Garment Supply Chain Management Based on Product Life Cycle

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Abstract. Garment supply chain management covers all the nodes of the enterprises, from fabric to end customers, with the purpose of better meeting customer needs, reducing the operation cost of the whole supply chain, and improving corporate efficiency. Garment products have the characteristics of multiple varieties, small batches, fast product update, and the bullwhip effect is obvious. The whole life cycle of clothing covers a series of links such as garment design, garment manufacturing, garment sales and after-sales service, and the whole process is considered and managed as a whole. From a systematic point of view, the concept of product life cycle is adopted to manage the clothing supply chain and achieve the coordinated management among enterprises in the chain, which can better solve the problems of information asymmetry and high inventory of clothing enterprises.

1 Preface

The basic needs of human beings are "food, clothing, housing and transportation", and the garment industry is a big industry to solve people's first needs. The traditional clothing enterprises have a low threshold for technology and capital requirements, and the industry is highly competitive. Clothing has a strong periodicity and seasonality, and the update speed is fast. Once inventory is overstocked, it will cause great losses to garment enterprises. Therefore, both in the business community and the academic community, people try to find better ways to reduce inventory and improve the corporate efficiency. With the progress of social economy and human technology, especially the development of information technology and Internet technology, the management efficiency and level of clothing enterprises have the opportunity to be greatly improved. The core of technology application is advanced management concepts, clothing enterprises must have the right management means as support, in order to give better play to the effectiveness of technology.

2 Product lifecycle management

The traditional product life cycle theory believes that the product life cycle includes four stages: introduction stage, growth stage, maturity stage, and decline stage, which essentially only covers the market life of the product, and does not take the stage before the product enters the market into account. The whole life cycle of a product refers to the whole life cycle of a product from the conceptual design stage, to the manufacturing, logistics, sales and service stages, until the final withdrawal from the market. The whole life cycle of garment products includes all parts of garment design, fabric procurement, garment processing, garment sales and logistics distribution, which are affected by the whole garment supply chain.

Product Lifecycle Management is to plan, coordinate and control the resources and information of the enterprise from the perspective of the whole Product Lifecycle, so as to maximize the Product's utility.
3 The connotation of garment supply chain

The traditional supply chain consists of a series of enterprises such as raw material parts suppliers, manufacturers, wholesalers, retailers and transporters. Raw materials parts pass through each enterprise in the "chain" in turn and gradually become products, which then pass through a series of circulation and distribution links and finally reach the hands of the end user. This series of activities constitute all the activities of a complete supply chain, the main contents of which are shown in figure 1.

Clothing enterprise supply chain refers to the surrounding clothing enterprises, through the control of the logistics, information flow and capital flow, from procurement of raw materials (including primary, accessories), made of intermediate products and final products, and finally by the sales network products to consumers' hands, it will connect suppliers, manufacturers, distributors, retailers and end users into an integrated function nets chain structure model.

The development trend of the socialized division of labor is that the division of labor is becoming more and more detailed and professional. The virtual business model of enterprises enables many brand apparel enterprises to separate production and manufacturing and entrust professional apparel processing enterprises to produce, which is reflected in the apparel supply chain and represents the diversification of partners, as shown in figure 2.

In the supply chain of brand apparel enterprises, brand operators are responsible for the construction and maintenance of apparel brands, market planning and positioning, product design and management, etc., connecting the supply chain with the product value chain as the main line. Supplier partners include qualified fabric suppliers, professional equipment suppliers, information technology suppliers, etc. Garment manufacturing partners include brand owners who build their own garment processing lines or outsourced garment manufacturers that meet the qualification requirements;
Offline operation partners include traditional dealers, agents, cooperative shopping malls, etc., while online operation partners include online dealers, agent operation service providers, and online sales platforms. End customers are all consumers who obtain products through online or offline channels. Logistics involves the material flow from suppliers to customers, as well as the reverse flow of product return, service, recycling and final processing. The information flow involves demand forecasting, order delivery and delivery status reports. The capital flow includes the settlement of payments and the mutual penetration of funds between the businesses on the chain, including credit card information, credit terms, payment schedules, shipments, and product name ownership.

4 Garment supply chain management system based on product life cycle

Based on the whole life cycle of products, the garment supply chain management system is established from the aspects of garment product design, inventory management, digital manufacturing technology and supply chain coordination.

4.1 clothing product design based on the full product life cycle

Brand clothing product design is the process by which a company aims to successfully design and develop clothing products that meet market demands, and forms clothing product ideas based on brand positioning, fashion trends, and other factors. Garment enterprises should strengthen the interactive relationship between the garment design process and garment fabric suppliers, garment manufacturers and garment sellers, establish an efficient garment design mechanism, and ensure that all links cooperate with the design team in terms of information, materials and technology. The designer should permeate the design process with the elements and products such as fabric, production process and cycle, as well as market acceptance and expected sales cycle, to increase the proportion of effective design.

4.2 apparel supply chain inventory management based on full product life cycle

In the whole life cycle of clothing products, inventory runs through. Inventory has a double-sided nature, which can not only solve the problem of shortage and improve customer satisfaction, but also lead to capital backlog, rising supply chain costs and mask various management problems. The inventory in the garment supply chain exists in various links of raw materials, semi-finished products and finished products, which takes up a large amount of resources. Once the surplus is formed after the season, it will bring huge losses to the enterprise. To establish a supply chain management system based on the full life cycle, implement Jointly Managed Inventory (JMI) and Vendor Managed Inventory (VMI).

JMI was proposed mainly to solve the problem of supply and demand amplification in the upstream and downstream of the supply chain caused by the decentralized and isolated inventory management of most nodal enterprises. It was initially reflected in the inventory management of the distribution center, which stored most of the supply chain inventory, while each seller only stored a small amount of inventory. Therefore, through JMI, the supply chain inventory sharing can effectively reduce the bullwhip effect and reduce the inventory risk of enterprises.

The main idea of VMI is that the supplier should set up inventory with the user's permission, determine inventory level and replenishment strategy, and have inventory control. Through VMI, customer inventory can be shared, reducing resources and waste in the apparel supply chain, and improving the response speed of suppliers to customers. For example, some garment manufacturing enterprises in China have set up free fabric warehouse and accessories warehouse to provide customers with raw materials and reduce the pressure of customer raw materials inventory.

4.3 apparel supply chain digitization technology based on the full product life cycle

Clothing digitization technology can be understood as a technical means of using modern computer technology to store and calculate various information of clothing, such as words, graphics, colors, relations, etc. in digital form in the computer, and then present them in different forms of expression or send them to the executing agencies in digital form.
Digital technology includes Computer Aided Design (CAD), CAM (Computer Aided Manufacture) and CAPP (Computer Aided Process Planning). It also includes Electronic Data Interchange (EDI), Radio Frequency Identification (RFID), Electronic Product Code (EPC) and other application technologies. The development and application of digital technology of garment supply chain run through the whole life cycle management of products and improve the management efficiency of supply chain.

4.4 collaborative management system of apparel supply chain based on full product life cycle

Supply chain synergy refers to the process in which all members of the supply chain work together to share information and make decisions together to meet customer needs and create competitive advantages of the supply chain. Through collaboration, the logistics, capital flow and information flow in the supply chain can be effectively integrated to reduce costs, improve efficiency and improve customer satisfaction. Through the Internet and information technology such as big data and cloud computing, a garment supply chain collaborative management system is established, so that enterprises can effectively manage the main production and operation links, facilitate the coordination of resource allocation in the manufacturing process, ensure unified data, and open up design, Information transmission channels for various processes such as purchasing, manufacturing, and sales, improve the efficiency of information transmission, improve the speed and accuracy of order response, realize data sharing, and ensure the consistency and correctness of material data.

5 Conclusion

Product life cycle management and supply chain management are both systematic management methods. This paper organically combines and applies them from a systematic point of view, so as to achieve the goal of reducing the cost and improving the benefit of the garment supply chain.

6 About the Author


References