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**Chalimbana University**

**Integrity. Service. Excellence**

**DIRECTORATE OF DISTANCE EDUCATION**

**BTL 1101: TRANSPORT AND LOGISTICS**

**First Edition 2019**

**Authors:** Chalimbana University

Muzumara Taonga

Mwansa Chomba Grace Private Bag E1

Lusaka

Zambia

Website: [www.chau.ac.zm](http://www.chau.ac.zm)

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Chalimbana University

School of Leadership and Business Management

Department of

Private Bag E 1

Chongwe

Zambia

Web: www. chau.ac.zm

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# MODULE OVERVIEW

**Pre-requisite: None**

## Introduction

Just imagine a world where nothing was delivered or transported between places. Not only is logistics vitally important to the distribution industry, it has made distribution prompt and efficient. Many companies rely on transport and logistics to keep their business strong. Transport and Logistics is an important part of the supply chain, it controls the effective forward and reverse flow of goods and services from the origin to the recipient. This means that logistics has an impact on the shipment of goods and how quickly they can get to the consumer, again adding a competitive edge to other businesses. This means that it helps in economic transactions, serving as a major enabler of growth of trade and commerce in an economy.

Welcome to the course ‘introduction to Transport and Logistics.

**Rationale of the study**

This course provides an overview of how Companies use distribution intermediaries to gain a competitive advantage in local and global markets through the integration of logistics and transport management. The management of the physical flow of products and information throughout the entire supply chain is examined, including physical distribution, transportation, warehousing, customer service, materials management, third-party and global logistics, systems planning, and operations and management of the supply chain.

**Aim**

The aim of this course is to gain the knowledge of possibilities of efficient optimization and management of operation in logistics and transport management and also the ability to apply them in the company reality.

**Learning Outcome**

At the end of this course, learners should be able to:

* To gain a working understanding of logistics principles and to expose students to the language of logistics.
* To provide an overview of the key activities performed by the logistics including transport function, distribution, global logistics and inventory control, Different mode of transport.
* To view transport and logistics as more than an operational function that passively executes a plan, but as a strategic function that creates value and competitive advantage.
* To combine the theoretical knowledge with practical knowledge

## Summary

The module looks at Transport and Logistics Management

## Study Skills

As an adult learner, your approach to learning will be different to that of your school days: you will choose when you want to study, you will have professional and/or personal motivation for doing so and you will most likely be fitting your study activities around other professional or domestic responsibilities.

Essentially you will be taking control of your learning environment. As a consequence, you will need to consider performance issues related to time management, goal setting, stress management, etc. Perhaps you will also need to acquaint yourself with areas such as essay planning, searching for information, writing, coping with examinations and using the internet as a learning resource.

Your most significant considerations will be *time* and *space* i.e. the time you dedicate to your learning and the environment in which you engage in that learning.

It is recommended that you take time now before starting your self-study to familiarise yourself with these issues. There are a number of excellent resources on the web. A few suggested links are:

<http://www.how-to-study.com/>

The “How to study” website is dedicated to study skills resources. You will find links to study preparation (a list of nine essentials for a good study place), taking notes, strategies for reading text books, using reference sources, test anxiety.

<http://www.ucc.vt.edu/stdysk/stdyhlp.html>

This is the website of the Virginia Tech, Division of Student Affairs. You will find links to time scheduling (including a “where does time go?” link), a study skill checklist, basic concentration techniques, control of the study environment, note taking, how to read essays for analysis, memory skills (“remembering”).

## Timeframe

You are expected to spend at least 18 hours of study time on this module. In addition, there shall be arranged contact sessions with lecturers from the University during residential possibly in April, August and December. You are requested to spend your time judiciously so that you reap maximum benefit from the course.

**Need Help?**

In case you have difficulties during the duration of the course, please get in touch with your lecturer for routine enquiries during working days **(Monday-Friday)** from 08:00 to 17:00 hours on Cell: +260963804004**; E-mail:** [**adsikalumbi@gmail.com**](mailto:adsikalumbi@gmail.com)**; website:** [**www.chau.ac.zm**](http://www.chau.ac.zm)**.**You can also see your lecturer at the office during working hours as stated above.

You are free to utilise the services of the University Library which opens from 07:00 hours to 20:00 hours every working day.

It will be important for you to carry your student identity card for you to access the library and let alone borrow books.

**List of Equipment**

In this module you will need the following tools;

Note books

## Assessment

In this course you will be assessed on the basis of your performance as follows:

**Continuous Assessment 50%**

Assignment 10%

Project 15%

2 Tests of equal weight 25%

**Final Examination 50%**

**Total 100%**

# Unit 1: Logistics

**1.1 Introduction**

Welcome to the first unit of this module. This unit will introduce you to the role of logistic both in the economy and organisation. Generally, the logistic definition, objectives, function will be highlighted as well as its importance. With that said let us sit back, relax and enjoy the course, because the future in logistics is bright.

**Outcomes**

**1.2 Learning Outcome**

By the end of this unit you should be able to;

* evaluate the role of logistics to the economy and organisation.
* define the term logistics.
* explain the objectives of logistics.
* determine the functions of logistics.
* describe the importance of logistics.
* establish the solution and the future of logistics.

Time

**1.3 Time Frame:**

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**1.4 The role of logistics in the economy and organisation**

The scope and influence of logistics has evolved in the late 1940s. Moving on to 1950s, and 60s, military was the only organization which used logistics. The scope of logistics has been extended beyond the army, as it has been recognized as one of the important tools for developing competitiveness. Competitive advantage means the company has the ability to differentiate itself, in the customer’s eyes and also is operating at a lower cost and greater profit.

Logistics facilitates in getting products and services as and when they are needed and desired to the customer. It also helps in economic transactions, serving as a major enabler of growth of trade and commerce in an economy. Logistics has come to be recognized as a distinct function with the rise of mass production systems. Production and distribution were earlier viewed as a sequential chain of extremely specialized activities. The role of logistics is to ensure availability of all the required materials before every step in this chain. Obviously inventory of raw materials, semi-finished and finished goods is a must across this chain to ensure its smooth functioning. The concept of logistics has its base upon the systems approach. There is a single chain, with flow of materials starting from the supplier, then to the plant and finally to the end customer, and also these activities are done sequentially in order to achieve customer satisfaction at low cost. For this to be successful there has to be co-ordination in the activities of the department. With reference to an organization, an organization gets a concrete shape due to its structure. In the earlier times, the suppliers in distribution activities were spread across the entire structure, thus resulting in an overlapping of activities and finally in unaccountable authority and responsibility. In today’s process driven organization, where the focus has shifted from functions to process, logistics has become an essential part of the process.

**1.5 Definitions of logistics:**

The American Council of Logistics Management defines logistics as “the process of planning, implementing and controlling the efficient, cost effective flow and storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customers requirements”.

Kotler (2008) defines logistics as “planning, implementing, and controlling the physical flows of materials and finished goods from point of origin to point of use to meet the customer’s need at a profit”.

**1.6 Objectives of logistics:**

Logistics has the following objectives:

1. **Reduction of inventory:** Inventory is one of the key factors, which can affect the profit of an enterprise to a great extent. In the traditional system, firms had to carry lot of inventory for satisfying the customer and to ensure excellent customer service. But, when funds are blocked in inventory, they cannot be used for other productive purposes. These costs will drain the enterprise’s profit. Logistics helps in maintaining inventory at the lowest level, and thus achieving the customer goal. This is done through small, but frequent supplies.
2. **Economy of freight:** Freight is a major source of cost in logistics. This can be reduced by following measures like selecting the proper mode of transport, consolidation of freight, route planning, long distance shipments.
3. **Reliability and consistency in delivery performance**: Material required by the customer must be delivered on time, not ahead of the schedule or behind the schedule. Proper planning of the transportation modes, with availability of inventory will ensure this.
4. **Minimum damage to products**: Sometimes products may be damaged due to improper packing, frequent handling of consignment, and other reasons. This damage adds to the logistics cost. The use of proper logistical packaging, mechanized material handling equipment, etc will reduce this damage.
5. **Quicker and faster response**: A firm must have the capability to extend service to the customer in the shortest time frame. By utilizing the latest technologies in processing information and communication will improve the decision making, and thus enable the enterprise to be flexible enough so that the firm can fulfill customer requirements, in the shortest possible time frame.
   1. **The functions of logistics:**

* **Order Processing:** Processing the orders received from the customers is an activity which is very important by itself and also consumes a lot of time and paperwork. It involves steps like checking the order for any deviations in the agreed or negotiated terms, price, payment and delivery terms, checking if the material is available in stock, producing and scheduling the material for shortages, and also giving acknowledgement to the owner, by indicating any deviations.
* **Inventory Planning and management:** Planning the inventory can help an organization  
  in maintaining an optimal level of inventory which will also help in satisfying the  
  customer. Activities like inventory forecasting, engineering the order quantity, optimization the level of service, proper deployment of inventory etc. are involved in this.
* **Warehousing:** This serves as the place where the finished goods are stored before they  
  are sold to the customers finally. This is a major cost center and improper warehouse  
  management will create a host of problems.
* **Transportation:** Helps in physical movement of the goods to the customers place. This  
  is done through various modes like rail, road, air, sea etc
* **Packaging:** A critical element in the physical distribution of the product, which also  
  influences the efficiency of the logistical system.

**1.8 Value delivery of logistics in the supply chain:**

The world has become a global village, where due to liberalization and globalization, business organizations are forced to supply products beyond their national boundaries. Thus in such situations, the role of logistics is to provide time and place utility of the products to customers. Also businesses are striving to attain competitiveness. In their struggle to survive, their focus has shifted to supply chain, and to deliver value for money for their customers.

Logistics plays an important role in the process of delivering value and successful   
supply chain management is greatly depends on logistics planning and support. Nowadays, the trend is to outsource. Organizations continue to outsource their operations because it is better to outsource the functional areas to experts who can do this job at a lower cost. This is one way of adding value.

# 1.8.1 Logistics delivers value to the customer through three main phases:

1. **Inbound logistics:** These are the operations, which precede manufacturing. These include the movement of raw materials, and components for processing from suppliers.
2. **Process logistics**: These are the operations, which are directly related to processing. These include activities like storage and movement of raw materials, components within the manufacturing premises.
3. **Outbound logistics:** These are the operations, which follow the production process. These include activities like warehousing, transportation, and inventory management of  
   finished goods.

1.9 Logistics Solution

Generally, the in-house logistics departments in manufacturing organizations take care of all  
aspects of logistics. But this is not an area of core competency of manufacturing or trading organizations. Today, a lot of successful business corporations across the world are outsourcing logistics to the third party logistics providers, who are having the necessary infrastructure and expertise to do the job in a better manner. Complete logistics solutions to manufacturers and traders is provided by the third party logistics providers, and they help in integrating various logistics operations, thus ensuring speedy and uniform movement of materials across the supply chain. Logistics is nowadays widely used in virtually every area. The success of a logistics service providing company depends on how they conceptualize and implement the logistics solution, and also tune to the requirements of the customer.

1.10 Future of Logistics

Nowadays corporations look only for sustainable competitive advantage, not only for growth, but also to survive. There is so much killing competition that corporations are compelled to review their business process while they deliver the products and services to customers, who are looking for more and more value for the money that they are spending. The focus of competition has shifted from the product to the supply chain. Today, logistics management is based on the system concept and cost approach. Transportation, warehousing, handling of material, inventory management and order processing are the major logistics activities, which impact the customer cost and operation. Integrated logistics helps in taking the cost out of the supply chain and also enhance the customer service level. When looking at the macro level, a growth of a country’s economy depends on the availability of excellent logistics infrastructure. The speed of the movement of goods depends to a great extent on the various modes of transportation like rail, road, air, and sea. With that said the future of logistics is bright.



**Activity 1.1**

1. Explain the importance of logistics to the economy and the organisation.
2. Evaluate the objectives and the function of logistics of an organisation of your choice.
3. Discuss the logistics challenges of an organisation of your choice and offer solutions.

**summary**

**1.11 Summary**

Congratulation for having reached the end of the unit, I know it has been a marathon, but worth it right!! I can confidently say that by now, you should be able to define logistic, its objectives, its function, its importance and value addition.

# Unit 2: Logistics and Customer Service

# 2.1 Introduction

Now that the light was shed on what logistics is, we then proceed to a very exciting and interesting topic; logistics and customer service.

**Outcomes**

# 2.2 Learning Outcome

By the end of this unit you should be able to;

* describe the elements of customer services
* determine Phases in customer services
* explain customer retention .

Time

# 2.3 Time Frame:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

# 1.4 Customer Service

Customers are the primary focus of any activity. The primary reason behind this is being that, ultimately every product, service or idea finally needs to accommodate customer’s requirements. According to Lalonde (2012), customer service is quiet complex because it involves all areas of the business which combine to deliver and invoice the companies product in a fashion that is perceived as satisfactory by the customer and which advances the companies objective. Customer service, as a concept has many aspects to it. Logistics management has a major role in enhancing the customer satisfaction and also retention, thus creating a lifetime customer value.  
In other words, customer service as a combination of activities enables a business firm to add more value to the buyer. It is a key element of the product or service, which is offered to the customer. With good customer service, the existing customers are satisfied and this attracts new customers through word-of-mouth communication. Customer Service is not just a function or an activity. It is a philosophy, and attitude. With so much importance given to customer service, companies are trying to increase the level of customer service and scale up to the expectations of the customer. Unless the products are in the hands of the customer at the time and place of requirement, products do not have any value attached to them. To attain a commendable service level, the firm has to plan a closely integrated logistics strategy.

In today’s market, customers are so much demanding, not only in the quality aspect but also with regard to the service aspect. Customers form a few perceptions in relation to the various aspects of customer service like reliability, competency, responsiveness, trustworthiness etc. With the help of these cues, customers evaluate the firm’s services and conclude whether they are satisfied or not. Physical distribution plays a major role in delivering customer service. As there is an increase in the competition, and there is advancement in technology, companies today are faced with the mounting pressure to develop even more innovative strategies for customer service.

Two key factors that have contributed maximum for the growing importance of customer  
service as a competitive weapon are the continuous development of customer expectations and the gradual shift of customers from branded products to local unbranded products. A very good example would be the personal computer market, where the buyer finds it difficult to make a difference between a branded version and an unbranded one. The rapidity of technological change and a decreased product life cycle has further developed the importance of customer service.

# 2.5 Elements of customer service

# 2.5.1 Order Delivery Cycle Time

The general tendency for a manufacturer to look into is the physical delivery of the product when the orders are not delivered on time. So, when orders are not delivered on time and customer complaints are received, the manufacturer looks into the physical delivery of the product to the customer and tries to solve this problem by bringing the product closer to the client. Thus, there is a tremendous increase in the stock-holding points for the manufacturer. When the manufacturer examines this closely, he/she will realize that physical delivery is not the most time consuming element of the order-delivery cycle time, but there are a host of other activities like transmission of the order, processing the order, which also affect the delivery. In fact an activity like the order processing itself consists of a series of activities like the registering the order in supplier’s system, allocation of material from work in progress, warehousing and distribution centers, packing the materials, dispatch of material.

2.5.2 Reliability of inventory

When a specific item is out of stock, which is interpreted as a loss of sale and if there is always stocks out taking place frequently, this will influence the customer service levels, and would further lead to a loss of credibility for the company.

**2.5.3 Consistency and frequency in delivery**

The firm must ensure the maintenance of a same or similar delivery period over a period of time to the customer. This means the firm must have the ability to coordinate the various logistics arms, and also the efficiency and effectiveness of the entire logistic chain. Also, the frequency of delivery is an important part of the customer service. Usually, a customer does not prefer to stock huge quantities of particular items, and would prefer smaller quantities in smaller lots. Eventually there is an increase in the transportation cost, but the inventory cost reduces and there is a net effect in the entire supply chain. When there are multiple orders from small clients, there is congestion in the logistics pipeline, and thus this reduces the ability of the company to serve its larger clients more efficiently. Also the logistics costs for small orders are more than the large orders and also they would swallow up the profit on the large orders. To avoid such hassles, and to avoid additional costs, the frequency of delivery and minimum orders are being used as limitations imposed on suppliers as an effort to reduce normal tendency of most clients.

**2.5.4 Other factors**

Apart from the regular factors there are also others like the transmission of order collection, frequency of visit of salesman to customers, invoicing and collection systems, communications level between customers and suppliers which can be of more importance to certain organizations.  
  
2.6 Phases in Customer Service

**a) Pre- transaction phase:** In this phase, the service level and other related activities are defined on a policy level in both qualitative and quantitative measures. It is the creation of a service platform to serve the customer, so as to build up credibility in the market and create a good image amongst the existing and prospective customers. In other words, this refers to those elements, which determine the capability of service before they are provided. Pre-transaction elements are usually relate to corporate policies or programs, written statements of service policy, adequacy of organizational structure and system flexibility.

The following are the important elements of the pre-transaction phase:

**Customer Service Policy Statement:** This gives the service standards for the company. For example, company X, a leading automobile spare part manufacturing company, makes a policy commitment to deliver the spare parts to its customers within 48 hours of placement of the order.

**Accessibility:** This refers to the ease with which customers can contact the firm.

**Building the organization**: In order to implement the policy derivatives on customer service, the firm must formalize the reporting structure, delegate authority and also allocate responsibility. Also, a proper reward system will motivate employees who are involved in customer service to interface efficiently with the customer.

**Structuring the service:** The expectations of customers, the industry standards, and the standard of service the firm would like to maintain influence the basic structure of any service. For sustaining the competitive advantage, innovation in service is very much necessary. Innovation adds to the value of the offerings made to customers. Another key aspect to service structure is the delivery. Two important aspects of delivery are place and time.

**Educating the customer**: This is important because this can reduce the customer complaints on deliveries of products, their operations and maintenance etc., usually customers are educated through manuals training, seminars workshops etc

**System design and flexibility**: While designing the system, care should be taken that all the possible queries, which the customers can ask, must be answered. The system may be manual or fully automatic, similar to ecommerce. Also the adaptability of the service delivery systems to meet a particular customer need is essential.

**b) Transaction phase:** During this phase, the customer service is associated with the  
routine tasks, which have to be performed in the logistics supply chain. Those variables directly involved in performance of the logistics functions, for example, availability of product; order cycle time, reliability of delivery etc. The following are the various service elements associated with this phase:

**Reliability of order fulfillment**: This is a key factor. There is to be reliability in fulfilling the order within the agreed time frame and also with respect to the quantity and quality of the material ordered.

**Order convenience:** The case with which customer can place an order. There are various barriers to this like the paper work required by the supplier, compliance to various procedures, complex payment terms, poor communication network at suppliers end.

**Order postponement** Sometimes, the customer may postpone an entire order or some parts of it. This means customer has to reschedule his requirements. In some other case, due to availability of a certain product category in the future, the seller can allow the buyer to place the order immediately and he would ship the product when it is available on future dates.

**Consistency of delivery:** Delivery consistency of repeat orders is important.

**Product substitute:** There may be some situations in which the product ordered couldn’t be shipped due to certain manufacturing or quality problems. In such cases, the seller can offer a substitute product and honor his commitment.

**c) Post transaction phase:** This is a phase where customer satisfaction and building up of a long-term relationship with the customer are involved. It involves commitment of resources to offer the desired level of service. These measure the customer satisfaction on the basis of the expected results. Generally supportive of the product in use, for example: warranty of products, parts and repair service, procedures for complaints of customer and replacements of products. The following are the elements associated with this phase:

**Information of order status:** In business to business transactions and e-commerce, the customer after payment of part value (sometimes full value) of the product as an advance, requests feed back on the status of the shipment on a continuous basis.

**Customer complaints, claims, and returns:** The seller’s responsibility will not be over once the product is dispatched to client. Sometimes, the products damaged during transit, or the product may not be according to the functional requirements of the customer. For this, there must be a policy for product return and this is usually done through reverse logistics system.

**Product installation, commissioning and technical snags**: This is part of the after sales service, as complex products may sometimes develop technical snags during the warranty period. The after sales department takes care of all these issues.

**Customer awareness and training**: A key aspect of service element in this phase. For technically complex products, it is necessary for the seller to train or educate the user regarding its operation.

**5.5 Customer Retention - an extension of customer service:**

It is the totality of the offer, which delivers value to the customer. An illustration to highlight this can be a comparison between a product in the warehouse and a product in the hands of the customer. The value addition here is the fact that the product is in the hands of the customer.  
According to the 80/20 Pareto (The Italian economist, Pareto) rule, 80 per cent of a  
company’s profits come form 20 per cent of the customers. A further dimension to this would be to say that 80 per cent of the total costs to service would be generated from 20 per cent of the customers. Thus identification of the real profitability of customers and then develop strategies to develop services that will improve the profitability of all customers is essential. While getting and retaining customers is the main focus of marketing, in practical terms, organizations put in more effort in getting the customers rather than retaining them. Organizations have to make a conscious effort in understanding how many of the customers they had a year or six months ago are still with them as customers. The retained customers can be more profitable than the new customers in the cost perspective. Also the word-of-mouth communication happens through existing customers. The principle of ‘Relationship Marketing’ is rapidly gaining popularity. A high level of customer satisfaction must be created so that they don’t consider any alternative suppliers or offers. There need to be certain pre-determined standards for controlling the service performance. There are various standards available like order cycle time, order-size constraints, technical support, order convenience, frequency of delivery, claims procedure.



**2.1 Activity**

1. Explain how important a customer is in the logistics chain.

2. Discuss the customer service elements.

**summary**

# 2.6 Summary

We have come to the end of the topic and the basic purpose of providing services is to deliver value to the customer for the money he is spending for the product. Customer service means all customers must be treated equally and also to extend service to build a fundamental business relationship. Also, a step ahead of offering basic services is to offer zero defect services. Repetitive operations have to be performed without errors by using automated systems. Another possibility is to provide value added service, which are basically unique and add efficiency and effectiveness to the basic service capabilities of the firm. These value added services have evolved due to forced innovation due to differentiated offering, for growing and surviving in competitive markets.

# Unit 3: Transportation

# Introduction

After looking at logistics and customer service, we now turn our attention to transportation, the main component of logistics, known to play an important part in all management decisions within the organization, from strategic decisions to everyday operations.

**Outcomes**

# 3.2 Learning Outcome

By the end of this Unit you should be able to;

* describe the main purpose transportation serves.
* discuss successful transport strategy.
* explain the participants in the transportation decision.
* determine factors affecting carrier and shipper decisions..
* evaluate the mode of transport.
* explain the transport economics.
* determine the document in transport decision making.
* explain the transport management.

# Time

# 3.3 Time Frame:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

# 3.4 Transportation

Transportation is basically the movement from one location to another as it makes its way from the beginning of a supply chain to the customer’s hands. Transportation not only ensures movement of people but also goods from one place to another thus assisting the economy in the growth of trade and commerce. Being one of the most visible elements in the logistics operations, this function has gained a lot of importance and interest from the logistics perspective. Transportation plays an important role in each and every supply chain because products are usually not produced and consumed in the same location. The third P in the marketing mix, ‘Place’ is of importance here. In fact, transportation costs occupy a significant part of the total costs in most supply chains. With the growth in industry and commerce, transportation facilitates in achieving the social and economic objectives. As times are changing and according to the requirements, the mode of transportation is changing to keep pace with the growth of science and technology across the globe. The degree of sophistication of the various transportation equipment in use, varies according to the level of economic condition and growth of any particular region / country. As the economy has transformed from subsistence agriculture to commercial agriculture, and also with the spurt of manufacturing activities, the scope of development of transportation modes has widened.

In the olden days, the various modes of transportation like human beings, camels, horses, donkeys, carts and ships were being used. Today, these have paved way to newer modes of transportation to suit the needs of the modern world. In spite of the emergence of sophisticated modes of transportation, older modes continue to serve the society, but in a smaller way. Transport, being the main component of logistics, plays an important part in all management decisions within the organization, from strategic decisions to everyday operations. Day to day management decisions also relies on transport, as “Just in Time” methods for both production and distribution have become the standard. With the growth in e-commerce, resulting in more and more home delivery of products, transportation costs have become very significant in retailing. Especially for products sold online, transportation cost is a larger fraction of the total  
delivery cost. The appropriate use of transportation is the key to any supply chain’s success

# 3.5 The Main Purpose Transportation Serves

**Product movement**: The primary function of transportation is the forward and backward movement of the product in the value chain. It is necessary that product be moved only when they are necessary and there is an enhancement in the product value. This is because transportation utilizes the financial resources for expenditure like driver’s labor, operation cost of the vehicle, and other administrative expenditure. The environmental resources are utilized both directly and indirectly. An example of direct usage can be the fuel and oil costs and an indirect usage can be the environmental expense caused by air, noise pollution in the environment.

**Product Storage**: Temporary storage for in-transit goods is expensive. But in circumstances where the warehouse space is limited, utilizing the transportation vehicles may be a better option. One option is where the product is loaded on the vehicle and then it takes a round about or indirect route to its destination. The vehicle can be used as a temporary storage option where the origin or destination warehouse has limited storage capacity. Another option is to take a diversion. This is done when there is an alteration in the shipment destination while the delivery is in transit. While, telephone was used for diversion strategies originally, today satellite communication handles this task efficiently.

# 3.6 Successful Transport Strategy

A transportation strategy to be successful should recognize the following:

**Customer requirements-** The supply chain involves continuous and efficient movement of product from vendor to manufacturer to customer. Thus the transportation program must reflect and meet the customer’s needs. The vital aspects are time and service.

**Timely movement of shipments-** Customers demand their shipments be delivered as they require, on the date needed, by the carrier preferred, both shipped complete and delivered complete and in good order. A transportation program, which can do this, can provide customer satisfaction and give a competitive edge.

**Mode selection**- Selecting the mode of transport is an important consideration. The transit time has to be considered while doing so.

**Carrier relationships-** Volume catches the attention of the carrier of forwarder. The carrier attention with volume creates a competitive interest in a business. Another side to this attention is that the business cannot be divided among many carriers. The chief reason being that responsive transportation can create a competitive advantage and this can be done only with a focused relationship with a carrier.

**Measuring/benchmarking-** There is a necessity to know about the performance of the strategy as well as the carriers. Measuring and benchmarking can be of assistance to this. Measuring or benchmarking means comparing performance against standards. Benchmarking means learning what other companies do the best practices. Benchmark needs to be done with a company in the same industry.

**Flexibility-** As change is happening everywhere, the strategy has to be ready to change. There is a constant change in the customers, products, business, suppliers and the overall corporate emphasis, which can dramatically change the company’s strategy. It is important to recognize that change will occur. Just as times are changing, the strategies will also keep changing. A company must adapt itself to such an environment.

# 3.7 Participants in the Transportation Decisions

Primarily there are five key parties in transportation decisions. Each of these parties has a role  
in the transportation environment.

**Shipper:** The party, which requires the movement of the product between the two points in the chain. The shipper’s objective is to fulfill the customer order with responsiveness but at the minimum cost.

**Consignee:** The destination party or receiver. The consignee also has the similar objective of receiving the goods at a lowest cost and with maximum responsiveness.

**Carrier:** The party, which moves or transports the product with an objective of maximizing the revenue at the least cost. Carriers have a tendency to charge a higher rate and reduce their costs by trying to consolidate various individual loads into economical loads and thus would seek flexibility in pickup and delivery with the client. This motive is in conflict with the manufacturer’s objective of reducing total transportation costs.

**Government:** The Government has a high interest level in the transactions because a stable and efficient transportation environment is necessary to sustain economic growth. To facilitate this, carriers must offer competitive services while operating profitably.

**Public:** The ultimate determinant of transportation by desiring goods at reasonable prices. Their concerns are related with the accessibility, expenditure, effectiveness as well as the safety and environmental standards.

* 1. **Factors affecting carrier decisions**

**Vehicle related cost:** Cost incurred by the carrier for purchase or lease of the vehicle to transport goods

**Fixed operating cost:** Costs which can be associated with the airport, terminals and labour which are incurred whether vehicles are in operation or not.

**Quantity-related costs:** Usually variable in nature except in circumstances where labour for loading and unloading is fixed.

**Trip-related cost:** Includes the price of labour and fuel incurred for each trip  
independent of the quantity transported.

**Overhead cost:** Any cost incurred for planning, scheduling a transportation network as  
well as the information technology costs incurred.

**3.9 Factors affecting shippers decision**

**Transportation Cost:** Total amount paid to various carriers for transporting products to customers.

**Inventory Cost:** Cost of holding inventory incurred by the shipper’s supply chain network.

**Facility cost:** Cost of various facilities in the shipper’s supply chain network.

**Processing cost:** Cost of loading / unloading orders and the other processing costs  
associated with transportation.

**Service level cost:** Cost of not being able to meet delivery commitments. This cost to  
be considered in strategic, planning and operational decisions.

# 3.10 Modes of transportation

**Air**  
This is the least hazardous in nature when compared to all other modes of transport. Air transport is expensive, and is very suitable for products having high value or extreme perishability. The prohibitive aspect of this mode is its high cost. From the operator’s point of view, though the fixed cost is low compared to other modes like rail, water and pipeline, variable costs are very high as a result of fuel, maintenance, and the labour for crew. Though the cargo handled by air is growing at a fast pace, it is still not important when compared to the cargo handled by other modes of transportation. Air, by whatever type of airline, is generally considered a premium means of transportation. The best justification for the high cost can be an emergency situation, which necessitates the service of air transport. Technological developments like new cargo-handling equipment at air terminals and the use of larger containers have been beneficial.

**Sea / Water**

This is the oldest mode of transportation. Water transport, due to its nature, is limited to certain areas. It is the slowest modes of all the modes and a lot of delays also occur at ports and terminals. Water transport is generally suited for carrying very large loads at low cost. Usually the shipping fleet across the globe comprises of tankers, dry bulk carriers, container ships and special vessels. Some of the problems encountered with this mode are rough weather characterized by storms, ice, high waves etc in-transit. Also there is a disadvantage of a limited range of operation and speed.

**Railways**

Generally capable of transporting large quantities of freight over long distances very economically. These are the principal carriers of men and material, and play a major role in the country’s trade and commerce activities. It is the main source of supply of essential commodities, which are transported across the length and breadth of the country. Road traffic is relieved to a certain extent and also air pollution caused by trucks can be eliminated. The railways also charge competitive freight rates.

**Roadways**  
Most popular mode of transport, with the manifold growth in industrial and agricultural activities, this mode has achieved a lot of importance. The various advantages of this mode are flexibility, faster turnaround, lesser risk of delays or strikes, door-to-door service, reach to remote places and through movement from consignor to consignee.

**Pipeline**

In Zambia, pipelines are used for oil transportation by all public and private sector petroleum  
refineries. They are also utilized for transporting manufacturing chemicals, dry bulk materials like cement and flour by hydraulic suspension, and also sewage and water within cities and municipalities. This mode is unique in comparison with the other modes in the sense that they operate throughout the day, with limited time for changeover and maintenance. The basic advantage here is that they reduce the operational costs, though the initial investment is high. Also these are eco-friendly. The disadvantage of this being its lack of flexibility where only limited commodities in the form of gas, liquid or slurry can be transported.

# 3.11 Transport Economics

The factors which influence transport economics:

**Distance:** This is a major influence on the cost as it is a direct contributor to variable costs like labour, fuel, and maintenance. The tapering principle, where the cost curve increases at a decreasing rate as a result of the distance function is relevant here.

**Volume:** It is viable to consolidate smaller loads into larger loads to take advantage of the economies of scale.

**Density**: The product density or weight discussed here, where the product density can be increased within a truckload for better capacity utilization.

**Stowability**: This refers to the product dimensions and how they affect the vehicle space utilization. It is easier to stow standard shaped items than odd-shaped items, which occupy more space.

**Handling:** While loading or unloading trucks, railcars, or ships, there is a necessity for special handling equipments like trolleys, forklift trucks, conveyors etc to load or unload  
trucks, railcars or ships.

**Liability:** These are product characteristics, which basically affect the risk of damage and the resulting incidence of claims.

**Market Factors:** Factors like lane volume and balance. A transportation lane refers to the movements between the points of origin and destination. When a vehicle is sent from the point of origin, it may return empty-handed or may bring back load. Due to the imbalances in demand in the manufacturing and consumption locations, a balanced (volume is equal in both directions) move is nearly impossible. It is the responsibility of the logistics managers to understand the influence these factors have on the transportation cost and minimize such expense.

**3.12 Documents in Transport Decision Making**

**Bill of Lading:** A computerized, basic document, which is, utilized in purchasing transport services. This serves as a receipt of the commodities and quantities shipped. It also serves as the basis for damage claims in case of loss, damage, delay etc. The terms and conditions of the carrier liability and gives in documentation form the responsibility for all possible causes of loss or damages.

**Freight Bill:** This is how the carrier charges for the transportation services he performs.  
The information contained in the bill of lading is utilized for preparation of this.

**Shipping Manifest:** This document is used when multiple shipments are placed on a  
single vehicle. The document provides a comprehensive list, which informs the entire  
load content, making it unnecessary to view individual bills of lading as all details relating  
to the stops, bills of lading, weight, case count etc for each shipment are listed in this manifest.

**3.13 Transportation Management**

Factors like globalization and technological improvements in the past years have changed the logistician’s view of transportation. The logistics manager is expected to be more proactive in identifying the desirable combination of carrier services and also the suitable pricing structures in order to meet the objectives of the firm. Transportation, when managed independently of other value added logistics operations often represents the weaker elements. Transportation decisions, which are made in co-operation with, related functions remove this weakness.

The two main fundamental principles in transportation management and operations are economy of scale and economy of distance. Economy of scale means the transportation cost per unit of weight decreases with an increase in the size of shipment. Economy of distance implies that there is a decrease in the transportation cost per unit with an increase in the distance. These principles are essential while evaluating alternative transportation strategies or operating practices.

Thus transportation management is an important activity for the organization which involves the  
following process:

**Analysis and Understanding of environment:** There is a necessity to understand the transport environment, to make sound transport decisions. The environment consists of the five parties – shipper, consignee, carrier, government and public.

**Clarity in objectives:** The order of preference in performance of transportation functions has to be decided. The manufacturer must determine his objectives at a level at which service can be performed and the levels at which customers expect, the amount of trade-offs that can be expected. Such setting of objectives can enable the company to choose an efficient mode of transport.

**Selecting mode of transportation**: A choice between single mode and intermodal transport has to be made to achieve objectives efficiently.

**In source or outsource:** After selecting the mode, the company must decide whether to in source the activity or outsource to third parties. According to the mode selected, the company must perform the functions.

**Evaluation and Control**: The efficiency of the transport system can be ascertained by  
measuring the customer satisfaction.

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**Activity 3.1**

1. Discuss the main purpose transportation serve in your company
2. Explain the mode of transportation and bring out the advantages and disadvantages
3. Describe transport management

**summary**

**3.14 Summary**

Modern transportation has undergone a sea change with a change in the point of view of  
an operational function to a strategic one. In the new era, transportation requires a constant  
search for methods to ensure that the customers order will arrive at their doorstep when  
required, in the right quantities and in undamaged condition. Additionally, transportation has  
to continually improve its flexibility and ability to respond to the market place, at a short  
notice, while providing better avenues for communication and also cost reduction. This  
makes transportation a continuous perennial activity rather than a one-time exercise.

# Units 4: Warehousing / Distribution

# 4.1 Introduction

I know by now we have been introduced to the concept of warehousing. In this unit we are going to look at warehousing in details

**Outcomes**

**4.2 Learning Outcome**

By the end of this Unit you should be able to;

* discuss the functions within the warehouse.
* explain the benefits of the warehouse.
* examine the warehouse alternatives.
* determine the nature of warehouse costs.
* discuss the decisions in planning the warehouse.
* develop a warehouse space and design.
* develop the warehouse management systems..

Time

**4.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**4.4 Warehousing**

Warehousing is a support function for logistics and plays an important role in attaining the overall objectives of an organization’s supply chain system. Warehouse is a place where inventory is stored. It is basically an area of interface for production, market, customers as well as suppliers. The performance of warehouse is often judged by its productivity and its  
cost performance. In today’s highly interconnected and interdependent supply chain networks, successful warehouse management involves a thorough understanding of how the basic warehouse management functions impact the supply chain. The warehouse, being a critical link in the supply chain, serves as the source of order status information for the customers, provides inventory visibility for the supply chain partners and for the enterprise as a whole.

While focusing on warehouse objectives of improving profit through reducing cost and enhancing customer service level, the following have to be taken into consideration:

* Utilizing the storage space to the maximum
* Higher productivity of labour
* Reduced material handling
* Reduced order filling time
* Maximum utilization of assets
* Reduced operating cost

**4.5 Functions within the warehouse**

**Receiving:** Collection of activities involved in proper receipt of all materials coming into the warehouse, providing the assurance that the quantity as well as quality is as per ordered, and distributing the materials to storage or to the other organizational functions which require them.

**Pre packing:** This is done in the case when products are received in bulk from a supplier and repacked into single consignments. The entire merchandise, which is received, may be processed at once, or a portion may be held in bulk for processing later.

**Storage:** Putting away the inventory received to complement order picking. It can be  
explained as the physical holding of merchandise while it awaits demand. Method of storage depends on the size and the quantity of the items in inventory and the handling characteristics of the product or its container.

**Order picking:** Physical selection of the products from their locations, after receiving the customer orders. In other words, process by which items are removed from storage in order to cater to a specific demand. A document named pick List containing details like sales order number, shipment details, item details, quantity etc facilitates order picking.

**Packaging or pricing**: This is basically optional which may be done after the picking process.

**Sortation and / or accumulation:** When a warehouse stores multiple products, this activity is done.

**Packing and shipping:** Performance of tasks related to dispatching an order. This includes the following tasks like checking whether order is complete or not, packing material in an appropriate shipping container, preparation of shipping documents, including packing list, address label, and the bill of lading, weighing the shipments to determine shipping charges, accumulate orders by outbound carrier, loading trucks.

**Traffic management:** Choosing the best mode of transportation for inflow and outflow.

**4.6 Benefits of warehousing:**

**1. Economic:** Refers to the overall reduction in the logistical costs by utilizing one of more benefits.

**The major benefits are as follows:**

1. **Consolidation:** Material from a number of manufacturing plants destined to a particular customer on a single shipment are consolidated and received by the consolidating warehouse which results in reduced transportation cost. The advantage is that it combines the flow of logistics from several small shipments to a specific market area. Several firms may also join together and use this consolidation service, which will benefit each shipper individually.

**b) Bulk Breaking:** Various combined customer orders are received from a manufacturer and shipped to individual customers. A break bulk warehouse sorts or splits individual orders and delivers them locally.

**c) Cross Docking:** This facility is similar to bulk breaking but involves multiple  
manufacturers. Truckloads of products arrive from multiple manufacturers, which are sorted customer wise. Then they are loaded into the truck destined for the appropriate customers. This system is widely used by retailers.

**d) Postponement:** A warehouse with facilities for light manufacturing activities like packaging and labeling can enable postponement of final production until the exact demand is known. The benefit here is a reduced level of risk and lower inventory as the final labeling and processing activity is done only on knowledge of the actual demand and thus the basic product is used for a variety of labeling and packing configuration.

e) **Stock Piling:** Stocks piled in the warehouse act as buffer inventory which help to tide over situations of material constraints and customer demands.

**2. Service:**

Service benefits may not reduce costs and the justification for a warehouse based on service is an increase in the market share, revenue and thus an increase in margin. The benefits are as follows:

**a) Spot Stocking:** A selected amount of a firm’s product line is placed in a warehouse to fulfill customer orders during a key period of maximum seasonal sales. Features include a  
narrow product assortment and stocks placed in many small warehouses catering to specific markets over a limited time horizon.

**b) Assortment:** Various product combinations are stocked in an assortment warehouse in anticipation of customer orders. This is similar to spot stocking except that this has a  
broader product line, is limited to a few strategic locations and functions throughout the  
year.

**c) Mixing:** Similar to the bulk breaking process with an exception that various different  
manufacturer shipments are involved. Truckloads of products are shipped from manufacturing plants to warehouses and upon arrival at mixing warehouses these are unloaded and the desired combination of specific product for a particular customer or market is selected. Inventory is sorted to suit specific customer requirements.

**d) Support in production:** Production support warehouses provide a constant supply of  
components and materials for assembly units. Such a warehouse supports production by supplying components or sub-assemblies in a regular and timely manner.

**4.7 Warehousing Alternatives:**

The various warehouse strategies are as follows:

1. **Private warehouse:**

Refers to having the entire facility under the financial and administrative control of the firm, i.e. the firm owns the product and also operates the warehouse. The actual facility can be either owned or can be taken on lease, for a short period. The major benefits of this warehouse are:

**Control:** The enterprise has complete decision-making authority over all activities in the facility, thus enabling integration of warehousing operations with other internal processes of the firm.  
**Flexibility:** Operation policies and procedures can be formulated and altered to suit individual needs.  
**Cost:** The basic objective of this warehouse is not profit -making, thus the cost aspects are less compared to public warehouses.

**Marketing:** An intangible benefit is a marketing advantage over other firms due to the  
firm’s name attached with the warehouse thus enhancing customer perception.

1. **Public Warehouse**:

These are similar to private carriers in transportation service. Services are provided to others by firms that have warehousing space, storage facility, and material handling equipment for their own use and are used a lot in logistical systems. These are designed to handle the most general packaged products or commodities, which would not require specialized storage or handling arrangement. The products usually stored are food grains, paper rolls, bulk material (cement, fertilizers), furniture, chemicals etc. A major advantage of a public warehouse is that they provide financial flexibility and economies of scale. More operating and management expertise is provided, as warehousing is the core business for such firms. Variable costs are lower compared to private facilities. With more customers and higher volumes, the fixed costs are spread over resulting in economies of scale. Public warehouses are of great use to firms, which are newly formed, and have the desire of expanding their distribution network and thus needn’t invest in developing a private warehouse. They can alternatively hire a space in a public  
warehouse or channel their funds into other activities, which generate more revenue. This would improve their performance and thus increase the return on investment. Location flexibility is also available through public warehouses. Firms can also close storage facilities in one market and open at other places without any financial losses.

1. **Contract Warehouse:**

Combine features of both public and private warehouses. The risk is shared and there is a long-term relationship that will result in lower costs. Benefits include economies of scale, flexibility, information, and equipment sharing among clients.

**4.8** **Other types of warehouse**

**• General Merchandise warehouses:** Deal in all commodities except specialized or commodity items. These can either be public or private.

**• Refrigerated/Cold Storage warehouses:** Used for storing perishable items, which are kept at low temperatures to preserve quality. These are expensive and a variation of this type of warehouse is known as the controlled temperature warehouse, which is lesser expensive and is used for storing fruits, milk and so on.

**• Bonded warehouses:** A special type of warehouse whereby distributors can produce, transfer and store products without paying excise taxes and duties on them. The government licenses these to various parties.

**• Inbound warehouses:** Bring in imported merchandise, store as well as display the merchandise in shops, which sell for export or sell merchandise, which is directly exported.

**• Special commodity warehouses:** These are specialized and handle a specific or a  
bulk commodity.

**• Combination warehouses:** Warehouses, which combine all the above facilities.

**4.9 Nature of warehousing costs:**

The warehousing costs can be either

**a) Fixed costs:** Incurred irrespective of how much or how little activities is experienced.

b**) Variable costs:** Vary with the level of activities.

Warehousing costs are associated with the following:

Table 1: Warehouse Costs

|  |  |
| --- | --- |
| **Association** | **Cost** |
| Land | Rent |
| Building | Rent and Rates |
| Storage and Material handling equipment | Maintenance |
| Labour | Pickers, packers |
| Supervision | Warehouse management |
| Services | Electricity, telephone e.t.c |

Source: (Osleen, 2016)

**Decisions in planning the warehouse:**

**4.10 Warehouse Site Selection:**

Cost and service are the key considerations here. The other supplementary factors are:

**1. Nature of product:** This influences the number and location of warehouses. For perishable commodities, proximity to the consumption centers is essential. It is preferable to have limited number of warehouses, which have delivery limitation in terms of distances and geographical reach.

**2. Infrastructure:** The efficiency of the warehouse operations improves with the availability of suitable infrastructure like roads, utilities (water, electricity, communication etc) and labour, the unavailability of which will increase the transportation cost. For example, for cold storage, availability of electricity is a major influencing factor.

**3. Access:** Again, when there the warehouse is located at a place where there is little accessibility, the transportation costs will escalate.

**4. Availability:** The availability of warehouse space is an issue, especially in the metros. In the case of non - availability, alternative location at the outskirts will be the alternative, but which will increase the transportation costs.

**5. Market:** To offer better service to customers, warehouses need to locate in proximity to consumption centers so that frequent deliveries by customers in small quantities can be organized at a limited time.

**6. Regulations and local taxes:** Government regulations guide the site selection for certain hazardous chemicals, explosives etc. In such cases, there are limited options for site selection. Also the regional sales tax influences the site selection. With a lack of uniformity in the sales tax structure across the States, warehouses will be planned to make maximum utilization of this.

**7. Product – Mix Consideration:** The product mix is directly related to the design and operation of a warehouse. Considerations such as product sales, demand, weight, bulk, packaging etc needs to be made.

**4.11 Selecting the material handling system:**

As movement is the primary function within a warehouse, it is necessary to select the appropriate material handling system

**4.12 Warehouse layout:**

The warehouse layout needs to fit specific needs. Considerations to be made while planning the layout and operation are:

* Deciding on the receiving and shipping locations
* Identify minimum paths for movement of equipment and people, for speedy storage and retrieval
* Classifying items as slow, medium and fast and then allocating separate area for
* These
* Placing the material handling systems at their assigned location

**4.13 Determination of warehouse space and design:**

a) A sales forecast or total tonnage expected is used to estimate the final size of the warehouse required. A number of techniques like linear programming, simulation etc are used to determine warehouse size.

b) Warehouse designing is a specialty planning activity usually done by an architect.  
Specifications like size of warehouse, lay out, path of material handling equipment,  
are required. The warehouse must be designed for maximum utilization of available  
space and material handling equipments.

While stocking the warehouse, a complete list of inventory needs to be obtained.

* Hiring and training of personnel is an important issue. There must be clarity about the  
  role played by personnel hired for specific requirements and each group of employees  
  needs to be given special training.
* The management must ensure that work procedures are developed and also  
  understood by personnel.
* Protection against theft of merchandise must be ensured. Adequate security measures  
  to be undertaken by allowing only authorized personnel to enter the premises, where  
  computerized inventory control and processing systems are of use.
* Product deterioration arises from careless storage and non-compatibility among  
  products stored in the same facility. Careless handling by warehouse employees is a  
  mater of concern.
* When firms handle a large number of products it is economical to utilize computers for  
  billing and inventory control. The computer inventory needs to be compared with the  
  physical stock
* Accident prevention is an important consideration.

**4.14 Warehouse Management Systems (WMS)**

This is a software solution to control movement and storage of materials within a warehouse, transportation management, order management, and a complete accounting system. The following activities are managed through a WMS:

**1. Inbound:** Functions like addition of a new purchase order, palletisation, receipt of goods,  
putting away received goods etc

**2. Inventory Management:** Transferring inventory, holding and adjusting inventory,  
awareness of inventory balances etc

**3. Outbound:** Tasks such as creating an order of shipment, shipping multiple orders, allocation of orders, shipping order status.

****

**4.1: Activity**

1. Explain the benefits of warehousing
2. Evaluate the decisions in planning the warehouse

**summary**

**4.15 Summary**

Warehouse being the interface area for production, market, customers and suppliers  
performs a number of functions in the supply chain. In many logistical system designs, the role of warehouse is viewed as a switching facility when contrasted to a storage facility. While the role of a traditional warehouse was to maintain a supply of goods to protect any uncertainty, the contemporary warehousing offers a host of much other value added services. Effective warehousing has become the order of the day.

# 

# Unit 5: Packaging and Materials Handling

# 5.1 Introduction

Welcome to unit five of this module. Here we are going to look at packaging and material handling.

**Outcomes**

**5.2 Learning Outcome**

By the end of this Unit you should be able to;

* explain the types of packaging.
* describe the function of packaging.
* discuss the types of packaging.
* explain palletisation for utilisation.
* discuss the characteristics of materials to be packaged.

Time

**5.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**5.4 Packaging**

Packaging is a marketing tool related to the performance of marketing function. The basic objective behind packaging is to prevent damage to the product during storage, transportation and handling, when it is in movement for distribution in the market. It forms an important cost element of goods and represents 5-30 per cent of the value of goods, depending on the type of product. It has a significant impact on the cost and productivity of the logistical system. The main cost elements are the purchase of packaging materials, introducing automated or manual packing operations, and further the need for disposal of material. A systems approach is necessary to manage packaging. Any central planning logic, which is designed to control total distribution costs, must keep in mind the costs related to packaging.

**5.5 Types of Packaging**

There are two main types of packaging: Consumer and logistical and industrial packaging

**Consumer packaging**

This packaging is done with a marketing emphasis. The packaging design focuses on aspects like customer convenience, market appeal, shelf utilization, product protection etc. The proper package design should have its base on a complete assessment of the logistical packaging requirements, which requires a complete evaluation of how all the components in the logistical system influence packaging.

**Industrial packaging**

The concept of containerization or unitization is where the individual products are grouped into carton, bags, bins, or barrels for handling efficiency. The master cartons are grouped into larger units for handling, the combination that is referred to as containerization or unitization. Logistical packaging is designed to meet the distribution objectives. Determining the degree of protection required to cope with anticipated physical and element environments is an important issue in package designing.

**5.6 Functions of packaging:**

**Damage Protection**

The master carton protects products from damage while movement and storage, in addition to being a restraint to pilferage. The cost of protection increases according to the degree of value and fragility of the product. The vulnerability of damage is related to the environment in which it is stored and transported. The physical environment relates to the logistical system. When the firm has more control over its physical environment, lesser the packing precautions are required. An example can be the utilization of privately owned transportation, which will move the product in a controlled environment. But if common carriers are used for transportations, more precaution needs to be exercised as the product may be transported in a variety of vehicles and there is lesser control. Certain situations in which the product will cause in-transit damage to the product are vibration, compression, puncture and impact. Securing the package with a tight strap or to load the carrier in a right pattern can reduce this. The outside elements also influence the packaging. There are certain factors like temperature, humidity etc which are beyond the control of logistical management. It has to be determined in advance how the contents of the packing will react to each of these factors and design the packing accordingly.

**Utility / Convenience**

This refers to how packaging can affect the logistical productivity and efficiency. When products are packed in certain configurations and order quantities, it increases the logistical output. Packaging thus provides convenience of handling and storing. Also the concept of unitization is very significant here. Unitization refers to the process of grouping the master cartons physically into one restrained load for easier material handling and transportation.

**Communication**

Packaging plays a significant role by assisting all channel members to identify the contents of the package. An attractive surface decoration can serve as a display item. Information such as the manufacturer’s name, quantity, code number etc is mentioned on the package. The labels must be visible from reasonable distances. Handling and damage instructions are provided on the package. Especially for hazardous products such as chemicals such instructions can be of great assistance. Tracking is one more feature of logistical packaging. The consignment moves along multiple storage locations, transportation systems at various points with other consignments. For a well controlled material handling system to track the product as it is received, sorted or shipped, packaging identifiable through a bar code is essential.

**Packaging Cost:**

The packaging cost depends upon factors like nature of product, physical dimensions, value, regulations etc. Delivery of the product at minimum overall packaging cost is essential. These are the costs included in packaging.

**Unit Package Cost:** Basic material or container price. This will depend upon factors like volume, freight charges, and methods of over packing and development costs. An increase in the volume attracts lesser price.

**Operation Cost:** The packaging equipment must have the strength and ability to withstand the stress of high speed filling equipment, in order to make the production process cost effective and efficient.

**Warehousing:** The packed product is shipped to the user’s warehouse for storage before shipment. Shape of the package and strength of the package are the factors of key importance here.

**Distribution:** Moving the product from the user’s warehouse involve several forms of transport. The costs of these are referred to as transport costs, which are governed either by the weight of the finished pack or the volume. They may also depend upon the shipping distance and value of the item being handled.

**5.7 Types of packaging material**

**Shrink-Wrapping:** Form of packing where a pre-stretched plastic sheet or a bag is  
placed over a platform and master cartons. Heating locks the cartons. Advantages of this packaging are adaptability to various shipment sizes, low cost, and the ease of identifying contents and damage. A major disadvantage is disposal of waste material.

**Stretch-Wrapping**: The unit load is wrapped with a tightly drawn external plastic  
material. Then it is rotated on a turntable to place the stack under tension. Platform is wrapped directly into the unit load.

**Aluminium:** The main area of usage is foil. These are used as a replacement for beverage cans, stackability being the main advantage. Metal tubes and moulded trays are the other two forms. While metal tubes are used in pharmaceuticals, crafts, and cosmetics, moulded trays are used in the food industry.

**High-Density Plastic Boxes:** Containers with lids similar to those purchased for  
home storage applications. These are rigid and sturdy, thus ensuring high protection.

**Plastic Strapping:** A load is unitized so that many smaller containers can be handled as a single larger container. The strapping, which is usually about one to one and a half inch wide, is bound tightly around the containers.

**Plastic Foam Dunnage:** Used to pack irregular shaped products into standard shaped boxes. These are light and do not increase the transportation cost and also provide substantial protection. A major issue here is the environmental problems related to disposal.

**Film-Based Packaging**: This utilizes flexible materials instead of rigid packaging like corrugated fibreboard boxes. Corrugated fibreboard cases represent an important part of the paper and board industry, in terms of both tonnage and value. Corrugated fibreboards are commonly used for television, washing machines, refrigerators, cigarettes, personal care products, etc among a host of other products. The advantages here include automatic operation, reduced labour costs of manually boxing products.

**Blanket-Wrapping:** A traditional form of packing, which is generally used in household packing. This packing is most suitable for irregular shaped products like chairs, tables and other furniture. Generally household goods carriers use these services.

**Returnable Containers:** These are mostly re-usable packages like steel or plastic and sometimes corrugated fibre board boxes. These are used by automobile manufacturers to pack inter - plant shipment of body parts.

**Intermediate Bulk Containers:** Used for granular and liquid product shipment quantities smaller than tank cars but larger than bags or drums. Resin pallets, food ingredients, and adhesives are packed in these containers.

**Plastic Pallets:** The rapid growth in the utilization of plastic in packaging is noticeable. These are lightweight and recyclable.

**Pallet Pools:** Third party supplies maintain and lease high quality pallets all through the country. Palletization has contributed immensely to logistical productivity. Advantages include reduced damage, lesser costs of disposal, and improved use of pallet resources. The disadvantage is the costly investment in pallets.

**Refrigerated Pallets:** A self - contained refrigerated shipping unit, which can be placed inside a regular dry van as a Less Than Truck Load shipment. This integrates the demands of environment and unitization. Unitization Products are grouped together in cartons, bags and barrels for handling efficiency. The containers used to group individual products are called master cartons. When the master cartons are grouped together, it is called unitization. The concept of Unitization has its base upon the theory that all shippers must pack their cargo in such a manner that it is moved and handled entirely by mechanical equipment, like lifts and cranes, all through the distribution network. It enables faster loading and unloading by transportation equipment, results in more efficient distribution center operations and also a reduced level of pilferage.

According to the unit load concept:

* Small, heavy and expensive items are enclosed in containers with double or triple wall to  
  avoid pilferage and damage.
* The boxes or containers are secured to pallets with shrink-wrap or steel strapping.
* Large items can be directly secured to pallets, with assurance that they are completely  
  protected from damage

**5.8 Palletisation for Unitisation**

Pallets enable unifying dry cargo loads. Basically, it is a flat tray upon which a lot of articles  
can be placed, and can be handled as one article. For securing the articles to the pallets,  
metal strapping, plastic films or more elaborate forms of devices are used.  
Benefits of palletisation include reduction in time required to load or unload the products  
from the vehicle, and better utilisation of warehouse space. Other benefits include assembly  
of individual packages according to a single customer order, easy handling of pallets for  
road as well as rail vehicles, and reduction in the rate of damage in transit, and reduced  
delivery time.

A drawback can be the lack of uniformity in pallets.

**5.9 Containerisation**

Container refers to physical equipment, which is used for unifying a number of shipments, which then move as individual units. These are used to handle bulk commodities as well as merchandise and are especially adaptable for inter-modal transport.

Benefits of containerization

* Reduced door to door shipment
* Reduced freight costs
* Reduced damage and pilferage, thus eliminating intermediate handling of packages
* Higher productivity of labour
* Lesser documentation
* Reduced warehousing and inventory costs
* Better utilization of capital equipment through uniformity of cargo
* Environmental control

**Drawbacks of containerization**

* All cargo need not necessarily suite containerization
* Heavy capital investment in equipment required
* Difficult to thrust liability as there are several carriers and also no intermediate inspection
* Proper equipment to handle containers may not be available
* System not comfortable with air freight

**Movement of containers**:

While moving the container, the consignor is faced with several choices such as the follows:  
**By Road:** This is done by using equipments like direct lifting cranes, forklift trucks, portal frames and other self-loading devices.

**By Rail:** For long distances, road may prove uneconomic and thus the rail transport can be used to transfer containers.

**By port terminals:** The container finally arrives at the port to be shipped whether road or rail transport is used to transfer containers.

**By ships:** To secure benefits of rapid loading and unloading and thus to ensure efficient utilization of space, containers are built or customized. Wide hatches give complete access to holds in these ships.

**5.10 Designing a Package**

Designing the package involves the following steps:

**Briefing the designer:** The person who is designing the package needs to understand what is in the mind of the manufacturer. A complete marketing analysis may be given to the designer or some specific objectives may be given. The designer needs to list his views about the problem.

**Gathering information about the package:** Meeting the people involved in the production, process and various channel members like sales personnel, dealers etc. has to be done. Facts about the packaging materials need to be gathered as well.

**Writing the Design Platform:** The designer gives a report giving details of what he has understood and what must be done to achieve the objectives he has laid down. The product and packaging engineers need to work together.

**Creative Phase:** Here, the creative people are involved. They are given a precise definition of the problem and a set of objectives to work upon. They are required to find visual solutions to the problems stated within the boundaries outlined in the platform of design.

**Consulting Suppliers:** Then, the appropriate suppliers of materials need to be called in. The ideas are synchronized with reality. The ideas need to be practical and also cost effective.

**Initial Presentation:** The ideas are presented at a first visual presentation meeting. The  
client actually sees the work being done. The designs should be judged in relation to the  
design platform.

**Modification:** Modifications, if any which need to be done after the first presentation,  
must be made.

**Design Testing:** To test package, a number of tests have been developed.

**Image tests:** Use the qualitative and quatitative research to assess consumer attitudes, preferences and message communicated.

**Usage tests:** Examine the functional related attitudes towards packaging and usually involve in - placement tests.

**Visibility tests:** Are designed to evaluate legibility of pack graphics, relative impact of  
different pack elements, and the relative impact of different designs.

**Brainwave analysis**: Used for both advertising and package designing. Method is  
based on Alpha and Beta brainwaves.

**Final Design Phase**: A final meeting with client is held to finalize the design. In this  
stage the various aspects of packaging like labels, contents, colour schemes, artwork on  
label etc need to be finalized.

**Production Design:** The complete designs are presented to the clients for approval. The design is approved and also set as per the initial discussions concerning the marketing strategy. Any variance needs to be resolved by consulting the experts in the respective fields.

**Finishing the Job:** The finalized artwork is turned over to the suppliers for producing the packs.

**5.11 Factors effecting choice of packaging materials**

**Characteristics of Materials to be Packaged**

* Destination
* Kind of Transportation
* Handling, stowability and storage considerations
* Conditions of usage and distribution
* Cost
* Availability of the type of package and
* choice of substitutes



**Activity 5.1**

1. Explain the types of packaging.
2. Describe the function of packaging.
3. Discuss the types of packaging.
4. Explain palletisation for utilisation.
5. Discuss the characteristics of materials to be packaged.

**summary**

**5.12 Summary**

Packaging has a key impact on the cost and productivity of the logistical system. A central planning logic designed to control the total distribution costs must incorporate all the relevant costs and trade-offs, also those related to packaging. The cost of every logistical activity is affected by packaging. Inventory control is dependant on the accuracy of the manual or automatic identification systems that are keyed by product packaging. The order selection speed, accuracy, and efficiency are affected by the identification of product, configuration and ease of handling. The capability of unitization and techniques influence the handling cost; Package size and density influences the transportation and storage costs too. From the customer perspective, factors like quality control during distribution, providing consumer education, compliance with environmental regulations explain the importance of packaging. Given the complexity in the global supply chain and the costs of locating new facilities, the concept of packaging postponement to achieve strategic flexibility is gaining importance. With so much influence of packaging in every logistical activity, an integrated logistics approach towards packaging operations can yield substantial savings.

# 

# Unit Six: Global Logistics

# 6.1 Introduction

Welcome to unit six of this module. Here we are going to look at the global logistics.

**Outcomes**

**6.2 Learning Outcome**

By the end of this Unit you should be able to;

* discuss the global supply chain.
* explain how to organizing for global logistics.
* discuss strategic issues in global logistics.
* determine forces driving globalization.
* evaluate strategies to enter global markets.
* explain barriers to global logistics.

Time

**6.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**6.4 Content**

Global brands and companies dominate most markets today. The global company seeks growth of its business by extending markets while at the same time seeking cost reduction through scale economies in purchasing and production and also through focused manufacturing or assembly operations. While the logic of globalization is strong, it also presents a few challenges. One challenge is that world markets are not homogenous; there is a requirement for local variation in a lot of product categories. Secondly, unless there is a high level of co-ordination, complex logistics of managing global supply chains may result in higher costs. Both these challenges are related. On one hand, offering local markets the variety which they require while still gaining the advantage of standardized global production and on the other, how to manage the links in the global chain from sources of supply through to end user. As an effective logistics system is important for domestic operations, it is equally important for global operations too. Global logistics operation must accommodate not only domestic requirements, but should also deal with increased uncertainties associated with distance, demand, diversity and documentation. With this background, there is a necessity for logistics managers operating globally to develop a wide variety of capabilities and expertise.

Globalized economies have created a host of business opportunities beyond the national boundaries of a country. The world has become a global village owing to the rapid advancement in information and communication technologies. Today, the Internet has made it easier to do business electronically in any part of the globe, from any point to any point. As businesses continue to globalize, their attention has increasingly turned to logistics operations. Speed and efficiency in the movement of goods across national boundaries depends on the available modes of transportation, their capacity and capability, inter-modal facility for movement, packaging, and handling, and logistical regulations in countries where the buyers, sellers, and carriers are located. The domain knowledge, connectivity with international cargo carriers, and documentation are the three crucial areas that need to be focused in global logistics.

These emphasize the need for defining **global logistics** as the design and management of a system that directs and controls the flows of materials into, through and out of the firm across national boundaries to achieve its corporate objectives at a minimum total cost. The various activities involved in global logistics include demand forecasting, packaging, labeling, documentation flow, customer service and parts and service support, which are outbound. Production, scheduling, procurement, and the handling of returned products form a part of inbound movements.

**Logistics Intermediaries:** These are logistics service providers who have expertise in customs clearance and other formalities of international trade. In import and export business, for the physical movement of cargo, the role of intermediaries is quite indispensable. Export Management Companies (EMCs) are intermediaries that market another firm’s products overseas. Export Packers They assist the exporter with special packaging requirements needed to reach some export markets.

**Customhouse Brokers:** These are usually tied to freight forwarders in exporting nations. The customhouse broker meets the importer’s shipment, and guides it through customs seeking to use tariff classifications that involve the smallest charges. Then goods are delivered to the importer’s place of business. Publication Distributors Publication distribution firms are specialised intermediaries. For example, an airline company has this service that includes wrapping, destination sorting, addressing, database management, and so on for magazines. Magazines move overseas by air and then are turned to post offices for delivery, saving on international package costs. Goods Surveyors are frequently referred to in international trade and are retained by the buyer, seller or both to inspect their quality and retain them. Parts Banks Several firms, often airlines, offer this service. This helps manufacturers to store important repair parts throughout the world, where they can be quickly flown to customers with equipment “down”.

**Container Leasing Companies**: These companies facilitate inter modal movements because they can relieve individual carriers of the financial burdens and control responsibilities they would have if they had to own all of their equipment. Companies lease containers on both a short and long term basis. Export trading companies are a distinct intermediary. They actually buy the manufacturer’s goods, take title, and then sell these goods in the export market. ETCs are customers of manufacturers in selected markets. By selling to an ETC instead of the importer, the manufacturer removes himself from some of the financial risks associated with exporting. Risks include political instability, importer creditworthiness, and the risk of unavailability of foreign exchange.

**6.5 The Global Supply Chain**

To meet logistical challenges, logistics management must evaluate complexity of global supply chains and must focus on the major differences between domestic as well as international trade. These are as follows:

1. Differences in operations – Major operational differences are as follows:

**Multiple languages:** Are required for both product and documentation for international operations. Complexities increase due to language differences when a product is limited to a specific country once it is been customized with respect to language. Product proliferation due to language requirements has been reduced because of multilingual packaging; this is not an acceptable strategy always. Apart from product language implications, multilingual documentation is required for every country through which the shipment passes. There are many countries where transportation and customs documentation needs to be provided in the local language, although English is the local language. This results in an increase in the time and effort for international operations as complex documents need to be translated before shipment.

**A large amount of documentation is required for international operations.** Though domestic operations can be generally completed using only an invoice and bill of lading, international operations require a lot of documentation.

**Global transportation is complex**. Certain services which are available and taken for granted in a particular country may not be available in another country, especially the underdeveloped countries.

**2. Differences in Systems Integration** - Earlier, there was little commonality between the international information systems in multinational enterprises. This was also acceptable as every country’s operation was viewed as separate and had an autonomous legal entity. In today’s scenario, there is a requirement for increased co-ordination through systems integration. There is a requirement for increased global co-ordination through integration of systems and a few firms have an integrated global logistics information system.

**3. Differences in Alliances -** The importance of carriers and specialized service suppliers is more in the international operations than domestic operations. In the absence of alliances, enterprises operating internally need to maintain contacts with retailers, manufacturers, suppliers and service providers all through the world. It would be time consuming to maintain these relationships. Market access and expertise is provided by international alliances, which reduces the inherent risk.

Organizing for global logistics when companies extend their supply chains internationally they have to confront the issue of structuring their global logistics organization. Companies have moved towards the conclusion that global logistics can be achieved only through a greater integration in different ways. This is in contrary to the conventional idea that a decentralized decision making responsibility needs to be developed and decentralized at least upto a strategic  
business unit level. This had led to many companies develop a strong local management, mostly with autonomous decision making at the country level.

A number of general principles that have emerged are as follows:

a) Strategic structuring and an overall control of logistics flows need to be centralized in order to achieve worldwide optimization of costs.

b) Control and management of customer service needs to be localized against the requirements of specific markets for gaining competitive advantage.

c) There is an increased trend towards outsourcing, which increases the need for global co- ordination.

d) A global Logistics Information System (LIS) is absolutely essential for ensuring the achievement of local service needs while seeking global cost optimization.

**Structure and Control:** A lot of companies, which are active on an international basis, find that there is a constraint on their search for global optimization by strongly infringed local systems and structure. The twin goals of cost minimization and service maximization can be achieved only through centralized planning and coordination of logistics. Organizations need to look into locational decisions through total cost analysis as the trend towards global manufacturing continues. There is a necessity for improved access to information for costs related to manufacturing, transportation, handling and inventory holding.

**Customer Service Management:** Considerable advantage can be achieved by formulating marketing strategies locally, within overall global guidelines. This is true especially in customer service management where opportunities for offering tailor made services to suit individual customer requirements are huge. Managing customer service involves a lot of monitoring of service as well as performance and also extends to the management of the overall order fulfillment process from order capture through delivery. With an increasing global and centrally managed order fulfillment system on the rise, there is a need for strong local customer service  
management.  
**Out-sourcing:** One of the greatest changes in the global business today is the increasing trend towards outsourcing. The trend nowadays is not only outsourcing the procurement of materials, but also outsourcing services, which have been provided in-house traditionally. The main idea behind this trend is that an organization will increase its focus on its core competencies and everything else will be outsourced. Control and management of network of partners and suppliers requires a combination of both central and local involvement.

**Logistics Information:** Managing global logistics involves management of information flows on a real-time basis. The information system acts as a mechanism whereby the complex flows of materials; parts, sub-assemblies and finished goods are co-coordinated for achieving cost-effective service. An organization aspiring to be a global leader depends upon visibility, which can be gained through material, inventories and demand flows throughout the pipeline. Any time lapses in information flows will be directly translated into inventory. There is a need for information systems, which can estimate demand at every level in the chain and also provide the driving power for a centrally controlled logistics system.

**6.6 Strategic Issues in Global Logistics**

**6.6.1 Internal Issues**

**Logistics Planning:** Logistics network planning is crucial for companies with global operations in order to gain competitiveness. Formulating a logistics network strategy also depends on factors such as unit value of the product, markets and competition. For example: A firm’s strategy to develop new markets and relocate facilities will trigger the need for sourcing of raw materials with reference to the delivery time frame, logistics cost, and reliability. So the formulation of logistics strategies should consider the location of production facilities, sourcing of materials and components and product market characteristics.

**Inventory:** Make to order or make to stocks: Making to order for delivering products directly to customer can result in a major shift in inventory planning and also reduce inventory levels. Consolidating global production into a single or focused factory for catering to needs of various markets can be an approach. Fulfilling the needs of local individual customers or local markets is done through the strategy of rationalization of product design. A modular approach to product design, where the product can be configured to its final shape at the distribution center catering to local markets can take care of the local markets.

**Product variables:** Reach of the logistical system is decided by the unit value of the product. In a globalized marketing environment, firms with low unit value products resort to the local manufacturing system for extending good customer service.

**Flexibility:** Global players focus on economies of scale for achieving cost advantage. There is inflexibility in this system as responding to a dynamic market and demanding customers can be difficult. Similarly the logistics system associated with the above strategy also becomes inflexible while responding to changing distribution needs. An example can be the emphasis on freight consolidation

**6.6.2 External Issues**

**Shorter Lead Time:** Global markets emphasize on responsiveness with a lean supply chain. Thus, customers bank on the shortest lead-time for inputs going into the product manufacture in order to compress the performance cycle, extend superior customer service, and simultaneously reduce overall levels of inventory. But, in the case of inflexibility in manufacturing system the supplier has to maintain some buffer stock for maintaining the desired level of customer service, thus sacrificing the benefits of lean inventory.

**Trade barriers and facilitation:** Though the trade barriers have reduced progressively owing to GATT/WTO, the non-tariff barriers have increased, particularly in the developed countries.

**Cultural Issues:** These can be a problem in global sourcing due to a wide variety of approaches to conducting business in different regions of the world.

**6.7 Forces Driving Globalization**

There are many forces, which drive the firms to enter the international arena. These play a combined role of being motivators as well as facilitators. Enterprises are motivated for global expansion of operations for growth and survival. Development of technologies and capabilities are also facilitated through global operations.

**6.8 Economic Growth**

A decline in the economic growth of industrialized economies has occurred simultaneously with an increase in the manufacturing and logistics productivity, which has resulted in excess capacity. With this scenario, a most direct means for an enterprise to increase profit and revenue is through global expansion into other developed and developing nations. This expansion requires an integrated global manufacturing with marketing capacities as well as logistics support for the new business location. A pursuit for growth and profit is a major force, which drives enterprises to serve the global markets.

**6.9 Supply Chain Perspective**

Another force is the total supply chain perspective adopted by manufacturers and distributors. A historical view sought that expenses incurred by other channel members were not important while making logistics related decisions. This trend is slowly changing. Also there was a practice that more control on logistics activities can be achieved by doing as many activities as possible internally. Eventually logistics managers found out that they could reduce capital deployed by outsourcing a host of logistics activities. This has led to development of alliances with global suppliers who could provide expertise and also quality service at affordable prices.

**6.10 Regionalization**

When firms decided to expand, they wanted to do this by spreading their wings to nearby geographic regions. To promote regional trade, countries began to enter into treaties and formalize partnerships. There is always an extra time required to accommodate political requirements, which add to the logistics costs without adding value to the ultimate consumer. Though efforts for regionalization have been designed to facilitate trade, continued government restrictions cause logistical bottlenecks.

**6.10 Technology**

Technological development has resulted in an increased capability for exchanging information facilitated by widespread availability of computer as well as communication networks. For instance, today, the total performance cycle time has been reduced through the use of enhanced information technology. Demand for world-class products and services are on the rise as the world has become more real-time oriented.

Fig 1: Forces driving globalization

Source: (Closs, 2014)

**Economic**

**Growth**

Supply Ch

ain

**Technology**

Regionalization

Table 1: Strategies to enter the global markets

|  |  |
| --- | --- |
| Technique | Modes of Entry |
| Indirect Exporting | * Exporting trading companies * Export management corporation * Piggy – backing |
| Active Exporting | * Agent * Distributor * Marketing Subsidiary * Co-ordinating direct exports * Foreign sales corporation |
| Production Abroad | * Contract manufacturing * Licensing * Franchising * Joint venture * Subsidiary |

Source: (Dale 2018)

1**. Indirect Exporting:** This means firms are not willing to export directly as they prefer to concentrate on their domestic markets. Under this, several alternatives are possible which are as follows:

1. **Export Trading Company:**

* This is an intermediary, which purchases the goods in the exporting company and resells them to a customer in a foreign country.
* ETCs are very large firms, with local offices in many countries. They take title to the goods in the exporting country, making this transaction a domestic transaction for the exporter, and transfer the title to the importer in the importing country, thus making the transaction a domestic transaction as well. For either parties dealing with the trading company, the product is seemingly handled by a domestic company, its foreign origin is not concerned for the buyer, and its sale abroad is not an issue for the seller.
* These trading companies have acquired a lot of information on potential sellers and buyers and they leverage this knowledge into sales.
* These companies offer a complete package of international logistics services such as shipping, insurance and financing international trade.

1. Export Management Corporation:

* An EMC is located in the exporting country and is operating as an export-oriented  
  manufacturer’s representative for the exporter.
* EMCs have the tendency to restrict their sales efforts to potential customers in a single country and often specialize in selling a single line of production in that country. Most of them represent more than a single manufacturer abroad, usually in complementary lines.
* The exporter is involved slightly more in the foreign sale as the EMC acts as an  
  agent.
* Thus, the EMC acts as the export department of the seller, handling every detail of the transaction.

1. Piggy-Backing:

* This choice is for the reluctant exporter.
* A successful exporter involves one of his suppliers or a company making complementary product in the markets that this exporter has developed.
* This strategy gives an opportunity for a firm to gain knowledge about selling  
  abroad.

1. Active Exporting: This option is where the firm desires to exploit the possibilities of sales abroad and decides to become involved in its exporting activities. Various alternatives are as follows:
2. Agent:

* An agent is usually a small firm or an individual located in the importing country, which acts as a manufacturer’s representative for the exporter. Thus the agent does not take title to the goods it sells but earns a commission on the sales it makes.
* The exporter is known as the principal due to the relationship with agent.

b) Distributor:

* A distributor is usually a firm located in the importing country- or sometimes in a neighboring country, which buys goods form the exporter. A distributor takes title to the goods it sells and earns a profit on the sales it makes.
* He takes more risk in his relationship with the exporter than an agent and experiences higher costs. He carries the traditional risks associated with inventory and also invests a considerable sum of money in the inventory.

c) Marketing Subsidiary:

* This refers to a foreign office, staffed by employees of the exporting firm that sells goods in the foreign market.
* It is incorporated in the foreign market, and is the importer on record as far as the foreign government is concerned, and the export takes place between two legal entities that are part of the same company, at a transfer price.

1. Foreign Sales Corporation:

Created in the United States for tax break for exporters, In fact more than a method of entry, it is a way for United States based corporations to lower its income tax.

1. Production Abroad:

This is a strategy where a company can start operations abroad. This can be done through the following alternatives.

1. Contract Manufacturing:

* Company enters an agreement with a producer in the foreign market to manufacture its goods.
* Suitable as an entry strategy for markets with significant barriers to entry such as high tariffs and quotas.

1. Licensing:

* Granting of rights to intellectual property owned by a company to another company for a fee.
* Company using the intellectual property has the right only to use the property and for every use has to pay a fee called royalty.
* In the international arena, the licensor is the exporting company and licensee is the foreign company.
* Use of this strategy is when high tariffs or non-tariff barriers, prohibitive shipping costs limit access to market or when licensor is uninterested in actively pursuing  
  the market.

1. Franchising:

* Process by which a firm possessing an array of intellectual property items grants another company the right to use these intellectual property items in exchange for royalties.
* Basically, the franchisee and franchisor are in distinguishable in the eyes of customers.

1. Joint Venture:

* Creation of a new corporation in a foreign country, jointly owned by the joint venture partners in any combination of ownership percentages.
* This strategy minimizes the impact of a possible nationalization.

1. Subsidiary:

* Investment by a firm in a foreign venture.
* Another option is where the firm can relocate an entire plant to a foreign location, for utilizing cheap labor and forgoing the higher costs of a brand new facility.
* Followed by firms who want total control of an investment and are willing to take the risk of such a venture.
* This strategy is more beneficial to the host country as it creates jobs and offers substantial incentives to foreign company that are willing to establish a facility within their borders.

1. Parallel Imports: Goods are sold outside the regular distribution channels of a company, usually because there is a difference between the price charged in one country and the price charged in another.

**6.11 Modes of Transportation in Global Logistics**

Transportation plays a vital role in the movement of cargo within or between countries.  
 Selection of the transportation mode depends upon the following factors

• Location of market

• Cost of transportation

• Speed of cargo transportation

• Reliability of mode

**Air:** Advantage of this mode is responsiveness as it can quickly respond to urgent and unpredictable demands for parts or components. There is minimum transit damages to the cargo. Also the insurance cost is lesser when compared to other modes. This mode is confined to high value density items-items having high selling prices where the transportation cost is an insignificant percentage of the price of the product. By using air transportation, since the value of cargo is high, the capital tied up in inventory in transit is released fast.

**Sea:** Used mostly for cross border cargo movement. The types of ships used are as follows:

a) Independent lines: Operate and quote rates individually and independently. They accept cargo from all shippers through freight forwarding agents.

b) Tramp vessels: Do not have any fixed route or schedules and operate on a charter basis. They are mainly involved in bulk cargo transportation.

c) Conference lines: Association of shipping companies across the world. They join hands to have common codes/rules for cargo movement, freight rates, shipping conditions etc.

**Road:** Preferred when countries are connected by land and other options are either costly or not feasible. In Zambia, roads are an important mode of cargo movement.

**6.11 Barriers to Global Logistics:**

A host of barriers hinder global logistics. Three significant barriers are as follows:

**Markets and Competition**

Restrictions of entry, availability of information, pricing and competition are the market barriers. Poor availability of information is one more barrier. Tariffs are the other marketing-related barriers. Tariffs are additional cost elements, which need to be considered while evaluating foreign sources of supply. Also tariffs are political, and are subject to change as and when government policies change. While most international firms experience a highly competitive environment, various rules concerning competitive governance is also proving to be global logistics barrier. A combination of lack of awareness regarding global rules as well as the necessity to conform to norms of particular geographic regions is a competitive barrier.  
**Financial Barriers**

These result from forecasting and institutional infrastructure. Though it is not simple to forecast in any situation, it is very difficult in global environments. The challenge in domestic forecasting is prediction of unit or dollar sales on the basis of customer trends, competitive actions as well as seasonality. In a global environment, the challenges also include exchange rates, customs actions, and government policy complexities. Barriers in institutional infrastructure arise out of the major differences in intermediaries like banks, firms, and legal counselors or transport carriers. A combined financial and institutional uncertainty makes it difficult for planning product and financial requirements.

**Distribution Channels**

Differences in the distribution channels such as standardization of infrastructure as well as trade agreements are a barrier confronting logistics managers. Infrastructure standardization means the differences in transportation and material-handling equipment, warehouse and port facilities and systems of communication. While there are recent efforts for standardization with respect to containerization, there are a lot of major differences in global transportation equipment like vehicle dimensions, capacity, weight and rail gauge. When there is no standardized infrastructure, products are loaded and reloaded into different vehicles or containers, while crossing national boundaries, which results in higher costs and time. Trade restriction barriers can also influence channel decisions, such as rules restricting volume of imports or increase duties once a specified volume has been reached.

Fig 2: Barriers to global logistics (Source: Closs, 2014)

Financial

Barriers

Distribution

Channels

Marketing/

Competition

Barriers to International Logistics

Potential Benefits of International Trade

Global Logistics Management

Successful

International

****

**Activity 6.1**

1. Discuss the global supply chain.
2. Explain how to organizing for global logistics.
3. Discuss strategic issues in global logistics.
4. Describe the forces driving globalization.
5. Evaluate strategies to enter global markets.
6. Explain barriers to global logistics.

**summary**

**6.12 Summary**

Implementing a global pipeline control is dependant to a large extent upon the organization’s  
ability to find a correct balance between central control and local management. Global organizations are expanding and this suggests that there are certain tasks and functions requiring local management and control. International competition has become more intense, due to a gradual reduction in the national barriers. Sophistication of product technology or marketing communications determines the difference between success and failure in the global marketplace.

# Unit 7: Logistics Strategy

# 7.1 Introduction

Welcome to unit seven of this module, where we are going to talk about logistics strategy

**Outcomes**

**7.2 Learning Outcome**

By the end of this Unit you should be able to;

* describe the requirements for effective logistics strategy
* explain strategic logistics planning
* examine logistics strategies
* describe implementation of strategy
* evaluate strategic issues
* determine strategic fit

**Time**

**7.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**7.4 Content**

In the modern day dynamic business environment, competitive pressures and customer demands force a large number of firms in shifting their priorities towards understanding the logistics supply chain process for delivering superior value to customer. In order to achieve this objective, the historic role of warehousing, transportation, storage, and handling have started with a more comprehensive role, which pervades the entire supply chain.

Logistics strategy facilitates gaining a competitive edge to support emerging technologies. As a service function logistics involves the four basic features:

* **Reliability**: Influences the degree of trust, which a supplier can have, in a company’s capability for honoring commitments. The supplier has to be perceived as reliable and for this the supplier needs to exhibit certain service characteristics. A high degree of reliability in terms of inventory and material delivery is expected from the supplier end. Thus a key objective of the logistical system needs to be reliability in meeting the needs of the customer, according to the resource planning.
* **Responsiveness**: The speed with which customer demands are being responded. Responsiveness is expected at all levels of the supply chain. Response to pre-sales enquiry by using latest available information and communication technologies is an important strategy. Supplying material as per customer needs, and frequent deliveries in fewer lot sizes are important. Deliveries can also be made at the various assembly centers, which are in proximity to the markets. A firm will gain a winning edge in competitive markets through a responsive strategy.
* **Relationship**: Firms spend huge amounts in Customer Relationship Management (CRM) related activities for development of long term relationships to retain customers, and also reduce the element of risk in demand management. Partnering with the right supplier and considering the supplier operations, as an extension of its own operations will enhance the efficiency and effectiveness of the supply chain.
* **Rationalization**: This refers to reducing the supplier base and partnering with select suppliers. The supplier’s facility is treated as an extension of the buyer’s facility and there is sharing of information, experience and resources for mutual advantage.

**Requirements for an effective Logistics Strategy**

Characteristics of an effective logistics strategic planning and project management are as follows:

**Dedicated planning resources and programs**: Unless proper resources are set aside for long term planning, it will not be carried out to the level of necessity to assess ways of changing economic, technological, competitive, demographic and regulatory environments affecting long-range requirement of logistics. A dedicated logistics planning team needs to be organized. The logistics planning team should include analytical and operational backgrounds that are required to resolve complex issues.

**Formal Logistics Planning Methodology**: Logistics is filled with interdependent activities, which impact other areas of the organization. Planning activity goes through three important phases such as investigation, vision and implementation. In the investigation phase, a logistics audit is conducted and the company’s current performance and practices are compared with world-class practices. The vision phase involves application of world-class practices to the current environment. In the implementation phase, detailed project plans for completing the recommended initiatives are developed and monitored.

**Strategic Logistics Planning**

Business firms have been forced to reengineer or redefine their business process so that efficiency and effectiveness can be brought into the operations. The main reason for this has been the increasing globalization of business activities, intense competition, and uncertain markets. Different firms have different process of strategy formulation and implementation. The process of strategic logistics planning has the following steps:

* Analyzing the external and internal environment, which will help to determine the resource requirements, limitations and any other factors.
* The environmental analysis identifies the company’s strengths, weaknesses, opportunities and threats in customer service.
* SWOT enables in formulating the appropriate resources and the logistics mix or resources required for achievement of organizational goals.
* A structural design is needed to implement the strategy. The primary concern here is the strategic planning of warehouses; transportation and information flow in the entire supply chain. A proper interface between channel structure of the firm and its logistical network can be done with the help of a structural design. The efficiency of the functional elements in the movement of information and inventory across the supply chain will influence the success of the strategy implementation.
* Selection of transportation route, mode and carrier operator is a key aspect for offering and maintaining a reliable and consistent service level.
* The role of material procurement and management also cannot be ignored.
* Implementing the strategy is absolutely important and its success depends on efficiency of the human resources, equipment and the interfaces involved. A major task at the level of operation are order registration, processing, picking, replenishment and dispatching.

Thus, the process of strategic logistics planning will improve the overall responsiveness of the organization.

**Fig 3: Strategic Logistics Planning** (Source: Sople, 2015)

Environm

ental Analysis

Logistics Objectives

Identification of resources

Logistics Strategy

Implementation

Results

Environment

Resources, skills

and timing

SWOT

Components of Information Decisions in Supply Chain Strategy:

* **Push Versus Pull**: While designing the pieces of supply chain, it is necessary to determine whether these are part of the push or pull phase in the supply chain. Push systems require an elaborate Master Production Schedule (MPS) and Master Requirements Planning (MRP). The Master Production Schedule rolls the Material

Requirements Planning (MRP) system. In contrast, for pull systems, information is required on actual demand for quick transmission throughout the entire chain so that the real demand is reflected.

* **Competitive Strategy**: This defines the customer needs to be satisfied through its products and services. A firm’s competitive strategy depends upon the customer requirements. It targets the customer segments with a main objective of providing products and services to cater to the customer needs.
* **Product Development Strategy**: Mentions clearly the portfolio of new products, which needs to be developed by a company giving an indication whether efforts towards these are done internally or externally.
* **Marketing and Sales Strategy**: Specifically mentions about market segmentation and details relating to positioning, pricing and promotion of the product.
* **Supply Chain Strategy**: A wide term, which includes supplier, operations and logistics strategy. Includes decisions relating to inventory, transportation, operating facilities and information flows. The strategy specifies the activities of supply chain such as operations, distribution and service.
* **Other Strategies**: A company also devises additional strategies for finance, accounting information technology and human resources.

**Logistics Strategies**

Formulating a logistics strategy can be viewed from the following three angles:

* Customer demands satisfied through strategy implementation
* Targeting customers
* Resources required for implementing strategies

Formulating a strategy is not an isolated process. Logistics strategy needs to have congruence with the overall goal and strategy of the business. A synergy with the other domains of the organization is necessary. An example of this can be the Management Information Systems of an organization encompassing all the functional areas of business. The MIS, being an information sharing system across the supply chain has considerable synergy with logistics operation.. Considering the importance of formulating a logistics strategy, the following are the possible approaches:

**The following competitive and generic strategies could be pursued for logistics operations:**

**1. Cost Leadership**: Achieving cost leadership is facilitated by logistics cost reduction to a major extent. This can be achieved by many ways. Examples of achieving logistics cost reduction are:

* Reducing transaction costs through IT support
* Warehouse operations based on scale economics
* JIT, cross docking and postponement, which results in reduction of inventory and related costs.
* Reduced vendor base and co-partnerships with suppliers.

**2. Differentiation**: This strategy focuses on offering superior service. Examples of offering logistics services for differentiation:

* On time and consistent delivery
* Logistics solutions to suit individual requirements
* Tracking consignments

**Collaboration**: A strategy where the customer works in collaboration with the suppliers. An example here is Vendor Managed Inventory (VMI). In VMI, customer places no orders but instead shares information with the vendor. This information relates to actual usage or sales of their product, their current on hand inventory and details of additional marketing activity. On the basis of this information, the supplier takes responsibility for replenishment of the customer inventory.

1. **Diversification**: Firms having a lot of operations adopt this strategy. The basic objective here is the lower cost and better control over operations thus providing superior customer service.
2. **Outsourcing**: Outsourcing services to logistics service providers having expertise in this area in order to bring efficiency and effectiveness into the logistics operations. An example in outsourcing is Customs Clearance service providers. As a majority of exporters and importers do not have a proper expertise in this area of logistics operations, many logistics service providers offer customs clearance services to their clients. This can reduce the overall transaction cost.

**Implementation of Strategy**

Implementation of the strategy is an important activity after the formulation. The firm needs to evolve a proper framework to successfully implement its logistics strategy. Important aspects for implementation of strategy are:

* Financial dimensions of control such as net income return on equity, net profits etc
* Non-financial parameters of control such as quality of service, customer satisfaction, delivery time etc
* The organizational culture and employee motivational programmes initiated by the company facilitate behavioral controls for employees.
* The structure of the organization is of importance. Organizational structure with a wide span of control give higher motivation to employees to perform well and strategy implementation can be done successfully in such organizations.
* Skills of the implementers of the strategy are also an important consideration.
* The successful implementation of logistics strategy depends to a great extent on the information shared with internal and external customers and also logistics partners. Transparency at both the buyer and seller’s end helps to build an element of trust, thus adding value to the customer delivery chain, which makes the task of implementation simpler.

**Fig 4: Framework for strategy implementation** (Source: Sople, 2015)

**Strategy**

Financial and Non

–

Financial

Controls

Complementary

Human skills

Organizational

St

ructure

Organizational

Culture

Performance

**Strategic Issues that confront today’s business organization**

With today’s business scenario becoming more complex these have an impact on logistics. The following strategic issues confront the area of logistics today:

**Expansion of customer service**: Today’s customers are more demanding, not only in terms of quality but also from service point of view. There is a need for differentiation with more and more markets becoming ‘commodity’ markets. The creation of differential advantage is through adding value, especially through customer service. Achieving competitive advantage through customer service is from a carefully planned strategy for service, and developing appropriate delivery systems and commitment from people throughout the organization. Achieving service excellence can be only through a closely integrated logistics strategy.

**Time Compression**: Time is a critical issue in management. Shorter product life cycles enable customers to accept substitute products, which are available just in time. In the case of introducing new products, management implications result from the reduction in the time ‘windows’ for making profits. Amidst all the concern for creating and managing innovation, there is an issue, which is perhaps given the necessary attention only now. This issue is the problem of extended logistics lead times. Lead-time is the time taken to convert order into cash. An important function of logistics is the provision of availability. The integration of marketing and manufacturing planning is necessary to achieve the availability requirement. More problems are created by limited co-ordination of supply decisions with the dynamic requirements of the market and the limited visibility in purchasing and manufacturing related to final demand. A radically different approach to manage lead-time is required to overcome these problems and establish long-term competitive advantage by ensuring timely response to changing demand.

**Globalization of the industry**: The increasing trend towards globalization is proving a challenge for logistics management. Global companies seek to achieve competitive advantage by identifying world markets for its products and then developing manufacturing and logistics strategy to support its marketing strategy.

**Organizational integration**: The classical business organization is based upon strict functional divisions and hierarchies. Achieving a closely integrated, customer-focused materials flow while encroached management with its priorities guards traditional territorial boundaries. Today’s organizations follow a systems approach where functions are components of the system, which requires an overall guidance to fit together.

**Strategic Fit**

This means that there is a common goal between the competitive as well as supply chain strategies. Aims at achieving a consistency between the customer priorities satisfied by the competitive strategy and the supply chain capabilities satisfied by the supply chain strategy. Three basic steps in achieving the strategic fit:

1. **Identifying the uncertainties of the customer and supply chain**: To have an understanding about the customer, the company must first understand the needs of the customer segment. For example a customer who visits a store nearby may be doing so for convenience and not for the low cost. Similarly, a customer may visit another store irrespective of its location for its low cost.

**Various attributes on the basis of which customer demand varies across segments are as follows**:

* Product quantity required in each lot
* Tolerable limit of response time
* Price of the product
* Required service level
* Desired level of innovation

**Demand and Implied Uncertainty**: Demand uncertainty reflects the uncertain customer demand for a product Implied demand uncertainty is related to the portion of demand, which the supply chain is required to handle. This is in contrast to the demand uncertainty, which reflects uncertain demand for a product.

1. **Understanding the Supply Chain**: After understanding the company uncertainty, the firm needs to meet the demand in the uncertain environment in the best possible way. A trade off between responsiveness and efficiency is of significance here. A responsive supply chain has an ability to provide the following such as responding to a voluminous demand; meeting high service levels, handling variety and innovative products. But responsiveness can be achieved only with a cost. An efficient supply chain operates by making and delivering a product to the customer at a lower cost.
2. **Achieving Strategic Fit**: The performance of the supply chain needs to be consistent with the targeted needs of the customer and uncertainty in the supply chain. A firm needs to consider all the functional strategies within the supply chain to achieve a complete strategic fit. A supply chain, which is highly responsive, needs to devote all its functional strategies towards service levels while an efficient supply chain needs to focus its functional strategies towards cost.

**Other Issues Affecting Strategic Fit**:

**Multiple products and customer segments**: A majority of the companies manufacture and sell multiple products to multiple customer segments, each one of these with different characteristics. Each of these products and segments has an implied demand uncertainty of their own. While creating a supply chain strategy for each of these, the company needs to balance efficiency and responsiveness provided the portfolio of products, customer segments and sources of supply are known.

**Product Life Cycle**: When products pass through the product life cycle, there is a change in the characteristics of demand and the needs of the customer segments being catered to. Towards the beginning of the cycle, demand of the product is absolutely uncertain and there is unpredictable supply. Availability of product is a crucial factor in capturing the market, cost being a secondary factor. High implied uncertainty makes responsiveness a key feature of the supply chain.

At the later stage of the life cycle, demand becomes more certain and supply is predictable to a certain extent. Increase in competition lowers the margin. The supply chain becomes efficient from responsiveness. Thus the supply chain strategy must keep changing over the product life cycle as demand and supply characteristics change.

**Competitive Changes over Time**

Finally, changes in competitor behavior are a point of consideration. Competitors can influence the competitive strategy. With more product variety, supply chain have been forced to develop an ability to supply high variety. With a change in the competitive landscape, firms are forced to alter the competitive strategy. A strategic fit needs to be maintained with a change in the supply chain strategy.

**Fig 5: Achieving Fit between Competitive and Functional Strategies**

|  |  |  |
| --- | --- | --- |
| |  | | --- | | Competitive Strategy |   Achieving Strategic Fit   |  | | --- | | **Functional Strategies**   * Logistics Strategy * Product Development Strategy * Marketing and Sales Strategy * Information Technology Strategy * Finance Strategy * Human Resources Strategy | |

****

**Activity 7.1**

1. Describe the requirements for effective logistics strategy
2. Explain strategic logistics planning
3. Examine logistics strategies
4. Describe implementation of strategy
5. Evaluate strategic issues
6. Explain the strategic fit

**summary**

**7.5 Summary**

Organizations formulate strategies responding to environmental pressure. Logistics is an important element in these strategies. The apparent trends today are from a logistics strategy approach to a strategic logistics approach. Logistics is being used as a tool to again sustainable strategic advantage more than a tool for developing competitiveness. The success of the strategy depends to a great extent on the framework, where key variables are control tools like organizational culture and structure, and human skills involved in the process.

Today, managers are encouraged to look beyond the traditional view and seek out to develop logistics strategies for exploiting a lot of potential to improve productivity and efficiency to deliver advances in customer service. A large amount of capacity utilization, reduction of inventory and improvements of service through tighter co-operation with suppliers is required.

# Unit 8: Logistics Information Systems

# 8.1 Introduction

Welcome to unit eight of this module. Here we are going to look at the logistics information systems.

**Outcomes**

**8.2 Learning Outcome**

By the end of this Unit you should be able to;

* explain the functions of LIS
* determine the building blocks of LIS
* examine data warehousing, mining and DSS
* identify information architecture
* explain LIS flows
* apply LIS
* explain principles of LIS

Time

**8.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**8.4 Content**

Logistics information systems are the means of capturing, analyzing, and communicating information related to logistics and supply chain management. Information was largely paper-based during the past and thus resulted in slow, unreliable, error-prone transfer of information. Now, with technology becoming user friendly and also less expensive, logistics managers can effectively and efficiently manage information electronically.

Earlier, logistics focused on efficient flow of goods through the distribution channel. Information flow was not given that much of importance. Now, timely and accurate information is critical owing to the following reasons:

* Total customer service includes information related to order status, product availability, delivery etc.
* To reduce supply chain inventory, information is very essential as this can minimize demand uncertainty
* There is more flexibility with information as there is clarity as to how, when and where resources may be utilized to gain strategic advantage

This has triggered the need for an effective Logistics Information System.

**Functions of a Logistics Information System are as follows:**

* Planning
* Co-ordination
* Customer service and communication
* Control

Fig 6: Functions of a Logistics Information System **(Source: Martin Christopher)**

**Planning Function**

-

Management of stock

by product and location

**Customer Service and**

**communication function**

**-**

Inbound shipment

status

**-**

Customer order

status

**-**

Availability of

Control Function

-

Customer service levels

-

Vendor, carrier and system

performance

**Co**

**–**

**ordination Function**

-

Production

scheduling

-

Sales or marketing

planning

-

MRP

**Databa**

**se**

Logistics information systems are the threads, which link the various logistics activities into an integrated process. The system builds on four levels of functionality:\

**Building Blocks of LIS are as follows**

1. **Transaction System -** Initiates and records individual logistics activities. Activities include order entry, selection, inventory assignment, shipping, pricing, invoicing and customer enquiry. In this system, the customer order performance cycle is completed though a series of information system transactions.
2. **Management Control Systems -** Focus is on performance measurement and reporting. Performance measurement provides management feedback regarding the service level and resource utilization. Customer service, productivity, financial and quality indicators are the commonly used performance measures. While, the Logistics Information System (LIS) reports past performance, it is also essential that exceptions are identified as and when they are processed.
3. **Decision analysis –** Focuses on decision applications to assist managers to identify, evaluate and compare logistics strategic and tactical alternatives, vehicle routing and scheduling, facility location cost – benefit analysis etc. Evaluates future tactical alternatives and thus need to be unstructured and flexible to consider a wide range of options. To benefit from its capability, user requires a lot of expertise and training.
4. **Strategic Planning** - Focus is on information support to develop and refine the logistics strategy. Decisions are typically more abstract in nature, are lesser structured and have a long-term focus. This level requires incorporating lower-level data collection into a range of business planning as well as decision-making models, which help in evaluating the probabilities and payoffs of strategies.

**Fig 7: Building blocks of LIS** (Source: Bowersox & Closs, 2015)

Strategic Planning

Decision Analysis

Management Control

Transaction

Systems

**Logistics Data Warehousing, Data Mining, and Decision Support Systems**

Logistics Data Warehousing serves as the foundation for the entire Information System. The data warehouse contains data structures, which are anticipated and developed ahead of the requirements for the other execution as well as planning systems, which makes the design, selection and implementations of those systems easier, and less time consuming. It contains information, which describe past activity levels as well as the current status, which serves as the basis for planning future requirements. This enables access of data. Data access usually becomes a bottleneck as it causes a lot of system failures, delays and response time problems. Also, profiling the logistics activity and data mining is not possible until the logistics data warehouse is designed and developed.

Logistics Data Mining is key to any logistics improvement initiative and is a methodical and systematic analysis of supply and demand activities. The process is designed to identify the root cause of materials and information flow problems, to identify major opportunities for improving processes, and also enables objective decision-making.

Logistics Decision Support Systems are computer based decision support tools, which provide solutions to logistics problems. Examples include QAD, SAP and JD Edwards.

**Information Architecture**

Logistics system architecture includes both the information - that which maintains the data warehouse as well as the execution components. Data warehouse contains past as well as current information. Execution components include activities such as initiation, monitoring, and measurement of activities required fulfilling customer as well as replenishment orders. These activities are as follows:

1. **Planning and Co-ordination**: These form the information system backbone for manufactures as well as merchandisers. Activities include material planning within the organization as well as between channel members. Components of planning and coordination include:

* Strategic Objectives- These are the primary information drivers in many organizations, which basically define the financial as well as marketing goals. These objectives are developed for a time period ranging for many years and usually include quarterly updates. A combined marketing and financial objective define markets, products as well as the services and indicate the activity levels for logistics managers during the planned time frame. A combined marketing and financial plan also serves as a direction for other enterprise plans.
* Capacity Constraints- These evolve from the strategic objectives. Capacity constraints identify the material bottlenecks using the defined activity levels and thus effectively manage resources to satisfy market demands. The place, time and quantity for production, storage and movement are determined by capacity constraints. Aggregate production and throughput limitations like annual or monthly capacity are considered. Time dimension is introduced into an organization’s strategic objectives by considering factors such as facility, financial and human resource limitations. These constraints have a great influence on logistics schedules. The enterprise’s aggregate plan is linked by capacity constraints, which have a great influence on the production for every location. A high level of integration across all planning and co-ordination components is highly essential for a good organization.
* Logistics Requirements: These co-ordinate the facility, equipment, labor, as well as inventory resources, which are necessary for accomplishment of logistics objectives. Distribution requirement planning (DRP) is used for implementation of logistics requirements. Future requirements and forecasts are based on customer orders, sales and marketing conjunction with historical activity levels. Logistics requirements need to be integrated with capacity constraints as well as manufacturing requirements in order to obtain optimal system performance.
* Manufacturing Requirements: Production resources are scheduled by manufacturing requirements and attempt to resolve day-to-day capacity bottlenecks within the material management systems. The Master Production Schedule (MPS) and Materials Requirements Plan (MRP) are determined by manufacturing requirements. Weekly or daily production schedules are defined by the MPS. Once the MPS is given, MRP enables co-ordination of purchase and arrival of materials to provide support to the desired manufacturing plan.
* Procurement Requirements: These facilitate the material releases, shipments and the receipts. Long-term material requirements and release schedules are demonstrated by procurement requirements, which build on the capacity constraints, logistics and manufacturing requirements.

1. **Operations:** Include information activities, which are required for receipt, processing and shipment of customer orders and also to ensure co – ordination of receipt of purchase orders. Components are as follows:
   * Order Management: Serves as the point of entry for customer orders and inquiries. Enables entry as well as maintenance of customer orders using various technologies of communication such as mail, phone, fax, EDI etc. Functions include retrieval of requisite information, editing appropriate values, and retention of acceptable orders for processing done. Information relating to inventory availability as well as delivery dates to confirm customer expectations can be obtained. Order management creates and maintains customer as well as replenishment orders base that affect the remaining operations components.
   * Order Processing: Available inventory is assigned to open customer and replenishment orders. Orders may be allocated on receipt basis or in batch mode. Real – time allocation is more responsive, and batch allocation provides more control over situations of low inventory. Generating an order solution satisfying both customer requirements as well as enterprise resource constraints is a suitable order processing application.
   * Distribution Operations: Direct all activities within the distribution centers using a combination of batch as well as real-time assignments. In the case of batch environment, LIS develops list of instructions or tasks for guiding each material handler (a person who handles material handling equipment such as fork trucks or pallet jacks) in the warehouse. In a real – time situation, information – directed technologies operate in interaction with LIS to prevent time elapse between decision and action. There is more operational flexibility and reduction in internal performance – cycle time requirements in case of real-time distribution.
   * Transportation and Shipping: Include LIS functions of planning, execution and management of transport and movement activities. Activities include scheduling and planning shipment, consolidation, notification, transport generation and carrier management There are three parties involved in transportation and shipping LIS – shipper, carrier and consignee. A basic level of information integration needs to exist for information to be shared. Increased planning as well as performance measurement capability can be incorporated with the help of state of the art transportation and shipping LIS.
   * Procurement: Procurement systems have not been considered a part of LIS. But the importance of integrating procurement is inevitable while managing the entire supply chain. Procurement manages preparation of purchase orders, modification, as well as their release. A desired procurement LIS needs to provide planning, direction of activities and measurement of performance and also co – ordinate inbound and outbound activity movement.
2. **Inventory deployment and Management**: Serves as the primary interface between planning, co-ordination and operations. It plans requirements and manages finished inventory from the production till customer shipment. The primary component here is the forecast module, which predicts product requirements of customers for every distribution centre and thus supports enterprise planning. Other components include simple reactive models to complex planning tools. Customer service objectives established by management are of significance in inventory deployment and management. With effective inventory deployment and management, level of inventory assets required can be significantly reduced. An important function of this is measurement of inventory performance by continuous monitoring. An integrated forecast information facilitates inventory deployment and management and this results in low inventory requirement.
3. **Logistics Information System Flow**

The LIS flow consists of the following elements:

* + Modules: Actual routines that process data or information. Examples include entering orders or assignment of inventory.
  + Data Files: Information structures that store task specific data like orders or inventory records.
  + Management and data entry activities: Represent the interface where LIS need to obtain input from externals environment like decision-maker or from another firm.
  + Reports: Provide information related to logistics activity as well as performance links.
  + Communication links: External and internal interfaces between LIS components and the external environment.

**Modern Technology Applications:**

Information technology is a major source of improved productivity as well as competitiveness. Specific technologies with widespread logistics applications are as follows:

**Electronic Data Interchange:** Intercompany computer-to-computer exchange of business documents in standard formats. It describes both capacity as well as the practice of communicating information between organizations electronically instead of using traditional methods like mail, courier or fax. Benefits of EDI are as follows:

* + Improved internal productivity
  + Improved external productivity
  + Improved channel relationships
  + Reduced operating cost
  + Ability to compete internationally

With regard to logistics cost, EDI impacts the same by reducing labor and material cost associated with papers, reduces communication and also clerical cost.

Electronic Data Interchange Standards**:** Essential elements in Electronic Data Interchange (EDI) which include communication and information standards. Communication standards influence the character sets, priority in transmission and speed. Information standards prescribe types of documents and sequence in which a document is transmitted

**Artificial Intelligence or Expert Systems:** This refers to a term, which describes a group of technologies, which are aimed at enabling computers to imitate human reasoning. Technologies include expert systems, natural language translators, neural networks, recognition of speech, 3D-vision etc.

Logistics expert systems increase a firm’s return on assets. They primarily include three components: knowledge base, inference engine and user interface. The process of developing the knowledge base is by interviewing a series of “experts” regarding the data as well the logic used to make decisions. The knowledge base regarding the best technique to use is available with an experienced forecaster. The inference engine to identify rules relevant for a specific decision searches the knowledge base. It determines the relevant rules and their sequence of evaluation. Interaction between the decision maker and the expert system is facilitated by the user interface, which formats the key questions to user in the natural language and also interprets the responses. As additional information or expertise is obtained, a good interface enables user to refine his knowledge base as additional expertise or information is obtained.

**Fig 8: Basic Structure of an expert system**

User

Interface

Inference

Engine

Knowledge

Base

**User**

Advi

ce and

Explanations

Facts and Data

**Communication:** Logistics performance through faster and widespread communication is enhanced by information technology. Earlier, logistics activities had a glaring communications disadvantage as they involved the movement in either a transport or a material handling vehicle or were decentralized. Thus, information and directions were removed in terms of time as well as location from the actual activity. Radio frequency, satellite communications and image processing technologies have overcome this problem to a great extent.

Radio frequency technology is within smaller geographical areas, like distribution centers, which facilitates two-way communication. These applications related to logistics include twoway communication between warehouse count verification, selection instructions and printing of labels.

Satellite technology enables communication across a wide geographic spread. It also provides faster and a high-volume channel for movement of information across the globe.

Image processing application depend heavily upon fax as well optical scanning technology for transmission as well as storage of freight bill information, as well as other documents of support such as proof of delivery receipts or bill of lading.

Substantial capital investment before obtaining returns is required for RF technology, satellite communication capability, as well as image processing. The major benefit for these communication technologies is an improved customer service.

**Bar Coding and Scanning:** Collection and exchange of information is very critical for logistical management as well as control. Earlier, manual collection and exchange were done which resulted in error and time consumption. Bar coding involves placing computer readable codes on items, cartons, containers, as well as railcars. A bar code system includes a bar code symbol, which represents a series of alphanumeric characters. Universal Product Code (UPC) is present on almost all consumer products. A standardized bar code reduces errors in receipt, handling or shipping a product. Two most significant developments in logistics are multidimensional as well as container codes. Multi – dimensional codes increase transfer of information as their design enables them to “stack” one bar codes on top of one another. Container codes enable manufacturers and distributors to provide container identification from point of production to point of sale.

**Radio Frequency Identification Device (RFID):** Radio frequency identification, or RFID refers to the technology that uses radio waves to automatically identify people or objects. An RFID system consists of a tag, which is made up of a microchip with an antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to receive these waves. A passive RFID tag draws power from field created by the reader and uses it to power the microchip’s circuits. The chip then modulates the waves that the tag sends back to the reader and the reader converts the new waves into digital data.

RFID is an evolutionary step in global supply chain integration. It makes it possible to synchronize the physical flow of goods and the related information flow without the need for human intervention from the point of origin to consumption.

**Principles of Logistics Information**

Six principles to be incorporated to ensure that management information needs are adequately met:

* **Accuracy** - The degree to which the Logistics Information System reports should match with the actual physical counts. The logistics information must accurately reflect both the current status as well as the periodic activity for measures such as customer orders as well as levels of inventory.
* **Availability** - Logistics information must be readily available when required. Enterprises usually have substantial data relating to logistics activities, but these are often paperbased or very difficult for retrieval from computer systems. It is necessary that these are available speedily to improve customer response and decision - making. The decentralization of logistics operations makes in necessary to access information from anywhere and update them, which the information system must enable to do.
* **Timeliness** – Refers to the time lapse between when an activity occurs and when the activity becomes visible in the information system. It is essential that timely information be provided for quicker management feedback. Corrective action can be taken and loss can be minimized with timely management controls. Thus, timely information reduces uncertainty and identifies problems, reduces inventory requirements and increases decision accuracy.
* **Exception-based Logistics Information System** – LIS needs to be exception-based in order to highlight problems and opportunities. The information system must identify exception situations, which require attention of management and decision-making. Managers can then focus on situations, which require maximum attention and offer opportunity to improve service or reduce cost. LIS need to be state of the art, highly exception-oriented and must utilize the system for identifying decisions requiring management attention.
* **Appropriate Format** – Logistics reports and screens need to contain the right information in the proper structure and must follow a logical sequence.
* **Flexibility** – LIS must be flexible to meet the requirements of both system users and customers. Tailored data to meet specific customer requirements must be made available by information systems. Within the organization, information systems must be capable of upgrading to meet future requirements of the enterprise without incurring huge costs or time.

**Fig 9: Principles of LIS** (Source: Sople, 2015)

**Logistics**

**Information**

**Systems**

Flexibility

Availability

Timeliness

Format

Exception

Based

Accurac

y

****

**Activity 8.1**

1. Explain the functions of LIS
2. Determine the building blocks of LIS
3. Examine data warehousing, mining and DSS
4. Explain LIS flows
5. Apply LIS
6. Explain principles of LIS

**8.7 Summary**

**summary**

A major factor for enhancement of logistics competitiveness is information. In fact, information is one of the few resources whose cost is declining and capabilities are on the rise. Improved information technology results in lower processing cost for orders, reduces the planning and operating uncertainty and also provides assistance to an enterprise in meeting strategic objectives. Logistics firms, which follow best practice, find that it is cheaper to manipulate information rather than moving inventory. Thus, competitive advantage can be achieved by information only when it provides support in transaction, helps in management control, decision analysis and also strategic planning capabilities.

# Unit 9 : Organization for Effective Logistics Performance

# Introduction

Welcome to the 9th unit of this module, sit back and relax as w look at organisation for effective logistics performance.

Outcomes

* 1. **Learning outcome**

By the end of this unit you should be able to;

* explain the significance of logistics in the organization.
* describe the organizational system or positioning.
* illustrate the stages of functional aggregation in the organization.

Time

**9.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**9.4 Content**

Organization structure helps in creating, implementing and evaluating plans. The organization structure gives concrete shape to the organization. Basically it is a pattern in which various parts or components are interrelated or interconnected. It prescribes the relationship among various positions and activities.

Logistics is generally viewed as a facilitating or support function prior to the 1950s. The organizational logistics responsibility is dispersed all through the firm. This resulted in duplication and waste, with fragmentation and aspects of logistics related activities were performed without any cross-functional co-ordination. The primary idea behind functional aggregation was done with a belief that grouping all functions of logistics into a single organization would increase the integration.

Basically, the organizational chart for a company represents a pyramid, which gives a clear view of how and where everyone fits and also the reporting relationships.

**Logistics significance is highlighted by the following concepts:**

**Structural Compression**: The role of the chief logistics executive is changing and this ignites the motivation for logistical structural compression. An environment with restricted head count as well as intensive control of assets has enabled the senior logistics manager to emerge as an important part of the firm’s continuous move towards gaining and maintaining customer loyalty.

**Centralization/Decentralization**: An enterprise is considered decentralized if their basis of function is autonomous. Every unit would be responsible for their own logistical planning as well as its execution. A centralized organization has the opposite policy. A central headquarters group directs logistical planning and execution. In today’s organization, which is information-intense, the distinction between centralization and decentralization is becoming hazy. Recent trends have seen a shift towards centralized organizations. But with the recent developments in distributed information processing, a centralized logistics organization is no longer required for efficient data processing. Logistical responsibility gets pushed down the organization, as a result. Basically, there is a direct relationship between the desired degree of centralization and the complete nature of business operations. Customers who desire a host of products sold by different business units of a conglomerate have encouraged many cross-divisional or various business units. The availability of information technology is considered a major benefit of decentralization.

To conclude, today’s organizations, which are agile simultaneously, enjoy both centralization and decentralization.

**Fig 10: Centralized and Decentralized Structures** (Source: Satish Kapoor, Purva Kansal, 2013)

Authority

Authority

Centralization

Decentralization

**Line and Staff Distinction**: Traditionally, line performed or executed day-to-day operations, while the staff was engaged in planning. Today this distinction is no longer relevant. Logistics managers in all levels are involving themselves in both planning and operations. Direct involvement and assumption of responsibility with regard to the reason and methodology of performing work is the key to a leading edge practice in logistics. One of the major reasons for the elimination of line/staff distinction is the impact of logistics information systems. A desired balance of the nature of work for line and staff needs to be communicated which results in an organization which reflects the total employee resources dedicated to serve customers through maximum integration.

In line organizations, logistics activities are centralized into departments and placed under the responsibility of a single manager. Activities are divided on the basis of importance to the achievement of the overall organization objectives. The manager is in the operational role. In a staff organization, functions are more of planning and measuring nature. There is not much requirement of reassignment of people. This type of structure can be implemented in a very short time. A drawback is the resistance from line personnel who refuse to follow the logistics manager and opts to follow their own views. An organization to have the best of both the structures needs to opt for staff and line function organizations. Providing a structure for logistics reduces the conflict among various activities of physical distribution. But this leads to an additional functional area within an organization and thus interfunctional conflict increases.

**Fig 11: Combination of Line and Staff Organizational Structure** (Source: Satish Kapoor,

Purva Kansal, 2013)

Physical Distribution Ma

nager

Distribution planning

and

control

Distribution

Engineering

Distribution

Operations

**Matrix to Horizontal Structure**: Under a functional structure, logistical activities like transportation and warehousing are grouped into clusters and authority and responsibility create a direct relationship. The matrix model of authority and responsibility has been gaining a lot of popularity in service organizations like consulting and public accounting. The matrix organization’s potential has gained a lot of interest as mangers are struggling with the challenges of process management. A technical resource group, which can be deployed geographically in order to satisfy line-unit requirements, is required by a matrix approach. This approach helps in sharing scarce assets and technical resources on a flexible basis. It also reduces the duplication of skilled personnel among business units. A horizontal organization is a modern extension of a matrix approach. While an organization is restructured, the key issue for the logistics managers is concerned as to how innovative he can make the new structure.

**Empowerment**: The main concept in empowerment is the availability as well as willingness of senior management to freely share the relevant information. Empowerment ranges from accommodating all requirements of an order on a single call basis to an on the spot resolution of discrepancies of delivery. An organization that is empowered allows middlelevel management to resolve problems as well as utilization of pro-active judgement. The response speed shows the extent to which an organization is empowered. From logistics point of view, empowerment makes it necessary for frontline managers to be positioned in order to complete all the aspects of their respective work. Empowerment, to be effective in an organization, requires fully established ways as well as means of gaining differential advantage.

**Teaming**: A self directed work team (SDWT) has originated from the idea that multiple viewpoints are better than the one which have a long standing in administrative practice. The SDWT is not structured typically for any specific assignment or problem solving. From logistics point of view, a special purpose work group can be formulated in order to facilitate the development of a new software application or for handling a unique requirement, like selecting a new location for distribution warehouse. A self-directed team is unique in the way its performance is planned and executed. The team members are empowered to perform whatever it takes so effectively as well as efficiently perform the designated work.

**Strategic and Operational structure:** Position of logistics in light of other enterprise functions. Logistics is considered as a strategic element of the overall organizational structure or an operational element. By this, its activities are spread under various other functions i.e., marketing, finance and production. If it is treated as a strategic element then various activities of logistics need to be grouped together. In the recent times, logistics has become a strategic department equivalent to marketing, production and finance as it helps in achieving interdepartmental objectives and also helps increase customer satisfaction.

**Stages of Functional Aggregation in an Organization**

**Stage I Organization**

During the late 1950s and 1960s an initial attempt at grouping logistical activities had emerged. Organizations with even minimal degree of formal unification have emerged only after the senior management has become committed to the belief that improved logistics is the result. Two or more logistics functions have emerged, which can be operationally grouped without changing the overall organizational hierarchy to a great extent. Such an aggregation initially has occurred both at the staff as well as line levels of the organization. During this initial development stage, organization units were rarely engaged in the purchasing and physical distribution integration.

**Fig 12: Stage 1 Organization** (Source: Bowersox & Closs, 2015)

CEO

Manufacturing

Finance

Marketing

Sub Functions

Sub Functions

Sub Functions

**Stage 2 Organization**

This stage of organization has begun to evolve with the overall enterprise gaining operational experience with logistics and cost benefits. The position of logistics has been elevated to that of a higher organization authority and responsibility. Positioning logistics at a higher organizational level has increased the likelihood of strategic impact. Logistics has been managed as a core competency due to the independent status given to logistics. The stage 2 organizations have been established as it was necessary to reassign functions and position newly created organization at a higher level within the overall enterprise structure. Though logistics has been given a lot of importance, the concept of a fully integrated system has not yet been achieved. An important factor for this is the lack of cross-functional logistics information systems. Another feature here is that the integrated physical and material management has begun to be accepted among the financial, manufacturing, and marketing counterparts.

**Fig 13: Stage 2 Organization (**Source: Bowersox & Closs, 2015)

CEO

Finance

Marketing

Physical

Distribution

Manufacturing

Su

b

Functions

Sub

Functions

Sub

Functions

Sub

Functions

**Stage 3 Organization**

Emerged in the 1980s with the beginning of logistical renaissance. Grouping many logistical planning and operational functions under a single authority and responsibility is the feature of this organization.

Every area of logistics-purchasing, manufacture and physical distribution is given the structure of a separate line operation. Operational responsibilities are well defined and thus it is possible to establish manufacturing support as a unit of operation similar to the purchasing and physical distribution.

Logistical resource planning covers the full potential of management information to plan and co-ordinate operations. Logistical resource planning facilitates integration.

Overall planning and controllership exist at the highest level of the organization. This organization serves as a single source for guiding the efficient application of financial and human resources right from sourcing of materials to customer delivery.

**Fig 14: Stage 3 Organization (Source: Bowersox & Closs, 2015)**

Head Logistics

CEO

Logistical Resource

Planning

Logistical

Support

Sub Functions

Sub Functions

Logistical Operations

such as purchasing,

Manufacturing

support

**Stage 4 Organization: A shift in the focus from function to process**

A conventional organization had a vertical design. There were functions with clearly identified tasks and within these functions there is a formal hierarchy that employees need to progress. This approach had a shortcoming in the sense that it is inwardly focused and the primary concentration is on the utilization of resources more than creating the outputs.

Measuring the outputs of any business can be done only if these can be in terms of customer satisfaction achieved at a profit. These outputs can be realized only when there is co-ordination and co-operation horizontally across the organization. The materials and information flows, which connect the customers with business and suppliers, have horizontal linkages, which mirror these. These are basically the core processes of the business.

There are many challenges in managing logistics as a process. Efforts need to be focused only on those activities, which contribute to customer value. Systems integration is required to stimulate synergism. A shift from functional to process orientation, has both positive and negative aspects. Positive aspects include general adoption of a process orientation builds on the basic principles of integration. Shifting the emphasis from function to process means it will be positioned as a chief contributor to all initiatives, which will focus on development of new products, customer order generation, fulfillment and delivery. The negative aspect is a lesser understanding of how the process will be performed and managed.

**Stage 5 Organization beyond Structure: Virutality and organizational transparency – Extended enterprise.**

An extended enterprise is a boundaryless organization where the internal functional barriers are eroded favoring a horizontal process management. There is very little separation between vendors, distributors, customers and the firm. A virtual organization exists without a formal recognition. Basically it consists of an informal electronic network replacing the formal hierarchical command and control in the structure. Key work teams may be linked electronically for performing critical activities in an integrated fashion. Formal organizational charts may not relate to the actual workflow.

**Fig 15: Extended enterprise and virtual supply chain** (Source: A.T.Kearney as quoted by Martin Christopher, 2015)

Sources

Converters

Retailers

Suppliers

Distributors

Consumer

Product and service flow

Information flow

Funds Flow

It is essential for the structure and strategy to be aligned for achieving the business objective of superior customer service at lowest cost. A three-level framework can be adopted for achieving this integration for a enabling a transition to a customer-oriented organization:

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**Activity 9.1**

1. Explain the significance of logistics in the organization.
2. Describe the organizational system or positioning.
3. Illustrate the stages of functional aggregation in the organization.

**summary**

**9.5 Summary**

The revolution in information is making logistics managers reconsider the traditional organizational logic. The idea of middle managers serving as guardians of information has been replaced with a frontline workforce having access to the entire information. A continuous redesign and re-engineering of the basic nature of work has made hierarchical organizations modified to accommodate networking of information and self-directed work teams.

# Unit 10: integrated logistics

# 10.1 Introduction

Welcome to the 10th unit of this module and congratulation for reaching this far. This time around we turn the leaf and look at the most exciting topic; integrated logistics.

**Outcomes**

**10.2 Learning Outcome**

By the end of this Unit you should be able to;

* interpret the imperatives for successful integrated logistics.
* explain need for integration.
* illustrate activity centers.
* describe barriers to internal integration.
* determine the hierarchy of logistics integration.
* discuss complete systems perspective.

Time

**10.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**10.4 Content**

Logistics links an enterprise with its customers and suppliers. Information flows through the enterprise from and to customers in the form of sales activity, forecasts and orders. Such information is refined into specific manufacturing and purchasing plans. A value-added flow of inventory is initiated as products and materials are procured. This ultimately results in transfer of ownership of finished products to customers.

Supply chain integration focuses on defining key linkages across functional areas both within and among companies partnering along a supply chain. Integrated logistics is a process-oriented integrated approach to procure, produce, and deliver products and services to customers.

Fig 6: Logistics Management

Inbound logistics

Warehousing&

Inventory

Logistics

Management

Outbound Logistics

Information

Management

Customer relationship

**The following are the imperatives for successful integrated logistics:**

* New Culture: Enabling employees to adapt to the new operating realities in cross-supply chain collaboration are a key component of integrated logistics. Core capability teams, which consist of professionals, must be focused on key integrated logistics activities, which synchronize activities across the entire supply chain. Senior executives entrusted with the task of integration and synchronization has to articulate the strategy for a new cross supply chain culture, which will be shared by all partners.
* Agreements on cost-sharing and revenue-sharing: Building a benefit structure balancing rewards with each partner’s understanding of their contribution is important for maintaining close partnering relationships. A generally agreed upon framework for equitable revenue and cost sharing amongst all participants is necessary. Analyzing the supply chain economics examines the role and costs of each of the different participants of the supply chain. Detailed practices and performance metrics will help in understanding the participant’s competitive advantage.
* Establish Transparency: Establishing of an integrated logistics system is challenged by participants’ unwillingness to forgo any degree of control, which is a symptom of lack of trust. This lack of trust will hinder acceptance of integrated logistics while lack of standard communication and business processes will hinder implementation.

**Need for Integration**

A significant feature of a responsive organization is the priority the organization attaches for integration. Not only integration within the organization but also integration upstream with suppliers and downstream with distributors and customers is important. There is also a lot of emphasis on linking organizations through information. Information systems nowadays drive companies to reconsider their relationships with customers and suppliers. Process integration is achieved through logistics integration, which means both upstream and downstream integration. The objective in an extended enterprise is creation of an ‘end-toend’ process so that innovative products are created and delivered at higher levels of quality and in lesser time frame to markets. This is achieved through the following means:

Rationalization of supply base: Companies try to rationalize their supply base by reducing the number of suppliers. In fact, companies are looking at these suppliers to provide systems rather than components. Companies are basically trying to rationalize their supply base. For example: the automotive sector is trying to integrate tier 1, tier 2 and tier 3 suppliers.

Centralized inventory: The extended enterprise not only includes upstream suppliers but also the downstream flow of finished products through dealer networks. Traditionally, when dealers did not have the product demanded by customers, they used to swap this with another dealer who had that product variety in stock. Today, enterprises have centralized inventory and also take responsibility for its management. The dealers have only demonstration models; they have on-line access of the enterprise supply system and can give the customer an immediate confirmation about the availability of the product of their choice and when it can be delivered. For those products not available from stock, dealers enter order directly into the production schedule and the product required is made to order.

Integrated Information Systems: The benefits of a fully transparent information system are being considered with the use of Electronic Data Interchange (EDI) together with the growing acceptance of ‘just-in-time’ philosophy. Suppliers can now manage the flow of materials into the plant on the basis of advance notification of a company’s production schedule. With integrated information systems, there are no manual orders, invoices or delivery notes. A single source of information provides the basis for a timely physical response, which automatically triggers payment to the supplier.

Supplier Development Programmes: Supplier development has replaced the traditional purchasing function. A cross functional team of specialists work closely with suppliers and seek improvements in supplier processes as well as in the interfaces with the enterprise’s processes.

Supplier involvement: Innovations in industries are supplier originated. By bringing suppliers closer to the process of new development, it has been found that innovation can be embodied in new products continually and simpler cost effective designs can be created.

**Activity Centers in integrated logistics**

Refers to the activities that make up business logistics. These are studied in the following two categories:

**Key Activity centers**: These are the activities forming the core of logistics function and also take place in every logistics channel. These are as follows:

Customer Service Standards: The customer has become more and more demanding in overall performance terms. The manufacturer needs to create a competitive advantage on the basis of customer-service. Co-operating with marketing to determine customer needs and wants determine the customer response to service and set customer levels.

Transportation: This is one of the most expensive activity centers in logistics. It is concerned with movement of raw materials to the plant and semi-finished goods or finished goods to the market. Any problems in the transportation service can result in the company holding inventory for more days than planned for. An efficient transportation planning and management is a pre-requisite function of logistics.

Inventory Management: The operational aspects of logistical management are concerned with movement and storage of materials and finished goods. Logistics operations start with the initial shipment of material from a supplier and finalized when a manufactured or processed product is delivered to a final customer. As material gains value at every step of its conversion into finished inventory, work-in-progress inventory needs to be moved to support final assembly for supporting manufacturing. A meaningful value-addition is done only when the final ownership is transferred to customers wherever specified. For better understanding of the inventory it is divided into the following three areas:

* Physical Distribution: Concerns with movement of a finished product to customers. Here, customer is the final destination of a marketing channel. Availability of a product is a key part in the marketing efforts of every participant. A major part of the overall marketing effort will be lost unless a proper assortment of products is delivered efficiently wherever needed. Time and space of the customer service becomes an integral part of marketing through the process of physical distribution. The common feature of all physical distribution systems is that they link manufacturers, wholesalers, and retailers into marketing channels that provide product availability as a key aspect of the overall marketing process.
* Manufacturing Support: This area focuses on managing work-in-progress inventory as it flows between various stages of manufacturing. The overall concern of manufacturing support is the method by which production occurs. Manufacturing support is different when compared to physical distribution. Physical distribution attempts servicing the desires of customers and thus needs to accommodate uncertainty of consumer and industrial demand. Manufacturing support involves movement requirements under the control of the manufacturing organization.
* Procurement: This area focuses on with purchasing and arranging the inbound movement of materials, parts or finished goods from suppliers to assembly plants or retail stores. It involves availability of the desired material wherever needed.

All the above three areas of inventory flow in logistics overlap in a typical enterprise. Looking at each as an integral part of the overall value-adding process gives an opportunity for capitalizing on the unique attributes of everything while facilitating the overall process. A major concern area for integrated logistics is co-ordination of overall value added movement. All these three areas combine to provide an integrated management of materials, work-in-progress and finished products moving between various locations.

Information Flow and Order Processing: Completing activities of the order cycle are very important in customer service. A lot of management attention is being given to activities involved in processing orders. An effective order processing system should have an effective order status reporting system also.

**Support Activity Centers**: These are the activity centers necessary for achieving synergy in key activity centers. This category includes:

Warehousing: Storing goods that are waiting for sale. This function is necessary as there is rarely a match between production and consumption. Organizations choose between warehouses and distribution centers. Distribution centers are larger, automated warehouses designed to receive goods from various plants and suppliers.

Material Handling: Efficient material handling methods in warehouses can improve customer satisfaction by decreasing the damage in handling, maintaining the quality of storage, facilitating order processing and moving the right goods at the right time to make them available to the right customers. Costs are also reduced through proper material handling techniques.

Information: Information collection, storage and handling are necessary for achieving higher customer service. Information enables reducing the gap between actual and benchmark and also assists in strategy formulation – a key activity in logistics.

Packaging: Packaging protects the goods and acts as a source of information for customers. It is also used as a marketing tool to attract customers. The concept of packaging has paved way to ‘Unitization’, where various package are handled together as one unit. Example: Palletization.

**Fig 7: Logistics Integration** (Source: Bowersox & Closs, 2015)

**Physical**

**Distribution**

**Manufacturing**

**Support**

**Procurement**

**Suppliers**

**Customers**

(Source: Bowersox & Closs, 2015)

**Barriers to Internal Integration**

Implementing internal logistics integration is not possible in a vacuum. There are certain barriers to integration, which are as follows:

**Organization Structure**: The traditional organization structure prevents implementation of any cross-functional process being implemented. Traditional structure is to divide authority and responsibility according to functional work. Organizations are generally concerned with achievement of functional excellence and this structure can hinder success of the goal of integration – which is co-operation among functional areas. Also, managers are usually rewarded for achieving functional excellence. Successful integration of logistics process requires managers to look beyond their organizational structure and facilitate crossfunctional co-ordination. This may not be possible by creating a new organization structure. Thus, regardless of whether organizational structure is realigned or not, organizations dealing with cross-functional matters are required for successful integration of processes.

**Ownership of Inventory**: Inventory can facilitate a specific function to achieve its mission. A traditional approach to ownership of inventory is to maintain adequate supply for gaining ease against demand and operational uncertainty. Availability of inventory also results in economy of scale. While such practices create benefits, they also have a related cost. The critical issue is cost-benefit relationship.

**Measurement systems**: Traditional measurement systems make cross-functional coordination difficult. A new scorecard needs to be developed for facilitating integration of logistics functions. The measurement system must facilitate logistics managers to view their specific functions as part of a process and not just stand-alone activities.

**Transfer of knowledge**: Ability to share experience is an additional barrier. Failure to transfer information or knowledge tends to nurture functional orientation by development of specialized employees. Many firms also fail to develop procedures and systems to transfer cross-functional knowledge. When work is done in a series of processes and involves many employees, transfer of this type of knowledge and experience is difficult.

**Information Technology**: IT acts as a key resource to achieve integration. IT applications need to be designed along organizational lines. Databases are mostly limited to specific functions are not easily accessed on a cross-functional basis. Data warehouses have emerged due to the need to share information. Schemes to transfer information are required to be developed as existing applications can serve as a barrier to process integration as critical data cannot be shared readily.

**Hierarchy of logistics integration**:

* Competencies: For long-term survival, a wide variety of competencies are required. A firm will excel in a few of these, which are referred to as core competencies.
* Performance Cycle: A structure integrating all aspects of logistical operations linking procurement, manufacturing, support and physical distribution.
* Function: These are traditional areas of logistics specialization, which are essential for operational excellence. They need to be viewed as integral parts of the overall logistical competency and not as unique areas of performance.
* Sub functions: Specific jobs within functions, which need to be performed within functions for satisfying logistical requirements.

**Complete Systems Perspective for Logistics**

This concept is a cost-service integration, backed by an integrated logistics network, which is aimed at minimizing the total cost of distribution at a given level of customer service. The main components are as follows:

Perspective of total cost: The cost of logistics includes various logistics activities such as cost of planning and managing range of logistics activities such as transportation, finished goods distribution, receipt, inspection and storage of goods etc. All functions necessary for converting inventories and satisfying customers have a cost. An individual cost control perspective should be avoided and the overall cost of all logistics elements need to be considered simultaneously. This is referred to as tackling the cost of logistics as a whole, while trying to tackle the primary function of logistics system i.e. to perform the function assigned to the system in a most cost effective manner. In fact, the total cost perspective is an important component of logistics.

System Perspective: This concept is an extension of the logistics concept and is a key for managing logistics function. This total system perspective of logistics is time consuming but results in reduction of inefficient logistics systems as a whole. The total system of logistics also has a number of sub-systems such as transportation, warehousing, inventory management etc. A number of techniques and objectives that are stated beforehand have been designed so that each of these activities is conducted in an optimal manner. A proper balance between these activity centers is necessary to reduce the total cost of logistics.

Trade-offs: This refers to the evaluation of the cost of each system component with the objective of determining a combination of components providing a minimum total cost for a specified level of customer service. Trade-off takes place when management incurs cost in a particular activity center as part of the strategy to achieve benefits from another activity center.

Intra- activity trade-off occurs when trade-offs occur within an individual activity of the logistics system. An example can be a decision to use one’s own transportation instead of a public transportation.

Inter-activity trade-off occurs between various activities of logistics system. Management prepares itself to bear the increased cost of one activity center so as to get the profits from another. For example, using airfreight can increase transportation cost but would result in a reduced inventory and warehousing cost.

Inter-functional trade-off occurs between the logistics system and other functional areas of the firm. A trade-off is made between various functions. For example, the packaging structure for a company was changed from conventional vacuum packs to a different shape to suit the structure of the product.

Inter-organizational trade-off is a category between manufacturer and other organizations involved in creating utilities for the manufacturer. The manufacturer has to be concerned with the members of the distribution channel and should try maintaining relations with these members.

**Managing the supply chain as a network**

The firm is at the center of an inter-dependant network that competes as an integrated supply chain against the other supply chains. Managing such a competitive structure requires various skills and priorities. A focus on the network management as well as upon internal processes is necessary to achieve market leadership. The following are the most significant issues in such an environment:

* Collective development of strategy: In the traditional view, members of a supply chain never considered themselves as part of a marketing network and so never shared their strategic thinking with each other. A higher level of joint strategy development is required for network competition to be truly effective. Network members must collectively agree to strategic goals for the network and the means of attaining them.
* Open communication: The advent of information technology is making the exchange of information between supply chain partners very easy and this has been one of the most powerful drivers of change in the marketing networks.
* Benefits for partners: There is a growing realization between network partners for cooperation that usually leads to improved performance. Another issue is how the results of that improved performance can be shared amongst the various players. All partners must benefit and be better off due to co-operation.



**10.1 Activity**

1. Interpret the imperatives for successful integrated logistics.
2. Explain need for integration.
3. Illustrate activity centers.
4. Describe barriers to internal integration.
5. Determine the hierarchy of logistics integration.
6. Discuss complete systems perspective.

**summary**

**10.5 Summary**

A key to logistics integration is the transparent flow of information from one end of the chain to the other. Supply chain partners are able to respond more rapidly to known demand with lesser inventory and hence lower cost by sharing information. A responsive supply chain is highly integrated. They integrate internally across functions and externally integrate with suppliers and downstream customers. A lot of companies are attempting to become more agile and responsive due to an encroached functional structure. They have a fragmented approach to the marketplace and thus manage functions rather than processes. It is also difficult for firms like these to reflect external integration when they lack internal integration. Companies that have got over this are now looking to design close linkages with their supply chain partners.

# Unit 11: Role of 3PL & 4PL

# 11.1 Introduction

Welcome to the last unit of this module, what a relief right? But interesting. Let us now look at the roles of 3PL & 4PL

**Outcomes**

**11.2 Learning Outcome**

* explain first party logistics.
* explain second party logistics.
* discuss third party logistics: functions, advantages, essential characteristics.
* discuss fourth party logistics: features, advantages
* determine selection of a service provider.
* explain key trends in logistics outsourcing.

Time

**11.3 Time Frame**:

You will cover the following time;

* 2 hour 30 minutes’ study time
* 2 hours in class

**11.4 Content**

Logistics involves getting the right goods to right place at the right time at the right cost in the right condition. To survive in today’s highly competitive markets, companies are focusing on their core competencies to adopt outsourcing as a strategic solution to improve quality of service and also reduce cost of key and non-core activities. An accepted trend today is to form a collaborative relationship with logistics service providers on the basis of the backbone of information technology, for integrating knowledge based supply chain.

Business organizations across the world are struggling for competitiveness for both growth and survival. Customers are demanding more and more value-added services from prospective suppliers for the amount spent. Business organizations have started reviewing business processes and realized that cost cutting and differentiating in value delivery systems is essential. Focusing on core business areas can be done through outsourcing non-core operations to experts in the field.

Logistics operations are an area of specialized function and a majority of marketing and manufacturing organizations do not have the requisite expertise in housed. Thus, there is a requirement for outsourcing operations to experts in the field. It has become an accepted practice to use strategic partnerships that are known as ‘third party service providers’ in integrated logistics.

Most companies consider using the services of a 3PL in their supply chain operations when they realize that it is essential in providing efficient and effective competitive customer service which requires huge investment and is difficult to develop on their own.

**Outsourcing has the following advantages:**

1. Focus on core competencies

* Management is freed from repetitive/mundane tasks, reduces investment and generates cash.
* Organization can concentrate on core competencies.

1. Organizations can adopt “best-in –class” practices.

* Vendors have considerable strength and focus on outsourced processes. To remain competitive, they are continuously looking to improvise their services and adopt best practices to make them more efficient.
* This helps organizations achieve faster, efficient, effective and more economical business process.

3.Organizations become more competitive

* Can respond more effectively to changing demands.
* Allows companies to gain more scalability.
* Outsourced activities allow companies to have greater leverage in responding to changes and to gain market access, expand.

4.Reduced cost and advanced technologies

* Vendors often implement latest technologies to make their processes and services. Companies can take advantage of these technologies, which they might not be always able to do if they were conducting activity in-house.
* Vendor’s economies of scale helps drive down overall cost in the system, thus enabling companies to realize more productivity and efficiency.

**Fig 8:Difference between various logistics service providers**

Managing the entire

supply chain

Managing complex

Supply chains

Traditional transportation

and warehousing function

Own operating of

logistics by producer

4

PL

3

PL

2

PL

1

PL

(Source: Bowersox & Closs, 2015)

**First Party Logistics**

First Party Logistics are companies, which do their own logistics activities.

**Second Party Logistics**

Second party logistics people provide their own assets such as truck owners, warehouse operators etc.

**Third Party Logistics**

Third party Logistics Provider (3PL) performs logistics services on behalf of another company. 3PLs provide the management skills along with the physical assets, labor, and systems technology to provide professional logistics services, relieving companies of the responsibility of performing these services themselves. 3PL's typically can provide transportation, warehousing, pool distribution, management consulting, logistics optimization, freight forwarding, transportation management, rate negotiations, cost evaluations, and contract management services.

3PL is the function by which the owner of goods outsource various elements of the supply chain to one 3PL company that can perform the management function of the clients inbound freight, customs, warehousing, order fulfillment, distribution, and outbound freight to the clients customers. 3PL is a service provider who gives service for one or more portfolios of services in stand alone or integrated manner with own or leased or contracted assets or services.

A 3PL can also be described as a contract logistics service provider who manage inventory/material flow between companies and encompasses all processes and activities such as transportation, warehousing, documentation.

Common 3 PL functions are as follows:

1. Transportation Management

* 3PLs fleet (or alliance partners) offer optimized network to serve their customers.
* 3PLs plan load management, routing, equipment and driver management by Shipment Management System (SMS).
* SMS can be effectively integrated with Warehouse Management Software (WMS), to provide integrated logistics solutions concepts such as multi-stop workload or less than truckload which are often used to serve customers better.
* Multi-vendor consolidation reduces overall costs. Full truckload economies can be used to combine freight from different vendor to common destinations.

1. Warehouse management

* 3PLs run and manage warehouses using Warehouse Management Systems, radio frequency scanning, and bar code labeling
* 3PLs manage and track the movement of goods from initial receipt to outbound shipment. Real time, periodic and accurate information can be provided to manage inventory and demand better.
* Additional services such as advanced shipment notifications can be generated to inform the retail partners in the supply chain.

Packaging

* 3PLs often have ability to do final product packaging in their warehouse, thus eliminating the need to ship product to off site packaging companies. This in turn means reduced product handling, reduced cycle time and reduced costs.
* 3PLs can offer variety of packaging services like custom pallets, display shippers, inserts and coupons, labeling and printing, repackaging / conversion and also wrapping and bundling.

Advantages to companies by using 3PL services:

* Focus on core competencies: Outsourcing enables companies to focus on the core businesses and strengths. The companies limited resources can be saved and the company can remain focused on what it can do best.
* Lower Investment: Organizations can outsource and save a large amount required for building logistics assets, networks and facilities such as warehouses. As an alternative for these investments, the companies can outsource these requirements by outsourcing and investing in their core processes.
* Enhanced technological capabilities and flexibility: Utilization of technological capabilities has enhanced the efficiency of logistics operations. But, it may not be feasible always for companies to invest in newer systems or upgrade their existing systems. However, deploying third party logistics providers can insure against such technological changes. 3 PL often invest in such technologies for providing competitive services.
* Best practices: Outsourcing logistics to third party logistics enables companies to implement best practices and also allows organizations to achieve best performance.

Essential characteristics of a 3 PL

* Solutions Orientation
* Logistics Know-how
* IT Capability
* Management and organizational Skill
* Innovativeness
* Independent and best of breed approach

**Fourth Party Logistics**

Information technology plays a key role in logistics and supply chain management. In fact logistics integration, which is a complex exercise, is completely dependent on IT support. Third party logistic suppliers provide logistics solutions to clients on the basis of their domain knowledge they have acquired over the years. 4 PL companies provide logistics solutions built around the domain knowledge provided by third party logistics companies. Thus 4 PLs have emerged out of the vacuum created by 3PLs.

Fourth Party Logistics (4PL) is the integration of all companies involved along the supply chain. 4PL is the planning, steering and controlling of all logistic procedures (for example flow of information, material and capital) by one service provider with long-term strategic objectives. Fourth-party logistics (4PL) has evolved as a breakthrough supply chain solution comprehensively integrating the competencies of third party logistics (3PL) providers, leading edge consulting firms and technology providers.

4 PLs see the process and what is required for the process to succeed. A 4PL is a supply chain manager & enabler who assemblies and manages resources, build capabilities and technology with those of complimentary service providers. They act as the first point for delivering unique and comprehensive supply chain solutions. 4PL leverages combined capabilities of management consulting and 3PLs. They act as an integrator assembling the resources, capabilities, and technology of their own organization and other organizations to design, build and run comprehensive supply chain solutions. 4 PL is an emerging trend and it is a complex model and offers greater benefits in terms of economies of scale.

**Features of a 4 PL:**

* Covers the customer’s entire supply chain
* Collaboration between two or more logistics service providers on a resource-sharing basis for extending logistics solutions to a common customer.
* Flexible arrangements

**The following are the requirements of a 4 PL:**

* 3PL cost advantage are one time achieved through the contract process
* Performance and competency across the logistics network
* Logistics planning and consulting
* IT support
* Operative and administrative logistics functions
* Customer Relationship Management
* Linking analytical capabilities with strong implementation and operational capabilities
* Building a high level of customer confidence in outsourcing and its solutions
* Offering transparent and flexible win-win contracts

**Advantages to companies using 4PL services: -**

* Reduced inventory and cycle time.
* Improved delivery performance.
* Lower supply chain cost.
* Improved order fulfillment, capacity utilization.
* Overall productivity.

**4 PL attempts to do the following to create value by:**

* Reduction of complexity/eliminate redundancy.
* Economics of scale
* Tailor made solutions
* Improved customer service at reduced cost.
* Access to new technology.

**Selection of a Service Provider**

Selection of a service provider is a strategic one and has long-term effects upon the customer service capabilities of an organization.

Major issues to be considered before deciding on a 3PL or 4PL partner:

* **Switching cost**: Outsourcing logistics services results in reorganizing the existing assets of a company in tuning with the working methodology of the service provider. It includes activities such as management of existing assets, fully or partly to the service provider, deploying existing assets on lease to service provider and divesting existing assets and completely switching over to the usage of a logistics infrastructure by the service provider. A high degree of risk is involved in each of the activities. Though outsourcing reduces cost substantially, switching over to other service providers in terms of poor customer service during the period of transition and stabilizing new system will cause more loss.
* **Degree of control**: The firm, which is outsourcing needs to be particular about the degree of control over activities of the service provider, for getting the desired service by the end user. It is not possible to have direct control over the activities of the service provider but the service provider should ensure timely availability of information to monitor activities.
* **Degree of outsourcing**: The following factors influence an organization’s logistics outsourcing in part or in total:
  + Existing logistics infrastructure of the company
  + Policy of management for third party involvement
  + Anticipated benefits
  + Product portfolio of the company
* The areas of responsibility and authority both at the outsourcer’s and service provider’s end must be clearly differentiated.
* **Channelizing logistics services to suit the needs of channel partners:** Logistics service standards are to be quantified as per requirements of channel members who service the end users or consumers in turn. Logistics acts as a key enabler for efficient channel management. Channel and logistics management must go together for effective and efficient physical distribution system.
* **Interface:** Suitable co-ordination through an intelligent interface is necessary for proper working of two organizations together in partnership. A match of cultures is essential. Proper interface between employees of both organizations is very important for formulating policies and guidelines for smooth operations of the outsourcing firm and service provider. Mismatch in technologies used at the two ends may result in problems too. Differences in technologies used in communication, material handling, storage, inventory management may cause delays and errors resulting in performance below the expected level.

**Key Trends in Logistics Outsourcing**

## The following are some of the important observations from logistics outsourcing

1. **Adoption of Internet, ERP, SCP and SCE technologies continues to accelerate**

* Many ERP systems are used for financials, payroll and HR, but not for core operations.
* Most ERP systems lack logistics service provider-specific functionality forcing the use of customised solutions.
* Need to increase intelligence and productivity of ERP by adding Internet communication technology, Supply Chain Planning and Supply Chain Execution components
* ROI from these technologies is often unclear.

1. **Global visibility has now become a basic requirement**

* Customers desiring to decrease transport costs, increase delivery reliability and crossdocking activity, and shorten cycle times are demanding end-to-end visibility of goods. For example: Shippers not only want to be able to track their goods via the Internet but also to receive automatic notification when a shipment is deviating from its schedule.
* Logistics service providers need to build or buy Inventory Visibility in the Supply Chain to meet this requirement.

**Most carriers and 3PLs in Zambia are unprepared to move from a transaction-based customer relationship to strategic supply chain partnerships with customers.**

* Shippers expect their logistics providers to help them improve supply chain processes and increase revenues.
* Customers will succeed via mass customisation and Web commerce initiatives. Logistics suppliers need to respond to such initiatives.
* SCM IT tools will help in facilitating of cross-docking, delayed allocation, in-transit merge, postponed assembly and other value-added services, increasing their customers' supply chain agility and velocity.
* Innovators will use IT to move beyond tactical logistics to influence product and procurement strategies.

1. **Ability of matching market Demand with available Supply**

* Leveraging suppliers’ distribution systems and collaborating closely with them to ensure seamless information flow across the supply chain.
* Using tactical initiatives such as sales promotions and pricing changes to shift demand towards in-stock products and accessories.
* Usage of scientific tools for better demand forecasting.

1. **Outsourcing of non-core activities**

* Increasing number of organisations are now outsourcing their non-core activities to specialist logistics service providers for whom it’s their core business.
* Past cost centres have now become present profit centres and the focus has turned to innovation and continuous improvement.

**Fig 9: A holistic view of 3 PL and 4 PL**

Business Process Management

3

PL Providers

IT Service Providers

4

PL

Client

Client

Cli

ent

-

Greater Functional Integration

-

Broader Operational Autonomy

Client

3

PL Service Providers

(Source: Bowersox & Closs, 2015)

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**Activity 11.1**

1. Explain first party logistics.
2. Explain second party logistics.
3. Discuss third party logistics: functions, advantages, essential characteristics.
4. Discuss fourth party logistics: features, advantages
5. Determine selection of a service provider.
6. Explain key trends in logistics outsourcing

summary

**10.6 Summary**

Third party logistics service providers have the core competency in a particular area of logistics such as warehousing, transportation, inventory management etc who provide comprehensive logistics service solutions for the entire supply chain. A new and emerging trend in outsourcing is the Fourth Party Logistics who assembles and manages the resources, capabilities and technology of its own organization with those of complimentary service providers to deliver a comprehensive supply chain solution. A management’s decision to outsource can be justified by its value proposition or the benefits. By outsourcing, the company gains on many fronts such as cost reduction, higher return on investments, utilization of manpower for more productive work and a clearer focus on core competency area.

**References**

1. Bowersox And Closs (2015) Logistical Management, The Integrated Supply Chain Process, Tata Mcgraw Hill, New York.
2. Bowersox, Closs, Cooper, (2017) Supply Chain Logistics Management. 2nd Edition.
3. Burt, Dobler, Starling, (2013) “World Class Supply Management, The Key To Supply Chain Management”, Tata Mcgraw Hill, New York.
4. Edward Frazelle (2014) “Supply Chain Strategy, The Logistics Of Supply Chain Management”, Tata Mcgraw-Hill.
5. Lysons And Farrington (2006) *Purchasing And Supply Chain Management* 7th Edition: Ft/Prentice Hall.
6. Martin Christopher,(2014) “Logistics And Supply Chain Management, Strategies For Reducing Cost And Improving Service”, Pearson, New Delhi.
7. Mohanty And Deshmukh (2015) Supply Chain Management, Theories & Practices, Biztantra,New Delhi.
8. Purchasing And Supply Chain Management, Kenneth Lysons And Brian Farrington. Seventh Edition Or Eighth Edition.
9. Purchasing. An Integrated Supply Chain Approach, Monczka. Trent. Handfield
10. Robert B. Handfield, Ernest L. Nichols, J( 2013)., “Supply Chain Redesign, Transforming Supply Chains Into Integrated Value Systems”, Pearson, New Delhi.
11. Tilanus (1997) Information Systems In Logistics And Transportation, Emerald Group.