Empirical Analysis of Digital Transformation for Typical Enterprises in China

Zhenyu Zheng

Department of Economics, University of Southampton, Southampton, United Kingdom

zz23u23@soton.ac.uk

Abstract. This study sets out to unravel the complexities of digital transformation challenges faced by traditional enterprises in China, focusing on identifying the multifaceted barriers that impede their progress towards digitalization. Employing a comprehensive review of existing literature coupled with empirical evidence from typical enterprises, the research adopts a qualitative approach to explore the core barriers to digital transformation. The findings reveal that traditional enterprises face significant hurdles in their digital transformation journey, including high transformation costs, prolonged investment durations with uncertain outcomes, and a lack of necessary capabilities for effective digital adoption. However, by strategically combining core factors such as innovation ecosystems, technological infrastructure, and digital components, and placing substantial emphasis on cultivating an internal learning-oriented mindset, enterprises can navigate these challenges effectively. The study illustrates that fostering a learning orientation not only accelerates the application and dissemination of digital technologies but also encourages critical assessment of existing management practices, thereby facilitating the transformation of operations and expansion into new markets. The impact of this research lies in its contribution to both academic discourse and practical implementation, offering valuable insights and recommendations for business leaders and policymakers. By highlighting the critical components of digital transformation and identifying strategies to overcome prevalent obstacles, the study provides a roadmap for traditional enterprises striving to innovate and thrive in the digital age.

Keywords: Digital Transformation, Typical Enterprises, Enterprise Strategy.

1. Introduction

1.1. Research Background and Significance

Digital transformation, by definition, refers to the process of revolution wherein enterprises apply digital technology in the production, operation, and service processes to minimize repetitive labor, or replace traditional digital technologies with advanced digital ones. The digital transformation of firms involves the incorporation of advanced digital technologies, such as the Internet of Things (IoT), big data analytics, and artificial intelligence (AI), into aspects of production management, organizational operation, and research and development (R&D) innovation. In other words, digital transformation is the process by which enterprises employ new digital technologies to enhance their core businesses, aiming to improve customer experiences, streamline operational processes, or create new business models [1]. Theoretically, this process can optimize the allocation of resources both within and outside the enterprise, enhance the capability for sustainable development, and ultimately lead to growth in scale and improvements in efficiency. This, in turn, promotes enterprise growth and long-term sustainable development. This digitalization transformation aims at leveraging digital technologies to drive strategic innovation, operational efficiency, and competitive differentiation, fostering an environment conducive to continuous improvement and market responsiveness [2].

1.2. Literature Review

The digital transformation of traditional enterprises presents a critical path towards sustainability and competitiveness in the modern economic landscape. This literature review synthesizes findings from several pivotal studies, offering insights into the mechanisms, strategies, and impacts of digital transformation on traditional businesses.

Chen et al. highlight the significance of digital transformation in enhancing national competitiveness, underscoring it as a cornerstone for modern economic strategies in the US and EU [3]. The study delineates digital transformation as an advanced phase built upon digitization and digitalization, aiming for a profound alteration in core business operations towards new business models. This transformation is distinguished by its focus on 'business digitization', transcending mere digitization of information or digitalization of processes to foster new forms of business and competitive advantages in a digital economy. Chen Chunhua proposes a novel "Traditional Enterprise Transformation Capability System," emphasizing the indispensability of understanding and developing a new capability system for effective digital transformation [4]. This system comprises six key capability elements designed to guide traditional enterprises through the complexities of digital transformation, ensuring a comprehensive approach that encompasses both strategic and operational dimensions. The review of corporate strategies and practical implementations reveals diverse approaches to digital transformation across industries. Haier's pioneering "Rendanheyi" model, GE's establishment of an independent digital unit, and Xiaomi's strategy of cultivating an open innovation ecosystem illustrate varied paths towards leveraging digital technologies for business model innovation and growth [5]. These cases exemplify the importance of strategic leadership, a dual focus on traditional and digital businesses, and the cultivation of an open, innovative organizational culture to navigate the digital transformation journey successfully [6]. The role of technology and Innovation ecosystems in digital transformation is underscored through examples such as Huawei's "Open, Cooperative, and Win-Wi" ecosystem strategy, TenCent's positioning as a "connector " and the comprehensive integration of digital technologies across organizational operations. These examples demonstrate the criticality of embracing open innovation, fostering collaborative partnerships, and developing robust digital capabilities to support and sustain digital transformation efforts [7].

In conclusion, the digital transformation of traditional enterprises encompasses a multifaceted process involving strategic reorientation, capability system development, organizational restructuring, and technological integration. Success in this endeavour requires a balanced approach that aligns strategic objectives with digital capabilities, fosters open innovation ecosystems, and leverages technology as a fundamental driver of transformation [8]. The insights from these studies contribute to a deeper understanding of the digital transformation process, offering valuable guidance for traditional enterprises navigating the complexities of the digital era.

1.3. Research Contents

This paper principally investigates the obstacles that traditional enterprises encounter throughout their journey towards digital transformation. It meticulously examines the multifaceted challenges these organizations face, ranging from technological adoption and integration to cultural shifts and skill gaps. By leveraging insights derived from an extensive review of existing literature and empirical evidence, the study identifies and analyzes the core barriers to digital transformation within these entities. Building upon the identified problems, the research further explores the essential elements and strategic imperatives necessary for successful digital transition, incorporating a comprehensive discussion on the role of leadership, organizational culture, technological infrastructure, and innovation ecosystems. Through a detailed examination of these components, the paper integrates findings from previous analyses and introduces key dimensions, such as the importance of fostering a digital-first culture, investing in cutting-edge technologies, and developing a continuous learning environment. By doing so, it aims to offer a nuanced understanding of how traditional enterprises can overcome the identified hurdles and harness the potential of digital technologies to innovate and thrive in the digital age. The conclusions drawn from this research not only contribute to the academic discourse on digital transformation but also provide practical recommendations for business leaders and policymakers aiming to navigate and facilitate this complex transformation process [9].

2. Obstructions in Digital Transformation of Traditional Enterprises

The deep integration of high-end digital technologies with the physical economy is driving a shift in the global economic development momentum from the traditional economy to the digital economy. Data and technology have become new engines driving economic and social development, alongside land, capital, and labor. Nonetheless, as well as positive opportunities, significant challenges are also existing for the related companies. For traditional companies, digital transformation often represents a complex and challenging long-term route, confronting a multitude of challenges across technological, resource, capability, organizational, cultural, and managerial dimensions. This process necessitates a strategic and holistic approach to overcome the multifaceted barriers inherent in transitioning from traditional to digital paradigms, requiring not only the integration of advanced technologies but also significant adjustments in organizational structure, culture, and management practices to realize the full potential of digitalization. Currently, domestic listed companies in China commonly face three major dilemmas in their efforts towards the process of digital transformation: the inherent reluctance to transform due to high transformation costs, the fear of transformation due to the long duration of continuous investment required with higher level of uncertainty, and the inability to transform due to lack of transformation capabilities. These challenges encapsulate the financial, strategic, and operational barriers that hinder the adoption and implementation of digital technologies within firms. Hence, the problem of how to facilitate digital transformation in companies and generate favorable corporate performance has emerged as a critically hot topic of mutual interest within both the academic and industrial communities. This issue underscores the critical importance of understanding the mechanisms and strategies through which digital transformation can be effectively promoted and its impact on enhancing organizational performance, making it a focal point for research and practice aimed at navigating the complexities of digitalization in today's business landscape. Addressing these dilemmas requires a comprehensive understanding of the economic, organizational, and technological dimensions of digital transformation, as well as the development of strategies to overcome these barriers, thereby facilitating a smoother transition towards digitalization [9].

3. Critical Components in Digital Transformation

According to Nambisan, digital components, digital infrastructure, and digital platforms constitute the foundational elements for the successful digital transformation of enterprises [10]. To achieve strategic goals and maintain a competitive advantage in the digital age, enterprises must continuously develop and implement digital components that align with their existing technology and regularly update their digital infrastructure and platforms in response to technological advancements. Hence, digital components, infrastructure, and platforms serve as the support conditions for enterprise digital transformation.

3.1. Digital Components

Digital components refer to hardware or software that provides specific functionalities and value to users, forming integral parts of new products or services, including digital accessories, applications, and media content (e.g., electronic chips, smartphone apps, smartwatches). Digital components are characterized by programmability, addressability, perceptibility, communicability, memorability, traceability, and associability. These characteristics enable new functionalities to be added rapidly to various digital products at minimal cost, facilitating the interconnectedness and intelligence of enterprises.

3.2. Digital Infrastructure

Digital infrastructure refers to the digital technology tools and systems that offer communication, collaboration, or computing capabilities to support digital innovation or entrepreneurship (e.g., cloud computing, data analytics, online communities, social media). Often defined as the basic logistics and organizational structures necessary for the functioning of a society or organization, digital infrastructure is viewed as a socio-technical system comprised of various technologies. It forms the foundation of an enterprise's digital capabilities, driving the overall process reengineering and capability restructuring, enhancing interactions between the enterprise and its customers/partners, and fostering a range of co-creation activities. The success of an enterprise's digital transformation depends on the development of robust and cost-effective digital infrastructure.

3.3. Digital Platforms

Digital platforms refer to the use of information and communication technologies to facilitate interactions among users (including commercial transactions) and leverage network effects for value creation and capture. Digital platforms enable enterprises to better manage information and integrate resources, playing a central role in the enterprise's value proposition and altering the way competitive advantages are obtained. Large enterprises can develop and deploy their own digital platforms by coordinating internal resources and developing key capabilities, whereas small and medium-sized enterprises may rely on third-party platforms (e.g., Alibaba) for business operations. In the digital era, enterprises frequently access shared digital platforms (e.g., Amazon) to complement their business and IT resources. The use of digital platforms has become a strategic decision involving core internal resources and practices of the enterprise.

4. Digital Transformation for Traditional Enterprises

For traditional enterprises (such as Sinopec, SAIC Motor, and other leading companies across various industries), an effective approach to digital transformation is the "Ecological Collaborative Innovation" strategy. This strategy is underpinned by three core concepts: "innovation ecosystemization", ecological collaboration, and collaborative innovation.

Firstly, "innovation ecosystemization" signifies the shift from closed innovation, akin to the central research institute model, to building an open innovation ecosystem. Traditional large enterprises should appoint a "Chief Technology Office" responsible for technological research and development as well as the construction of the R&D ecosystem. This role is crucial for establishing an open innovation ecosystem, enabling the firm to leverage digital transformation technologies to become a global leader in technological innovation within its industry.

Secondly, ecological collaboration involves employing big data and smart technologies for proactive intervention and management of the ecosystem, realizing "quantitative operation" of the ecosystem. With the advent of the digital economy era, the emergence of the Internet of Things and big data smart technology has significantly reduced the costs and enhanced the efficiency of large-scale ecological collaboration. Consequently, enterprises should create the position of "Chief Data Office" at the group level. By utilizing big data and intelligent technologies, the capabilities of R&D ecosystem partners, supply chain ecosystem partners, sales ecosystem partners, talent ecosystem partners, and investment and financing ecosystem partners can be synergistically integrated. This orchestrates the "quantitative operation" of the ecosystem within the entire corporate group system, providing the digital nourishment necessary for rapid evolution under the paradigm of "massive collaboration"

Lastly, collaborative innovation represents the core engine for driving both technological innovation and business model innovation in the digital economy era. Digital transformation entails developing digital technologies and supporting capabilities to establish a profitable digital business model, emphasizing the dual drive of technology entrepreneurship and business model innovation to explore new domains of company development.

5. Conclusion

This study reviews the relevant literature and research on the digital transformation of typical enterprises, identifying the obstacles that these firms might be confronted, classifying critical points during digital transformation. From all the analysis above, it can be drawn to the conclusion that given all the challenges, typical enterprises are ought to efficiently combine and utilize the core factors and place substantial emphasis on the cultivation of an internal learning-oriented mindset. Fostering a learning orientation not only encourages employees to actively engage in learning activities related to digital skills and management knowledge, accelerating the application and dissemination of digital technologies and digital management practices within the organization, but also encourages employees to question existing management practices that do not align with the digital development of the enterprise. Furthermore, it enables the use of acquired digital skills and knowledge to transform existing operations to develop new businesses, and expand into new markets, thus translating the practice of digital transformation into improved corporate performance. Traditional enterprises undergoing this transformation must also place great importance on training and disseminating digital skills and knowledge among employees at all levels. It is crucial to clarify the purpose of the enterprise's digital transformation and the individual learning objectives of employees at each level. Creating a positive and open learning atmosphere within the organization encourages employees to apply the digital skills and knowledge they have acquired to their daily management practices. This continuous improvement of the enterprise's products, services, and processes promotes an enhancement in corporate performance.

Nonetheless, there are certain inherent limitations of this research, which can be converted into directions of future deeper research in this field. To begin with, this research is mainly focus on empirical investigation without specific quantitative analysis from firms' data in detailed situation within significant sample. Therefore, utilizing large-scale field survey data to expand and deepen the understanding of the value realization process in digital transformation of typical enterprises presents a worthwhile avenue for further detailed investigation and research. This approach not only enriches the empirical basis for studying digital transformation but also enhances the granularity and precision of insights into how digital transformation drives value creation and capture within enterprises. Consequently, this methodological strategy holds significant potential for advancing the theoretical and practical knowledge of digital transformation processes, offering nuanced perspectives on the mechanisms through which digital technologies influence organizational performance and competitive advantage.

References

[1] Research report on the practice of digital transformation paths in Chinese enterprises, retrieved from report of iResearch Consulting Series, 2021(2): 49.

[2] Big Data Standards Working Group of the National Information Technology Standardization Technical Committee. White Paper on Enterprise Digital Transformation. China Electronics Standardization Institute, 2021, Retrieved from https://o.media360.vip/pdf/3380.pdf.

[3] Chen, J., Yang, W., & Yu, F. Ecological collaborative innovation strategy in digital transformation: A study based on Huawei Enterprise Business Group (EBG) China. Tsinghua Management Review, 2019 (06): 22-26.

[4] Chen, C. Construction of the capability system for digital transformation in traditional enterprises. People's Forum · Academic Frontiers, 2019 (18): 6-12.

[5] Wang, Y., & Wang, L. Identification of types and selection of transformation models for traditional enterprise digital transformation strategies. Management Review, 2012, 33(11): 84-93.

[6] Wu, J., Chen, T., Gong, Y., et al. Theoretical framework and research prospects of enterprise digital transformation. Management Review, 2021,18(12): 1871-1880.

[7] Yuan, C., Xiao, T., Geng, C.,et al. Digital transformation and enterprise division of labor: Specialization or vertical integration. China Industrial Economics, 2021 (09): 137-155.

[8] Ni, K., & Liu, X. Digital transformation and enterprise growth: Theoretical logic and Chinese practice. Economic Management,2021, 43(12), 79-97.

[9] Tan, Z., Zhao, X., Pan, J., et al. The value of digital transformation: A perspective based on corporate cash holdings. Finance & Economics Research, 2022, 48(03): 64-78.

[10] Nambisan, S. Digital entrepreneurship: Toward a digital technology perspective of entrepreneurship. Entrepreneurship Theory and Practice, 2017, 41(6): 1029–1055.