MIT SCALE RESEARCH REPORT

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This reprint is intended to communicate research results of innovative supply chain research completed by faculty, researchers, and students of the Global SCALE Network, thereby contributing to the greater public knowledge about supply chains.

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Research Report: ZLC-2012-7
Linking Customer Perceptions and Supply Chain Efficiency
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KEY INSIGHTS

1. Targeting a proper service level is key to keep profitable when improving customer perceptions.

2. Identifying customer perception drivers and supply chain efficiency drivers is important to maximize customer perception at the lowest cost.

3. Product availability and information transparency plays a vital role in customer perceptions.

Introduction

How to continuously improve customer perceptions without significant incremental cost? What types of customer-facing policies are effective in aligning customer perceptions and supply chain efficiency? These challenges are faced by the distribution business unit of our sponsor company, a global leading engine manufacturer.

The sponsor company's parent company, ComX, has a global logistics network that reaches out to over 190 countries. It has four Master Distribution Centers, which are located in three continents. This thesis investigated one of its Master Distribution Centers, PDC. The role of PDC is to serve the aftermarket requirements of the EMEA (Europe, Middle East and Africa) regions. We focused on the distribution of spare parts inventories for ComX's Engines and Filtration businesses. The parts are distributed from PDC to distributors, dealers, and OEMs (Original Equipment Manufacturer) in the EMEA region. PDC serves over 70 countries in the EMEA region, with hundreds of distributors, dealers and OEMs. PDC views them as its customers. The customers order products from PDC and PDC delivers them using 3PL (Third-Party Logistics) providers. In the current distribution network, end-customer demand mostly occurs at the distributors' level and no shipments take place between distributors. The warehouse at PDC stocks and distributes two main types of products: Parts (X) and Fills (Y). There are over 150,000 different and genuine parts of X and over 12,000 parts of Y.

ComX is experiencing rapid growth. In the past 10 years, its revenue has tripled. To serve its customers better and reduce logistics cost is a challenging issue for PDC. The goal of PDC is to provide a superior customer experience that creates loyalty and drives profitable new and repeat business with an efficient supply chain. Additionally, PDC wants to provide customers with world-class delivery of parts and information at the lowest possible end-to-end logistics cost. However, according to PDC’s current understanding of its customers, their satisfaction is not as high as PDC’s expectation. Hence, it is vital

### Summary:

This thesis investigated the supply chain of a master distribution center, focusing on its customers (distributors, dealers and OEMs). We created a framework of improving customer perceptions while achieving supply chain efficiency. With respect to the sponsor company's existing situation and facing problems and challenges, the thesis proposed actionable recommendations on customer-facing policies.
for PDC to make effective customer-facing policies while maintaining supply chain efficiency. This thesis aims to analyze customers’ perceptions regarding PDC’s performance, compare their perceptions to the current supply chain and develop a strategic road map that will allow all stakeholders (PDC as well as its customers) to achieve supply chain efficiency.

Approach

To address the above research question, firstly, we analyzed the customer surveys conducted by PDC. Additionally, during the on site visit to PDC, we met the customer services manager to understand the existing level of customers’ perceptions. We also developed an understanding of key challenges faced by PDC. We also found areas in which customers were highly satisfied. Secondly, we reviewed PDC’s current supply chain structure, policies and performance. Next, we researched relevant literature and existing success stories to identify the gaps between PDC’s strategies and objectives. Finally, we suggested actionable recommendations that could help improve customer perceptions without significant incremental investment.

Key problems and challenges

We identified two main problems that impacted customer satisfaction. We also found the causes of the two problems, as shown in figure 1.

However, it is challenging for PDC to solve the problems. For instance, low level of product availability resulted in low System Fill rate, which in turn led to low customer satisfaction. However, it will be costly to increase product availability if PDC still only relies on its own stock to meet customer demand, especially when it is facing rapid demand growth. Last year, its System Fill rate was about 90%. Thus, there is scope for improvement. However, the average inventory will grow rapidly with the improvement of System Fill rate from the current level. This will result in increase in Working Capital Requirement, bringing more financial risk. Additionally, the fast growing business also requires PDC to hold more inventories on hand, resulting in higher inventory holding cost. As well, this leads to higher transportation cost.

Framework

To tackle the problems and challenges, we constructed a framework (see figure 2). The core of the framework is the two objectives: to improve customer perception and to achieve supply chain efficiency. For each objective, we identified key impacting factors. For those factors in our research scope, we gave actionable suggestions. In figure 2, the two circles are the core objectives, the rectangles with borders are key impacting factors in this research scope, and the words with grey background are actionable suggestions, which will impact both objectives.

Figure 1- Main problems of low customer satisfaction

Figure 2 Framework linking customer perception and supply chain efficiency
Agile Distribution Network

Agile distribution network is one way to achieve efficiency, while improving customer perceptions. By breaking independence of each stakeholder in the supply chain, the whole supply chain can lower channel inventories and the customers can perceive better services. Sharing inventory among customers (resellers) makes the network flexible (Compare figure 3 and 4).

Supply Chain Visibility Excellence

The role of information is vital when transferring goods from the factory to the end customers. It becomes even more challenging to get information in complex supply chain systems. In a pressure to minimize costs, increasing visibility especially in the end-to-end logistics network can greatly reduce costs and improve service.

Tailored Supply Chain Strategies

Normally, one single supply chain strategy cannot fit the whole business in a big company, when it owns multiple products and customer segments. In PDC, the demand patterns of the two categories of products, X and Y, are different. For X, demand is relatively uncertain, while for Y, demand is relatively certain. Therefore, it is suitable to use responsive supply chain strategy for X, but efficient supply chain for Y. In addition, based on customer segmentation, different strategies should be applied in different customer segments. For “big customers”, we recommend responsive supply chain strategy, but using efficient strategy for “small customers” (see figure 5, “P1”-Y, “P2”-X, “C1”-“small customers”, “C2”-“big customers”).

Recommendations

- Segment customers
- Implement Web-Enhanced Tools
- Actively update information
- Enhance system fill rate
- Work on the 6 supply chain performance drivers to achieve efficiency
- Track backorder issues

Conclusions

In a highly competitive business environment, it is crucial to continuously improve customer perception to maintain customer loyalty. It is equally important to keep supply chain efficient to achieve profitability. These two goals are not necessarily trade-offs. In this thesis, we identified links to achieve both goals simultaneously.

For PDC to reach out to its customers in an effective way, we recommended “Customer Segmentation”. It would help PDC to improve services for the profitable segments without affecting the existing service level of the non-profitable segments. This would lead to higher levels of perception among the key customers. Additionally, relevant and user defined web enhanced technologies can help the information required by customers to be readily available. Again, having updated information on time can help a customer to maintain higher levels of perception even if there is an issue with order fulfillment. To utilize resources efficiently, we have looked at the performance drivers and suggested ways of leveraging economies of scale. Further, we have suggested a workable template to identify root causes of backorders, which will enable PDC to take required actions. These actionable recommendations can help PDC have customers with increased levels of perception as well as increased utilization of resources in an efficient manner.