Reveal the Evolutionary Trajectory of Digital Innovation in Small and Medium-sized Enterprises

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Abstract. The continuous maturation and advancement of information technology and digital technology are compelling enterprises to embark on the journey of digital transformation. Numerous large enterprises have successfully undergone digital transformation. However, small and medium-sized enterprises (SMEs), as the largest group in the business world, face challenges in their digital transformation due to constraints in capital, technology, talent, and other aspects. This paper aims to summarize the obstacles hindering SMEs by reviewing relevant literature. The challenges faced by SMEs during the process of digital transformation include limited product portfolios, high capital costs, environmental fluctuations, inadequate understanding of digital technologies, limited human resources availability, and a need for standardized practices. Technological challenges also exist within this context due to resource limitations and insufficient knowledge about information management among SMEs. Nevertheless, these companies can leverage their relatively small scale and flexibility to achieve successful digital transformation through improved management capabilities. The objective of this article is to overcome these challenges effectively with sustainability at its core focus on driving innovation compliance with regulations/guidelines employee upskilling is crucial for SMEs' success in achieving balanced growth while undergoing sustainable digital transformations. Lastly, this paper emphasizes the complexity and diversity involved in SMEs' journey towards digitization providing feasible strategy suggestions based on reflection discussion combined with case analysis.

Keywords: Digital transformation; Small and Medium-sized Enterprises (SME); Organizational capacity; Sustainability.

1. Introduction

1.1. Background

"Digital transformation" has been widely used in the past two decades, reputable enterprises and esteemed scholars have put forth a plethora of diverse interpretations and definitions thereof, which may be due to differences in perspective. Almost all enterprises actively or passively participate in the digital revolution. Among them, numerous large enterprises possess vast amounts of data and keen business acumen, enabling them to promptly respond and successfully establish a distinctive presence in the digital industry, such as Walmart, Disney, Apple, and others. Additionally, there are also proactive disruptors like TikTok that leverage the digital trend to rapidly emerge within a short period and become global social media giants.

However, small and medium-sized traditional enterprises face significant challenges in embarking on their digitalization journey due to factors such as the lack of core technology, misalignment between technology development and strategic choices, and the inability to bear the costs associated with digital transformation. To effectively address these challenges, traditional enterprises lack a comprehensive system and methodology; therefore, they can only rely on continuous exploration and trial-and-error processes. This paper aims to comprehend the definition of digitalization from the perspective of traditional small and medium-sized enterprises (SMEs) by reviewing relevant literature on digital transformation. Additionally, it explores a viable path for digitalization within traditional enterprises by considering aspects such as technology adoption, strategic alignment, effective management practices, and cost optimization. The analysis is further complemented by an examination of successful enterprise cases.

1.2. Related research

Margiono initially discusses the demand of businesses for digital transformation. Combining information, computer, communication, and connectivity technologies, digital transformation involves restructuring a company's strategy, organizational structure, processes, and culture. Enable the company to respond to market entrants and support new businesses. And highlight the opposite transformation path: Offensive and Defensive. In this regard, enterprises must evaluate and analyze to avoid organizational inertia led astray [1]. Akter et al. have researched numerous instances of businesses utilizing technologies to achieve digital business transformation. Artificial intelligence, cloud computing, and data analytics are emerging technologies that are revolutionizing digital business transformation. These technologies offer personalized benefits, enabling quick corporate expansion and increased efficiency. By automating operations, matching supply and demand, offering dynamic pricing, and enabling real-time decision-making, these technologies can propel disruptive business models [2]. Baiyere et al. said that the traditional BPM methodologies place a strong emphasis on modeling, IT architecture, and personnel permission for sustained process optimization. This paper explores the evolution of BPM in the turbulent age of digital transformation. Three novel BPM techniques are introduced: 1) adaptable "light touch" processes, 2) adaptable infrastructure for dynamic data flow, and 3) empowered actors that modify processes in response to context. This study clarifies BPM's function in the age of digital transformation [3].

Xia et al. discuss the competitive environment of the conventional manufacturing sector, emphasizing the growing reliance on supply chain networks as a result of the fast advancement of digital technology. They contend that sustained digital transformation may boost organizational capacity and productivity. The author examines case company investments in technology, perceptions of innovation, and knowledge exchange, highlighting key issues and outlining workable solutions [4]. The inability of organizations to successfully implement digital transformation is attributed, according to Ismail et al., to a mismatch between technology development and strategic choices. They discuss the causes of digital transformation as well as internal and external drivers. Ismail et al. offer insights into the positioning of digital transformation and its essential aspects compared to other technology-driven transformations by integrating digital transformation literature, tracing its roots, and synthesizing research findings [5]. Zhang et al. contend that the absence of core technology makes traditional Chinese businesses "big but not strong." To establish company core technology and improve competitiveness in the face of the global digital industrial revolution, it is important to analyze the internal mechanisms of digitalization and production efficiency, merging 5G, artificial intelligence, big data, the Internet of Things, and other technologies [6].

"Digital transformation" describes how the broad adoption of digital technology has affected organizational developments. Four viewpoints are taken into consideration: the influence of technology, partition adaptability, system change, and general coevolution. These viewpoints establish a connection between organizational development and the nature of digital technology, resulting in continuous change that enhances comprehension of digitalization. To help businesses travel the digital highway, the goal is to increase people's knowledge of digitalization. To aid in this process, it is necessary to increase people's comprehension of digitization [7]. Andriushchenko et al. outline key determinants promoting enterprise digital transformation in diverse industries encompassing developmental factors, speed of advancement, density of quality changes, and multiplication effects. Utilizing mathematical modeling enables a thorough examination and computation of the influence exerted by digital transformation on enterprises for acquiring risk predictions and identifying developmental trends while mitigating potential adverse effects like instability, and dynamism inherent in transformations, as well as directional forecasts for developments. Consequently, it can be inferred that there exists a positive correlation between production/operational efficiency and the caliber of digital transformations [8]. Using Sri Lanka as a case study, Rassool and Dissanayake examine the factors and challenges that hinder the growth of small and medium-sized enterprises (SMEs), which exert minimal influence on market prices and volumes. Simultaneously, they address the significant issues arising from a lack of personalized

differentiation and difficulties in cost reduction. Subsequently, this study delves into how SMEs with limited resources can strategically leverage digital transformation to their advantage, aims to summarize an effective methodology, and anticipates prospects while making necessary preparations" [9]. Ghobakhloo and Iranmanesh initially conducted a comprehensive literature review focusing on content and identified 11 crucial determinants for achieving success in digital transformation. The findings revealed that the first step towards ensuring successful digital transformation is to obtain external digital support while accessing technology readiness emerged as the most challenging determinant. In conclusion, SME manufacturers need to possess specific capabilities such as change management and strategic planning for digital transformation, along with a certain level of information, digital, operational, and network maturity. This will enable SMEs to acquire advanced manufacturing technologies and strategic planning skills required for the successful implementation of Industry 4.0 [10].

1.3. Objectives

In the second chapter, this paper primarily focuses on the process of digitalization in small and medium-sized enterprises (SMEs) and examines their current situation to analyze their digital requirements from multiple perspectives. It also investigates the key technical challenges and comprehension obstacles faced by SMEs during their digital journey. The main manifestations include a lack of independent digital platforms, an inability to sustain continuous capital investment, and scarcity of talent and management capabilities resulting in deviations in the direction of digital transformation. Additionally, in the third chapter, this paper explores the advantages and characteristics of SMEs in terms of digital transformation while studying these pros and cons. The objective is to explore a methodology suitable for leveraging SMEs' strengths, mitigating weaknesses, and enhancing possibilities for digital innovation.

2. Digital Demand and Progress of SMEs

Small and medium-sized enterprises (SMEs) are the backbone of both developed and developing countries, making significant contributions to national economic development, employment generation, tax revenue generation, and import-export activities. In the present era, digitalization has become a crucial aspect not only for large corporations but also for accelerating the process of digital transformation among SMEs. Particularly, some innovative SMEs have successfully integrated digital technologies into their operations and extended them to related ecosystems. As a result, the digitized market for SMEs is gradually being unleashed. Taking China as an example, SMEs constitute the mainstay of its market and play a pivotal role in ensuring stable economic development, creating employment opportunities, and improving the livelihoods of people [11]. The Chinese government places great emphasis on fostering the growth of SMEs by implementing a series of policies that facilitate financing options while reducing fees and tax burden on businesses [11]. Additionally, efforts are made to optimize services provided to them along with establishing technology research platforms [11]. These measures collectively create a favorable environment conducive to the development of SMEs [11]. Small and medium-sized traditional enterprises also serve as the backbone of the US economy, accounting for 98% of all businesses in the United States and creating two-thirds of new job opportunities in recent decades [12]. These enterprises exhibit accelerated export growth, contribute to employment expansion at a faster pace, and offer higher wages. They directly and indirectly support nearly four million jobs across communities through exports [12]. Similarly, European countries, including the UK, present a comparable scenario where small and-sized enterprises constituted 99.9% of all private sector businesses in 2018 [13]. Moreover, they contribute to 60% of private sector employment and represent 52% of total turnover [13]. Micro-enterprises alone account for 90% of global business entities, providing approximately 60%-70% of global employment opportunities while contributing to half of the world's GDP [14].

The Fourth Industrial Revolution, characterized by the pervasive influence of information and communication technology (ICT) on the economy, society, businesses, and individual behavior, has catalyzed the advent of a digital economy and propelled companies toward digital transformation [15]. Industry 4.0, which aims to maximize output while minimizing resource usage, presents a unique viewpoint on the fusion of production and cutting-edge technology [16]. Continuous technological advancements have profoundly reshaped the operational landscape of businesses, necessitating changes in various decision-making domains and compelling enterprises to reassess their development strategies and business models. Given the progress and evolution of the information society, digital transformation has emerged as an imperative. The inception and progression of digital technologies, epitomized by communication technology, propel all enterprises towards a path of 'digital revolution' [15]. Digital transformation is widely acknowledged as the multifaceted impact of digital technologies on organizations and processes, fundamentally reforming organizational structures and operations at a profound level to adapt to ever-evolving market demands, thereby achieving sustainable development for businesses. As the primary group in the commercial world, small and medium-sized enterprises face both challenges and opportunities in keeping up with the ongoing social transformation and technological innovation under the backdrop of Industry 4.0 [15]. The development of intricate economic systems necessitates a comprehensive understanding and mastery of the various components involved in dynamic interactions, thereby compelling companies to actively pursue innovative opportunities for maintaining a competitive advantage more than domestically [17]. In an increasingly interconnected global landscape, small and medium-sized enterprises (SMEs) face heightened vulnerability to emerging challenges and opportunities in foreign markets [17]. Nowadays, digital technology is not only a tool for improving organizational performance but also possesses the ability to drive organizational operational changes [15]. The rapid advancement of information and communication technology, coupled with the widespread proliferation of the Internet, has fundamentally revolutionized interpersonal communication and interaction, leading to a profound metamorphosis in data acquisition and processing [15]. In this context, small and medium-sized enterprises must identify appropriate technological tools tailored to their specific requirements, establish customer-centric data analysis capabilities, and prioritize them as a cornerstone for achieving sustainability [15].

2.1. Challenges and Contradictions of Digital Transformation

Undoubtedly, as representatives of traditional enterprises, small and medium-sized businesses have significantly contributed to the advancement of the global economy. However, their digital during the Industry 0 phase has encountered several challenges [16]. These challenges primarily manifest in limited product portfolios that fail to fully exploit the efficiency of automation and autonomous production systems; high costs associated with acquiring funding; volatility in micro and macro environments; a lack of comprehension regarding Industry 4.0 with an emphasis on operational aspects at the expense of company growth; inadequate recognition of the strategic significance of Industry 4.0; restricted human resources; and a need for standardized practices [16].

2.1.1. Technical Challenges

The dynamic nature of technology continuously reshapes various facets of organizations, including management, operations, and risk control. Enterprises are now actively seeking digital innovations that align with their specific requirements to drive project development, cater to a broader spectrum of customers and sustain competitiveness among peers. Companies have mere storage of data [18]. They possess a comprehensive understanding of the potential value and actively prioritize data-driven innovation. For small and medium-sized enterprises, the biggest obstacles to implementing digital transformation stem from resource constraints within the company and a lack of knowledge of information [18]. Based on a survey of 417 companies in Switzerland and Germany, we can infer the following: many companies have initiated a phased transformation with a moderate level of digital maturity; only a small fraction of large enterprises have embarked on the path of digital innovation, while the majority of small and medium-sized enterprises are grappling with challenges and lack clear

direction regarding digital innovation. This situation arises from inadequate capabilities of staff, technology, and funding within these SMEs. Data indicates that such SMEs have an annual turnover not exceeding 50 million euros and an average employee count below 250 [18]. However, it is difficult for small and medium-sized enterprises to find digital projects that truly meet their own needs. Even if they can achieve technological innovation, such arbitrary changes cannot align with the company itself and fail to create practical value and returns because technology itself does not possess inherent value [18]. To make matters worse, the special requirements of tools for small and medium-sized enterprises and the inability to independently bear the cost of trial and error make it almost impossible for them to independently judge the successful path of implementing digital innovation [18].

2.1.2. Comprehension Obstacles

In addition, small and medium-sized enterprises still question the benefits of digital transformation [16]. The high costs associated with technological investments and the unpredictable return on investment are impeding companies from implementing these initiatives [16]. For instance, in Romania, small and medium-sized enterprises face several obstacles including a lack of understanding about Industry 4.0, strategic as well as concepts related to operations and costs. The core technologies prevalent in this region encompass robotics, vertical and horizontal system integration, big data analytics, Internet of Things (IoT), and cybersecurity; however, small and medium-sized enterprises generally exhibit limited competitiveness in areas such as information technology updates due to deficiencies in advanced manufacturing techniques, strategic management gaps, and absence of standards [16].

To effectively support operational and management activities, as well as gain access to external resources and expertise, SMEs face several significant challenges: 1) Ensuring a comprehensive and realistic assessment of their IT needs while digital objectives with strategic goals; 2) Accurately evaluating the requisite resources and skills for enterprise digitalization; 3) Considering the intricate business environment and relationships, including establishing and managing connections with IT specialists and service providers, such as professionals specialized in socio-economic support (e.g., management experts in public organizations).

SMEs currently employ turnkey IT applications to facilitate business operations, such as utilizing Google Analytics for marketing analysis, employing PayPal for e-commerce transactions, and leveraging Facebook as a platform for digital communication and information access [19]. However, effective collaboration between SMEs and in terms of strategic alignment and operational processes. These challenges primarily stem from the absence of shared terminology between enterprise managers or company operators and IT experts or digital service providers. Both parties possess distinct cognitive frameworks when assessing the relationship between technology and business, leading to communication barriers among all participants. The difficulty lies in aligning IT objectives with strategic goals due to the limited adaptability of digital technology tools in accommodating individual contingencies and specific characteristics unique to SMEs [19]. Furthermore, this challenge is compounded by the gradual commodification of IT that restricts management practices aimed at achieving strategic objectives [19]. Consequently, these difficulties result in underestimating technical capabilities exhibited by digital IT while also encountering fragmented information requirements; additionally, exhibit overly idealistic tendencies which impede the successful integration of technology with practical management thinking during digital transformation initiatives [19].

2.2. Characteristics and Advantages of SMEs

When it comes to the advantages of digitalization for small and medium-sized enterprises, it is essential to introduce the concept of dynamic management capability (DMC), which pertains to "the managerial capacity to construct, integrate, and reconfigure organizational resources and capabilities" [20]. For small and medium-sized enterprises, the digital acumen of business managers plays a crucial role in achieving digital transformation across three key aspects: cognitive management, social capital

management and human capital management [20]. Small and medium-sized enterprises are characterized by their limited scale, relatively straightforward operational models, and consistent employee numbers. While these characteristics may be perceived as disadvantages compared to larger enterprises, they can also serve as advantages during the process of digital transformation. This is because managers of small and medium-sized enterprises possess the ability to swiftly analyze and comprehend the diverse information required by their companies through Digital Mindset Capability (DMC). Additionally, they can establish a diverse management team with complementary knowledge, experience, and skills through restructuring their managerial configurations. By fostering communication and collaboration with digital technology experts talent acquisition level and managerial level, they can maintain dynamic cognitive awareness while effectively identifying market opportunities and empowering them to achieve strategic transformation reliably while executing specific activities to a satisfactory extent [20]. The key to the success of SMEs' digital transformation lies in achieving sustainable development, which refers to the pursuit of development that satisfies current needs while safeguarding the ability of future generations to meet their own needs [21]. Currently, small and medium-sized enterprises generally possess a certain level of digital technology and employ individuals with digital awareness. However, they face challenges in sustaining operations innovation based on these foundations. In this context, small and medium-sized enterprises can consider temporarily setting aside the ultimate goal of digital innovation and instead allocate resources and expertise towards attaining sustainable development through partial digitization. This approach is crucial as it ensures the continuous operation of enterprise machinery, enabling the cost of digital transformation to be recouped by identifying innovative approaches that align with the company's unique culture through iterative experimentation.

3. Solutions and Prospects

3.1. Information-oriented OCTD

To effectively tackle the intricate challenges posed by digital transformation initiatives, SMEs must initially enhance their organizational capabilities for digital transformation. Despite the simplicity of SMEs' organizational structure and the limited degree of job specialization, which may result in blurred departmental boundaries, discrepancies in OCTD development still exist [22]. Among these variances, information emerges as the most crucial digital factor within an enterprise due to its high liquidity, relevance, and quality. Information culture can be broadly categorized into four types based on different functions and values: results-oriented information cultivates a competitive advantage for enterprises; rule-following related information culture reinforces internal stability by guiding management in adjusting rules and policies; relationship management-focused information culture fosters a sense of belonging, strengthens internal communication and participation, and promotes team spirit; lastly, an adventurous culture is indispensable as it encourages creativity, supports the birth of new ideas, and serves as a continuous driver for digital innovation [22].

Small and medium-sized enterprises, can enhance their "information capabilities" by establishing a distinctive and rational information culture to achieve organizational effectiveness, encompassing practices in information technology, information management, as well as information behaviors and values [22]. SMEs can utilize the OCTD model tool to evaluate the level of digitalization within their operations, gain deeper insights into the digital processes involved in production and management, and conduct feasibility design for digital transformation initiatives that consider the interplay between enterprises and market dynamics, technological advancements, policy environment, cultural factors, and even employee engagement [22]. Multi-angle analysis facilitates systematic digital distribution, thereby addressing the competitive disadvantages faced by SMEs in technology acquisition, strategic management, and cognitive deficits related to digitalization. The establishment of an efficient system within the enterprise can be accomplished through meticulous analysis, comprehensive consideration of digital expenses, return cycles, and other pertinent information, facilitating open source capabilities

and streamlined resource allocation. In response to external environmental changes, enterprises can proactively adapt by taking into account relevant policies and market trends when making decisions, as shown in Fig.1.

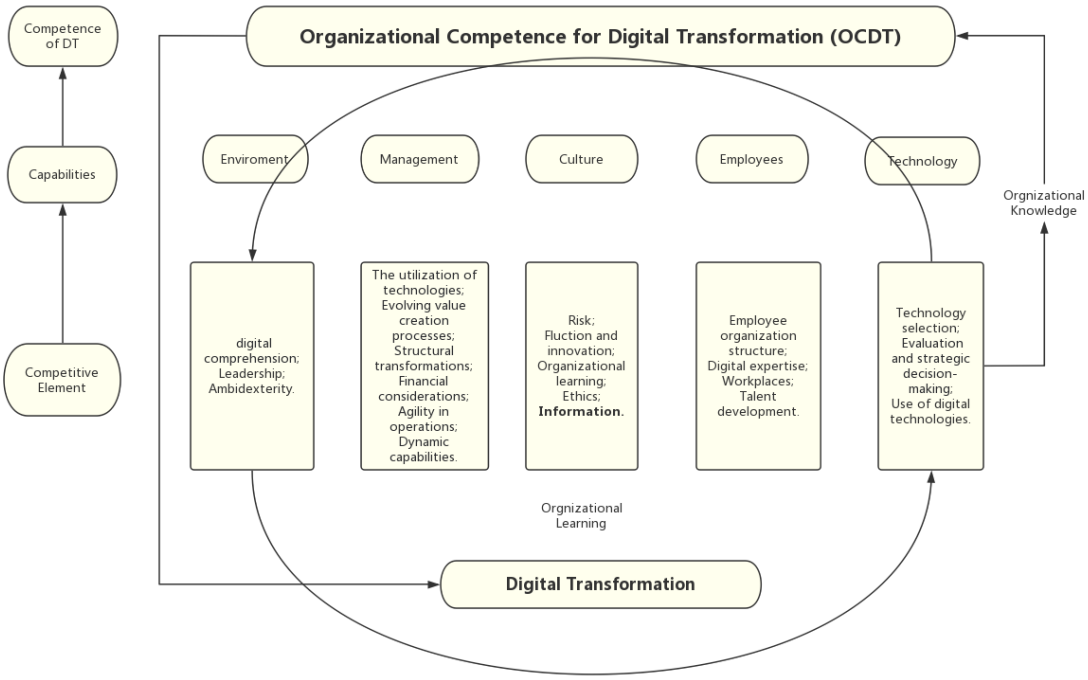

Fig 1. The Model of Organizational Competence for Digital Transformation.

3.2. The Role of Individuals in SMEs

The organizational structure of most small and medium-sized enterprises, consisting of a few dozen individuals, amplifies the significance of each individual's role in the digital realm. The competence demonstrated by organizers and managers serves as a reflection of the overall capability of the enterprise. Similar to an iceberg hidden beneath the sea surface, a company's performance merely represents its visible tip that emerges within the public market domain; meanwhile, its substantial foundation lies in the abilities possessed by its managers and employees. To enhance “above-water “effectiveness, concerted efforts for growth are indispensable and it requires a ninefold increase within the organization. In this regard, business managers and organizers should harness their creativity to develop activities aligned with their passions and talents, fostering an environment conducive to entrepreneurial dynamism [23]. Moreover, it is crucial to effectively utilize human resources by establishing a robust corporate structure and recruiting suitable talents for respective positions [23]. These factors exert a decisive influence on business performance through knowledge levels, skills proficiency, capabilities, and attitudes exhibited by individuals involved [23]. Consequently, it becomes imperative for managers to accurately define roles while communicating them; organize employees based on job requirements; create favorable working conditions; and implement reward systems that motivate employees toward achieving team objectives [23]. By linking personal employee performance with company development endeavors, small and medium-sized enterprises can ensure stable growth akin to an 'iceberg' (Fig. 2).

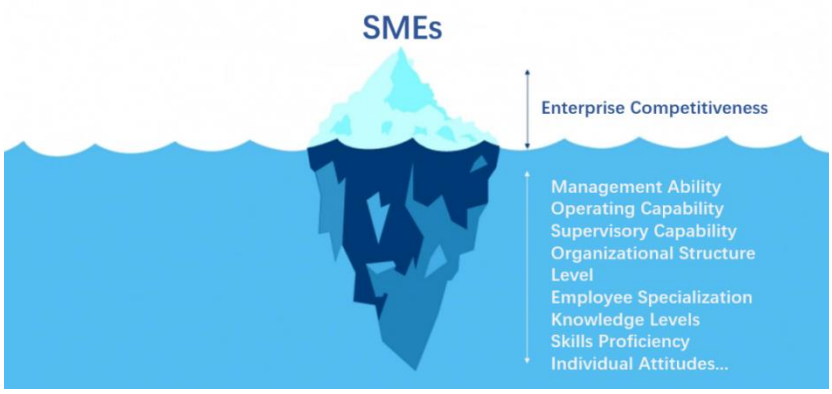

Fig 2. The Iceberg Model of Enterprise Competitiveness.

3.3. Balanced Development and Sustainability

Thirdly, SMEs must carefully balance digital innovation with sustainable development. In addition to pursuing their own developmental objectives, all enterprises must prioritize environmental and social sustainability as an integral dimension. This necessitates the formulation of innovative 'green development strategies' by SMEs [24]. The challenge posed by technology digitization does not lie in impeding enterprise transformation; rather, the true difficulty lies in effectively leveraging technology to drive innovation and align value-creation strategies with customer engagement, supplier collaboration, and stakeholder involvement. Adhering to standard regulations and guidelines while comprehending intellectual property protection is crucial [24]. Prioritizing data sharing for optimal configuration should be accompanied by providing employees with essential skills and knowledge [24]. Based on this information, SMEs should strategically determine their short-term and long-term technological priorities while embracing planned implementation and phased progress as the universal path toward digital transformation.

4. Conclusion

After conducting a comprehensive discourse on the challenges, technological factors, advantages, and solutions encountered by small and medium-sized enterprises (SMEs) in their digital transformation journey, several key findings have emerged. Firstly, this paper identifies multiple obstacles faced by SMEs during their digital transformation process, including resource constraints, technology disparities, shifts in management paradigms, and limited awareness of emerging digital concepts. Collectively, these barriers significantly impact the pace and intricacy of the digital transformation journey for these enterprises. The paper further highlights the pivotal role of technology and its significance to small and medium-sized enterprises. Despite the transformative potential that technology offers, SMEs often struggle to fully capitalize on the opportunities presented by technology due to limited internal resources and restricted access to information. One notable finding from this research centers on the intrinsic benefits held by SMEs. Their demonstrated agility alongside their managers' adeptness in digital cognition have been recognized as crucial assets that propel innovation and adaptability amidst digital transformation. Regarding potential remedies, this study underscores the importance of nurturing a distinct information culture, fostering dynamic managerial competencies and organizational capacities, while also acknowledging individuals' pivotal roles within enterprises. Such strategic approaches effectively empower SMEs to address challenges arising from digital transformation. The study highlights the crucial importance for SMEs to achieve a delicate equilibrium between growth and sustainability in their digital transformation endeavors. It emphasizes that holistic digital transformation strategies should not only focus on technological innovation but also incorporate environmental and social sustainability as integral components. This balance significantly contributes to ensuring the long-term success of SMEs. Finally, it is hoped that these deliberations and discoveries shall serve as a wellspring of inspiration for small and medium-sized enterprises.

References

[1] Margiono, A. (2020). Digital transformation: setting the pace. Journal of Business Strategy. https://doi.org/10.1108/jbs-11-2019-0215

[2] Akter, S., Michael, K., Uddin, M. R., McCarthy, G., & Rahman, M. (2020). Transforming business using digital innovations: the application of AI, blockchain, cloud and data analytics. Annals of Operations Research, 308. https://doi.org/10.1007/s10479-020-03620-w

[3] Baiyere, A., Salmela, H., & Tapanainen, T. (2020). Digital transformation and the new logics of business process management. European Journal of Information Systems, 29(3), 1–22.

[4] Xia, H., Ye, P., Jasimuddin, S. M., & Zhang, J. Z. (2022). Evolution of digital transformation in traditional enterprises: evidence from China. Technology Analysis & Strategic Management, 1–21. https://doi.org/10.1080/09537325.2022.2124909

[5] Ismail, M., Khater, M., & Zaki, M. (2017). Digital Business Transformation and Strategy: What Do We Know So Far?

[6] Zhang, T., Shi, Z.-Z., Shi, Y.-R., & Chen, N.-J. (2021). Enterprise digital transformation and production efficiency: mechanism analysis and empirical research. Economic Research-Ekonomska Istraživanja, 35(1), 1–12. https://doi.org/10.1080/1331677x.2021.1980731

[7] Hanelt, A., Bohnsack, R., Marz, D., & Antunes, C. (2020). A systematic review of the literature on digital transformation: insights and implications for strategy and organizational change. Journal of Management Studies, 58(5), 1159–1197. https://onlinelibrary.wiley.com/doi/abs/10.1111/joms.12639

[8] Andriushchenko, K., Buriachenko, A., Rozhko, O., Lavruk, O., Skok, P., Hlushchenko, Y., Muzychka, Y., Slavina, N., Buchynska, O., & Kondarevych, V. (2020). Peculiarities of sustainable development of enterprises in the context of digital transformation. Entrepreneurship and Sustainability Issues, 7(3), 2255–2270. https://doi.org/10.9770/jesi.2020.7.3(53)

[9] Rassool, R., & Dissanayake, R. (2019). DIGITAL TRANSFORMATION FOR SMALL & MEDIUM ENTERPRISES (SMES): WITH SPECIAL FOCUS ON SRI LANKAN CONTEXT AS AN EMERGING ECONOMY.

[10] Ghobakhloo, M., & Iranmanesh, M. (2021). Digital transformation success under Industry 4.0: a strategic guideline for manufacturing SMEs. Journal of Manufacturing Technology Management, 32(8), 1533–1556. https://doi.org/10.1108/jmtm-11-2020-0455

[11] IDC: Enterprise numbers continue to grow, IDC releases China SME Survival Status Report, 2022. (2022, July 18). IDC: The Premier Global Market Intelligence Company. https://www.idc.com/getdoc.jsp?containerId=prCHC49515422

[12] Small Business | United States Trade Representative. (n.d.). Ustr.gov. https://ustr.gov/issue-areas/small-business

[13] Crossley, R. M., Elmagrhi, M. H., & Ntim, C. G. (2021). Sustainability and legitimacy theory: The case of sustainable social and environmental practices of small and medium-sized enterprises. Business Strategy and the Environment, 30(8), 3740–3762. https://doi.org/10.1002/bse.2837

[14] United Nations. (2022). Micro-, Small and Medium-sized Enterprises Day. United Nations. https://www.un.org/en/observances/micro-small-medium-businesses-day

[15] Ziółkowska, M. J. (2021). Digital Transformation and Marketing Activities in Small and Medium-Sized Enterprises. Sustainability, 13(5), 2512.

[16] Pech, M., & Vrchota, J. (2020). Classification of Small- and Medium-Sized Enterprises Based on the Level of Industry 4.0 Implementation. Applied Sciences, 10(15), 5150. https://doi.org/10.3390/app10155150

[17] Hervé, A., Schmitt, C., & Baldegger, R. (2020). Digitalization, Entrepreneurial Orientation & Internationalization of Micro-, Small-, and Medium-Sized Enterprises. Technology Innovation Management Review, 10(4), 5–17. https://doi.org/10.22215/timreview/1343

[18] Barann, B., Hermann, A., Chasin, F., Becker, J., & De, B. (n.d.). Supporting Digital Transformation in Small and Medium-sized Enterprises: A Procedure Model Involving Publicly Funded Support Units.

[19] Pelletier, C., Dba, & Cloutier, L. (n.d.). Challenges of Digital Transformation in SMEs: Exploration of IT-Related Perceptions in a Service Ecosystem.

[20] Li, L., Su, F., Zhang, W., & Mao, J. (2017). Digital transformation by SME entrepreneurs: A capability perspective. Information Systems Journal, 28(6), 1129–1157. https://doi.org/10.1111/isj.12153

[21] Emas, R. (2015). The Concept of Sustainable Development: Definition and Defining Principles.

[22] González-Varona, J., López-Paredes, A., Poza, D., & Acebes, F. (2021). Building and development of an organizational competence for digital transformation in SMEs. Journal of Industrial Engineering and Management, 14(1), 15. https://doi.org/10.3926/jiem.3279

[23] Popescu, L., Iancu, A., Avram, M., Avram, D., & Popescu, V. (2020). The Role of Managerial Skills in the Sustainable Development of SMEs in Mehedinti County, Romania. Sustainability, 12(3), 1119. https://doi.org/10.3390/su12031119

[24] Philbin, S., Viswanathan, R., & Telukdarie, A. (2022). Understanding how digital transformation can enable SMEs to achieve sustainable development: A systematic literature review. Small Business International Review, 6(1), e473. https://doi.org/10.26784/sbir.v6i1.473