Supply Chain Management in Garments Industry

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Abstract - The term “supply chain management” has become a popular buzzword, probably first used by consultants in the late 1980s & then analyzed by the academic community in the 1990s. If one wants a simple definition, supply chain management links all the supply interacting organizations in an integrated two-way communication system to manage high quality inventory in the most effective & efficient manner. The supply chain management reflects those actions & values responsible for the continuous improvement of the design, development & management processes of an organization’s supply system, with the objective of improving its profitability & ensuring its survival, as well as the profitability & survival of its customers & suppliers.

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Supply Chain Management in Garments Industry


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I. INTRODUCTION

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only the manufacturers and suppliers, but also transporters, warehouses, retailers, and even customer themselves. Each stage in a supply chain is connected through the flow of products, information and fund. These flows often occur in both directions and may be managed by one of the stages or an intermediary. Here we can see raw materials supplier supply industrial product to the manufacturer, and make the product sale to distributor, distributor sale this product to the retailer by small lot, and final consumer get the product from the retailer.

Supply chain stages:
- Raw material supplier
- Manufacturer
- Wholesaler/distributor
- Retailer
- Customer

![Figure 1: An example of supply stage.](image)

II. REASONS FOR FORMING SUPPLY CHAIN MANAGEMENT

Practices experienced in the traditional management of the supply chain raised the need for conversion to a new paradigm of supply chain management (SCM). The traditional supply chain and manufacturing processes relied on experience and intuition of managers and were designed with long supply cycle times, large batch sizes, capacity based on annual volumes, volume-driven technology, and numerous suppliers for the same parts on the short-term base contracts. With traditional management processes, the goal of business activities was to maximize the efficiency of an individual functional unit by achieving competitive edges based on cost reduction. SCM is designed to solve these problems and is important to reduce inventory investment in the chain, to increase customer service, and to help build a competitive advantage for the channel. With a changing management focus, companies also began to realize that maximization of efficiency in one department or one functional unit is less desirable than optimal performance for the whole company.

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III. The Four Phases of Supply Management

The four phases of supply management all require many perspectives & inputs best obtained through a cross-functional approach. These four phases of supply management are as follows:

- **Generation of Requirements**: The generation of requirements is a critical activity that results in the identification of the optimal materials & services to purchase, together with the development of specifications & statements of work describing these requirements. Approximately 85 percent of the cost of purchased material, services & equipment is “designed in” during this phase. Thus supply management should be involved up-front during the generation of requirements to ensure that all commercial issues such as cost, availability, substitutes & so on, receive appropriate consideration.

- **Sourcing**: The objective of sourcing is the identification & selection of the supplier whose costs, qualities, technologies, timeliness, dependability & service best meet the firm’s needs. The development of supply alliances is a sourcing activity.

- **Pricing**: The objective of pricing is the development of prices that appropriately reward the supplier for its efforts & which result in the lowest total costs of ownership for the customer firm. While negotiations occur throughout the supply management process, their most significant role normally is during the pricing phase.

- **Post-Award Activities**: This important activity ensures that the firm receives what was ordered on time & at the price & quality specified. Post-award activities include supplier development, technical assistance, troubleshooting & the management of the contract & the resulting relationships.

IV. Issues in Supply Chain Management

The classic objective of logistics is to be able to have the right products in the right quantities (at the right place) at the right moment at minimal cost.

V. Decisions on Three Levels

Supply chain management decisions are often said to belong to one of three levels; the strategic, the tactical, or the operational level. Since there is no well-defined and unified use of these terms, this Section describes the how they are used in this thesis.

Figure 3 shows the three levels of decisions as a pyramid shaped hierarchy. The decisions on a higher level in the pyramid will set the conditions under which lower level decisions are made.

VI. Metrics and Data Collection

Management can be defined as the planning, execution, and control of goal oriented activities. Today’s supply chains are too complicated to be controlled based on intuition. It is necessary to have access to statistical data on the performance of the supply chain.

VII. Inventory Management in The Supply Chain

Inventory management is one aspect of SCM. The main goal of SCM is to better manage inventory throughout the chain via improved information flow aimed at improved customer service, higher product variety, and lower costs and used the term "Networked Inventory Management" (p.16) for the inventory aspect of SCM.

When customers are trying to operate on fewer inventories, manufacturers can respond in two ways:

1. Carrying more inventories to compensate for the shorter lead times.
2. Improving the management of the supply chain.
As shown in Figure there are three inventories in the model: The raw product inventory (RPI), the work in process (WIP), and the finished goods inventory (FGI). The RPI is the inventory for incoming parts ready to enter assembly, the WIP are the products that are in the assembly, and in the FGI we find the finished products ready for shipment to customers.

A safety stock is the stocking level desired at any time for a given part in a given inventory. Holding inventory is costly and the ideal situation would therefore be to have no parts in stock when they are not immediately needed. In the real world however materials and production planners meet many uncertainties. A safety stock superior to zero is therefore in general required for the RPI and FGI.

VIII. Time and Material Flow

Time is measured in weeks. When a month is used this signifies four weeks. When arriving from the suppliers the parts enter the RPI (see Fig). From the RPI the parts enter assembly (WIP), and are now referred to as products. A set of one unit of each of the nine parts makes up one product.

The parts have different lead times from suppliers. These are shown in Table Parts of index 1 have 6 weeks lead time, index 2 parts have 10 weeks, and index 3 parts 14 weeks. All parts are delivered according to lead time, and there are no damaged parts.

Since materials orders must be ready up to 13 weeks prior to the arrival of orders, it is impossible for the company to base the materials planning on incoming orders. A demand forecast is necessary. The demand forecast gives the expected product quantity ordered for a set number of weeks. In the model we assume the forecasted demand to be as is shown in Fig.
Table 1 provides an indication of the size of these losses and of note is the cost of carrying inventory. The biggest item is forced markdowns - mainly at retail - with the total losses amounting to over 14% of retail sales. A distinction is made between promotional markdowns, e.g., special sales, and the marking-down that occurs out of necessity when a season ends and unwanted goods must be moved to make way for new merchandise – forced markdowns.

**QUICK RESPONSE AND OFFSHORE SOURCING:** As highlighted earlier, consumer demand is becoming more volatile. QR is designed for such an environment. The fashion industry is, perhaps, one of the most demanding challenges for logistics management with hundreds of colours, thousands of styles and millions of SKU’s on the retail shelves at any one time. Further, the average shelf life of these merchandise items shortens with each passing year. A key factor in the value of QR is its ability to deal with uncertainty or variance. There are numerous sources of uncertainty in a fashion supply pipeline starting with demand through to the reliability on the part of suppliers and shippers, etc, and Quick Response offers the ability to counter the negative impacts of uncertainty.

In this initial scenario two possible buying decisions are reviewed using QR and then offshore sources of supply. First, end-consumer purchases, whether bought from a retailer or manufacturer, are assumed to be one hundred thousand pounds. It is then assumed that the customer (a manufacturer or retailer) has bought the goods for the same price (£60k). An averaged gross margin is also assumed of 40% on these sales. The only difference between the two sourcing alternatives is the flexibility and speed of response. The ability of the QR supplier to rapidly replenish the stock of the customer (manufacturer or retailer) to real-time consumer demand allows the customer to turn inventory of the product as opposed to 2.5 times a year.

This faster turnover rapidly increases the customer’s gross margin return1 on each pound invested in inventory from £1.67 to £4.00, more than twice that of the offshore competition. Because of this inventory turnover advantage the manufacturer or retailer could afford to pay a premium for the product and still get a better return (Table 3).

In the table the price paid for goods by the customer has increased by almost one-third, but because of the flexibility and responsiveness of the supplier, the return on inventory has increased by 1.2 percent or from 167% to 169%.
This paper has provided a conceptual focus upon the main logistical issues involved in fashion retailing. The peculiar nature of the industry was discussed in terms of its volatility, complexity and dynamism. It is with these factors in mind, that the need for agility and responsiveness in the logistics pipeline has been identified.

X. Key Components of Supply Chain Management

Supply chain management is an enormous topic covering multiple disciplines and employing many quantitative and qualitative tools. The twelve categories we define are
- location
- transportation and logistics
- inventory and forecasting
- marketing and channel restructuring
- sourcing and supplier management
- information and electronic mediated environments
- product design and new product introduction
- service and after sales support
- reverse logistics and green issues
- outsourcing and strategic alliances
- metrics and incentives
- Global issues

References Références Referencias

Table 4 - A Move to Offshore Supply

<table>
<thead>
<tr>
<th></th>
<th>QR Supplier</th>
<th>Offshore Supplier</th>
<th>Cost reduction Applicable</th>
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</thead>
<tbody>
<tr>
<td>Consumer Purchase Price (£)</td>
<td>100,000</td>
<td>100,000</td>
<td></td>
</tr>
<tr>
<td>Customer Purchase Price (£)</td>
<td>60,000</td>
<td>39,448</td>
<td>35.92%</td>
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<tr>
<td>Gross Margin (£)</td>
<td>40,000</td>
<td>61,552</td>
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<tr>
<td>Average Inventory (£)</td>
<td>10,000</td>
<td>15,379</td>
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<tr>
<td>Gross Margin (%)</td>
<td>40.00%</td>
<td>61.55%</td>
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<tr>
<td>Inventory Turns (p.a.)</td>
<td>5.62</td>
<td>2.5</td>
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<tr>
<td>GMROI (%)</td>
<td>400</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

Source: Lowson RH, King R and Hunter NA (1999)

Table 5 - The Effect of QR Velocity

<table>
<thead>
<tr>
<th></th>
<th>QR Supplier</th>
<th>Offshore Supplier</th>
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<tr>
<td>Consumer Purchase Price (£)</td>
<td>113,000</td>
<td>106,000</td>
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<tr>
<td>Customer Purchase Price (£)</td>
<td>60,000</td>
<td>60,000</td>
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<tr>
<td>Gross Margin (£)</td>
<td>53,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Average Inventory (£)</td>
<td>10,000</td>
<td>24,000</td>
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<tr>
<td>Gross Margin (%)</td>
<td>40.00%</td>
<td>40.00%</td>
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<tr>
<td>Inventory Turns (p.a.)</td>
<td>0.02</td>
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<tr>
<td>GMROI (%)</td>
<td>358</td>
<td>167</td>
</tr>
</tbody>
</table>

Source: Lowson RH, King R and Hunter NA (1999)

Finally, Quick Response also has an impact upon strategic pricing decisions. Velocity and flexibility in the supply system will allow an original equipment manufacturer (OEM) or retailer to reduce the price of the finished good below that of the competition and capture greater market share.

Table 6 - QR and Strategic Pricing

<table>
<thead>
<tr>
<th></th>
<th>QR Supplier</th>
<th>Offshore Supplier</th>
<th>Possible price reduction %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer Purchase Price (£)</td>
<td>76,840</td>
<td>100,000</td>
<td>-22.00</td>
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<tr>
<td>Customer Purchase Price (£)</td>
<td>60,000</td>
<td>60,000</td>
<td></td>
</tr>
<tr>
<td>Gross Margin (£)</td>
<td>16,840</td>
<td>40,000</td>
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<td>Average Inventory (£)</td>
<td>10,000</td>
<td>24,000</td>
<td></td>
</tr>
<tr>
<td>Gross Margin (%)</td>
<td>21.93%</td>
<td>40.00%</td>
<td></td>
</tr>
<tr>
<td>Inventory Turns (p.a.)</td>
<td>6.0</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>GMROI (%)</td>
<td>169</td>
<td>167</td>
<td></td>
</tr>
</tbody>
</table>

* Based upon purchase price of £113,000 as seen in Table 5
Source: Lowson RH, King R and Hunter NA (1999)
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