not use often, and enhance our enjoyment of possessions we currently own. Instead of disposing of outdated items that may not be properly recycled and might potentially harm the quality of life for future generations, we will choose things that are consistently enhanced, upgraded, and modernised (Porter & Heppelmann, 2015).

Productivity Growth

The benefits identified by Pfister and Lehmann (2023) include enhanced employee productivity, greater internal communication, enhanced cooperation, teamwork, and networking, higher profitability, and time savings for businesses. A study by Jadertrierveiler et al. (2019) showed that economic development is closely associated with improved working conditions and the resolution of human needs. The potential for innovation offered by intelligent, interconnected items and the resulting increase in data might significantly stimulate economic development. If this occurrence takes place, there will be a rise in novel sectors, services, and positions that will empower individuals to achieve their ambitions. Porter and Heppelmann (2015) go so far as to forecast significant and favourable effects on employment. Smart, linked items will enhance individuals' productivity and reduce the need for monotonous and repetitive tasks. By providing a technician with an augmented reality program and a smartphone, they may successfully do a complicated repair task, even with no training. Specialists can instruct and advise less skilled personnel with more ease. Over the last a decade, the corporate landscape has been marked by a focus on reducing domestic expenses, careful investment strategies, higher profitability, a rise in mergers and acquisitions, and discreet advances by major economic actors.

Consequently, there has been a decline in the development of employment, income, and living standards among the general population, which has resulted in a diminished perception of economic prospects, skepticism towards capitalism, and decreased public endorsement of business (Porter & Heppelmann, 2014). In the current age of intelligent, interconnected goods, companies and governments must collaborate to establish the required guidelines and laws for establishing benchmarks, fostering creativity, safeguarding data, and overcoming obstacles generated by advancements (Porter & Heppelmann, 2014). The second aspect is associated with quality, including the precise measurement of manufacturing parameters and products at

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a high resolution throughout the whole process. The use of novel machine learning methods for quality evaluation of goods (Jang et al., 2019) involves using production data to automatically identify the underlying causes of quality flaws and forecast waste-related problems in advance.

Efficiency and Effectiveness

Albukhitan (2020) states that digital transformation brings about increased productivity by enabling quicker and more informed development and design processes. This is achieved via the use of technologies like augmented reality (AR) and 3D printing, which influence real-time interactive data from consumers. Enhanced machine connection enables the transmission of crucial maintenance data, leading to improved production and reduced downtime by preventing machine problems and increasing productivity. The mentioned improvements include process optimization, enhancement of the whole life-cycle, better network capabilities, implementation of digital accounting and automated invoicing, reduction in efforts for payment documentation, more flexibility, and improved speed (Pfister & Lehmann, 2023). Meanwhile, according to Jadertrierveiler et al. (2019), new business models are seen as a positive outcome of digital transformation. The development of technology based on Industry 4.0 will equip organizations with enhanced capabilities, allowing them to fulfil more complex customer demands. This transition will need the creation of novel business structures and collaborations that specifically cater to these demands. They also mention the forecast that the progress of new business models for manufacturing on the Internet of Things (IoT) and services would reach a level of development and dynamism comparable to that of the Internet itself. According to Brettel et al. (2014), remote maintenance, together with the introduction of new services and updates based on data extraction and analysis, may improve the perceived quality of items by consumers.

Table 3: Benefits of Digital Transformation Adoption

Author	Benefits of Adoption
Pfister and Lehmann (2023)	Decrease in operation cost
	Employee productivity
	Process optimization
Albukhitan (2020)	Advantages regarding cost
	Increased productivity
Porter & Heppelmann (2015)	Cost-effective goods
	Effects on employment
Jadertrierveiler et al. (2019)	Improved working
	Positive outcome
Brettel et al. (2014)	Perceived quality of goods

Summary of the Findings

This research identified the factors and benefits that SMEs should consider before implementing digital transformation in their firm. This article highlights five key elements that should be considered before implementing digital transformation, as well as the advantages that come with embracing digital transformation. A study published by Battistoni et al. (2023) has recognized Industry 4.0 technologies as the key aspects that SMEs should consider. Scuotto et al. (2021) identified the growth of organizations and the exploitation of possibilities as crucial considerations for SMEs. Khin and Kee (2022) argue that SMEs in Malaysia must consider labour issues while implementing digital transformation. There are also three primary

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advantages of implementing digital transformation in a firm discussed in this SLR. Pfister and Lehmann (2023) state that implementing digital transformation may lead to cost savings, a benefit backed by Albukhitan (2020) and articles by Porter and Heppelmann (2015). The publications by Pfister and Lehmann (2023), Jadertrierveiler et al. (2019), and Porter and Heppelmann (2015) discuss the advantages of digital transformation, specifically highlighting productivity increase. Final advantages, the studies conducted by Albukhitan (2020), Pfister and Lehmann (2023), Jadertrierveiler et al. (2019), and Brettel et al. (2014) have provided evidence of the correlation between efficiency and effectiveness. Figure 1 shows the distribution of the factors and benefits of digital transformation adoption from the main findings of the SLR.

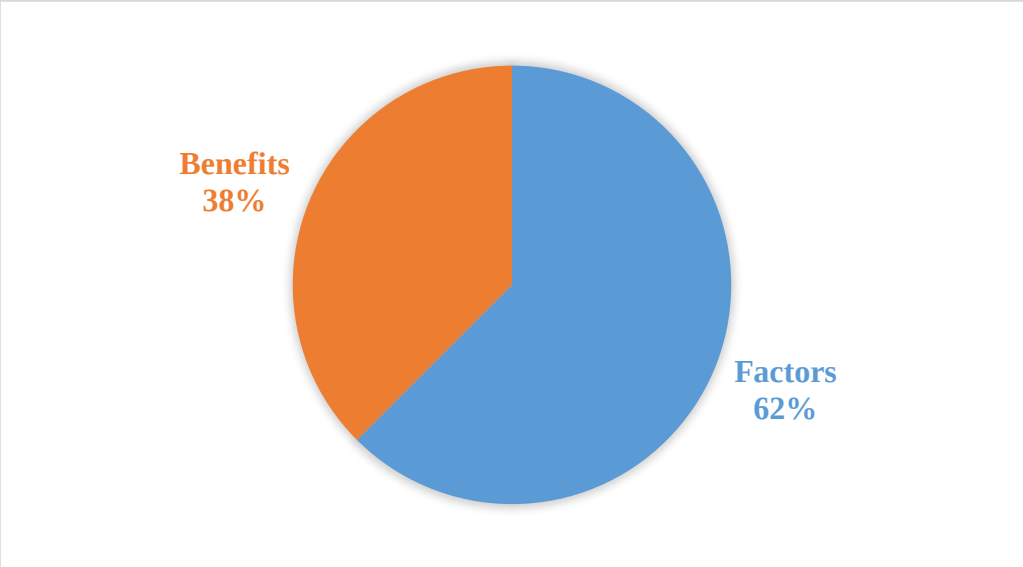

Figure 1: Distribution of Factors and Benefits of Digital Transformation Adoption

Conclusion

The findings of this SLR indicate that the adoption of digital transformation offers several key factors (industry 4.0 technologies, organization growth, exploiting opportunities, e-commerce, and labour problem) and benefits for SMEs, including cost reduction, productivity growth, and efficiency and effectiveness. These factors and benefits align with the objectives outlined at the beginning of this study, which aimed to identify and synthesize the key factors and benefits associated with digital transformation in SMEs.

Research Limitations

Readers of this SLR should carefully examine the following limitations since they likely influenced the results. This article provides a comprehensive analysis of digital transformation without specifically focusing on any one kind or criteria. Furthermore, our study was tailored to provide a comprehensive analysis of the factors that SMEs take into account while pursuing digital transformation, since this was one of our research objectives. The factors used and the suggested category were derived from the findings of previous research. Our research has also investigated the factors and advantages of digital transformation in other separate papers. Readers should scrutinize the data-gathering procedure of our study from 2014 to 2024, considering the current accelerated rate of research activities. Furthermore, the outcomes of implementing digital transformation cannot be uniformly applicable to all SMEs owing to the

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varied features and circumstances of each organization. Therefore, these discoveries need empirical research to validate their relevance in real-life situations.

Research Implications

Despite previous limitations, the SLR discussed in this paper has substantial consequences. Our research has proposed doing an SLR on the variables influencing the adoption of digital transformation in SMEs. This research greatly improves our understanding of the adoption of digital transformation in firms, especially SMEs. This resource assists managers, SME owners, specialists, researchers, and individuals who are embracing digital transformation in understanding all the facets and advantages associated with adopting digital transformation in SMEs in both emerging and established countries. Professionals like owners and managers at SMEs may benefit from our SLR by gaining insights into the elements that influence digital transformation. This knowledge can assist them in establishing strategic adoption plans.

Future Research

The objective of this systematic literature study is to provide significant perspectives on the key factors and benefits that SMEs should consider before adopting digital transformation. Stakeholders may enhance the digital resilience of the SME sectors by acknowledging these elements and implementing targeted measures and policies.

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