

Transformation Strategies and Risk Management for Traditional Enterprises in the Context of Digital Transformation

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Abstract. Against the backdrop of the deepening development of the digital economy, industrial digitization has become a core driver for enhancing the quality and efficiency of China's real economy. Although the government has successively introduced various policies to guide traditional enterprises in accelerating their digital transformation, the actual outcomes of these transformations have generally fallen short of expectations, with opportunities and risks intertwined. This paper examines the transformation process of traditional enterprises from the perspectives of dynamic capabilities and risk management. Based on existing literature and industry evidence, it analyzes how enterprises can achieve digital transformation while controlling related risks. The study reveals that digital technologies can help break down data barriers across the entire enterprise value chain, expand innovation space, and revolutionize traditional risk management approaches, thereby effectively reducing costs and increasing efficiency. However, the transformation process also entails three major core risks: a shortage of talent and sluggish organizational change, internal pressure resulting from substantial capital investments, digital security threats arising from data breaches, and misalignment between digital technologies and physical business operations. Based on these findings, this paper proposes synergistic optimization strategies at three levels: the enterprise level, the industry level, and the macro-policy level. The research conclusions clarify the mediating role of dynamic capabilities between digital transformation and risk prevention and control, providing a theoretical foundation for enterprises to build adaptive risk management systems, industries to optimize technological supply, and policymakers to refine regulatory frameworks.

Keywords: Digital Transformation, Traditional Enterprises, Dynamic Capabilities, Risk Prevention and Control, Organizational Change

1. Introduction

Digital technology serves as the core engine driving the development of the digital economy. According to the "China Digital Economy Development White Paper (2023)" published by the China Academy of Information and Communications Technology, in 2022, the scale of China's digital industry reached 9.2 trillion yuan, while the scale of industrial digitalization reached 41

trillion yuan. These two components accounted for 18.3% and 81.7% of the total digital economy, respectively. With the rapid development of digital technologies, industrial digitalization has increasingly influenced the development of traditional industries. The transition toward digital and intelligent operations has become an important direction for enterprises seeking to improve efficiency and competitiveness. At the national level, policy support for leveraging digital technology to empower the real economy continues to intensify, and digital upgrading has evolved into an inevitable choice for the development of the real economy. Thus, understanding the opportunities and challenges of digital transformation has become increasingly important for traditional enterprises.

However, based on practical outcomes, traditional enterprises often face complex organizational structures and lengthy industrial chains, furthermore, operational conditions vary significantly across different industries and enterprise sizes, resulting in overall transformation outcomes that fall far short of expectations. McKinsey's research indicates that the success rate of corporate digital transformation ranges only between 4% and 26%, a survey conducted by Tsinghua University further reveals that 39% of enterprises have vague digital transformation strategic directions, 48% have not simultaneously adjusted their organizational structures, and 75% have yet to deploy artificial intelligence tools. These numerous micro-level challenges collectively highlight the real obstacles encountered in the digital transformation of industries. Addressing how to help enterprises overcome the predicament of being "unwilling to transform, afraid to transform, or unable to transform" has become a core issue that must be resolved in the context of industrial upgrading [1].

Digital transformation can indeed unlock multiple benefits for traditional enterprises: digital platforms integrate data across all business processes, optimize production and inventory management, and enhance operational efficiency, big data technologies enable precise insights into market demands, thereby expanding the scope for product innovation, and digital risk management systems monitor operational indicators in real time, enabling proactive risk early-warning mechanisms and disrupting the traditional post-event remediation model [2]. However, the transformation process also entails numerous risks: talent shortages, lagging organizational restructuring, and the financial pressure resulting from long-term digital investments constitute internal operational risks [3, 4]. The centralized online storage of enterprise and customer data, if inadequately protected, can easily lead to information leakage, creating unique digital security risks, furthermore, generic digital solutions often fail to accommodate the personalized production requirements of various industries, while misalignment between technological supply and demand drives up transformation costs, resulting in an imbalance between input and output [1].

This paper explores how traditional enterprises can achieve digital transformation while improving their risk prevention and control capabilities. Building upon the Dynamic Capabilities Theory, the Industrial Integration Theory, and the Comprehensive Risk Management Theory, this study analyzes the mechanism through which digitalization impacts enterprise risk prevention and control, and proposes optimization strategies from enterprise, industry and police, aiming to provide a reference for traditional enterprises to achieve a smooth digital transition.

2. Relevant theoretical foundations

Dynamic capabilities refer to an enterprise's comprehensive ability to integrate and build, as well as restructure both internal and external resources, while continuously adjusting its operational framework in rapidly changing market environments to adapt to market dynamics and maintain competitive advantage [3]. These capabilities encompass three core dimensions: risk perception, resource integration, and organizational restructuring. At the level of risk perception, digital tools

allow enterprises to collect and analyze operational data from different sources. By monitoring changes in supply chains, finance, and markets, enterprises can identify potential risks earlier and shift from reactive responses to proactive management. At the resource acquisition level, enterprises introduce new types of resources—such as digital talent, computing infrastructure, and online operational platforms—to optimize capital and inventory allocation strategies, buffer against external market shocks, and reduce operational volatility. The organizational restructuring capability aligns with the concept of organizational transformation discussed earlier: enterprises break down hierarchical management structures, update their risk control and data security frameworks, and align these systems with digital operational logic. An empirical study confirms that digitalization alone cannot directly mitigate business operational risks [4]. Instead, it requires the leveraging of three types of dynamic capabilities to serve as intermediaries that enhance the overall risk resilience of the enterprise. Compared with digitally native enterprises, traditional physical enterprises often have weaker digital foundations, face greater challenges in cultivating dynamic capabilities, and encounter more pronounced transformation risks.

The Industrial Integration Theory posits that the digital industry and traditional physical industries achieve bidirectional integration through technological penetration. The digital industry provides digital tools and platform technologies, offering traditional industries real-world application scenarios. This integration can create new opportunities for innovation and reduce operational costs. However, many traditional enterprises still face challenges because digital solutions are not always well matched with their specific industry requirements.

The Comprehensive Risk Management Theory emphasizes that risk management should cover all business activities and stages of development. It should not be considered the responsibility of only the finance department. In traditional enterprises, risk management coverage is often limited, with data from different departments being disconnected from one another, making it difficult to meet the requirements of comprehensive risk management, in contrast, a digitalized risk management middle office integrates procurement, production, project, and financial data to achieve unified risk supervision across all business areas, thereby aligning perfectly with the core tenets of this theory.

3. The intrinsic mechanism

3.1. Digitalizing risk perception and identification

Digitalization enables different departments, including production, finance, supply chain, and customer management, to share data and establish a more integrated monitoring system. By leveraging real-time operational data, enterprises can track anomalies in the market, capital flow, and supplier supply chains, assess risk probabilities in advance, and transition away from the traditional model of periodic manual inspections followed by remedial actions only after risks have materialized [5]. Empirical studies demonstrate that the integration of digital technologies with the physical industry can significantly enhance supply chain risk perception capabilities and reduce the occurrence of sudden operational crises [6].

For traditional enterprises undergoing transformation, a comprehensive data-awareness system can promptly identify internal risks such as talent shortages, inadequate institutional alignment, and financial constraints, thereby reserving sufficient adjustment time and reducing potential risk losses at their source. Zang argues that a big data monitoring platform serves as a core tool for enterprises to implement proactive risk management, addressing the shortcoming of traditional enterprises [2].

3.2. Digitalization for risk resilience via resource acquisition

During the digital transformation process, enterprises introduce new production factors—such as digital talent, computing infrastructure, and online operational platforms—and reconfigure existing resources—including capital, inventory, and supply chains—to better withstand external shocks such as market downturns and rising raw material costs, thereby stabilizing business operations [7].

Insufficient resource integration is the core reason behind the failure of most enterprise transformations, small and medium-sized enterprises often have limited funds and talent reserves, making it difficult for them to fully access digital resources, and thus exhibiting weaker resilience when confronted with financial or industrial alignment risks. Zeng Delin [8], in his research on the digital integration framework, points out that the ability to acquire and restructure resources directly determines an enterprise's capacity to withstand transformation risks and serves as a key indicator distinguishing successful from unsuccessful transformation outcomes.

3.3. Digital transformation and organizational restructuring

The digital operating model requires enterprises to adjust traditional organizational structures and improve internal management systems. This includes strengthening digital departments, improving data management, and enhancing risk control mechanisms. A well-designed organizational transformation can streamline cross-departmental data flow and clarify authority and responsibilities, thereby mitigating the derivative risks arising from internal management chaos. Qin et al., analyzing from the perspective of organizational inertia, argue that the inherent management models of traditional enterprises create resistance to transformation [9]. Only by simultaneously innovating the organizational structure can the value of digital risk management be fully unleashed. If organizational and institutional updates lag behind digital transformation efforts, and if the old and new management models conflict with each other, this can amplify multiple risks—particularly in talent, finance, and management—and reduce the success rate of transformation [5]. Relevant survey data indicate that 48% of corporate transformation failures stem from failing to synchronize adjustments to the organizational structure, lagging organizational change can nullify the advantages brought about by digital risk management [1].

3.4. Case study – Jiaokong Technology's digital risk management practices

Building upon Lin Zhiyi's case study of Jiaokong Technology's digital transformation of its risk management system, we can further validate the aforementioned mechanism of action [10]. As a rail transit equipment manufacturing enterprise, Jiaokong Technology focused not only on developing digital technologies but also on improving its risk management system during the transformation process. Specifically, the company established a digital monitoring platform to combine business data with risk information and improve risk identification. In addition, the company adopted a phased approach to digital projects, which helped reduce financial pressure and improve its ability to manage transformation risks, meanwhile, by adjusting its organizational management framework, refining the allocation of digital risk control functions, and strengthening cross-departmental collaboration, it has facilitated the transition of its risk management from a traditional decentralized approach to a systematic and collaborative one. The experience of Jiaokong Technology shows that digital risk management depends not only on technology itself but also on improvements in data management, resource allocation, and organizational governance.

4. Digital transformation of traditional enterprises: optimization and risk prevention

First, enterprises should integrate comprehensive data across production, finance, supply chain, and customer dimensions to establish an integrated digital risk management middle platform, by using big data, they can monitor operational fluctuations in real time and achieve proactive risk identification as well as dynamic early warning mechanisms [10]. Zang proposes that traditional enterprises should abandon fragmented and isolated information systems, eliminate internal data silos, and utilize digital monitoring systems to compensate for the lag inherent in traditional risk management, thereby enabling the early identification of potential risks in funding, supply chains, and markets [2]. Enterprises should strengthen their digital capabilities by attracting technology professionals, introducing intelligent equipment, and adopting online operational systems. These measures can improve resource allocation and reduce the impact of market uncertainty [4]. Zeng suggests that small and medium-sized enterprises should invest in digital resources in a phased manner, avoiding large one-time expenditures that may induce financial pressure, and instead steadily build their risk resilience [10]. Digital transformation must be accompanied by adjustments to the organizational structure and breaking away from rigid hierarchical management models. Data indicate that the direct cause of failure in nearly half of enterprise transformations is the lag in updating the organizational structure [1]. Only after completing organizational restructuring can the digital risk management system show its full effectiveness.

Secondly, digital technology service providers tailor bespoke digital transformation solutions based on the specific characteristics of industries such as manufacturing, retail, and agriculture, thereby addressing the current mismatch between supply and demand [1]. Industrial clusters establish public digital service platforms to share computing power, technologies, and talent resources, thereby reducing the costs and risks associated with independent digital transformation for small and medium-sized enterprises (SMEs) and alleviating their predicament of being "unwilling, hesitant, or unable" to undergo such transformation.

Third, governments should continue supporting enterprise digital transformation through financial assistance, talent training, and technical guidance. These policies can reduce the barriers faced by enterprises during transformation. They should also improve data security laws and regulations, standardize the processes for enterprises' data storage, usage, and transmission, and mitigate specific digital risks such as data leakage and loss. Both the report to the 20th National Congress of the Communist Party of China and the "Overall Plan for Building Digital China" emphasize that policy guidance serves as a crucial safeguard for promoting the steady digital upgrading of industries and mitigating transformation risks.

Finally, enterprises should establish a complete risk management system throughout the digital transformation process. This system should include risk identification, assessment, early warning, response and continuous improvement, thereby ensuring that risk management responsibilities are not confined solely to the finance department. Enterprises should routinely conduct post-implementation reviews of various risks arising from the transformation process, continuously optimize both the digital platform and internal management systems, and thereby build a sustainable long-term mechanism for risk prevention and control.

Baosteel Group's risk management practices further illustrate the inherent logic through which enterprises enhance their risk prevention and control systems via digital means. Baosteel used information technology platforms to integrate risk management processes into daily operations [11]. This approach has facilitated a transition in risk management from post-event control to pre-event identification and process-based governance. Also, Baosteel has extended its risk management

functions to multiple areas, including production and operations, supply chain management and business decision-making, thereby enhancing the efficiency of risk information transmission and the enterprise's ability to respond to risks through cross-departmental collaboration.

In practical implementation, Baosteel has consistently conducted risk assessment and post-event reviews to dynamically adjust potential risk factors identified during its production and operational processes, thereby optimizing its internal control procedures and management systems, enabling its risk management framework to possess continuous improvement and self-adjustment capabilities. The Baosteel case shows that digital risk management involves more than simply applying information technology. Effective data integration, improved management processes, and stronger cooperation between departments are also important for enhancing risk governance. Baosteel's practice provides a representative case study for understanding how large manufacturing enterprises can leverage digital transformation to upgrade their risk management systems.

5. Conclusion

This study analyzes the risks faced by manufacturing enterprises during digital transformation and explores possible approaches to improve risk prevention and control. The research indicates that, digital transformation has become a crucial pathway for manufacturing enterprises to enhance their competitiveness. However, enterprises still commonly encounter challenges such as inadequate strategic planning, difficulties in organizational coordination, weak technological foundations, and insufficient investment in talent and capital, which contribute to the high level of uncertainty and risk associated with digital transformation. Digital transformation can improve operational efficiency and resource allocation while helping enterprises identify and monitor risks more effectively. However, the success of transformation still depends on factors such as data security, cooperation within industrial chains, and organizational management capabilities. Enterprises also need to improve their ability to recognize risks, allocate resources efficiently and adjust organizational structures. Therefore, strengthening dynamic capabilities is a vital factor in helping enterprises achieve successful digital transformation.

However, this study does not include first-hand data collected from enterprises, which limits the empirical support of the conclusions. Consequently, the research conclusions predominantly reflect theoretical analysis and inductive reasoning. Furthermore, this paper does not perform a classified comparison of digital transformation risks across different industries and enterprise sizes, nor does it adequately address the new types of risks arising from next-generation digital technologies and the associated governance challenges. Thus, there remains room for further refinement of the research content. Future research could include more enterprise case studies and questionnaire surveys in industries such as steel and equipment manufacturing. More empirical data would help verify the relationship between digital transformation and risk management.

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