

Study on Data-driven Digital New Retail Supply Chain Innovation

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Abstract: The innovative development of new retail supply chain driven by data is of great significance to enterprises, which can improve operational efficiency, improve service quality, optimize cost control, strengthen supply chain cooperation and coordination, and promote business model innovation, so that enterprises can maintain competitive advantage in the fierce market competition, to achieve sustainable development. Therefore, enterprises also actively analyze the challenges and opportunities faced by the development of digital new retail supply chain driven by data, and actively take measures to explore innovative strategies for the development of digital new retail supply chain based on their own conditions. Such as strengthening data quality management, strengthening data security protection, improving technical infrastructure, changing organization, cultivate talents, and promoting cooperation among supply chain participants to facilitate the smooth development of the new digital retail supply chain.

Keywords: Data-driven; digital retail; supply chain; innovation.

1. Introduction

With the rapid development of digital technology, the trend of digital innovation is reshaping the retail business model. The digitization innovative development represented by emerging digital technology which includes Internet of Things, big data, cloud computing, artificial intelligence provides soil and nutrients for the development of digital new retail supply chain. The demand for standardization, high efficiency and customization of the new retail supply chain is increasing in the market environment, which also brings new challenges to the supply chain coordination level of retail enterprises. The digital new retail supply chain innovation based on data is aimed at optimizing supply chain management, improving operation efficiency, strengthening the connection with customers, and realizing the overall upgrading and transformation of supply chain.

2. The Concept of Digital New Retail Supply Chain

Through the application of information technology and the Internet, the traditional retail supply chain is combined with advanced digital technology to realize the comprehensive digitization, intelligence and efficiency of the digital new retail supply chain.[1] The digital new retail supply chain emphasizes cooperation and information sharing among various links. It can realize information sharing and coordination among manufacturers, suppliers, logistics companies and retailers, improve the overall efficiency and flexibility of supply chain through the connection of information systems and the support of Internet technology. This kind of supply chain management is customer-oriented. It meets the diverse needs of customers, providing better shopping experience and service quality through detailed data analysis and personalized services. And it focuses on rapid response to market changes and demand fluctuations in the development, and achieves efficient operation of order processing, inventory management and logistics distribution through the flexibility and agility of the supply chain to adapt

to dynamic changes in the market. The data in figure 1 indicate that in 2021, the revenue of different types of participants in the supply chain digital services is about 2.8 trillion yuan. The digital supply chains are being widely used in various industries.[2]

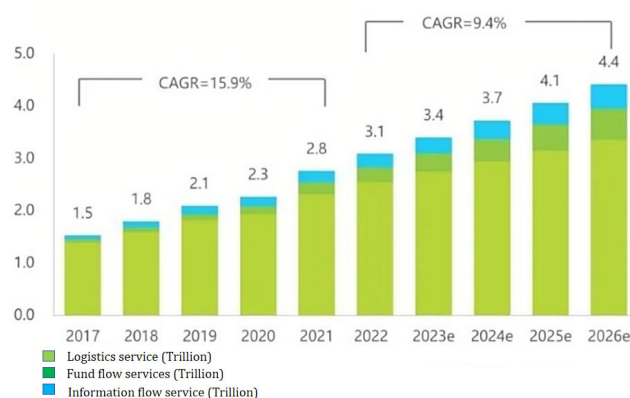


Figure 1. The scale of the supply chain digital services industry

In addition, digital new retail supply chain through information systems and Internet of things technology, the supply chain to achieve all aspects of the visual monitoring, including commodity inventory, order status, logistics trajectory, etc., improved operational controllability and transparency. Finally, the digital new retail supply chain advocates innovative thinking and technology application, and constantly introduces new technologies, new business models and new products to promote the innovative development of the supply chain and enhance competitiveness and market share.[3]

3. The Significance of Innovative Development of New Retail Supply Chain Driven by Data

3.1. The fine operation of retail industry

With the continuous growth of online retail transaction,

new retail supply chain needs continuous innovation to meet the demand of online retail transaction. Through the data collection, analysis and utilization, the new retail supply chain can more accurately understand customer demand, market trends and competition, so as to achieve fine operation. Supply chain can make rational decisions on inventory management, goods pricing and channel planning according to the guidance provided by the data, so as to improve the efficiency and flexibility of supply chain. In addition, the innovation and development of digital new retail supply chain driven by data is more conducive to improving the service quality of enterprises. Through data-driven, the new retail supply chain can monitor the status of goods inventory and logistics in real time, provide more accurate and faster service to customers. Supply chain can forecast customer's demand according to data, adjust supply chain resources, meet customer's individual demand, and improve service quality and customer satisfaction.[4]

3.2. Optimizing cost control

Data-driven new retail supply chain can accurately predict sales demand and inventory demand, reduce the waste of funds due to excessive purchases or inventory backlog. At the same time, through data analysis and optimization, can reduce the cost of transportation costs, warehousing costs and other supply chain costs, improve the profitability of enterprises. The use of digital supply chain can bring many benefits to enterprises. Data shows that many Central and state-owned enterprises have achieved good results in digital supply chain procurement, more than 40% of central and state-owned enterprises digital procurement penetration rate reached 50% (Figure 2), it can be seen that the development of digital supply chain can effectively control the cost of enterprises. In addition, effective accountability data analysis can establish a new business model. Data-driven New Retailing Supply Chain Provides Strong Support for Enterprise Innovation. Through in-depth mining and analysis of data, enterprises can find market opportunities, adjust product strategies, develop new business models, achieve differentiated competition and brand value promotion, drive innovation and continuous improvement in the consumer experience.[5]

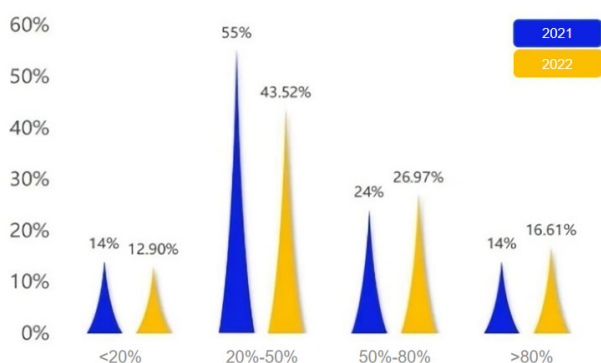


Figure 2. Penetration of central state-owned enterprises in digital procurement[6]

3.3. Strengthen cooperation and synergy in the supply chain

The data-driven new retail supply chain can realize the information sharing and coordination among all links of the supply chain. By connecting information systems and interacting with data, manufacturers, suppliers, logistics companies and retailers can work better together to promote

supply chain optimization and innovation, sharing resources, sharing costs, and controlling risks together to improve overall supply chain effectiveness.

4. The Challenges of Digital New Retail Supply Chain Development

4.1. Unsecured data quality

The accuracy, completeness and timeliness of data are fundamental to data-driven development. However, in the new digital retail supply chain, there may be low data quality, such as data acquisition errors, data missing, data delay. This can affect the accuracy of decision-making and the effectiveness of supply chain operations. In addition, there are some data privacy and security problems in the process of data collection and analysis. In the new digital retail supply chain, a large amount of data which may include customer information and trade secrets needs to be collected, stored and processed. Therefore, the protection of data privacy and security is an important issue. We need to take effective measures to prevent data leakage, data tampering and malicious attacks.

4.2. Scarce technology and human resources

The implementation of a new digital retail supply chain relies on advanced technological infrastructure, such as cloud computing, big data analytics, the Internet of things. However, some enterprises may lack such technological infrastructure, or the existing infrastructure is not stable and reliable enough, which will affect the construction and operation of digital supply chain. At the same time, the problem of organizational change and personnel training is also a challenge in the innovative development of new retail supply chain driven by data, to adapt to new business models and technology. However, organizational change may encounter difficulties and resistance that require effective management and communication. It is also a challenge to develop people with knowledge and skills in data analysis, information technology and supply chain management.

4.3. Integration and standardization

In the new digital retail supply chain, many links and participants are involved, such as manufacturers, suppliers, logistics companies and retailers. In order to achieve efficient coordination of supply chain, it is necessary to integrate data and share information among all parties. However, there may be differences in systems and data formats between different participants that require uniform standardization and integration. Therefore, in the development of digital new retail supply chain, we should pay attention to the traditional supply chain system upgrade and digital transformation, the introduction of advanced technology and tools. For example, cloud computing, big data analytics, artificial intelligence, the Internet of things to optimize the efficiency of all aspects of the supply chain and improve the accuracy and real-time data.

5. Innovation Strategy of Data-driven Digital New Retailing Supply Chain

5.1. Integrate data and analytics

In the digital supply chain innovation driven by data, it is very important to make good use of data analysis. Firstly, integrate the data of all links to establish a comprehensive supply chain data platform. This method can discover pain

points and opportunities in the supply chain, and provide accurate data support for decision-making by analyzing and mining the data deeply. Secondly, forecast and optimize according to the information provided by Big data. Based on historical data and market trends, use predictive models to forecast demand so that supply chains can be prepared in advance.

At the same time, combined with real-time data and optimization algorithms, all aspects of the supply chain are optimized and adjusted to reduce costs, improve efficiency and respond quickly to market demand. And actively apply artificial intelligence, Internet of Things, Big Data Analysis and other intelligent technologies to realize the automation and intelligence of the supply chain. For example, the use of IoT technology to achieve real-time monitoring of logistics and transportation processes, the use of Big Data Analysis to optimize inventory management and forecast sales trends, the use of artificial intelligence algorithms for supply chain risk assessment. The survey data have shown that in the development of digital new retail supply chain, the Internet of things has become the most frequently used technology in enterprise supply chain. Finally, sharing data and conducting cooperations. By establishing a data-sharing platform, we can promote information sharing and collaboration among various sectors. By sharing the data, all the links in the supply chain can work together to achieve the timely delivery of information and co-optimization.

5.2. Conduct a crossover cooperation and make innovation

The new digital retail supply chain can realize resource sharing and complementary advantages through cross-border cooperation with other industries or enterprises. For example, working with logistics companies to improve delivery efficiency, and with technology companies to develop intelligent warehousing solutions. At the same time, it can also provide unique products and experiences by innovating business models and service ways to meet the individual needs of consumers. In addition, in cooperation with other enterprises, emphasis should be placed on strengthening sustainable supply chain development. Focusing on environmental protection and social responsibility, and integrating sustainable development into considerations of digital new retail supply chain management. For example, choosing suppliers and partners that meet environmental standards; implementing green packaging and logistics programmes to reduce environmental impacts; and actively participating in public welfare activities to enhance brand image and social impact, to ensure the long-term development of the new digital retail supply chain.

5.3. Make the supply chain visible and transparent

The visualization and transparency of supply chain can be realized by means of data-driven technology. Through the visualization of supply chain, we can monitor and manage every link of supply chain in real time, find and solve problems in time. At the same time, through transparency, can increase consumer trust in product sources and production process, improve brand image and competitiveness. In addition, risk management needs to be continuously strengthened to ensure the balanced development of the new digital retail supply chain and to forecast and assess the risks that may arise in the supply chain through the establishment

of sound risk management mechanisms, and formulate corresponding coping strategies. For example, supply chain risk resulting from information asymmetry can be reduced through data analysis and monitoring to capture market demand and competition dynamics in real time. Management efficiency can also be improved by introducing more intelligent technology, and the efficiency and reliability of supply chain can be improved by using intelligent technology. For example, the introduction of automated warehousing and logistics equipment to reduce manual operation; the use of Internet of things technology to achieve the supply chain nodes of real-time monitoring and management; the application of artificial intelligence algorithm to inventory forecast and demand forecast, reduce inventory backlog and out-of-stock situation.

5.4. Strengthen personnel training and team building

In the innovation of digital new retail supply chain driven by data, more professional and comprehensive talents are needed to promote the sustainable development of digital new retail supply chain. Therefore, enterprises need to actively train personnel with the ability of digital supply chain management, and establish an efficient team. Through training and learning, enhance team members' professional literacy and technical ability, strengthen communication and collaboration ability, and promote the development of digital new retail supply chain. Excellent professional talents can help enterprises to gain competitive advantage in the field of digital new retail supply chain, and achieve more efficient, more flexible and more sustainable supply chain operation.

6. Conclusion

Digital new retail supply chain focus on data collection, analysis and utilization, through big data, artificial intelligence and other technologies, to achieve real-time monitoring and forecasting of supply chain data, data-based decision-making and operational management. Strengthening the innovation and development of digital new retail supply chain driven by data can give more guidance to the design, management and risk control of digital new retail supply chain system, provide direction for enterprises to develop digital supply chain management. There is no doubt that as more enterprises embrace digitization, the digital supply chain will continue to accelerate the pace of industry-wide penetration, industrial transformation and upgrading of the results will continue to emerge.

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