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E-commerce Logistics in Supply Chain Management: Practice Perspective

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Abstract

E-commerce is booming with the development of new business model and will be continuously boosted in the several decades. With large number of enterprises carrying out E-commerce, logistics driven under the background has been largely influenced. This paper presents the state-of-the-art E-commerce logistics in supply chain management from a view of practice perspective. Worldwide implementations and corresponding models together with supporting techniques are reviewed in this paper. Typical E-commerce logistics companies from North America, Europe, and Asia Pacific are comprehensively reviewed so as to get the lessons and insights from these practices. Opportunities and future perspectives are summarized from the practical implementations so that interested companies like E-commerce and logistics companies are able to get some guidance when they are contemplating the business.

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1. Introduction

Based on the booming E-commerce, logistics and supply chain management (LSCM) has been greatly influenced when we are now already overwhelmed by its successes in both developed and emerging economies.In the E-commerceLSCM,there are two major types of business models. They are business to consumer (B2C) and business to business (B2B) (Bolumole, Closset al.2015). In B2C model, business website is a place where all the transactions take place between a business organization and consumer directly (Miangiaracina, Marchet et al. 2015). In this model, a consumer visits the website and places an order to buy a catalog. The business organization, after receiving the order, will dispatch the goods to the customer. Successful examples like Amazon.com and Priceline.com are B2C leaders (Rappa 2008, Ta, Esper et al. 2015). Key features of this model are heavy advertising required to attract large customers, high investment of hardware and software, and good customer care service (Nica 2015). B2B refers to a situation where one business makes a commercial transaction with another, thus, the transaction volume of B2B is much higher than the volume of B2C. In a typical supply chain there will be many B2B transactions involving sub components or raw materials, and only one B2C transaction, specifically sale of the finished product to the end customer. The purchase of B2B products is much riskier than B2C products. Thatis because purchasing the wrong product or quantity, or at the wrong terms, can put the entire purchasing business at risk (Sila 2013).

The modern logistics have become the most important means to improve the efficiency of material flow, reduce distribution costs in various industries; at the same time, the recent development of E-commerce also contributed to the expansion of the logistics market, promote the development of technologies related to logistics. Large numbers of practices have been carried out in the E-commerce logistics (Bask, Lipponen et al. 2012, Masmoudi, Benaissa et al. 2014, Ramanathan, George et al. 2014). In order to figure out current movement of E-commerce logistics, this paper gives a comprehensive state-of-the-art review of E-commerce logistics in supply chain management from a practice perspective so as to get the lessons and insights from various practices for guiding future implementations. This paper summarizes the logistics models and supporting techniques for the E-commerce logistics and highlights the challenges, opportunities, and future perspectives.

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The rest of this paper is organized as follows. Section 2 presents the worldwide implementations in various practices from the real-life company. Section 3 highlights the challenges and future directions. Section 4 concludes this paper.

2. Worldwide implementation

2.1. North America

2.1.1. Home Depot

Home Depot is an American retailer company selling home improvement, construction products and service. Until 2014, it has more than 355,000 employees, and runs more than 2,000 superstores that are located in America, Canada, Mexico, China, and so on. In the year of 2006, in order to adapt to the dramatically increased E-commerce market, Home Depot decided to remodel its traditional supply chain into omni-channel supply chain and upgrade its logistics service network (Maloney 2009).

In the traditional model, each retailer store has a logistics management department, and this department is in charge of the store's replenishment, storage management, in/out products flow controlling and any other relative issues. When suppliers receive the stores' replenishment orders, they have two ways to deliver orders to retailers, of which one is directly sending products to the store, the other is using Home Depot's distribution center to ensure cost effective transportation. However, in real situation, 80% of the orders are sent to the retailers directly, because each store has its unique replenishment cycle and requirement so that it is hard for suppliers to realize full truckload during one piece of set time. The company's legacy network of distribution network is also hard to achieve customers' service expect, for the E-commerce orders are increased at dramatic speed.

For the Line-Haul phase, the Home Depot sets centralized inventory and replenishment (I&R) department in the corporate's headquarters, develops and deploys of a new network of distribution centers for store replenishment. The new I&R department takes place of the individual stores' replenishment teams, and is responsible for all the stores' inventory management. The centralized replenishment improves the demand forecast accuracy, gains more power for Home depot while negotiating with suppliers as the single order is much larger than before and it also brings benefits of transportation cost effective, high top-selling SKUs (Stock Keeping Units) availability which can achieve 99% and so on.

2.1.2. Lowe's

Lowe's is the second largest home improvement retailer company in the North America. Until the year 2011, there are 1840 Lowe's retailer stores all over the world. Most of them are located in North America, and some are located in Austria. Lowe's is recognized as the top service provider in home improvement industry.

Lowe's business model is very similar as the one used by Home Depot. Although Home Depot has larger market shares which improve its supply chain management continuously to save cost, Lowe's has to explore in other ways to keep increasing in the home improvement market (Gukeisen 2005). First, instead of quick expansion in metropolis, Lowe's chooses to explore the consumption potential in small and medium size cities. Second, Lowe's adds the categories of products, invests for store decoration, redesigns the layout of retailer stores, and finally attracts a lot of women customers shopping in Lowe's (Fogel 2002). Third, Lowe's builds its own service team to cover logistics service, sales guidance, installation service, design service and so on. Lowe's also transfers part of do-it-yourself (DIY) products into only buy-it-yourself (BIY) products, and offers special service to different types of customers.

In Lowe's case, customer service is the first priority. The good shopping and service experience they provide to customers is the breakthrough point to gain market share under Home Depot's intensified competition pressure. It ensures Lowe's sales keep increasing steadily every year (Timothy Thacher 2007). However, the product diversity, personized service, quick expansion in smaller cities and other characteristics that bring by self-support logistics service team all lead to the serious problem of cost control, as the E-commerce order emerges, this problem will become more and more serious. Lowe's has to find a balanced way between high customer service and cost effective supply chain management.

2.1.3. Amazon

Amazon is an E-commerce and cloud computing company. It's the biggest Internet Retailer in the America. It began as an on-line bookstore but its current business scope covers DVD, blue ray, CD, video game, electronic, furniture, food, toys, jewellery and so on. Amazon has independent sales website facing different countries and areas, including America, the U.K. and Ireland, France, Canada, Germany, Italy, Spain, Netherlands, Australia, Brazil, Japan, China, India and Mexico.

Amazon saves a lot of storage costs by integrating the inventories in DC (Distribution Center) and the warehouses of partners. Then there is no need for Amazon to keep a high level of inventory like physical retail stores (Chiles 2005). The determinants for locating DCs consist of distance from customer intensive places and level of taxes. Within the DC, Amazon has different processing procedure and equipment when dealing with various product groups. Those products which are easily classified and transported are stored in highly automated equipment (Hays, Keskinocak et al. 2005), while those irregularly shaped products are handled by equipment of low-level automation.

When dealing with inter-city transportation, Amazon sets some injection points, i.e. transportation hubs (Cronin 2014). They are located in the districts where customers are highly concentrated to save cost. Orders are integrated in the distribution centres first. After that, the less than truckload