

The Research of Supply Chain Management in China's E-commerce Environment — Taking JD.com as an Example

Yue Cao^{1,a,*}

¹Transportation Institute, Inner Mongolia University, Hohhot, China
a. 0213123219@mail.imu.edu.cn

*corresponding author

Abstract: In the environment of the rapid development of e-commerce in China, JD.com has adapted to this trend and established its own relatively complete e-commerce and logistics system. However, JD.com still needs to continue optimizing its supply chain and solve some existing problems in order to cope with the changing environment and enhance its competitiveness. These problems include logistics cost, cooperations with traditional enterprises, and dual-channel supply chain. In response to these problems, this article puts forward three suggestions. From the aspect of the inter-enterprise information sharing, this article first advises JD.com to optimize existing logistics costs. Then the second one is to advise JD.com to keep developing the internet of things (IOT) technology from the aspect of logistics technology. Moreover, the last suggestion is that JD.com should use different pricing strategies depending on different circumstances from the aspect of the client demands and experiences. Eventually, this article aims to provide ideas for JD.com and other similar enterprises in their future reform and thus make certain contributions to the development of e-commerce and even the economy in China.

Keywords: Supply Chain Management, E-commerce, Dual-channel Supply, JD.com.

1. Introduction

The rapid growth of China's economy, the Internet, and other fields in recent years has led to an improvement in the living standards of Chinese people and the increasing stringency of their commodity requirements. Against this background, e-commerce has been rapidly rising and developing in China because it breaks the geographical and time restrictions of traditional business models and provides rich commodity choices and payment methods. As shown in Figure 1, the National Bureau of Statistics of China's data indicates that e-commerce transaction volume has continued growing in the past 5 years and reached 46.83 trillion RMB in 2023. It reflects the continuous expansion of China's e-commerce market and provides a good environment for enterprises to develop e-commerce.

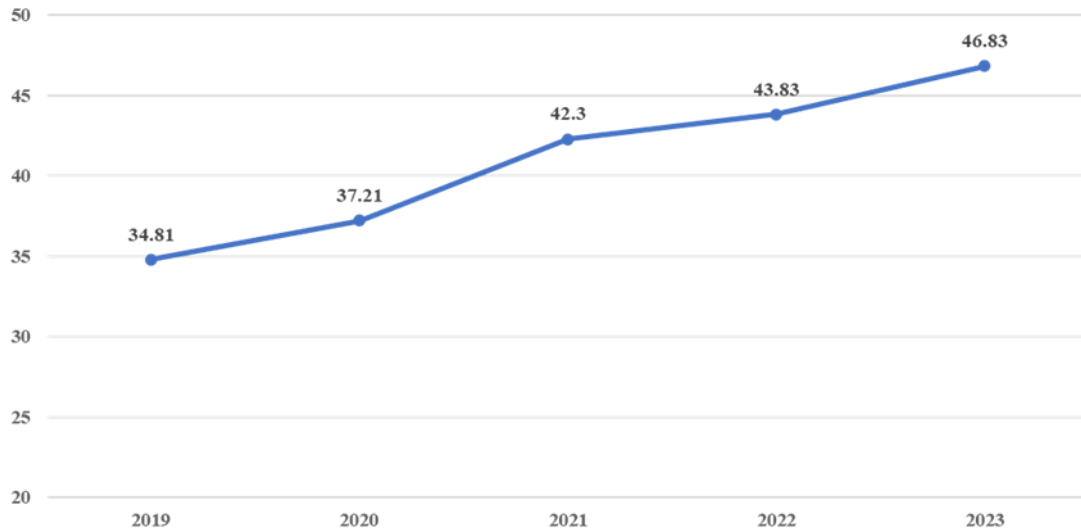


Figure 1: The e-commerce transaction volume (trillion RMB) from 2019 to 2023 in China (Photo credit: Original).

For logistics enterprises, supply chain management plays an important role in improving their market competitiveness. Therefore, with the rapid development of e-commerce in China and the change of people's consumption concept, logistics enterprises need to analyze and optimize the existing supply chain to meet customer demands better, and maintain a good competitive advantage. In order to achieve this goal, logistics enterprises can improve themselves from three aspects: inter-enterprise information sharing, client demands and experiences, and logistics technology [1].

JD.com, one of the Chinese logistics companies, entered the e-commerce sector in 2004 and has developed a relatively perfect e-commerce platform and logistics system over the next 20 years. However, like many other similar enterprises, JD.com also has a series of problems to be solved in the process of development. Hence, this article aims to point out the existing problems in JD.com and give corresponding conclusions and suggestions which may offer ideas as JD.com and other similar enterprises optimize their supply chains.

2. The Logistics and E-commerce System by JD.com

2.1. JD.com's Logistics System

JD.com uses self-operated logistics distribution and third-party logistics distribution as its primary distribution modes.

2.1.1. The Self-operated Logistics Distribution Mode

Since 2007, JD.com has been working on developing its self-operated logistics system and continually improving it by utilizing methods including jointly managed inventory (JMI) to offer effective logistics distribution [2, 3]. These strategies become a reason that not only brings customer a satisfactory online shopping experience but also make JD.com one of the most competitive enterprises in China.

Generally, the goods that use this delivery method are JD.com's self-owned goods. This is the goods that JD.com purchases from suppliers in advance and puts in its own warehouse, and then sells to customers through the JD.com's e-commerce platform.

By 2022, JD.com has already built 8 logistics hub and 43 large and highly automated logistics parks named Asia No. 1 Fulfillment Centers. These facilities make JD.com's customers in most areas in China can receive their deliveries on the same day or next day they place orders in JD.com's e-commerce platform. As is shown in Figure 2, JD.com has already built a delivery network through Asia No. 1 Fulfillment Centers and logistics hubs that can cover most parts of China. Combining about 1,400 warehouses JD.com built in China, this network can connect various resources in economic circles including the Yangtze River Delta and the Pearl River Delta in eastern China to improve resource utilization. It also brings more convenient supply chain services to consumers in relatively slow developing regions of midwestern China such as Xinjiang and Inner Mongolia, which ultimately further promote China's economic development.



Figure 2: JD.com's delivery network [4].

2.1.2. The Third-party Logistics Distribution Mode

The majority of the goods using this mode are either the goods owned by JD.com in areas that JD.com's self-operated logistics network does not cover, or the goods from suppliers who sell their goods through JD.com's e-commerce platform to customers [5].

The third-party logistics distribution mode is also a necessary part of JD.com's logistics system and even its future development. One of the reasons is that there are still areas in China that are not covered by JD.com's self-operated logistics network and may not be in the future. Because the benefits of building high-cost warehouses for self-operated logistics may not be as high as the benefits of using third-party logistics directly in some areas. Another reason is that it offers another channel to suppliers who are not inclined to take part in JD.com's logistics system as a result of high cost [6].

2.2. JD.com's Strategy of E-commerce Logistics Integration

The supply chain's information communication can be enhanced by JD.com's e-commerce logistics integration strategy. It aims to cooperate with suppliers for win-win results by establishing

information sharing system based on meeting the needs of customers [7]. One of the reasons why JD.com's generated this strategy is that they know effective information communicating can ensure the seamless connection among enterprises in the supply chain. This connection not only improves operational efficiency and decreases costs, but also enhances the response ability of the supply chain and optimizes the resource allocation in a rapidly changing market environment. Information communication can also improve the transparency and stability of the supply chain by strengthening cooperation between upstream and downstream enterprises in the supply chain. As a result, each link's operation can be clearly monitored and understood. Therefore, suppliers are more likely to further promote the degree of information sharing and observe relevant rules.

On the other hand, a qualified e-commerce logistics integration also needs to be built on precise information alignment to provide high quality service to both customers and suppliers. It means JD.com has to keep optimizing its information sharing system to support such strategy and eventually increase the profits of the enterprises in its supply chain.

2.3. JD.com's Supply Chain Innovations in the E-commerce Environment

Supply chain innovation in the e-commerce environment has brought many advantages, such as reducing costs, improving service quality, or enhancing risk control capabilities. These advantages can enhance the competitiveness of enterprises and help them develop sustainably [7].

In addition to information communicating, JD.com has also independently developed a variety of products, which plays an integral role in warehousing, distribution and even overall monitoring of the whole supply chain. These products mainly include intelligent storage selection system, intelligent delivery vehicle, intelligent delivery drone and intelligent terminal. They can show the characteristics of supply chain informatization, digitalization and intelligence in the e-commerce environment. They also play a crucial role in promoting innovation and progress in logistics enterprises' supply chain management [8].

3. Existing problems with JD.com's Logistics and E-commerce System

3.1. Logistics Cost

For any logistics enterprise, reducing logistics costs can directly reduce expenditures and increase profit margins, which significantly improve their long-term development and market competitiveness of enterprises. There are four main aspects that contribute to the logistics cost problem in the current JD.com logistics system [9].

The first aspect is the large proportion of procurement cost and the increasing account payable to suppliers in recent years. As shown in Figure 3, the proportion of procurement cost is basically over 85% from 2019 to 2022, and the account payable to suppliers keeps increasing to the peak of 126.82 billion RMB in 2022. The second aspect is the continuous increase of storage equipment cost and net inventory value, which respectively increased to 69.37 billion RMB and 77.95 billion RMB as shown in Figure 4. They respectively reflect that JD.com keeps constructing warehouses these years and faces enormous pressure on its warehousing system. The third one is the high cost associated with reverse logistics caused by JD.com's return and exchange policy along with the theft and damage during the transportation process [10]. Eventually, the last one is the unreasonable labor cost structure with excessive logistics distribution personnel, which is about 67.09% of the total employees by the end of 2022 [9]. These unreasonable logistics costs need to be optimized to prevent the decline of profits and the loss of consumers.

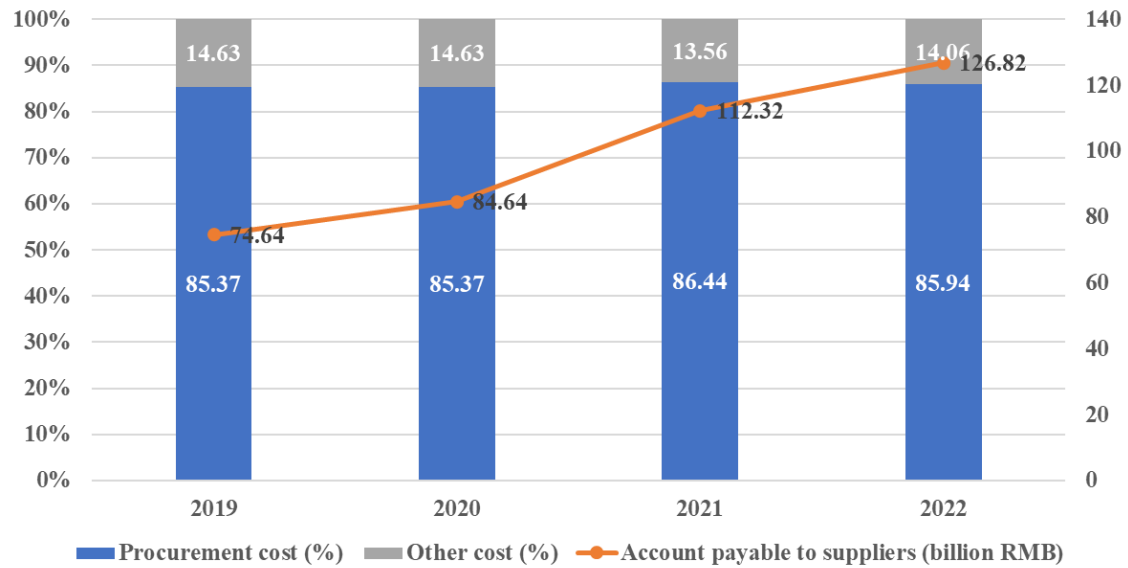


Figure 3: JD.com's cost proportion and account payable to suppliers from 2019 to 2022 [9].

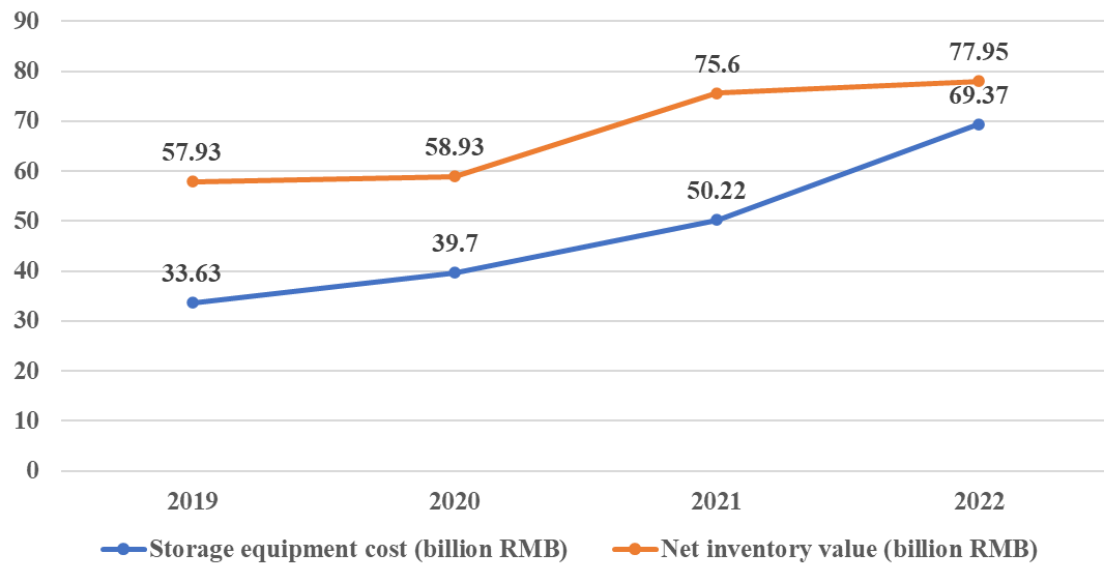


Figure 4: JD.com's storage equipment cost and net inventory value from 2019 to 2022 [9].

3.2. Cooperations with Traditional Enterprises

With the development of e-commerce, more and more traditional enterprises are considering whether to cooperate with companies like JD.com to expand their sales channels through online sales.

During this process, these traditional enterprises have two main hesitations. One is that traditional enterprises will bear more return costs if they decide to expand online sales channels. Because the current research shows that costumers' return rate of online shopping is significantly higher than that of offline shopping [6]. The choice between self-operated logistics and third-party logistics is another question. Since compared with third-party logistics services, although the self-operated logistics services have a higher service level, they require enterprises to pay an annual service fee that may be so high that they cannot afford [6]. Therefore, JD.com faces the challenge of convincing traditional enterprises to work with them despite their hesitations.

3.3. Dual-channel Supply Chain

In an e-commerce environment, dual-channel supply chain management refers to a marketing strategy that enterprises use both traditional sales channels and online sales channels to sell products to consumers.

JD.com uses this strategy to improve the company's market coverage, reduce costs and enhance market competitiveness. By the year of 2020, JD has built more than 15000 offline physical stores, and planned to continue to build more offline physical stores in the future. However, due to the choice tendency of consumers and the convenience of the Internet, offline channels are likely to become less attractive to consumers, which could cause the loss of offline customers and disrupt the balance between the two channels [11]. Then the dual-channel supply chain cannot achieve the effect such as increasing profits or improving the consumer experience.

4. Suggestions and Countermeasures

4.1. Optimize Existing Logistics Costs

In general, the efficiency of supply chains can be enhanced by increasing the degree of information sharing [12]. Therefore, in terms of procurement costs, when purchasing goods from upstream suppliers, JD.com should strengthen the sharing of consumer demand forecast data with suppliers. In this way, JD.com can negotiate with suppliers on procurement prices better, and maintain a friendly and stable cooperative relationship to control procurement costs [9].

As for warehousing cost, since it is unlikely to slow or even stop the existing warehouse construction process because of JD.com's goal of continuing to build the network, JD.com should optimize interior layout of its warehouse. To make the use of warehousing space more reasonable, JD.com can evaluate the utilization rate of equipment, storage efficiency and other indices using methods like fuzzy comprehensive evaluation method.

In addition to reasonable planning of distribution routes, strict selection of suppliers and other methods, JD.com can optimize reverse logistics costs and unreasonable labor cost structure by strict screening third-party logistics. Moreover, JD.com can also establish stable partnerships with third-party logistics to deliver goods that cannot use JD.com's self-operated logistics network. That is because qualified third-party logistics may reduce reverse costs caused by the return of damage goods and labor costs caused by recruiting too many distribution staff in remote areas as a result of their high logistics quality and extensive transport coverage [9].

4.2. Keep Developing the IOT Technology

JD.com has independently developed and applied a certain scale of IOT technology in its own smart warehouses. In addition, IOT technology not only has a wide range of applications in e-commerce, but also has a strong policy support in China. Therefore, JD.com should continue to research and apply IOT technology [13].

JD.com can utilize their own IOT system combines RFID and GIS technologies to achieve real-time goods tracking and managing, preventing potential issues of damage and loss during transportation. Additionally, JD.com is also capable of providing customers with real-time updates on their items' transportation status, enhancing customers' overall experience [12].

4.3. Use Different Pricing Strategy Depending on Different Circumstances

Suitable pricing strategies can solve the problems in both cooperations with traditional enterprises and dual-channel supply chain.

In order to make traditional enterprises more willing to cooperate with JD.com, JD.com should first consider reducing the annual service cost, on the premise that the logistics cost is optimized through other methods to ensure a certain profit. At the same time, under the current circumstances, JD.com still needs to provide third-party logistics channels. The reason is that in the event of a high logistics cost time-sensitive coefficient, which means time impacts logistics costs significantly, these enterprises are more inclined to select third-party logistics [6].

For the problems in dual-channel supply chain, JD.com should maintain the existing pricing strategy of the same price online and offline so as not to lose the existing self-operating advantages. Meanwhile, JD.com should continuously optimize the existing supply chain system to reduce the logistics costs online and offline. Moreover, it is also necessary to properly upgrade the physical store on the basis of the existing physical stores with digital and home appliances, and gradually add services derived from these goods. For example, JD.com can add cleaning and maintenance of digital equipment to attract more customers.

5. Conclusion

Logistics companies must make adjustments to their supply chains to accommodate the constantly evolving environment caused by the rapid growth of e-commerce. The article uses JD.com as an example to point out three existing problems in logistics cost, cooperations with traditional enterprises and dual-channel supply chain.

In the view of the first problem, suggestions on optimizing cost structure and developing IOT technology are put forward from the aspects of inter-enterprise information sharing and logistics technology. As for the second and third problems, from the perspective of client demands and experiences, suggestions on the optimization of pricing strategies are put forward in the respective aspects of suppliers and customers.

Although there is a limitation of not establishing a detailed mathematical model to show quantitative results, this article gives detailed analyses and suggestions based on the current situation. These analyses and suggestions can provide ideas for the future reform of JD.com and other similar enterprises, and make certain contributions to the development of e-commerce and supply chain management.

References

- [1] Xiaoyan, T. (2024). *Research on Enterprise Logistics and Supply Chain Management Innovation under E-commerce Environment*. *Trade Fair Economy*, 14, 112-115.
- [2] Jiangqi, F. (2019). *Exploration of the Construction of Supply Chain Logistics Management System of B2C E-Commerce Enterprises — Taking Jingdong Mall as an Example*. *Rural Economy and Science-Technology*, 14, 92-93.
- [3] Limei, Z. (2018). *Exploration of how Joint Inventory Creates a New Way of E-Commerce — Taking "JD Logistics" as an Example*. *Think Tank Era*, 28, 153-154.
- [4] JD Logistics. *JD Logistics' s "Weaving Network Plan" has Achieved Results, and the Integrated Supply Chain has Become an Important Guarantee for JD.com' s 618 Shopping Festival*. May 5, 2022. Retrieved on October 5, 2024. Retrieved from <https://new.qq.com/rain/a/20220520A0644T00>.
- [5] Shanshan, W. (2020). *Research on Logistics Mode of E-commerce Enterprises — Taking JD.com as an Example*. Northeast Agricultural University.
- [6] Kaiying, C., Yuqiu, X., Qiang, W., Jia, W. and Chunnian, L. (2021). *Optimal Channel and Logistics Service Selection Strategies in the E-Commerce Context*. *Electronic Commerce Research and Applications*, 48, 101070.
- [7] Guixing, Z. (2018). *A Study on the Integration of E-Commerce Logistics Based on Supply Chain Management — Taking Jingdong Mall as an Example*. *Journal of Heihe University*, 11, 58-59.
- [8] Renyou, L. (2022). *Management Innovation of Enterprise Logistics and Supply Chain under E-Commerce Environment*. *Modern Enterprise Culture*, 35, 28-30.
- [9] Han, Y. and Jinsheng, L. (2024). *Research on Logistics Cost Management Optimization of Jingdong Mall Company from the Perspective of Supply Chain*. *Logistics Sci-Tech*, 3, 114-117.

- [10] Pankaj, D., Pravin, S., Pallav, G. and Arnab, D. (2019). *Managing Risk for E-Commerce Supply Chains: an Empirical Study*. *IFAC-PapersOnLine*, 52 (13), 349-354.
- [11] Lili, L. (2020). *Research on Dual Channel Supply Chain Management in E-Commerce Environment*. *Guangxi Quality Supervision Guide Periodical* 3, 173+172.
- [12] Lu, C., Yanfei, F. and Aijun, L. (2020). *Research on Information Sharing Strategy of Low Carbon Supply Chain in the Environment of Macro-control and Economical Scale*. *Journal of Guizhou University of Finance and Economics*, 1, 78-86.
- [13] Huang, B. (2021). *Research on Optimization of E-Commerce Supply Chain Management Process Based on Internet of Things Technology*. In *Journal of Physics: Conference Series* (Vol. 2074, No. 1, p. 012070). IOP Publishing.