

Effective Strategy of Enterprise Supply Chain Quality Management

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Abstract

Supply chain quality management is to organize the individual links of the supply chain to build a complete and effective supply chain quality assurance system to ensure that the supply chain has continuous and stable quality assurance capabilities. This article aims to analyze the importance of supply chain quality management, clarify the core concept of supply chain quality and demonstrate Phenomena and trends of the supply chain in today's society, concentrating on four effective strategies to realize quality controlling on supply chain management.

Keywords

Supply chain; Quality; Quality Control; Supply chain quality management strategy.

1. Introduction

Contemporary listed company, be it in the service industry or product R&D. Effective supply chain management will help to offer edge in competitiveness, shortening the capital circulation time, reducing enterprise risks, etc. Now, supply chain era has quietly arrived. Specifically, it has opened up the entire supply chain information flow, logistics, and capital flow, adjusted business structure according to changes in customer needs, established an efficient and collaborative organization system, and provided customers with high-quality services. Thus, this enterprise supply chain trend has become an essential research for today's enterprises direction, which demonstrates that the company has entered the era of a comprehensive supply chain. Under the system model of supply chain, the management of an enterprise is the management of quality, and the quality management station must stand at the system level of the supply chain. Therefore, keeping the line of defense of the enterprise supply chain quality management has become the most critical core issue.

Let us first clarify, what is the quality standard of a company's supply chain? There are usually three levels of quality standards: the first layer: compliance. Such standards often include laws, regulations, international standards (such as ISO requirements, etc.), national standards (such as Japan's JIS), and implementation standards. The second layer: requirements stipulated by corporate standards. Specifically, this refers to the documented quality standards established by each enterprise according to its own characteristics. The third layer: customer requirements. This level is the highest level of quality standards and is also a key element for companies to win customer orders. Therefore, the core task of supply chain quality management is to face customers, accurately grasp the pulse, and locate customer needs (Figure1). So, how to efficiently manage the quality of a company's supply chain and keep the defense line of supply chain quality? Let's talk about the four aspects of the strategy at the beginning:

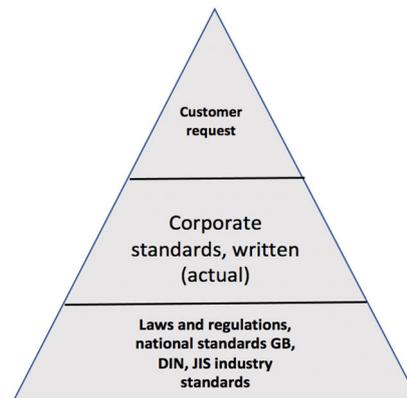


Figure 1. Three levels of quality requirements

2. Four Perspectives

First of all, under six-sigma management process, high-quality products are the foundation for grasping the quality management of an enterprise's supply chain.

All the companies have always been fitted in awe of quality on their target products. How much can quality costs of different manufacturing levels account for a company's turnover? On table 1: with a company with a general industrial level ($3\sim 4\sigma$), its quality cost can account for 15% to 30% of its operating income; for an enterprise that lacks competitiveness ($1\sim 2\sigma$), its quality cost can account for 30%~40% of its operating income, even higher [1]. Therefore, it can be seen that the higher the quality level, the lower the proportion of quality cost to turnover. that is, high quality and low cost. The relationship between quality level and turnover proportion is also shown in the following figure 1:

Table 1. The relationship between quality level and proportion of turnover

σ Level	Defect rate (PPM)	Quality cost, turnover	Level of competition
6 σ	3.4	<10%	World class
5 σ	224	10%~15%	
4 σ	6387	15%~20%	Industry average class
3 σ	66811	20%~30%	
2 σ	305250	30%~40%	Lack of competitiveness
1 σ	701361	>40%	

Actually, quality is the main driving factor for market share. In the 1980s, enterprises worldwide received a wakeup call on the market. Japanese manufacturers like Cannon, Kawasaki, and Toyota invaded the U.S. market, capturing market share and putting rivals out of business (e.g., the U.S. consumer electronics industry). Lots of local United States Analysts find that the local U.S. products don't have first-mover advantages to attract the customers and then, they begin to consider that "What are they doing differently on products between United States and Japan?" When they did the analysis, the pundits discovered that Japanese rivals adopt relying on longer-term, more tightly integrated buyer/supplier relationships promoted by just-in-time sourcing and the Japanese Keiretsu structure. In other word, the Japanese manufacturers adopt the mantra, "faster, better, cheaper" and better quality and lower prices delivered by Japanese manufactures captivated the American consumer, taking over the market. When local U.S. manufacturers lose competitiveness and market share, how did they respond on such market monopoly? The answer is that they adopted lean-six sigma manufacturing and slowly but surely, they turned to high-end quality suppliers for help. By 2015, even General

Motors had announced that it would adopt longer-term contracts and build closer relationships on such lean operating suppliers to gain greater access to guarantee product quality innovation. In short, supplier selecting process will promote guarantee of high-quality products and the implementation of six-sigma management promotes a virtuous cycle from understanding and satisfying customers' needs to achieving maximum profits. It aims to improve customer satisfaction by reducing arbitrariness and error rates. Also, quality breaks away from a set of inherent characteristics and targets to meet and exceed customers' expectations from improving quality to charming quality, leading customers' expectations and making customers become loyal fans. On the basis of 6 management, informatization and automation, intelligent manufacturing lays the foundation for the realization of excellent performance.

Second, enterprise should promote synchronization management with suppliers. A case demonstrates that Boeing's outsourcing the major modules of its signature product 787 plane to suppliers around the world. what seemed to be a wise strategy to cut down the up-front development costs. Unfortunately, Boeing's and its suppliers' efforts weren't synchronized. Therefore, the result is that Boeing companies ended up delaying the 787's launch by over three years and driving up the initial development and manufacturing costs to over \$30 billion [2].

As I studied this case, I found that the effective coordination between suppliers and manufacturers is the key to the success of a project, which cannot be possible without both parties engaging actively in the process. However, it is the latter that often takes the lead and works closely with their suppliers by establishing themselves as the authority of a supply chain. This is not easy, because the supplier commitment is hard-earned. In other word, this is to say, suppliers might not want to work closely with a manufacturer– they might be worried about expending too many scarce resources or getting distracted from their core business. Therefore, if a supply chain project is to succeed, its manager should be able to convey clearly “what’s in it for them” and step up as a motivator. This is what initially interested me about project management: it is a field in which I will be prompted to be a leader or a coach, encouraging my team and partners to work at the same pace and overcome challenges together.

Third, effectively reduce the utilization rate of the production line can promote the quality management of the supply chain. In black Friday, waiting in line outside the Canadian goose store in Chicago, we will see that there are obviously more people in the store, but the waiter asks to wait in line. Many tourists are puzzled. In fact, the purpose of the waiter did this in order to reduce the utilization rate of the waiter for the entire Canadian goose store. If the store carries more customers every day or during seasonal peaks, the limited number of waiters in the store will not be able to serve every customer efficiently. If the utilization rate of waiters reaches its peak, customers will wait in long queues, and there will be cases where there is no stock on the shelves but no one to replenish. Therefore, it is very essential to effectively reduce the utilization rate of the production line in the supply chain to ensure normal operation. Also, I highly appreciate the scientific utilization of process in supply chain management. From the initial goods delivery, to applying EOQ analysis, all aims at reckoning the balance between ordering cost and number of inventories, specifically in reducing the utilization of using forklift and storage space in the warehousing system to guarantee lower utilization rate of reserved space and less holding cost in warehouse. Therefore, the utilization rate always promotes the alternation of supply chain system, dedicating in lower utilization rate to adapt the higher demand of the market.

$$EOQ = \sqrt{\frac{2(\text{Annual Demand} * \text{Cost per Order})}{\text{Annual holding cost per unit}}}$$

Lastly, supply chain quality management is related on big data management, fitting into E-commerce tendency in manufacturing, warehousing, supplier process selection, retailer's system and transportation. In the manufacturing process, data management can improve to

identify the dimensional difference between parts and therefore, it is benefit for the enterprises or suppliers to make defects analysis of the products, finding the drawback and enhanced the quality of products on the market. In the warehousing system, a leading forklift supplier have blended ERP and WMS into the automatic forklifts, promoting these machines to collect the exact information of inventories in a real time during the picking process. The image video on these automatic forklifts can demonstrate temperature, shelf weight, and the weight on the forklift, contributing on monitoring picking accuracy, warehouse productivity and inventory accuracy in real time.

Data analysis also promotes strategic decisions on supplier selection process. Currently, one pharmaceutical enterprise has established a database with bidding activities for packaging. The data analysis in E-commerce has been evaluated to fully understand the cost structure of those suppliers, setting up detailed cost models for diverse types of packaging to hold reverse auction on the bidding suppliers. Using updated information on percentage analysis of commodity prices, factor costs, and plant utilization, these cost models can be dedicated into selection of the most suitable suppliers for new packaging projects.

Retailers can also use new data sources management to improve planning processes and their demand-sensing capabilities. For example, Blue Yonder has developed a data-intensive forecasting method, which is now applied to the retail industry, with 130,000 SKUs and 200 influencing variables generating 150,000,000 probability distributions per day [3]. This greatly improvement dedicates the accuracy of forecasts and better understanding of the logistics of enterprise in capacity needs, reducing obsolescence, inventory levels and out of stock in the warehousing system. Another classic example dedicated into Wal-Mart's retail link model. If you fly to Arkansas Northwest Regional Airport (XNA), you will immediately notice large proportion of leading consumer goods suppliers. In order to support Wal-Mart, the world's largest retailer, they opened an office. If you visit Procter & Gamble or Unilever at the same time, you will find a large number of inventories, merchandise and replenishment managers to establish network of supply chain online. Their job is to use the E-commerce system on real-time inventory and POS data received through the Wal-Mart retail link system to determine when and how much goods will be shipped to Wal-Mart stores nationwide and around the world [4]. Their goals are to optimize circulation (products sold in Wal-Mart stores) and minimize the cost of inventories. In a sense, Walmart uses Retail Link to share the information needed to outsource most of its "back office" to suppliers.

In the transportation perspective, Trucks corporation already promotes using of analytics to enhance their operations. For instance, those companies adapt fuel consumption analytics to improve driving efficiency, controlling GPS technologies to reduce waiting times by allocating warehouse bays in real time. In order to save freight cost during the delivery process, Courier enterprises have innovated real-time e-commerce routing of deliveries to customers based on their truck's geo-location and traffic roads data management system. For example, UPS has spent ten years developing its On-Road Integrated Optimization and Navigation system (Orion) to optimize the 55,000 routes in the network [3]. Today's, with complete routes network systems on E-commerce, UPS uses big data analytics on logistics to promote fewer delivery attempts during the transportation, protecting the environment by lower emission of carbon dioxides and reducing freight costs.

3. Conclusion

Summary, in order to build a good supply chain quality management system, we cannot rely solely on a single supplier. 6-sigma technology can better help us occupy market share. Synchronous cooperation with suppliers increases the processing efficiency and turnover of products. problem. The utilization line enables us to adapt to the changes in various customer

needs while improving product quality. Finally, today's supply chain in the era of big data provides us with an efficient and fast integrated logistics system from manufacturing, supplier selection, warehousing systems, retail and transportation industries, using data analysis to maximize product defects and promote the effectiveness and accuracy of supply chain quality management.

Finally, let us create the beauty of the supply chain together and open a world of quality!

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