A Literature Review of E-commerce Supply Chain Management

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Abstract. The development of the Internet affects the needs and habits of consumers, thus changing the market pattern. In the new economic environment, e-commerce enterprises are facing greater competition, which leads to the integration of e-commerce enterprises on their supply chain has become the key to obtain competitive advantage in the future. This paper mainly describes the three prevailing modes of e-commerce supply chain, analyzes their operation modes, and takes various e-commerce companies as examples to analyze the operation process of these three modes of e-commerce supply chain, and finds the existing problems, summarizes and gives suggestions. In this paper, three kinds of e-commerce supply chains are compared and analyzed to provide reference value for industry stakeholders and provide some inspiration for the development of e-commerce supply chain management in the future.

Keywords: E-commerce, supply chain management, supply chain modes.

1. Introduction

The rapid popularization of the internet and information technology in the world has become one of the important factors to promote the emergence and development of e-commerce. For China, although e-commerce started late compared with developed countries like the United States, it has been striving to catch up for a long time [1]. The development of the electricity is caused a huge impact on the traditional supply chain management, enterprise management mode of supply chain management in e-commerce is a kind of innovation and development of e-commerce supply chain based on the Internet service platform, namely the supply chain process of electronic trading, informatization, thoroughly change the traditional pattern of upstream and downstream business synergy [2]. E-commerce enterprises integrate their existing business infrastructure with supply chain management, which breaks down the barriers between end-users and manufacturers compared to traditional supply chains, the relationship between enterprises is not a simple chain structure, but a complex supply network, including the central manufacturers, as well as other as the hub of the upstream suppliers of the industrial chain, distributors of the downstream of the industrial chain, logistics transport service providers and correspondent banks[3]. The goal is to provide better service for physical products before and after-sales.

So far, there are three supply chain management modes of e-commerce, namely B2B, B2C and O2O. In this study, my goal is to illustrate the four types of electricity supply chain management mode, with specific companies, for example, and carries on the analysis and discussion, pointing out that the four kinds of electricity supply chain model of deficiency, hope this article can for the electric business enterprise management, consumers or investors in the process of electricity supply chain management to provide some enlightenment.

The structure of the remaining content is as follows. In the next section, three types of e-commerce supply chain management modes are illustrated by taking specific companies as examples. Finally, the research results of the paper are summarized and the direction for further study and research is provided.
2. **B2B supply chain management**

2.1 **The concept and model of B2B**

B2B business activities are widely used in e-commerce activities in China and occupy more than half of the Chinese market share. The B2B model mentioned in e-commerce supply chain management is the communication and cooperation between enterprises, that is, the Internet serves as a platform on which enterprises exchange products, information and services (see Figure 1). Usually, there are two ports of supply chain and demand chain in the B2B model. Suppliers belong to the upstream, and the downstream is the customer. Therefore, the two are from different perspectives, and there are differences in the content and operation mode. For those enterprises who are in the mode of the intermediate links, the size and strength of the supply chain gap is the decisive factor, between the two parties to develop B2B strategy model strategy at the same time due to the economic environment changes and the influence of market demand, the market environment has dominated by-products from into markets dominated by consumers [4]. Compared with the previous, purchasing for inventory is changed to purchasing for order, internal purchasing management is changed to external resource management, and the general buying and selling relationship is changed to strategic cooperative partnership [5]. These changes are in line with the integrity principle, high-efficiency principle and information principle [6]. First, such a transformation makes all the participating enterprises in the whole supply chain unify and coordinate with each other, thus effectively simplifying the smooth capital flow, information flow and logistics, promoting the joint efforts of all enterprises and improving the overall competitive advantage. Secondly, the big data analysis of the Internet trading platform can make logistics more efficient and save costs at the same time. In addition, enterprises can share and obtain information through the Internet trading platform, which makes the communication between enterprises more convenient and faster without barriers. Therefore, by following the three principles to improve the market response speed and sensitivity of the whole supply chain, with the lowest cost to obtain the maximum economic benefits. However, the current B2B supply chain model in China has a short development time, although some enterprises have achieved great success in the management reform, there are still some problems. Information integration among enterprises is still in its infancy, and stable cooperative relationship between enterprises has not yet been determined. In some enterprises, the two sides are even in opposition to each other's interests, and partners are often regarded as the source of interest, which leads to the failure to establish an interdependent cooperative relationship.

![Figure 1. B2B model](image)

2.2 **Take Suning B2B supply chain management reform as an example**

According to the above analysis, the current market environment is a consumer-led market, which makes many B2B e-commerce platforms begin to reform their supply chain management. As a well-developed platform for domestic e-commerce, Suning's supply chain formed with upstream suppliers is a very typical B2B model and has implemented supply chain management reform in response to
market requirements. At present, Suning has more than 10,000 suppliers, more than 100 branches and 700 retail terminal stores nationwide. Upstream business with suppliers includes all logistics, information flow and capital flow of commodities, purchase plans, orders, receipt and delivery, and account settlement [7]. Since improving process efficiency, reducing transaction costs, improving the accuracy of commodity flow and accelerating the response speed of suppliers have become the key factors for the supply chain to become the core competitiveness, Suning has built a B2B supply chain management platform that integrates commodity sales demand management, purchase management, order process tracking, logistics management, commodity inventory status, fund settlement management and service management, which directly reduces the cost of each order by 40 yuan, improves personnel efficiency by 50% and saves tens of millions of yuan in transaction cost every year [8]. In this way, a unified entrance can be provided for suppliers. The upstream can display the real-time status of commodity sales so that the information and inventory status of relevant commodities can be directly predicted by using big data. Meanwhile, it can also automatically respond to orders and distribution demands from Suning. The traditional supply chain and demand chain interaction modes are directly realized through the B2B automation process, which directly improves the level of supply chain management. However, in terms of logistics downstream of Suning's supply chain model, Suning usually uses the second-party logistics system, that is, Suning carries the purchased goods through its self-owned logistics service [9]. Although each logistics step can be well controlled in this way, because the vehicles and delivery personnel are all Suning's employees, this greatly increases the logistics cost, which will be reflected in the commodity price eventually, which reduces Suning's competitive advantage.

3. B2C supply chain management

3.1 B2C supply chain management current situation

The B2C supply chain model is the business chain from enterprises to consumers. Driven by Internet technology, this kind of supply chain also has the mode of inserting distributor links in the middle and finally reaching the consumer port, namely B2B2C [10]. At present, in the Chinese market, e-commerce enterprises such as Jingdong and Amazon, which are engaged in self-operated products, are in a typical B2C business model. Enterprises directly face consumers, and after consumers place orders, they will be delivered by the self-operated logistics chain of e-commerce enterprises. As for the shop owners joining the e-commerce platform online, they will become distributors in the supply chain and provide supply chain services for consumers together with the platform [11]. Thus, it can be seen that most of China's e-commerce platforms, including some professional online purchase platforms, register online stores on the e-commerce platforms and take charge of product trading, while logistics, information flow and capital flow are all handled by the platforms. Such merchants act as agents or distributors of online electronic channels to break through the value transfer chain between the original manufacturers and consumers in the supply chain. No matter B2C or B2B2C, this kind of supply chain management method is a typical lean supply chain management method, namely consumer-centered [12]. Service to consumers is the starting point of supply chain management, through the establishment of a lean management system, to improve customer service quality and customer satisfaction. The core of lean management lies in consumer experience and fast response [12]. On the one hand, facing the current market environment dominated by consumers, consumer satisfaction and consumer experience are the key, which is not only reflected in product price, delivery time and service attitude but more importantly, whether the products and services provided to consumers can truly meet consumer needs. On the other hand, the fierce competition environment requires the whole supply chain to have the ability to respond quickly, to flexibly allocate resources. Take Amazon as an example. Amazon's traditional supply chain management passively reflects consumer demand. After consumers place orders, the whole supply chain is driven by the orders to provide services for consumers. At present, Amazon builds a back-office warehouse logistics system, and its response to orders is transformed from passive to active. That is, the system predicts the number
of orders for a certain type of product in a certain region through data analysis and predicts the local sales volume of the product in a day based on historical data. Meanwhile, the supplier's time of goods preparation and delivery is also recorded in the system [13]. If it takes three days to ship, Amazon's purchasing department sends the order to the supplier ten days before. That means the book is already in storage before consumers place their orders. Thus, it can respond to consumer demand at the fastest speed. Such an agile supply chain concept is also used by Jindong and Alibaba [14]. Therefore, the B2C supply chain inventory management model has become the key to obtaining competitive advantages for e-commerce enterprises.

3.2 model of B2C

The inventory cost of B2C supply chain and whether it can quickly respond to consumer demand have become a link that e-commerce enterprises must pay attention to, so supplier inventory management has become a new supply chain inventory management method widely used by e-commerce enterprises. Previously, the traditional purchase order model is shown in Figure 2, in which the manufacturer delivers according to the online retailer's purchase order, and the online retailer generates accounts payable and is responsible for the later warehouse storage and logistics distribution [15]. This means that the electric business enterprise to the manufacturer to purchase goods, building its own warehouse and logistics system, the benefits of this are can buy goods at a lower price, free pricing, for goods storage, centralized management it effectively reduce storage costs, faster response to the demands of consumers, but it is facing the risk of goods out of stock or inventory backlog. B2B supply chain VMI model is transformed from the traditional purchase order model, which is divided into Drop Shipping mode, Consignment Stock mode, third-party logistics HUB mode, third-party logistics HUB+ Cross Docking mode, which can solve the problem of goods out of stock and backlog.

![Figure 2. Traditional procurement mode](image)

### 3.2.1 Drop Shipping mode

In this mode, the manufacturer is responsible for the storage and logistics distribution of goods, sharing the information generated by the e-commerce platform, and then carrying out production and preparing the goods in advance. When the order is generated, the manufacturer sorts and distributes the goods in the warehouse according to the principle of proximity, and finally distributes the goods to consumers [16], as shown in Figure 3. This model has been applied to many brands of e-commerce sales channels, which can cover a wider range of places throughout the country. For example, The online sales channel of Midea, a Chinese household appliance brand, adopts the manufacturer's direct delivery mode to build its own logistics system and form a logistics network of distribution center + logistics line + distribution station [17]. At present, it has set up 143 logistics platforms in China, and
the home appliance distribution network covers all large and medium-sized cities in China. With the advantages of this logistics network, it has cooperated with Amazon, Taobao and other e-commerce platforms in logistics [17].

3.2.2 Consignment Stock mode

Consignment Stock model is different from Drop Shipping, warehousing logistics system is electric business enterprise self-built electric business enterprise information sharing with the manufacturer, the goods and replenishment is directly to electricity enterprise warehouse, electric commodity logistics business enterprise is responsible for the late, but the warehouse storage, goods management and logistics expenses are paid by the manufacturer [18], as shown in Figure 4. Such supply chain model is applied to the Amazon, manufacturers, according to Amazon's sharing daily sales information data to predict after the sales of the commodity self-built, unified distribution to the Amazon warehouse, by Amazon are responsible for the management of goods, distribution, and the manufacturers, and a series of after-sales service, you just need to pay to Amazon for [19]. This supply chain model will produce the scale effect of purchasing goods, reduce the procurement cost and logistics cost, and warehousing also enables consumers to close orders, but also increases the certainty of experience.

Figure 3. Drop Shipping Mode

Figure 4. Consignment Stock mode
3.2.3 Third-party logistics HUB mode

The third-party logistics HUB mode refers to that e-commerce enterprises and manufacturers have no self-built warehouses and logistics systems, and they outsource supply chain inventory management to third-party logistics partners, using THE VMI HUB mode [20], as shown in Figure 5. This means that the electricity enterprises and manufacturers, and third-party logistics partners share information, manufacturers according to the data of production and replenishment to the third-party logistics warehouse of partners, third party logistics to management and distribution to the consumer goods, produced by the cost of warehouse management, order processing cost and distribution cost in a certain proportion paid by electricity companies and manufacturers. SF Express is the best example. As a comprehensive express logistics service provider in China, SF Express has established an e-commerce warehousing and distribution system that can cover the scope of China, providing e-commerce warehousing and stocking services, and establishing 7 regional distribution centers (RDC) in 7 cities, 50 cities to build a distribution center (DC) [21]. The application of this model has achieved a win-win effect. The inventory cost and total supply cost of e-commerce enterprises and manufacturers are reduced, the response speed to consumers is timely enough, and the distribution and logistics are more professional.

Figure 5. Third-party logistics HUB mode

3.2.4 Third-party logistics HUB+ Cross Docking mode

For the sake of consumer experience, when multiple orders need to be processed together, the third-party logistics HUB+ Cross Docking mode becomes the best choice. This model is based on the third-party logistics HUB mode. When consumers place an order, the third-party logistics partner distributes the goods to the e-commerce enterprise transport center for cross tally, to realize the just-in-time replication mode, and finally, the goods are delivered to the customers by the local logistics distribution company [22], as shown in Figure 6. This mode can enhance consumers’ sense of experience and reduce the cost of logistics and distribution so that multiple goods orders can be delivered at the same time after being processed together. It is suitable for e-commerce enterprises with multiple categories and large quantities of goods.
In short, the core of the VIM mode of the B2C supply chain is inventory management under the premise of information sharing, to meet the needs of consumers with the fastest response speed and reduce the inventory cost of the supply chain. For e-commerce enterprises, the transaction costs are reduced, the turnover speed of goods is accelerated, the risk of stock shortage and inventory overstocking is reduced, the information sharing of the whole supply chain is timely, and the cost is reduced. This mode changes the cooperation mode of e-commerce enterprises, manufacturers and third-party logistics partners, and provides new management methods and ideas for B2C supply chain inventory management.

4. O2O supply chain management

4.1 O2O supply chain management status and model

O2O is a kind of online and offline connection e-commerce model that emerged in the development of the Internet, and the O2O supply chain management model is a new cooperative supply chain system under the O2O e-commerce model. The essence of this supply chain management mode lies in "joint service". Enterprises under the cooperative system aim at efficiency and cost reduction and effectively integrate the service supply chain to provide comprehensive online and offline services to customers [23]. In other words, in the whole process of consumers' consumption, online platforms are equipped with information integration functions such as consumption guide, product information, payment method and sharing platform, while offline stores are dedicated to providing services for consumers. In addition, compared with B2C, the O2O supply chain management model is more suitable for traditional industries, such as furniture, real estate, cars and other commodities without certain standards and with high prices, or fresh products. The consumption demand of such customers requires extreme consumption experience [24], while B2B and B2C models cannot provide consumers with an offline consumption experience. In terms of cooperation and transaction, The O2O supply chain model is similar to that of B2C. The main difference lies in the effective integration of resources to manage consumer experience [24]. As shown in the figure 7, the model takes offline stores as the core. Online e-commerce enterprises and third-party payment platforms feedback on customer demand and relevant information to offline stores as information dissemination and payment methods, while offline stores provide customers with services and places for customers to pick up goods and order. For online e-commerce enterprises, they face consumers directly, but consumers' purchasing demand is uncertain and the regional distribution is scattered. Therefore, the construction of a logistics distribution system and logistics costs are one of the key problems faced by e-commerce enterprises. However, cooperation with offline stores can effectively solve the problem of high distribution costs and improve service quality.

Figure 6, Third-party logistics HUB+ Cross Docking mode
Offline stores, since offline stores exist for a long time and most of them are located in business circles, can develop into logistics service providers downstream of the supply chain of e-commerce enterprises by cooperating with e-commerce enterprises and taking advantage of the convenience of e-commerce platform and real-time information update. In this way, offline stores can realize product display, physical handover with consumers, as well as after-sales product return and exchange of goods and other services. This O2O supply chain management model is still in the early stage of development, and some e-commerce enterprises have begun to use this model, such as Hema under Alibaba Group [25]. Although there are still some problems, it does provide a new idea for the development of the e-commerce supply chain.

4.2 O2O supply chain model analysis of Hema fresh

Hema, a fresh food e-commerce provider founded by Alibaba Group, uses the O2O supply chain management model. It uses the business model of online ordering and offline store pickup or distribution. As the pre-logistics center, the offline store provides stock for its store and can transfer goods urgently to other stores, to coordinate the reasonable distribution of fresh product resources. The store is also a supermarket that provides shopping and catering experiences for people. Based on offline stores, online platforms provide delivery services within five kilometers and within half an hour to consumers [26]. This mode is mainly aimed at consumers with high consumption levels. It can improve customers' offline consumption experience through the innovative mode of combining catering and fresh food, and help enterprises grasp consumers' consumption preferences through big data analysis, to implement precision marketing. Due to China's fresh products supply chain system of the professional, organized and informationization level is low, making the box Jian-li ma own cold-chain logistics automation system, the use of big data, Internet of things and automation technology to ensure that the standardization of transport as well as sales and logistics, will people, product and offline store three optimization matching [27]. This means that from suppliers to warehouse management to final delivery, consumers can place orders online or offline, and boxes can be delivered quickly within the distribution range of each store. In the procurement link of the supply chain, Hema adopts the mode of direct source procurement, and some products are purchased in cooperation with Tmall Fresh and Tmall Supermarket [28]. This directly shortens the intermediate link and reduces the cost of product purchase. For product storage management, the automatic mode of front store and back warehouse is adopted [29]. Automatic transmission of the process from stores to storage packaging can effectively reduce the loss of fresh products in the transportation process, and the catering function of stores can also reduce the loss of products. This effectively reduces costs for merchants and improves consumer value for consumers. In the Huma distribution process, a cold chain distribution system was established in the area where the stores were located, and the distribution chain was automatically synthesized in the stores and warehouses according to the order content and distribution location [29]. Hema Fresh realizes the automation, digitalization and systematization of the distribution process in this link, which greatly improves the distribution
efficiency and consumers' sense of distribution experience. Horsebox of the supply chain, in short, a lot of great change and innovation, to consumers as the center to distribution logistics resources, greatly shorten the supply chain, with digital drive supply chain optimize the supply chain, for supply chain procurement, sorting, processing, packaging, and distribution and so on each link to automation, intelligent transformation, effectively reduce the operating costs to improve efficiency. However, at present, there are few offline stores, and each store has a limited radiation area. Customers five kilometers away can only buy offline, resulting in the limitation of consumer groups. Meanwhile, Hema's current fresh suppliers are mainly foreign, which makes the products only suitable for some consumers and unable to meet the consumer needs of different income groups. This has also become a challenge for the current O2O e-commerce supply chain management model.

5. Conclusions

In short, the market demand is constantly changing, and the supply chain model of e-commerce is also constantly improving and developing. Typical enterprise cases mentioned in this paper use B2B, B2C and O2O models to share information resources with the help of the Internet, big data and other information technologies, to reduce costs, maximize the utilization of resources and meet market demand. B2B e-commerce supply chain mode follows the three principles of integrity, high efficiency and information technology to improve process efficiency, reduce transaction costs, improve the accuracy of commodity flow and speed up the response of suppliers. The supply chain management mode of B2C e-commerce mainly lies in its inventory management mode. The adoption of VMI mode changes the cooperation mode of manufacturers, e-commerce enterprises and third-party logistics in the supply chain, providing new ideas for inventory management. O2O e-commerce supply chain mode integrates offline stores and e-commerce enterprises through the service supply chain, arouses the enthusiasm of online and offline, and ensures the level of logistics service, forming a new cooperation model that gives full play to the advantages of all parties, which has great reference value for other industries. However, the e-commerce supply chain still faces some challenges. For example, in the face of the unstable relationship between suppliers in the supply chain, institutions and regulations are needed to restrict the suppliers to achieve a win-win situation. Or the problem of the small radiation range of offline stores, the solution is to set up more stores, expand the radiation range of stores, and optimize the distribution route. According to the review and analysis of this paper, the e-commerce supply chain management model has been relatively mature and can be applied in the process of supply chain management. Although there are still some problems that need to be improved, it has a great possibility to be solved in future development.

References


