

# CONTEMPORARY PERSPECTIVES ON SUPPLY CHAIN MANAGEMENT

Supply Chain Management (SCM) has been the focus of much attention in recent times. More and more companies are swearing by SCM. Academicians are writing dozens of articles on the subject in well-known journals. Consultants have made SCM a lucrative practice. And computer software companies are coming up with various packages to automate SCM. In this article, the author explains the basics of SCM, the key objectives and how to put in place an effective supply chain.

**W**hat exactly is Supply Chain? In simple terms, the supply chain can be defined as the system which enables organizations to source, make and deliver their products or services according to the market demand. A Supply Chain serves two functions. The *physical* function involves processing raw materials into finished goods and transporting them from one point to another. The *market mediation* function ensures that customers get what they are looking for at the right time. Some practitioners make a distinction between the supply side (which deals with suppliers), and the demand side (which is concerned with dealers and customers). Conceptually, however, it makes sense to consider the supply chain as one long pipe running from the basic raw material/parts suppliers to the end-customers. This is because, it is the entire set of activities, extending from the supplier's supplier to the customer's customer that together add value for the customer. Looking at a part of the chain and investing time and money in improving its efficiency will be of little use if other parts continue to be managed inefficiently. Such inefficiencies will ultimately result in diminished value or increased cost for the customers. This is particularly relevant in the case of many Indian

companies, which keep their factories clean but expect suppliers and dealers to hold inventory on their behalf!

## What is New about SCM?

Before we go further, we need to understand that SCM, though a recently coined jargon, is not exactly a new concept. Companies like Toyota of Japan have been practicing SCM for decades, though under a different name — (Just In Time production). Over the years, Toyota has succeeded in putting in place a system that collects orders from dealers efficiently and relays the information backwards to the parts suppliers. Consequently Toyota manufactures a car only after receiving a firm order. At the same time, the response time is so little that Toyota's customers can continue to get what they want virtually off the shelves. What is more commonly known as Just-In-Time production or lean production is nothing but SCM, if one carefully examines the underlying philosophy.

Supply Chain is also not significantly different from the value chain<sup>1</sup> defined by the famous management guru, Michael Porter. When Porter first wrote about the value chain, many organizations were vertically integrated. The value chain served as a useful framework to understand how efficiently primary

activities, (such as inbound and outbound logistics and operations), and support areas (such as infrastructure and technology development) were being managed. Today, most companies are concentrating on their core competencies and are outsourcing all the peripheral activities. In this context, co-ordination of the activities of the external partners becomes critical. This in turn necessitates the timely availability of real time information. Indeed, it is this combination of outsourcing and information technology that has fuelled the growing interest in SCM, in recent times.

## Reasons for the Growing Importance of SCM

What have been the important SCM drivers in recent times? Demanding customers not only want reliable but also Just-in-Time delivery. Consequently, information relating to customer demand has to be collected and transmitted efficiently for speedy order processing. Another important SCM driver has been shrinking product life cycles. Rapidly changing technologies (microprocessors) and customer tastes (fashion goods) have increased the risk of obsolescence. Unnecessary piling up of inventory at any point along the supply chain may

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<sup>1</sup>Porter has used another term "Value System" that includes the value chains of a firm, its suppliers, the channels and the end customers.

result in distress sale if it becomes obsolescent. Yet, another reason for the growing importance of SCM is proliferating product offerings. In this era of mass customization, customers expect unique designs and configurations to suit their requirements. Managing a huge product portfolio is an extremely challenging task. Without effective SCM, inventory tends to pile up and create serious problems. A fourth reason is the growing power of the retailers. Earlier, large companies could dump inventory without a second thought, at the dealers' premises and abdicate the responsibility of making the final sale to end customers. Now dealers are asserting themselves and expect goods to be delivered only as and when needed but without any delay. A good example is the relationship between Wal-Mart and Procter & Gamble (P&G) in the US. P & G's shipments are directly linked to the depletion of stocks on Wal-Mart's shelves. To sum up, SCM is being increasingly looked upon as a source of sustainable competitive advantage by cutting costs intelligently, without in any way reducing value for the customer.

### SCM Objectives

What do companies try to achieve by streamlining their supply chain? Any business solution, has to result in tangible benefits. Otherwise, there will be frustration, disillusionment and heartburns at having invested a lot but

achieved little. Many companies are investing heavily in software without a clear understanding of what it is supposed to do. The SCM initiatives should hence be strongly focussed on three basic objectives—revenue growth, asset utilization and cost reduction. In other words, the basic questions to be addressed are: How do we generate greater sales from a given amount of resources? How do we use existing resources more efficiently? How can we provide more value for the customer either by cutting costs or by providing more for the same price? Companies would miss the woods for the trees, if they focus too much on the measurement of inventory levels, or speedy implementation of information systems. On the other hand, if they ensure that the revamped chain results in greater value for the customer, the SCM initiative will pay off. Needless to say, all the objectives should be quantified to the extent possible to ensure that the performance of the supply chain can be measured.

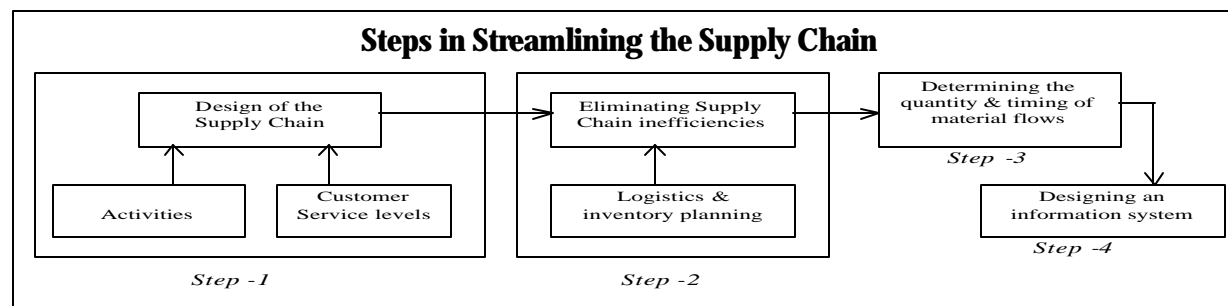
### Streamlining the Supply Chain

How can a company streamline its SCM practices? (See Box: Steps in Streamlining the Supply Chain) The first stage involves the design of the chain after taking into account the entire network of activities and the levels of service which different customers expect. Providing a higher level of service than that required, will

only add to costs. Hence, the service level needs to be carefully defined. For example, all customers may not be expecting off-the-shelf delivery. In the next stage, opportunities to optimize the supply chain have to be carefully identified after taking into account the logistics and manufacturing requirements. For example, companies should aim to eliminate unnecessary loading and unloading activities. In the third step, the company can work backward from the demand side to the supply side and determine the quantity and timing of material flows. This is necessary to understand the capabilities required to move materials in a timely fashion. The final step involves designing an information system that can efficiently handle activities such as order entry, order fulfillment and physical replenishment. Since information flow is the overriding element in SCM, careful design of the information system is absolutely essential. Making information available online to all the entities concerned is an integral part of the exercise. But it must be stressed that information technology is only a tool and not an end in itself. Unless information is made available for easy access in a desirable form and used to improve the quality of decision making, technology will be of little use.

### Supply Chain Decisions

Four major decisions are involved in SCM—plant location, production, inventory and distribution.



Plant location is a strategic decision, involving long-term commitment of financial resources. The factors to be considered include the number of plants, the location of the plants, and the degree of flexibility required in the manufacturing system. The ability to switch production from plant to plant based on the location of the customer and the associated logistics requirements is a crucial factor here.

Then comes the issue of what to produce and in which plants to produce. A related issue is the way the plants are designed. Production systems needed for a high degree of customization are radically different from those meant for standardized products. When customer tastes/demand patterns are changing fast, it is important to develop flexible manufacturing processes, where changeover time is minimal.

Inventory is primarily held as a buffer against uncertainty. How much inventory to hold is a crucial decision. Excess inventory may lead to obsolescence or higher holding costs but shortage may lead to lost sales. Both are not desirable.

Transportation typically accounts for 30 per cent of logistics costs. As such, choosing the right mode(s) of transport is crucial. The indirect costs incurred should also be carefully considered. To take an example, shipping is the cheapest means of transport for large quantities of bulk items, but it involves handling at the port and loading and unloading from the ship. These costs may sometimes turn out to be more than the freight itself.

The interrelationships among transportation, inventory and customer service have to be carefully examined while framing SCM policies. While designing the supply chain, one must appreciate the differences between functional and innovative products. In the case of functional

products, such as processed foods, demand tends to be stable. Consequently, market intermediation tends to be easier. Thus, focusing on the physical costs is adequate. Timely information can be accessed by installing software such as ERP. In the case of innovative products, such as fashion goods, demand is uncertain. Short product life cycles increase both the cost of lost sales and the risk of obsolescence. So, market mediation costs tend to dominate. Hence, it is important to interpret the market signals correctly. Also, in the case of innovative products, suppliers should be chosen for their flexibility and ability to respond fast, rather than low prices alone.

### **Customization Versus Responsiveness**

We have just mentioned that inventory is a hedge against uncertainty. And one of the most important sources of uncertainty is customer demand. If companies could know the average demand and the variability of that demand, how easy life would become! Unfortunately, demand patterns are difficult to predict, especially when technology or customer tastes are changing rapidly. How can companies fulfill orders fast and yet meet the specialized requirements of small market segments without allowing unnecessary inventory to pile up? One way to do this is to postpone the act of giving the finishing touch to a product for as long as possible.

Consider a typical paint manufacturer who offers several shades and packs of the same grade of paint. Due to proliferating Stock Keeping Units (SKUs), SCM becomes extremely complicated, leading to unwanted inventory accumulation. The practical solution is to make the paint in a few important colors and in large packs, at the factory. Dealers can then break bulk and offer the paint in

smaller quantities and in various colors by adding suitable pigments at the point of sale. By keeping the number of SKUs at a manageable level, inventory can be drastically reduced. Indeed, this is what companies like Asian Paints are attempting to do in India.

We can generalize (the above example) by stating that modular product design can greatly improve the efficiency of a Supply Chain. Such a design not only facilitates the postponement of the final assembly but also maximizes the number of standardized components used across products, leading to significant cost reduction. If different modules can be manufactured simultaneously in parallel production lines, the response to a customer's order can be even faster. In short, a company can have the best of both worlds—responding fast and yet meeting the specialized needs of a customer.

### **Process innovations in SCM**

In some industries, through a clever sequencing of the different stages of value addition, the management of inventory can be significantly improved. Indeed, the innovations can be deceptively simple in some cases. Consider Benetton, which earlier followed the practice of dyeing the yarn before knitting the sweaters. The Italian company later decided to knit the sweaters first and do the dyeing after receiving the order or when it had a better idea of the fashion trends during a particular season. In effect, Benetton postponed the point of product differentiation and cut significantly the cost of obsolete inventory. Benetton's example illustrates that SCM can be quite similar even in the case of seemingly different products. In fact, Stan Shih, CEO of the famous Taiwanese personal computer manufacturer, Acer, has remarked that the PC and

fashion garments businesses face pretty much the same kind of SCM problems.

The American company, Planters, is a good example of how simple process innovations based on a good understanding of customer requirements can facilitate customization without the loss of efficiency. Planters realized that the basic product desired by different retail chains is very often the same and only the packaging requirements vary significantly. It has installed new packaging lines that can tailor the package's size, the promotional information and also adjust the number of cases to be placed in a carton depending on customer requirements.

The famous Hong Kong-based trading company, Li & Fung is another good example of process innovation to streamline SCM practices. Normally, shippers tend to send full container loads of one item to minimize idle

freight. Let us say a trader has tied up with 10 factories each making a single product. The standard practice would be for each factory to ship full container loads of the item.

When these containers reach the port, they are opened and assortments of items restuffed into them to cater to the requirements of individual customers. Instead if one container is moved from factory to factory and stuffed with exactly the quantity the customer needs, it can be shipped directly to the customer without the need for opening and restuffing at the port.

As Victor Fung, Li & Fung's Chairman puts it<sup>2</sup>: "The shipping cost will be greater and you will have to be careful about stacking the goods properly. But the total systems cost could be lower because you've eliminated the consolidator altogether. When someone is actively managing and organizing the whole supply chain, you can save costs like that."

## IT as an Enabling Tool

Distorted information flows from one end of a supply chain to the other can lead to what is called the *bullwhip effect*. Demand and orders go more and more out of sync as we move up the supply chain. Information technology can be used to prevent this by sharing demand information on a timely basis with upstream entities. (See Box: Hunter Douglas). At a more advanced level, IT can be used as a strategic tool to add value rather than just providing timely information. We have just seen that innovations in the manufacturing process can greatly improve the capabilities of a supply chain. Many of these innovations have been triggered by IT.

Consider the apparel industry. Traditionally, retail outlets have sold finished clothing with little or no scope for any modification to suit the customer's fit or tastes. Today, this scenario is changing. Retail stores can use computers to take a customer's

### Hunter Douglas

Rotterdam based Hunter Douglas has annual sales of about \$1.5 bn. 80 percent of its sales comes from metal or plastic blinds and similar products—where it is one of the world's leading suppliers. Hunter generates only about one-third of its sales in Europe. The rest comes from around the world. The company has 13,600 employees and 140 plants.

Against the current trend towards outsourcing, the company has a highly integrated approach to manufacturing. In Europe, it makes in its own plants; roughly 80 per cent of the individual components that go into the final products. The job of matching the production of parts with what the consumer wants, involves a massive exercise in logistics. Every day, 10 to 15 trucks arrive at the company's central European warehouse near Rotterdam with parts from the company's six main European manufacturing units. These are mainly in the Netherlands, and produce items such as metal sheets, fixtures, textiles—and even the paint used in the final finish.

The individual components—made in some 10,000 different shapes and sizes—are almost immediately reshipped either to Hunter's 20 or so assembly plants around Europe or to other companies that do the assembly and distribution job under licensing deals.

Since many of the items are made to order by the consumer, there is an urgent requirement to create a smooth link between production and the final consumer. A typical customer order (placed via a retailer to which Hunter's assembly plants ship directly) is on an average only about \$150. This means the company has to make its final products in hundreds of thousands of variants. Demand forecasting is extremely important to keep track of information from retailers and distributors and link this with its parts production schedule. For this job it uses a computer system provided by Demantra, a US-based company that specializes in demand-management projects. The system has allowed the company to increase the accuracy of its forecasts for the production of certain types of components and reducing both stock outs and excess inventory build-ups.

The system connects managers in charge of parts production in individual factories with demand information so that manufacturing can be tuned better with external demand. Thanks to IT, Hunter is now forecasting monthly rather than twice a year for most products, making the business more responsive to trends in the market. Hunter is now in a better position to appreciate complete switches in direction by consumers—for instance for blinds painted in different colors or which use new types of fabric.

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<sup>2</sup>Harvard Business Review, September-October, 1998

measurements and relay them to the clothing vendor, who stitches and dispatches the garment in just a few days, if not hours. Not only is the retail store able to increase customer satisfaction, but it is also able to make more optimal use of its floor space. The outlet needs to keep only a few samples of a garment, instead of all sizes and colors. By minimizing inventory and building to order, the cost of obsolescence can be drastically reduced. This is a critical success factor for fashion goods retailers. According to some estimates, retailers charge the list price for only about 50-60 percent of their inventory and offer steep discounts to dispose of the remaining garments which go out of fashion. There are also significant benefits for the manufacturers, who need to stock only relatively inexpensive raw materials and can begin production after the orders have been received.

Innovative use of information technology, combined with a serious commitment to understanding customer tastes can virtually eliminate

the risk associated with obsolete inventory. Consider Paris Miki, a Japanese eyewear retailer. Its Mikissimes Design System enables customers to get exactly the type of glasses they are looking for. The system takes a digital picture of each customer's face and analyses its attributes. The customer's views are also sought. A specific lens shape and size is then recommended and displayed on the digital image of the consumer's face. The shape and size of the glasses are adjusted till the customer is satisfied and the order can be frozen. A technician grinds the lens and makes it available to the customer in less than an hour.

The rapid emergence of the Internet as an efficient medium for sharing information, making procurements and executing orders is making a tremendous impact on SCM. (See Box: Siemens' Computer Tomography Division) Dell Computer which has used its website as a powerful tool to conduct business online is a good example. But like all

great companies, Dell has understood that the web is only a tool and the efficiency of operations ultimately depends on how well the business processes have been reengineered. As CEO Michael Dell has remarked, "An Internet-based system can revolutionize business processes in a way that blurs traditional boundaries between supplier and manufacturer and manufacturer and customer. The Internet makes it possible to bring customers and suppliers inside your business to openly share critical business information and applications, to create true information partnerships. These partnerships, formed around information assets will transform traditional notions of economic value." In India, Telco has made serious efforts to make its procurement activities web enabled. And the largest automobile company in the world, General Motors, which has seen its market share decline over the years is trying to reinvent itself, under the leadership of Rick Wagoner, by using the Net to manage its supply chain more effectively.

#### Siemens' Computer Tomography Division

Siemens' Computer Tomography (CT) division is the world's second-biggest manufacturer of such equipment, after General Electric of the US. CT systems are highly complicated medical scanners costing up to Euros 900,000, and which use X-rays to look at sections of the body to diagnose or monitor diseases such as cancer. The German operation—based in Forchheim, near Nuremberg—generated sales of about Euros 700m, in 2000, of which 85 per cent were outside Germany. Since 1996, productivity of workers has doubled—a change brought about by several factors, including streamlining of the supply chain and strengthening the link with customers.

The Internet has been at the heart of Siemens' new SCM initiatives. At the premises of selected suppliers of parts for its CT machines, Siemens has installed web cameras—small TV cameras linked to the Internet—which monitor production lines to check on the availability of components. This allows information to be relayed to the division's Forchheim plant—which is the world's biggest CT factory and where 500 of the 1,200 people in the division work—about the flow of components. Siemens is planning to use a similar concept in an effort to move closer to customers.

Every time the company is about to install a CT machine in a room at a clinic or hospital, anywhere in the world, technicians will put web cameras in these rooms a month or so before the shipment date. These will provide instant feedback to Forchheim on the efforts being made by the customer to prepare the rooms. The installation procedure which involves technical and manufacturing staff from Forchheim—can frequently be delayed because the rooms do not have the required electrical wiring or are not properly painted. Use of the web camera system will keep such delays to a minimum, thus improving both customer satisfaction and operational efficiency.

Since the mid-1990s, the CT division has been outsourcing much more of its parts production. Currently about 80 per cent of the cost of the parts in each CT machine is accounted for by outside suppliers, compared with only about 50 percent four years ago. To reduce the complexity of the supply chain, Siemens has also reduced the number of suppliers from 100 to about 30, of which roughly half are in Germany.

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### Soft Issues in SCM

The new approach to SCM is crucially dependent on the tight co-ordination of activities among both internal and external entities. Working with a “boundaryless” mindset naturally implies the need for excellent people. As information goes online, the traditional centres of power are likely to shift. The behavioral issues arising in this context need to be addressed properly (See Box: Soft Issues in SCM). Training is also necessary to make people understand the objectives of SCM and how their individual contribution will make an impact.

Synchronization of supply chain activities demands tremendous understanding across functions and with outside partners. This is possible only if the top management invests sufficient time and effort in promoting a climate of trust. Indeed, lack of trust between manufacturers and retailers can be a difficult hurdle to overcome where such relationships have traditionally been based on tough bargaining. To get the partners to share information in a transparent way is hence a major challenge. Building trust with suppliers, transporters and dealers can be very tricky, in a country like India. Many large companies use their bargaining power to bulldoze their small suppliers and make them work with unsustainable margins. Truck operators have traditionally been given a step motherly treatment by big manufacturers and are often asked to operate at unsustainable rates.

Consequently, unethical practices such as pilferage of the material being transported have resulted. Making transporters real partners in SCM initiatives calls for a lot of effort. Management of relationships with dealers is also extremely important. Unless dealers are considered an integral part of the family and involved in activities such as product development, they may feel alienated.

Victor Fung has explained the importance of nurturing and strengthening relationships with supply chain partners, “I’m in the process of creating a database to track systematically all our supplier relationships. We need something that everyone in the company can use to review the performance history of our suppliers. One of my colleagues said, “We’d better guard that with our lives because if somebody ever got into our system, they could steal one of the company’s greatest assets.” I am not so worried. Someone might steal our database, but when they call up a supplier, they don’t have the long relationship with the supplier that Li & Fung has. It makes a difference to suppliers when they know that you are dedicated to the business, that you’ve been honoring your commitments for 90 years.”

### Conclusion

To conclude, supply chains must result in the lowest cost and the highest responsiveness. When the industry is stable and markets are mature, the scope for differentiation may be less.

#### Soft Issues in SCM

##### *Intra-Organizational issues*

- Inter-departmental co-operation
- Redefining key processes with customer service as the objective
- A culture of trust, information and knowledge sharing
- Support and commitment of top management.

##### *Inter-Organizational issues*

- Orientation towards building long-term relationship
- Similar customer service goals
- Seamless flow of information
- Shared risks and rewards
- Co-operative behavior.

Consequently SCM initiatives must focus on cutting costs by reducing inventory holding and transportation costs. On the other hand, when customers are prepared to pay and demand the latest technology or products, responsiveness becomes crucial. In such a situation, a very sophisticated information system is necessary to stay in touch with the market and reorganize production schedules at short notice.

A Supply Chain that takes into account the requirements of the customers and which provides the correct level of service can go a long way in generating a sustainable competitive advantage.

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### Points to Ponder

1. What are the factors responsible for the growing importance of Supply Chain Management?
2. One of the key requirements for effective Supply Chain Management is information sharing. But lack of trust among supply chain partners hampers this process. What can the companies do to address this issue?

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