

Innovation Strategies and Challenges of Enterprise Supply Chain Management in Digital Age

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Abstract: This paper analyzes the low penetration rate of digital technology, the lack of security of supply chain management and the sustainability of supply chain in Chinese enterprises Insufficient challenge. In order to cope with these challenges, it is necessary to consolidate the foundation of digital hardware and software and improve the application level of digital technology. Strengthen enterprise data and communications Security protection of interest assets; Increase capital investment, node enterprises to promote the digital transformation of supply chain upstream and downstream and other countermeasures. Finally, the Internet of Things and big data are proposed Analysis, supply chain digital collaboration platform, intelligent warehouse management and supply chain financial services and other innovative ways to meet the supply chain management in the context of enterprise digital transformation requirement.

Keywords: Digital transformation, Supply chain management, Innovate, Challenge.

1. Introduction

With the rapid development of information technology and the deepening of digital trend, enterprise supply chain management is undergoing a transformation from the traditional linear model to the network model based on digitalization. This shift presents significant opportunities for businesses, but it also comes with an unprecedented set of challenges. According to the latest market research report, the global market size of enterprise digital transformation is expected to reach \$1.7 trillion by 2025, of which supply chain management is an important area. However, the implementation of digital transformation is not easy, and enterprises face many challenges during the transformation process. According to a Stanford University study, about 80% of enterprises have encountered organizational restructuring and cultural change during the digital transformation process. These challenges require companies to maintain efficient supply chains while also dealing with a redesign of organizational structures and a reshaping of corporate culture. In summary, in the context of digital transformation, supply chain management is faced with both innovation opportunities and severe challenges. This requires enterprises to deeply understand and grasp the trend of digital transformation, and actively respond to challenges in order to optimize and upgrade supply chain management.

2. The Core Role of Digital Age in Enterprise Supply Chain Management

2.1. Leading the New Direction of Management Innovation

In the digital age, the application of big data technology has opened up a new direction for enterprise supply chain management innovation. Compared with the traditional mode in which business personnel take the initiative to contact upstream and downstream enterprises for research, the application of big data technology significantly reduces the workload and improves management efficiency. By

collecting and analyzing massive data related to supply chain management, enterprises can better understand the development environment of supply chain management, clarify their own strategic goals, and determine the ideas and methods of supply chain management innovation accordingly. This management innovation model based on big data enables enterprises to avoid unnecessary detente in the process of supply chain management innovation and realize innovation more accurately and efficiently.

2.2. Improve the Accuracy of Supply Chain Management

Supply chain management involves many links of enterprise operation, and the accuracy of its management is directly related to the survival and development of enterprises. In the digital era, through the use of information technology such as big data, enterprises can accurately analyze all aspects of supply chain management and find and solve problems in a timely manner. This precise management method avoids the blindness and arbitrariness in traditional supply chain management, improves the pertinence and effectiveness of supply chain management, and thus promotes the overall improvement of enterprise supply chain management level.

2.3. Optimize the Supply Chain Management Cost Structure

In the process of supply chain management innovation, enterprises need to invest certain resources such as people and property. However, in the process of traditional supply chain management, it is difficult for enterprises to control cost reasonably because of lack of scientific data support. In the digital era, through the application of information technology such as big data, enterprises can more accurately predict and evaluate the cost required for supply chain management innovation, and realize the scientific allocation and rational use of resources. This cost management method based on big data not only reduces the cost of supply chain management of enterprises, but also improves the efficiency of cost expenditure, and provides strong support for the development of enterprises.

3. Present Situation and Challenges of Supply Chain Management in Chinese Enterprises

3.1. Present Situation of Supply Chain Management in Chinese Enterprises

The present situation of supply chain management in Chinese enterprises presents many positive development trends. As a country with a complete industrial system, the comprehensiveness of China's industrial system provides a broad and solid foundation for enterprise supply chain management. In the entire process from raw material procurement to product manufacturing, to sales and after-sales service, enterprises can achieve closed-loop management of the whole industrial chain, which significantly enhances the controllability and synergy of the supply chain. At the same time, Chinese enterprises are committed to improving the innovation capacity of the industrial chain and supply chain. By actively introducing advanced information technology and intelligent equipment, enterprises are gradually realizing the visualization, intelligence and automation of the supply chain. This not only improves the management efficiency of the supply chain, but also enables enterprises to more accurately grasp the market demand and supply chain risks through data analysis and forecasting models, so as to make more accurate decisions, and further enhance the flexibility and response speed of the supply chain. In addition, Chinese enterprises have also achieved remarkable results in promoting the green transformation of the industrial chain. With the increasing awareness of environmental protection and the government's policy support, enterprises are actively reducing pollution emissions and resource consumption, and promoting the green transformation of the supply chain. This transformation not only contributes to the sustainable development of enterprises, but also makes a positive contribution to the realization of China's green economy goals.

In the current context, Chinese enterprises have successfully realized the efficient operation of the supply chain, significantly improved their competitiveness, and contributed to the realization of sustainable development by virtue of their complete industrial system, continuously enhanced innovation capability, and firmly promoted green transformation. However, with the acceleration of the pace of digital transformation and the increasingly fierce competition in the global market, Chinese enterprises also need to face multiple challenges such as information security risks and organizational changes. In order to meet these challenges, companies must actively seek innovation, adapt and integrate into the development trend of new technologies. By introducing advanced digital tools and management concepts, companies can further optimize supply chain management processes, improve management efficiency, and effectively deal with uncertainties in global competition. At the same time, enterprises also need to strengthen information security protection, ensure the integrity and confidentiality of supply chain information, and reduce potential information security risks. Therefore, Chinese enterprises still need to continue to move forward on the road of supply chain management, and continuously improve the efficiency and competitiveness of supply chain management through continuous innovation and technology application, in order to adapt to the rapidly changing market environment, and lay a solid foundation for

the long-term development of enterprises.

3.2. The Challenge of Supply Chain Management of Chinese Enterprises at Present Stage

The penetration of digital technology in supply chain management. In today's enterprise supply chain management, the application of digital technology is gradually deepening, but its penetration rate is limited. This is mainly due to the unstructured data involved in some parts of the supply chain, which is difficult to process and analyze effectively by traditional digital technologies due to its complexity and diversity. For example, text and emotional information in market research and consumer feedback are difficult for machines to understand. In addition, the heterogeneity of information systems among supply chain participants, that is, different participants may use different data standards and systems, also increases the complexity of digital technology integration and analysis. Information sharing and security issues remain key obstacles to the digital integration of supply chains. While digital technologies can provide data support and decision analysis tools, their limitations cannot be ignored when dealing with the complex decision-making and coordination processes in supply chain management.

Security challenges in supply chain management. With the development of globalization, the security problem of supply chain management in Chinese enterprises is becoming more and more prominent. The adjustment and reshaping of the global supply chain, especially external policies such as the US manufacturing reshoring strategy, as well as emergencies such as the novel coronavirus epidemic, have had a significant impact on the supply chain management of Chinese enterprises. The trend of global division of labor to regionalization makes China's industrial system more dependent on the global supply chain, which intensifies the complexity of security risks. The imbalance of economic welfare also intensifies the risks and challenges in enterprise supply chain management. The exchange of data and information in the supply chain involves a large amount of sensitive business information, and its leakage and abuse may cause huge losses to enterprises. Therefore, it has become an important task for enterprises to strengthen the security of supply chain management and ensure the safe transmission and storage of information.

Supply chain integration technology is backward. Under the tide of the digital age, scientific and technological progress represented by modern information technology such as big data and cloud computing has brought unprecedented opportunities for change in supply chain management. However, the supply chain management level of Chinese enterprises is generally low, especially in the supply chain integration technology, there is an obvious lag. At present, the communication network infrastructure of Chinese enterprises is not perfect, and the ability to use computers to achieve efficient communication and liaison with suppliers, distributors, retailers and other supply chain participants is still insufficient. Supply chain management innovation is increasingly dependent on information technology, which requires a high degree of coordination and unification among various information systems to ensure smooth transmission and efficient use of information. However, in reality, many enterprises are faced with the dilemma of technology integration in the process of promoting supply chain

management innovation. Due to the lack of advanced supply chain integration technology, it is difficult for enterprises to realize the rapid response and efficient use of supply chain information, which undoubtedly poses a serious restriction to the process of supply chain management innovation. Therefore, how to overcome the lag of technology integration and speed up the flow of supply chain information has become an urgent challenge for Chinese enterprises to promote supply chain management innovation.

Low efficiency of supply chain connection. In the context of the rapid development of big data technology, supply chain operation is facing unprecedented challenges, among which the most significant problems are low efficiency of supply chain connection and long logistics stagnation. According to the internationally recognized standard of supply chain management, the practice of supply chain management in many enterprises in our country has not reached the expected level, which is mainly attributed to the insufficient cohesion effectiveness of the supply chain. This low efficiency of connection not only significantly reduces the operational efficiency of the entire supply chain, but also leads to a series of problems such as overstocking of finished products and slow inventory turnover, which has a serious adverse impact on the healthy operation of the capital chain of enterprises. With the wide application of big data technology in the economy and society, the market demands increasingly on the efficiency of supply chain operation. However, the low efficiency of the current supply chain connection not only hinders the pace of supply chain management innovation, but also runs counter to the expectations of efficient and flexible supply chain operation in the era of big data. Therefore, improving the efficiency of supply chain connection, optimizing logistics process and shortening stagnation time have become the key issues to be solved in current supply chain management. This requires enterprises to deeply explore the application of big data technology and innovate supply chain management strategies to achieve efficient operation and continuous innovation of the supply chain.

Corporate supply chain sustainability challenges. In the context of increasing global environmental protection and social responsibility requirements, the sustainability of corporate supply chains faces serious challenges. As a country with a complete industrial chain, the green transformation of China's enterprise supply chain is particularly critical. However, at present, Chinese enterprises still face many difficulties in realizing the green transformation of supply chain. Although the government has put forward the goal of green and low-carbon development, in practice, enterprise supply chain management often fails to fully integrate green concepts and practices. This may be related to the lack of awareness, resources and technical support of enterprises for green transformation. In addition, supply chain management involves multiple links, each link may have an impact on the environment, to achieve green transformation, need to improve and optimize in each link, which is a complex and huge task for enterprises. At the same time, companies also need to focus on supply chain compliance, supplier ethics and responsible sourcing to ensure the full sustainability of the supply chain.

4. Countermeasures and Suggestions of Enterprise Supply Chain Management Under the Background of Digital Transformation

4.1. Consolidate the Foundation of Digital Hardware and Software, And Improve the Penetration Rate of Digital Technology

Under the macro background of enterprise digital transformation, the innovation path of supply chain management should focus on building a solid digital infrastructure and core technology system. As the cornerstone for enterprises to achieve efficient operation and build competitive advantages, the successful implementation of digital transformation is highly dependent on the vigorous development of digital economy and the improvement of infrastructure. In this process, enterprises need to make full use of cloud computing, big data, Internet of things and other cutting-edge information technologies, actively participate in the construction and upgrading of digital infrastructure, and establish close cooperative relations with relevant institutions to jointly promote the improvement of digital infrastructure, so as to provide strong technical support for supply chain management. In addition, enterprises should increase investment in the research and development of digital core technologies, deepen basic research, and cultivate and introduce talents with high-end skills to drive the pace of innovation in digital transformation. Enterprises with core technology support can gain unique competitive advantages in digital transformation, thereby improving the efficiency and quality of supply chain management. As the cornerstone of the deep integration of digital transformation and supply chain management, data validation should be highly concerned by enterprises. In the process of digital transformation, enterprises should fully recognize the value and security of data, and establish a sound data ownership and use rights system. By clarifying data ownership, enterprises can make more effective use of data resources and promote intelligent and refined supply chain management. At the same time, standardization plays a pivotal role in driving digital transformation. Enterprises should actively participate in the development and promotion of standards related to supply chain management to promote the standardization and scale development of digital transformation. Standardization can not only realize the interconnection of supply chain management, improve collaborative efficiency, but also effectively reduce costs. However, the current digital transformation still faces a series of challenges, among which the data system construction lags behind the practical application. Especially in the industrial application scenario, there are still many deficiencies in the construction of data system. Therefore, enterprises need to strengthen cooperation with the government and relevant institutions, jointly explore the data system to meet the needs of the modernization of the industrial chain, in order to accelerate the construction of digital infrastructure, promote the breakthrough of digital core technology, and strengthen the work of data ownership and standardization, so as to comprehensively improve the digital and intelligent level of supply chain management, and achieve the sustainable development of digital transformation.

4.2. Strengthen Security Policies for Enterprise Data and Information Assets

In the wave of enterprise digital transformation, it is particularly important to strengthen the security of data and information assets. With globalization and the deepening of the data economy, enterprises face increasingly complex cyber threats and data breach risks. Therefore, it is necessary to pay close attention to the security of enterprise data and information assets and take appropriate protective measures. To achieve this goal, companies should first conduct a comprehensive security risk assessment of their digital supply chain to identify and address potential security vulnerabilities and risks. In addition, the promotion of standardized safety management guidelines is also one of the key steps. Enterprises should develop and implement unified security management specifications, including but not limited to data backup and recovery policies, access control mechanisms, and the application of encryption technology to ensure the integrity and confidentiality of data and information assets. At the same time, enterprises need to focus on the synergistic development of digital transformation and security capabilities. This requires companies to strengthen security education and skills training for internal employees to improve their ability to identify and respond to cyber-attacks and data breaches. In addition, the government should also play an active role in strengthening supervision and providing necessary legal and technical support to promote the improvement of enterprise data and information asset security protection capabilities. Through these comprehensive security strategies, enterprises can effectively strengthen the security protection of data and information assets, improve the security of digital supply chain management, and achieve a harmonious coexistence of digital transformation and security capabilities.

4.3. Synergies between Capital Investment and Digital Transformation Across the Supply Chain

In the process of digital transformation to promote supply chain management innovation, capital investment and collaborative transformation of upstream and downstream of the supply chain are indispensable. Digital transformation often requires huge upfront investment and constant trial and error costs, so companies need sufficient financial support to smoothly proceed with related projects. The government should also provide the necessary financial support for enterprises through the purchase of services and other means to promote the smooth progress of digital transformation. At the same time, node enterprises should take the lead to promote the digital transformation of the upstream and downstream of the supply chain. These node enterprises occupy a core position in the supply chain, and the success of their digital transformation will directly affect the efficiency and reliability of the entire supply chain. Therefore, governments and businesses should work together to provide core enterprises with the necessary support and resources to enable digital transformation and lead innovation across the supply chain. However, digital transformation should not be limited to node enterprises, but should gradually extend to the entire industrial ecosystem. Only when the upstream and downstream aspects of the supply chain are digitally transformed, can the supply chain be coordinated and efficient. Therefore, the government and enterprises should jointly

formulate relevant policies and measures to encourage more enterprises to participate in digital transformation and promote the digital upgrading of the entire industrial ecology.

4.4. Strengthen Inter-Enterprise Cooperation and Talent Construction, And Promote Supply Chain Management Innovation in The Digital Era

With the increasing market competition, supply chain management innovation has become a key measure for enterprises to enhance competitive advantage and achieve sustainable development. The advent of the digital age brings new opportunities and challenges to the innovation of supply chain management. In order to meet these challenges and seize opportunities, enterprises need to strengthen inter-enterprise cooperation and talent building to promote supply chain management innovation in the digital era. On the one hand, deepening cooperation between enterprises is an important driving force for supply chain management innovation. The digital age makes the information exchange and cooperation between enterprises more convenient. Enterprises should make full use of this advantage and strengthen the cooperation with enterprises in all links of the supply chain. This requires enterprises not only to pay attention to transactions and competition, but also to pay attention to common risks and benefits, and realize risk sharing and benefit sharing. Through the signing of long-term strategic cooperation agreements, the responsibilities and roles of all parties in the supply chain management innovation process are clarified, and the collaborative efficiency and innovation ability of the overall supply chain are improved. On the other hand, accelerating the construction of professional talents is a necessary condition for the innovation of supply chain management. The digital age has higher requirements for supply chain management talents, and enterprises need to have a professional team with digital skills and supply chain management knowledge. To this end, enterprises should develop a sound training plan, professional training of existing personnel, improve their digital skills and comprehensive quality. At the same time, enterprises should also actively introduce external talents, especially excellent talents with digital skills and supply chain management experience, to provide strong talent support for the enterprise's supply chain management innovation. To sum up, strengthening inter-enterprise cooperation and talent building is the key to promote supply chain management innovation in the digital era. Enterprises should actively respond to the opportunities and challenges brought by the digital age, deepen cooperation between enterprises, accelerate the construction of professional talents, in order to achieve continuous innovation and development of supply chain management.

5. The Innovative Approach of Supply Chain Management in The Context of Enterprise Digital Transformation

5.1. Internet of Things and Big Data analytics

Under the macro background of enterprise digital transformation, supply chain management is facing unprecedented opportunities and challenges. To address these challenges and seize the opportunities, the use of innovative

technologies is particularly important, among which the Internet of Things (IoT) and big data analytics, as two core drivers, are becoming the key to supply chain management innovation. The wide application of Internet of Things technology enables enterprises to realize real-time monitoring and data collection of all links of the supply chain by connecting sensors and devices. This technological innovation not only enhances the perception ability of key information such as logistics, inventory and production, but also enables enterprises to grasp the real-time state of the supply chain more accurately. This provides a solid foundation for enterprises to achieve efficient supply chain operation, and helps enterprises optimize resource allocation and improve operational efficiency. On the other hand, the introduction of big data analysis technology has brought deeper insight and decision support to supply chain management. Through the mining and analysis of massive data such as orders, inventory and sales, enterprises can find potential problems and opportunities in the supply chain, and then optimize and adjust the supply chain. This data-based decision-making model not only improves the flexibility and response speed of the supply chain, but also helps enterprises achieve more accurate demand forecasting, more reasonable supplier selection and lower operating costs.

5.2. Construction of Supply Chain Digital Cooperation Platform

Under the background of enterprise digital transformation, the construction of supply chain digital collaboration platform has become one of the key paths of supply chain management innovation. The platform integrates the resources and information of internal and external supply chain participants to achieve efficient collaboration and collaboration in all links of the supply chain. With the help of digital collaboration platforms, enterprises can realize real-time information sharing and collaborative decision-making among supply chain participants, significantly improving the response speed and flexibility of the supply chain. In addition, the platform provides comprehensive data analysis and visualization tools to help companies accurately identify bottlenecks and risks in the supply chain and make timely adjustments and optimizations accordingly. Through the digital collaboration platform, enterprises can fully realize the digital management of supply chain, improve management efficiency and accuracy, better adapt to market changes, and meet customer needs. At the same time, in order to ensure the security of the platform, enterprises need to strengthen the security protection of data and information, establish a sound authority management and data protection mechanism, to ensure that the interests of enterprises and supply chain participants are protected.

5.3. Innovation in Intelligent Warehouse Management

In the wave of digital transformation, intelligent warehouse management has become an important innovation direction of supply chain management. Through the introduction of advanced technologies such as the Internet of Things, big data analysis and artificial intelligence, intelligent warehouse has deeply changed the traditional warehouse management method. With the help of the Internet of Things technology, the intelligent warehouse realizes the real-time monitoring and coordination of all links in the warehouse, and collects and transmits the inventory, location, temperature and

humidity and other information of the warehouse items in real time through the application of sensors and labels. Combined with big data analysis, enterprises can accurately grasp the inventory status, adjust the supply chain strategy, and achieve efficient warehousing operation. In addition, big data analysis technology provides accurate forecasting and decision support for intelligent warehouse management. Through the analysis of historical data and real-time data, it predicts sales trends, customer demand and inventory changes, and supports enterprises to carry out reasonable supply chain planning and resource allocation. At the same time, the intelligent warehouse also introduces artificial intelligence technology to realize the automation and intelligence of the warehouse operation, such as the use of robots for cargo handling and sorting, to improve operational efficiency and accuracy. Through the application of deep learning and intelligent algorithms, intelligent warehouses can automatically identify goods, optimize the placement of goods, predict the loss of goods, and further improve the quality and efficiency of warehouse management.

5.4. Digital Transformation of Supply Chain Financial Services

Driven by digital transformation, supply chain financial services have become another important way of supply chain management innovation. Through digital transformation, enterprises upgrade and transform traditional supply chain financial services with the help of fintech to achieve more efficient and reliable supply chain capital flow. Digital transformation provides a wider range of data sources and data analysis capabilities for supply chain financial services, and realizes data sharing and collaboration between the upstream and downstream of the supply chain by connecting the supply chain system of enterprises and the data platform of financial institutions. This enables financial institutions to more accurately assess the risk and value of each link in the supply chain, provide personalized financial services, such as supply chain financing, accounts receivable transfer, etc., to meet the capital needs of enterprises, and improve the liquidity and flexibility of the supply chain. In addition, the digital transformation promotes the intelligence and automation of financial services in the supply chain. Through the introduction of artificial intelligence and big data analysis technology, the transaction behavior in the supply chain is monitored and predicted in real time, and the risk of each link is accurately determined. Intelligent algorithms can quickly assess credit risk in the supply chain and provide efficient risk management and control. This intelligent supply chain financial service not only improves efficiency, reduces financial risks, but also promotes the stability and sustainable development of the supply chain. At the same time, digital transformation has promoted the emergence of innovative models of supply chain financial services, and the application of blockchain technology has made supply chain financial services more transparent, secure and efficient, providing strong support for the stable development of the supply chain.

6. Conclusion

With the increasing market competition, supply chain management innovation has become a key measure for enterprises to enhance competitive advantage and achieve sustainable development. The advent of the digital age brings new opportunities and challenges to the innovation of supply

chain management. In this context, accelerating the realization of supply chain management innovation has become an important issue that enterprises need to pay attention to. From the discussion of this paper, in order to realize the innovation of supply chain management, enterprises should actively respond to the opportunities and challenges brought by the digital age, formulate and implement effective strategies from multiple aspects, so as to realize the innovation of supply chain management and lay an important foundation for the sustainable development of enterprises.

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