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## Investigating Challenges and Implementing Strategies for Digital Transformation in the Field of Circulation Enterprises

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Abstract. With the profound development of the global economy and the continuous innovation of information technology, circulation enterprises are encountering unprecedented challenges and opportunities for digital transformation. As one of the world's largest consumer markets, China's circulation enterprises' process and outcomes of digital transformation will exert a significant impact on the global business ecosystem. Revised sentence: "This paper conducts a comprehensive analysis of the questionnaires collected from 356 circulation enterprises in the wholesale, retail, and logistics industries through literature review and questionnaire survey. It deeply examines the challenges faced by Chinese corresponding countermeasures to provide valuable insights for the sustainable development of these enterprises. The challenges encountered in the digital transformation of circulation enterprises include low security performance, inadequate talent reserve, limited government funds, and legal support.

Keywords. Digital transformation, circulation enterprise, operational efficiency.

#### 1.Introduction

In the digital economy era, as a crucial link between production and consumption, the digital transformation of distribution enterprises has become pivotal in enhancing competitiveness. With the continuous advancement of cloud computing, big data, Internet of Things, and other technologies, distribution enterprises have gradually transitioned from traditional business models to digital and intelligent ones[1]. Digital transformation not only enhances operational efficiency but also provides consumers with more convenient and personalized services. During this process, Chinese distribution enterprises face internal challenges such as technological innovation, talent shortage, and information security while also encountering external pressures like intensified market competition and diversified consumer demand. In recent years, the application of digital technology has presented new opportunities for the development of distribution enterprises but has also brought forth new challenges. Effectively utilizing digital technology to improve operational efficiency and accelerate enterprise digitization has become an urgent issue for distribution enterprises. Therefore, studying the impact of digital transformation on distribution enterprises holds great theoretical and practical significance.

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### 2. Research methods and innovations

### 2.1. Research methods

### 2.1.1 Literature research method

This paper conducted a comprehensive review of academic journals and doctoral papers related to keywords such as "digital transformation of circulation enterprises" through authoritative platforms such as CNKI and Wanfang, using the collected data as the theoretical foundation for the research. Through in-depth study and analysis, relevant literature on digital transformation of circulation enterprises at home and abroad was organized and summarized to understand key concepts and clarify the theoretical framework for problem analysis.

#### 2.1.2 Questionnaire survey method

Relevant data was collected for research purposes through a questionnaire survey.

#### 2.2. Innovation

#### 2.2.1 Technological application innovation

In the process of digital transformation, circulation enterprises should actively adopt advanced technical means such as big data, artificial intelligence, Internet of Things, etc., to enhance operational efficiency and service quality.

#### 2.2.2 Business model innovation

Digital transformation presents opportunities for business model innovation in circulation enterprises. Enterprises can explore new retail models integrating online and offline channels to expand sales channels beyond traditional restrictions; simultaneously, by developing their own e-commerce platform or collaborating with others, they can achieve seamless integration between online and offline operations to improve customer experience.

#### 2.2.3 Organizational management innovation

Digital transformation necessitates internal organizational management changes and innovations. Enterprises should establish flat and flexible organizational structures adaptable to rapidly changing market environments; concurrently strengthen internal communication and collaboration across departments and levels to foster crossfunctional teamwork capabilities that facilitate smooth implementation of digital transformation.

### 3. Literature review

The issues of industrial digitalization and digital industrialization have garnered widespread attention and thorough examination by experts and scholars. This study primarily focuses on the challenges present in the digital transformation of the circulation industry. Regarding the main issues in the digitization of the circulation industry, Wang Yuxiang and Xu Hongbo (2021) [2] conducted an empirical analysis on the impact of digital transformation on residents' consumption upgrading, highlighting that improving circulation efficiency has a greater effect on expanding township residents' consumption than urban residents, but has a greater impact on enhancing urban residents' consumption quality than township residents. Yang Haichao (2022) [3] emphasized that constructing new infrastructure is a crucial approach to accelerate China's circulation industry's digital transformation and facilitate domestic circulation. Tang Renwu and Zhang Jingsen (2022) [4] stressed that digital technology enhances modern circulation systems, transforming it into a system interconnected by various modes, organizations, carriers, and technologies to promote common prosperity realization. Lin Gang and Fan Canghai (2022) [5] argued that online retail has reshaped supply-demand structure and mode of circulation while accelerating value chain upgrade within supply chains. Chen Zekai and Guo Wenxing (2022) [6] through empirical analysis, demonstrated how higher levels of digital economy development can drive high-quality development within the circulation industry. Zhou Lin and Wang Xiaoyi(2022)[7] discussed obstacles to digital transformation at three levels: macro-economic environment, middle-market operation mechanism, micro-enterprise operation mode; they proposed corresponding suggestions from policy, technology, and industry perspectives respectively. Wu Hailan & Liu Yuqiang (2023) [8] suggested commercial enterprises should further research consumer shopping habits & increase R&D for new logistics technologies to achieve internal & external innovation.

(Autio et al 2018; Li 2020)[9][10] noted existing research mainly focuses on business models organizational structures & innovation performance; big data application changes enterprise cost mechanisms & value exchange reducing intermediary power in value chains innovating business models; Chen Yuchan(2023)[11]suggested strengthening goods quality control developing promotion plans according to goods particularities improving brand values promoting enterprise development. Zhou Ruohan(2022)[12]argued modern circulations reflect integrated logistics-business flow developments where business flow drives logistics feedbacks develop business flows conducive domestic economic cycles.

The above literature indicates increasing global scholarly attention towards understanding impacts of digital transformations. The focus lies mainly upon resident impacts & circulation modes[13]. Although studies exist regarding computer, internet, intelligence, digital transformations effects upon circulations, &demonstrated importance in reducing transaction costs & accelerating goods/services circulations[14][15], no definitive conclusions reached, few studies address challenges posed by such transformations. Based holistic thinking, this paper analyzes advantages, challenges, &countermeasures related to digitizing the circulating industries.

### 4. Questionnaire design and investigation

#### 4.1 Questionnaire design

Circulation enterprises encompass a wide range of industries, including commerce, trade, logistics, retail, wholesale, and transportation[16][17]. This study focused on conducting a questionnaire survey within the representative supply chain of retail, logistics, and wholesale sectors to ensure the effectiveness and relevance of the questionnaire. The designed questionnaire specifically targets the application of digital transformation in circulation enterprises and its influencing factors. It covers various aspects such as advantages, existing problems, effects, and aims to comprehensively reflect the impact of digital transformation on circulation.

#### 4.2 Survey

Between December 2023 and February 2024, a total of 356 enterprise questionnaires were obtained through face-to-face interviews with individuals from the retail industry, wholesale industry, logistics industry as well as online questionnaires. The effective rate of the questionnaire was 100%. The statistical information regarding the questionnaire is as follows:

		Wholesale industry		Retail industry		Logistics	
Categories	Options	Number of people	Percentage %	Number of people	Percentage %	Number of people	Percentage %
1. Gender	male	49	48.04%	64	43.24%	60	56.6%
	female	53	51.96%	84	56.76%	46	43.4%
2. Age	18 to 25	15	14.71%	14	9.46%	12	11.32%
	25 to 35	36	35.29%	55	37.16%	31	29.25%
	35 to 45	34	33.33%	56	37.84%	38	35.85%
	45 to 55	4	3.92%	15	10.14%	15	14.15%
	55 to 60	13	12.75%	8	5.41%	10	9.43%
4. Practice Time	Within three months	10	9.8%	8	5.41%	9	8.49%
	3-12 months	27	26.47%	54	36.49%	31	29.25%
	1-3 years	28	27.45%	42	28, 38%	29	27.36%
	More than three years	38	36.27%	44	29.73%	37	34.91%
Total		102	100%	148	100%	106	100%

Table 1. presents the basic information of the survey objects

## 5. Analysis and Interpretation of Survey Findings

Table 2. presents the survey findings regarding the benefits of digital transformation in circulation enterprises

Questions	Options	Wholesale industry	Retail industry	Logistics	Survey statistics
1. Is your organization	yes	81.37%	73.65%	84.91%	79.1%
undergoing digital transformation?	no	18.63%	23.65%	15.09%	20.79%
2. Has digital	Significantly improved	28.43%	22.97%	34.91%	28.09%
improved your	Some improvement	45.1%	47.3%	36.79%	43.54%

business's ability to	No noticeable effect	14.71%	17.57%	11.32%	14.89%
innovate?	Somewhat reduced	11.76%	12.16%	16.98%	13.48%
<ol><li>Has digital</li></ol>	Significantly improved	42.16%	28.38%	32.08%	33.43%
transformation made	Some improvement	39.22%	45.95%	42.45%	42.98%
productive?	No noticeable effect	10.78%	13.51%	14.15%	12.92%
Î	Somewhat reduced	7.84%	12.16%	11.32%	10.67%
4. Has digital	Significantly improved	40.2%	29.05%	34.91%	33.99%
transformation improved the	There is some improvement	35.29%	36.49%	37.74%	36.52%
efficiency of your	No noticeable effect	11.76%	20.95%	12.26%	15.73%
business?	Somewhat reduced	12.75%	13.51%	15.09%	13.76%
5. Whether digital	Significantly improved	39.22%	29.73%	33.96%	33.71%
transformation has	Some improvement	32.35%	45.27%	37.74%	39.33%
of customer service	No obvious effect	14.71%	1.54%	18.87%	16.29%
at your business	Somewhat reduced	13.73%	9.46%	9.43%	10.67%
6. How does the	Greatly shortened	31.37%	25%	32.08%	28.93%
business process	Somewhat shortened	41.18%	43.92%	38.68%	41.57%
digital	No significant change	13.73%	18.92%	7.55%	14.04%
transformation?	Some growth	10.78%	8.78%	18.87%	12.36%
	Substantial increase	2.94%	3.38%	2.83%	3.09%

#### 5.1 Advantages of digital transformation in the distribution sector

Based on survey data, digital transformation has become a widespread trend, with 79% of enterprises in the three industries surveyed having undergone digital transformation, while only about 20% have not. The majority of those that have not are concentrated in the retail industry. Digitalization within the distribution industry involves the application of technologies such as big data, Internet, cloud computing and blockchain to enhance market efficiency. The development of digital technologies has led to optimized business processes, improved customer service quality and time savings within the distribution industry.

#### 5.1.1 Optimize business processes and innovate business models

According to our survey data, among enterprises that have undergone digital transformation, 28.93% have significantly improved their business processes and 41.57% have shortened their business process cycle to some extent. Information technology enables automation and digitization of business processes leading to enhanced efficiency and reduced cycle times for businesses. For logistics enterprises, real-time monitoring and data analysis through IoT and cloud computing has resulted in shorter cycles, reduced costs and increased efficiency; however, the most significant change is seen in innovative business models facilitated by digital technology applications which provide greater flexibility for creating new models tailored to different user needs. For retail enterprises' employees who rely heavily on e-commerce sales driven by digital technology during this internet era - providing consumers with more convenient personalized shopping experiences - it also brings additional market share opportunities for these companies.

#### 5.1.2 Enhance operational efficiency and save working time

By leveraging digital technology, distribution enterprises can achieve real-time tracking and management of the supply chain, optimize inventory and logistics management, enhance the speed of goods flow, and mitigate inventory costs and unsalable risks. Research indicates that approximately 80% of enterprises have experienced improved operational efficiency post digital transformation. This is attributed to the substantial data support provided by digital transformation, enabling distribution enterprises to conduct data analysis, identify potential market opportunities and areas for improvement, as well as establish a scientific foundation for decision-making. The advancement of digital technology has bolstered the volume, immediacy, and effectiveness of data information, ensuring efficient transmission with integrity and accuracy across industries. Data production factors serve as crucial groundwork for enterprise production and operation decisions.

#### 5.1.3 Enhance the quality of customer service and reduce operational costs

Based on survey data, digital transformation has the potential to significantly elevate enterprise service standards.70%-80% of employees believe that through digital technology, enterprises can promptly gather customer feedback, data, and other information for analysis and insight mining, leading to continuous product and service optimization and enhanced customer satisfaction. For instance, in the retail industry, digital technology enables improvements in service levels and cost reduction through online ordering, intelligent queuing systems, and smart vending machines. The application of digital technology also elevates customer experience and service models while bolstering customer satisfaction and loyalty. Interviews with delivery personnel reveal that intelligent customer service systems can enhance the quality of customer support; big data analysis facilitates personalized services; mobile apps offer a convenient shopping experience—all contributing to improved customer satisfaction and loyalty which ultimately enhances enterprise competitiveness.

#### 5.2 Circulation enterprises face challenges in their digital transformation

Problems	Options	Wholesale industry	Retail industry	Logistics	
<ol> <li>What challenges do you face in digital</li> </ol>	Technology implementation is difficult	37.25%	37.16%	36.79%	37.08%
transformation?	Under-skilled staff	68.63%	70.95%	66.04%	68.82%
(multiple choices)	Data security concerns	66.67%	70.27%	72.64%	69.94%
	Low level of government support	48.04%	42.57%	59.43%	49.16%
2. What kind of support has	Policy support	36.27%	34.46%	30.19%	33.71%
your company received?	Legal support	18.63%	41.89%	25.47%	30.34%
(Multiple choices)	Financial support	38.24%	31.76%	22.64%	30.90%
	Basically none	28.43%	28.38%	38.68%	31.46%
3. Have you received any	yes	40.2%	43.92%	34.91%	40.17%
training in digital transformation?	no	59.8%	56.08%	65.09%	59.83%

Table 3. Results of the survey on challenges in digital transformation are presented

4. Has digital transformation improved data security in	Significantly improved	26.47%	14.19%	16.98%	18.54%
	Slightly up	24.51%	35.14%	27.36%	29.78%
your business?	No change	24.51%	27.7%	29.25%	27.25%
	Somewhat reduced	24.51%	22.97%	26.42%	24, 44%

According to our survey, while the majority of respondents are optimistic about digital transformation, some have identified challenges in the process, such as rapid technological advancements, low security performance, a shortage of skilled professionals, and inadequate government funding and legal support.

5.2.1 From the perspective of enterprise investment, businesses are under immense pressure to keep up with rapid technological advancements, which often surpass their expectations and capabilities

With the continuous evolution of cloud computing, big data, artificial intelligence, and other technologies, circulation enterprises are confronted with the challenge of swift technological updates. According to survey results, 37.08% of enterprises encounter technical difficulties. Businesses must stay abreast of new technologies in order to ensure seamless operations. However, the pace of technological obsolescence frequently exceeds enterprises' expectations and capacities, resulting in significant pressure on them. Rapid technological changes can also disrupt strategic planning and decision-making processes. Companies need to continuously adjust their strategic direction and business models to adapt to technological shifts; however, such frequent adjustments may lead to strategic instability and impact long-term enterprise development.

5.2.2 From the perspective of the social environment, the insufficient legal and financial support from the government for circulation enterprises has significantly hindered their digital transformation

According to survey results, inadequate financial and legal support from the government may result in circulation enterprises not receiving sufficient policy incentives and legal protection during their digital transformation process. 30% of enterprises indicated a lack of preferential tax policies and financial support for digital technologies during their transformation. Additionally, over 30% of employees believe that there is a lack of legal protection in digital transformation, leading to reluctance among circulation enterprises to pursue digital transformation due to fear of risks and losses. The substantial investment required for digital equipment as part of long-term income generation becomes a deterrent if government funding is lacking along with legal protection.

## 5.2.3 From a security performance perspective, the digital transformation of circulation enterprises poses security risks that impact the enterprise's ability to guarantee security

Digital transformation simplifies data, facilitating collection and analysis for circulation enterprises handling large amounts of customer and business data. However, over 50% of individuals still perceive digitization as potentially causing security issues. Without proper security measures in place, this could result in data breaches exposing personal or sensitive corporate information, leading to financial and reputational damage. As online business grows, circulation companies' network infrastructure faces increased security pressure from cyberattacks, virus transmission, and malware which can disrupt

normal operations. Physical logistics also require attention to physical security such as storage facility management and goods safety during transit due to inadequate security measures.

5.2.4 From a staffing perspective, circulation enterprises lack sufficient technical personnel and provide inadequate technical training for existing staff, which hinders the digitalization progress of these enterprises

The survey revealed that 69% of employees in circulation enterprises feel that there is a shortage of technical personnel, leading to challenges in implementing or updating technologies. This can result in project delays or even impact the successful implementation of projects. With only 40% of current employees receiving technical training, companies are not investing enough in enhancing their technical capabilities to keep up with technological advancements. This may put them at a disadvantage compared to their competitors. Insufficient staffing and low levels of technical training may impede a company's ability to innovate. Neglecting the staffing and technical training of technicians can also affect employee morale and work enthusiasm, potentially leading to decreased work efficiency and overall operational impacts on the enterprise. In some cases, insufficient technology may pose security risks.

# 6. Improved Measures and Recommendations for Advancing the Digital Transformation of Distribution Enterprises

#### 6.1 Increase investment in technology research and development

Establish a dedicated research and development department or team to focus on the advancement and application of novel technologies. These teams should consist of professionals with relevant technical and industry expertise to ensure the professionalism and effectiveness of R&D activities. We will augment our investment in technology research and development, elevating the proportion of R&D funds in total enterprise expenditures. This will ensure that companies have ample capital to support technology research and development activities, driving the translation and application of innovative results. Strengthen collaboration with external partners such as universities and scientific research institutions to jointly undertake technology research and development projects. Through industry-university-research cooperation, enterprises can access more innovative resources and technical support, accelerating the process of technology research and development. Formulate a digital transformation strategy and plan. Enterprises should delineate clear goals for digital transformation, formulate specific implementation plans with timelines, ensuring orderly progress in digital transformation initiatives. Leverage advanced technologies like big data analytics and artificial intelligence to optimize business processes, enhancing operational efficiency.

## 6.2 The government should enhance financial support for the digital transformation of circulation enterprises

Governmental financial aid can alleviate the financial burden on enterprises and expedite their digital transformation process. In the era of digital economy development, many circulation enterprises are eager to undergo digital transformation; however, breaking away from traditional modes may lead to bankruptcy due to disrupted capital chains. Throughout the process of digital transformation, circulation enterprises often require loans and financing from banks and other financial institutions. Due to their limited scale or insufficient collateral, these enterprises may encounter difficulties in obtaining costly financing. Governmental financial support can serve as a guarantee or interest reduction for these enterprises, thereby lowering their financing costs and facilitating smoother completion of their digital transformation efforts. Digital transformation demands significant investments in technology, equipment, talent acquisition, among other aspects—a considerable expense for numerous circulation enterprises. Governmental financial assistance can help address this issue by providing necessary support for these investments.

# 6.3 The government should enhance legal assistance to facilitate the digital transformation of distribution enterprises

In the current digital era, the digital transformation of distribution enterprises has become an inevitable trend. This transformation not only enhances operational efficiency and reduces costs but also better aligns with consumer needs and improves market competitiveness. However, enterprises often encounter various legal risks and challenges during this process. Therefore, it is essential for the government to enhance legal support for the digital transformation of distribution enterprises and provide improved legal protection and guidance. Throughout the digital transformation process, enterprises will face a range of legal issues including data protection, privacy, intellectual property rights, etc. By formulating relevant laws and regulations, the government can offer legal protection for distribution enterprise's digital transformation efforts while reducing associated risks and improving success rates. The government should also refine laws related to data protection, privacy, and intellectual property rights in order to clarify rights and obligations during digital transformations while safeguarding legitimate interests of enterprises. Strengthened supervision over these transformations is necessary to ensure compliance with relevant laws as well as providing legal advisory services to help resolve any encountered issues.

#### 6.4 Enhance staff training and foster team cohesion

In the process of digital transformation, distribution enterprises must enhance the training of relevant talents. On one hand, enterprises should focus on talent acquisition and development. To support digital transformation, companies need to recruit and nurture professionals with expertise in digital technology or upgrade the skills of current employees through training and refresher courses. In order to advance digital transformation more effectively, distribution enterprises need to intensify employee training by developing personalized training plans tailored to different positions and business needs in order to enhance their digital skills. Additionally, companies can establish an internal training system and regularly organize internal training activities to share experiences and results related to digital transformation. Furthermore, businesses can also bolster their intellectual support for digital transformation by recruiting exceptional external talents.

#### 6.5 Enhancing security protocols

As the volume of enterprise data grows and digitalization deepens, cybersecurity risks, data protection, and business continuity will also increase. Strengthening security mechanisms is crucial for circulation enterprises during the digital transformation process due to its impact on various aspects such as data processing, business operations, and customer information. Security issues can lead to significant economic losses and damage the reputation of the enterprise and customer trust. Establishing a robust data security management system including data classification, encryption processing, permission control, backup and recovery is essential to ensure data integrity, confidentiality, and availability. Additionally, enhancing employee training to raise awareness of data security is necessary in order to prevent operational errors or malicious behaviors leading to data leakage or damage. The emergency response mechanism should encompass emergency planning, dedicated response teams, allocation of emergency resources, among other components. Furthermore, regular security audits and risk assessments are essential for identifying potential security vulnerabilities and points of risk in a timely manner; corresponding measures can then be implemented for improvement purposes to ensure the efficacy of the security assurance mechanism during digital transformation.

### 7. Conclusion

The digital transformation of distribution enterprises is a multifaceted and challenging endeavor, necessitating collaborative efforts from businesses, government, and society. Only through sustained innovation and proactive adaptation to challenges can the circulation industry achieve digital transformation and high-quality development. We anticipate that in future developments, the digital transformation of distribution enterprises will yield even more remarkable outcomes and contribute significantly to societal prosperity and advancement.

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