

ROLE OF INVENTORY MANAGEMENT IN SUPPLY CHAINS

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ABSTRACT

In any manufacturing company effective inventory management cuts down inventory holding costs and increases profit. In a supply chain, it is complex to manage inventory as it depends on the variability of efficiencies of suppliers and product demand. This paper highlights the significance of inventory management in supply chains.

INVENTORY MANAGEMENT

Current manufacturing paradigm demands high productivity and the company's ability to respond to unstable market settings. For most of the industries, high competition led ways to optimize the manufacturing processes and structure their own inventory management plans accordingly. Inventory management is managing the parts or stocks of materials in any form inside the plant and stabilizing the flow of materials considering the variability in demand. It is very important that the inventory plans are structured in such a way that they accommodate variability in demand especially when the company deals with multiple products. Inventory management starts from procurement of materials for manufacturing or processing until it reaches the customer as a finished product. Even stocked up finished goods are to be managed inside the facility along with the unprocessed materials. So it becomes important to frame an overall plan that considers all materials to be stocked up inside the facility.

Inventory management plans will lead to categorizing parts that comprise to a complete product and helps in deciding the amount of inventory for each part that is stocked at any given time. Inventory management also facilitates a plant to decide the release and order intake dates of raw materials and finished parts considering the demand of the product and allotment of space for stocking materials inside the available facility.

SUPPLY CHAIN MANAGEMENT

Supply chain management involves the management of the whole process of supplying raw material from the suppliers to different levels of customers until the

product reaches the end user as a finished one. Supply chain involves suppliers, production plants, wholesale dealers and supermarkets regardless of the sort of products being produced. Apart from the flow of materials supply chain also involves flow of information and money from suppliers to producers to stores and to end users. So it is very essential to design the supply chain in such a way that it tolerates rapid changes in the product market and manages to attain the effectiveness in delivering the products into the market. Supply chain management should also involve plans that satisfy both higher end customers and lower end suppliers and act as a beneficial chain of product development and should strive for continual improvement in the product market.

According to Zokaei & Simons (2006), the effectiveness of a supply chain is measured in terms of satisfying customer expectations and efficiency is measured by comparing the inputs and the outputs. Also the performance of a supply chain depends on the service level of the suppliers at different levels, so it is important that a common framework is developed for analyzing the effectiveness and efficiency of the supply chain incorporating the service levels of the suppliers at each level of the supply chain. In order to achieve the optimal effectiveness and efficiency levels of the supply chain it is important to have healthy levels of information flow at all levels of the supply chain. According to Cachon & Fisher (2000) the developed value shared data communication or information strategies reduced the supply chain expenses by 2.2% when compared with the conventional information flow plans. Using information technology as an effective tool, leveling of information sharing across the supply chain could be achieved

thereby resulting in the increase of the revenue or reducing costs in the whole supply chain.

INVENTORY MANAGEMENT IN SUPPLY CHAIN ENVIRONMENT

Researches in Supply Chain Inventory Management (SCIM)

Most of the researches in supply chain areas are concerned about optimizing the supply chain in terms of its efficiency and competence in the product market, but only limited studies are done considering the inventory management in supply chains. Effective inventory management in a supply chain can play a vital role in cutting inventory holding costs across the different stages of the supply chain, thus emphasizing the need of a general model for managing inventories within a supply chain. Baganha & Cohen (1996) developed a stabilizing model for effective inventory management for supply chains. Supply chain materials management methods could be made complex considering a multi product scenario and discontinuous supply chains. So the models developed should have room for all kinds of supply chain variability. Lee & Billington (1993) developed a model for inventory management considering decentralized supply chains.

Significance of Information flow in Supply Chain Inventory Management (SCIM)

Inventory management for supply chains could be effective only when the information flow from top to bottom of a supply chain is streamlined. Cachon & Fisher (2000) developed a value shared information model and performed a comparative study with the conventional data sharing strategies and ended up with the proposed model performing better, reducing inventory holding expenses. Strategic plans for the effective

distribution of information are essential for supplying goods at the customer expected rate. Mutual sharing and analyzing of the information and standards between the supplier and customer at every stage of the supply chain is crucial and it also nurtures customer supplier relationships. Thus incorporating information flow standards in inventory management in a supply chain will definitely result in increased returns.

INVENTORY MANAGEMENT IN DISCONTINUOUS SUPPLY CHAINS

Supply chains can be streamlined in such a way that they are continuous and follow the chain of activities at any given time. But there are certain cases where the chains appear to be in a broken or discontinuous form due to lack of communication flow and other practical factors that limit them from following the supply chain policy. So in such cases it is extremely difficult to evaluate the inventory management strategies. Materials stored at various locations of a supply chain can have divergent effects on the cost and service levels of the chain (Lee & Billington, 1993). So managing inventories in such supply chains requires special focus and considerations at all levels.

DEVELOPING A FRAMEWORK FOR SCIM

Considering the variability in product demand, product variety and supplier performances it is vital to concentrate on the inventory levels at each stage of the supply chain. Certain key performance measures can be targeted for building a common model for inventory management in a supply chain, also periodical evaluations should be performed as part of continuous improvement activities. Supply chain performance can be measured by analyzing the following factors,

1. Quality standards of the suppliers.
2. Product variety combined with the suppliers.
3. Service levels of suppliers at every level of the chain.
4. Price levels of materials from each supplier.
5. Inventory level or inventory holding capacity of all suppliers.
6. Existing inventory management strategies of the suppliers.
7. Available technology interface for linking suppliers and customers.
8. Information transfer policies in a supply chain.
9. History of supplier delivery before due dates.
10. Ability to integrate customer values into supply chain procedures.

Steps involved in developing a framework for SCIM

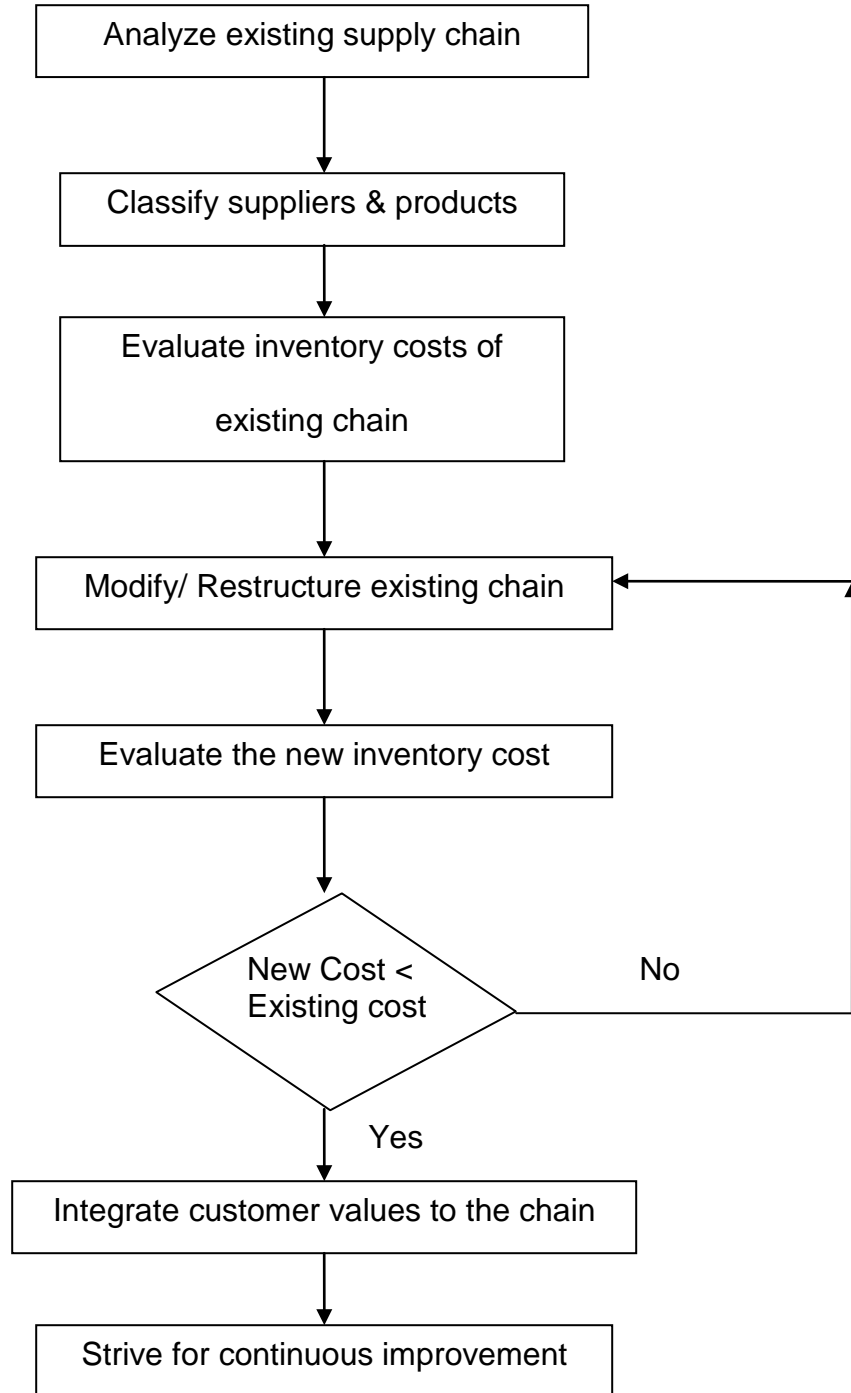
1. Study the supply chain in terms of its efficiency and flexibility in handling product variety.
2. Classify suppliers with respect to product type, service levels and segregate the chain to different levels.
3. Evaluate the inventory holding costs incurred at level of the supply chain.
4. Develop/modify existing plans for a steady level of inventory in a supply chain considering the demand variability and also by improving information flow and restructure the existing inventory plans with the stabilized ones.
5. Perform an inventory cost analysis for the existing and the developed inventory management strategies.
6. If the cost of the proposed plan is less then proceed with the new strategy else go to step 4.

7. Integrate customer values into the supply chains.
8. Strive for continual improvement at every stage of the chain.

Hopp & Spearman (2000) classify inventories into raw materials, work in progress, finished goods and spare parts. So inventory management in a supply chain has to consider all inventories that are spread out in a product supply chain. Just in time (JIT) concepts can be applied in a supply chain to achieve minimum levels of inventory at the same time satisfying the market demand. In order to develop an efficient supply chain one the most important factor is achieving good customer-supplier relationships by conducting programs that bind the two ends of the supply chain. Policies that benefit both customers and suppliers should be developed. Inventory management training and knowledge sharing are more important and should be part of the supply chain enhancement programs. Periodical market and suppliers evaluations are necessary for handling the market fluctuations.

FIGURE I

Flowchart Showing the Framework for SCIM



CONCLUSION

Supply chain inventory management is so critical for planning or forecasting for the future needs and for developing strategic plans to handle the market situations. It needs a top down approach to structure an effective way of tackling inventory managing problems in supply chains. A common framework considering all critical factors that drive inventory management could be a better solution for solving the inventory problems in supply chains regardless of the type of manufacturing industry being analyzed.

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