

Research on the New Business Model under the Digital Supply Chain: A Case Study of JD.com

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ABSTRACT

Taking JD.com as an example, this paper explores the new business model with the digital supply chain and its impact on enterprise development. Following literature review and case study, this research finds that the digital supply chain significantly supports the extension of enterprise value and business model innovation by mechanisms such as improving operation efficiency, resource allocation optimization, and supply chain resilience enhancement. Through such practices as supply chain digitalization, application of big data technology, and supply chain finance innovation, JD.com has built a new business model that is innovative and agile, which is an important reference for the industry. The study also shows the positive effects of the digital supply chain in promoting the ESG performance of firms and enhancing their global value chain ranking, and suggests directions and policy recommendations for future growth.

KEYWORDS

Digital Supply Chain; New business model; JD.com; Big data Technology

1 Introduction

With the fast development of the digital economy, digital transformation has become a main means for enterprises to enhance competitiveness. As the core node of enterprise operations, the digital transformation of the supply chain has a great impact on business model innovation. The Chinese government attaches great importance to digital transformation and has clearly stated the strategic objective of promoting the transformation of the mode of production by means of digital transformation in the 14th Five-Year Plan. In this situation, studies on the new business model under the digital supply chain are of extremely theoretical and practical significance. Because it is a leading corporation in China's e-commerce and supply chain markets, the digital transformation practices of JD.com are normative and typical. JD.com is chosen as the case study object in this paper, attempting to deeply analyze how the digital supply chain drives business model innovation and how the impact mechanism of such innovation influences enterprise development. Through systematic literature review and actual cases of JD.com, this research will offer good references to other enterprises involved in business decision-making and provide a basis for policymakers to make decisions.

2 Literature review

The digital supply chain and its contribution to enterprise development have been central concerns in recent scholarly research. Past research has focused mainly on the following areas: In terms of digital transformation and enterprise performance, it has been established that digital transformation is the key to drastically improving the ESG performance of enterprises, especially impacting positively the environmental, social, and corporate governance dimensions ^[1]. Research on the supply chain configuration model has found that supply chain diversification promotes the digital transformation of enterprises, and this effect is particularly significant in small-scale and non-state-owned enterprises ^[2]. For the relationship between supply chain digitization and enterprise value, empirical research confirms that supply chain digitization significantly adds to enterprise value through two channels: reducing concentration and enhancing risk resistance ^[3]. In terms of the value creation mechanism, scholars suggested network embedding as a mediating variable and found that digital capabilities have a positive impact on the value co-creation of circulation enterprises, where network embedding has a partial mediating effect (explaining 35.73%) ^[4]. Research on regional industrial chains shows that new forms of productive forces have an empowering role in the modernization of regional industrial chains, and digital transformation has a beneficial regulatory impact on it ^[5]. In the field of the global value chain, digitization of trade has a strong promotion effect on the role of regions in the global value chain via channels like improving resource allocation and driving industrial transformation ^[6]. From the view of financial innovation, the digitally enabled supply chain finance model can effectively reduce the financing cost and regulatory complexity through improved information transparency ^[7]. The case studies show that the digital marketing approach built on the foundation of the 4C theory significantly improves the operational efficiency of fresh food e-commerce ^[8]. Research into the application of big data technology shows that application of this technology in supply chain finance not only streamlines the loan process but also promotes information sharing ^[9]. Research into vertical e-commerce determines the place of digital marketing strategies in enhancing the competitiveness of businesses ^[10]. Enterprise management research confirms that digital

technology increases the efficiency of management of supply chain enterprises significantly by automating processes ^[11]. In so far as the management of funds goes, supply chain digitization simplifies the overall efficiency of working capital utilization of enterprises by increasing the efficiency of each link's turnover ^[12]. Research on estimation of enterprise value innovatively applies digital driving forces to the EVA model and provides a new method of Internet company valuations ^[13]. Foreign research has found that digitalization significantly enhances the resilience of supply chains by promoting supply chain cooperation, and adds social capital as a regulatory factor in it ^[14]. Environmental sustainability studies demonstrate that analysis using big data promotes the green supply chain transformation by reducing the carbon footprint and extending the product life ^[15]. Furthermore, foreign researchers have found that enterprise digitization reduces dependence on supply chain financing significantly, and the effect is more evident under the epidemic ^[16]. In brief, the latest studies report that the electronic supply chain has an impact on enterprise growth by different mechanisms but rigorous investigation in business model innovation still needs to be intensified.

3 Demonstration and analysis

3.1 Theoretical foundation of the digital supply chain

Digital supply chain refers to the application of digital technology and data analytics to improve the management and operation of each link in the supply chain. The core is data-driven decision-making, end-to-end visibility, smart forecasting, and real-time response. The theoretical foundation is mainly rooted in the theory of supply chain management, the theory of value chain, and stakeholder theory. Supply chain management theory emphasizes cross-organizational cooperation and process integration; value chain theory focuses on value creation activities' maximization; and stakeholders theory takes into consideration the balancing between the interests of various stakeholders. These theories create a multi-dimension view in understanding the digital supply chain.

3.2 Practice case of jd.com's digital supply chain

3.2.1 JD.com has made systematic and deep field explorations on digital supply chain

In warehousing and logistics, JD.com has constructed the highly automated "Asia No. 1" smart warehouse. With robots, automatic sorting, and smart scheduling algorithms, its operating efficiency has greatly increased. In JD.com's inventory management, it is based on big data analytics and machine learning technologies to achieve precise forecasting, reducing the inventory turnover days to a industry-leading level. In the distribution link, JD Logistics has built an extremely efficient "last mile" distribution network through digital route planning and real-time tracking.

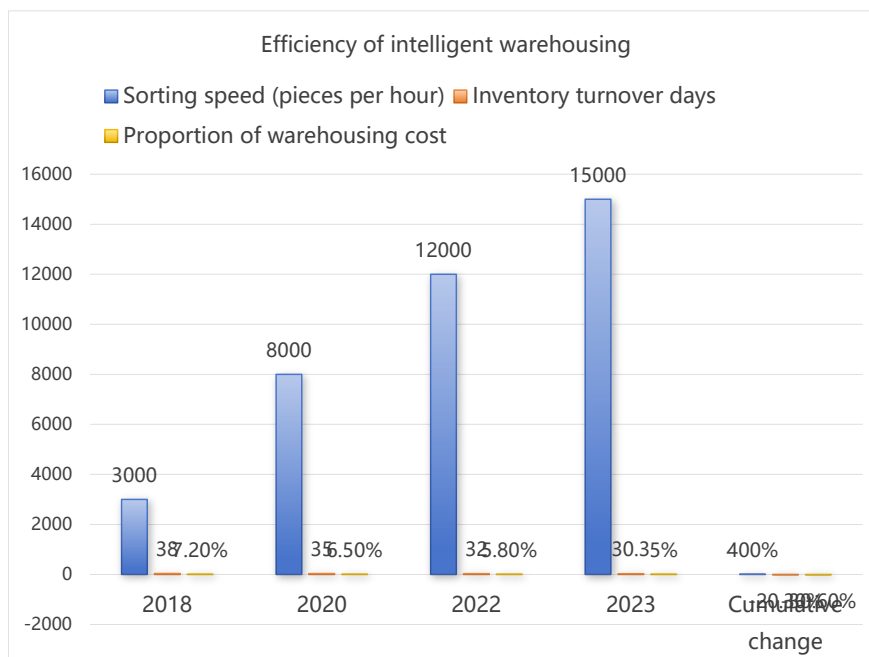


Figure 1 Efficiency of intelligent warehousing

JD.com's financial reports/ESG reports (2018-2023), references [9], [11], [12], IDC China Retail Technology Report

3.2.2 JD.com's supply chain digitization platform also exhibits itself in the cooperation with suppliers.

By establishing a supplier portal and e-procurement platform, JD.com has achieved real-time information sharing and

joint planning with suppliers. Such detailed coordination significantly enhanced the response speed and agility of the supply chain. JD.com's blockchain technology is also used to enhance the supply chain's transparency, especially for product categories that require high traceability such as food and medicine.

3.3 Application of big data technology to jd.com supply chain

3.3.1 JD.com applies big data technology extensively to all the nodes of the supply chain

For demand forecasting, JD.com integrates historical sales data, user behavior data, and external environment data to set up accurate prediction models. Such models can identify sales trends, seasonal cycles, and promotion influences, thereby facilitating procurement and inventory decisions.

3.3.2 JD.com uses big data to analyze routes of distribution

In logistics optimization, JD.com uses big data to analyze routes of distribution, traffic flow, and customer dispersal in order to achieve dynamic distribution resource allocation. Intelligent algorithms can adjust the plan of distribution in real time to counteract unexpected factors such as weather or traffic congestion. Furthermore, JD.com also upgrades product and service quality constantly through analyzing customer opinions and return rates using big data.

3.3.3 Technology of big data also supports JD.com's risk control of the supply chain

Through monitoring each node in the supply chain's data indicators, JD.com can find potential risks early and take prior control measures in response. For example, it examines the stability of suppliers from their financial indicators and delivery performance; and prevents potential distribution lag by monitoring the performance of the logistics network.

3.4 Business model innovation under the digital supply chain

First, The digital supply chain has led to JD.com's overall business model innovation. For one, JD.com has transformed from a conventional retailing model into a new retail infrastructure service provider with its supply chain being the core competitiveness. By opening up its supply chain capacity, JD.com provides third-party merchants with full-chain services from warehousing to distribution, creating new revenue streams.

Second, JD.com has cultivated data-based value-added services. For example, it provides market insights and product suggestions to brand owners using the analysis of consumers' data; and it helps suppliers maximize production schedules with supply chain data sharing. The services not only enhance customer stickiness but also generate new profit models.

Thirdly, JD.com has built an omni-channel retailing model which integrates online and offline. Shared inventory and joint management have become feasible in the digital supply chain, and consumers are able to enjoy goods and services in multi-channels at any time and place. Smooth shopping processes have greatly improved customer satisfaction.

Finally, JD.com has made investments in diversified expansion of its business through the digital supply chain. For example, in the medical care sector, JD Health has built a new business ecosystem of medical services and drug retailing based on the supply chain; in the industrial products sector, JD.com's corporate business offers corporate customers a digital procurement platform. All these innovations are founded on a solid digital supply chain.

3.5 Impact pathway of the digital supply chain on enterprise value

First, The digital supply chain drives enterprise value in multiple pathways. Firstly, improving operating efficiency lowers costs and increases asset turnover directly. JD.com's case shows that the digital supply chain has always reduced the proportion of its operating costs, and its inventory turnover efficiency is far higher than the industry average.

Second, the customer experience drives revenue growth and brand premium. The timely delivery and precise services facilitated by the digital supply chain enhance customer loyalty, with the repurchase rate and average order value driven correspondingly. The constant growth in the quantity and activity of JD.com's Plus members is indisputable evidence of this.

Third, the enhancing of innovation capacity constitutes long-term competitive advantages. Digital supply chain provides a base on which JD.com can create new technologies and new businesses. New technologies and new businesses like drone delivery and smart retail rely all on supply chain digitization.

Fourth, the improvement of risk management capability decreases enterprise value volatility. The transparency and flexibility of the digital supply chain allow JD.com to adapt more effectively to risks including changes in demand and supply chain disruptions.

Ultimately, a better sustainable development performance creates long-term value for the business. The supply chain in the digital era reduces its environmental footprint through optimized means of transport and reducing its waste of inventory, while simultaneously improving its social impact by reducing labor wastage. These all feed into improved ESG score and investment attractiveness.

4 Conclusion

This paper empirically analyzes the new business models in the digital supply chain in a systematic way, and takes JD.com as an example to investigate how digital transformation reshapes enterprise operations and value creation. Based on the research, it is discovered that the digital supply chain significantly promotes enterprise value growth and business model innovation through different mechanisms such as improving efficiency, refining the user experience, promoting innovation, and enhancing resilience. The JD.com case illustrates that only through harmonious adjustments in strategy, organization, and technology will digital transformation pay off. The results of the research are mainly exhibited in three ways: first, it constructs a theoretical framework of the impact of the digital supply chain on business model innovation; second, it provides empirical data by the case of JD.com; third, it shows future research directions and policy implications. However, there are some flaws in this research. For example, it mainly relies on secondary data, and future research can use more primary data for validation. The implications for practitioners are: digital transformation must aim at innovation of the business model as a whole, rather than application of technology; digitalization of the supply chain must be driven alongside organizational transformation; data governance and capacity building are success enablers. The recommendations for policymakers are: upgrading digital infrastructure; enabling digital transformation of small and medium-sized enterprises; and preparing data sharing and standard specifications. Subsequent studies will be able to analyze the variation in digital supply chain implementation across sectors, its impact on long-term performance, and its link with social sustainable development. Further, the application of emerging technologies such as artificial intelligence and blockchain within the supply chain also needs to be studied in depth.

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