

Comparative Analysis of Global Supply Chain Management of Chinese and USA HI-TECH Electronic companies and Its Implications

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Abstract

With the rapid development of information science and technology and the continuous advance of economic globalization, the international market competition is becoming increasingly fierce. Faced with the increasingly complex global market competition, multinational corporations, in order to continuously enhance their competitiveness, improve customer satisfaction and maximize profits, take the global market as the background, take product research and development, raw material procurement, manufacturing and processing as well as final product distribution into account, so as to realize the global design of supply chain network, form a global supply chain, and establish a global supply chain management strategy. At present, under the sweeping tide of economic globalization, global supply chain management will become the mainstream trend of management development of multinational corporations in the future.

In this context, this paper makes an in-depth study of global supply chain and its management, and makes a detailed analysis of Dell's and Lenovo's global supply chain management, which are typical multinational enterprises that have established effective global supply chain management. Through the research and case analysis, this paper aims to have a comprehensive and profound understanding of global supply chain and its management, to have a critical understanding of Dell's and Lenovo's effective global supply chain management and understand their strengths and challenges, and finally to provide practical suggestions for the development of Chinese enterprises in domestic and international markets.

Finally, the following findings are obtained in this paper. With its global supply chain management, Dell has reduced costs and built good relationships with suppliers and customers. Lenovo has also adopted effective global supply chain management modes, which enable Lenovo to achieve the competitive advantages of information integration and costs reduction as well as the competitive advantages in the mode of operation and management technology. However, in the domestic

and international environments, there are still some problems in Dell's and Lenovo's global supply chain management, which presents them with some challenges. Through the comparison between the two, this paper finds that they have both similarities and differences in global supply chain management, as well as successes and shortcomings. Therefore, this paper believes that, for Chinese companies, in order to have a foothold in the world, they must learn from the common successes of Dell and Lenovo, focusing on customer demand and product value added as well as minimizing costs. In addition, Chinese enterprises must learn from Lenovo and Dell respectively when exploring domestic and international markets, learn to adapt measures to local conditions, and make full use of the advantages of the direct selling model. In addition, Chinese enterprises should also clearly recognize the problems in their own supply chain management, and actively adopt countermeasures to achieve the overall optimization of their own supply chain management.

Keywords: *global supply chains, supply chain managements, multinational companies*

1. Introduction

With the rapid development of information science and technology and the continuous advance of economic globalization, the international market competition is becoming increasingly fierce. Faced with the increasingly complex global market competition, multinational corporations, in order to continuously enhance their competitiveness, improve customer satisfaction and maximize profits, take the global market as the background, and take product research and development, raw material procurement, manufacturing and processing as well as final product distribution into account, so as to realize the global design of supply chain network, form a global supply chain, and establish a global supply chain management strategy. At present, under the sweeping tide of economic globalization, global supply chain management will become the mainstream trend of management development of multinational corporations in the future. In this context, making an in-depth study of global supply chain and its management, and a case analysis of multinational enterprises which have established effective global supply chain management can bring inspirations to Chinese enterprises and provide practical countermeasures for them to expand domestic and international markets.

This paper is mainly divided into eight chapters. The first part is a general introduction to the whole paper. The second part is the application analysis of Dell's global supply chain management. In this part, this paper first briefly introduces Dell, then analyses Dell's global supply chain management modes, the features and advantages of its global supply chain, and finally analyses the problems and challenges in Dell's global supply chain management. The third part is the application analysis of Lenovo's global supply chain management. In this part, the paper first briefly introduces Lenovo, then analyses Lenovo's global supply chain management modes, the features and advantages of its global supply chain, and finally

analyses the problems and challenges in Lenovo's global supply chain management. The fourth part is a comparative analysis of Dell's and Lenovo's global supply chain management, and its implications for Chinese enterprises.

2. The Application Analysis of Global Supply Chain Management at Dell

The Introduction to Dell

Dell is a computer technology company which is multinational from the United States. It is headquartered in Austin, Texas. Dell has been a pioneer and leader in the field of e-commerce since it was founded in 1984. It has long been known in the industry for manufacturing, designing, and selling office and home computers. At the same time, it dabbles in the computer market which is high-end, manufacturing and selling data storage devices, servers, networking equipment, etc. Dell is also known for its own innovations in the aspects including e-commerce and supply chain management, especially its direct sales mode and its production mode which is configure-to-order or build-to-order, which provide customers with personal computers that meet their own requirements¹. Until 2014, Dell was No. 51 on the Fortune 500². By 2015, Dell was the third-largest PC vendor in the world, rank only second to Lenovo and HP³. Dell is the world's largest computer monitor shipper⁴. Dell is the sixth-largest company in Texas in terms of revenue, according to Fortune magazine⁵. It is also the second-largest non-oil company in Texas after AT&T⁶.

Dell operates a wide variety of products, including the following types: desktop computer (domestic use: Dimension; for business: OptiPlex), laptop (domestic use: Inspiron; for business: latitude), servers (Power Edge series and Dell/EMC series), memorizer (Power vault); interchanger (Power connect), printer (Dell xxx), PDA (Axim series), and projector (Dell xxx MP).

The Global Supply Chain Management Mode of Dell

Dell's global supply chain management mainly includes the following three modes.

¹ What You Don't Know About Dell. Bloomberg BusinessWeek.

http://www.businessweek.com/magazine/content/03_44/b3856001_mz001.htm, download: 2019. 04. 02.

² Dell – Fortune 500 2013 – Fortune. Fortune.

<https://money.cnn.com/magazines/fortune/fortune500/2013/snapshots/1053.html>, download: 2019. 04. 02.

³ Gartner Says Worldwide PC Shipments Declined 8.3 Percent in Fourth Quarter of 2015. <https://www.gartner.com/en>, download: 2019. 04. 02.

⁴ Dell Sees Solid Year-Over-Year Growth in Worldwide PC Monitor Market in Second Quarter of 2017, According to IDC. International Data Corporation. September 18, 2017.

⁵ Fortune 500. CNN. <https://money.cnn.com/magazines/fortune/fortune500/2011/states/TX.html>, download: 2019. 04. 02.

⁶ Fortune 500 2010: States: Texas Companies. CNN.

<https://money.cnn.com/magazines/fortune/fortune500/2010/states/TX.html>, download: 2019. 04. 02.

The first one is personalized product customization mode²¹. Dell adopts the B2C mode in its sales process. It directly sells online to customers, omitting the middleman link. Dell uses the Internet to get the customers' needs in the first place, and then provides the corresponding products and services according to the customers' needs. For example, customers can choose the accessories they need to assemble their computers online according to their preferences. They can even specify delivery and payment methods.

The second one is vendor managed inventory mode²¹. Dell adopts vendor managed inventory, namely VMI. Sharing information and sign long-term agreements with its own suppliers, Dell requires the suppliers supply in accordance with its production plan. The mode at this stage is B2B mode. Dell transmits and exchanges the transaction data with its suppliers through the internet. That is why Dell could successfully achieve information instead of inventory management. Therefore, Dell's spare parts inventory cycle is much lower than the average of the industry which is about 30~40 days, and it can stay within 4 days all the time. As a result, Dell avoids the devaluation which is caused by the rapid renewal of parts and finished products in the industry.

The last one is direct selling mode⁷. Through direct selling, Dell removes the middleman link and sells computers directly to users at factory prices. Compared with competitors in the same industry, Dell has a strong price advantage. However, HP, IBM and other brands still use the traditional way of relying on agents to sell, which usually increases the price by about 7%-9%. At the same time, the storage cost and capital occupancy cost in distribution channels will also increase. More importantly, they will face the risk of price reduction of spare parts. The final prices are much higher than that when they leave the factory, thus losing the price advantage.

The Characteristics and Advantages of Dell's Global Supply Chain Management

Dell's global supply chain management has its own characteristics and advantages.

First, Dell strictly selects suppliers, builds virtual combination with suppliers, and establishes partnerships with them⁸. Dell has a complete system to select and certificate suppliers. The main criterion for supplier evaluation is whether the supplier can continuously provide products without flaws. The object of assessment includes not only products, but also the whole process of production, in other words, suppliers are required to have a system which controls quality and meets the standards. To become Dell's suppliers, enterprises must prove that they have comprehensive comparative advantages in four aspects: technology, cost,

⁷ HUANG, T.: Research on Supply Chain Management Mode of Dell. MODERN SOE RESEARCH. 2016 (16), p. 71.

⁸ WANG, X. H.: Supply Chain Management for Mass Customization: A Case Study Based on Dell. Economy and Management. 2007 (7). p.42-46.

service and sustained supply capacity. Particularly, the suppliers must have a stable supply capacity over the long term in case supply instability adversely affects Dell's commitment to final users. When assessing suppliers, Dell adopts the method of safe mass production. According to the results of supplier evaluation, Dell escalates the purchasing scale of its products in stages to lower risks of unstable supply capacity of newly selected enterprises. Building virtual combination with suppliers is a kind of new mode different from traditional management. It breaks through the limitation of the organization and only retains the most important functions. These functions can represent well the characteristics of enterprises. In terms of the comparative advantage theory and the principle of core competitiveness, the non-core business of the organization is outsourced to the professional enterprises that are good at these functions. Due to the customers' demands will change at any time, the product parts production must follow the market closely. If Dell manufactures these parts itself, it will bring a great cost pressure for Dell on capital and technology investment as well as R&D. Furthermore, other suppliers are more professional than Dell. So, Dell outsources the product parts production to those powerful large suppliers. Dell and those suppliers form alliances mutually to better meet its customers' demand.

Second, Dell's inventory management is very efficient, which refers to low inventory of materials and zero inventory of finished products²². In the aspect of inventory quantity management, Dell's low materials inventory and finished products zero inventory are very famous. The average materials inventory is about only 5 days. Within the industry, the toughest competitor for Dell still has the inventory of over 10 days, and the average inventory within the industry of other enterprises is about 50 days. Owing to the material cost will depreciate by 1% every week, inventory cycle time greatly influences product costs. Low inventory alone makes Dell products have the price advantage of over 8% than other enterprises. Sales orders are transferred to the suppliers' public warehouses through Dell's data center and then the global partner of Dell will manage them. The global partner of Dell refers to Burlington which is a third-party logistics service provider. Burlington, on the other hand, can get the goods ready within an hour after receiving Dell's list and deliver them within 20 minutes. The inventory management of Dell is not just focused on "low". By managing its own supply chain bilaterally, Dell comprehensively considers users' demand and the supply capacity of suppliers, so as to achieve the better balance between the former and the latter, and further achieve the dynamic balance of inventory, which is the final objectives of the inventory management of Dell⁹.

Thirdly, Dell's customer relationship management is very effective²². Dell is able to quickly and accurately obtain customers' individual needs through one-to-one marketing to key

⁹ ZHANG, S. G.: Dell Empire-Direct and Low Price Made Powerful Dell. Beijing, China Commercial Publishing House, 2004. p. 51.

customers. In the mass customization mode, there is a coordinated and interactive relationship between enterprises and customers, which goes beyond the connotation that enterprises usually collect information and meet customer needs. The relationship between manufacturers and customers is not the traditional relationship of supply-demand any more. Manufacturing enterprises no longer proactively provide products or services to achieve the satisfaction and loyalty of customers. Consumers are no longer traditional passive goods recipients. Customer relationship management (CRM) requires production companies interact well and integrate with their customers. When customers have identified their demand with Dell's help, the salesperson will provide them with the products they need according to the customers' requirements. After the sale of products, the understanding of customers is not over. Salesmen will also establish information files of customers via Internet, telephone, or face-to-face communication, carry out quality tracking services, and continue to explore the new needs of customers. In the point view of Dell, have a good understanding of its customers is very important. In order to ensure customers, have a good consumer experience companies should be on the basis of the perspective of customers to develop new products, tailored for customers, finally achieving interactive effect.

The Problems and Challenges in Dell's Global Supply Chain Management

Although Dell's global supply chain management mode has many unique advantages, which makes Dell occupy a large market share worldwide and become one of the most successful computer enterprises in the world, it is undeniable that Dell's global supply chain management mode has faced various challenges in its own development process, and the problems of the management mode have been constantly exposed.

First, Dell's direct selling mode has its own inherent defects. The advantages of the direct selling mode are obvious, but everything is two-sided; the direct selling mode itself has inevitable defects. For the first place, the cost which is saved by the direct selling mode is actually the profit of the channel merchants in the distribution mode. That will cause the resistance of intermediary channel merchants. In the context of the dominant distribution mode in the current market, Dell adopting direct marketing mode will undoubtedly offend intermediaries. This contradiction is becoming more and more prominent in some developing countries. For example, in China, the market mechanisms are imperfect, so distribution mode cannot be replaced completely by the direct selling mode. In China's vast county-level regions and rural markets, Dell's direct marketing mode is impossible to work. Secondly, the efficiency of direct selling depends on the perfect online trading system, credit card system, logistics system, as well as all facilities and systems conducive to flat and efficient management. These are not problems in the general developed countries, such as the United States. However, in some countries where such infrastructure construction is not yet complete, such as China, it is easy to occur such phenomena as delayed delivery and

increased logistics transportation time, which will lead to undetectable cost increases, squeeze the cost savings brought by the direct marketing mode to a certain extent, and make the cost advantages of direct marketing weaken.

Second, the transformation of Dell's sales mode brings cost pressure to Dell. The magic weapon of Dell's success is to make full use of the cost advantages brought by direct marketing. However, in the process of its globalized development, in order to open up more markets, Dell has to transform its own sales mode. For example, because of the imperfect infrastructure in all aspects of the Chinese market, the advantages of direct marketing cannot be fully reflected. In order to open up the Chinese market, Dell adopts the traditional distribution mode, but this will inevitably lead to a rapid increase in costs and bring great pressure to Dell. With the strangeness of channel management, Dell will lose its competitive advantage which is the most important advantage for Dell.

Thirdly, Dell faces a saturated market and increased competition. As the price of IT products drops sharply, IT products market, particularly personal computers market, has become saturated little by little, and the whole industry has entered an era of low profit¹⁰. In this case, the development and in-depth excavation of new markets are particularly important. In some developing countries, such as China, the development and deep excavation of new markets are usually done by distributors. But for Dell, its early direct selling mode directly damages the interests of distributors, and there is a long-standing interest resentment between distributors and Dell, which makes distributors reluctant to sell Dell's products. This partly makes it difficult for the products of Dell to enter the local market.

Fourthly, Dell's rapid expansion has created loopholes in its internal management. Dell's rapid expansion has gradually exposed the loopholes in its internal management system, so Dell cannot keep up with the pace of market expansion. For example, Dell's services are often complained by users, there are loopholes in the management of call centers, and internal staff turnover rate is high. In 2005, Dell received 1,533 consumer complaints¹¹. In 2006, Dell acknowledged problems with its customer service, including call transfers of over 45% of calls and long wait times¹². Although these problems will not cause serious consequences in a short time, if they are ignored for a long time, they will cause more customers' dissatisfaction, further adversely affect the loyalty of customers to the company, and ultimately adversely affect the company's performance.

¹⁰ ZHANG, C.: Dell's Existing Problems and Development Strategy. *Journal of Hubei College of Finance and Economics*. 2009 (3). p. 14.

¹¹ LEE, L.: It's Dell vs. the Dell Way. *Business Week*. 2006. p. 18.

¹² Dell Spiffs Up Its Service. *Business Week*. 2006.

Finally, Dell's R&D investment is insufficient, making it gradually lose the advantage of leading technology. Dell's investment in R&D is low, and the major objective of R&D is cost reduction. The investment of Dell on R&D is not more than 1% of its sales revenue, which is far below the average level of 5% to 6% of its competitors. In 2006, Dell spent \$455 million on R&D, while HP spent \$4 billion²⁴. In essence, Dell is more like a sales-oriented company, which makes profits in the way of sales model's innovation as well as sales management. This mode is more effective in the situation in which the market is not saturated and the competition aims at more market share. However, with the saturation of the market and the trend of competition for new products and technologies, Dell seems to be lacking in stamina, which is also the core difficulty faced by Dell's global supply chain management.

3. The Application Analysis of Global Supply Chain Management at Lenovo

The Introduction to Lenovo

Lenovo Group Ltd., commonly abbreviated as Lenovo, is a multinational technology company. Its headquarters are located in Beijing, China and Morrisville, North Carolina, USA¹³. Since 1996, Lenovo has been the top seller of computers in China's domestic market. In 2005, Lenovo acquired IBM PC (Personal computer) business unit. In 2013, the computer sales of Lenovo rose to number one in the world and Lenovo became the largest PC manufacturer in the world. In October 2014, Lenovo announced that it had completed the acquisition of Motorola Mobility. As a leader in the global computer market, Lenovo develops, manufactures and sells reliable, safe and easy-to-use technology products and high-quality professional services to help customers and partners around the world succeed. Lenovo mainly produces desktop computers, laptops, servers, smart TVs, printers, PDA, motherboards, all-in-one computers, mobile phones, etc. By 2018, Lenovo had reached \$45 billion in revenue and \$28 billion in total assets¹⁴, having 54,000 employees¹⁵ and three subsidiaries, including Motorola Mobility, ZUK Mobile, and Medion¹⁶.

The corporate culture of Lenovo is different from other companies from China. It is operated as a private enterprise with little interference from the government, although it was founded with an investment from the Chinese Academy of Sciences which is a state-owned research

¹³ Our Company. About Lenovo. <https://www.lenovo.com/maintenance/500page.html>, download: 2019. 04. 02.

¹⁴ Financial Statements for Lenovo Group Limited. Lenovo. <https://investor.lenovo.com/en/global/home.php>, download: 2019. 04. 02.

¹⁵ Burcu Noyan: Lenovo Group. Fortune. <http://fortune.com/global500/lenovo-group/>, issued: July 2015, download: 2019. 04. 02.

¹⁶ Roger Cheng: It's official: Motorola Mobility now belongs to Lenovo – CNET. <https://www.cnet.com/news/lenovo-closes-acquisition-of-motorola-mobility-from-google/>, issued: October 2014, download: 2019. 04. 02.

institution. Many of Lenovo's senior executives come from abroad. Two foreigners have previously served as Lenovo's CEO¹⁷.

The Global Supply Chain Management Mode of Lenovo

By implementing global supply chain management, adopting ERP system and efficient supply chain system, and using flexible automated production lines, automated storage equipment, and other facilities, Lenovo brings various links into its own management, such as purchasing, producing, distributing, and use service, and manages these links within its own supply chain so as to optimize the cost and efficiency of the entire supply chain. Lenovo's global supply chain management mainly includes the following three modes.

The first one is Lenovo's VMI warehouse model. Since Lenovo implemented its own global SCM, it has enhanced its communication with the suppliers in the aspect of information, made many efforts to eliminate information gradient with them, and established VMI (vendor managed inventory)¹⁸. VMI mode is beyond the traditional mode in which there is only cooperation among enterprises in isolation. Formerly, Lenovo's two-week inventory led suppliers to stock some materials in advance to replenish the goods in time, and the cost of the inventory will be passed on to Lenovo by suppliers through raising the material price. Now Lenovo builds a VMI dynamic warehouse which is located in the factories of suppliers, and the supplier is responsible for the material in the warehouse. Lenovo only builds a transit warehouse belonging to itself. Lenovo picks up goods at VMI warehouse whenever necessary, so as to ensure that Lenovo does not suffer from product delays as a result of insufficient supply in the upstream. In terms of the warehouse management of VMI, Lenovo and its major suppliers conduct data exchange twice a day so as to reduce the errors between actual demand and the level of inventory. Both sides monitor the stock status in the warehouse by managing visually inventory. If the suppliers find that the material in the VMI warehouse is going to be run out, they will replenish within the shortest time. The VMI model has reduced Lenovo's inventory from 14 days to 5 days at the time of order production. The key to the success of VMI mode lies in eliminating the information fence between enterprises and minimizing the information gradient, which makes the inventory level in VMI warehouse beneficial to both sides. For suppliers, they can reduce the material backlog inventory costs caused by insufficient knowledge of Lenovo demand. For Lenovo, the reduction of inventory costs of suppliers will inevitably reduce procurement costs. The replacement rate of parts in PC industry is very high, and its monthly depreciation rate is about 2%. The establishment

¹⁷ From guard shack to global giant; Chinese industry. The Economist.
<https://www.economist.com/news/business/21569398-how-did-lenovo-become-worlds-biggest-computer-company-guard-shack-global-giant?fsrc=rss>, issued: January 2013, download: 2019. 04. 02.

¹⁸ LI, B.: Theoretical Analysis of Lenovo's Supply Chain Management. China Business & Trade. 2011(9). p.202-203.

of VMI warehouse reduces Lenovo's risk in the procurement process. Constructing the whole model reflects the win-win concept of supply chain

The second one is electronic bidding mode. After the successful introduction of ERP, the production process tends to be controlled by electronic information. Lenovo relies on electronic procurement in the procurement process³². First, according to the mode of material purchasing, order is placed through the e-commerce website. After the comprehensive system processing, the order becomes the corresponding number of parts which are required. Next, Lenovo searches for the data in the ERP system to check if the inventory meets the production. If the integrated plan can be implemented, the system will order production from the manufacturing system and feedback the delivery date to the customers; if the material is insufficient or part of the material is missing, the integrated planning system will generate purchase orders and ask Lenovo's suppliers for goods through the procurement coordination website.

The third one is Lenovo's gold supply chain. Through the construction of VMI, CTO (customization), electronic bidding and the exploration of Lenovo's dual business operation mode, Lenovo has built a "gold supply chain" for itself, which is admired by other enterprises³². The optimization of CTO process not only meets the different needs of customers, but also improves the customers' delivery ability to buy customized products. The electronic bidding procurement mode makes full use of the business opportunities brought by the Internet to enterprises, and greatly reduces the procurement cost of Lenovo. Under the system integration of Lenovo's end-to-end dual business model, Lenovo has established a network of logistics with three factories in Beijing, Shenzhen, and Shanghai as the center, covering 39 distribution centers in large and medium-sized cities throughout the country. After the supply chain optimization from 2000 to 2004, Lenovo has created a more efficient gold supply chain in the Chinese market than Dell's agile supply chain. Its corresponding speed and cost control have surpassed that of Dell. In China, the cost of Lenovo is just around a quarter of that of Dell, and its corresponding time is only 4 days (Dell needs about 1 week)¹⁹. This supply chain has laid the foundation for Lenovo to gain momentum in the Chinese market.

The Characteristics and Advantages of Lenovo's Global Supply Chain Management

The most prominent feature of Lenovo's global supply chain management is combining push and pull SCM to implement a dual business operation model driven by product plus sales. Lenovo divides customers into relational customers and transactional customers through

¹⁹ LIU, W. F.: The Core Competence of Enterprises from the Perspective of Supply Chain Management. *Management & Technology of SME*. 2008 (11). p. 55.

push and pull operation modes, and then adopts different supply chain management modes according to different types of customers, giving full play to their own advantages. The advantages of Lenovo's global supply chain management are mainly reflected in the following four aspects.

First, Lenovo's global supply chain management has the competitive advantage of information integration. Lenovo's global supply chain management minimizes the information cost of its entire supply chain, and its management goal has become the information management of the whole supply chain integration. In the course of operation, a closely related information network will eventually be formed which integrates the whole supply chain and having an information interest group that integrates dispersed information in the market, Lenovo can improve its market competitiveness and participate in a higher level and more comprehensive market competition.

Second, Lenovo's global supply chain management has a competitive advantage in the way it operates. Through obtained information Lenovo organizes production and operation according to the actual needs of consumers, making Lenovo's operation mode shift from speculative demand to actual demand. As long as customers have requirements, Lenovo must wholeheartedly meet their requirements. Therefore, Lenovo can directly meet the customers' requirements for product personalization. In this way, using the supply chain network, Lenovo can communicate with customers in time, and can grasp the demand information of consumers in time, so as to it can adapt to rapid and changeable demand changes.

Thirdly, Lenovo's global supply chain management has the competitive advantage of reducing costs. Through global supply chain management, Lenovo has changed the traditional concept of inventory and come up with a new inventory concept. Through VMI and other new inventory management technologies, methods and concepts, Lenovo's zero inventory management can be realized, thus greatly reducing some duplicate resource costs, and then greatly reducing the management cost of the entire supply chain.

Fourthly, Lenovo's global supply chain management has the competitive advantage in management technology. Lenovo's global supply chain management has made the traditional business operation mode change. Through the application of modern information technology, such as logistics bar code technology, commodity bar code technology, electronic ordering system (EOS), vendor managed inventory (VMI), and quick response services (QRS), it has improved the accuracy and rapidity of business processing, reduced staff, simplified the operation process and improved efficiency.

The Problems and Challenges in Lenovo's Global Supply Chain Management

Lenovo began to integrate its global supply chain after acquiring IBM personal PC in 2004. However, over the past few years, Lenovo's dual mode replication has not been successful enough. Lenovo's push and pull SCM are facing challenges in the international environment.

First, Lenovo's push SCM suffers from channel blockage. Push supply chain management operation mode refers to the one which is around manufacturers and in which the products are gradually promoted from distributors to customers after production. Push mode corresponds to Lenovo's previous transactional customer business model. It is impossible for this supply chain to grasp the market demand accurately as it does when facing enterprises directly. It needs to forecast the market and strengthen the management of channel inventory.

Push supply chain requires produce in advance. If the market forecast is not accurate, it will cause higher inventory costs. In the adjustment of Lenovo's business, Lenovo subdivides the original seven regions into 18 sub-regions. At the same time, it makes the organizational structure flat enough. By doing this, the information flow is shortened and the make the information gradient less influence the loss of information.

Managing push supply chain should attach importance to accurately grasping market demand information, making the forecast data of orders and accessories more accurate and the adjustment frequency more intensive, so as to make the products manufactured by enterprises can meet market demand without the shortage of supply caused by the shortage of goods.

PC business operates in two different channel modes at home and abroad. In the market domestically, it is mainly a manufacturer-driven mode, in other words, Lenovo brand influences all of the links within the supply chain, drives distribution and drives retail sales. In the channel mode internationally, the terminal is the most important, that is, consumers decide the demand of the whole market. The promotion of this model certainly suffers resistance before opening up its own channels abroad²⁰.

Secondly, Lenovo's pull SCM lacks agility. Pull-type supply chain management operation mode refers to the one which takes the end-user as the driving source. The whole supply chain has high integration density and quick exchange of information. With this supply chain, customized services could be achieved in accordance with users' needs. The pull-type supply chain of Lenovo, in fact, mirrors the relational customer operation mode in Dell's direct selling mode, and implements tailor-made service mode for end customers.

²⁰ LI, B.: Analysis of Lenovo's Global Supply Chain Management. Productivity Research. 2011 (9). p.171.

Pull-type supply chain directly face customers' personalized demand, so the enterprise's various links face higher requirements. It requires enterprises not just to digest and absorb the features of market demand, but also to synchronously improve their R&D capability and development capability of new products, etc. Otherwise, in the face of the increasingly diversified demand in the PC industry, enterprises will be difficult to cope with, resulting in customer churn, the decline of customer satisfaction, etc.

In the pull-type supply chain, customers include domestic customers and foreign customers. At the international level, the diversification of demand for Lenovo production line design put forward more stringent requirements. For mature markets, such as the markets in the United States and Europe, consumers' choices of PC are more rational and their requirements for functions are more diversified. A wider customer base has put forward higher requirements for Lenovo's production, and the requirements for the cohesion of each link have been improved accordingly. Lenovo's product delivery routes are much longer in overseas market than in domestic market, and the length of transport routes in pull supply chain affects delivery speed. Lenovo's long delivery routes affect the agile supply to customers. After getting into the market internationally, Lenovo is confronted with challenges in balancing the cost of logistics with on-time delivery³⁴.

4. The Comparative Analysis of Global Supply Chain Management between Dell and Lenovo and Its Implications

The Comparative Analysis of Global Supply Chain Management between Dell and Lenovo

Through the above elaboration of Dell's and Lenovo's global supply chain management, we can summarize the two companies' global supply chain management modes up as integrated supply chain management and seamless supply chain management. The former is based on the construction of direct marketing channels in the downstream of the supply chain, crosses the enterprise's own boundaries in the upstream of the supply chain, implements virtual management on the basis of demand information, brings parts suppliers and complete machine suppliers into Dell's management system, and fulfils its functions in accordance with Dell's instructions. The latter takes demand forecasting as a link. Through the demand forecasting model and the fast adjustment mechanism when the forecast deviates, and with the aid of supply coordination and distribution coordination, it achieves the seamless transmission of information with supply collaboration and distribution collaboration, so as to

meet the differentiated and diversified demand of customers²¹. The differences between them are mainly reflected in the following aspects.

First of all, Dell's direct selling mode enables Dell to forecast directly the demand of downstream end customers and share the demand information with its supplier in the upstream by the supplier participating in inventory plan, which makes the whole supply chain ready to meet the expected demand, thus realizing virtual integration and integrated operation. In contrast, in its global supply chain management, Lenovo is faced with the complex tasks of opening up the international market, establishing a global supply chain and realizing the transnational integration of supply chain after the acquisition of IBM. This makes Lenovo unable to align with the advantages of external resources to improve the quality of its products like Dell. At the same time, the degree of Lenovo's information sharing with suppliers and channels is also affected by the integration process. For example, after acquiring IBM and doing overseas business, Lenovo's domestic business and overseas business belong to two management systems. The core resource demand plan in the supply chain can only be adjusted in the international system once a week, while it is adjusted in the domestic system twice a day. In the original IBM PC system, customer return information is fed back to the back end through the IT system often in a week or two weeks²². However, it cannot be denied that Lenovo pays more attention to the integration of channel management and supply chain management. Its understanding of demand has gradually changed from the demand response stage to the demand impact and lead stage. Dell's make-to-order operation process, which receives orders through website and telephone and constantly adjusts its production plans according to market changes, is still in the stage of rapid and accurate passive response to requirements²³.

Secondly, Dell's logistics management has obvious advantages. Dell has been focusing on the reduction of cost and the establishment of time advantage. Dell has six factories worldwide, including Penang in Malaysia and Xiamen in China. It centralized orders from over 200 suppliers to 50 of them, but only if they build warehouses next to Dell's factories and delivery to the nearest, and eliminated the suppliers which were reluctant to do that from the supply chain. Dell's own spare parts inventory time is less than 2 hours. Once Dell receives the order, it will notify the supplier to send the spare parts. It takes just 4 hours from the feedstock to the assembly and delivery. In the procurement logistics, Lenovo's implementation of customer demand design procedures has been significantly improved. In

²¹ GAO, J. J. et al.: Analysis and Comparison of Innovated Demand China Management Modes in Computer Industry. *Logistics Technology*. 2012 (1). p. 114-115.

²² FENG, Y. D.: Lenovo Supply Chain Integration: The Most Complex Questions and Answers. *Business Week*. 2007 (20). p. 85-87.

²³ WANG, Y. M.: Virtual Integration of Supply Chain Enterprises from Dell's Business Model. *China Business & Trade*. 2010 (14). p. 48-49.

terms of finished goods logistics management, Lenovo began to search for suitable transport providers through electronic bidding in 2009. It uses Ariba's electronic bidding tool, invites logistics suppliers to conduct online real-time bidding, and determines partners according to service price and quality. But Lenovo's manufacturing base needs to purchase raw materials and spare parts globally with more than 300 suppliers, which leads to the inevitable hoarding of original parts in Lenovo's production. At the same time, in order to meet the demand of the market in the downstream sales channels, a lot of inventories are needed to support sales at all sales points, resulting in difficulties in inventory and cost reduction.

Thirdly, the cost control of sales channels is the key link for the two computer enterprises to build their core competitive advantage. The direct marketing mode has become the common development direction for them to reduce the cost. Dell's direct marketing model completely cancels the distribution link, directly contacts customers in a way of direct selling to reduce costs and improve service quality, and is not restricted by distribution channels in terms of capital return, thus establishing its own competitive advantage. Lenovo has also launched its own direct marketing channels to gain this competitive advantage, but it strives to make full use of its old channels while developing direct marketing channels. By adopting the way of joint construction of entity retail channel, distribution terminal and service terminal, and building harmonious channel relationship, Lenovo increases trust among channel subjects to avoid the increase of channel cost.

Finally, in terms of product appreciation, there are no large-scale value-added programs in the computer industry. Lenovo and Dell have both made some explorations in terms of product appreciation. Dell products are positioned at same benefits for less price, and its efforts to increase product value are more reflected in the choice of suppliers. Companies with strong R&D capabilities, manufacturing capabilities, financial capabilities, quality and cost control capabilities, and flexible supply capabilities are likely to become Dell's suppliers. Dell usually also expects suppliers to have a wide range of customers. Dell believes that if a supplier only serves for Dell, its vision is often not wide enough to keep close contact with the market. If a supplier serves for Dell and other companies, such as HP, Apple and IBM, its products are guaranteed²⁴. Lenovo increases customer value through customization. Customers can configure automatically according to their own choices. The system can offer quotation automatically, so that customers can choose products online, and can get real-time price and delivery time.

²⁴ HAN, R.: Dell's Global Supply Chain Management. *China Logistics & Purchasing*, 2005 (2). p. 68-70.

The Implications of the Case Analysis for Chinese Enterprises

Through the comparative analysis of Dell's and Lenovo's global supply chain management, we can find that, first of all, Dell's and Lenovo's global supply chain management have both similarities and differences. Secondly, although Dell's and Lenovo's global supply chain management have differences, they have taken certain market shares and achieved their own development with their own global supply chain management. Thirdly, Dell and Lenovo have regional differences in their respective successes with global supply chain management. Therefore, this paper believes that Chinese enterprises can get the following inspirations.

Firstly, Chinese enterprises should learn from their common successes, that is, to focus on customer needs, to reduce costs as much as possible, and to focus on product appreciation. Firstly, Chinese enterprises should attach importance to customer needs. On the one hand, they should make full use of the Internet and related information systems to better understand the real needs of customers, and provide customers with products that keep them satisfied. On the other hand, they should improve their own services to match their products, so as to avoid customer dissatisfaction or even loss due to service defects. Secondly, Chinese enterprises should strive to establish a more perfect global supply chain management, optimize all links of the supply chain, reduce their operating costs as much as possible, and provide consumers with products with higher cost performance. Finally, Chinese enterprises should make continuous improvements in products and services, realize the added value of products, and then achieve their own sustainable development.

Secondly, when developing domestic market, Chinese enterprises should learn from Lenovo and adapt to local conditions. That is to say, Chinese enterprises should take into account the reality of the domestic market when developing the domestic market. For example, in the Chinese market, the intermediary channel merchants shoulder the responsibility of opening up and digging new markets in depth. Moreover, the various market mechanisms are not perfect enough. In addition, the sales mode in the vast county-level regions and rural markets is not mature enough. Therefore, in China, the direct marketing mode cannot completely replace the distribution mode. Moreover, the incomplete infrastructure will bring hidden cost increase to the direct selling mode. Therefore, when developing domestic market, Chinese enterprises should take into account the two modes of direct selling and distribution, make full use of their advantages, and minimize the negative impact of their disadvantages on their own development.

Finally, Chinese enterprises should learn from Dell and make full use of the advantages of direct selling mode when developing international markets, especially in developed countries with relatively perfect market mechanisms such as European and American countries. Specifically, Chinese enterprises should integrate suppliers and customers effectively like

Dell, to improve their operational efficiency. Chinese enterprises should also simplify and optimize the supply chain process like Dell, speed up information feedback, strengthen their own inventory management capabilities and their collaboration with suppliers. In addition, Chinese enterprises should strive like Dell to establish good relations with customers, do a good job in customer relationship management, maintain existing customers with better products and services, and attract more new customers.

5. Conclusion

Supply chain is a complex organizational network. It contains many links, such as manufacturers, suppliers, retailers, distributors, and customers. By controlling the flow of information, materials, and capital as well as starting from the purchase of raw materials to the sales of finished products, supply chain connects many links in the upstream and downstream into a whole. If the node enterprises in a supply chain belong to or are located in different countries, this supply chain is called global supply chain. In accordance with different criteria, global supply chain could be classified into many types. Global supply chain has the characteristics of internationality, complexity, risk and high standard. Supply chain management is to design, plan and control all links and elements of the supply chain to maximize the overall value of the supply chain. Supply chain management has gone through several stages of development. Global supply chain management has its own features, that is, taking consumers as the core, the concept of cooperation and competition as the concept, and modern network information technology as the support.

In the construction of supply chain, the application of information technology is the effective tool, the optimization of goods flow is the foundation, the adjustment of supply chain management structure is about strategy, and the maximization of the profit of enterprise supply chain is the goal. It can be said that information is the primary task of the development of enterprise supply chain. Therefore, Chinese enterprises must carry out information transformation that suits them, and widely implement the application of enterprise management consulting system, resource planning system and electronic supply chain management system. To strengthen the management of goods flow, enterprises should fully realize the control of production planning. Optimizing inventory management of the overall supply chain, reducing logistics costs, improving logistics efficiency as well as enhancing control over the core competitiveness of enterprises. What's more, enterprises can apply business outsourcing with the integration of enterprise resources for driving the development of enterprises with an overall enhanced supply chain.

As China's green supply chain management is still in its infancy, it can be said that popularizing green supply chain management in China will be a long and arduous process. In addition to introducing advanced concepts from abroad, many domestic companies are

also exploring the transformation path of their own supply chain management structure. And the direction of the solution is similar to that of foreign countries, for example, they are beginning to realize the importance of the choice of suppliers to the enterprise. However, although Chinese enterprises have taken many measures to improve management efficiency in the management process, most of them are carried out within the enterprise or within the enterprise sector, and are not considered from the perspective of the entire supply chain. Most of enterprises do not understand global supply chain management, and they do not understand the status of foreigner management. The functions of traditional logistics departments within the enterprise can no longer adapt to the current international business environment, and it is urgent to carry out reforms from the management concept.

Due to the particularity of China's socialist economic system, government policies and legal regulations will affect the cooperation of various sectors in the supply chain, which will have an impact on the supply chain management of enterprises. Officially, the government should pay attention to the improvement of the enterprise supply chain management environment. It is necessary not only to promote the improvement of industry laws and regulations, but also to strengthen the standardization of supply chain management. It is also necessary to implement the agreement of industry supply chain management to reduce the management differences between enterprises. The market should establish a supplier quality assurance system to strengthen the relationship between enterprises and suppliers. It can enable powerful suppliers to participate in the transformation of important issues of the companies and establish a strategic alliance with them to enhance their own competitiveness. While vigorously developing diversification, Chinese enterprises should do a good job evaluation of the projects, reduce the high-cost business and redundant investment of the enterprise. To concentrate the core resources of the enterprise, fully apply the business outsourcing. Especially small and medium-sized enterprises must strengthen the concept of taking the overall supply chain as the core.

As the leading enterprises in the computer industry, Dell and Lenovo have achieved their own development and growth through effective global supply chain management. Dell's global supply chain management modes mainly includes personalized product customization, vendor managed inventory and direct selling. With its global supply chain management, Dell has reduced costs and built good relationships with suppliers and customers. However, Dell's global supply chain management also has some defects, making it face a series of challenges. Lenovo has also adopted effective global supply chain management modes, including vendor managed inventory, electronic tendering mode, and dual business mode. These enable Lenovo to achieve the competitive advantages of information integration and costs reduction as well as the competitive advantages in the mode of operation and management technology. However, in the international environment, Lenovo's global supply chain management has also exposed some problems and faced many challenges. Through the comparison between

the two, we can find that they have both similarities and differences in global supply chain management, as well as successes and shortcomings. For Chinese companies, in order to have a foothold in the world, they must learn from the common successes of Dell and Lenovo, focusing on customer demand and product value added as well as minimizing costs. In addition, Chinese enterprises must learn from Lenovo and Dell respectively when exploring domestic and international markets, learn to adapt measures to local conditions, and make full use of the advantages of the direct selling model. More importantly, Chinese enterprises must clearly recognize the problems in their own supply chain management, and adopt effective countermeasures to optimize their supply chain management, so as to make themselves invincible in the domestic and international markets.

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