Research on the Impact of Digital Transformation on Internal Control of Enterprises

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Abstract: In today's era, the rapid development of digital technologies, such as cloud computing and big data, has profoundly altered the operational environment and development models of enterprises. Digital transformation has become an inevitable path for the development of enterprises. From a macro perspective, the global economic landscape has been reshaped by the wave of the digital economy, with countries enacting policies to encourage corporate transformation. China's 14th Five-Year Plan also strongly supports this initiative. From a micro perspective, market competition is fierce, and consumer demands are diverse. Enterprises can only establish themselves in the market by leveraging digital transformation to improve efficiency, reduce costs, and optimize products and services. However, internal control in enterprises faces both challenges and opportunities in the process of digital transformation. Traditional internal control systems are struggling to adapt to rapid information flow, massive data growth, and other circumstances, revealing problems such as poor information circulation. This paper deeply investigates the impact of digital transformation on internal control, finding that prior to transformation, there were many inadequacies in internal control, while after transformation, the five key elements of internal control are significantly empowered. However, enterprises must remain vigilant about new risks, such as data security, and achieve the collaborative development of both to ensure sustainable growth.

Keywords: Digital transformation, Five key elements of internal control, Risk prevention, Collaborative development, Technological empowerment

1. Introduction

In the booming digital economy of today, digital transformation has become a key driving force for global enterprise innovation and competition. In 2024, the government proposed the "Artificial Intelligence +" initiative through the "Government Work Report," and the "Decision of the Central Committee of the Communist Party of China on Further Deepening Reform and Promoting Chinese-Style Modernization" emphasized the use of digital intelligence and green technologies to transform traditional industries, demonstrating the importance and support for corporate digital transformation. Numerous industry-leading enterprises have actively responded, with digital technologies deeply penetrating every aspect of enterprise operations, reshaping business patterns and operational models. In this context, internal control, as the foundation of stable operations, is facing reshaping and challenges brought by the wave of digitalization.

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In-depth research on the impact of digital transformation on internal control is of great significance from multiple perspectives.

At the theoretical level:

(1) Currently, research on the relationship between digital transformation and internal control is insufficient in terms of industry characteristics, enterprise size differences, and dynamic evolution of internal control at various stages of transformation. This study helps fill these theoretical gaps and construct a more refined theoretical framework.

(2) As digital technologies rapidly evolve, existing internal control theories need to be updated. The research results can provide academic support for the integration of emerging technologies and internal control, thereby strengthening the theoretical foundation of enterprise management.

(3) From an interdisciplinary perspective, the integration of information science and management knowledge can expand the boundaries of internal control research and give rise to innovative theoretical branches.

At the practical level, enterprises lack practical internal control strategies during the process of digital transformation. In-depth research can help enterprises develop customized internal control plans that align with their resources and development pace, effectively managing data and technological risks. Furthermore, it can help enterprises optimize processes, meet diverse stakeholder interests, and strengthen supply chains and customer relationships. In addition, aligning with the trend of collaborative digitalization and lean management can help enterprises create an intelligent and efficient internal control system, enhancing core competitiveness.

During this critical period, deeply analyzing the impact of digital transformation on internal control and exploring optimized paths for internal control in the digital age has become key to enabling enterprises to achieve sustainable development, enhance core competitiveness, and improve risk management capabilities. This not only determines the success or failure of enterprises in the digital wave but also affects whether enterprises can effectively leverage new technologies, innovate business models, and meet the expectations of diverse stakeholders. Therefore, this paper will deeply explore the complex interaction between digital transformation and internal control, providing theoretical guidance and practical instructions for enterprises to build a robust, efficient, and intelligent internal control system.

2. Literature Review

2.1. Research on Digital Transformation

2.1.1. The Impact of Digital Transformation on Industrial Environment

At the inter-industrial activity level, the rapid development of digital technologies has broken down communication barriers between industries and laid the foundation for the free flow of production factors. It has significantly improved the speed of information exchange between industries, enhanced the ability to integrate and exchange data, and facilitated the precise matching of supply and demand. Basole et al. pointed out that digital technologies, by promoting information flow, have significantly improved industry productivity and reshaped the overall economic landscape[1]. On this basis, Xiaonan Qiao and Yan-ping Qi further discovered that the application of big data and artificial intelligence technologies in fields such as manufacturing and logistics not only replaced human labor and resources, thereby liberating the workforce, but also promoted the deep integration of traditional and emerging industries, giving rise to new industries and production models, strengthening the circulation and innovation within the market[2]. Meanwhile, Xiao-jia Zheng et al. observed new trends brought about by the deep coupling of digital technologies with industries, indicating that industries are developing towards modularization, efficiency, precision, and flexibility, with

improved traceability of upstream and downstream industries and profound changes in industrial collaboration models[3].

2.1.2. The Impact of Digital Transformation on Enterprises

In the era of the digital economy, new-generation information technologies such as the Internet of Things and cloud computing drive profound changes in enterprises. While digital technologies cannot directly create new production and operation models, they have significant advantages in information processing, making them a key support for building new models. On the one hand, digital technologies enhance an enterprise's ability to utilize its own resources, help enterprises more effectively acquire, identify, and utilize digital resources, and promote high-quality development[5]. These technologies not only optimize resource allocation within enterprises but also optimize organizational structures through digital transformation has led to a shift in enterprise organizational structures from traditional "pyramid" models to flat structures, making decision-making faster and more accurate. On the other hand, digital technologies also assist management in making scientific decisions, reducing agency costs[7], and effectively controlling capital operation costs by optimizing information ecosystems and lowering the costs of information acquisition and disclosure[9]. These changes collectively drive improved corporate performance and enhanced market competitiveness.

2.1.3. The Economic Consequences of Digital Transformation

Currently, research on the economic consequences of digital transformation in enterprises focuses on aspects such as enterprise performance, audit costs, and corporate innovation. Scholars hold differing views on the relationship between digital transformation and performance. Jian Sun and Rong-li Yuan et al. found through surveys that some enterprises experienced a decline in profitability after implementing ERP systems. The reasons included compliance with government requirements, large investments, and the need to adapt to the digital environment, with blind following of trends leading to performance decline[10]. In contrast, research by Yan-chao Rao and Ye Chen and Wang provides positive evidence, indicating that an increase in the level of informationization can directly or indirectly drive performance growth through knowledge-sharing mechanisms, and that there is a significant positive correlation between the level of informationization and economic returns. In terms of the impact of digital transformation on audit costs, Xiao-feng Quan and Xing-mei Xu found that the application of big data and other information technologies by enterprises increases audit risks, which, to mitigate these risks, leads to an increase in audit procedures, thereby raising audit costs [11][12][13].

2.2. Research on Internal Control

2.2.1. Economic Consequences of Internal Control in Enterprises

In the field of research on the impact of internal control, the focus has primarily been on aspects such as enterprise value, costs, and investment efficiency. A sound internal control system is of great significance. Effective internal control can suppress adverse selection behaviors by management that may misuse accounting policies, reduce the risk of information distortion, and decrease agency costs, thereby enhancing the authenticity and reliability of financial statements. Specifically, high-quality internal control ensures more comprehensive financial statement disclosures, reduces the likelihood of managerial fraud, and increases investors' understanding and confidence in the operation of the enterprise, prompting them to make more informed investment decisions, ultimately increasing enterprise value[14][15][16]. Furthermore, in the context of the separation of ownership and

management, the impact of internal control on corporate investment efficiency has been further explored. High-quality internal control helps enterprises clarify division of responsibilities, form checks and balances between departments, and effectively prevent internal conflicts, thus significantly improving investment efficiency[17].

2.2.2. Factors Affecting the Quality of Internal Control in Enterprises

In the field of research on the factors influencing the quality of internal control, existing literature mainly focuses on the internal business environment of the company and the external governance environment. Regarding the internal environment, complete governance systems and reasonable governance structures are crucial for the effectiveness of internal control and are closely related to the enterprise's development status. Small-scale companies, due to immature organizational structures and business processes, often have lower internal control quality compared to larger companies. This highlights the fundamental role of company size and organizational maturity in internal control quality, and also indicates that small businesses face more challenges in building internal controls[18]. From a governance perspective, the emphasis that senior management places on internal control is a key factor in improving its quality. It is suggested that internal control can be optimized through the implementation of incentives related to internal control[19]. In addition, studies by Hoitash et al. and Jing-yi Xu further expand on external factors influencing internal control quality. Strict external legal supervision can force enterprises to improve internal control processes, thereby enhancing their quality[20]. Additionally, the independence and objectivity maintained by audit firms during external audits are critical for ensuring the quality of corporate internal control[21].

2.3. The Impact of Digital Transformation on Enterprise Internal Control

In the field of research on the relationship between enterprise digital transformation and internal control quality, scholars have offered valuable perspectives. Yan-mei Luo and Bao-ping Gao both emphasized the positive impact of digitalization on the quality of internal control. Digitalization of internal control can effectively reduce information distortion, lower transmission costs, and enhance operational efficiency, thereby comprehensively improving internal control quality[22]. It can also break down information flow barriers, improve transparency, reduce fraudulent behaviors, and standardize information, which leads to a more accurate understanding of internal control by employees, significantly enhancing its quality[23]. However, Xue-ying Yin and Ekata et al. raised concerns about potential issues and challenges in digital transformation. Accelerated informationization may lead to disorganized and complex information, making authenticity and security difficult to ensure, which could result in a decline in internal control quality[24]. Moreover, the "IT Paradox" further raises the issue that investment in information technology by enterprises may not necessarily lead to the expected performance improvements or optimization of internal control quality[25].

2.4. Literature Review

With the rapid development of digital technologies, their impact on enterprise internal control has become a focal point of both academic and practical attention. Previous research has yielded fruitful results, revealing the interaction mechanisms between digitalization and internal control, analyzing the paths through which digital technologies reshape the elements of internal control, and highlighting the value of internal control in supporting transformation. These studies provide operational guidelines for enterprises and inject vitality into academic research, laying a solid theoretical and practical foundation. However, there are still gaps in the existing research. First, most studies focus primarily on the relationship between digital transformation and internal control in large enterprises or specific industries, with relatively little attention paid to small and medium-sized enterprises (SMEs) and emerging industries. Due to limited resources, SMEs face unique challenges and opportunities in the digital transformation process, and their internal control systems differ from those of large enterprises.

Second, most existing research adopts static analytical methods, failing to fully consider the dynamic process of digital transformation and the adaptive changes of internal control at different stages of transformation. Digital transformation is an ongoing process, comprising stages such as digital infrastructure construction, business process digitization, and digital innovation. Each stage imposes different requirements and impacts on internal control. However, only a few studies attempt to categorize different stages of digital transformation and explore the corresponding characteristics and changes of internal control at each stage.

Third, digital transformation involves the application of knowledge and technologies from multiple disciplines, including information technology, management, economics, and law. However, research on its impact on enterprise internal control has largely been confined to a single disciplinary perspective, lacking interdisciplinary integrated research. Internal control itself is a comprehensive management field that requires multidisciplinary knowledge to better address the complex challenges brought about by digital transformation.

3. The Current Status of the Impact of Digital Transformation on Enterprise Internal Control

3.1. Issues in Enterprise Internal Control Before Digital Transformation

In the stage of low digitalization, enterprises face numerous problems in their internal control. In terms of information flow, communication between departments primarily relies on manual methods, such as paper document transmission and oral reports, which results in slow information flow and the risk of delayed, distorted, or even lost information. For example, financial department reports cannot be promptly and accurately conveyed to management, affecting the timeliness and effectiveness of internal control. Regarding control processes, traditional internal control processes rely on manual operations, with numerous and complex steps. The procurement approval process requires multiple layers of signatures and reviews, consuming a significant amount of time and effort, leading to inefficiency and vulnerability to human error or deliberate violations. Manual data recording and processing also increase the likelihood of mistakes, thereby raising internal control risks. In risk assessment, due to the lack of digital tools, enterprises struggle to collect and analyze large amounts of internal and external data, making it difficult to identify potential risks in a timely and accurate manner. External risks such as market changes and competitor dynamics, as well as internal risks like process and personnel issues, are only assessed through experience, lacking scientific and effective risk assessment models and early warning mechanisms. Once risks occur, enterprises lack rapid and effective response measures, undermining the effectiveness of internal control in risk prevention. In supervision, the internal audit department, facing large and scattered data volumes, finds manual auditing methods inadequate for comprehensively and thoroughly reviewing internal control implementation. The collection and organization of audit evidence are cumbersome, leading to lengthy audit cycles, and the timeliness and accuracy of supervision cannot be ensured. Moreover, tracing and rectifying identified issues is difficult, and an effective supervisory feedback loop is challenging to establish.

3.2. Impact on Enterprise Internal Control After Digital Transformation

During the process of digital transformation, significant optimization has been achieved in various aspects of enterprise internal control.

In optimizing the control environment, digital technologies have broken down barriers between departments, enabling real-time information sharing and collaborative work. By establishing digital platforms, enterprises have clarified the responsibilities and authority of each department and position, optimized organizational structures, and significantly improved decision-making efficiency. At the same time, digital training and communication methods have developed employees' digital literacy and risk awareness, creating a favorable internal control culture.

In terms of enhancing risk assessment capabilities, enterprises now use big data analytics, artificial intelligence, and other technologies to collect and analyze massive amounts of internal and external data. Through real-time monitoring and analysis of data, they have established scientifically accurate risk assessment models that can identify potential risks, predict the likelihood and impact of these risks, and formulate response strategies in advance. For example, using data analysis tools to assess market trends and customer credit effectively reduces market and credit risks faced by enterprises.

In improving control activities, digital transformation has automated and intelligentized control activities. Automated financial accounting systems ensure the accuracy and timeliness of financial data, reducing errors and fraud risks caused by human intervention. Intelligent approval systems automatically process approval flows based on preset rules, improving approval efficiency and consistency. At the same time, digital technologies monitor and record the execution of control activities in real time, facilitating the timely detection of anomalies and enabling traceability and rectification.

In terms of enhancing information and communication, digital platforms provide efficient and convenient channels for internal information transfer. Employees can access and share the information needed for their work in real-time through internal information systems, while management can promptly grasp the enterprise's operational status and the execution of internal controls, making timely decisions and adjustments. Moreover, communication between enterprises and external stakeholders has become smoother. Through electronic data exchange, e-commerce platforms, and other means, information can be rapidly exchanged with suppliers, customers, and regulatory authorities, increasing the enterprise's transparency and credibility.

In strengthening the supervisory function, digital technologies provide powerful tools for internal auditing and supervision. Audit software collects and analyzes business and internal control data in real-time, enabling continuous monitoring and auditing of internal controls. By analyzing data, weak areas and potential issues in internal control can be quickly identified, and early warnings can be issued. Additionally, digital systems record and store the auditing process and results, facilitating future traceability and review, improving the effectiveness and deterrence of supervision.

In summary, digital transformation has brought comprehensive and profound changes to enterprise internal control, helping enterprises achieve sustainable development in an increasingly complex market environment.

4. The Empowering Effect of Digital Transformation on the Five Elements of Internal Control

Digital transformation empowers the five elements of internal control in multiple ways.

4.1. Control Environment

Digital technologies enable enterprises to optimize their organizational structures, break down traditional departmental barriers, and facilitate cross-departmental collaboration through ERP

systems, ensuring smooth communication and clear responsibilities across departments, thus enhancing overall operational efficiency. At the same time, digital transformation drives corporate culture development. By leveraging digital platforms for training, knowledge sharing, and other activities, enterprises cultivate employees' digital literacy and innovative mindset, fostering a positive internal control culture. Moreover, digital tools and data analysis methods enhance leadership by enabling business leaders to better understand the enterprise's operations and make data-driven, informed decisions.

4.2. Risk Assessment

Digital technologies help enterprises collect and analyze large volumes of internal and external data. By using data analytics tools and artificial intelligence algorithms, enterprises can deeply explore and accurately identify potential risks, such as predicting market trends through big data analysis. Digital technologies also enable the creation of scientifically accurate risk assessment models, allowing businesses to quantitatively evaluate risks based on their operational characteristics and risk preferences. This provides a solid foundation for formulating appropriate risk response strategies. Additionally, real-time data updates and feedback mechanisms ensure continuous monitoring of business risks, such as using the Internet of Things (IoT) technologies to monitor enterprise production equipment in real time.

4.3. Control Activities

Digital technologies facilitate automation in control activities. Automated financial systems enable the automatic collection, processing, and analysis of financial data, reducing manual intervention and improving the accuracy and timeliness of financial data. Automated approval processes also enhance efficiency by following preset rules for decision-making. Artificial intelligence and machine learning technologies support intelligent decision-making by analyzing business data and providing valuable insights for management decisions. These technologies can automatically identify risks based on historical data and experience and make corresponding decisions. Furthermore, digital transformation encourages the optimization of business processes. By redesigning and integrating processes, enterprises can reduce unnecessary steps, achieving online and automated business processes through digital platforms.

4.4. Information and Communication

Digital platforms enable efficient internal information sharing within enterprises. Through internal networks, cloud storage, and other means, enterprises can integrate and share information, ensuring employees have timely access to the necessary data. Multiple communication channels, such as instant messaging tools, email, and social media, make communication more convenient and efficient, facilitating the timely transmission of information and feedback. Digital transformation also strengthens information security by utilizing encryption techniques, firewalls, and other measures to safeguard enterprise data and establish comprehensive information security management systems.

4.5. Supervision

Digital technologies enable real-time monitoring of internal control processes within enterprises. Through digital platforms, various business activities are continuously monitored and analyzed, allowing for the timely identification of internal control issues. Digital tools and technologies also promote the informatization of auditing. By automating and digitalizing the auditing process, audit efficiency and quality are enhanced, and the auditing process is tracked and recorded. Furthermore, enterprises can adopt data-driven supervision. By analyzing and mining large volumes of data, internal control problems and risks are uncovered. Real-time data analysis and reporting provided by digital platforms help businesses make informed decisions and strengthen supervision.

In summary, digital transformation brings significant empowerment to the five elements of internal control, helping enterprises enhance operational efficiency, mitigate risks, and improve overall internal control systems.

5. Conclusion

In the context of the rapid development of the digital economy, enterprises are accelerating their digital transformation efforts to gain a competitive edge in the intense market competition. This study, based on this background, explores the impact of digital transformation on corporate internal control in depth. The research finds that prior to digital transformation, enterprises faced numerous challenges in internal control, including inefficient information flow, complex control processes, inaccurate risk assessments, and ineffective supervision. However, with the advancement of digital transformation, significant improvements and empowerment have been observed in corporate internal control. The control environment has been optimized, risk assessments have become more accurate, control activities have been automated and intelligentized, information and communication have become more efficient and convenient, and supervisory functions have been strengthened.

Although digital transformation has brought about many positive changes in corporate internal control, this study still has some limitations. First, due to time and resource constraints, the study did not cover all types and sizes of enterprises, and the sample selection is therefore limited, which to some extent restricts the depth and breadth of the research. Second, the study did not delve deeply into the specific implementation details and best practices of internal control during digital transformation, which affects the universality and applicability of the conclusions.

In the future, as digital technologies continue to develop and proliferate, enterprises should maintain a focus on emerging digital technology trends and actively explore and innovate digital applications for internal control. Future research can further expand the sample scope, covering more types and sizes of enterprises, to validate and refine the conclusions of this study. At the same time, a deeper investigation into the specific implementation details and best practices of internal control during digital transformation is necessary to provide more concrete and feasible guidance to enterprises. This will help better understand and address the impact of digital transformation on corporate internal control and lay a solid foundation for the sustainable development of enterprises.

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