

A Study Based on Lean Six Sigma Auto Parts Production

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Abstract: The improvement of technology and economic levels has provided a good development advantage for the automotive industry, and the size of the automotive industry market continues to expand. This has made the competition in the auto parts processing industry gradually fierce. and new auto parts processing technologies have been continuously produced. The quality of auto parts affects the overall performance of the car, so in the auto parts processing industry, quality, efficiency and technology have become prime competitive factors. Lean six sigma is a management method that is increasingly popularized in today's quality management system, which actually combines lean production and six sigma management methods. This study selected a real case of process transformation in the background of an auto parts production company. Based on the idea of Lean six sigma process transformation, the improved methods of auto parts production process was fully adapted to achieve double improvement in business and efficiency.

Introduction

With the development of modernization, intelligent technology and the auto parts manufacturing industry have effectively merged to form a new intelligent manufacturing system. Although the current research on auto parts production is relatively comprehensive, the research on lean auto parts supply chain logistics is slightly inadequate, and apart from Japan's Toyota Motor Corporation, other auto companies failed to successfully apply lean auto parts supply chain research. The manufacturing execution system, as the execution layer between the company's planning management and the grass-roots control layer, is an integral part of realizing the company's intelligent automation and improving the manufacturing efficiency of intelligent auto parts. At present, the entire automobile manufacturing industry is becoming more and more refined and streamlined. The production of a car requires the cooperation of multiple companies, and each part of the car needs to be produced and distributed between various suppliers. This tendency makes the proportion of logistics costs in the entire automobile production cost cannot be ignored, and it is considered by domestic and foreign automobile manufacturers as the source of third-party profits. Existing research shows that in Europe and the United States, the cost of parts logistics accounts for 8% of the entire automobile manufacturing cost. In Japan, its share has been squeezed even lower, at only 5%. However, the share of parts logistics costs in China is as high as 15%. This paper proposes the Lean six sigma auto parts production theory, and uses this theory to summarize the relationship between automobile assembly manufacturers and various parts suppliers, that is, one assembly manufacturer is interconnected with multiple parts manufacturers, one parts manufacturer is interconnected with multiple assembly manufacturers. It is a very complex multi-node network.

1. Problems with Auto Parts Enterprise Cost Control

The auto parts industry is the foundation of the automobile industry. In recent years, with the rapid development of the vehicle consumption market and the service and maintenance market, especially with the support of national policies, China's auto parts industry has developed rapidly and has shifted to a specialized direction. However, the overall development of China's auto parts industry is still on the initial stage. The output value of China's auto parts industry accounts for only about 30% of the total output value of the automobile industry, which is far from the 60% to 70% of

the developed countries. Moreover, due to the lack of quality control and research and development capabilities, auto parts enterprises in our country mainly produce low value-added products.

Some employees of Auto parts enterprises with inadequate cost awareness mistakenly believe that they just completed their assigned work simply and mechanically, and enterprise cost control is only the responsibility of a small number of managers and financial departments. Due to the lack of brand-new cost control awareness of auto parts companies, the enthusiasm of cost control is severely reduced. The cost management is mainly based on after-the-fact accounting and analysis. With the development of era, there are serious differences between the traditional cost management model and the development of enterprises. Traditional cost management has a low management effect on current auto parts companies, the principle of benefit trade-off is not unified, with one-sided attention to short-term economic benefits and lack of comprehensiveness and relevance of cost management. Cost prediction, cost decision, cost planning and other links belong to ex-ante control, cost accounting, cost analysis while cost assessment belong to ex-post control, cost control must be done at all stages. Most of China's auto parts enterprise cost control only considers the results, but ignores ex-ante control and in-event control, and the company often reduce costs blindly, leading to problems such as misjudgment of managers and reduced enterprise efficiency. Relationship between economic efficiency and cost control cannot be handled, ignoring the realization of corporate core competition strategy. Due to various factors, China's auto parts companies lack a complete cost control system, and it is difficult to clarify the cost responsibility of each department.

2. Lean Six Sigma Theory

The basis of the fundamental principles of lean thinking is to define value from the customer's point of view, drive the value stream with the customer demand, and achieve cost improvement and optimization by continuously eliminating waste such as inventory, materials, waiting, and overproduction. In lean thinking, continuous improvement is both the basic method and the foundation and summary of lean thinking. The basic principle of lean thinking is "reach perfection". Emphasis on "through continuous improvement, continuous development and perfection of different areas or work positions of the enterprise, to move towards perfection." Continuous improvement is the biggest advantage of lean management. Many management models attach importance to improvement, but they often ignore the spirit of uninterruptedness and continuity. This is the key to continuous perfection of the management model and continuous improvement of relationships with customers, suppliers, and employees. Six Sigma (Six Sigma, 6 Sigma) is a management strategy. It was proposed by Bill Smith, an engineer who was working at Motorola in 1986. Six Sigma's strategy first emphasizes to set high goals, then collects and analyzes data through various technical means, and finally eliminates variations in the process to reduce defects in products and services.

The application of the concepts and tools in Lean six sigma in production makes the enterprise reduce waste and the product quality is continuously improved. The effectiveness of Lean six sigma originates from the integration of two popular process improvement methods to form a single, coordinated solution that complements and promotes each other. Compared with adopting these two methods alone, the combination of the two can identify and implement improvements faster, control process changes better, and reduce costs to a greater extent. Lean six sigma is a method to maximize shareholder value by improving customer satisfaction, reducing costs, improving quality, speeding up processes and improving capital investment. If any one of the management methods is implemented in the enterprise, it will soon be found that another management method is needed to cooperate with each other, so the integration of Lean and Six Sigma can achieve the best results.

3. Research of Lean Six Sigma Theory Applied in Auto Parts Production

Auto parts inventory is the materials that are stored to ensure the smooth progress of production

and operation, including raw materials, work in progress, maintenance spare parts, consumable parts, finished products, etc. Just like a large ship operated by auto parts company sailing on the iceberg is at risk of hitting the rocks at any time. So it is said that inventory is the resource of all badness. Auto parts company's current warehouse is divided into raw material warehouse, semi-finished product warehouse, packaging material warehouse, finished product warehouse and chemical warehouse. Due to the wide distribution and long distances of suppliers, even some suppliers distributed abroad, coupled with the variety of electronic parts and complicated products, the inventory has always been high, the number of inventory turnover has been around 9 times, and the current total amount of warehouse inventory is about 68 million, mainly including finished products, semi-finished products, raw materials, packaging materials and sluggish materials. The proportion of the specific types of material inventory amounts is shown in Figure 1.

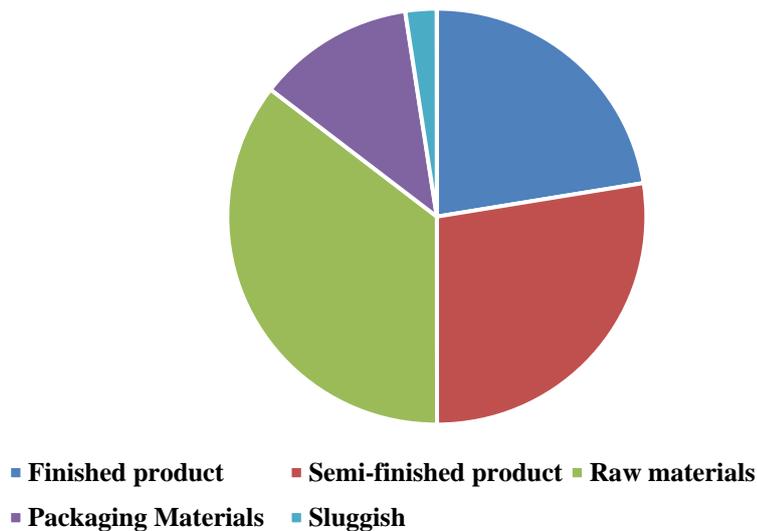


Figure 1. Auto parts company Warehouse stock materials amount distribution chart

Lean six sigma is generally implemented in the form of projects in enterprise promotion, mainly focusing on process optimization, eliminating waste and reducing variation. The specific performance is to shorten the delivery cycle to increase order fulfillment rate, reduce the variation of the manufacturing process to improve quality of the product, and implement on-time production to reduce the inventory backlog.

The production of Auto parts mainly comes from two aspects. On the one hand, it is from good communication with customers and listen to them. At the same time, customers are the first, so satisfy their requirements as possible to improve customer satisfaction. This is what we usually call VOC (VOC: Voice of customer). On the other hand, it comes from the auto parts company's own business development requirements, which is what we call VOB (Voice of business). According to the strategic development of auto parts company, auto parts company needs self-adjustment and self-improvement. In order to promote these improvements in time, the Lean six sigma project appears.

Conclusion

Under the context of increasingly tense competition in the auto market and the increasingly important cost of auto parts production, the optimization theory and lean theory can be adapted to improve the previous insufficient model of auto parts supply chain logistics. Based on overall consideration of all factors influencing the service level of auto parts supply chain logistics, an optimization model of lean auto parts supply chain logistics is proposed. This mode can effectively reduce the cost of auto parts production and thus reducing the cost of automobile production. It is of great significance to improve the brand competitiveness of China's automobile enterprise. In

addition, as the matter that automobile enterprise started late in our country, ability to cope with risks is low, and experience of auto parts production is deficient, the proportion of each link in auto parts production should be adjusted in a targeted manner, according to the differences in market positioning of automobile enterprises in China. So as to achieve the purpose of accurate optimization optimization of minimizing logistics cost at minimum cost.

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