
UNIT 4 LOGISTICS - INBOUND AND OUTBOUND

Objectives

After reading this unit you would be able to:

- define Logistics;
- describe the facets of Logistics i.e. Transportation & Warehousing;
- portray Logistics as a key to supply chain management;
- discuss about Inbound & Outbound Logistics; and
- describe Logistics from supplier to manufacturer & manufacturer to consumers.

Structure

- 4.1 Introduction
- 4.2 Logistics: Definition
- 4.3 What is Supply Chain Management (SCM)?
- 4.4 Design and Management of SCM
- 4.5 Logistics: Inbound and Outbound
 - 4.5.1 Suppliers to Manufacturers
 - 4.5.2 Manufacturers to Consumers
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- 4.7 Integrating Logistics
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- 4.9 Summary
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4.1 INTRODUCTION

The role of logistics has for long been perceived by many senior managers and chief executives, as nothing more than getting the right product at the right place in time and within costs. However, in recent times to be successful logisticians a wider perspective has to be developed with due consideration to the strategic role played by logistic management in an organization. Strategic management of acquisitions, movement, storage of raw materials, production and shipment to delivery to end-users are some of the significant tasks of logistics management. Cost-effectiveness and speed are the inherent requirements to make the operation a successful one.

Logistics is a very intricate yet a very simple subject to learn about, but a very complicated subject in case the channels of logistics are not in place and not integrated. Logistics per se, require a lot of coordination and integration at the highest and the lowest of levels. Rightly said, a logisticians phone never stops ringing, he moves from crisis to crisis, and from one criticality to another.

4.2 LOGISTICS: DEFINITION

We will begin with an illustration. Take the case of a small time businessman who manufactured and marketed jam, those were the days when it had only a few brands to reckon with. It entailed traveling long distances from Calcutta (now Kolkata) to the remotest parts of Bengal & Bihar (some areas of Jharkhand). The load used to be

huddled up at the rear (body of the vehicle) neatly packed in bright colored cardboard packages. The manufacturer processed the guavas/mangoes/pine-apple etc into a jelly like substance, bottled them carefully under his eyes, sealed them with molten wax (that was the practice those days), labeled them, packed them into neat containers careful enough to prevent breakages, marked them for the consignor and dispatched them to their destination. The surplus were sent to a badly lit room and stacked neatly by placing bricks under the packages to prevent against damp. You must have observed how meticulous he was and so concerned about his products.

One must admit here that one learn logistics in a very practical way. Right from the time you used your tri-cycle to lug the loads your friends carried. When you played as children, unknowingly, stacking your belongings neatly and carefully, inadvertently, and later delivered them to another friend and took a few marbles in return of those proud possessions. Till date one is doing almost the same thing; mobilizing men, material, equipment and supplies over long distances across the length and breadth of this country, and stocking them for a further use. That is what is logistics in short.

Coming to the proper definition, the term logistics could be used to cover all aspects of movement, storages of material and to deliver the material to the user. For a manager the definition would mean involving movement of goods both in the inbound and outbound sides. It is responsible for both incoming goods and distribution of goods to the next member of the supply chain and to the end consumer per se. In almost all cases, the logisticians design and manage the company's distribution system, which consists of warehouses, distribution points and transport systems. Logistics can play a major role in shaping and determining the nature of the overall corporate response to exploit market opportunities (Deshmukh & Mohanty, 2004). Marketing forecasts precede exploration of market opportunities, since, overall potential of the market, customer profiles, price/volume combinations and resellers profile is to be identified before the best suited infrastructure is utilized to maximize the opportunities available. A logistic activity enables a broader view that has to be undertaken on how the available opportunity can at best be approached. This would further enable the management to review the number of production options available whether it is manufacturing of components, assembly operations or a combination approach. The important characteristics of this decision process concern the relationship between fixed and variable costs ab-initio and also through the product life cycle. This will require a view of the markets, the response of the product competitors and an assessment of market risk.

Logistics can make or break a company. How? Once a logistics decision is taken, the implications of that will be, high level of services in terms of product availability and delivery. Failure of logistics will affect your company repute and overall affect the market share. Therefore, in a nutshell one has to understand the importance of logistics and its related decision, since it's the key to effective supply chain management, and also the first step towards building a strong market position.

Let us see this through an illustration fig 4.1:

Once you have generally understood the basics of logistics we can now inch forward to the intricacies involved in making this logistics happen and what helps in a successful logistics activity. Like in the army it is said that no war can be won without the foresight and planning of an expert logisticians. A soldier can fight a battle in the adverse of conditions, only when, the logistician ensures timely supply of stores, ration and ammunition in all weather and terrain conditions. The two major aspects of logistics are transporting and warehousing, without which logistics is seriously affected.

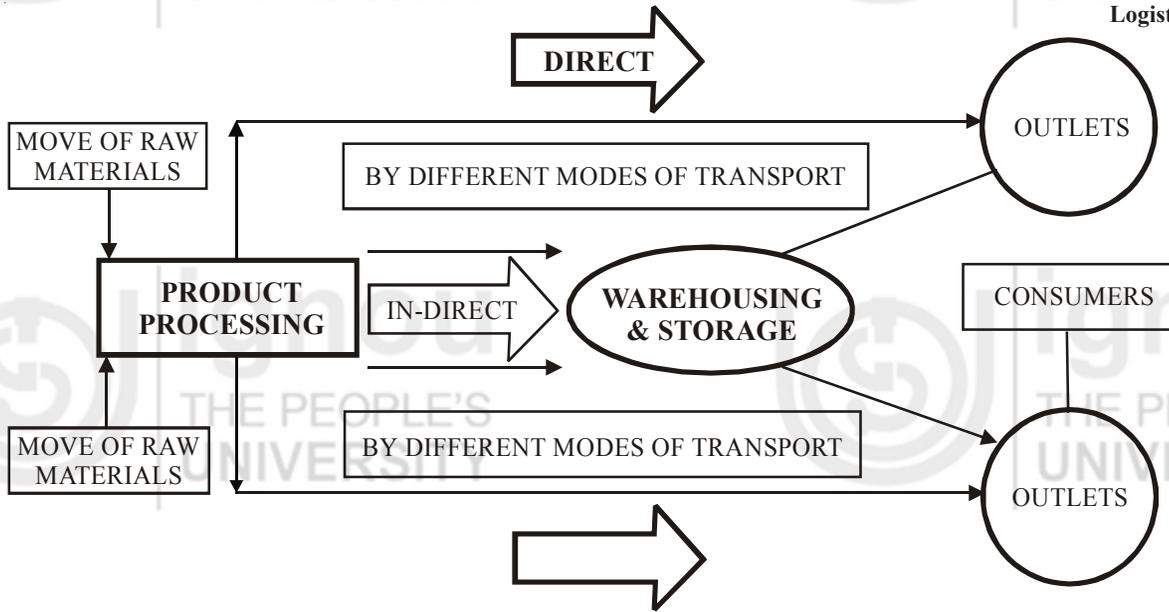


Fig 4.1: Basic Block Diagram to Understand Logistics

Transportation

Transportation happens to be the most fundamental part of strategic logistic management. Transport costs include all costs associated with movement of products from one location to another. The average transport costs ranges from 5 to 6% of the recommended retail price of the product.

Transportation is the movement of products, materials and services from one area to another, both inbound and outbound. It can also be said as movement from one node of the supply chain to the other. As Deshmukh and Mohanty (2004) says, “ by providing for the swift and uninterrupted flow of products back and forth through the chain, transportation provides a sort of lubrication to run the chain smoothly. It also permits deeper penetration of newer markets far from the point of production.”¹ Therefore, in order to effectively manage this transportation system the first step would be to establish a cost effective transportation mode. In other words highest customer service in lowest price, leads to company growth (Fig 4.2).

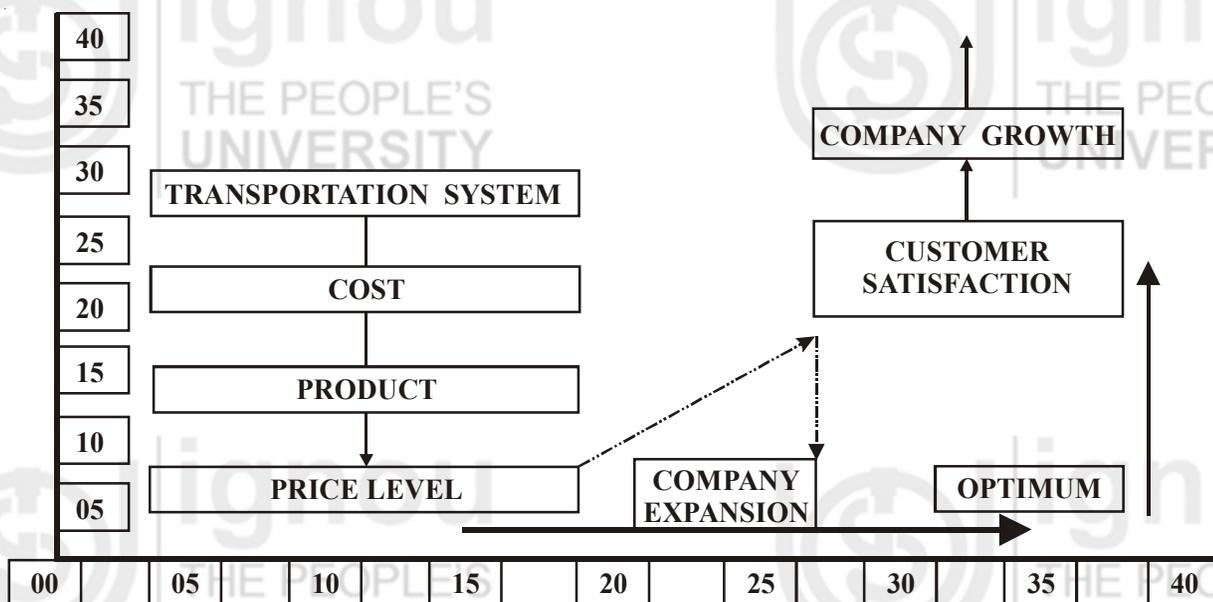


Fig 4.2 Transportation Cost Factor and its bearing on the Company and Customer

¹ Mohanty & Deshmukh in Essentials of Supply chain Management, chapter 7, pp. 118-119.

Where, numerical 40 is a variable factor representing the optimum level in terms of costs & growth in X & Y axis. With the transportation costs coming down from 40 to 30 the product costs lowers to even between 10 and 5, which is directly proportional to the customer satisfaction, which rises to 30 to 35 and affects company growth to 40.

Transportation system has a strategic bearing on operation of a company. Therefore, failure to identify the best transportation mode can directly affect the growth of a company. Higher transport costs will raise prices, which will directly affect the customer satisfaction in a negative way. The three factors as mentioned by Gattoma & Walters required to consider are:

- Customer
- Environment
- Product & company.

Organization, which involves physical movement of goods require transport services that varies from mode to mode. The best suitable mode is required to be identified depending upon the nature of product that has to be moved. Therefore, in order to identify the right transport system the following have to be considered:

- Impact of the transport system on the supply chain.
- Factors that determine the choice of transport mode.
 - Who are the customers to your product per se?
 - What are the environmental factors?
 - What is the product?
 - What is your company profile?
- Feedback and reporting both from within and the environment on the choice of transport, and rectify in case you went wrong the first time.
- Your foresight, flexibility & integration of available resources in planning stage will be one of the crucial factors that will dictate the choice of transport.

Next we have to see as to what are the considerations that influence transportation?²

Considerations Influencing Transportation

- **Customer Communications:** in order to obviate delays in transportation and handling of logistics both the suppliers and distributors are relying more and more on electronic transfer systems, IT & the internet. This will help in considerable reduction in time delays and effect better cooperation between the chains.
- **Market Coverage:** transportation costs influence the size of markets covered in a big way. The characteristics are: costs, flexibility, reliability and availability. The product per se will influence the economics of the decision. A low volume and high value product will be able to support higher costs, which means extended delivery distances and increase in delivery frequency.
- **Sourcing Decisions:** the geographical dimension of the source markets can be influenced by low cost transportation system, i.e. 'reliable bulk freight services could extend the source markets,' says Mohanty & Deshmukh. Companies therefore have to consider a trade off between price & quality and the costs involved in delivering to the processing point, i.e. volume & cost of transportation.

- **Manufacturing Operations:** cost of transporting has a direct bearing on the location of the manufacturing market center. That is why, extraction based units are close to the source of raw materials and the products related to customer satisfaction are closer home, i.e. near to the customer hub center.
- **Pricing Decision:** transportation happens to be the important component of product costs. Therefore, selection of the appropriate transportation mode will have a direct bearing on the product costs per se, with more relevance to exports. Increase in transportation costs increases the product pricing.
- **Customer Service Decisions:** both customer service policy and transportation decisions go hand in hand and hence one cannot be considered in isolation of the other. Moreover, the type of market will also dictate the decision and will vary considerably. Therefore, it's pertinent to overrule the cost factor while servicing the medical customers, since speed is more important than cost in selecting the transport mode.

An Effective Selection System

Transport selection can effectively be resolved by adhering to the five stages of selection framework:³

- Stage I: identification of those factors affecting the choice of transport selection.
- Stage II: categorize the significant factors and identify the potential risks.
- Stage III: determination of the distribution network depending upon the number and size of the depots.
- Stage IV: application of matrix analysis for selecting the right transport.
- Stage V: measure and monitor costs continuously.

A Decision Framework

Determining an organization's transport requirement will be based on the following underlying considerations:

- The available depots, their sizes including movement requirements of raw materials to manufacturing units and finished products to the warehouses and on to the consumers.
- The best choice of mode available depending on the distance involved.
- Product characteristics that will further dictate the type of transport mode to be employed.
- The choice of equipment in terms of type of transport for each requirement.
- The financial option that could be employed in terms of individual type of equipment.
- The operation needs in terms of usage of the equipment for maximum utilization and minimum operational costs.

From the above it's evident that transportation is one of the important facets of logistics and equally important in the process of SCM, because they impact the customer services and other areas of cost. These decisions are prominent within the purview of company logistics decisions due to the factor of trade off potential that exists between alternative modes of transportation and other logistics functions within the firm. Therefore, an understanding of costs and benefits of alternative transport modes, together with an in-depth evaluation of overall corporate implications is mandatory. Transportation costs will always have a direct bearing on the product

³ Deshmukh & Mohanty in Essentials of SCM, pp130-131.

costs, i.e. increased transport costs will have risen prices and vice versa. Therefore, appropriate selection of the right transport mode is necessary for optimum customer satisfaction and for a balanced logistics system of the firm.

Warehousing: This happens to be the other important facet of logistics chain and works side-by-side with transportation. It is that segment of logistics function that deals with storage and handling of inventories starting from supplier receipt to consumption point. The management of this includes the maintenance of accurate and timely information relating to inventory status, location and disbursement. Factors influencing the warehousing decisions are:

- Type of distribution.
- Value of the firm.
- Quantity and potential for obsolescence.
- Competitiveness.
- Economic condition.

Warehousing perform a variety of roles as mentioned below:

- Material handling. It consists of receiving, storing and shipping.
- Storage. This maximizes customer services by improving product and location positioning.
- Transfer of information. This ensures timely and accurate information on inventory status, space utilization, equipment and manpower availability and transport capacity.

In order to develop an effective warehousing strategy the following areas have to be addressed:

- Documentation of existing warehouses operations.
- Documentation of the storage facilities and put forth requirements over the planning horizon.
- Identify the shortfalls within the warehouses that are available including the deficiencies.
- Alternate warehousing plans to meet contingencies in strategy.
- Selection of the best alternative.
- Update the warehouse strategic plan.

With that as a backdrop to our study let us see the design and management of Supply Chain Management, since logistics happens to be the key of SCM.

4.3 WHAT IS SUPPLY CHAIN MANAGEMENT (SCM)?

A simple definition would be; an integrated, synchronized and a closely knitted chain which links all the supply interacting organization in a two way communication system in order to maintain a high quality of inventory in the most effective manner. Managers at all levels should understand this, since this is related closely to world-class supply management. It can also be defined as:

- An integrated system that helps in managing the flow of distribution channel from supplier to the consumers.
- SCM is a systematic method designed to manage the flow of information, materials and services both inbound and outbound, i.e. from the supplier to manufacturer to the end customers.

- It's a strategic coordination of all the related business functions within a particular firm and across businesses within the supply chain, in order to improve performance of the individual companies and of the supply chain.
- It is associated with all the activities encompassing the upward and downward movement of goods and materials from the nascent stage to the production stage and to the consumer. SCM is integrating these activities under one control for better management and for attaining substantial and sustainable advantage. It can be better achieved through better coordination and relationship.
- It's a concerted effort of all in the channel to develop, design, manage and implement value added services towards ultimate customer satisfaction. Integrating men, technology, information, finances and material under one roof is the ultimate aim of this SCM system.

These varied definitions placed above are to guide you to understand the concept of SCM better and can be used as per individual perception. The common factor to all this is one has to go beyond the realms of traditional functioning to include and integrate external entities to include customers and suppliers.

For better assimilation let us put it across this way.

The Chocolate Way

You manufacture a particular brand of chocolate, a popular one with all age groups. Now, in order to make your product responsive and hold fast into the competitive market you got to maintain a close link with suppliers who will provide the best milk

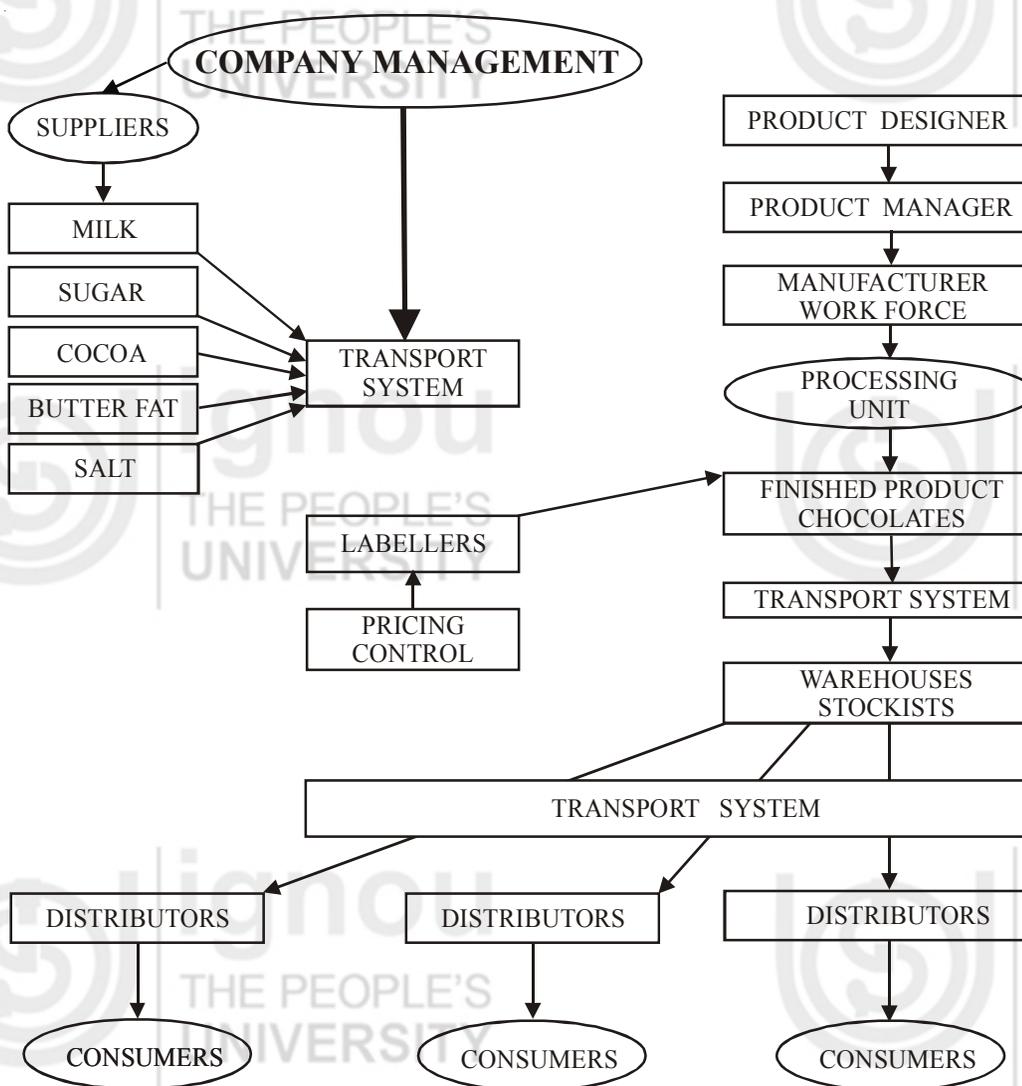


Fig. 4.3 : A Layout of An Ideal Processing Unit Explaining the Supply Chain

for your money, the best coca powder for the flavor, an efficient product manager with an equally trained staff who will design and manufacture what the market requires, an effective marketing system and above all the vendor who will carry it and distribute it to my consumers. This is your supply chain and managing this to maintain a high quality at all times is called the supply chain management.

It is a linkage, so designed, that one cannot function with out the other and all have to function in close unison and you, as the entrepreneur has to ensure this. It involves a well conceived strategic planning and long-term tactical orientation, and there is a world of difference between practicing and preaching.

A few flow diagrams have been placed for your better understanding. Once you have understood this part of the unit the associated and related matters to supply chain will follow suit, (figure 4.3).

Activity 1

Visit a nearby industry and understand the SCM system being followed in that organization and co-relate the same with what you have learnt theoretically.

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4.4 DESIGN AND MANAGEMENT OF SCM

Internal functions and external suppliers constitute a company's supply system, which are involved in identification and fulfillment of requirement for equipment, materials and key services in an optimized manner. Supply management is the foundation to successful supply chain management. It can create a tremendous impact on any company's bottom line more than any other business function. In case the supply chain is not positively been addressed there is bound to be problems in the firm. Integration of these services and managing them under one head is therefore the key to an effective supply chain system in the organization.

The principle phases of supply chain management are:

- What are the requirements and its generation?
- Sourcing
- Pricing
- Post-award activities

These phases are all interrelated and interdependent and cannot function in isolation. The generation of requirement phase is the most important of all the phases, since; almost 85% of the cost of materials, services and equipment is designed during this phase. However, the irony is that supply management is not a contributor to this phase in particular but assumes greater role for the next three phases, i.e. sourcing, pricing and post award activities⁴.

¹ World Class Supply management by Burt, Dobler & Starling Tata Mc Graw-Hill page 2.

Let us now see the four phases of supply management and how best can this be obtained by interfacing each one of them with the other.

Generation of Requirements

As an entrepreneur what is your requirement, and how do you get them? It is a question that is continuously lingering in the minds of all managers involved with this. It is a critical activity that terminates in identifying the right and the best material along with development of specifications and statements of work that describe these requirements. The exodus of materials, services and equipments are 'designed in' during this particular phase⁵, to the tune of almost 85%. Therefore in order to ensure appropriate consideration to the services, raw materials and costs per se, supply management should be involved right from the word go during generation of requirement phase.

Sourcing

When one decides to go shopping just try and visualize what all plays up in one's mind? Say, you have to buy a Music System for example. Then what? The mental appreciation quickly says them following:

- Budget: How much money can you spend on a system?
- Brand: Which is the best brand available in the market for the budget you have?
- Availability: Is it readily available too?
- Services: In case it is available how are its after sales services?
- Final selection: What is the best that suits all the above?

That is exactly the appreciation one got to do before sourcing. Identifying and selection of the best supplier available in the market, whose costs, materials, dependability, quality and services suits the manufacturers requirements. Sourcing is development of a supply alliance, and it is an activity by itself.⁶

Pricing

It's a two way traffic aimed both at the supplier and the manufacturer. It's done in such a way that it benefits the supplier for its effort and also results in lowest cost for the firm who buys the supplies. Keeping in mind inflationary trends, pricing forms part of the on-going process in supply management with inbuilt negotiations, to arrive at the best deal possible. If the supplies are costly the price of the commodity also rises. Therefore, in order to strike a balance the job of supply management is to continuously monitor this aspect so as to keep the prices from rising. For example, when the prices of diesel goes up, the transportation cost increases leading to increase in prices of supply. Foresight and planning on the part of the manufacturer plays a leading role in assessing and reacting to such eventualities in a big way.

Post pricing

This is another important phase which ensures that the firm receives what it demanded, and that too timely. It also ensures that the prices are in check and that quality is being maintained. This also includes supplier developments, criticalities management, technical assistance and management of the complete contract.

That is what are the principal phases of supply chain management (SCM). All the sub phases are inter-related and managed under one head the SCM systems. Let us see this more closely with this block diagram.

⁵ "Manufacturing by Design" by D Whitney, Harvard Business Review, July 1988, pp. 83-91

⁶ 'The Foundation', chapter 1 of WCSM, by Burt, pp. 16.

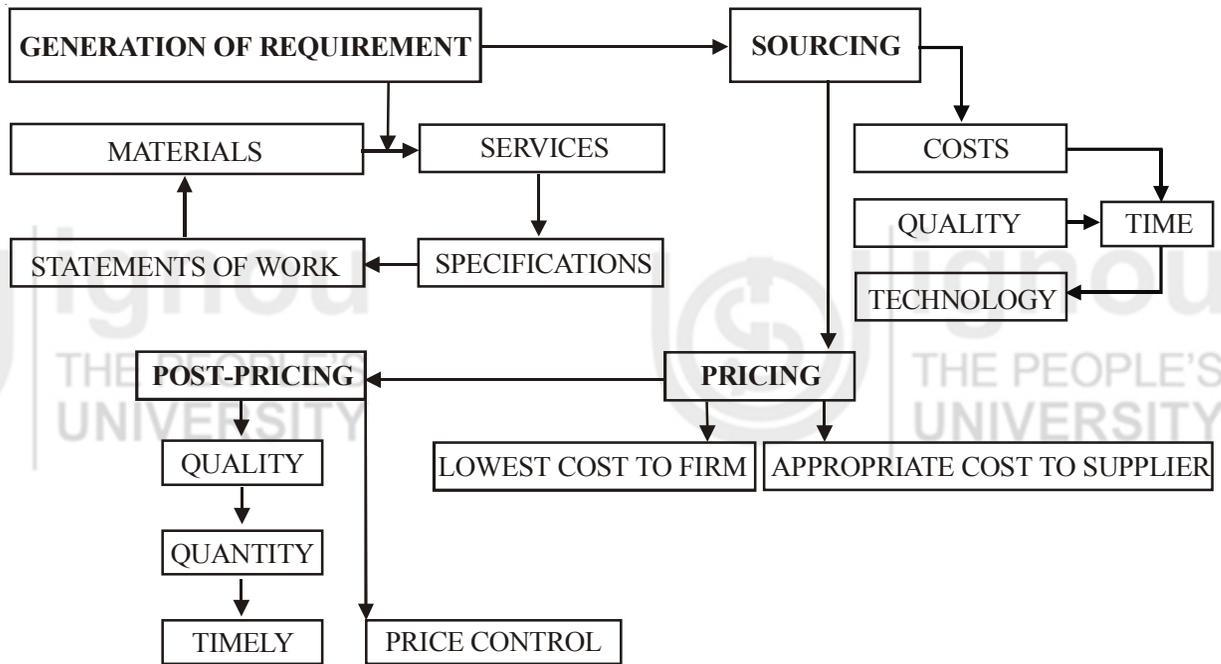
**Design and Management of
 SCM**


Fig 4.4: The Principles and Phases of SCM

4.5 LOGISTICS : INBOUND AND OUTBOUND

Let us now take a closer look at the logistics both inbound and outbound. Let me tell you this is the most intricate part of the system of SCM. If your goods don't reach in time and they are of inferior quality you as an entrepreneur earn a bad name too. So why give the consumer a chance? Plan it in a way that you ensure both quality and quantity in a reasonable time frame. Take for example 7 days trucker's strike in 2004. It was bad for economy of the country and above all worse for those manufacturer's who couldn't deliver goods on time. A strike or a *bandh* as we call it in India is a happy situation for the fleet owners but a bad time for the drivers, mill owners, small timers, labourer, suppliers, manufacturers and the consumers. That is the reason contingency planning plays a predominant role in shaping our SCM system. How, let us see.

4.5.1 Suppliers to Manufacturers

The most complicated, yet, the most important phase in any production is the movement of raw materials from the supply point by the suppliers to the manufacturing unit. Identification of the right type of suppliers is therefore the key to effective SCM system.

Can you envisage the various agencies and steps that are involved in this total system? Let us see them one by one.

- What is the raw material that has to be moved?
- What is the cheapest and the best available with the suppliers?
- Where is it available?
- What are the credentials of the supplier?
- What is the mode of transport being utilized for the move?
- Is it cost effective?

- What is the time factor involved in the movement?
- Does weather and climate play a predominant role in moving the raw material?
- What are the terrain conditions in the areas from where it has to be moved?
- What is the distance involved?
- Is it of acceptable quality?

All these have to be addressed before one plans for movement of these raw materials, that too in great detail. That is what is an effective SCM system to be followed by every firm. Let us see this with an illustration.

An Illustration

A material 'X' has to move from Bihar, which is famous for lot of ores and raw materials responsible in shaping our products. Let me be more specific in saying so. Some minerals from Sasaram have to be moved to Surat in Gujarat for making some product 'Y'. The road distance works out close to approximately 1600 kilometers, quite a lot as per Indian standards. A truck loaded with X leaves Sasaram on D-day (where D is 1). As per Indian road conditions it could take anything between 3 to 4 days for the material to reach. Therefore the total time works out to D+3/D+4, i.e. 4th/5th day the truck will reach Surat. Unloading time ½ a day, running time works out to 4 ½ / 5 ½ days. Thereafter quality checks and various processes to place these raw materials on the production line will take another 2 days works out to 6 ½ / 7 ½ days. Production time of 1 to 2 days depending on the type of product works out to 7 ½ / 8 ½ days. Keeping a cushion of 1 day the time taken for the finished product will be anything between 9 to 10 days. That is the planning involved in making a finished product and achieving your target. That is under absolute ideal conditions. India is subjected to numerous disruptions in form of natural calamities, man made obstacles, disasters, accidents and unrest. One has to cater for these criticalities and therefore foresight in planning is must. Suppose there is flood like situation at Sasaram, then what? One has to plan for warehousing near Surat where certain stocks catering to these kinds of contingencies have to be catered for, ab-initio. Like floods there could be strikes and bandh too. These are the gray areas that have to be addressed in totality, apart from the fact that the vehicle could also break down en-route. There could be a number of examples related to movement of stocks and supplies, be it rail, water, road or air. All have their complexities and peculiarities, but the underlying basics are the same one has to plan ahead come what may, to avoid irregularities.

Table 4.1: Terrain-wise Criticalities

Criticalities	Mountains	Plains	Desert	Link Roads
Going Conditions	Hilly roads, Bends & Zigs	Smooth Going, Faster mode	A mix of good and bad going	Rough and slow
Time Factor	Slow	Fastest	Medium	Very slow
Prone To	Severe accidents, Losses in supplies	Lesser magnitude, but Cannot be ruled out	Rare but at times over speeding results In damages	Loots, bandh and Strike, Accidents Related to population
Repair & Recovery	Difficult, Frequent breakdown	Available in plenty	Repair facility restricted to highways only	Rare, prone to severe breakdowns
Calamities	Road Blocks, Slides, Flash Floods	Floods, bandhs, riots & strikes	Very rare, since population centers are far apart	Frequent disruptions owing to congestion of population centers

**Design and Management of
SCM**

Movement of supplies from suppliers to manufacturers differs from place to place. Terrain plays a predominant role in this aspect and you have to realize this point. In mountains the criticalities are far too many and you can understand the aforesaid through this chart in a better way.

From the above it's evident that criticalities in any form disrupts movement in a big way irrespective of the terrain but you got to plan your time schedule depending on the terrain on which your supplies are moving. Therefore, knowledge on these areas is very important so that the suppliers cannot take you for granted on these counts. Studies on geography and layout of an area of responsibility and related aspects are therefore important for a manager dealing with logistics.

Activity 2

Study the aspects of terrain and its implications on logistics management. Visit a few places in the hilly and mountainous terrain and understand the implication of these areas on logistics management.

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Differences in Urban and Rural Areas

India is one such country, which enjoys a rare mix of both urban and rural pockets at regular intervals. Rural areas require tremendous amount of logistics supply and coordination to make the SCM system effective. That is the lay of Indian society and hence one has to understand and be live to the problem. Actually most of our supplies move generally from these rural areas and hence you should be aware of these areas in a nutshell. Let us discuss them for a while.

The various criticalities pertaining to logistics in rural areas are:

- Large quantities and more number of collection points.
- Distance between the manufacturers and users are large.
- Materials are bulky, perishable, and expendable and have inferior packaging.
- Certain places have to be communicated through handcarts, tractors, boats, cycles and bullock carts.
- Trips are generally one-way and hence not cost effective.
- Uniformity in work is missing, since; logistics are restricted to peak seasons only.
- A mix of intermediaries and direct delivery.
- Storage, movement and packaging of agro products are difficult and time consuming.

There are many more to this depending upon the nature of terrain and climatic conditions too, but these are the salient ones and you as a manager have to understand this aspect. Trading in rural areas is difficult and risky too.

Storage in rural areas is another criticality due to restriction in storage areas and because the agro produces are seasonal in nature. These are to be consumed round the year, both in season and off-season. Storage starts right from the time the harvest is ready till its distributed to the consumers. The various storage places available are:

- At the farm itself.
- Village collection centers/collection points.
- With the processor.
- Wholesaler.
- Bins and self-help store rooms under stringent conditions.
- Retailer.
- Market place/selling points.

The shelf life of these items generally the farm produce are very less and hence planned infrastructure has to be developed for proper storage facility like the cold rooms.

Transport in these areas is still primitive in nature; starting from bullock carts, cycles, hand carts, rickshaw van, boats, animal transport and even stragglers. This is due to bad roads and roads connectivity. India has one of the largest road networks in the world with approximately 2.5 million kilometers of road network. National highway accounts to nearly 5200 km, which is barely 2% of the total roads in the country. Actually movement of goods from rural areas becomes expensive due to its handling costs and number of organizations involved in it. Let us see it with an illustration.

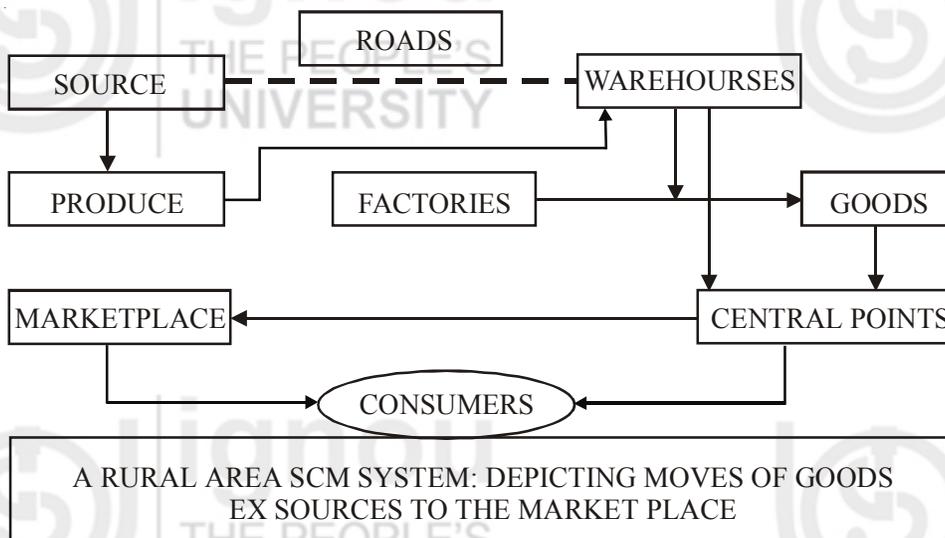


Fig 4.5: Rural Area SCM System

Activity 3

As a student of Logistics suggest a few practical viewpoints, which differs urban from rural logistics, both in terms of management and maintenance. Organize a visit to a rural area factory and carry out a feasibility study on how logistics can be improved for better response.

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Coming on to urban areas, the process is certainly different since; it doesn't have to go through the exercise of moving through bad roads too often and poor storage system. Things move more systematically and less time consuming, though at times the carriers perforce move through difficult stretches of rural areas, generally a mix of urban and rural areas. What happens in urban areas? Let us see.

- The procurement is done generally closer home and very near to the towns and cities.
- The supplier's job is to supply the goods in the time frame and price that is fixed initially.
- The company management generally contacts the supplier who has nominated go-downs close to the place of manufacture, for better and even time management.
- Unlike rural areas the suppliers in the fastest mode deliver the material and services in order to save on time; a combination of rail, air and road at places even waterways.
- Manufacturing takes lesser time in production and distribution thereafter.
- A better market available to the manufacturer for his goods.

From the above it's evident that a manufacturer in the rural area stands at a disadvantage visa-vie his urban counterpart for the following reasons:

- Movement of raw materials.
- Transport system.
- Storage facility.
- Production.
- Preservation.
- Distance from source to market area.
- Availability of market.

In a nutshell the SCM involved in managing a rural enterprise is more cumbersome than the urban one.

4.5.2 Manufacturers to Consumers

Let us now visualize the various stages involved in moving the finished products from the manufacturing units to the consumers. They are:

- Packaging of goods.
- Stocking them in warehouses/containerization.
- Loading into carriers/transportation.
- Delivery to the nearest wholesalers.
- Wholesalers to retailers.
- Retailers to market places/stores.
- To consumers.

These 7 steps are like any of those 7 days. It's difficult to skip one to save on another. Yes, there are direct marketing that the companies are following these days, but they are numbered. But the basic stages of these companies too move through pre-designated franchises and not directly. Hence, the time taken or cost per se generally remain the same.

Problems envisaged in movement of products from manufacturing units to consumers are many and can be listed as under:

- Perishable products.
- Losses in transit.
- Accidents and calamities.
- Unavoidable delays in terms of strikes and bandh.
- Labor unrest.
- Rats and rodents.
- Breakages during handling.
- General costing since at times even double handling is involved.

Let us see this with the help of a diagram, (figure 4.6).

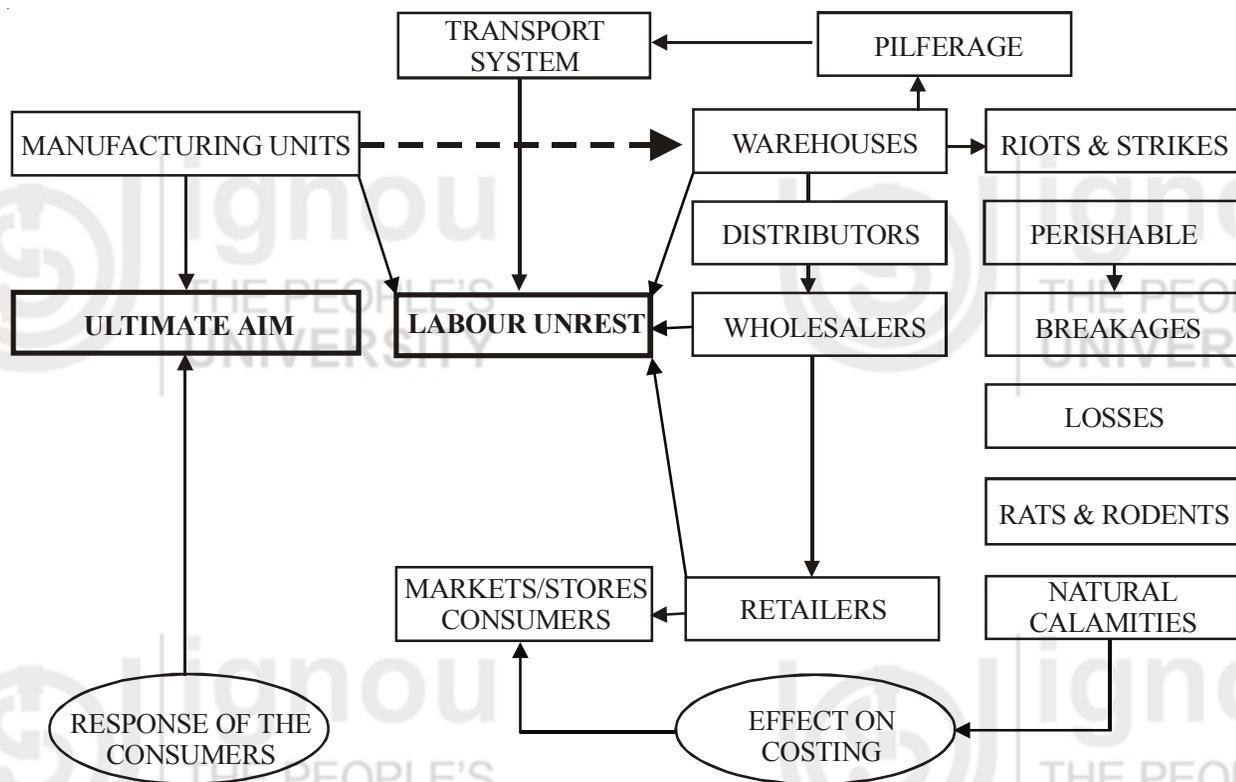


Fig. 4.6: Problems Involved in Logistics Support

From the above it's evident that labor's unrest is generally common in the complete process and an effective SCM in position can only help reducing these miscalculations and criticalities. Natural calamities and strikes do pose a problem for the manufacturer and indirectly increases the cost of items ultimately available to the consumers. What is therefore your ultimate aim in this process of SCM? It's the response of the consumer for whom you made this happen, and side-by-side what is the effect of the problems and criticalities on your product? It affects the costing per se, and this is what is shown in the diagram above (Fig.4.6).

Logistics both inbound and outbound is very intricate in nature. A consumer sitting at the comfort of the room cannot virtually visualize how a packet of toothpaste reaches him every time he uses it. What actually happens on ground can only be realized by him who makes it happen that way. Once you start thinking on it the various questions that arise are:

**Design and Management of
 SCM**

- Where does the raw material come from?
- Who supplies it to you?
- What is the best course available to you in procuring the right material with in the cost per se from the available options? Who decides on that? You and the management.
- How is the material moved and where to?
- How do you store this?
- What are the various contingencies involved in this?
- What if the stores don't reach on time? What is the option available to you?
- What would be the losses in production?
- What would be the losses in packaging?
- If the production channel breaks down, then what?
- How do you transport the finished goods in the time frame available to you?
- How will your marketer's distribute or market the products?
- What will be the response of the consumers to your product, your ultimate aim?

All of the above are interlinked and have a direct bearing on the net output of the firm. An effective SCM system in place wards off any such minor shortcomings that can run into problems and criticalities later.

4.6 LOGISTICS MANAGEMENT

Before we went on to this let us see the triangle that is formed in the supply chain management (SCM).

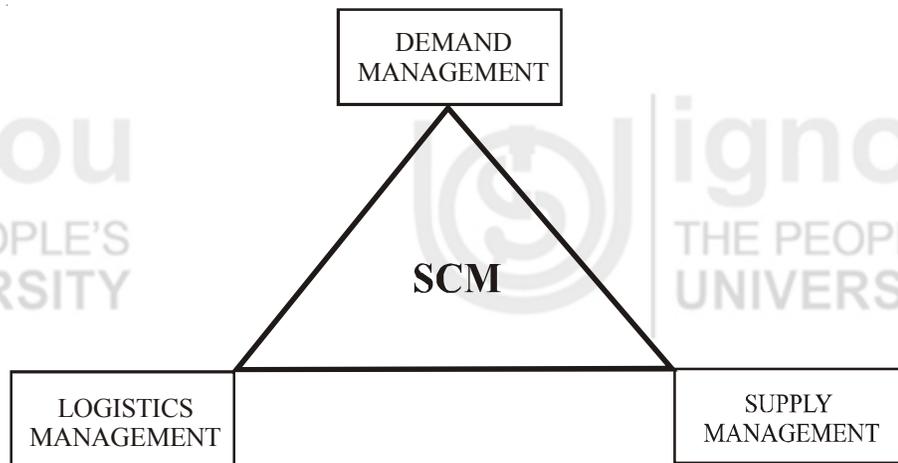


Fig. 4.7: Three Components of SCM

The three critical components of SCM are:

- Supply management
- Demand management
- Logistics management

You would learn about the supply and demand part of SCM in next unit and would discuss on logistics part of it now. As discussed earlier that the logistics professionals play a vital role in shaping the success of SCM as regards

management of transportation, storage and warehousing. We sometimes do tend to ignore the role of logistics but the supply and demand chain cannot be met without the integrated and close-knit support of the logistics.

Logistics management deals with receiving, handling, movement, storage and delivery of material, services and finished product in an SCM system. Logistics is required both at the beginning and at the end of it. (Fig 4.8)

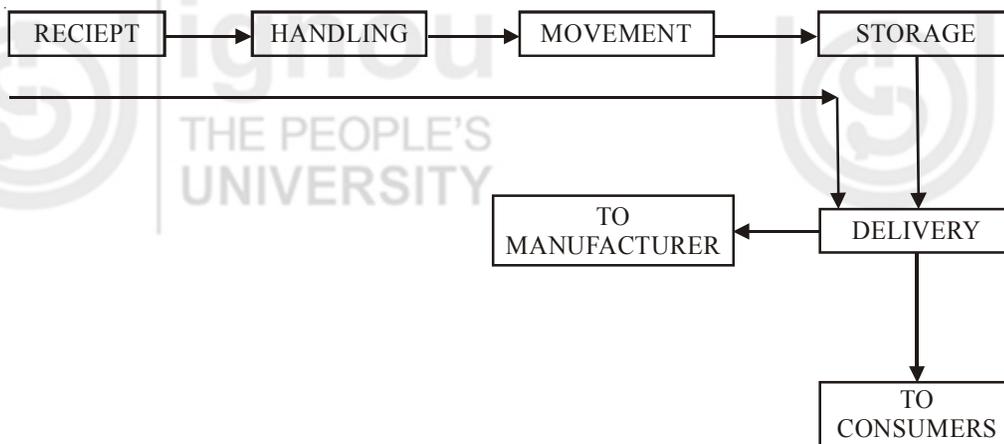


Fig 4.8: Domain of Logistics

As Coyle puts it, “logistics is the part of supply chain process that plans, implements and controls the efficient, effective flow & storage of goods, services and related information from point of origin to point of consumption for the purpose of conforming to consumer requirements”. Logistics include the following role (Fig 4.9)

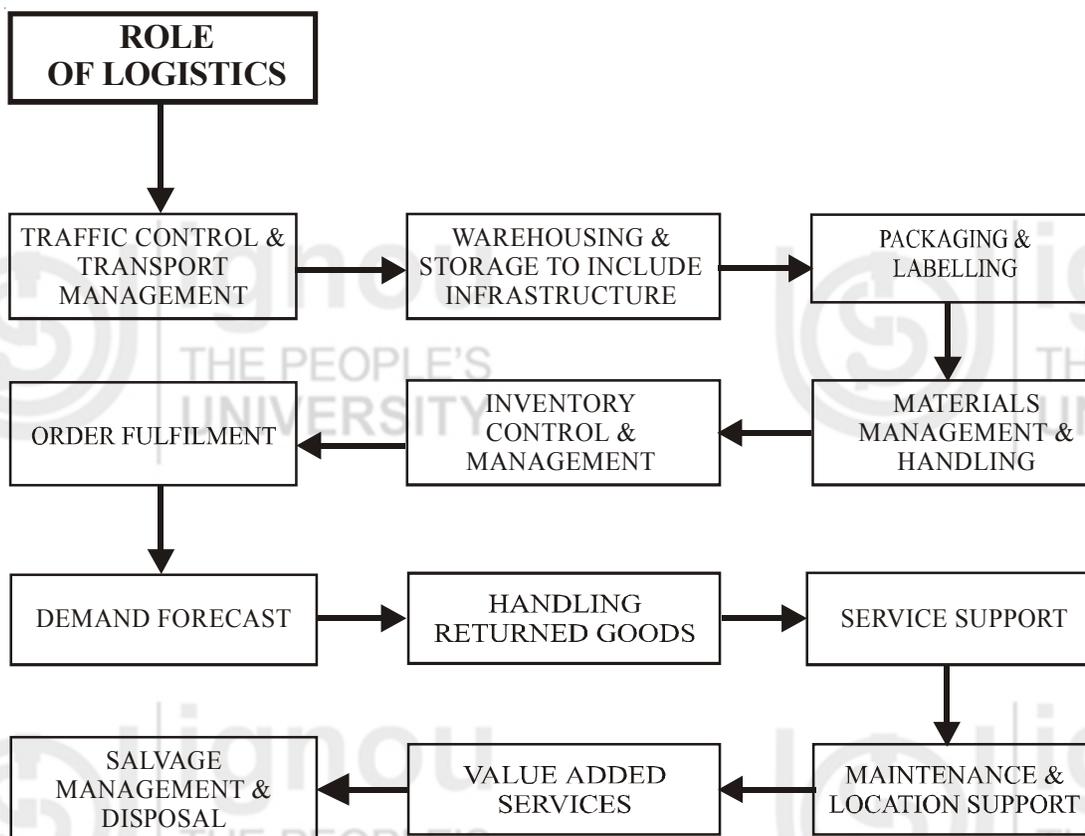


Fig 4.9: Role of Logistics

An effective SCM system will never be possible without the integration of logistics, since logistics is the foundation of SCM discipline and is responsible for its activities. Needless to mention here is that the transportation cost is the

heaviest in the entire chain, and even more than product selling prices. Therefore, in order to maximize customer satisfaction and meeting firm's goal it is mandatory to ensure that effective storage facilities for goods and services are in place.

4.7 INTEGRATING LOGISTICS

Logistics planning has to be integrated with material and capacity planning in order to achieve maximum and optimum level of satisfaction. The needs and requirements of our customers is variable and never a constant factor, therefore, in order to serve them better and be profitable you got to tailor your logistics and ensure it to be more dynamic with passing time. The emphasis should be on reduction of cycle time and elimination of waste in order to increase customer satisfaction. You have to understand that movement of goods, warehousing of materials and delivery is time consuming and at times requires precision synchronization at all levels i.e. from supplier to manufacturer and from manufacturer to consumer.

Illustration

Can you visualize the effort involved in moving crackers from Shivakasi in Tamil Nadu to Kolkata? A child who burst these crackers only have to demand them, and you as the guardian have to procure them from the shop, which sells these. Where does the shopkeeper get it? He gets from the wholesaler, and the wholesaler from the distributor/stockiest of that area. How does the company X stock the stockiest? The crackers are packed at Shivakasi and loaded in carriers, depending upon the time it has to reach and the time in hand before it is required. In case the planning fails the crackers will land up after Diwali to the dismay of many. That's dead stock and is of no use to the consumer.

Therefore, logistics involves procuring and transporting of the raw materials required to make firecrackers from the source to the manufacturer and once again tran-shifting the finished products to the warehouses near to the target area, so that closer to the festival the crackers could be utilized at once. When this is happening another set of crackers are in the process of moving from Shivakasi for the target area to meet any contingency. What if the warehouse catches fire? That actually depends on the demand per se and supply thereof, which we shall see in the follow up unit.

From the above it's seen, as to what all gets involved in movement of firecrackers, from the source to the consumer, and how logistics play a predominant role in assisting the products to reach the consumers in time.

4.8 PERSPECTIVES IN LOGISTICS

One has to continuously think and think rightly to get over the routine criticalities that are involved with logistics. Theory will surely help you to understand the guidelines involved in logistics, but unless you understand the practical aspects and device methods to tackle them, you will find yourself in a quandary each time, when faced with a criticality. Certain newer perspective in logistics planning and execution could be as enumerated below.

- **Produce at Source:** This will involve production near to the source of raw material and cheap labor. It will also involve lesser movement of transport and reduce double handling to a large extent. There are other disadvantages

in this though, like distance from the target population, which will involve more number of stocking points and areas. But, this can reduce the basic cost of production considerably.

- **Fleet Management:** Can you think of managing your own set of transport? Yes, certainly you can. Thinking of additional costs and expenditure? Yes, there are. But, certainly not more than hiring and facing the problems of trucker's strike, and incessant rise of carriage charges. Maintaining a fleet is cumbersome today, but if you can maintain a good sixty vehicles along with a minor repair organization, it will help you immensely on a rainy day. You have something to call your own.

Integration of logistics network. Logistics have to be integrated with the others in the firm for a better coordination. How? Let us see with the help of a figure.

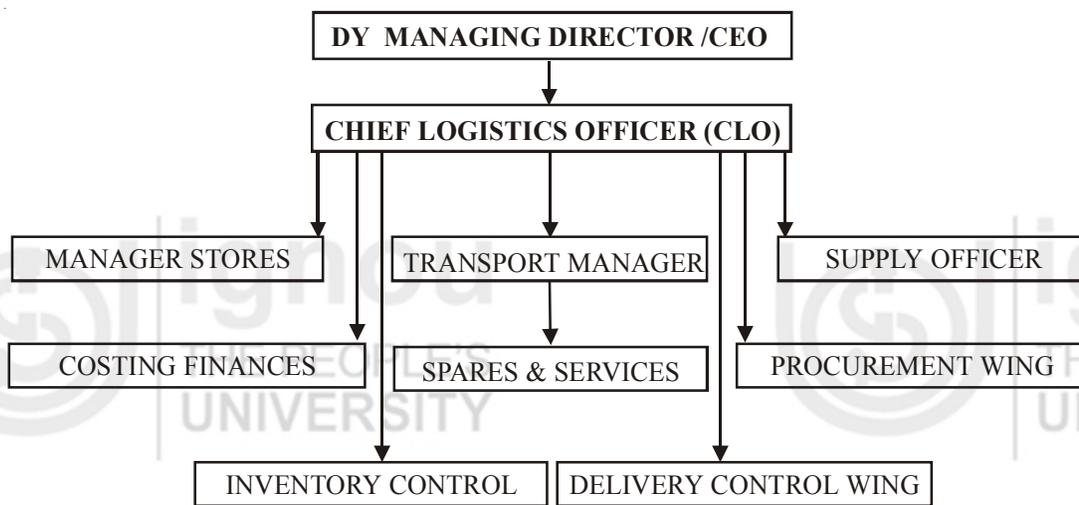


Fig. 4.10: Showing An Integrated Logistics Organization And Inherent Reporting

Activity 4

Suggest a new perspective to logistics management keeping in mind the present changing logistics scenario.

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4.9 SUMMARY

Logistics plays a predominant role in designing and shaping of SCM in a firm. Without an effective logistics system the effectiveness of the firms SCM channel is questionable. Logistic activity helps in enabling a broader view to be taken for handling the best available opportunity and how it is to be approached. If we understand and know the economics of logistics activities it is possible to review a number of production options that may include individual production (manufacturing of all components), assembling, or an ideal combo approach. The key players of logistics activity that is transportation and warehousing has been amply discussed and will enable you to understand the nuances of selecting the right transport mode for the right product and equipment within the overall gambit

of cost effectiveness. We have discussed the issues pertaining to move of logistics both in-bound and out-bound in the Indian scenario, within the scope of this unit per se. Last but not the least, we have understood the designing and management of SCM and the key to effective SCM, the logistics.

4.10 SELF ASSESSMENT QUESTIONS

- 1) Define logistics and elucidate with appropriate examples in the Indian context.
- 2) Explain the various factors of logistics with special reference to transportation.
- 3) What are the stages for selection the appropriate transport mode and why?
- 4) Why is transportation important in a firm's supply chain?
- 5) What is more important-inbound or outbound logistics in a supply chain?
- 6) Give relevant examples of the problems involved in logistics activity. How can we overcome them?
- 7) What is a supply chain and what is effective SCM?
- 8) What are the factors that link supply chain?

4.11 REFERENCES AND SUGGESTED FURTHER READINGS

- 1) Krishnaveni Muthiah (2003), *Logistics Management & World Sea-borne Trade*, Himalaya Publishing House, Mumbai (for basics of Logistics & marketing interface)
- 2) Deshmukh & Mohanty(2004), *Essentials of SCM* , Jaico Publishing House, Mumbai (should be included in compulsory reading, since the text pertains to Indian context, simple and easy to comprehend)
- 3) Simchi-Levi, David Kaminsky, Philipsimchi-Levi, Edith (2004), *Designing And Managing The Supply Chain*, Tata McGraw-Hill
- 4) Mentzer, *Fundamentals of Supply Chain Management*, Sage India Publishers
- 5) Burt, Dobler & Starling, *World Class Supply Management*, Tata Mc Graw-Hill
- 6) D Whitney (1988), *Manufacturing by Design*, Harvard Business Review, July 1988, pp. 83-91.