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Recital Of Supply Chain Management Globally

Prof. Kartikey Koti

Faculty in Management

DKVK Education Trust, Hubli.

Abstract

Despite the extensive research carried out in the area of supply chain management (SCM) all over the world, SCM practices have not yet been well adopted in developing countries like India. Supply Chain Management and Logistics involves optimizing the delivery of goods, services and information from supplier to customer. An effective supply chain makes companies competitive and profitable. Information is essential to making optimal supply chain decisions because it provides the global scope needed to make optimal decisions. Information technology (IT) provides the tools together this information and analyses it to make the best supply chain decisions

Key words: SCM and Logistics, IT, CPFR, ERP, CRM, SRM and RFID.

Introduction

The concept of Supply Chain Management is based on two core ideas. The first is that practically every product that reaches an end user represents the cumulative effort of multiple organizations. These organizations are referred to collectively as the supply chain.

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The second idea is that while supply chains have existed for a long time, most organizations have only paid attention to what was happening within their "four walls." Few businesses understood, much less managed, the entire chain of activities that ultimately delivered products to the final customer. The result was disjointed and often ineffective supply chains.

Supply chain management, then, is the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective & efficient ways possible. Supply chain activities cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities.

The organizations that make up the supply chain are "linked" together through physical flows and information flows. Physical flows involve the transformation, movement, and storage of goods and materials. They are the most visible piece of the supply chain. But just as important are information flows. Information flows allow the various supply chain partners to coordinate their long-term plans, and to control the day-to-day flow of goods .

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Literature Review:

Role of Information Technology in Supply Chain Management- Rohita Kumar Mishra

This Author focuses the role of Information technology (IT) in supply chain management. It also highlights the contribution of IT in helping to restructure the entire distribution set up to achieve higher service levels and lower inventory and lower supply chain costs. The broad strategic directions which need to be supported by the IT strategy are increasing of frequency of receipts/dispatch, holding materials further up the supply chain and crashing the various lead times. Critical IT contributions and implementations are discussed. Fundamental changes have occurred in today's economy. These changes alter the relationship we have with our customers, our suppliers, our business partners and our colleagues. It also describes how IT developments have presented companies with unprecedented opportunities to gain competitive advantage. So IT investment is the pre-requisite thing for each firm in order to sustain in the market.

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Status of Supply Chain Management in India- M. Venkata Ramana Reddy

Effective Supply Chain Management and Logistics contributes to competitive advantage to organizations. This paper conveys the conceptual idea of SCM and Logistics as well as importance of information technology tools and technologies for improving the performance of SCM and Logistics in India. To achieve this improved performance, organizations should focus on applying techniques which offer a strategic opportunity for companies to gain an increase in revenue. This is possible by refocusing on integrating IT with supply chain management and Logistics The desired technology platform can capture enterprise-level data and deliver information to support the specific needs of their global manufacturing or distribution. Organizations must realize that they must harness the power of IT to collaborate with their business alliances.

Objectives:

1. To examine Faces and identify significant decisions of Supply Chain Management.
2. To evaluate drivers of Supply Chain Management.
3. To Study the Role of Information Technology in Supply Chain Management.

Research Methodology

The data has been collected both through primary and secondary source. Primary data was collected through a detailed discussion with the experts and the relative individuals. Secondary data was collected through journals, daily newspapers, books and with the aid of different search engines through internet.

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Two Faces of Supply Chain Management

SCM has two major faces to it. The first can be called loosely as the back-end and comprises the physical building blocks such as the supply facilities, production facilities, warehouses, distributors, retailers, and logistics facilities. The back-end essentially involves production, assembly, and physical movement. Major decisions here include:

1. **Procurement** (supplier selection, optimal procurement policies, etc.)

2. **Manufacturing** (plant location, product line selection, capacity planning, production scheduling, etc.)

3. **Distribution** (warehouse location, customer allocation, demand forecasting, inventory management, etc.)

4. **Logistics** (selection of logistics mode, selection of ports, direct delivery, vehicle scheduling, etc.)

5. **Global Decisions** (product and process selection, planning under uncertainty, real-time monitoring and control, integrated scheduling)

Supply Chain Decisions

We classify the decisions for supply chain management into two broad categories -- strategic and operational. As the term implies, strategic decisions are made typically over

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a longer time horizon. These are closely linked to the corporate strategy (they sometimes {\it are} the corporate strategy), and guide supply chain policies from a design perspective. On the other hand, operational decisions are short term, and focus on activities over a day-to-day basis. The effort in these type of decisions is to effectively and efficiently manage the product flow in the "strategically" planned supply chain.

There are four major decision areas in supply chain management: 1) location, 2) production, 3) inventory, and 4) transportation (distribution), and there are both strategic and operational elements in each of these decision areas.

Location Decisions

The geographic placement of production facilities, stocking points, and sourcing points is the natural first step in creating a supply chain. The location of facilities involves a commitment of resources to a long-term plan. Once the size, number, and location of these are determined, so are the possible paths by which the product flows through to the final customer. These decisions are of great significance to a firm since they represent the basic strategy for accessing customer markets, and will have a considerable impact on revenue, cost, and level of service. These decisions should be determined by an optimization routine that considers production costs, taxes, duties and duty drawback, tariffs, local content, distribution costs, production limitations, etc. (See Arntzen, Brown, Harrison and Trafton [1995] for a thorough discussion of these aspects.) Although location decisions are primarily strategic, they also have implications on an operational level.

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Production Decisions

The strategic decisions include what products to produce, and which plants to produce them in, allocation of suppliers to plants, plants to DC's, and DC's to customer markets. As before, these decisions have a big impact on the revenues, costs and customer service levels of the firm. These decisions assume the existence of the facilities, but determine the exact path(s) through which a product flows to and from these facilities. Another critical issue is the capacity of the manufacturing facilities--and this largely depends the degree of vertical integration within the firm. Operational decisions focus on detailed production scheduling. These decisions include the construction of the master production schedules, scheduling production on machines, and equipment maintenance. Other considerations include workload balancing, and quality control measures at a production facility.

Inventory Decisions

These refer to means by which inventories are managed. Inventories exist at every stage of the supply chain as either raw materials, semi-finished or finished goods. They can also be in-process between locations. Their primary purpose to buffer against any uncertainty that might exist in the supply chain. Since holding of inventories can cost anywhere between 20 to 40 percent of their value, their efficient management is critical in supply chain operations. It is strategic in the sense that top management sets goals. However, most researchers have approached the management of inventory from an operational perspective. These include deployment strategies (push versus pull), control policies --- the determination of the optimal levels of order quantities and reorder points,

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and setting safety stock levels, at each stocking location. These levels are critical, since they are primary determinants of customer service levels.

Transportation Decisions

The mode choice aspect of these decisions are the more strategic ones. These are closely linked to the inventory decisions, since the best choice of mode is often found by trading-off the cost of using the particular mode of transport with the indirect cost of inventory associated with that mode. While air shipments may be fast, reliable, and warrant lesser safety stocks, they are expensive. Meanwhile shipping by sea or rail may be much cheaper, but they necessitate holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore customer service levels, and geographic location play vital roles in such decisions. Since transportation is more than 30 percent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes (consolidated bulk shipments versus Lot-for-Lot), routing and scheduling of equipment are key in effective management of the firm's transport strategy.

Significant Drivers of Supply Chain Management

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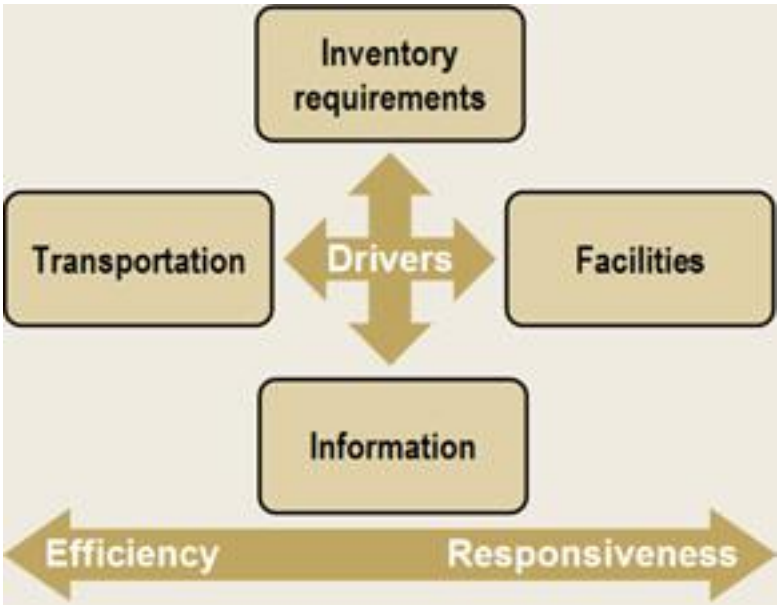

Inventory

Inventory is spread throughout the supply chain and includes everything from raw material to work in process to finished goods that are held by the manufacturers, distributors, and retailers in a supply chain. Again, managers must decide where they want to position themselves in the trade-off between responsiveness and efficiency. Holding large amounts of inventory allows a company or an entire supply chain to be very responsive to fluctuations in customer demand. However, the creation and storage of inventory is a cost and to achieve high levels of efficiency, the cost of inventory should be kept as low as possible. There are three basic decisions to make regarding the creation and holding of inventory:

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1. Cycle Inventory—This is the amount of inventory needed to satisfy demand for the product in the period between purchases of the product. Companies tend to produce and to purchase in large lots in order to gain the advantages that economies of scale can bring. However, with large lots also comes increased carrying costs. Carrying costs come from the cost to store, handle, and insure the inventory. Managers face the trade-off between the reduced cost of ordering and better prices offered by purchasing product in large lots and the increased carrying cost of the cycle inventory that comes with purchasing in large lots.

2. Safety Inventory—Inventory that is held as a buffer against uncertainty. If demand forecasting could be done with perfect accuracy then the only inventory that would be needed would be cycle inventory. But since every forecast has some degree of uncertainty in it,we cover that uncertainty to a greater or lesser degree by holding additional inventory in case demand is suddenly greater than anticipated. The trade-off here is to weigh the costs of carrying extra inventory against the costs of losing sales due to insufficient inventory.

3. *Seasonal Inventory*—This is inventory that is built up in anticipation of predictable increases in demand that occur at certain times of the year. For example, it is predictable that demand for anti-freeze will increase in the winter. If a company that makes anti-freeze has a fixed production rate that is expensive to change, then it will try to manufacture product at a steady rate all year long and build up inventory during periods of low demand to cover for periods of high demand that will exceed its
production rate. The alternative to building up seasonal inventory is to invest in flexible manufacturing facilities that can quickly change their rate of production of different products to respond to increases in demand. In this case, the trade-off is between the cost

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of carrying seasonal inventory and the cost of having more flexible production capabilities.

Transportation

This refers to the movement of everything from raw material to finished goods between different facilities in a supply chain. In transportation the trade-off between responsiveness and efficiency is manifested in the choice of transport mode. Fast modes of transport such as airplanes are very responsive but also more costly. Slower modes such as ship and rail are very cost efficient but not as responsive. Since transportation costs can be as much as a third of the operating cost of a supply chain, decisions made here are very important.

There are six basic modes of transport that a company can choose from:

1. *Ship* which is very cost efficient but also the slowest mode of transport. It is limited to use between locations that are situated next to navigable waterways and facilities such as harbors and canals.

2. *Rail* which is also very cost efficient but can be slow. This mode is also restricted to use between locations that are served by rail lines.

3. Pipelines can be very efficient but are restricted to commodities that are liquids or gases such as water, oil, and natural gas.

4. *Trucks* are a relatively quick and very flexible mode of transport. Trucks can go almost anywhere. The cost of this mode is prone to fluctuations though, as the cost of fuel fluctuates and the condition of roads varies.

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5. *Airplanes* are a very fast mode of transport and are very responsive. This is also the most expensive mode and it is somewhat limited by the availability of appropriate airport facilities.

6. *Electronic Transport* is the fastest mode of transport and it is very flexible and cost efficient.However, it can only be used for movement of certain types of products such as electric energy, data, and products composed of data such as music, pictures, and text.
Someday technology that allows us to convert matter to energy and back to matter again may completely rewrite the theory and practice of supply chain management ("beam me up, Scotty. . .").
Given these different modes of transportation and the location of the facilities in a supply chain, managers need to design routes and networks for moving products. A route is the path through which products move and networks are composed of the collection of the paths and facilities connected by those paths. As a general rule, the higher the value of a product (such as electronic components or pharmaceuticals), the more its transport network should emphasize responsiveness and the lower the value of a product (such as bulk commodities like grain or lumber), the more its network should emphasize efficiency.

Information

Information is the basis upon which to make decisions regarding the other four supply chain drivers. It is the connection between all of the activities and operations in a supply chain. To the extent that this connection is a strong one, (i.e., the data is accurate, timely, and complete), the companies in a supply chain will each be able to make good decisions for their own operations. This will also tend to maximize the profitability of the supply

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chain as a whole. That is the way that stock markets or other free markets work and supply chains have many of the same dynamics as markets. Information is used for two purposes in any supply chain:

1. *Coordinating daily activities* related to the functioning of the other four supply chain drivers: production; inventory; location; and transportation. The companies in a supply chain use available

data on product supply and demand to decide on weekly production schedules, inventory levels, transportation routes, and stocking locations.

2. *Forecasting and planning* to anticipate and meet future demands. Available information is used to make tactical forecasts to guide the setting of monthly and quarterly production schedules and timetables. Information is also used for strategic forecasts to guide decisions about whether to build new facilities, enter a new market, or exit an existing market. Within an individual company the trade-off between responsiveness and efficiency involves weighing the benefits that good information can provide against the cost of acquiring that information. Abundant, accurate information can enable very efficient operating decisions and better forecasts but the cost of building and installing systems to deliver this information can be very high. Within the supply chain as a whole, the responsiveness versus efficiency trade-off that companies make is one of deciding how much information to share with the other companies and how much information.

The importance of information in an integrated supply chain management environment:

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Prior to 1980s the information flow between functional areas with in an organization and between supply chain member organizations were paper based. The paper based transaction and communication is slow. During this period, information was often over looked as a critical competitive resource because its value to supply chain members was not clearly understood. IT infrastructure capabilities provides a competitive positioning of business initiatives like cycle time reduction, implementation, implementing redesigned cross-functional processes. Several well know firms involved in supply chain relationship through information technology. Three factors have strongly impacted this change in the importance of information. First, satisfying in fact pleasing customer has become something of a corporate obsession. Serving the customer in the best, most efficient and effective manner has become critical. Second information is a crucial factor in the managers' abilities to reduce inventory and human resource requirement to a competitive level. Information flows plays a crucial role in strategic planning.

Information and Technology: Application of SCM:

In the development and maintenance of Supply chain's information systems both software and hardware must be addressed. Hardware includes computer's input/output devices and storage media. Software includes the entire system and application programme used for processing transactions management control, decision-making and strategic planning. Recent development in Supply chain management software is:

1. Base Rate, Carrier select & match pay (version 2.0) developed by Distribution Sciences Inc. which is useful for computing freight costs, compares transportation mode rates, analyze cost and service effectiveness of carrier.

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2. A new software programme developed by Ross systems Inc. called Supply Chain planning which is used for demand forecasting, replenishment & manufacturing tools for accurate planning and scheduling of activities.

3. P&G distributing company and Saber decision Technologies resulted in a software system called Transportation Network optimization for streamlining the bidding and award process.

4. Logitility planning solution was recently introduced to provide a programme capable managing the entire supply chain.

Electronic Commerce:

It is the term used to describe the wide range of tools and techniques utilized to conduct business in a paperless environment. Electronic commerce therefore includes electronic data interchange, e-mail, electronic fund transfers, electronic publishing, image processing, electronic bulletin boards, shared databases and magnetic/optical data capture. Companies are able to automate the process of moving documents electronically between suppliers and customers.

Electronic Data Interchange:

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Electronic Data Interchange (EDI) refers to computer-to-computer exchange of business documents in a standard format. EDI describe both the capability and practice of communicating information between two organizations electronically instead of traditional form of mail, courier, & fax. The benefits of EDI are:

1. Quick process to information
2. Better customer service
3. Reduced paper work
4. Increased productivity
5. Improved tracing and expediting
6. Cost efficiency
7. Competitive advantage
8. Improved billing

Though the use of EDI supply chain partners can overcome the distortions and exaggeration in supply and demand information by improving technologies to facilitate real time sharing of actual demand and supply information.

Bar coding and Scanner:

Bar code scanners are most visible in the check out counter of super market. This code specifies name of product and its manufacturer. Other applications are tracking the moving items such as components in PC assembly operations, automobiles in assembly plants.

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Data warehouse:

Data warehouse is a consolidated database maintained separately from an organization's production system database. Many organizations have multiple databases. A data warehouse is organized around informational subjects rather than specific business processes. Data held in data warehouses are time dependent, historical data may also be aggregated.

Enterprise Resource planning (ERP) tools:

Many companies now view ERP system (eg. Baan, SAP, People soft, etc.) as the core of their IT infrastructure. ERP system have become enterprise wide transaction processing tools which capture the data and reduce the manual activities and task associated with processing financial, inventory and customer order information. ERP system achieve a high level of integration by utilizing a single data model, developing a common understanding of what the shared data represents and establishing a set of rules for accessing data.

Conclusions

India is one of the world's fastest growing economies with diverse markets. Managing supply chain in such a vast country is most challenging for any organization because of business practices, government regulations, technology capabilities, transportation infrastructures etc. The current paper has explored the state and different faces, drivers of supply chain management of India. World is shrinking day by day with advancement of technology. Customers' expectations are also increasing and companies are prone to more and more uncertain environment. Companies will find that their conventional

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supply chain integration will have to be expanded beyond their peripheries. The strategic and technological innovations in supply chain will impact on how organizations buy and sell in the future. However clear vision, strong planning and technical insight into the Internet's capabilities would be necessary to ensure that companies maximize the Internet's potential for better supply chain management and ultimately improved competitiveness. Internet technology, World Wide Web, electronic commerce etc. will change the way a company is required to do business. These companies must realize that they must harness the power of technology to collaborate with their business partners. That means using a new breed of SCM application, the Internet and other networking links to observe past performance and historical trends to determine how much product should be made as well as the best and cost effective method for warehousing it or shipping it to retailer.

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