

Digital Transformation of Small and Medium Sized Enterprises (SMEs): Current Status, Dilemmas, and Strategies

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Abstract: With the rapid advancement of information technology, the digital transformation of SMEs has emerged as a critical topic in the development of the digital economy. The advantages offered by digital technology provide novel opportunities for SME growth. Digital transformation not only serves as a pivotal route for fostering innovation and high-quality development within businesses but also stands as an imperative choice in addressing market competition and uncertainties. However, compared to large corporations, SMEs encounter an array of unique dilemmas and obstacles during their digital transformation journey. These dilemmas frequently include a lack of digital awareness, insufficient funding, weak foundations, and talent shortages. This paper begins by examining the current status of SME digital transformation in terms of exploration phase, geographical distribution, and industry distribution. It then delves deep into the reasons behind the dilemmas faced during the digital transformation of SMEs and proposes a set of countermeasures in response.

Keywords: SMEs, Digitalization, Transformation, Current Status, Strategies

1. Introduction

Small and Medium-sized Enterprises, an indispensable component of the national economy, play a profoundly influential role in socio-economic development. They are not only pivotal in ensuring the stability of the national economy but also crucial in achieving collective prosperity. According to a report on the "Digital Transformation Pathways of Chinese SMEs" published by iResearch (2022), by the end of 2021, SMEs accounted for over 99% of market entities, holding a dominant position. Their contribution to the national economy demonstrates the "5678" feature—contributing to over 50% of tax revenues, occupying more than 60% of GDP, representing over 70% of invention patents, and absorbing over 80% of employment [1]. They have actively influenced employment stability, innovation encouragement, and economic enhancement, while also significantly impacting the reduction of income disparity, liberation and improvement of productivity, and elevating economic quality. Currently, digital transformation is becoming a driving force across all industries. With the swift progress of science and technology and the extensive application of information technology, digital transformation has been recognized as a vital strategic option for SME growth. Hence, accelerating the digital transformation of SMEs is of paramount importance. Nevertheless, compared to large enterprises, the issues and difficulties

SMEs face during their digital transformation are relatively more intricate and pronounced. SMEs commonly grapple with insufficient awareness about digital transformation, a dearth of funds, weak foundational structures, and a scarcity of skilled personnel. Therefore, this paper aims to provide an integrated analysis of existing research, examining the current status and dilemmas of the digital transformation of SMEs, and offering potential solutions and recommendations.

2. Current status

2.1. Exploration phase

The "Analysis Report on the Digital Transformation of SMEs (2021)" indicates that 79% of SMEs remain in the initial phase of digital transformation exploration, 12% are in the application exploration phase, and a mere 9% have reached the in-depth exploration phase [2]. Nonetheless, compared to 2020, tangible progress has been made. Over the long term, digital transformation showcases a positive trend; however, generally speaking, SMEs' digital transformation is still predominantly in its nascent stages (See Figure 1).

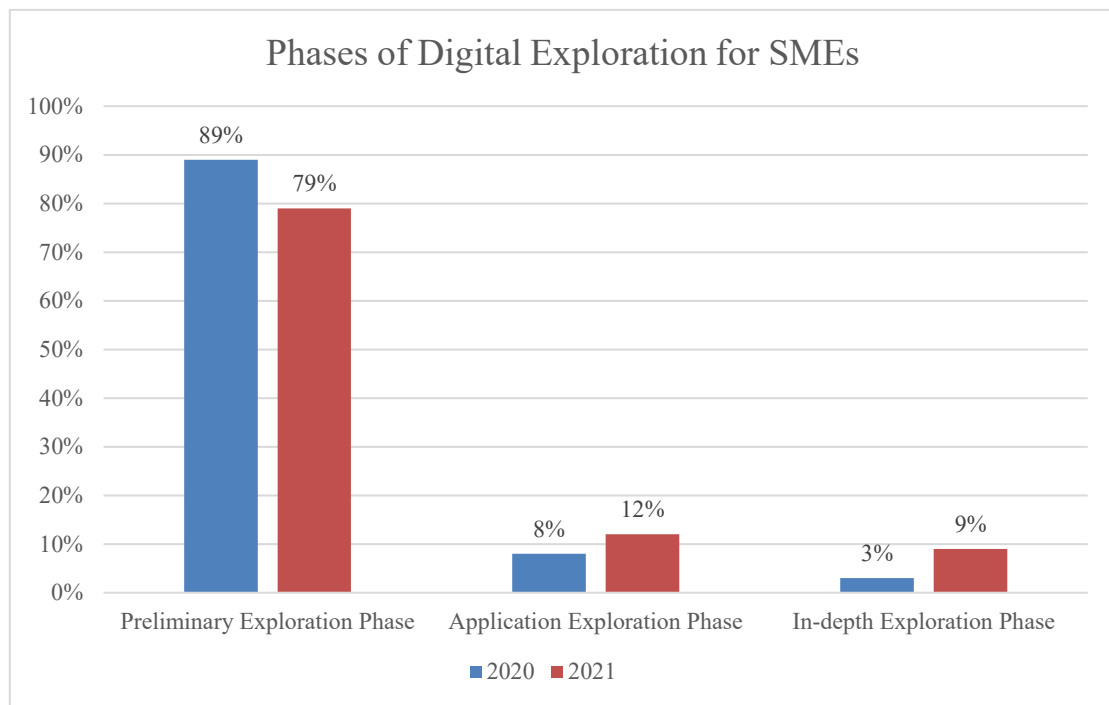


Figure 1: Distribution of SMEs across Digital Exploration Phases

2.2. Geographical distribution

As depicted in Figure 2, the Yangtze River Delta, Pearl River Delta, and the Beijing-Tianjin-Hebei metropolitan clusters emerge as the epicenters for the digital development of SMEs. Specifically, the Yangtze River Delta region boasts the highest proportion of SMEs undergoing digital transformation, followed by the Pearl River Delta, and then the Beijing-Tianjin-Hebei cluster, with respective percentages of 43.0%, 40.1%, and 37.4%. In contrast, the Chengdu-Chongqing and Middle Yangtze urban clusters have proportions of SME digital transformation below the national average, accounting for 34.6% and 31.0% respectively [3]. This predominance of the southeastern coastal regions can be attributed to their advanced economic foundations, relatively mature markets, and comprehensive infrastructure, which collectively provide ample market opportunities and

resources for the digital transformation of SMEs. Additionally, variances in industrial structures among these regions also influence the digital transformation rates. The Yangtze River Delta and Pearl River Delta regions are predominantly dominated by manufacturing and high-tech industries. These industries, compared to others, tend to be more reliant on digital technologies, making SMEs within them more receptive to the importance of digital transformation and subsequently driving them to undertake relevant initiatives.

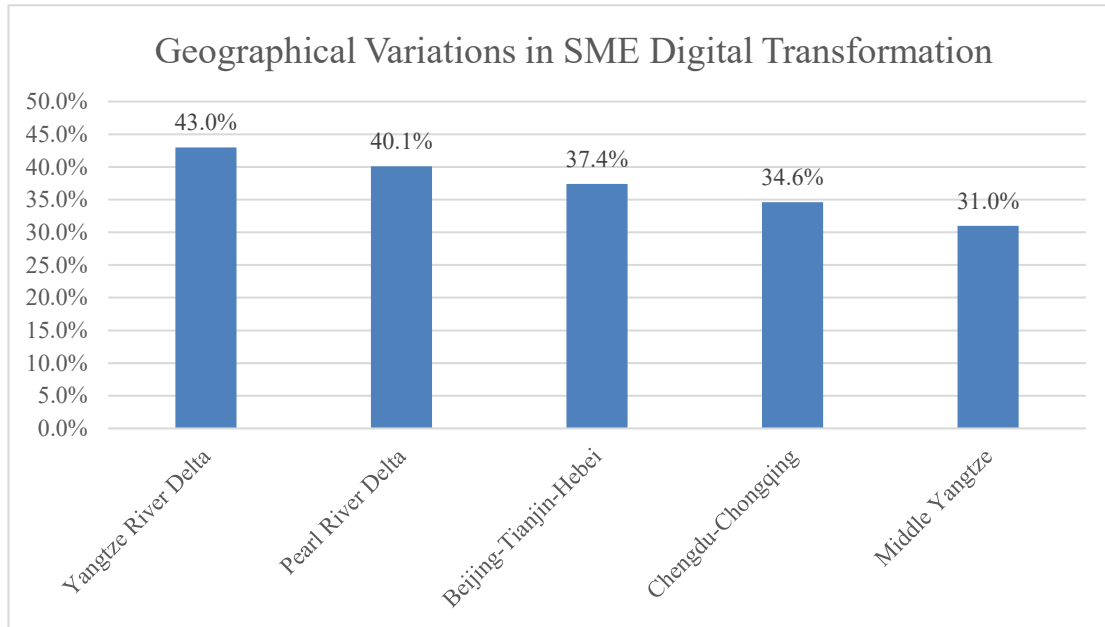


Figure 2: Geographical Variations in SME Digital Transformation

2.3. Industry distribution

According to Figure 3, the computer, communication, other electronic equipment manufacturing, instrument and meter manufacturing, and automotive industries rank highly in terms of digital transformation [2]. This can be attributed to the fact that these sectors inherently possess a high degree of technological intensity and demand for information technology. Notably, the industries of computer, communication, and other electronic equipment manufacturing are intrinsically arenas for the production and application of digital technologies, rendering their need and drive for digital transformation naturally substantial. Moreover, the government's support and guidance in these industries play a pivotal role. Through industry policies, technological R&D, and financial backing, the government provides certain industries with targeted policy support, promoting businesses to undergo digital transformation. For instance, regarding the automotive industry, the government has issued policies to encourage the development of new energy vehicles and intelligent connected vehicles, spurring the sector towards digital and intelligent transformation. This policy endorsement has furnished industries with a conducive environment and conditions for digital metamorphosis.

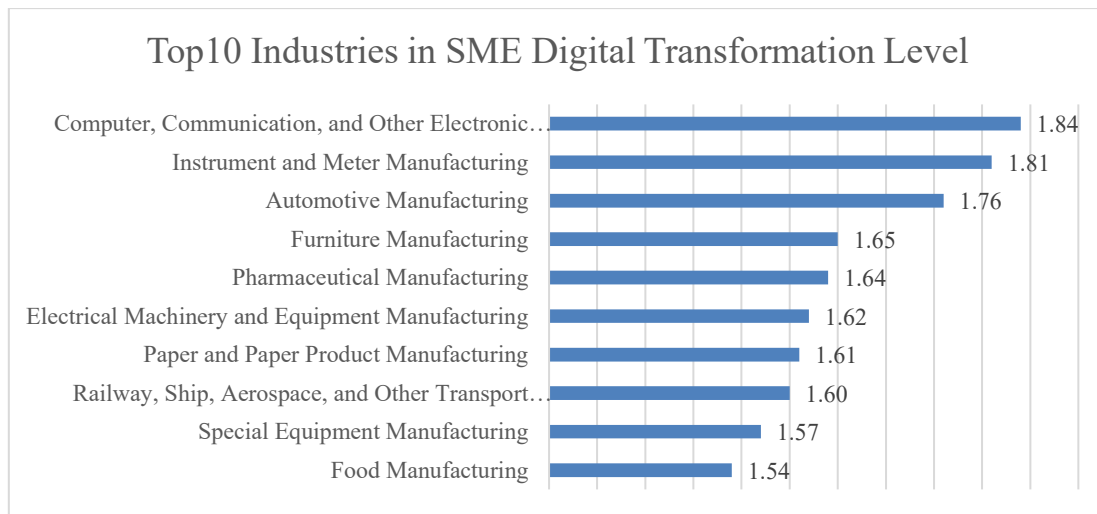


Figure 3: Top 10 Industries in SME Digital Transformation Level

3. Dilemmas

3.1. Inadequate understanding

The prerequisite for successful digital transformation lies in having sufficient willingness for it. This demands a comprehensive understanding among the enterprise's leaders and senior management regarding digitalization and its required investments and impacts. Digital transformation is a prolonged journey, devoid of instantaneous results. Some SME managers, constrained by traditional mindsets, are complacent with the status quo, seeking short-term gains, and hence adopt a pessimistic attitude towards digital transformation. Concurrently, another subset of SME leaders, although positive about digital transformation, possess a myopic understanding of the concept, mistakenly equating the use of certain digital software or systems to comprehensive digital transformation. They lack a holistic, end-to-end framework for digital transformation, leading to diminished efficacy. Surveys illustrate that nearly 50% of SMEs utilized digital tools like modeling and simulation during the R&D process. However, only 20% achieved full digital management in design and R&D. For areas like warehousing and physical logistics where digital applications are advanced, a mere 9% of SMEs have accomplished complete digital monitoring of logistics and warehousing [4].

3.2. Paucity of funds

Digital transformation is reliant on the support of various software and hardware. As the depth of digital transformation augments, a continuous influx of capital is imperative to sustain the operation of the digital system. This mandates SMEs to maintain a substantial financial buffer. Given the relatively smaller operational scale of SMEs, their lower market share, and limited profitability, they find it challenging to fund the significant capital investments needed for digital transformation from their own profits. According to the National Bureau of Statistics, in 2021, the profit margin of SMEs in large-scale industries in our country was merely 6.2% [5]. Furthermore, SMEs possess limited avenues for financing in the capital market, making it strenuous to secure ample external capital support. The high costs involved in updating and upgrading existing information technology equipment, software systems, and training staff compound the challenges. This highlights the capital constraints faced by SMEs in their digital transformation journey.

3.3. Weak foundation

From a Technological Standpoint: SMEs (Small and Medium-sized Enterprises) typically exhibit a lower deployment rate of digital devices and information systems. Coupled with their rudimentary level of digital technology, it becomes challenging for them to establish a proprietary digital platform. This subsequently impinges upon their ability to effectively gather, process, and analyze data. As data indicates, within the realm of production and R&D, the digitalization rate of SMEs generally hovers below 50%. Specifically, the adoption rate of digital equipment in critical procedures stands at 45%, while the coverage of production process information systems is 40%, and the device interconnectivity rate is 35% [6]. Furthermore, due to varying degrees of digitalization across different departments within SMEs, there exists a substantial disparity in data volume and quality. Consequently, this poor connectivity between data points restricts the effective utilization of digital technology to support decision-making and innovation.

From a Cultural Standpoint: In executing digital transformation, a conspicuous void in the digital transformation atmosphere within SMEs is apparent. To accomplish a successful digital transformation, endorsement from top-tier management alone is insufficient. Grassroots management and operational personnel also need to foster an acceptance of digital transformation. This ensures that the entire enterprise is actively engaged in the transformation process. Currently, most SMEs in our country resort to a top-down, obligatory directive for managing transformation. This often engenders resistance and aversion among basic staff, thereby impeding the advancement of relevant initiatives.

3.4. Scarcity of talent

Indubitably, the digital transformation journey hinges on the support of digital talent. Yet, a glaring inadequacy in digital talent is observed across SMEs, stymieing the further progress of their digital evolution. The "Research Report on the Digital Transformation of SMEs in China (2022)" reveals that digital-related talent in SMEs constitutes a mere average of 20%, with only 15% of businesses having established a system for digital talent cultivation [7]. From the Market Perspective: As the wave of digital transformation gathers momentum, an increasing number of enterprises are embarking on this journey, leading to a supply-demand disparity in digital talent. The "Industry Digital Talent Research and Development Report (2023)" estimates a current comprehensive digital talent deficit ranging between 25 to 30 million, and this gap continues to widen [8-10]. From the Enterprise's Own Perspective: On one hand, given the modest scale of SMEs, their limited resources, and relatively lower compensation render them less competitive in the talent market. On the other hand, due to their simplistic operational models and underdeveloped educational and training capabilities, there's a pronounced inadequacy in talent reserves. This lag in the cultivation of digital talent culminates in a dearth of professionals proficient in information systems and skilled in relevant operations when embarking on digital transformation, thereby decelerating the pace of transformation.

4. Strategies

4.1. Cultivating a mindset geared

The government should redouble its efforts in raising awareness by ardently constructing platforms for digital dialogue. Through the medium of seminars, training sessions, and other venues, the imperative nature and merits of digital transformation need to be conveyed. This would steer enterprise leaders to recognize digital transformation as a linchpin in their long-term developmental strategy. It's imperative to embolden them to not only actively embrace but also fervently champion

this transformation, thereby enhancing the digital acumen of management personnel. Concurrently, by spotlighting success cases emanating from SMEs' digital transformation journeys, the tangible benefits and outcomes can be demonstrated to their peers. Such revelations could kindle an interest in digital transformation among leaders and fortify their conviction and determination to tread this path. Furthermore, government departments can form leadership teams for digital transformation efforts and set up communication groups with relevant enterprise departments to provide in-depth operational guidance for digital transformation.

4.2. Increasing support

Firstly, the government can provide relevant policy support, subsidies, and other financial aid to reduce the costs of digital transformation. For instance, for small and medium-sized enterprises engaged in digital transformation, the government could offer corresponding tax relief measures to alleviate financial pressure. Moreover, the government can establish dedicated funds to support digital transformation projects for these enterprises, fostering innovation and technological upgrades. Simultaneously, encouraging financial institutions to provide low-interest loans or other specialized financial products for small and medium-sized enterprises will broaden their financing channels. SMEs should also focus on optimizing internal resources to enhance their self-sufficiency in digital transformation. Establishing a department for digital transformation planning within the enterprise can manage and integrate existing resources. Prioritizing resource allocation and utilization in key areas of digital transformation will promote the efficient utilization of funds.

4.3. Solidifying the foundations

From the perspective of the digital development environment, it is incumbent upon the nation to amplify its efforts in bolstering the infrastructure of industrial internet, artificial intelligence, 5G networks, big data, and other emergent paradigms, thereby optimizing the external milieu for the digital transformation of SMEs. Concurrently, SMEs must also accentuate the construction of their internal information systems. There should be a pronounced impetus to invest in both hardware and software infrastructures to cater to the exigencies of information processing and data storage pivotal to digital transformation. Additionally, enterprises should endeavor to cultivate an ambiance conducive to digital transformation, incorporating such a metamorphosis into the developmental blueprints of all departments. Employees who are proactive in spearheading digital transformation initiatives should be recognized and incentivized. There's an imperative to galvanize the entire workforce to willingly participate, engage in perpetual learning, and foster an ebullient culture of digital erudition. Such an approach ensures that employees continually rejuvenate their knowledge and skills, adapting seamlessly to the ever-evolving digital landscape.

4.4. Accelerating the cultivation

Digital transformation hinges on the symbiotic interplay between humans and data. To acquire more digital talent resources, small and medium-sized enterprises can collaborate with universities and research institutions to establish centers for cultivating digital talent. Enterprises might offer internships, inviting fresh talent to partake in digital-related research endeavors, and facilitating the practical application of theoretical knowledge. Internally, it's incumbent upon SMEs to proffer a plethora of digital training opportunities to their employees and fervently advocate their participation. For grassroots employees, the focus should be on cultivating their practical digital skills. Since there are a considerable number of grassroots employees, companies can selectively train exceptional members within each team in digital skills. These trained individuals can then impart their digital knowledge to their respective teams, thereby improving the efficiency of talent

cultivation. For mid-level and senior management, the emphasis should be on cultivating their understanding of digital models and enhancing their logical analysis capabilities concerning data. Following the training, enterprises should utilize mechanisms such as employee feedback and performance evaluations to monitor and gauge the effectiveness of the training, making necessary adjustments and refinements to the training strategies as required.

5. Conclusion

In summation, the digital transformation of small and medium-sized enterprises (SMEs) remains in its nascent stages. To bolster the digital transformation of SMEs and thus achieve high-quality enterprise development, both the government and businesses should work in tandem. While the government provides support to SMEs in areas of public awareness, fiscal policy, infrastructure development, and talent cultivation, enterprises should also intensify their internal efforts to foster a digital transformation environment. By fully utilizing the various support policies and harnessing their inherent potential, enterprises can contribute constructively to the development of the digital economy.

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