
UNIT 2 PRINCIPLES OF SUPPLY CHAIN MANAGEMENT

Objectives

After reading this unit, you would be able to:

- define how the supply chain works;
- understand the key processes required to integrate the supply chain;
- examine critical areas of Logistics-Marketing Interface; and
- examine critical areas of Logistics-Manufacturing Interface.

Structure

- 2.1 Introduction
- 2.2 How does SCM Work?
- 2.3 The Logistics-Marketing Interface
 - 2.3.1 Logistics and Product Life Cycle
 - 2.3.2 Areas of Logistics and Marketing Interaction
- 2.4 The Logistics-Manufacturing Interface
 - 2.4.1 Customer Service Issues at the Logistics-Manufacturing Interface
- 2.5 Summary
- 2.6 Self Assessment Questions
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2.1 INTRODUCTION

Now you are aware of what Logistics and SCM mean. You have appreciated the role of Logistics and SCM in the economy. SCM is basically a system that connects an organization with its customers and suppliers. SCM is the management of all key business processes across a number of supply chains. It is important to know about different supply chain processes for having an integrated SCM.

Also there is a strong relation between Logistics group and Marketing group in an organization. Similarly, Manufacturing and Logistics are also interrelated. This unit will take you through to these concepts.

2.2 HOW DOES SCM WORK?

The supply chain management (SCM) is viewed as a system that links an enterprise with its customer and suppliers. As shown in Figure 2.1 information flows from customer in the form of forecast and orders to both the enterprise and suppliers. This information is refined through planning into specific manufacturing and purchasing objectives. As materials and products are purchased, a value added inventory flow is initiated which ultimately results in ownership transfer of finished product to customers.

SCM is an integrated approach that is highly interactive and complex and requires simultaneous consideration of many trade-offs. SCM is the management of all key business process across a number of the supply chains. Successful SCM requires a change from managing individual function to integrating activities into key supply chain processes. Operating an integrated supply chain requires continuous information flows, which in turn helps to create the best product flows.

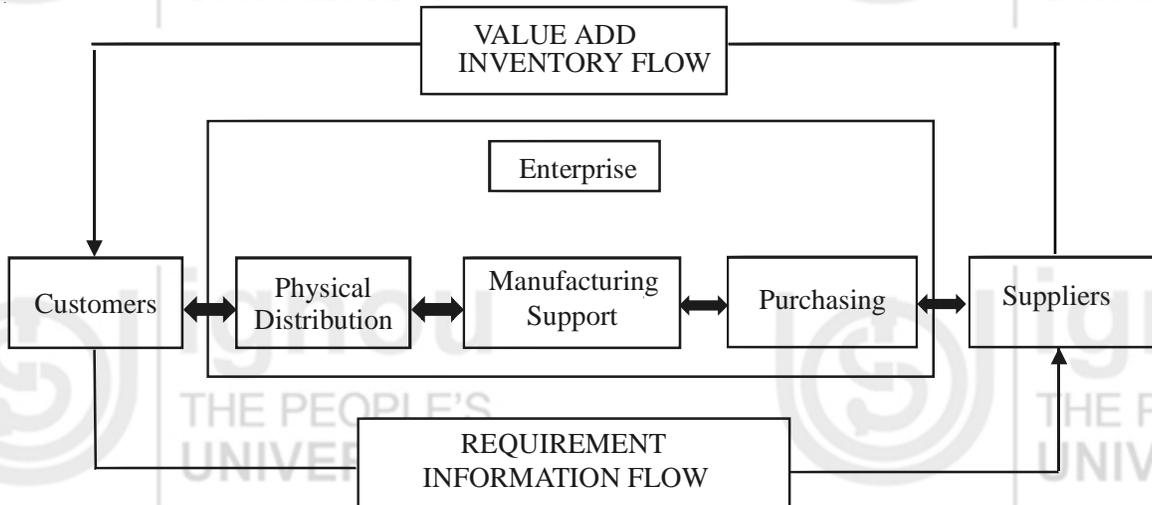


Figure 2.1: Supply Chain System

Source: Logistics Management, Bowersox et al., 1986

The customer remains the primary focus of the process. However, improved linkages with supplies are necessary because controlling uncertainty in customer demand, manufacturing processes and supplier performances are critical for effective SCM. The key processes for the integrated SCM (Figure 2.2) are as follows:

Customer Relationship Management

This is the process to identify the key customers. With customer moving to centre stage, more companies have begun to treat a customer as a value independent entity. The companies no longer view sales as selling of their products, but as selling of relationships, solutions, support and care. Customer relationship teams develop and implement partnering program with key customer. Product and service agreements specifying the level of performance are established with these key customers.

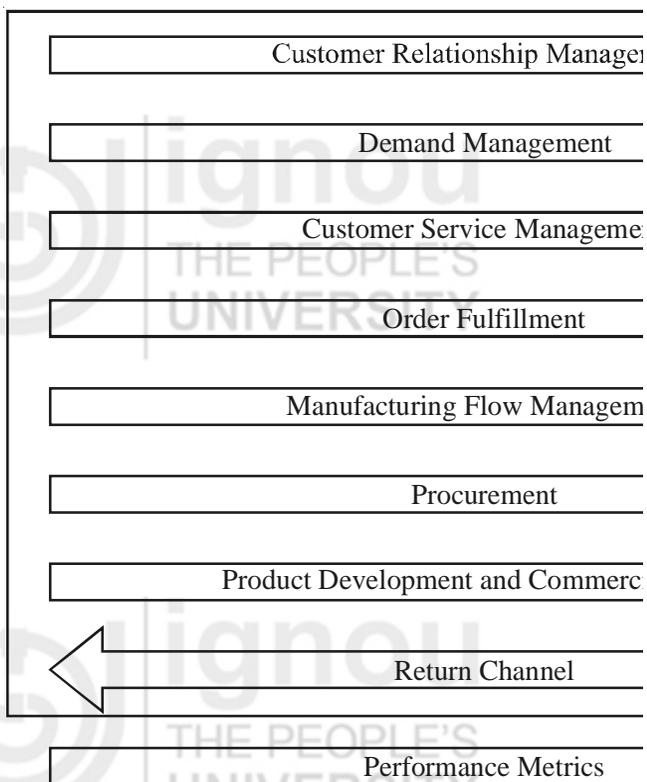


Figure 2.2: Supply Chain Process for Integrated SCM

Source: Lambert 1998

Customer Service Management

Increased and intense competitions all around have made customer service as the key differentiator in a marketing system. Customer service provides the single source of customer information. It provides the customer with real time information on promised shipping dates and product availability. Customer service is a valuable business activity governing both resources and top management attention. Customer service is being offered in many forms such as post warranty support, fast repairs, speedy response to service calls from customers, easy availability of spares, qualified, competent and customer friendly technicians.

Demand Management

Customer demand in the form of irregular order pattern is the largest source of variability. Given this variability in customer ordering, demand management is a key to an effective SCM process. Manufacturers are moving from a push system to make to order mode, in such case predicting or forecasting demand is the key driver on which all of the supply related decision will depend. The demand management process must balance the customer's requirement with the firm's supply capabilities. A good demand management system uses point of sales and "key" customer data to reduce uncertainty and provide efficient information flows through out the supply chain.

Customer Order Fulfillment

The key to effective SCM is to achieve high order fill rate. Order fill rate can be defined as % of order fulfilled before or on the due date set by the customer.

Performing the order fulfillment process effectively requires integration of firms manufacturing, distribution and transportation plans.

Manufacturing Flow Management

This functional area decides how production should be organized and managed. Traditionally production system uses push strategy but in a customer focus environment pull strategy is more effective. To implement pull system, manufacturing process must be flexible to respond to market changes. This requires the flexibility to perform rapid change over to accommodate mass customization; orders are processed on a just in time basis in minimum lot size. In a customer focused business world, production process has to optimize balance between customer satisfaction and efficiency.

Procurement

Procurement is concerned with buying and movement of materials, parts or finished inventory from supplier location to manufacturing or assembly plants, warehouse or retail stores. Traditionally procurement is carried out on the basis of bid and buys system whereas in new integrated concept long-term partnerships are developed with core group of suppliers. Suppliers are involved at the early design stage which can lead to reduction in product development cycle times. For quick response to customer demand purchasing activities are carried out with rapid communication mechanism such as EDI and internet linkages. This reduces the cost and time on the transaction portion of the purchase.

Product Development and Commercialization

In today's fast changing environment new products are life bloods of a company. For the firm to remain competitive it has to sharpen its product development times. This requires that customer and suppliers must be integrated into product development process.

Return Channel

Managing the return channel as a business process offers the same opportunity to achieve a sustainable competitive advantage as managing the supply chain from an

out-bound perspective. Effective process management of return channel enables the identification of productivity improvement opportunities and break through projects.

Focusing effort on improvement in key business process is the foundation of SCM philosophy. Thus the goals of these processes are to:

- a) Develop customer focused teams that provide beneficial product and service agreement to strategically significant customers
- b) Provide a permit of contact for all customers, which efficiently handle their inquiries.
- c) Continually gather, compile and update customer demand to match requirement with supply.
- d) Develop flexible manufacturing system that responds quickly to changing market conditions.
- e) Manage supplier partnership that allows for quick response and continuous improvement.
- f) Fill 100% of customer order accurately and on time
- g) Enhance profitability by managing the return channel (reverse logistics)

Activity 1

Take the case of an organization where you are working or about which you know of and identify the key processes within that organization vis-à-vis those proposed by Lambert.

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2.3 LOGISTICS-MARKETING INTERFACE

Traditionally logistics group assumed primary responsibility for warehousing, inventory and transportation within many organizations while marketing group is responsible for negotiation, promotion and selling. As neither group had responsibility for over all channel management, conflicts arose at the expense of overall organization goal. The organizations had realized that functional interdependence, not internecine conflicts, is the key to satisfy customer needs. Despite the realization by logistics and marketing manager that cooperation is essential marketers often criticize logistics department for being cost minimizers having no concern for customer needs while logistics department accuses marketers of chasing sale at any cost. Therefore it is essential that organizations identify area of agreement and potential conflict. Senior management must be keen to actively support cooperation between the two groups. This can be assisted by performance measurement that rewards cooperation and a spirit of interdependence that actively discourages parochial behaviour.

2.3.1 Logistics and Product Life Cycle

Product life cycle (PLC) is a key marketing concept that affects the relationship between logistics and marketing. For different stages of PLC i.e., introduction, growth, maturity and decline, different level of logistics support is required by marketing. In the introduction and growth stage timely cost effective fulfillment of order is a major requirement in ensuring initial acceptance of the product. Later as sales slow down and the product moves into the maturity and decline stages, the company changes to trimming cost as the product faces stiff price competition and consequent pressure on margins. Hence there is need for a logistics manager to understand what marketing is trying to achieve with each product and what appropriate level of logistics support is required accordingly.

2.3.2 Areas of Logistics and Marketing Interaction

In today's competitive environment organizations are utilizing the benefits of their established logistics/marketing interface to be competitive not in terms of product and price but also logistics services tailored to meet individual customer needs. These organizations are able to differentiate themselves from their competitors by offering a total service with logistics forming an essential part of the total value chain.

The major area of interaction between logistics and marketing includes (Gattorna 1995):

- **Product Design:** This can have a major effect on warehouse and transportation utilization (and therefore costs).
- **Pricing:** This is the means by which logistics services customer demand affects the overall cost of the product and in turn the organization's pricing policies.
- **Market and Sales Forecasts:** Marketing forecasts will largely dictate the level of logistics resources needed to move products to customers.
- **Customer Service Policies:** If marketing opts to offer a very responsive level of service to customer, logistics resources, in the form of facilities and inventory, will need to be very considerable.
- **Number and Location of Warehouses:** This is one of the greatest areas of contention and can only be satisfactorily resolved if marketing and logistics develop the policy jointly.
- **Inventory Policies:** This is another area of contention, as these decisions have a significant bearing on operational costs and the extent to which desired levels of customer service are achieved. It is another key area where policy should be developed jointly.
- **Order Processing:** Responsibility for who receives customer's orders and the speed and efficiency with which they are processed has a major impact on operational costs and customer's perceptions of service levels. This is another area where joint policy-making is preferable.
- **Channels of Distribution:** Decisions to deliver direct to the customer or through intermediaries will greatly influence the level of logistics resources required. As channels change, so will the resources required. Marketing should definitely consult with logistics when making channel decisions.

2.4 THE LOGISTICS-MANUFACTURING INTERFACE

Manufacturing and logistics are interrelated so no one can be considered in isolation. Decisions made in these two areas commit the organization to relatively long-lasting cost structures and also determine the manner in which the business competes in its chosen markets.

To maintain its competitive position in a dynamic industry, the manufacturing and logistics functions must respond positively by considering the manufacturing/logistics network as whole and continuous improvement programmes coordinated across the various activities like delivery service, production priority control and purchasing to exploit the synergy available.

There are two fundamental competitive strategies, which every organization has to decide to remain unbeaten in the competitive environment. Cost leadership i.e., be the lowest-cost producer in the industry or meaningful differentiation i.e., to differ by competitor in some form, that can be in terms of service like delivery time, delivery reliability etc. or in terms of technical advantages like superior features, superior product etc. In new environment, where integration is the driver to achieve competitive advantage, organizations have evolved new approaches to develop interface between two functions. The differences in these perspectives are shown in Tables 2.1 and Table 2.2 when organizations decide to compete on the basis of cost leadership and differentiation respectively.

Table 2.1: Manufacturing / logistics approach when the basis for competing is cost leadership (Source: Gattorna 1995)

<i>Basis for Competing: Lowest – Cost Competitor</i>	
Old Approach	New Approach
Cost-reduction programmes	Eliminate all non-value adding activities/procedures/tasks etc
Reduce inventory	Reduce the need to buy capacity by shortening internal lead times
Trim 10% all budget allocations	Reduce the material conversion cost by simplifying processes through integration and technology
Defer capital expenditure	Emphasize product and process quality so as to reduce costs associated with rework, breakdowns etc.
Emphasize control on expenses particularly direct labour	Reduce need for inventory through superior planning systems, shortened internal lead times; linking processes etc
<i>Which also results in:</i>	<i>Which also results in:</i>
● Inadequate support	● Improved product performance
● Poor product quality	● Reduced product variability
● Ageing equipment/processes	● Improved flexibility
● Poor customer service	● Improved responsiveness to market
● An image of being unreliable	
● Poor product availability	
● Poor delivery service	

Table 2.2: Manufacturing / logistics approach when the basis for competing is differentiation
 (Source: Gattorna 1995)

<i>Basis for Competing: Product Availability and delivery time</i>	
Old Approach	New Approach
Increase inventory to act as a buffer	Shorten internal lead times to improve responsiveness to market
Increase number of branch warehouses	Emphasize schedule performance to ensure reliable supply
Increases capacity to provide flexibility	Emphasize product and process quality so as to reduce delays caused by rework, breakdowns etc.
Release orders early to production	Utilize express transport and centralized distribution to prevent misallocation of stock
Emphasize production output	Initial superior customer service and order entry systems to enhance customer communication
<i>Which also results in:</i>	<i>Which also results in:</i>
Higher costs	Lower costs
Negatives cause by the complexity of the system and poor product quality caused by emphasis on 'getting the product out'	Improved product performance Reduced product variability
Long internal lead times caused by early release of works orders to give the plant 'plenty of time'	An image of reliability
Stock-outs due to work order overload, confused priorities and difficulty in allocating stock to many warehouses	Improved flexibility in volume and product mix

Logistics link the manufacturing both from characteristics of inputs i.e., suppliers of raw materials and characteristics of market i.e., customers. For a given manufacturing organization there is a production/branch warehouse configuration, which satisfies most constraints or pressures imposed by the inputs or the markets. For effective operation of manufacturing/logistic interface there are two primary determinants i.e., Capacity and Location.

Capacity is related to location and logistics in the following way. First, production capacity must be matching in some sensible way to the market demand then in accordance with the production capacity matching is required for the logistics network i.e., procurement, storage, order entry and processing, outbound transport, branch warehouse and final customer delivery.

The capacity issues are very crucial decision and are required to change as per the market demand and demand locations. Short-term solutions can be capacity enhancement by overtime, second and third shifts, third party contracting, extension of the existing facility and long-term solution are additional facility in a new location or extensive capacity in new location. Short term decisions possess the least risk, and impact on the logistics network only in terms of the additional capacity requirement where as long term solution demand a re-evaluation of the manufacturing/logistics network not only in terms of the capacity of each component but also the strategic necessity and location of each facility (factory, warehouse) in terms of its contribution to the effectiveness of the total network. In other words, a change in location and capacity of any one facility requires a review of the location and capacities of all other facilities. Clearly, the issues involved in location, capacity and logistics are inextricably linked.

2.4.1 Customer Service Issues at the Logistics-Manufacturing Interface

Customer service strategy is an on-going process of increasing both the quality and number of links between the manufacturing organization and the customer. The whole emphasis in today's service intensified businesses are to increase a series of both human and information based technological relationships between customer and the organization so that better customer services and satisfaction to the customer can be realized. The issues at the manufacturing/logistics interface for better customer service are as follows:

Demand Forecasting

The general function of product forecasting in the short to mid term is to contribute to the process of ensuring the availability of stock for customers. This includes the use of distribution requirements planning (DRP) wherever appropriate. For the longer term, forecasting at the product group level is crucial for manufacturing capacity and flexibility decisions.

Customer and Supplier Oriented System

Organizational systems will need to be directly related to the issues of how to bind the customer more tightly to the organization and how effectively integrate suppliers into the overall supply chain with the objective of enhancing customer service.

The systems installed by organizations will need the capability to formally link the customer in a form that benefits both parties. Systems will also be required to link with suppliers in a manner that gives meaning to the concept of strategic alliances. In a strategic alliance the supplier and the manufacturer agree to a relationship that goes beyond the normal commercial relationship such that each obtains synergistic benefits similar to that obtained by forward/backward integration but with least associated risks and negative attributes.

Plant Configurations

The location, nature and operating performance of manufacturing facilities, central warehouses and branch warehouses impact heavily on both cost structure and service levels. In the longer term, and in conjunction with other factors (systems, supplies), the plant/branch configuration is a major structural input to reducing overall supply chain costs. When the links between manufacturer and customer and manufacturer and supplier are complete, a rethink of the logistics (supply chain) network from supplier through to customer will be required, for two reasons:

- Available technology, particularly information technology, will allow certain plant/branch configurations, previously ruled out, to be feasible.
- There will be an on-going need to reduce (in real terms) the cost of the network.

A key feature of this process will be the requirement of involving in an appropriate manner both customers and suppliers. This will be new ground for many organizations and will force a re-evaluation of values and mission in some circumstances.

Master Production scheduling

The master production schedule (MPS) is an area where a number of parties (manufacturing, logistics, marketing, finance) have a vested interest. Often as not, though, it is done by one group in isolation from the others. In the operational sense the MPS is primarily concerned with stock availability within a set of constraints such as capacity. As such, it is the single instrument, which demonstrates the plan for:

- g) Finished goods inventory levels

- b) Customer service in terms of stock availability
- c) Machine utilization
- d) Capacity utilization
- e) Labor productivity
- f) Output
- g) Need for overtime/casual employees and so on.

The real power of the MPS, however, is its potential to involve all interested parties. In practice, when people from marketing, logistics and manufacturing get together and agree on a schedule, the result is a superior schedule. Clearly the MPS may be used as a vehicle to integrate a number of parties into the planning and decision-making process with the result being a superior plan which, when executed, results in superior customer service.

2.5 SUMMARY

In this unit, we have discussed how the supply chain works and what are the key processes required to integrate the supply chain. We have also examined the critical areas of logistics-marketing interface and logistics-manufacturing interface. These interfaces are critical for enhancing supply chain performance. Finally we have discussed how manufacturing-logistics interface could provide better customer service.

2.6 SELF-ASSESSMENT QUESTIONS

- 1) Explain various supply chain processes for an integrated SCM. Are there any other processes that you can think of?
- 2) What are the primary responsibilities of logistics group and marketing group within an organization? Why there is a conflict between the two? What measures can be taken to enhance cooperation?
- 3) What are the differences between manufacturing/logistics approach when the basis for competing is
 - i) Cost leadership
 - ii) Differentiation

2.7 REFERENCES AND SUGGESTED FURTHER READINGS

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- 4) Lambert D. M., 1998, *Fundamental of Logistics Management*, McGraw Hill.
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- 6) Gattorna, J. L. & Walter P. W., 1996, *Managing the Supply Chain : A strategic Perspective*, Plagrave Macmillan Indian Reprinted Ed., 2004