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DIRECTORATE OF DISTANCE EDUCATION

International Logistics Management

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MBA - INTERNATIONAL BUSINESS

IV - Semester

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Paper – XIX

International Logistics Management

Unit - I

Marketing Logistics: Concept, objectives and scope; System elements; Relevance of logistics in international marketing; International supply chain management and logistics; Transportation activity – internal transportation, inter-state goods movement; Factors influencing Distribution Logistics.

Unit - II

Transportation: Containerization; CFS and inland container depots; Dry ports; Road-Multi-modal transportation and CONCOR; Role of intermediaries including freight booking, shipping agents, C&F agents.

Unit - III

General Structure of Shipping: Characteristics- Types of shipping- liner and tramp operations; Conference Chartering operation- Freight structure and practices; Chartering principles and practices; UN convention on shipping information- Documents for shipping of goods.

Unit - IV

Air Transport: Air transportation –total cost concept, advantages, freight structure and operations; Carrier consignee liabilities- Cargo handling- Information Support System.

Unit - V

Inventory Control and Warehousing: Inventory management – concepts and application to international marketing; Significance and types of warehousing facilities; Total cost approach to logistics.

References

1. **Asopa**, V.N SHIPPING MANAGEMENT CASES AND CONCEPTS, *Macmillan, New Delhi*.
2. **Desai**, H.P INDIAN SHIPPING PERSPECTIVES, *Anupam Publications, Delhi,*
3. **Khanna**, K.K. PHYSICAL DISTRIBUTION, *Himalaya Publishing, Delhi.*
4. **Lambert**, D et al STRATEGIC LOGISTIC MANAGEMENT, *Tata McGraw Hill, New Delhi*.
5. SHIPPING DOCUMENTS AND REPORTS, *UNCTAD*

UNIT – I

Marketing Logistics

Unit Structure

Lesson 1.1 - Introduction to Marketing Logistics
Lesson 1.2 - Relevance of Logistics in International Marketing
Lesson 1.3 - Transportation Activities
Lesson 1.4 - Factors influencing Distribution and Logistics

Lesson 1.1 - Introduction to Marketing Logistics

Learning Objectives

After reading this chapter you should be able to

- Define 'Logistics' and Associated terms
- Understand the concept of logistics
- List different activities of logistics and understand the relationship between them
- Key logistics objectives
- System elements of logistics
- Recognize the Significance of logistics

Introduction

In recent years there has been a growing recognition that the process whereby one has to fulfill customer demands through their organizational offerings. These processes are means by which product are developed, manufactured and delivered to customers

and through which the continuing service needs of those customers are met. The logistics concept is the thread that connects these crucial processes and provides the basis for the design of system that will cost-effectively deliver value to customers.

Accompanying this recognition of the importance of process has been fundamental shift in the focus of the business towards the marketplace and away from the more inwardly oriented production and sales mentality that previously dominated most industries.

This in orientation has necessitated a review of the means by which customer demand is satisfied hence, the dramatic upsurge of interest in logistics as a core business activity.

Concept

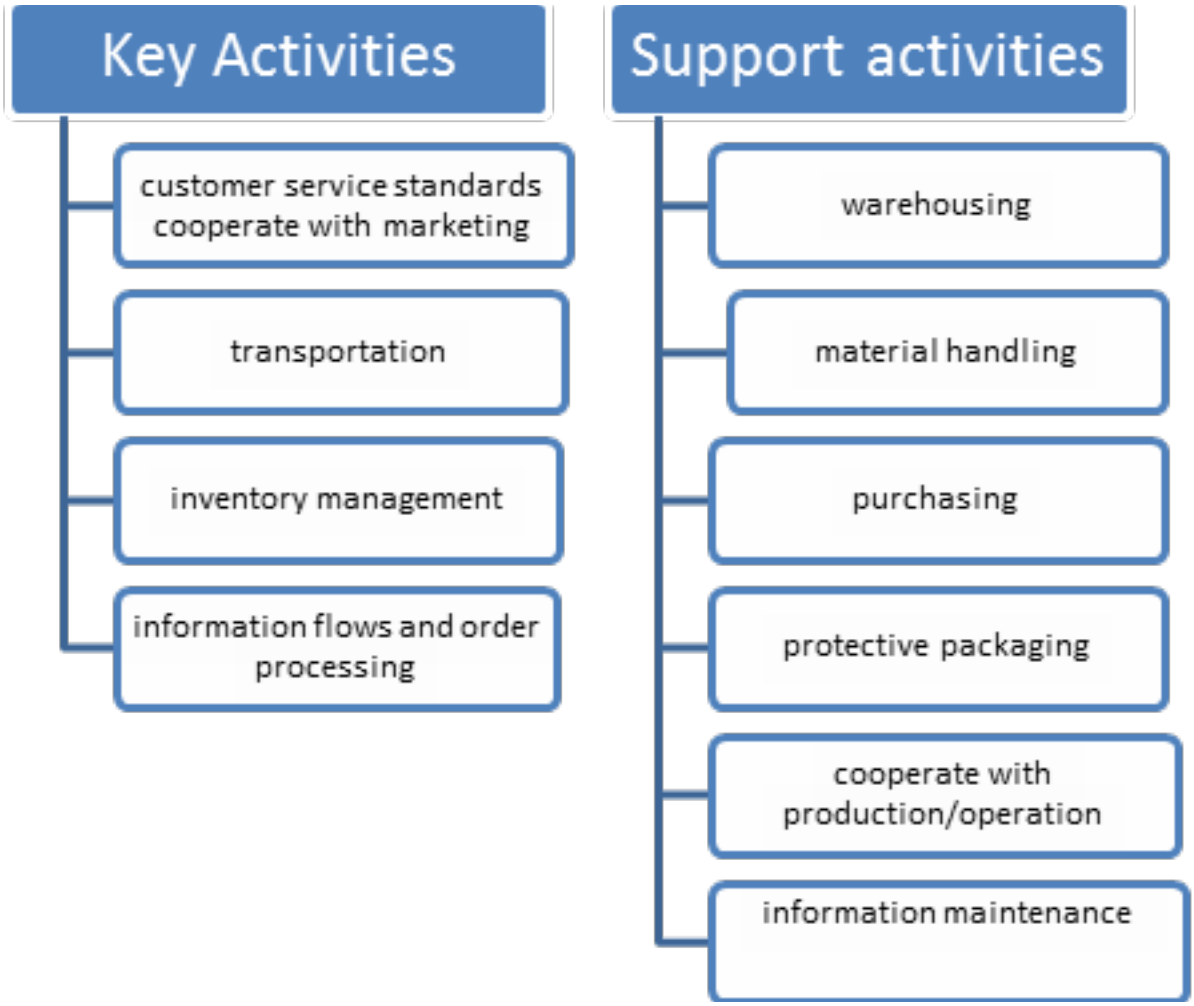
Logistic is the function that enables the flow of materials from suppliers into an organization through operations within the organization out to the customers. It is derived from the Greek word "logistikos' which means 'to reason logically' It is basically consists of all operations required for goods (both tangible and intangible) to be made available in markets or at specific destinations.

In other words Marketing logistics are basically the physical distribution of goods. Marketing logistics involve planning, delivering, and controlling the flow of physical goods to a market as well as the material and information necessary to meet customer demands. The demands of the customer must be met at a profit that increases revenue for the organization.

According to Council of Logistic Management (USA) **"Logistics us the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption for the purpose of conforming the customer requirements".**

Logistics Activities

Logistics is responsible for the movement and storage of material as they move through the supply chain. When the material moving through an organization one can see the following activities are normally included in logistics



Logistics Activities

Logistics Key Activities

Customer Service

Customer satisfaction is paramount importance in any logistics activities. The marketing concept assumes that the sure way to maximize profits in the long run is through maximizing the satisfying the customer through an efficient management of physical distribution. During the course of action one has to concentrate the activities like offering goods in right time and right frequency, improving the level of customer service by developing an effective system of warehousing, quick and economic transportation, and maintaining optimum level of inventory.

Traffic, Inward and Outward Transportation

Traffic actually moves materials from suppliers to the organization's receiving area. This has to choose the type of transport (road, rail, air and so on), find the best transport

operator, design a route, make sure that all safety and legal requirements are met, get deliveries on time and at reasonable cost and so on. Outward transport takes materials from the departure area and delivers them to customer with concerns that are similar to inward transport.

Inventory Control

Inventory control set the policies for inventory. It considers the materials to store, overall investment, customer service, stock levels, order sizes, order timing and so on.

Order Processing

Order processing makes sure that materials delivered correspond to the order, acknowledges receipt, unloads delivery vehicles, inspects materials for damage, and sorts them.

Distribution Communication

The physical flow of materials is the associated flow of information. This links all parts of the supply chain, passing information about products, customer demand, materials to be moved timing, stocks levels, availability, problems, costs, service levels and so on. Co-coordinating the flow of information can be very difficulty, and logistics managers often describe themselves as processing information rather than moving goods.

Logistics Support Activities

Warehousing and Storage

Warehousing moves material into storage, and takes care of them until they are needed. Many materials need special care, such as frozen food, drugs, alcohol in bond, chemicals that emit fumes, animals and dangerous goods. As well as making sure that materials can be available quickly when needed, warehousing also make sure that materials can be available quickly when needed, warehousing also makes sure that they have the right conditions, treatment and packaging to keep them in good condition.

Material Handling

Material handling moves materials through the operations within an organization. It moves materials from one operation to the next, and also moves materials picked from

stores to the point where they are needed. The aim of materials handling is to give efficient movements, with short journeys, using appropriate equipment, with little damage, and using special packaging and handling where needed.

Purchasing

The flow of material though an organization is usually initiated when procurement send a purchase order to a supplier. This means that procurement finds suitable suppliers, negotiates terms and conditions, organizes delivery, arranges insurance payment, and does not everything needed to get materials into the organization. In the past, this has been seen as a largely clerical job centered on order processing. Now it is recognized as an important link with upstream activities, and is being given more attention.

Packaging

Packaging finds and removes materials from stores. Typically materials for a customer order located, identified, checked, removed from racks, consolidated into single load or multiple load, wrapped and moved to a departure are for loading onto delivery vehicle

Plant and Warehouse Side Selection

Logistic activities can be done in different locations. Stocks of finished goods, for example, can be held at the end of production, moved to nearby warehouse, put into stores nearer to customers, passed on to be managed by other organization, or a range of alternatives. Logistics has to find the best location for these activities. It also considers related question about the size and number of facilities. These are important decisions that affect the overall design of the supply chain.

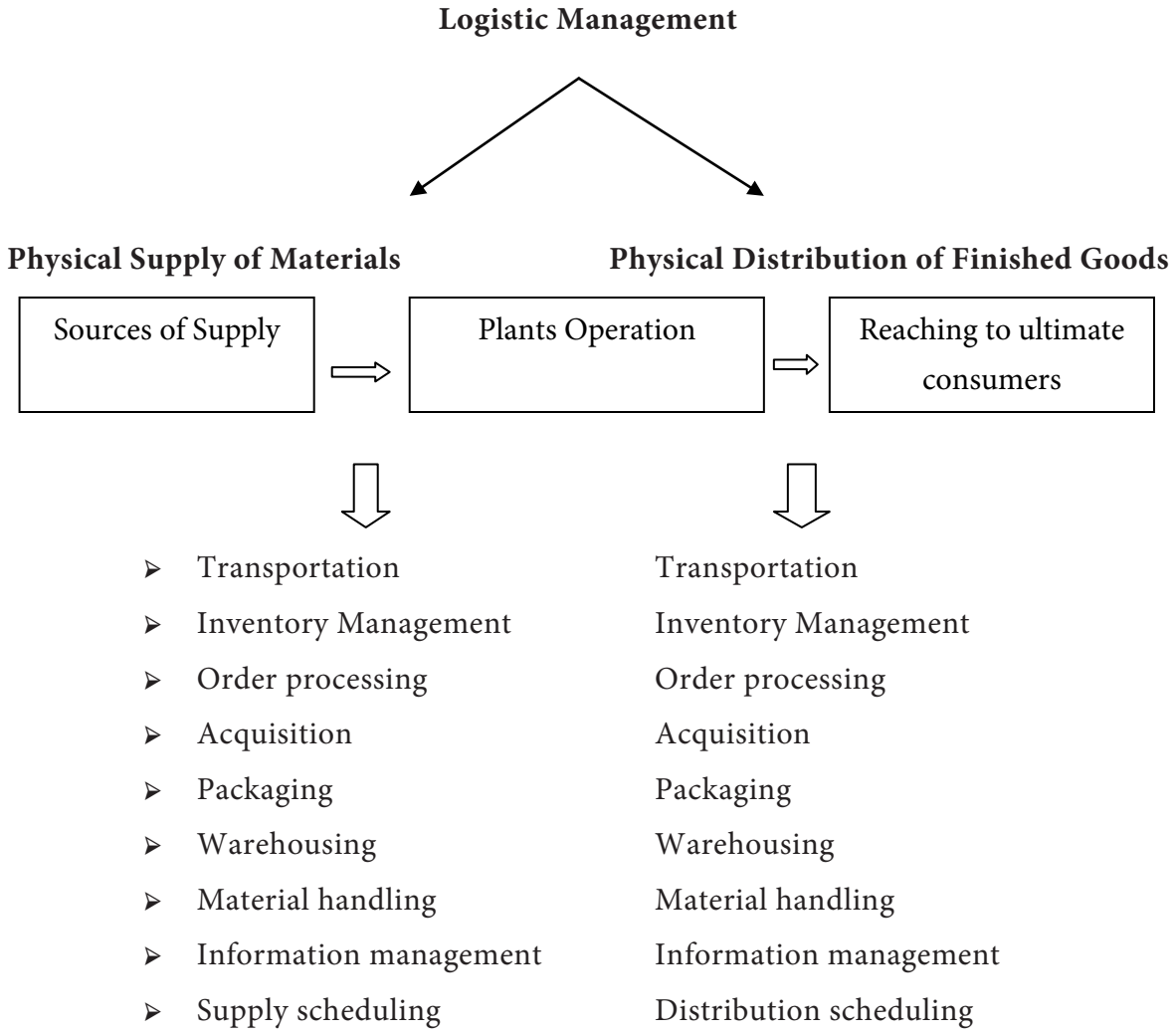
Return Goods Handling, S**alvage and Scrap Disposal**

Even when products have been delivered to customers, the work of logistics may not be finished. There might, for example, be problems with delivered materials, perhaps there were faulty, or too many were delivered, or they were the wrong type and they have to be collected and brought back.

There are materials that cannot be used again, but are brought back for safe disposal, such as dangerous chemicals. Activities that return material back to an organization are called reverse logistics or reverse distribution.

Information Maintenance

Finally, information maintenance especially the collection, storage, data analysis and control procedures of information supports all other logistics activities in that it provided the need information for planning and control

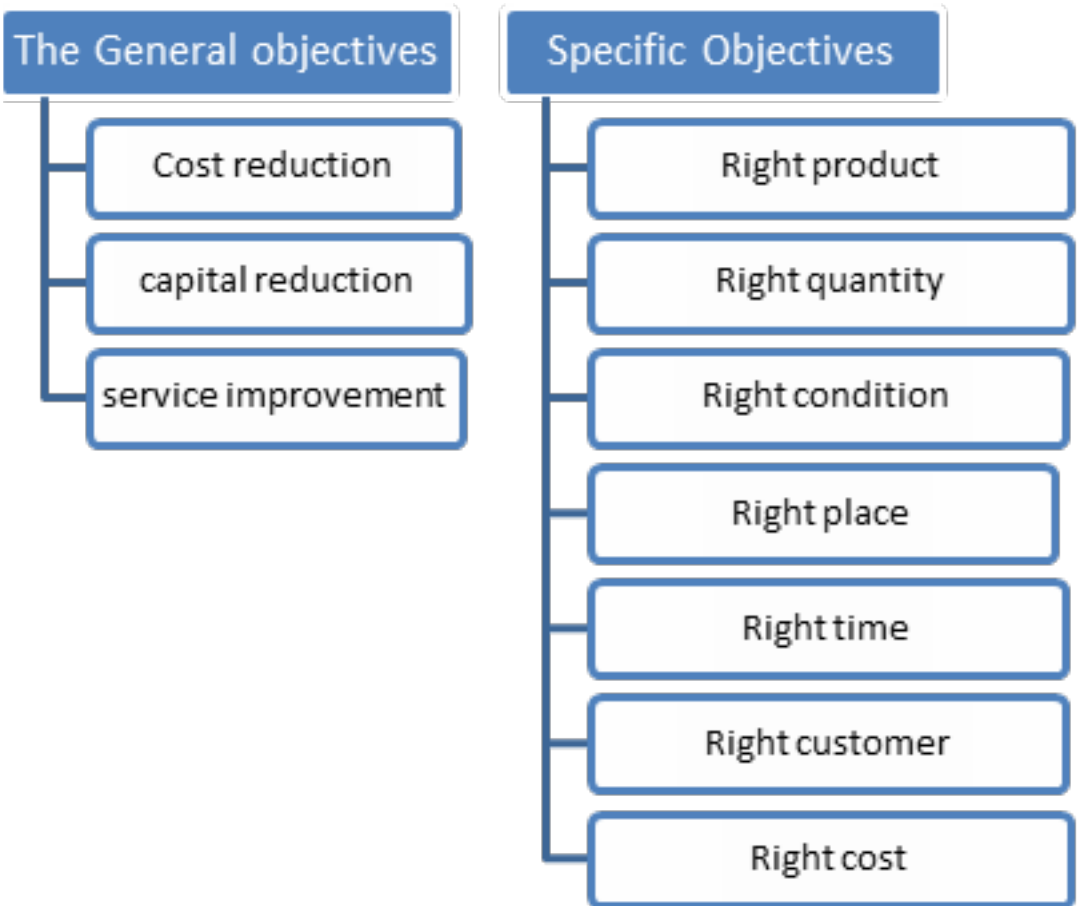


Logistics Activities in a Manufacturing Company

Objectives and Scope of Logistics

This implies that a firm will aim at having a logistics system which maximizes the customer service and minimizes the distribution cost. However, one can approximate the reality by defining the objective of logistics system as achieving a desired level of customer service i.e., the degree of delivery support given by the seller to the buyer. Thus, logistics management starts with as curtaining customer need till its fulfillment through product supplies and, during this process of supplies, it considers all aspects of performance which

include arranging the inputs, manufacturing the goods and the physical distribution of the products. However, there are some definite objectives to be achieved through a proper logistics system. These can be described as follows



Objectives of Logistics

1. Improving Customer Service

As we know, the marketing concept assumes that the sure way to maximize profits in the long run is through maximizing the customer satisfaction. As such, an important objective of all marketing efforts, including the physical distribution activities, is to improve the customer service. An efficient management of physical distribution can help in improving the level of customer service by developing an effective system of warehousing, quick and economic transportation, all maintaining optimum level of inventory. But, as discussed earlier, the level of service directly affects the cost of physical distribution.

Therefore, while deciding the level of service, a careful analysis of the customers' wants and the policies of the competitors is necessary. The customers may be interested in several things like timely delivery, careful handling of merchandise, reliability of inventory, economy in operations, and so on. However, the relative importance of these factors in the

minds of customers may vary. Hence, an effort should be made to ascertain whether they value timely delivery or economy in transportation, and so on. One the relative weights are known, an analysis of what the competitors are offering in this regard should also be made. This, together with an estimate about the cost of providing a particular level of customer service, would help in deciding the level of customer service.

2. Rapid Response

Rapid response is concerned with a firm's ability to satisfy customer service requirements in a timely manner. Information technology has increased the capability to postpone logistical operations to the latest possible time and then accomplish rapid delivery of required inventory.

The result is elimination of excessive inventories traditionally stocked in anticipation of customer requirements. Rapid response capability shifts operational emphasis from an anticipatory posture based on forecasting and inventory stocking to responding to customer requirements on a shipment-to-shipment basis. Because inventory is typically not moved in a time-based system until customer requirements are known and performance is committed, little tolerance exists for operational deficiencies

3. Reduce Total Distribution Costs

Another most commonly stated objective is to minimize the cost of physical distribution of the products. As explained earlier, the cost of physical distribution consists of various elements such as transportation, warehousing and inventory maintenance, and any reduction in the cost of one element may result in an increase in the cost of the other elements. Thus, the objective of the firm should be to reduce the total cost of distribution and not just the cost incurred on any one element. For this purpose, the total cost of alternative distribution systems should be analyzed and the one which has the minimum total distribution cost should be selected.

4. Generating Additional Sales

Another important objective of the physical distribution/logistics system in a firm is to generate additional sales. A firm can attract additional customers by offering better services at lowest prices. For example, by decentralizing its warehousing operations or by using economic and efficient modes of transportation, a firm can achieve larger market share. Also by avoiding the out-of-stock situation, the loss of loyal customers can be arrested.

5. Creating Time and Place Utilities

The logistical system also aims at creating time and place utilities to the products. Unless the products are physically moved from the place of their origin to the place where they are required for consumption, they do not serve any purpose to the users. Similarly, the products have to be made available at the time they are needed for consumption. Both these purposes can be achieved by increasing the number of warehouses located at places from where the goods can be delivered quickly and where sufficient stocks are maintained so as to meet the emergency demands of the customers. Moreover, a quicker mode of transport should be selected to move the products from one place to another in the shortest possible time. Thus, time and place utilities can be created in the products through an efficient system of physical distribution.

6. Price Stabilization

Logistics also aim at achieving stabilization in the prices of the products. It can be achieved by regulating the flow of the products to the market through a judicious use of available transport facilities and compatible warehouse operations. For example, in the case of industries such as cotton textile, there are heavy fluctuations in the supply of raw materials. In such cases if the market forces are allowed to operate freely, the raw material would be very cheap during harvesting season and very dear during off season. By stocking the raw material during the period of excess supply (harvest season) and made available during the periods of short supply, the prices can be stabilized.

7. Quality Improvement

The long-term objective of the logistical system is to seek continuous quality improvement. Total quality management (TQM) has become a major commitment throughout all facets of industry. Overall commitment to TQM is one of the major forces contributing to the logistical renaissance. If a product becomes defective or if service promises are not kept, little, if any, value is added by the logistics. Logistical costs, once expended, cannot be reversed. In fact, when quality fails, the logistical performance typically needs to be reversed and then repeated.

Logistics itself must perform to demanding quality standards. The management challenge of achieving zero defect logistical performance is magnified by the fact that logistical operations typically must be performed across a vast geographical area at all times of the day and night. The quality challenge is magnified by the fact that most logistical work is performed out of a supervisor's vision. Reworking a customer's order as a result

of incorrect shipment or in-transit damage is far more costly than performing it right the first time. Logistics is a prime part of developing and maintaining continuous TQM improvement.

8. Life-Cycle Support

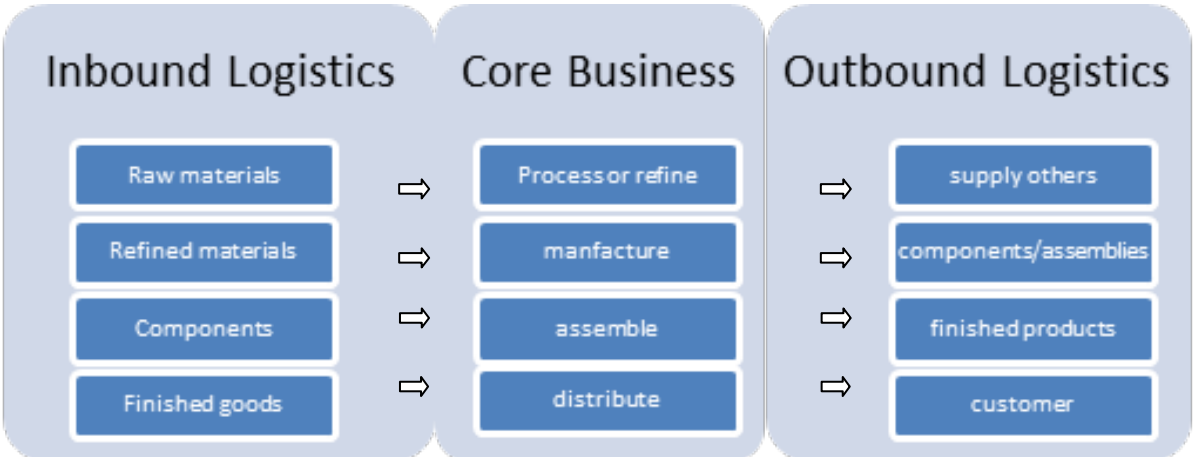
A good logistical system helps to support the life cycle. Few items are sold without some guarantee that the product will perform as advertised over a specified period. In some situations. the normal value-added inventory flow toward customers must be reversed. Product recall is a critical competency resulting from increasingly rigid quality standards, product expiration dating and responsibility for hazardous consequences. Return logistics requirements also result from the increasing number of laws prohibiting disposal and encouraging recycling of beverage containers and packaging materials. The most significant aspect of reverse logistical operations is the need for maximum control when a potential health liability exists (i.e.. a contaminated product). In this sense, a recall program is similar to a strategy of maximum customer service that must be executed regardless of cost. Firestone classical response to the tyre crisis is an example of turning adversity into advantage. The operational requirements of reverse logistics range from lowest total cost, such as returning bottles for recycling, to maximum performance solutions for critical recalls. The important point is that sound logistical strategy cannot be formulated without careful review of reverse logistical requirements.

9. Movement Consolidation

As the logistical system aims at cost reduction through integration, consolidation One of the most significant logistical costs is transportation. Transportation cost is directly related to. the type of product, size of shipment, and distance. Many Logistical systems that feature premium service depend on high-speed, small shipment transportation. Premium transportation is typically high-cost. To reduce transportation cost, it is desirable to achieve movement consolidation. As a general rule, the larger the overall shipment and the longer the distance it is transported, the lower the transportation cost per unit. This requires innovative programs to group small shipments for consolidated movement. Such programs must be facilitated by working arrangements that transcend the overall supply chain.

The Scope of Logistics

The basic nature of business is that it procures or buys something, whether goods or information; changes its form in some way which adds value and then sells a product or service onto someone else. In manufacturing industries in particular, the following sequence may occur a number of times



Scope of Logistics

System Elements of Logistics

According to CLM, the components of a typical logistics system are "customer service, demand forecasting, distribution communication, inventory control, material handling, order processing, parts and service support, plant and warehouse site selection (location analysis), purchasing, packaging, return goods handling, salvage and scrap disposal, traffic and transportation and warehousing and storage". The logistics activities to be managed that make up business vary from company to company, depending on a company's particular organizational structure.

Elements of Logistics

The following are the main elements of logistics

1. Transportation
2. Warehousing
3. Inventory management
4. Packaging and utilization and
5. Information and communication

4. Significance of Logistic

Logistics is about creating value, value for customers and suppliers of the firm, and value for the firm's stakeholders. Value in logistics is primarily expressed in terms of time and place. Products and services have no value unless they are in the possession of the customers who are looking for the same in a particular place at a particular time. In the globalised economy for many organizations logistics has become an increasingly important value –adding process for the following reasons

Logistics Consumes Cost

Transportation costs have been drastically raised over the period due to rise in oil prices

Impact of Globalization, Liberalization and Privatization

Organizations can become global in outlook, buying, storing, manufacturing, moving and distributing materials in a single, worldwide market. As a result international trade and competition are continuing to rise. Organizations used to look for competitors in the same town, but now they are just as likely to come from another continent.

Customer Expectation

Customers are more knowledgeable, and demand higher quality, lower costs and better services. The internet, just –in-time operating procedures, and continuous replenishment of inventories have all contributed to customers expecting rapid processing of their requests, quick delivery, and a high degree of product availability.

Competition

Competition is getting fiercer, and organizations must look at every opportunity to remain competitive**.**

Organizational Changes

Organizations are introducing new type of operation, such as just-in-time, lean operations, time compression, flexible manufacturing, mass customization, virtual operations, and so on.

Information Technology Impact

There have been considerable improvements in communication. These allow electronic data interchange (EDI), item coding, electronic fund transfer, e-commerce, shared knowledge systems and other new practices

Transportation

Attitudes towards transport are changing, because of increased congestion on roads, concerns about air quality and pollution, broader environmental issues, government policies for the real cost of road transport, privatization of rail services, deregulations of transport and a host of other changes.

Alliance & Partnership of Companies

Organizations are increasing co-operation through alliances, partnerships, and other arrangements. This integration is important for logistics, which is usually the main link between organizations in a supply chain.

Organization Focuses on Core Business Activities

Organizations are outsourcing peripheral activities and concentrating on their core operations. Logistics is a useful area for third-party operators, with specialized companies offering a range of services.

International Trade

International trade continues to grow. This is encouraged by free trade areas such as European Union and North American Free Trade Area.

Organized Retail Formats

The growth of 24 X7 hour opening, home deliveries, out-of town malls, retail parks, telephone and on-line shopping

Increasing Environmental Concerns

There is growing concerns about air pollution, water pollution, energy consumption, urban development and waste disposal. Logistics does not have a good reputation for environmental protection. Demonstrated by the emissions from heavy lorries, use of green field sites for warehouses, call for new road building, use of extensive packaging, ships illegally flushing their fuel tanks, oil spillages from tanker accidents and so on.

Direct Delivery to Customers

These days' customers are placing order through mobile, web or finding some other means of ways to secure the product from the company directly. This helps to reduce lead time, reducing costs to customers, having manufacturing talking directly to their final customers, allowing customer to access to a wider range of products and so on. It also means that logistics has to move small deliveries quickly to find customers. This has encouraged the growth of courier and expresses parcel delivery services such as FedEx, UPS and DHL.

To Avoid Accumulation of Stocks

Traditionally, producer move the finished goods out of production and store them in the distribution system until they are needed. When there are many variations on a basic product, this can give high stocks of similar products. Postponement moves almost finished products into the distribution system and delays final modification or customization until the last possible moment.

Use of Specialized Logistic Companies

Now a day's organizations realize that they can benefit from using specialized companies to take over part, or all, of their logistics. Using a third party for materials movement leaves an organization free to concentrate on its core activities.

1. Large scale production of the factories forced to distribute the goods
2. Fundamental changes in inventory management
3. Proliferation of product and product lines
4. Economic regulation reduction

Self Assessment Question

1. Define logistics management and explain its objectives.
2. Define logistics management and discuss its role in today's business.
3. Discuss logistics decisions which an industrial enterprise has to take.
4. How important is logistics to the national economy?
5. The cost of logistics varies widely from organization to organization. What factors affect these costs? Are the costs fixed or can they be controlled?
6. How do you think international logistics differ from domestic logistics?
7. What are the key activities of the business logistics function? Discuss their existence and importance to the management of i) automobile company, ii) a fast food chain (McDonald's)
8. Discuss the role that efficient and effective logistics systems play in encouraging a high level of foreign trade.
9. Explain the concept of logistics? What are the objectives of logistics?
10. What is the relationship between marketing and logistics? Quote the suitable example to prove the relationship.
11. What are the key activities of the business logistics functions?
12. What do you mean by supply chain management?
13. Mention the factors and forces that give logistics importance among other functional areas of the firm.

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Lesson 1.2 - Relevance of Logistics in International Marketing

Learning Objectives

- Introduction to global logistics
- Differences between global logistics and domestic logistics
- Reasons for the growth international logistics
- Significance of global logistics
- How international logistics differs from supply chain management
- Problems faced in international logistics

Introduction

International trade continues to grow at a remarkable rate. One of the most important phenomena of the 21st century has been the international expansion of industry. Today, virtually all major firms have a significant and growing presence in business outside their country of origin. This international trade is based on the recognition that an organization can buy things from a supplier in one country, use logistics to move them, and then sell them at a profit to a customer in another country. Improved communication, transport, financial arrangements, trading agreements, and so on, mean that organizations search the world to find the best location for their operations. Then international logistics move the related materials through long and complex supply chains. International logistics are different from national logistics and it is not just a case of moving the same activities to another location. The following are some of the common differences

- International trade usually has much bigger order sizes, to compensate for the cost and difficulties of transport
- International markets are more erratic, with large variations in the demand and importance of any market
- Most organizations have less experience with international logistics, so they are working in areas here they have less expertise
- More number of intermediaries like freight forwarders and customs agents are involved

- The relationship between the logistic company and their customers some time disturbed due to more intermediaries involved and distance covered
- Communication become more difficult at a distance and across culture
- Terms of trade vary and may be unfamiliar
- Financial arrangements can be less certain
- Documentation procedures are more complicated

International Logistics Functions

International logistics involves movements that cross borders, and these movements are considerably more complex than domestic ones. Many international movements go aboard ship/air/road, and the entire process of moving through ports and being at sea is time consuming. Complicating matters, differences between time zones can limit the hours when verbal communications can take place. Also, the documentation required for international logistics are varied and complicated, often requiring the services of experts. And today, inventory-in-transit is managed as if it were inventory-in-place, increasing the information management complexity and demands of international logistics.

The firm's international logistics department is responsible for the management, communications, control, and planning of the logistics activities. Specific activities or functions, all of which fall under the business firm's international logistics umbrella, include the following, which may be categorized in terms of usually being associated with outbound movements, inbound movements, or overall logistics management Demand forecasting, order management, packaging, labeling, documentation flow, customer service and parts and service support are typically associated with outbound flows.

Logistics activities that are related to both sales and procurement include inventory management, materials handling, transportation management, warehouse and distribution center management, returned products, salvage scrap disposal, inter-plant movements, plant and warehouse site selection, and movement of people. All logistics functions today are assisted by information systems as well, and many firms consider information systems related to logistics functions as themselves a part of logistics management.

The various separate logistics activities listed will be discussed, but one should realize that they must be planned and executed in coordination with each other and with other functions in the firm's supply chain. Forever present is the idea of cost trade-offs the logistics manager may pay more for one element of service in order to save an even larger amount on a different element.

For example, if one uses air freight, an expensive form of transportation, one saves money on packaging because airlines are more careful with cargo than are many ocean carriers. In addition, one will receive quicker payment since the goods will be delivered more quickly.

Also, current logistics thought holds that improving the level of customer service has its own reward in the form of increased sales.

International Logistics Functions

1	*Planning functions* Location selection Supplier selection Supplier contracting Scheduling
2	*Equipment functions* Selection Allocation Sequencing Positioning Inventory control Ordering Repair
3	*Terminal functions* Gate checks Location control
4	*Handling functions* Pick-up Consolidation Distribution Expediting Diversion Transloading
5	*Administrative functions* Order management Document preparation Customs clearance Invoicing Inventory management Performance evaluation Information services Communications
6	*Warehousing functions* Receiving Inventory control Reshipment
7	*Pre/post-production* Sequencing Assorting Packaging Postponement Marking
8	*Transportation functions* Modal co-ordination Linehaul services Tracking and tracing

Outbound Logistics Functions

Outbound logistics for the exporting firm are covered those mostly associated with marketing include demand forecasting, order management, packaging and labeling, and documentation. Note that every firm has its own methods of selling overseas, and often uses different arrangements in different markets.

Demand Forecasting

Demand forecasting is carried on in conjunction with the firm's marketing staff and its principal overseas distributors and is used by the firm to project sales. This translates to production and procurement needs for the next planning period. These in turn translate into direct logistical requirements that include both delivery to customers and receipt of raw materials or components for assembly. Since the logistics staff is also involved with order management, it also has very early information about what customers are actually ordering. This is important intelligence for others in the firm who are planning and scheduling production and may wish to make alterations because of changes in demand. Note that the free flow of accurate demand forecasts is essential among the members of a supply chain to ensure a smooth flow of goods from origin to final consumer. Thus demand forecasting is equally important to managers of inbound movements.

Order Management

Order management starts with the receipt of an order from an overseas customer. It may be obtained by the firm's salesperson, be telephoned or faxed in, come by mail, or arrive electronically through EDI, email, or the World Wide Web. The first step in most international order management systems is to verify the accuracy of the order; that is, make certain that the various documents accompanying the order contain no internal errors that might mean the customer was uncertain about what he or she was ordering. The next step is to verify the customer's credit, or ability to pay.

Packaging

Three purposes are served by packaging identifying the product, protecting it, and aiding in handling. Identification serves a variety of purposes, from automated recognition of the product through bar coding to promotional purposes packages make the product stand out on a store shelf and say "take me home" to the customer. The protective function is to protect the product and, in some instances, to keep the product from damaging surrounding items. Packaging also makes handling the product in distribution a much

simpler task. The choice of packaging materials is influenced by concerns for environmental protection. Containers that can be recycled, or are made of recycled materials, are enjoying increased demand.

Labeling

Labeling has several functions, the principal of which is to describe the contents of a package. Labeling is usually in the language of the exporting nation, although it is often advisable to have it in the importing nation's language as well. The buyer may intend to have the same shipping carton used for the international move serve for the domestic move as well, in which case additional labeling may be applied. Today, a common request would be to have bar code labels applied.

Documentation

Documentation is the preparation and handling of all the documents accompanying a shipment. In international movements, all documents must be present at the point where the goods are passing through the importing nation's customs and inspection posts. In recent years, computers and the electronic preparation and presentation of documents through EDI and the World Wide Web have made documentation less of a burden. International shipments require many more documents than domestic shipments. For example livestock must be accompanied by a veterinarian's inspection certificate when its exported. Documentation also links the shipment to payment for the product, a form of control necessary to insure that goods are not shipped without regard to their payment status.

Customer Service

Customer service involves an array of activities to keep existing customers happy. It makes sense to focus on customers you already have, encouraging repeat Customer service functions are important to a firm's success. In a survey of logistics practice worldwide, firms listed customer service performance ahead of six other performance variables in terms of importance to the success of logistics within their firm. Customer service ranked ahead of such concerns as lowered logistics costs and delivery speed and dependability.

Parts and Service Support

Parts and service support are another element of customer service. Equipment that has been sold must be maintained. Buyers of capital equipment insist on knowing that their

purchase will be kept in running order for many years, and thus prompt delivery of repair parts is necessary. Air freight is often used for that purpose. Repair parts inventories are expensive to maintain and often must be justified on different criteria than are used for the main product lines. Parts and service support is an element of customer service although, in fact, buyers of a product may shift to another firm for long-term service support. In many trades special parts lists exist showing the interchangeability of various competitors' parts. In an era when long-term partnerships are increasingly common, manufacturers of capital goods are recognizing that post-sales activities are important.

Inbound Logistics Functions

Three functions associated with inbound logistics are production scheduling, procurement, and handling returned products. Either a manufacturing firm or a wholesale/retail firm must first forecast demand, and then determine what must be purchased for use in the production process or to stock inventories. Handling returned products is more of an issue for domestic transactions than for foreign ones because the difficulties in returning a product across borders may erase any
advantages of doing so.

Production Scheduling

Scheduling of production is done with the assistance of the logistics staff. Production is scheduled in an attempt to balance demand for products with plant capacity and availability of inputs. In the international arena, one must take into account anticipated changes in relative values of currencies, longer distances and times for materials to travel, quotas on imports, etc. Some firms are truly international in stature and try to develop products that can be manufactured and sold in many parts of the world. One example is the Ford Focus, which is a "world designed" vehicle that one can spot variants of in many countries. Inbound materials and components must be scheduled to fit into the production process. The production process itself is scheduled to fulfill existing and planned orders, and is thus dependent on accurate sales forecasting. Manufactured products must be scheduled for shipment to wholesalers, retailers, and customers.

Procurement

Closely related to production scheduling is procurement (or purchasing), since many of the inputs needed for production must be procured from outside sources, known as vendors. Boeing, for example, relies on about 10,000 vendors worldwide. The procurement cycle has been visualized as having four major components in a process that is an input to

manufacturing. First, an order is received based on a manufacturer's production schedule or on a supplier's stocking needs. Second, the supplier schedules the necessary production. Third, components are manufactured and shipped. And fourth, the components are received at the manufacturer's location.

Returned Products

In domestic markets, there are many categories of returned products. A few are subjects of product recalls, meaning that a safety defect or hazard has been discovered and the products are removed from the shelves and both retailers and consumers attempt to return them to the manufacturer or to some intermediary. Some returned goods are those that have been on the shelves too long, and are no longer fresh. Then there are products that the customer is returning to be repaired or replaced. Some products are returned to be recycled in some way or another. Finally, there are products that may have been placed on consignment, never sold, and are being returned. The firm doing business internationally will have to realize that in many national markets where the product is being sold, some returns can be expected for reasons given in the previous paragraph. Reverse flow channels must be established within those nations. Strict accounting controls are necessary to protect all parties in these sorts of transactions. Some care is also needed to insure that the returned product, thought to be scrapped, does not "reappear" to compete with one's other products in the same or perhaps in a different market. Increasingly firms are using information technology to facilitate reverse logistics flows. Firms accepting returns must categorize, approve, and specify procedures as far forward in the distribution channel as possible. Such gate keeping functions can now be pushed down to the point of end-customer return, typically a retail store. Returned products may be examined for completeness and condition, scanned into the reverse logistics information system, and appropriate final disposition determined before the good leaves the retail location. Firms typically outsource the design and operation of such sophisticated reverse logistics systems. It is possible, although unlikely, to have products returned to the nation where they were manufactured. This does not happen frequently because of logistics costs and uncertainties regarding the items' value at its final destination point. Quite often returned products are disposed of inside of the nation in which they were sold to the end customer. This may involve repackaging and sale, salvage sale, or disposal (usually requiring some level of destruction to prevent the resale of defective goods).

Overall Logistics Activities

Some logistics functions are not specific to import or export operations. Terms of sale may assign responsibility for them to either the buyer or the seller. Most common

of all logistics activities are inventory management and transportation management. Also covered here are materials handling, warehouse and distribution center management, salvage and scrap disposal, interplant movements, plant and warehouse site selection, and moving people.

Inventory Management

Logistics management function deals with management of inventories. In some firms, it is the single most important decision, since decisions concerning the locations of inventories and their directions and patterns of flow do, in fact, reflect the design efficiency of the total system. Inventories also represent an investment that the owner hopes to sell. (Sometimes they represent an "involuntary" investment that occurs when goods are produced faster than they are sold. If a demand forecast is too high, surplus inventory can begin quite early in the supply chain.) There are costs associated with holding inventories, including interest on the money invested in the inventory, storage costs, and risks of deterioration, obsolescence, and shrinkage.

Many different classes of products are kept in a firm's inventory. They may include company supplies, work-in-process goods, finished goods (made by the firm), packaging materials, labels, promotional materials (catalogs and samples), raw materials and components, resale goods (purchased from other firms for resale—a firm that manufactures air cleaners may buy filters from an outside source), returned goods made by others, returned products made by the firm, scrap and waste to be disposed of or recycled, spare parts, and traded-in goods of a competitor's or one's own brand. For products that are traded internationally, there are additional inventory classifications the country of origin, since import duties or charges sometimes vary by country of origin; countries where goods can or cannot be sold, an example being that some foreign autos cannot be sold in the United States because of emission control and crash safety requirements; and the specific languages used on the product or package or in catalogs. Maintaining accurate records of international inventories is more difficult because of the length of the pipeline through which the products travel and the fact that there many more places where the inventory can hide. It is vital to understand that inventory ages at each of these hiding places.

Transportation Management

Planning, arranging, and buying the international transportation services needed to move a firm's freight is known as transportation management. It is probably the single most costly element of international logistics. The transportation manager is concerned with freight consolidation, carrier rates and charges, carrier selection, certain documentation,

tracing and expediting, loss and damage claims, demurrage and detention, movements of hazardous materials, employee moving services, and use of private carriage.

Freight consolidation means the assembling of many smaller shipments into a smaller number of large shipments. The reason for this is that the carriers charge less per pound for handling larger shipments since less paperwork and individual handling are involved. Hence, a transportation manager would like to see a customer's daily orders consolidated into a single weekly order, or have orders for seven customers in a foreign country handled as a single shipment to that country, and then broken down inside that country for delivery to each of the seven. Carriers establish their rates in several ways, as discussed in chapters dealing with transportation. Transportation managers must know how to determine rates and, in some markets, be able to negotiate for even lower rates. Carrier selection is a two-step phase. First the company must decide which mode—water, rail, pipeline, truck, or air—to use for each segment of traffic it handles. Air is the fastest way to carry international shipments, but it is also the most expensive. Once the modal choice decision is made, the transportation manager must choose which carrier firm or firms should get the company's business. After the selection is made, the carriers' performance is monitored to make certain that its quality does not deteriorate. Increasingly, transportation managers are purchasing transportation services from intermodal carriers who creatively combine modes under single ownership for point-to-point transportation solutions.

Transportation managers must also know how and where to combine modes. Tracing and expediting are related; both involve paying attention to a shipment that is in the carrier's hands, somewhere. Tracing is the effort to find a delayed or misplaced shipment. Expediting is the attempt to have a specific shipment move faster through the carrier's system because it is needed immediately by the consignee. An example would be components needed for an assembly line. Tracing and expediting are today facilitated by real-time shipper access to carrier and customs databases through the Internet. Loss and damage claims require the transportation manager to attempt to collect the amount of the damages from the insurance company and from the carrier. Demurrage and detention reflect the traffic manager's responsibility to load and unload carrier equipment promptly. If he does not, then the carrier assesses daily detention or demurrage charges until the transportation manager's firm frees the carrier's equipment. This is to prevent the shippers and consignees from using the carriers' equipment as warehouses. Hazardous materials movements require special attention. Sometimes only certain routes, ports, warehouses, and vehicular equipment can be used. For example, there are a number of hazardous materials that may be moved by land or truck but which are prohibited in air transport. For some hazardous material movements specialized carriers must be used. Containers and vehicles have special markings and additional documentation is needed to accompany the

shipment. The transportation manager is also responsible for dealing with the household goods carriers that move the families of employees being transferred from country to country. Private fleet management involves control of railcars, trucks, vessels, or airplanes that the company owns for carrying its own products. Mention should be made of "turnkey" projects. They involve the building, finishing, and turning over to new owners a complete, operating project, such as a power dam.

Materials Handling

This term is used in several different ways. Materials handling often cover movements of goods that are under the firm's immediate control, such as within a plant or warehouse complex or between plants. The term is also associated with procurement, that is, what to do with materials after acquiring ownership. Lastly, the term sometimes refers to the handling of bulk products. For examples iron ore, coal, and grain that move in trainload, truckload, and shipload lots. The materials are loaded, unloaded, and transferred by large mechanical devices. Liquids such as petroleum are pumped through pipelines. Flour and cement are moved between dry tanks pneumatically, that is, by large vacuum-cleaner-like devices. Materials flow is another term that is used.

Warehouse and Distribution Center Management

This logistics activity involves the management of the locations where the firm's inventories are stored. Warehouses and distribution centers are similar but the latter places more emphasis on moving the goods through promptly. In international logistics, one usually thinks of having overseas warehouses managed by third parties who are providing a bundle of services for an exporter/importer, of which inventory maintenance and warehousing is but one part.

Salvage and Scrap Disposal

Management of waste materials is important as part of material management. Normally one desribe scrap disposal as a domestic activity. Many firms sell their scrap to other firms which specialize in disposal and recycling. However, there are a few international aspects of scrap disposal. Old ships are sailed or towed to nations in the world where labor is very cheap. India is one country with an active ship dismantling and recycling industry, for example. Auto batteries are shipped for recycling to nations with weak worker safety and environmental protection controls. These practices can raise ethical questions. Firms must also be wary of companies offering disposal services to make certain that they dispose of the materials in legal and environmentally sound ways. The public is becoming increasingly

concerned about each firm's environmental scoreboard, and more and more care is needed to make certain that environmental concerns are addressed in the firm's scrap disposal methods. Markets for many used products are worldwide, although the demand elsewhere must be sufficient to cover all the added costs of international movements.

Interplant Movements

During the production process a firm moves products among its various plants. A large manufacturer might have several thousand suppliers feeding parts into dozens of factories that assemble components that will be used by a few assembly lines. Flows must be controlled and altered to meet changing demands. A continual challenge is reducing the size of work-in-process inventories.

International interplant movements are subject to customs scrutiny because they are related party transactions. Duties are taxes levied on imports, and ad valorem duties are duties based on the value of goods. If one were a customs inspector reviewing an import invoice from a related party, might one not wonder whether the value shown represents the true or fair market value of the goods covered by the invoice? Fair market value, or FMV, roughly means the price at which a willing seller will sell to a willing buyer under similar conditions. Since willing infers that neither party is under any compulsion, an important aspect of fair market value is missing in related party, or intercompany, transactions. The possibility is that the product is intentionally underpriced in order to avoid paying the full amount of duty due. Hence, when making plans for intercompany transactions, one of the cost items to be controlled is customs payments as the materials cross borders. Consider this

Plant and Warehouse Site Selection

Firms often must find the location for a new facility. Usually this decision follows a process of system analysis and design wherein a determination is made of how many facilities the firm should be operating. As an example, a firm needing to distribute repair parts overnight within fifty industrialized nations could probably reach nearly all markets by air from five or six warehouse locations, if the firm were willing to use air express services. Or a growing firm may decide that it needs a new warehouse to serve a certain region. Several layers of analyses would be performed, each with a finer focus. After a world region is selected, then a country within the region is chosen. Criteria to this point include markets, membership in a trade bloc, availability and wage rates of labor, tax rates, political stability, energy costs, proximity to suppliers and to markets, customs charges, import quotas, climate, and transportation.

Moving People

Little has been said about the logistics of moving people. This can be handled in two ways. Individuals can be given instructions to meet at a certain point, either nearby or far away. They then assume responsibility for making their own travel arrangements and showing up as directed. If larger groups of people are to be moved, a firm may assume responsibility for a group move and charter an airplane and arrange for a block of hotel rooms. When large projects are constructed in remote areas, it is necessary to build housing for the construction workers and to continually supply them with food and other goods. A firm that transfers employees around the world also must relocate their families and household possessions. There are third-party firms that provide this service. Some nations often supply the workforce used in other nations. The workers are recruited in their home nation and moved to where they are needed. Recall that during the war in Kuwait, many of the persons living in Kuwait were common laborers from other nations.

Coordinating and Managing Logistics

It may have a separate logistics department that is equal in status with other major departments such as finance, production, marketing, and so on. Today, some firms rely on third-party logistics, whereby they contract with an outside firm to coordinate, manage, and sometimes perform the various functions. Communications links are important and are also obviously complex, although EDI and the Internet are being used for buyer-seller, shipper-forwarder-carrier, and importer-exporter-customs linkages. Many ocean carriers allow cargo to be booked by computer. Maersk Sea-land allows shippers direct access to its computer network. The customer can bypass a Maersk Sea-land customer service representative and, using a connection to Maersk Sea-land's website (http //www. maersksealand.com), can Perform cargo tracking, learn shipment status Request vessel schedules Book space (via the website) Make direct queries about information on specific bills of lading, that is, charges, piece counts Email queries to other Maersk Sea-land offices anywhere in the world Learn cargo availability (imports) Book facilitating services from Maersk Sea-land or cooperating intermediaries Obviously, the task of managing an international logistics system is challenging and calls for one to be able to understand, control, and lead all the elements covered in this book.

Significance of International Logistics

Internationally successful companies have identified the importance of logistics as a management function. Public awareness of logistics has increased significantly, and its influence on strategic corporate decisions is strong. However, many companies are still in

the process of defining the specific scope of responsibility for their logistics function and gearing their service networks towards the needs of their customers. Reduced delivery times and adherence to defined delivery dates as well as completeness and accuracy of delivery are important criteria for increasing customer satisfaction through logistics services.

At the same time, worldwide mega trends such as internationalization of procurement, production and sales, increasing resource scarcity and energy costs are challenges for logistics managers and lead to new and changing requirements on the network competence of companies. As a result, overriding macroeconomic and social trends have an ongoing effect on the development of logistics. More than ever before, today's logistics mangers are confronted with dynamic trends in corporate development, and dynamic trends are difficult to forecast. Future –oriented strategies must be able to adapt to nascent trends as early as possible, and logistics goals must be geared towards these trends. This is only way to ensure the long-term success of a company. Besides globalization, other major logistics challenges are continuously arising, especially in the form of internationalization, increased security requirements and an increasing demand for ecological sustainability.

Managing Rising Logistics Costs

The most obvious reason why global logistics is now getting C-level attention is a four-letter word cost. Logistics costs now represent a larger percentage of sales. In fact, they now eat more than ten percent of sales revenues for most companies; consequently, logistics costs are beginning to erode, or at least counter-balance many of the economic advantages of global sourcing. These costs are driven by both internal and external factors. Internally, the increasing tendency toward global sourcing has resulted in a great deal of network complexity. The extremely rapid nature of this transition has forced logistics networks and distribution centers to assimilate loads and variables that they were never designed to manage**.** Additionally, many global companies are dealing with a legacy of fragmented internal logistics structures that are siloed by brand or department, which makes it difficult to apply consistent management processes and tools. This fragmentation also makes it hard to leverage cost savings across divisions and brands — and even leads to suboptimal container-utilization levels.

External costs are also continuing to rise. Inputs such as fuel, labor and real estate show no signs of falling in price. Supply and demand curves, tight schedules and capacity levels for ocean shipping place upward pressure on costs — especially in trans-Pacific trade lanes. Additionally, some recent merger and acquisition activity in the carrier market is creating the potential for greater price control for the tier-one carriers. Finally, there are the costs and complexities related to compliance with government regulations associated with

global trade. Managing customs declarations and other documentation, not to mention the varying fees and tariffs involved, has driven up logistics costs. Given the impact of these internal and external factors, it just makes sense to develop an overall strategic approach to leverage economies of scale, improve import decision support and increase lane densities.

Lean Manufacturing

The advent of lean manufacturing and lean supply chain initiatives has meant that logistics must also support these goals. The lean approach helps companies move toward demand-based product flow from the consumer or end customer back to the point of origin. It has inspired global businesses to focus on reducing waste and lowering inventory. But while lean initiatives have reduced inventories in warehouses, the greater distances and transit times involved in global sourcing have led to longer inbound supply cycles. This longer cycle creates pressure to build up stock against potential shortages, undercutting the goals of lean manufacturing. Meanwhile, shortening the supply cycle means integrating inbound and outbound sides of the supply chain, so logistics planning and execution now need to be integrated with sourcing and materials procurement. This required integration is yet another reason why C-level executives are turning their attention toward enterprise-wide logistics management and organizational integration.

Operating as an On Demand Business

In line with the move toward lean manufacturing, many companies are transforming to support On Demand Business operations. This transformation often requires a makeover of the company's logistics operations, too. IBM defines an On Demand Business as an enterprise whose business processes — integrated end-to-end across the company and with key partners, suppliers and customers — can respond with speed to any customer demand, market opportunity or external threat.

To stay competitive in the era of On Demand Business, companies need to become responsive to changing market conditions, aware of variables in their cost structures, focused on core competencies and resilient in the face of disruptions or setbacks. Companies also need to examine how the ownership of assets, such as warehouses, truck fleets and the resources to operate them, affects their ability to respond quickly to new market pressures. Creating a global logistics infrastructure that supports the goals of On Demand Business requires top-down planning and coordination. And the good news a business that is flexible enough to vary its logistics costs in line with revenue is well-positioned to react to unexpected changes that are geopolitical in nature and beyond the control of the enterprise.

Cross-Functional Sourcing Decisions

The dramatic increase in global sourcing has changed the process for strategic decision making in areas like offshore manufacturing locations, private label growth and vendor selection. To make these decisions in today's world, sourcing specialists need access to detailed logistics information, for example, you can't change a vendor or a manufacturing location without understanding how that move will affect your logistics costs. In addition, new overseas market opportunities need to be exploited, where setting up manufacturing within the distribution region can offset logistics costs. Either way, you'll want to know where your liabilities and your opportunities lie, so you'll need to assess which sourcing locations best balance factors related to cost, customer service, working capital and risk. Cross-function processes must now provide what-if analyses of sourcing information, based on robust information about direct and indirect logistics costs. Again, that means direct involvement on the part of C-level executives to enable the organizational transformation and the waterfall of business objectives that is required to set goals and constraints.

Logistic Effect on Supply Chain Management

Because logistics does have such an enormous impact on supply chain management, global logistics information is now essential for supporting enterprise decision making, including forecasting and demand planning. To make good decisions, line-of-business managers and executives need to understand optimized logistics costs — by both origin and destination. They also need predictable delivery dates, clear visibility into import logistics events and automated alerts when plans change or a shipment is off schedule. Automated transactions and analytics are important to help manage the growing volumes of imports, for example, to enable the automatic optimizing of carrier allocations according to predefined business rules, carrier performance and contract commitments

Companies Should Closely Examine their Shipping Options

Air freight, in particular, may harbor hidden costs, even though it is commonly perceived as the better option for moving goods overseas quickly. Companies may assume that faster shipping times justify the higher prices they pay, compared to ocean shipping. However, delays in customs or other areas can wreak havoc with your inventory, negating many of the benefits of faster transit times. It is important to use a model that accounts for all aspects of the journey, so that you can make appropriate decisions regarding which forms of transportation to use. A framework that enables better forecasting and supports collaboration with suppliers — while managing carriers — can help you align your shipping mode to your profit goals.

Clearly, global logistics is now a critical-path operation. Whether your objective is to protect the economic value of global sourcing, adhere to lean manufacturing, build On Demand Business logistics operations or make better supply chain decisions, you need to be able to track your shipments and manufactured goods at all times and know what it costs you to get them where they need to go. Optimizing costs and integrating business decision making usually means transforming your logistics operations to support your overall business goals. Fortunately, the transformation path has been mapped by some leading global companies.

Economic Conditions and Relative Economic Strengths also Influence Trade Patterns.

Changes in relative values of two nations' currencies influence amounts and directions of trade and tourism between them. Also, they influence the carrier's cost of doing business since the firm's revenues and costs are in several fluctuating currencies. Some U.S. airlines have stopped serving certain developing countries because they can't use the local currency earned there. The carrier fears being paid in declining currencies while accruing charges that must be paid in a currency that is gathering strength. Shifting currency values add an element of uncertainty to all international transactions.

Petroleum and its Price have had a Significant Impact Upon International Logistics

Petroleum is the single largest commodity to move by sea, and the demand for tankers has repercussions throughout all international shipping markets. Oil spills from tankers are a matter of continual concern. Movements of coal depend upon the price of oil, although to most users, coal is a less desirable fuel. Fuel represents a major cost item for both sea and air carriers.

In times of high fuel prices, air and sea carriers often add a fuel surcharge to their freight rates, and this impacts shipper as an added cost of moving along the supply chain.

Technological improvements also Influence International Logistics

The most pronounced one as we enter a new century has been the revolution in information management in international logistics. The Internet has provided access to a host of facilitating tools for managing global supply chains. Managers today are able to control information about inventory in transit in the same ways that managers once controlled actual inventory stocks. Global logistics systems have become quite predictable and reliable due to this enhanced information flow, and thus have become more manageable and precise. The Italian government has contributed three containerized space freight

modules to the development of the international Space Station Alpha. Looking to the not-too-distant future, space logistics opens up logistical opportunities and challenges of its own.

Environmental Protection Issues are also Having an Impact

Many nations are enacting more stringent packaging regulations in an effort to increase resource recycling. Aircraft engine noise restrictions are forcing airlines to retire aircraft from some markets (although they still can be used in some parts of the world). Double hull tankers are now being required in U.S. ports to reduce the likelihood of oil spills. However, as some nations enact stricter environmental and worker safety measures, manufacturing is sometimes shifted to those nations with less restrictive standards or lax enforcement. One recent problem has been the dumping of toxic wastes in nations willing to import those wastes for a fee.

International Logistics is more Difficult to Manage Than Domestic Logistics

Because the assumptions made by managers may not be as reliable, situations are generally less stable, the geography is much broader, and monitoring logistics processes is more complex. Business practices and standards differ from nation to nation. Consider the problems of a global paint manufacturer. Many pigments and other paint ingredients have regulatory limitations regarding products with which they may or may not be used. Clear Cross, an international trade software firm, is developing global regulatory information systems to streamline the global operations of firms with such complex supply chain problems. Cultural differences also play major roles in selling and establishing ongoing relationships. The hard sell may be effective on the streets of Brooklyn but totally futile in Japan. The German businessman may be very direct and precise in price negotiations, while the Italian may be very deliberately and expertly coy. The American may want everything in writing, in contract form, whereas personal relationships will count for everything with the Saudi. Indeed, insisting too much on legalisms may be offensive to a foreign businessman and cause the deal to collapse. Systems of jurisprudence vary also. Contract law and the uniform commercial code as known in the United States are not universal. Firing a distributor in Venezuela, Argentina, or Saudi Arabia is not like firing a distributor in Hong Kong. Indeed, it may be very difficult to impossible to fire a distributor in certain countries.

International Logistics is Clearly more Challenging and Costly Than Domestic Logistics

Significant cost differences exist for the increased inventory needed due to the length of international transportation times. The tradeoffs between inventory cost and

transportation cost become magnified in international logistics, rendering some domestic solutions to those tradeoffs irrelevant to global movement of goods. A second category of increased cost is the complex documentation that is generally required in international trade but is nearly absent in domestic trade.

Managing the Logistics of a Global Organization

Managing the logistics of a global organization is immensely complicated. It can involve the movement of huge quantities of materials around the world. Unfortunately, there is no single best method for global supply chain that can be used by every organization. Each organization has to find its own solution. The following are the common methods for global logistics

Sell Globally but Concentrate Production and Sourcing in One Area

Logistics then has a fairly simple job of moving materials from local suppliers into the organization, but there are more problems with distribution from operations to international customers.

To some extent this model gives fairly easy logistics, as the organization is a pure exporter with global marketing rather than global operations. This can also be the most vulnerable to external presses, as it is seen as concentrating economic benefits in one centre.

Concentrate Production in One Centre but buy Materials and Components From Around the World

Materials are now collected from distant suppliers, and products sold to distant customers. This gives, perhaps, the most difficult logistics with potential problems for both inward and outward logistics. It gives more widespread economic benefits, but the main value-adding activities are still concentrated in one location.

'Postponement" moves the Finishing of Production Down the Supply Chain

In a global context, postponement typically opens limited local facilities to complete production. This gives some opportunities for local value, but all components and parts are imported from main production centres. Because of the limited local input, low added value, and competition for local manufacturers, this kind of screwdriver' operation can be unpopular with host countries.

Operating as a Local Company, Buying a Significant Proportion of Materials From Local Suppliers

The inward movement of materials is easier, as it becomes a local matter. Of course, this means that it may be vulnerable to changing local conditions. The products might be destined for local markets, or operations could be big enough to export to international customers. This is the most popular approach with host countries as it develops local skills and brings considerable economic benefits.

Some Global Operations have Limited Need of Logistics

The company works globally, but practicalities demand that it does not have an extended supply chain, but buys almost all materials locally and sells to local customers.

The features of the product and the company structure set the overall shape of a supply chain/.logistics. A global company, for example, is unlikely to use the first model with centralized operations, as this is more like a 'International Company'.

International Logistics Vs. Supply Chain Management

The terms logistic and supply chain are many times used synonymously without much regard to the marked differences between the two. Logistics is that part of the supply chain that plans and implements and control the efficient, effective, forward and reverse flow, and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirement. Logistics is a part of the bigger supply chain management or otherwise supply chain management is an expanded version of the logistic process. In clear term supply chain management involves strategies, tactics, and operations. On the other hand logistics concentrates on the actual ways and means to fulfills the overall supply chain strategy. Both logistic and supply chain management are incomplete without each other. Supply chain exists in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry and from company to company.

Logistics management is essentially an integrative process that seeks to optimize the flows of materials and supplies through the organization and its operations to the customer. It is essentially a planning process and an information-based activity. Requirements from the market place are translated into production requirements and then into materials requirements through this planning process.

It is now being recognized that, for the real benefits of the logistics concept to be realized, there is a need to extend the logic of logistics upstream to suppliers and downstream to final customers. This is the concept of Supply Chain Management (SCM).

Supply chain management is a fundamentally different philosophy of business organization and is based upon the idea of partnership in the marketing channel and a hjigh degree of linkage between entities in that channel. Traditional models of business organization were based upon the notion that the interests of individual firms are best served by maximizing their revenues and minimizing their costs. If these goals were achieved by disadvantaging another entity in the channel, then that was the way it was.

Under supply chain management model the goal is to maximize profit through enhanced competitiveness in the final market- a competitiveness that is achieved by a lower cost to serve, achieve in the shortest time-frame possible. Such goals are only attainable if the supply chain as a whole is closely coordinated in order that total channel inventory is minimized, bottlenecks are eliminated, time-frames compressed and quality problems eliminated.

This new model of competition suggests that individual companies compete not as company against company, but rather as supply chain against supply chain. Thus successful companies will be those whose supply chains are more cost effective than those of their competitors. The fig. outlines the critical linkages that connect the market place to the supply chain.

Critical linkages in Supply Chain Management

The key linkages are between procurement and manufacturing, and between manufacturing and distribution. Each of these three activities, while part of a continuous process, has a number of critical elements as pointed above.

Problem with International Logistics

The following are the major issues faced by logistic companies when they are involved in international trade. These might appear at every border, and circumstances can change within a very short distance

Difference in Logistics

International logistics are different from national logistics, and it is not just a case of moving the same activities to another location in terms of types of transport used, large variation in the demand for the service, more intermediaries involved, communication become more difficult distance and culture and documentation is more complicated.

Problem with Trade

The administrative difficulties are one type of problem for international logistics are physical barrier, such as border control and customer formalities, technical barriers, such as differing and health and safety standards and fiscal barriers such as different rates of value added tax, excise and customs duties.

Political and Legal System

The type of government and laws in different countries give significantly different conditions. Practices that are accepted on one country may be unacceptable in a neighbor. So the logistics company should take into consideration of the expectation of the country's political and legal system with regard to logistics.

Economic Conditions

Political system directly affects the economy, and there are significant differences in prosperity, disposable income and spending habits. Sometimes there are very rapid changes between borders of the two countries.

Competition

This competition varies between very tense, the market driven competition in some countries, to state run monopolies in others. Logistics in say China is particularly well developed and companies compete for business over a wide area.

Availability of Technology

Many logistics companies use sophisticated technologies for e-commerce, efficient customer response, satellite location, in-cub navigation, real-time routing, total communication, and a whole range of other developments.

Although such technology feasible, it does not mean that everybody uses it. Most of the world does not have access to, does not need, or cannot afford the latest technological development.

Geography

Transport is generally easier in straight lines over flat terrain. Physical barriers that hinder transport include seas, mountain ranges, desserts, jungles, rivers, cities, national parks, and so on.

Financial Issues

There are many financial factors to consider. Some countries do not allow their currency to be taken out of the country, the value of some currencies fluctuates wildly or falls quickly, some banking system are inefficient, sometimes exchanging money is difficult and so on. A different type of problem comes with customs duties and tariffs for material entering the country.

Customs Barriers

Conventionally, customs duty is payable whenever materials enter a country. In practice, there is more than just customs duty, and it can be quite difficult to add all the taxes and duties to calculate the amount payable. For example goods entering the European Union one might have to pay customs duty, countervailing duties, anti dumping duties etc., these are not only costs of crossing a border, as companies have to pay the cost of compliance with export/import regulations, such as compulsory documentation and information requirements.

Self Assessment Questions

1. Describe logistics as a business process.
2. What is global supply chain management? What is the role of international logistics in global supply chain management?
3. Make a list of logistics activities and participants in global supply chains.
4. What are channels? Give examples of different channel flows.
5. What are channel intermediaries? Give examples of different types of intermediaries.
6. What is a cost trade-off? Give an example from international logistics practice.

7. What are the main differences between logistics within a single country and logistics that span a number of different countries? What are the specific problems of working internationally?
8. Wh are companies moving towards global operations? What are the implications for logistics?
9. What major trends do you see in world trade and in the significance of global logistics?

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Lesson 1.3 - Transportation Activity

Learning Objectives

After reading this chapter you should be able to

- Define the proactive transportation
- Know the different modes of transportation
- List the factors considered in transport selection
- Discuss the five transportation activities
- Understand the transportation documents and its use

Introduction

Transportation is one of the major elements of logistics. Transport is responsible for the physical movement of materials between points in the supply chain. In an organization uses third party transport, the price of moving a unit of material between locations is the rate or tariff. This is set by the cost of the service provided, value to the customer, the distance moved, weight, size and value of goods, complexity of journey, and so on. This rate is an important consideration for logistics, and can affect whole pattern of movement. As a customer one is accustomed to seeing trucks and trains moving products, or parked at a distribution facility. While this experience provides a good visual understanding of transportation elements, however, to understand transportation's role in logistics operations one need a more in-depth knowledge. Previously the transportation service offerings were limited. There was little differentiation among the suppliers of transportation in terms of either quality or price. Things have changed since then and now there is increased pricing freedom and availability of new services and relationships, which require today's logisticians to be more proactive in identifying the most desirable combination of carrier services and pricing structures to meet the firm's objectives.

Definition

Transportation is a simple language can be defined as a means through which goods are transferred from one place to another. Otherwise transport is responsible for

the physical movements of material between points in the supply chain. Transportation concerns the movement of products from a source—such as a plant, factory, or workshop—to a destination—such as a warehouse, customer, or retail store. Transportation may take place via air, water, rail, road, pipeline, or cable routes, using planes, boats, trains, trucks, and telecommunications equipment as the means of transportation. The goal for any business owner is to minimize transportation costs while also meeting demand for products.

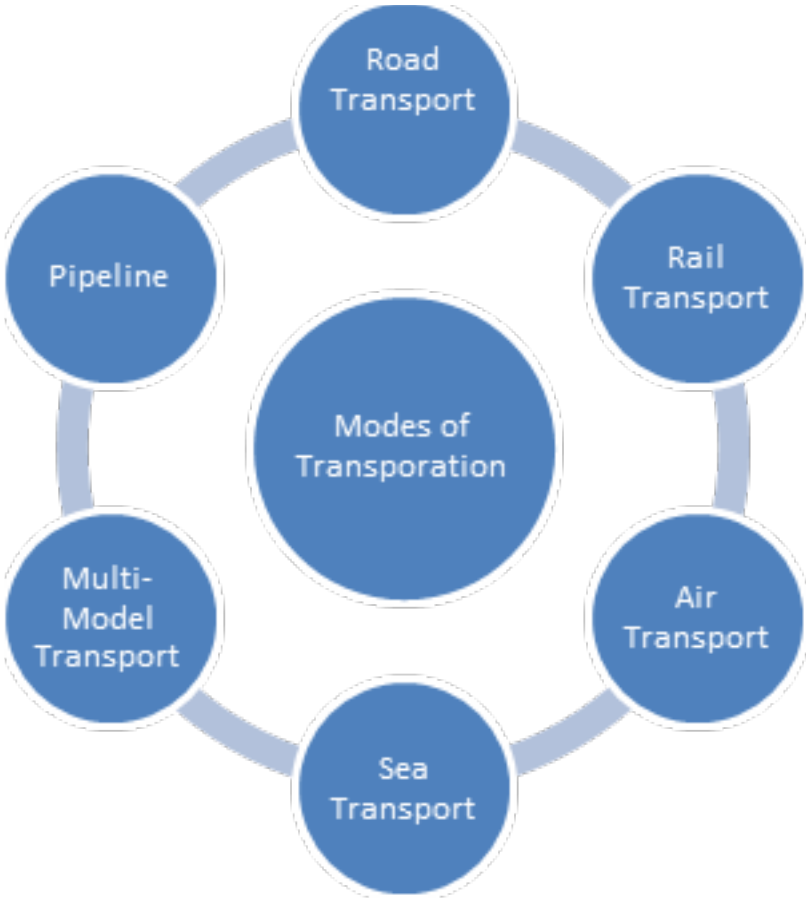
Transportation costs generally depend upon the distance between the source and the destination, the means of transportation chosen, and the size and quantity of the product to be shipped. In many cases, there are several sources and many destinations for the same product, which adds a significant level of complexity to the problem of minimizing transportation costs. Indeed, the United States boasts the world's largest and most complex transportation system, with four million miles worth of roads, a railroad network that could circle the earth almost seven times if laid out in a straight line, and enough oil and gas lines to circle the globe 56 times.

The decisions a business owner must make regarding transportation of products are closely related to a number of other distribution issues. For example, the accessibility of suitable means of transportation factors into decisions regarding where best to locate a business or facility. The means of transportation chosen will also affect decisions regarding the form of packing used for products and the size or frequency of shipments made. Although transportation costs may be reduced by sending larger shipments less frequently, it is also necessary to consider the costs of holding extra inventory. The interrelationship of these decisions means that successful planning and scheduling can help business owners to save on transportation costs.

Basic Means of Transportation

The mode of transport describes the type of transport used. There are basically five different options – rail, road, water, air and pipeline. Each mode has different characteristics, and the best in any particular circumstances depends on the type of goods to be moved, locations, distance, value and a whole range of other things. Sometimes there is a choice of mode, such as rail or ferry across etc., many distribution networks consist of a combination of these means of transportation.

For example, oil may be pumped through a pipeline to a waiting ship for transport to a refinery, and from there transferred to trucks that transport gasoline to retailers or heating oil to consumers. All of these transportation choices contain advantages and drawbacks.



Mode of Transport

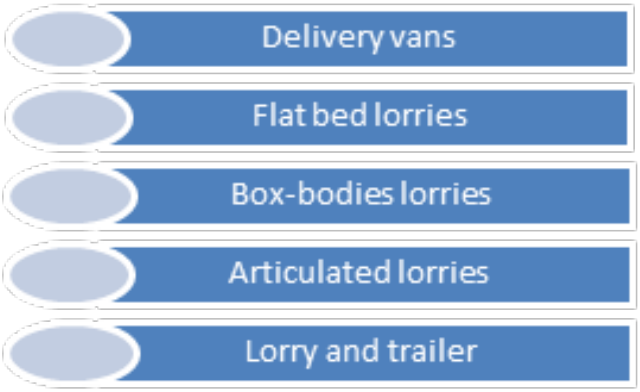
Road Transportation

Road is the most widely used mode of transport and is used at least somewhere in almost all supply chains. Its main benefit is flexibility, being able to visit almost any location.

Although the maximum speed on roads is limited, this ability to give a door-t-door service avoids transfers to other modes and can give a shorter overall journey time. Road transport has the advantage of being able to use extensive road networks. Unlike rail, these already exist, so users do not have to build and maintain their own tracks.

Also, vehicles do not have to keep to such rigid timetables, so they can go on journeys at short notice and with little planning. These days' different types of road vehicle are used to transport the goods.

In which many of these specialized and designed for specific purposes, and there are different regulations in different countries. The following are some of the roads vehicles used for transportation of the goods.



Multimodal Transportation

Multi model transport comprises of carriage of goods by more than one mode of transport namely, by road-rail – sea. The multi modal transport (MMT) is the same as combined transport. The multi modal or the combined transport is used in relation to shipment by sea. The need for combined transport or the multi modal transport had arisen due to the introduction of containers for transportation of goods in international trading.

Advantages of Multi-Modal Transport

- Loss of time and risk of loss, pilferage and damage to cargo incidental to the conventional segmented transport are eliminated
- The movement of cargo is faster
- The burden of documentation and other formalities connected with segmented transport is reduced
- The resultant cost savings tend to reduce through freight rates and the cost of cargo insurance.
- The consignor has to deal with only one agency- the multimodal transport operator in all matters relating to the movement of his goods including settlement of claims
- The through rates offered by Multimodal Transport Operators (MTO) make it easier for the exporter to negotiate sales contracts with foreign buyers on the basis of delivered prices.

Documents used in Multi Modal Transport

- Multi modal Transport Document (MTD) constitutes title to the goods and is transferable by endorsement. The holder of the MTD is entitled to receive or transfer the goods as mentioned in the MTD

- The contents of the Multi modal Transport Document (MTD) or the combined transport document are the same as given in the traditional Bill of Lading except that MTD
- MTD shows the place of acceptance or receipt and the place of delivery instead of ports of shipment and discharge
- MTD confirms that the goods have been 'taken in charge" for through-carriage from the place of acceptance or receipt to the place of delivery instead of being loaded on board a named carrying vessel.
- MTD may be issued by an operator who does not necessarily own the ships used to carry out any sea transport involved
- MTD necessarily involved transshipment (by transfer from one mode of transport to another)

Air Transport

Air transportation offers the advantage of speed and can be used for long-distance transport. Air transportation also carries a significant amount of freight, for products where speed of delivery is more important than the cost. In practice, this limits airfreight to fairly small amounts of expensive materials. Perhaps the most common movements are documents and parcel delivery, with carriers such as Federal Express, UPS, and Gati etc., There are three main types of operation. The first type is regular service, where major airlines use the cargo space in passenger aircraft that is not needed for baggage. The second type is cargo service, where operators run cargo planes on regular schedules. These are public carriers, moving goods for any customers. The third type is charter operations, where a whole aircraft is hired for a particular delivery.

In common with shipping and airlines has problems getting materials to and from their journeys. There are all sorts of facilities located around major airports for moving materials from sources onto the right planes, and then away from planes and out to customers. Unfortunately, these transfers again take time, and can reduce the benefits of air travel. Another problem for airlines is their costs, over which they have very little control. They have a combination of high fixed costs (aero planes are expensive to buy) and high variable costs (due to fuel, landing fees, staff and so on). It is expensive to keep planes flying, and there is no real way of reducing these costs. Competition can also be fierce, putting a limit on the amount they can charge and this frequently sends new airlines into bankruptcy. Air transportation generally used only for smaller items of relatively high value—such as electronic equipment—and items for which the speed of arrival is important—such as

perishable goods. Another disadvantage associated with air transportation is its lack of accessibility; since a plane cannot ordinarily be pulled up to a loading dock, it is necessary to bring products to and from the airport by truck.

Railways

Trains are ideally suited for shipping bulk products, and can be adapted to meet specific product needs through the use of specialized cars—i.e., tankers for liquids, refrigerated cars for perishables, and cars fitted with ramps for automobiles. Rail transportation is typically used for long-distance shipping. Less expensive than air transportation, it offers about the same delivery speed as trucks over long distances and exceeds transport speeds via marine waterways. In fact, deregulation and the introduction of freight cars with larger carrying capacities has enabled rail carriers to make inroads in several areas previously dominated by motor carriers. The capability to efficiently transport large tonnage over long distance is the main reason railroads continue to handle significant intercity tonnage and revenue. Rail experiences relatively low variable operating costs, the replacement of steam by diesel power reduced the railroad's variable cost per ton-mile, and electrification offers potential for more reductions. New labour agreements have reduced workforce requirements, further decreasing the variable costs. On the other hand railroad operations incur high fixed costs because of the use of expensive items to lay track, switching yards and terminals etc., the access to the network remains a problem for many businesses.

Motor Carriers

Accessible and ideally suited for transporting goods over short distances, trucks are the dominant means of shipping in the international logistics. Motor carriers have flexibility because they are able to operate small fixed investments in terminal facilities and operate on publicly maintained highways. Although the cost of license fees, user fees, and tolls is considerable, these expenses are directly related to the number of over-the road units and miles operated. The variable cost per mile for motor carriers is high because a separate power unit and driver are required for each trailer or combination of tandem trailers. The characteristics of motor carriers favour manufacturing and distributive trades, short distances, and high value products. Motor carriers have made significant inroads into rail traffic for medium and light manufacturing. Because of delivery flexibility, they have captured almost all freight moving from wholesalers or warehouses to retail stores. The prospect for maintaining stable market share in highway transport remains bright. The primary difficulties relate to increasing cost to replace equipment, maintenance, driver wages, and platform and dock wages. Although accelerating labour rates influence all modes of transport, motor carriers are more labour-intensive, which causes higher wages

to be a major concern. To counteract this trend, carriers have placed considerable attention on improved line-haul scheduling that bypasses terminals, computerized billing systems, mechanized terminals, tandem operations that pull two or three trailers by a single power unit, and utilization of coordinated intermodal systems. These enhancements reduce labour intensity and, thus cost.

Water Transport

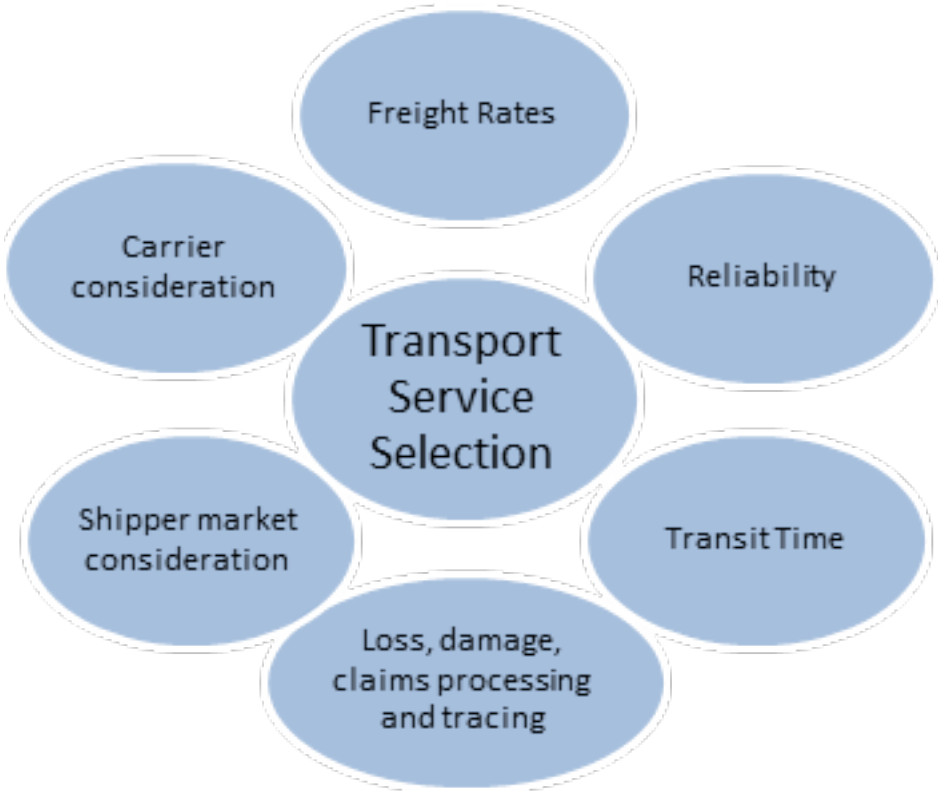
Both rail and road transport has the obvious limitations of only being used on land. Most supply chain use shipping to cross the oceans at some point, and over 90 percent of world trade is moved by sea. There are three types of water transport – rivers and canals (usually called inland waterways), costal shipping (moving materials from one port to another along the cost) and ocean transport (across the major seas). Countries like Canada, USA, UK have well-developed river and canal transport. Cities like New York, Hong Kong, and Chicago have major ports. Water transportation is the least expensive and slowest mode of freight transport. It is generally used to transport heavy products over long distances when speed is not an issue. Although accessibility is a problem with ships—because they are necessarily limited to coastal area or major inland waterways—piggybacking is possible using either trucks or rail cars. However, industry observers note that port terminal accessibility to land-based modes of transportations is lacking in many regions. The main advantage of water transportation is that it can move products all over the world. The main drawback with water transport is, of course, its inflexibility in being limited to appropriate ports. Journeys from suppliers and to customers inevitably used a change of mode, even if they are close to ports. The other problem with shipping is that it is relatively slow, and needs time to consolidate loads and transfer them at ports.

Pipeline Facilities

Pipe lines are the cheapest way of moving liquids particularly oil, chemicals, slurry coal and gas over long distances. Local network can add flexibility by delivering to a wide range of locations such as supplies of water and gas to homes. Pipelines have the advantage of moving large quantities over long distances. Unfortunately, they have the disadvantages of being slow, inflexible and only carrying large volumes of certain types of fluid. In addition, there is the huge initial investment of building dedicated pipelines. Despite this initial investment, pipelines are the cheapest way of moving liquids According to *Transportation and Distribution,* in the USA natural gas line networks include 276,000 miles of transmission pipe and more than 919,000 miles of distribution lines, which combine to deliver nearly 20 trillion cubic feet of gas on an annual basis.

Factors Influencing Transportation

The selection of a mode of transport or service offering within a mode of transportation depends on a variety of service characteristics. According to Michael A. McGinnis (1996) the following are key transport service choice



Transport Service Selection

The factors influencing the selection of transportation mode depends on variety of factors. Perhaps the main ones are the nature of materials to move, the volume and distance and other factors include the following

Transportation Cost

Transportation cost was the predominant carrier selection determinant in early carrier selection works. The transportation cost includes the rates, minimum weights, loading and unloading facilities, packaging and blocking, damage in transit and special services available from a carrier.

Transportation cost analysis is oriented toward evaluating alternative modes, since the rates, minimum weights, loading and unloading facilities, packaging and blocking will vary from one mode to another.

Transit Time

Transit time is the total time that elapses from the time the consignor makes the goods available for dispatch until the carrier delivers same to the consignee. This includes the time required for pickup and delivery, for terminal handling and for movement between origin and destination terminals.

Cost of Materials

The values of materials as expensive items raise the inventory cost and encourage faster modes of transportation

Market Coverage

Transportation costs influence the size of markets covered in a big way. The characteristics of transportation are costs, flexibility, reliability and availability. The product per se will influence the economics of the decision. A low volume and high value product will be able to support higher costs, which extended delivery distance and increase in delivery frequency.

Safety and Security of Goods

The goods transported should reach in the same condition. Although the common carrier is held liable for all loss and damage, with limited exceptions, the firm does incur costs when the carrier loses goods or delivers them in a damaged condition. Unsafe service results in opportunity costs of forgone profits or productivity because the goods are not available for sale or use. The continued use of an unsafe carrier will adversely affect customer satisfaction and consequently sales.

Capability and Accessibility

Capability and accessibility determine whether a particular carrier can physically perform the transport service desired. Capability refers to the carrier's ability to provide the equipment and facilities that the movement of a particular commodity requires. Accessibility considers the carrier's ability to provide service over the route in question. Accessibility refers to a carrier's physical access to facilities. The geographic limits of a carrier's route network (rail lines or water ways) and the operating scope that regulatory agencies authorize constrain a carrier's accessibility. A carrier inability to meet the desired capability and availability service requirements can eliminate the carrier from consideration in the carrier selection decision.

Impact of Communication

In order to obviate delays in transportation and handling of logistics, both suppliers and distributors today's are relying more on electronic transfer systems, IT and the Internet. This will help in considerable reduction in time delays and effect better cooperation between the chains.

Sourcing Decisions

The geographical dimensions of the source markets can be influenced by low-cost transportation systems;

Manufacturing Operations

The cost of transporting has a direct bearing on the location of the manufacturing market centre. That is why extraction-based units are usually located close to the source of raw materials and products related to customer satisfaction are closer nearer to the customer hub centre.

Product Decision

Transportation happens to be one of the most important components of product costs. Therefore, selection of the appropriate transportation mode will have a direct bearing on the product cost, with more relevance to exports. Evidently, an increase in transportation costs increases the product pricing.

Customer Service Decisions

Both customer service policies and transportation decisions go hand in hand and hence one cannot be considered in isolation without the other. Moreover, the type of market will also dictate the decision and price will vary considerably. Therefore, it's pertinent to overrule the cost factor while servicing medical customers, for instance, since speed is more important than cost in selecting the transport mode.

Special Equipment

Some time shippers making the carrier decision based on the special equipment available in the modes of transport to hand goods during loading and unloading etc.,

Financial Stability of Transportation Company

Transportation rates, the carrier's willingness to negotiate rate changes, and the carrier's financial stability reflect the negotiating strategy inherent in the deregulated environment. Today's shippers utilize their economic buying power in the marketplace to realize lower transportation rates from carriers but this highly competitive motor carrier industry has experienced thousands of bankruptcies since deregulation begun in 1980's.

Internal Transportation

Internal transportation is the management of a complex supply chain from suppliers to manufacturers through efficient transport. A critical part in supply chain that involves manufacturing is getting all the required parts and raw materials in the right sequence, the right quantity, the right quality and the right time to the manufacturing and assembly plants. In the search for the most cost-effective solutions to organize these often very complex activities, inventory levels are bring reduced and technological advances are put to use to provide visibility in the whereabouts of all parts moving to the plant at any given time.

Inter-State Goods Movement

For a countries' economy, the transportation sector is often viewed as an important barometer of growth. As more goods are consumed within a country, the transportation sector must grow accordingly in order to accommodate the transport of additional goods. For the inter-state goods movement logistics part a prime role and can be considered as a tool for getting resources, like products, services, and people, where they are needed and when they are desired. It is difficult to accomplish any marketing or manufacturing without logistical support. It involves the integration of information, transportation, inventory, warehousing, material handling and packaging. The logistician must contend with many peculiarities of demand, distribution, competition and government regulation that differ from one country to another. These constrain the logistics system design generally to fewer choices than are domestically available and at the same time, they force the logistician into operating the logistic systems in a manner different from domestic operations for the same product.

The major transport models that are used for inter-state goods movements are include aviation, road, shipping and courier. For inter-state transactions few additional logistical obligations are to be considered which are discussed below

Documentation

There are several types of documentation required to perform inter-state movements of goods, it is used to govern, direct, control and provide information about a shipment. Especially documents like bill of lading, freight bill, sales documents, transportation documents like export declaration, export license, invoices, carnet, dock receipt and airway bill are demanded during interstate movement of goods.

Government Regulations

The logistic companies who are planning and operating in international logistics system have to deal with a vast number of legal regulations by government that varies from democracies to dictatorships. These regulations can affect all aspects of distribution, ranging from packaging, marketing documentation to the location of warehousing and manufacturing facilities.

The latter are more generally affected because governments seek to satisfy their own interests in such areas as employment, industrial growth, uses of raw materials and acquisition of wealth.

Regional Differences

The inter-state goods movement finding regional differences is a common factor pervasive factor. Heavy tariffs, duties and taxes that governments place on imported goods often prove a hurdle to the trader. Regional differences, special zones and free ports, eliminate this disadvantage for the benefit of both the exporting and the importing country. There can be numerous advantages to the logistician responsible for international goods movements. Duties, quotas, and other restrictions and costs placed on the exporter or importer by governments are real concerns to the logistician.

However the trade zone is a key link in the logistical channel for minimizing movement cost and for providing potential customers with service levels that are competitive with domestic products.

Managing Transportation

Managing transportation for inter-state goods movements that result from growing international trade creates new problems for the logistician. International shipments often originate in the interior of one country and have destination in the interior of another. The

logistician may have to deal with various transporters and several freight classifications and tariff schedules. The liability of a carrier in international movement is quite different from that of domestic carriers. In fact it is much less for the international carriers.

Documents Used in Transportation

Export Declaration

Export declaration provides information to Department of Commerce with information concerning the export shipment's nature and value. To know the commodity information like description of the commodity, the shipping weight, a list of the marks and numbers on the containers, the number and dates of any required export license, the place and country of destination and the parties to the transaction are consist in the export declaration.

Export License

Export license given by government to export the goods by the company or the individual. Normally two different types of export licenses issued to exporters are general license and validated export license. General licenses allow the export of most goods without any special requirements. Validated export license used only for items whose export the government wishes to control like military hardware, certain high-tech items such as supercomputers and other goods for which control is in the national interest.

Commercial Invoices

The commercial invoice, which the seller uses to determine the commodity's value less freight and other charges is basically the seller's invoice for the commodities sold. The letter of credit and companies or agencies often require this invoice to determine the correct value for insurance purposes and for assessing import duties. Some countries have special requirements (languages, information requested etc.,) for the commercial invoice.

Carnet

Carnet is often issued when the shipment is made in a sealed container. Carnet indicates that the shipment has been sealed at its origin and will not be opened until it reaches its final destination. The container may then pass in transit through intermediate customs points without inspection. Carnets very useful for intermodal shipments and for containers crossing several national boundaries between origin and destination.

Bill of Lading

When the goods are accepted by the transportation then he issues the transport documents call bill of lading. Bill of Lading indicates the title of the goods shipped, receipt for the goods shipped and admission to their apparent condition and quality at the time of shipment and an evidence of contract of affreightment. Bill of lading is negotiable instrument and can be transferred by endorsement and delivery. Its possession is equivalent to the possession of goods.

Certificate of Insurance

This is document indicating insurance of the cargo. It is issued by the insurance company. The difference between the two is that the certificate is just an evidence of insurance; it does not state the terms and conditions of insurance. The insurance policy, on the other hand, states the terms and condition of insurance of the goods.

Dock Receipt

An exporter has to pay the port and dock charges when the shipment is sent by sea. The amount of these charges is assessed on the basis of the nature of goods, volume, weight etc., of the goods. These details are given in the prescribed form which is known by different names such as dock challan, export application.

Airway Bill

Airway bill is a standardized document that air carriers use on all international air shipments. By reducing required paper work to one document, the carriers reduced processing costs. Having a standardized document also helps to speed shipments through customs.

Certificate of Origin

The certificate of origin which specifies the country where the goods has been produced. In most countries, importers are required to submit a certificate of origin in respect of import consignment for obtaining their customs clearance. In India such a certificate can be issued by any chamber of commerce, Export Promotion Councils and various other trade promotion councils authorized by the government of India

Self Assessment Questions

1. Explain the various activities of transport
2. Explain the scope of internal transport
3. Explain the activities of interstate transportation
4. Transport is becoming increasingly less important, as e-commerce and other developments become widespread'. Do you think that is true?
5. One of the major trends in logistics is the move towards contract transport. Why?
6. What is multi model transportation of goods? What are the advantages of multi modal transportation as compares to segmented modes of transportation?
7. Discuss the factors that you would consider in the selection of modes of transport.

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Lesson 1.4 - Factors Influencing Distribution and Logistics

Learning Objectives

After reading this chapter you should be able to

- Define 'Logistics' and Associated terms
- Understand the Concept of logistics
- List different activities of logistics and understand the relationship between them
- Show how Factors influencing in distribution and logistics

Introduction

Organization can only survive by supplying products that customers view as somehow better than those from competitors. Logistics affects the lead time, availability, cost, customer support, damage and so on and hence customer's view of a product. In this sense, logistics actually contributes to the design, quality, perceived vale and success of a product. Selecting a good logistics strategy requires much of the same creative processes as developing a good corporate strategy. The following are factors influencing the logistics related decision of any organization.

Factors Influencing Distribution and Logistics

Customer Service

The customer service is of great importance to the logistics. A company should consider minimizing buyer inventory costs to be just as important as keeping product price low, since minimizing such costs will contribute to more profit or in turn enable the seller to be more competitive.

Order Cycle

The order cycle length directly affects inventory requirement is a well-accepted principle of logistics management; stated another way; the shorter the cycle, the fewer

inventories is required. Order cycle as the time it takes for a customer to receive an order once he or she has decided to place it. It includes elements such as order transmittal time, order preparation time, and transportation time.

Substitution

Substitutability very often affects the importance of customer service. In other words, if a product is similar to other products, consumers may be willing to substitute a competitive product if a stock out occurs. Therefore, customer's service is more important for highly substitutable products than for products that customer may be willing to wait for or back order. In this case the logistics manager should spend more on transportation.

Transportation Effect

Companies usually trade off increased transportation costs against decreased lost sales costs. For transportation, this additional expenditure involves buying a better service. For example, switching from water to rail, or rail to motor, or motor to air. The higher transportation costs also could result from shipping more frequently in smaller quantities at higher rates.

Impact of Transportation Costs

Transportation rates reflect the risk associated with the movement of goods. There is often more chance for damage with higher value goods; damage to such goods will cost the transportation company more to reimburse. Transportation companies also tend to change higher rates for higher value products because their customers can typically afford to pay a higher rate for such products. A relationship exists between the product value and the rate amount in transportation rate structures.

Spatial Relationships

Spatial relationship means that the location of fixed points in the logistics system with respect to market and supply points. Spatial relationships are very important to transportation costs, since these costs tend to increase with distance.

Density

Density which refers to the weight/space ratio. An item that is lightweight compared to the space it occupies. For example, household furniture has low density. Density affects

transportation and warehousing costs and transportation costs tend to fall. In establishing their rates,. Transportation companies consider how much weight they can fit into their vehicles, since they quote their rates in terms of dollars.

Distance

The distance factor or spatial relationship may affect logistics costs in ways other than transportation costs. For example, a firm located far from one or more of its markets may need to use a market-oriented warehouse to make customer deliveries in a satisfactory time period. Therefore, distance can add to warehousing and inventory carrying costs. It may also increase order processing costs. Distance or spatial relationships are of such importance to logistics costs that logistics responsibilities include site location.

Factors Influencing Distribution and Logistics

Cost

Most organizations want low costs, but some adopt a positive strategy of minimizing their logistics costs. This leads to higher profits for the organization and lower prices for customers.

Customer Service

Logistics controls stock levels, delivery times, speed of response, and other measures of customer service. By concentrating the logistics strategy on customer service, organizations can get a long-term competitive advantage.

Timing

Customers generally want products as soon as possible, so a common logistics strategy guarantees fast deliveries. Timing can also mean rapid supply of new products, or delivering at the time specified by a customer.

Quality

Customers demand higher quality in all products. A common logistics strategy guarantees high quality service, even though it can be difficult to say exactly what mean by 'high quality logistics'.

Product Flexibility

This is the ability of an organization to customize products to individual specifications. One logistics strategy is based on a specialized or customized service, such as pick fords removals.

Volume Flexibility

Changing levels of business can cause severe problems for logistics, as one can see during the morning rush hours in any major city. Volume flexibility allows an organization to respond quickly to changing levels of demand.

Technology

Logistics uses a wide range of technologies for communication, tracking loads, sporting parcels, identifying products, recording stock movements, and so on. Some organizations have a strategy of developing and using the latest technologies.

Location

Customers generally want products to be delivered as close to them as possible. This might mean that a book club delivers directly to door, a shop has a convenient location

in a town centre, or a wholesaler has a regional logistics centre near to major cities. One logistics strategy is to provide a service in the best possible location, such as bus station in town centers.

Self Assessment Questions

1. Define distribution system in logistics
2. Describe the factors considered in logistic related decisions
3. What are the factors influencing the distribution and logistics decisions in international business
4. Define order cycling in distribution system

CASE STUDY

Varun Limited, a cash rich company involved in business of fruit processing and making of fruit syrup (sarbat). The fruit pulp is mainly exported and has very limited market in metros, whereas sarbat is having very good domestic market. They are selling their products under the very popular brand "Natural". They have a modern plant, which is located near Bhopal.

The fruits purchased from various fruit cultivating areas such as grapes from Nasik, etc., to make effective localized procurement they have four procurement centers with cold storage facilities. The fruits are transported from this procurement centre to factory using hired trucks. While transporting frits from warehouse to factory, there were shortages and also damages/ decompositions that varied from 15% to 25% and also there were inconsistency in transit time.

The "Natural" packaging is one of the reasons for popularity of his brand. The quality and taste of syrup has created very good consumer base for sarbat. The sarbat is sold in ten different variants and three different packaging sizes. The sarbat loses the taste if it is kept for longer period (2 months) in normal condition. The taste remains to its best if it is kept in cold condition. The sarbat is distributed through 20 different distribution centers and are equally distributed in each zone. These centers are directly reporting to factory and passes information once a week. These sarbat were packed in very strong secondary packaging, even then there were 18% to 20% damages in transit. There was excess inventory in some of the distribution centers while shortage in others. Also, specifically in summer season there were complaints about the quality (change in taste) of syrup.

Entry of multinationals with synthetic sarbat increased the competition and put lot o pressure on "Natural". The Managing Director of Varun Limited formed a team of senior executive to come with concrete plan to fight the competition and increase market share and margin. And they decided to appoint a logistic consultant to overcome some of the problem. The Managing Director wants to appoint you as logistics consultant to solve the above problems so that the company can fight competition and increase market share and margin.

Questions

1. Suggest proper transportation policy to ensure minimum transportation loss of fruits and Sarbat and reduction in packaging cost.
2. Suggest the appropriate distribution method to maintain the quality of Sarbat
3. Develop a demand forecasting techniques to take care of seasonality, reduction in inventory and shortage of some area
4. Establish a connectivity between factory and distribution centers (networking diagram)

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UNIT - II

Transportation

Unit Structure

Lesson 2.1 - Containerization
Lesson 2.2 - Container Freight Station
Lesson 2.3 - Container Corporation of India Limited (CONCOR)
Lesson 2.4 - Dry Ports
Lesson 2.5 - Role of Logistics Intermediaries

Lesson 2.1 - Containerisation

Learning Objectives

After reading this chapter you should be able to

- Define Containerization
- Understand the Need for Containerization
- List different benefits of Containerization
- Understand different types of Containerization
- Know the Disadvantages of Containerization

Introduction

Transportation from shipper's premises to gateway port usually required transportation through road/rail/sea. This aspect of transportation from warehouse to gateway port resulted in multiple handling, damages, pilferages and delays to the goods due to switch over from one mode of transport to another. Keeping this factor in mind

the senders of goods naturally insured the goods for transit at a higher rate of premium. To overcome the above obstacles transportation of cargo is greatly facilitated through containerization and packaging developments to safeguard the goods during transit. Containerization can be defined as a system of intermodal [The term intermodal means that the container can be loaded on different means (or modes) of transport - for example, ships, aircraft, trains, trucks, etc. - with the minimum of effort and without have to unpack and repack the container.] freight and cargo transport using standard ISO containers (known as Shipping Containers) that can be loaded and sealed intact onto container ships, railroad cars, planes and trucks. The idea of using standard containers that could be easily and quickly packed and loaded onto like 'lego blocks' onto ships, aircraft, trucks and trains, resulted in a huge reduction in port handling costs, contribute significantly to lower freight charges, increased cargo security and, in turn, boosted trade flows.

Need of Containerization

A container is a large rectangular box into which a firm places commodities to be shipped. After initial loading, the commodities themselves are not re-handled until they are unloaded at their final destination. Throughout the movement, the carrier handles the container, not the commodities; the shipper can transfer the container from one mode of transport to another, eliminating the need to handle the commodities each time. Reducing commodity handling reduces handling costs, damage costs, theft and pilferage, and the time required to complete the modal transfer.

Containerization changes materials handling from a labor intensive to a capital intensive operation. Handling containerized freight requires less labour because the container is too large and too heavy for manual movement. Many firms that modify their materials-handling systems to include cranes, forklift trucks, and other equipment capable of handling the large, heavy containers have found containerization to be a desirable avenue for increasing productivity and controlling materials-handling costs, especially in periods of continually increasing labour costs.

Containerization has gained notable acceptance in international distribution. The service reduces the time and a cost associated with shipment handling at ports and curtails damage and theft. Some firms containerizing shipments to foreign markets have reduced costs by from 10 to 20 percent and have increased the service level they provide to these markets.

The transportation mode like intermodal service using the container is the land bridge, which utilizes rail transportation to link prior and subsequent container moves by

water transportation. For example, containers destined for Europe from the Far East move to the West Coast of the United States by water transportation. The containers move by rail to the East Cost, where a carrier a carrier loads them onto an oceangoing vessel for the final transportation to Europe. The rail movements provide the intermodal bridge between the two water moves and permits an overall transit time shorter than that of an all water shipment.

Some of the benefits of containerization include

- Simplified transport and flow of goods
- Easier and faster handling
- Genuine door-to-door service
- Faster deliveries
- Reduced loss due to damage, misplacement and pilferage
- Reduced packing costs
- Lower insurance costs
- Separation of incompatible goods
- Use of less congested routes
- Improved transport encourages trade

Types of Containers

In most instances the definition is derived from statistical standards developed by international organizations such as the IMF, OECD, and ILO. The main types of containers as defined by ISO Standards Handbook on Freight Containers are

General Purpose Containers

A shipping unit designed to hold nonspecific types of goods without special equipment, controls, restraints, protective gear or other parts to preserve the condition of the contents.

Specific Purpose Containers

- Closed ventilated container;
- Open top container;

- Platform based container open sided;
- Platform based container open sided with complete superstructure;
- Platform based container open sided with incomplete superstructure and fixed ends;
- Platform based container open sided with incomplete superstructure and folding ends;
- Platform (container);

Specific Cargo Containers

- Thermal container;
- Insulated container;
- Refrigerated container - (expendable refrigerant);
- Mechanically refrigerated container;
- Heated container;
- Refrigerated and heated container;
- Tank container;
- Dry bulk container;- named cargo container (such as automobile, livestock and others); and,
- Air mode container.

Disadvantages of Containerization

- High capital costs are involved in purchasing and maintaining containers.
- High training costs are incurred in training labour to handle the loading and unloading of containers.
- Containers occupy a lot of space and hence large space is needed to keep the containers.
- The weight of the containers, reduce the amount of goods that can be transported.
- Containers are loaded and unloaded with the help of cranes.
- This replaces human labour thus causing unemployment.

Self Assessment Questions

1. What are the different purposes of containers?
2. Describe the need for containerization
3. How containers are useful in multimodal transportation?
4. Classify the different types of containers
5. What are the problems faced due to containerization of goods?

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Lesson 2.2 - Container Freight Station (CFs) or Inland Containder Depots (ICDs)

Learning Objectives

After reading this chapter you should be able to

- Define CFS or ICDs
- Understand the Concept of CFS or ICDs
- List different Functions of CFS or ICDs
- Key Benefits of CFS or ICDs
- System elements of logistics
- To Know the Existing Guidelines for approval of CFS or ICDs

Introduction

With the liberalization of Indian economy, last few years have seen considerable growth in import and export volumes. With the new modes of transportation and increase in international trade and containerization, the ports were getting congested. Further, with widespread industrialization and economic growth, the imports for use in hinterland and exports originating from there have increased over time. It was difficult for importers or exporters based in the hinterland, to come to a gateway port for clearance of imported or export goods. With the development of multi-modal transport system with its stress on greater facilitation to importers/exporters, a need was felt to develop Inland Container Depots (ICDs) or Container Freight Stations (CFSs). These were to essentially function like a dry port. These ICDs/CFSs were to function as common user facilities offering all the services for Customs clearance like any other port.

Definition of ICD/CFS

An Inland Container Depot / Container Freight Station may be defined as

"A common user facility with public authority status equipped with fixed installations and offering services for handling and temporary storage of import/export laden and empty containers carried under customs control and with Customs and other agencies competent to clear goods for home use, warehousing, temporary admissions, re-export, temporary

storage for onward transit and outright export. Transshipment of cargo can also take place from such stations".

In India to monitor the growth of ICDs/CFSs, a regulatory authority in the form of an Inter-Ministerial Committee (IMC) under the chairmanship of the Additional Secretary(Infrastructure), Ministry of Commerce, has been set up. It comprises representatives from the Department of Revenue, Ministry of Surface Transport, Ministry of Railways and the Ministry of Commerce. The Committee considers the proposals submitted by Public Sector as well as Private Sector entrepreneurs for setting up of new ICDs/CFSs at different centres in the country and monitors their progress. There were about 30 ICDs/CFS prior to constitution of the IMC. After its constitution in the year 1992, the IMC has approved about 135 ICDs/CFS and out of total 165 ICDs/CFSs, about 100 are reported to be already in operation and others are in pipe line.

A For the purpose of examination, assessment of the containerized cargo, both import and export Container Freight Station (CFS) are set up. They are appointed as custodians of the imported goods by the Commissioner of Customs, under Section 45 of the Customs Act, 1962. The imported goods shall remain in the custody of such person as approved by the Commissioner of Customs until they are cleared for home consumption or warehoused or transshipped.

Distinction Between an ICD & a CFS

Functionally there is no distinction between an ICD/CFS as both are transit facilities, which offer services for containerization of break bulk cargo and vice-versa. These could be served by rail and/ or road transport. An ICD is generally located in the interiors (outside the port towns) of the country away from the servicing ports. CFS, on the other hand, is an off dock facility located near the servicing ports which helps in decongesting the port by shifting cargo and Customs related activities outside the port area. CFSs are largely expected to deal with break-bulk cargo originating/terminating in the immediate hinterland of a port any may also deal with rail borne traffic to and from inland locations. Keeping in view the requirements of Customs Act, and need to introduce clarity in nomenclature, all containers terminal facilities in the hinterland would be designated as " ICDs".

Functions of ICDS/CFSS

The primary functions of ICD/CFS may be summed up as under

- Receipt and dispatch/delivery of cargo.
- Stuffing and stripping of containers.

- Transit operations by rail/road to and from serving ports.
- Customs clearance.
- Consolidation and desegregation of LCL cargo.
- Temporary storage of cargo and containers.
- Reworking of containers.
- Maintenance and repair of container units.

The Operations of the ICDs/CFSs Revolve Around the Following Centers of Activity

i) Rail Siding (in case of a Rail Based Terminal)

The place where container trains are received dispatched and handled in a terminal. Similarly, the containers are loaded on and unloaded from rail wagons at the siding through overhead cranes and / or other lifting equipments.

ii) Container Yard

Container yard occupies the largest area in the ICD/CFS. It is stacking area were the export containers are aggregated prior to dispatch to port, import containers are stored till Customs clearance and where empties await onward movement. Likewise, some stacking areas are earmarked for keeping special containers such as refrigerated, hazardous, overweight/over-length, etc.

iii) Warehouse

A covered space/shed where export cargo is received and import cargo stored/ delivered; containers are stuffed/stripped or reworked; LCL exports are consolidated and import LCLs are unpacked; and cargo is physically examined by Customs. Export and import consignments are generally handled either at separate areas in a warehouse or in different nominated warehouses/sheds.

iv) Gate Complex

The gate complex regulates the entry and exist of road vehicles carrying cargo and containers through the terminal. It is place where documentation, security and container inspection procedures are undertaken.

Benefits of ICDs/CFSs

The following are the main benefits from ICDs/CFSs

- Concentration points for long distance cargoes and its unitization.
- Service as a transit facility.
- Customs clearance facility available near the centers of production and consumption
- Reduced level of demurrage and pilferage.
- No Customs required at gateway ports.
- Issuance of through bill of lading by shipping lines, hereby resuming full liability of shipments.
- Reduced overall level of empty container movement.
- Competitive transport cost.
- Reduced inventory cost.
- Increased trade flows.

Existing Guidelines for Approval of ICD/CFS

1. Feasibility Study/Prior Survey a Must

For the ICD/CFS to be successful, reduction in total transport cost is a prime criterion, as there is a possibility of marginal increase in total handling cost per box on origin to destination basis. This underlines the need for sound economic justification for setting up ICD/CFS through a carefully evaluated traffic likely to be handled at the proposed facility.

A survey/feasibility study must precede the setting up of all ICDs/CFSs and copy of the report should invariably accompany the application for setting up such a facility. Data for carrying out analysis could be from secondary sources and field observations, structured over time and space. The latter is more realistic and truthful. Prior discussions must be held with exporters, shipping lines, freight forwarders, port authorities, concerned Commissioners of Customs/Excise etc., and their point of view fully reflected in the report.

2. The traffic flows between inland centers of production and ports need to be analyzed with reference to -

- Commodities
- Directional-split (Imports/Exports)

- Proportions of less-than-container load (LCL) & full-container-load (FCL)
- Forecast of future growth.
- Modes of transport available.
- Possible reduction in tone per kilometer or
- Box per kilometer costs.

3. The facility has to be economically viable for the management and attractive to users

To the railways for full train load movements; to other transport operators; seaports; shipping lines; freight forwarders etc. must have certain minimum amount of traffic. The prospective entrepreneurs are, therefore, strongly advised to study very carefully the viability of the project from the TEU traffic availability point of view.

In the background of growing international trade, the infrastructure facility may have to precede the actual generation of demand. This is particularly important as such facilities have a long gestation period for being fully operationalised. Though it is not proposed to lay down any minimum TEU figures as part of the criteria for approval of ICDs/CFSs, following are suggested indicative norms -

For ICD – 6,000 TEUs per year (Two way)

For CFS – 1,000 TEUs per year (Two way)

4. Land Requirements

The minimum area requirement for a CFS would be One Hectare and for ICD Four Hectare. However, a proposal could also be considered having less area on consideration of technological up gradation and other peculiar features justifying such a deviation.

5. Design and Lay-Out of ICD/CFS

The design and layout should be the most modern state-of-art equipped with mechanical/electrical facilities of international standards. Key to a good lay-out is the smooth flow of containers, cargo and vehicles through the ICD/CFS. The design and lay out should take into account initial volume of business, estimated volume in 10 years' horizon and the type of facilities exporters would require.

The initial lay out should be capable of adaptation to changing circumstances. The design broadly should encompass features like (rail) siding, container yard, gate house and

security features, boundary wall (fencing), roads, pavements, office building and public amenities. The track length and number of tracks should be adequate to handle rakes and for stabling trains where relevant. The perimeter fencing and lighting must meet the standards required by Customs authorities. The gate being the focal point of site security should be properly planned. The administration building is the focal point of production and processing of all documentation relating to handling of cargo and containers and its size will be determined by the needs of potential occupants. Fixed provisions should be made for sanitation facilities and possibly a food service facility.

A good communication system and computerization and EDI connectivity is essential. Following Infrastructure should be available at the ICDs/CFSs

- Provision of standard pavement for heavy duty equipment for use in the operational and stacking area of the terminal. In cases where only chassis operation is to be performed, the pavement standard could be limited to that of a highway.
- Office building for ICD, Customs office and a separate block for user agencies equipped with basic facilities.
- Warehousing facility, separately for exports and imports and long term storage of bonded cargo.
- Gate Complex with separate entry and exit.
- Adequate parking space for vehicles awaiting entry to the terminal.
- Boundary wall according to standards specified by Customs.
- Internal roads for service and circulating areas.
- Electronic weighbridge.
- Computerized processing of documents with capability of being linked to EDI.

6. Equipping the ICD/CFS

The ICD/CFS would select most modern handling equipment for loading, unloading of containers from rail flats, chassis, their stacking, movement, cargo handling, stuffing/ destuffing, etc. Following minimum equipment should be made available at ICDs/CFSs (Reach stacker may not be mandatory

I. Dedicated equipment such as lift truck (front end loader, side loader or reach-stacker), straddle carrier, rail mounted yard gantry crane, rubber tyred yard gantry crane, etc. of reputed make and in good working condition (not more than 5 to 8 years old) and equipped with a telescopic spreader for handling the 20 ft and

40 ft boxes. The equipment must have a minimum residual life of 8 years duly certified by the manufacturer or a recognized inspection agency. An additional unit of equipment should be provided when the throughput exceeds 8000 TEUs per annum or its multiples for lift truck based operations.

II. Terminals resorting to purely chassis-based operations do not require dedicated box handling equipment. However, chassis-based operations should be restricted to CFSs proposed to be set up near ports.

III. Small capacity (2 to 5 tonnes) forklifts must be provided for cargo handling operations in all terminals.

7. Rail Head ICDs

The parties will be required to provide at their own cost all infrastructure facilities including land, track, handling equipment for containers, maintenance of assets including track, rolling stock, etc. as per extant railway rules applicable to private sidings. The cost of the railway staff would be borne by the party as per the prevailing Government policy.

8. Tariff

Tariff structure and costing should be worked out along with the feasibility study and information provided with the application.

9. General

The main function of an ICD/CFS being receipt, despatch and clearance of containerised cargo, the need for an up-to-date inventory control and tracking system to locate containers / cargo is paramount. Each functional unit of the facility (e.g. siding, container yard gate, stuffing/destuffing area, etc.) should have up-to-date and where possible on-line, real time information about all the containers, etc., to meet the requirements of customers, administration, railways etc. As far as possible, these operations shall be through electronic mode.

Procedure for Approval of ICD/CFS and its Implementation

1. Proposals for setting up ICD/CFS will be considered and cleared, on merits, by an Inter Ministerial Committee for ICDs/CFSs, which consists of officials of the Ministries of Commerce, Finance (Department of Revenue), Railways and Shipping. Views of the State Governments as necessary would be obtained.

2. Application 10 copies in enclosed form should be submitted to the Infrastructure Division in the Ministry of Commerce, Udyog Bhavan, New Delhi. Application must be accompanied by 10 copies of feasibility reports mentioned in the guidelines.

3. The applicant should also send a separate copy of the application to the jurisdictional Commissioner of Customs. The Commissioner of Customs will send his comments to the Ministry of Commerce and the Central Board of Excise & Customs (CBEC) within 30 days. In case, the project is planned in a port town, a copy of the proposal should also be sent to the concerned Port Authority who would furnish their comments within 30 days to the Ministry of Surface Transport and the Ministry of Commerce.

4. The applicants are also requested to familiarise with the statutory Custom requirements in relation to Bonding, Transit Bond, Security Insurance and other necessary procedural requirements and cost recovery charges payable before filing the application.

5. On receipt of the proposal, the Ministry of Commerce would take action to obtain the comments from the jurisdictional Commissioner of Customs and other concerned agencies within 30 days. Wherever necessary, a copy of the proposal should also be sent to Zonal Railway Manager, under intimation to the Ministry of Railways One copy of the proposal would also be made available to the IMC Members for advance action. The decision of the IMC would be taken within six weeks of the receipt of the proposal under normal circumstances.

6. On acceptance of a proposal, a Letter of Intent will be issued to the applicant, which will enable it to initiate steps to create infrastructure.

7. The applicant would be required to set up the infrastructure within one year from the date of approval. The Ministry of Commerce may grant an extension of six months keeping in view the justification given by the party. Thereafter, a report would be submitted to IMC to consider extension for a further (final) period of six months. The IMC may consider extension or may submitted to IMC to withdraw the approval granted.

8. The applicant, after receipt of approval, shall send quarterly progress report to Ministry of Commerce. Three formats (given as annexure I to III) for sending the quarterly/ annual report shall have to be submitted to Department of Commerce through electronic mode as well as through hard copy.

9. After the applicant has put up the required infrastructure, met the security standards of the jurisdictional Commissioner of Customs and provided a bond backed by bank guarantee to the Customs, final clearance and Customs notification will be issued.

10. The approval will be subject to cancellation in the event of any abuse or violation of the conditions of approval.
11. The working of the ICD/CFS will be open to review by the Inter Ministerial Committee.

Self Assessment Questions

1. Explain the term Container Freight Station (CFS)
2. Detail the facilities provided by the container freight station
3. Explain the dry port/land container depot (ICD)
4. Explain the significance of containers?
5. Describe the services offered by Clearing and Forwarding Agents to facilitate the shipment of goods.
6. "Containerization has revolutionized the transportation of goods" – Discuss

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Lesson 2.3 - Container Corporation of India Limited (Concor)

Learning Objectives

After reading this chapter you should be able to

- Define CONCOR
- Understand the Core Functions of CONCOR
- List different International and National logistics Services Offered by CONCOR
- Key Network of CONCOR
- Recognize the Financial Performance of CONCOR

Introduction

Ever since globalization transformed the transport sector, national boundaries have become permeable to penetration by trade, creating the need for flexible transport solutions. Intermodalism and containerization were the by-products of this era and were poised to metamorphosize transport of "general cargo", moving it 'seamlessly' through sea and land arteries. Forty years ago, the physical process of exporting or importing goods was arduous. Goods needed to be transported by lorry to the port, unloaded into a warehouse and then reloaded into the ship 'piece by piece'. Malcolm McLean's idea of containerization changed the basics of cargo transport by standardizing the dimensions of the container and simultaneously improving the productivity of ports by mechanizing handling of container-carrying 'cellular' ships and reducing their handling to a few hours only. Unitizations helped elimination of multiple handling of cargo and made transfers quick, cheap and easy. As containerization came to stand for 'cargo care', it grew by leaps and bounds the world over.

Formation and Growth of CONCOR in India

Container Corporation of India Ltd. (CONCOR), was incorporated in March 1988 under the Companies Act, and commenced operation from November 1989 taking over the existing network of **7 ICDs** from the Indian Railways. From its humble beginning, it is now an undisputed market leader having the largest network of 61 ICDs/CFSs in

India. In addition to providing inland transport by rail for containers, it has also expanded to cover management of Ports, air cargo complexes and establishing cold-chain. It has and will continue to play the role of promoting containerization of India by virtue of its modern rail wagon fleet, customer friendly commercial practices and extensively used Information Technology. The company developed multimodal logistics support for India's International and Domestic containerization and trade. Though rail is the main stay of our transportation plan, road services and also provided to cater to the need of door-to-door services, whether in the International or Domestic business. For the growth of business, **CONCOR** plans to carve a niche for itself as provider of third party logistics services. This could involve the setting up of District parks, Freight Centers, Trade Development Centers etc. IT could be achieved through Alliance, associations, Joint Ventures or just on its own, and the services offered could be total logistics solutions to select customers or, if required, as a common user service.

Objectives of CONCOR

CONCOR is committed to providing responsive, cost effective, efficient and reliable logistics solution to its customers. It strives to be the first choice for its customers. **CONCOR** is a customer focused, performance driven, result oriented organization, focused on providing value for money to its customers.

According to objectives statement of CONCOR highlights

- " we will be a customer focused, performance driven, result oriented organization, focused on providing value for money to our customers.."
- " we will strive to maximize productive utilization of resources, deliver high quality of services, and be recognized as setting the standards for excellence."
- " we will constantly look for new and better ways to provide innovative services. we will aim for customer convenience and satisfaction, learn from our competitors and always strive for excellence."
- " we will set measurable performance goals to support the objectives and mission of our organization and work as a professional, competent and dedicated team for the organization to achieve excellence in all areas of our business and operations by benchmarking ourselves with our competitors."
- " we will follow highest standards of business ethics and add social value for the community at large by discharging social obligations as a responsible corporate entity."

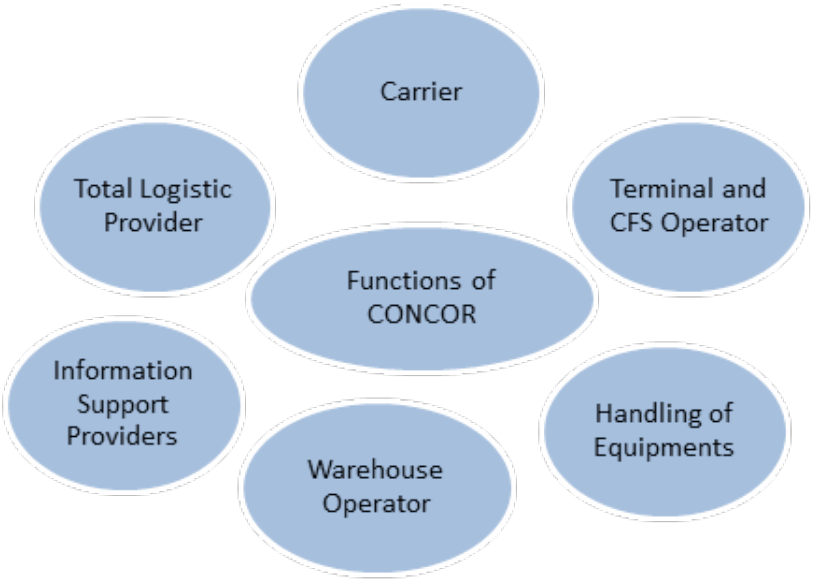
- " we will maintain absolute integrity, honesty, transparency and fair-play in all our official dealings and strive to maintain high standards of morality in our personal life."

Advantages offered by CONCOR as Logistics Service Provider

- Efficient transportation of containers
- Massive warehousing capacity
- Country-wide network
- Large fleet of containers
- Relationship with top-end customers
- Relationship with various intermediaries in logistics
- Intellectual capital

Main Functions of CONCOR's

CONCOR's core business is characterized by three distinct activities, that of a carrier, a terminal operator, and a warehouse operator.



Main Functions of CONCOR's

Carrier

Rail is the mainstay of **CONCOR's** transportation plans & strategy. Majority of CONCOR terminals are rail-linked, with rail as the main carrier for haulage. Facilities are, however, provided for first and last mile transportation by road also. As rail is price-

competitive over long distances, the price advantage can be passed on to clients, thus allowing for flexible and competitive pricing. The rail link also plays a major role in decongesting our ports and the road corridors that lead to these ports. Though rail is the mainstay of **CONCOR's** transportation plan, some **CONCOR** terminals are exclusively road-fed as well. Road services are mostly in the form of supplementary services to provide the door to door linkages having carried the bulk of long lead by rail. However, where ever it is operationally or economically a superior option, road is used as an alternative to rail as well.

Terminal and CFS Operator

CONCOR started operations in November 1989 with 7 Inland Container Depots (ICDs). We have since extended the network to a total of 61 terminals, of which 18 are export-import container depots, and 13 exclusive domestic container depots and as many as 30 terminals perform the combined role of domestic as well as international terminals. The company expects the number of terminals to increase to 61 in the next few years. **CONCOR's** customs bonded Inland Container depots are **dry ports** in the hinterland, and serve the purpose of bringing all port facilities including Customs clearance to the customer's doorstep. The terminals are almost always linked by rail to the Indian Railway network, unless their size or location dictates that they be linked by road. The rail links enable us to facilitate the moving of large volumes over long distances in the most cost effective manner. **CONCOR's** terminals provide a spectrum of facilities in terms of warehousing, container parking, repair facilities, and even office complexes.

As CFS operator, CONCOR adds value to the logistics chain by offering value added services such as

- Transit warehousing for import and export cargo
- Bonded warehousing, enabling importers to store cargo and take partial deliveries, thereby deferring duty payment
- Less than Container Load (LCL) consolidation, and reworking of LCL cargo at nominated hubs
- Air cargo clearance using bonded trucking

In the area of domestic business door pick up and door delivery services are the most popular. We also use our terminal network to plan hub and spoke movements that allow single customers to move cargo to multiple locations at a single time, with **CONCOR** taking care of the distribution and re distribution requirements.

The key value CONCOR's offer is the provision of a single-window facility co-ordinating with all the different agencies and services involved in the containerized cargo trade, from Customs, Gateway Ports, and Railways, to road hauliers, consolidators, Forwarders, Custom House Agents and shipping lines. To achieve a high degree of customization, it offer packages designed to provide the most cost-effective combination of road and rail. This enables CONCOR to offer services which can be individually tailored to every customers specifications, **minimizing customers own efforts.**

Handling Equipment

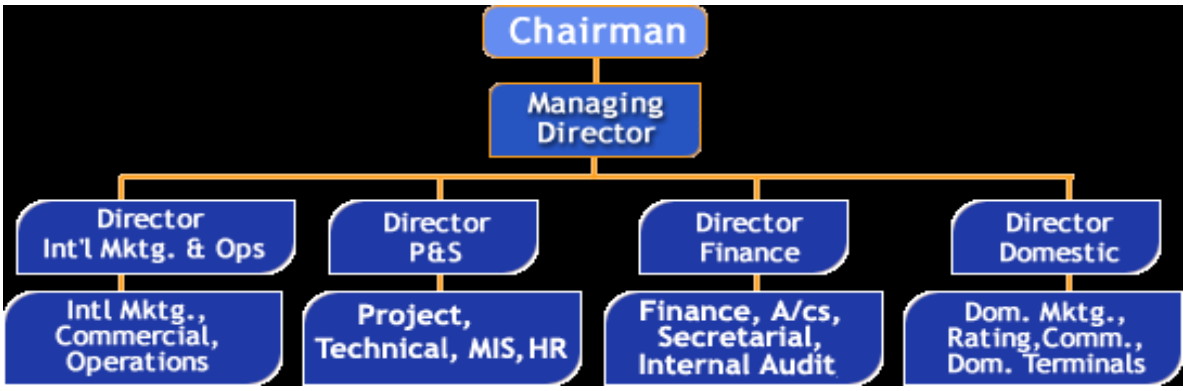
CONCOR has generally followed a policy of organizing specialized cargo/container handling services by deployment of state-of-the-art equipment on contractual basis. In addition, at ICD Tughlakabad, in Delhi, which is the company's flagship terminal, we also own, operate and maintain the most modern and sophisticated handling equipments such as a Rail Mounted Gantry (RMG), Rubber Tyre Gantries (RTGs), and Loaded and Empty handling Reach Stackers.

Wagons

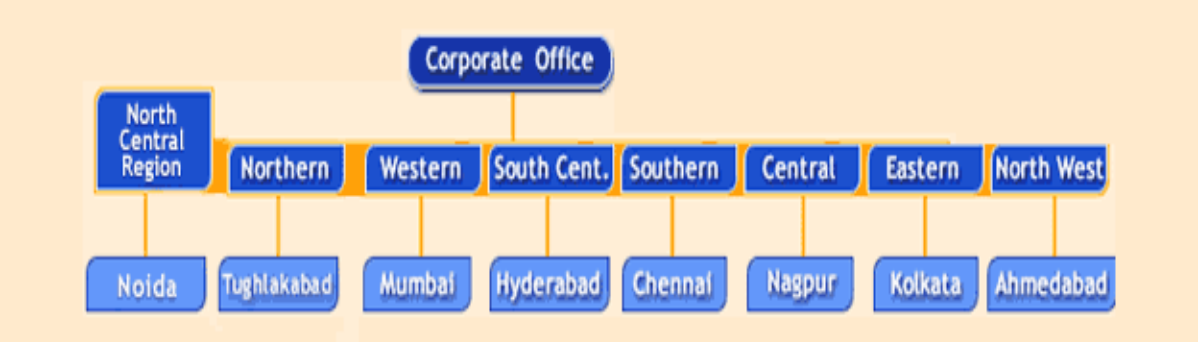
After starting operations with make-shift container wagons that were provided by the Indian Railways, **CONCOR** started acquiring state-of-the-art high speed container flats (BLC wagons), capable of running at 100 kmph. Since last 9 years. These have been progressively introduced on major container circuits in the last three years, as a result of which transit times have reduced and service quality has shown considerable improvement. 7200 such wagons are already deployed, and **CONCOR** plans to add to that fleet every year to cater to the growth in business as well as to replace outworn rolling stock. **CONCOR** has also purchased some 7200 container flat wagons from the Indian Railways, which have been since upgraded and retrofitted to also provide improved service quality and better transit times.

Infotech

IT forms the backbone of any service industry, where information correlates directly with improved levels of efficiency. In the transport sector, antiquated, cumbersome paper-based procedures cause an enormous waste of time and money. All too often, goods move through transport systems at a frustratingly slow speed, especially in developing countries. The physical side of trade transactions should aspire to become as efficient as the electronic transfer of money. This can be done through working partnerships among all those involved to improve logistics services through the use of information and network technology.



Management Structure of CONCOR



CONCOR Focus on Customer Satisfaction

CONCOR's regularly making efforts to improve business processed to provide for improved quality of customer satisfaction. Some of the practices adopted by the organization for achieving these goals are listed below

➢ On line Information & Container Tracking
➢ Container Repair & Cleaning Facilities
➢ Cargo Palletisation, Strapping etc.
➢ Cargo Lashing/Choking Facility
➢ Fumigation of Cargo/Containers
➢ Supply Chain Management
➢ Door Delivery/Pick Up of Containerized cargo
➢ Container/Cargo Survey
➢ Pre Deposit Accounts
➢ Round the Clock Security at Terminals
➢ Facilitation of Customs Clearance
➢ Flexible Payment Arrangements

CONCOR International Services

CONCOR was incorporated in March 1988 as a Public Sector Enterprise under the Ministry of Railways with the prime objective of developing modern multimodal transport logistics and infrastructure to support the country's growing international trade. The company commenced operations on November 1, 1989, by taking over seven Inland Container Depots from the Indian Railways located at Delhi, Ludhiana, Bangalore, Coimbatore, Guwahati, Guntur and Anaparti. Since then, **CONCOR** has developed a vast network of container terminals at prime locations all over the country. At present, it has a total of 41 Exim Terminals (Rail / Road linked ICDs and Port Side Container Terminals (PSCTs), with another 13 in the pipeline.

Containerization of exports and imports does not begin and end at the ports. **CONCOR** provides transport linkages between ports and the hinterland. Regular container trains are run to and from ports to **CONCOR's** terminals in the hinterland. Some of the terminals are also served by road. With liberalization and opening up of the India economy, lowering of import tariffs and reduction in the number of commodities whose import/ export was prohibited by the Government, there is an increasing trend of containerized imports/exports into/from India. Along with the growth of container business at Indian Ports, the level of containerization itself is increasing.

The advantage of containerized movement into the hinterland are self evident, a major plus being the decongestion of ports which would lead to higher turnover and added growth. **CONCOR'S** existing presence at port-towns is sizeable. **CONCOR's** Terminals at Mumbai at Mulund, New-Mulund & Wadibundar cater to the Ports of Jawaharlal Nehru Port Trust and Mumbai Port Trust. Similarly, we have presence at Tondiarpet and the Harbour of Madras for Chennai Port, and Cossipore Road and Shalimar terminals at Kolkata cater to Kolkata & Haldia. There are terminals also at Cochin and Tuticorin and Vishakapatnam.

Presence in the port towns, in addition to the hinterland, would help tie-up both end points of the shipment route facilitating control over the entire logistics chain. Carrying the strategy further, **CONCOR** may also consider operating container berths in greenfield ports in order to provide integrated transportation logistics solutions to customers. Having already developed requisite expertise in operating hinterland terminals, port terminals should not pose any technical problems. As more port container terminal privatization takes place, it may be difficult for **CONCOR** to gain entry into quayside operations. Rail face operation at Port terminals still remains a strong possibility even at Private Ports.

One of the major thrusts in improving the quality of service in area of exim business has come with the introduction of new State-of-the-art Rolling Stock by **CONCOR** for

running long lead export and import special trains to and from the gateway ports. Around 1900 High speed flat wagons have already been procured and and another 1300 odd are in the pipeline. These wagons run at higher speeds (100kmph) and safety norms than conventional railway wagons, and have contributed significantly in reducing transits and improving the reliability of exim train services.

To meet the growth in Exim traffic at some of its terminals, and to meet the challenge head on, **CONCOR** is also acquiring more modern container handling equipment as well. The plan is to commission a new Rubber Tyre Gantry Crane, and a Rail Mounted Gantry Crane at our biggest facility in Tughlakabad, New Delhi soon. Similarly, RTGs are to be procured for ICD Dadri also. Apart from above, deployment of tailor-made equipment like Grappler arms etc. in some of the terminals is being contemplated to increase their handling capacity and efficiency.

The total warehousing space available for **CONCOR's** Exim business is presently approximately 110000 sqm. By 2003-04, the Exim warehousing space should exceed 150000 sqm., with facilities for handling bonded cargo, multi stacking, consolidation of LCL cargo, air cargo handling etc. besides conventional transit warehousing. **CONCOR** has plans of introducing value-added services like Palletisation/Fumigation of cargo, Repacking/ strapping of cargo etc. at all its terminals. Though presently **CONCOR** is providing this service through contractors at some of its Exim terminals, these services are proposed to be extended, and once they have been introduced, **CONCOR** will be able to provide almost all warehousing-related services to its users.

CONCOR sees its future growth in accessing the untapped potential market within the country by opening more terminal facilities. The global trend in containerization of general cargo, particularly in relation to inter national trade has been rapid from the 1960's. Abroad, 75-80% of general cargo is containerized, as against approx. 50% in India. In India the percentage of container traffic out of the total Port traffic has also risen from 0.2% in 1981 to 10% in 1999-00. The growth in containerization has been faster than the growth in volumes of general cargo. This is partly because international trade in geared primarily to handle containerized cargo.

The global trend is that 70-80% of containerized cargo moves directly between the hinterland customers and the seaports in containers. Of total container handled at Indian Ports, **CONCOR** at present moves 30%. There is therefore intrinsic potential for further growth in **CONCOR** business apart from the push given by increase in foreign trade. In the decade of its existence, the throughput growth of the company's exim business has been almost 20% per annum.

CONCOR Domestic Services

The modal split between rail and road has shifted from 80 20 in 1950-51 to 40 60 in 1997-98. Substantial 'small volume' transit-sensitive' general goods traffic that typically needed to be consolidated went over to road because of several perceived advantages. 'Client-focused' customized services are the backbone of this segment. Each service will have to be tailor-made to suit the specific requirements of the client concerned. Large companies with substantial movement requirements shall be the ones in focus. The advantages of rail for long and heavy hauls are clear. By contrast, the road situation today is marked by poor maintenance, congestion and delays (38% of travel-times spent waiting at check posts). Given a choice, the shipper is willing for a modal shift, if one can guarantee speed, safety and ensure reliability. Indian Railway's strategic initiative to containerize cargo transport put India on the multi-modal map for the first time when the Indian Railways entered the market for moving door-to-door domestic cargo in special Indian Railway Specification (IRS) containers starting in 1966.

Though **CONCOR,** was incorporated in March 1988, it embarked on the transportation of domestic cargo only in 1991, using ISO standard containers for the job. Between 1993 and 1996, there was a major thrust in the domestic business, so much so that domestic business represented almost half of **CONCOR's** total business in 1995-96. This business however was dependent on large scale chassis-to-chassis movement of cement, which had come **CONCOR's** way due to shortage of conventional rail wagons. By 1997 It became clear that while there was a vast potential of domestic traffic to be tapped, this could only be done by focusing the strategy on the movement of goods that were erstwhile moving on road, and not on bulk, rail based traffic. A separate Domestic Division was therefore created in December 1997. The objective of the division is to bring back to rail, goods which are now being transported by road. The division aims to do this by containerizing piecemeal cargo and offering a comprehensive door to door intermodal service. The domestic division functions through a network of terminal/hubs. There are at present 5 exclusively domestic terminals, but as many as 20 of the other terminals on the **CONCOR** terminal map also offer domestic services. As a matter of policy, most of the new terminals being introduced are now being planned as combined domestic/international terminals.

The main asset in which domestic cargo is carried is the standard 20ft container. **CONCOR's** fleet of TEUs in domestic service is currently at approximately 8500 TEUS. Of these, some are owned and some are brought in on short or long term lease depending on the demand requirements. Besides leasing, **CONCOR** also uses conventional ISO (international) containers by offering special Cabotage rates for empty movements. In

this practice, containers that would otherwise move as empty are 'borrowed'/leased on an extreme short term basis (usually for a single trip) for domestic cargo movement, thereby increasing the carrying capacity for domestic cargo as a whole. There are also different types of specialty containers such as Open Top, Side Doors, Tanks, and 22ft/high cube containers to cater to special types of cargo. The thrust of domestic operations is to run a series of point to point scheduled trains.

These 'CONTRACK' services form the spokes in a wider hub-spoke strategy whereby cargo is consolidated through road or even rail, at major hub terminals from where such CONTRACK services operate. Extensive movement of shipping-line empty containers is undertaken by **CONCOR** to balance the differential levels of exports and imports in the country today. By "Cabot aging" these containers. **CONCOR** can offer a substantial discount to both shipping lines and the potential domestic client. This seen as an area of focus and a strategy to boost volumes and profitability.

For the charging of freight, all commodities carried by CONCOR fall into three categories

1. **CC(carrying capacity):** These are heavy commodities, which when stuffed normally reach the carrying capacity of the container (usually 21.5t in a 20' container, and 27.5t in the 40' container) before the container is filled to its volumetric capacity. The Indian Railways has only retained 5 specific commodities as 'CC' for use of **CONCOR**. These are (1) Cement, (2) Iron & Steel dispatched from steel plants, (3) Petroleum and other hydrocarbon oils, (4) Grains & Pulses, and (5) Edible Salt.

2. **M (mixed goods):** Commodities other than the five listed above, which have 'CC' loadability in the Railway Goods tariff are included in this category. When commodities with 'CC' loadability and less than 'CC' loadability are loaded in a container, they will also be charged under this category.

3. **W (weight condition):** These are light commodities which have loadability less than 'CC' even after occupying the total space of a container. These commodities are separately listed in the Railway Goods Tariff

CONCOR Containers

The following is a list along with photographs and specifications of various types of containers that are used in the containerized cargo movement business. The dimensions listed below are intended as a guide only. There are differences in the dimensions between containers produced by various manufacturers.

Conventional Dry Cargo Containers

20/40 ft. conventional end open containers: These are usually built to ISO standards, and are used for the movement of conventional dry cargo. For domestic movement, **CONCOR** has inducted a fleet of approx. 12000 such 20 ft. containers either under direct ownership or on lease for internal movements within the country.

20/40 ft High Cube containers: These containers offer the added advantage of extra volumetric capacity due to their additional height, and are especially useful of movement of light but bulky cargo.

20 ft Side Access Containers: These containers are used exclusively for domestic traffic movements within the country. They offer the advantage of having doors on the side panels, and this makes it convenient for use in locations where chassis stuffing operations have to be used. **CONCOR** has currently about 3300 such self owned domestic SA containers in its fleet.

22 ft/High Cube Domestic Containers: These containers have also been exclusively introduced by **CONCOR** for the purpose of carrying cargo that requires greater volumetric capacity or container length. **CONCOR** has currently about 2000 such self owned domestic 22ft containers in its fleet.

Specialty Containers

20 ft/40 ft/ 40ft High Cube Refrigerated Containers: These are containers that can be used for the movement of refrigerated/perishable cargo. Special facilities such as the availability of plug points, portable clip on generators for trailer movements, power packs for train movements etc. are required for moving cargo in these containers. It must therefore be ascertained whether such facilities are available at the handling terminals before planning such movements.

20 ft/ 40ft/ Collapsible Flat Rack and Platform Containers: These containers are especially useful for carrying over dimensional cargo or fully packed machines, equipment etc. Since most of the movement of containers on **CONCOR's** network is through rail, special permission must be obtained for movement of over dimensional consignments to ensure that these do not infringe upon the standard moving dimensions of the Indian Rail network.

20 ft/ 40 ft Open Top Containers: These containers are used mostly for cargo that needs to be handled with cranes and cannot be easily loaded from the front doors of the containers. Open tops can also be used for carrying over dimensional cargo of certain types. Such containers have also been inducted for domestic service and can be supplied on demand if such cargo is offered. **CONCOR** has currently about 100 such self owned domestic open top containers in its fleet.

20 ft Tank Containers: These containers are specially designed for the movement of liquid cargo of different types. Such containers have also been inducted for domestic service and can be supplied on demand if such cargo is offered. **CONCOR** has currently about 300 such self owned tank containers in its fleet.

CONCOR as a multi-modal logistics service provider is constantly seeking to innovate on the uses and flexibility of container handling operations. We have introduced special containers with rolling floors to facilitate pallet handling, containers within built collapsible shelves to increase load ability etc. We are also willing to examine the possibility of designing any specialty containers subject to suitable business prospects. Customers are encouraged to contact our field staff with their specific requirements.

Claim Procedures

- Compensation claims for loss, damage, etc. to consignments in transit are dealt with by CONCOR in accordance with the provision of the Indian railways Act 1989. CONCOR assumes responsibility for the loss, destruction, damage or deterioration, or non-delivery of any consignment in transit, arising from any cause except the following, namely -

  a) Act of god

  b) Act of war;

  c) Act of public enemy's;

  d) Arrest, restraint or seizure under legal process;

  e) Orders or restrictions imposed by the Central Government or a State Government or by an officer or authority subordinate to the Central Government or a State Government authorized by it in this behalf;

  f) Act or omission or negligence of the consignor or the consignee or the endorsee or the agent or servant of the consignor or the consignee or the endorsee;

  g) Natural deterioration or wastage in bulk or weight due to inherent defect, quality or vice of the goods;

h) Latent defects;

i) Fire, explosion or any unforeseen risk

- According to the rules notified under the said Act, every person entrusting any cargo to CONCOR for carriage by rail or road shall execute a Forwarding note in such form as may be specified and the consignor shall be responsible for the correctness of the particulars furnished by him in the forwarding note. The consignor shall indemnify the CONCOR administration against any damage suffered by it by reason of the incorrectness or incompleteness of the particulars in the forwarding note. Further, the liability of CONCOR for general goods shall not exceed an amount calculated on the basis of invoice value subject to a maximum rate of ₹ 50/- per kg unless the consignor had declared the value of the consignment at the time of booking, and paid in addition to freight charges, a percentage charge which varies from 0.25% to 1% of the value depending on the distance for which the consignment is booked. In no circumstance the liability would exceeds ₹ 50 per kg while goods are in custody of CONCOR.
- In order to avoid a time bar on settlement of claims the claims should be preferred within six months of the date of booking.
- All claims should be addressed to the Head of the Region (CGM/RGM) where the destination station/depot lies.
- To assist us in dealing with claim case promptly, claimants are requested to furnish the following details in their claim letter in the format which can be downloaded

Format for Claim Letter

- Copy of Inland Way Bill which shall be prime facie evidence of weight and no. of packages.
- Booking station
- Destination station
- Factory stuffing/Terminal stuffing
- Terminal destuffing/factory destuffing.
- Commodity-description & weight
- Details of loss/shortage/ damage
- Shortage certificate/open delivery/ assessment delivery certificate issued by CONCOR at the time of delivery.
- Amount claimed (indicating the basis on which this has been arrived at, such as original trade invoice, beejuk, bill,etc.

Network of CONCOR's Terminal

Exoneration from responsibility under section 102 of IR Act 1989

CONCOR administration shall not be responsible for the loss, destruction, damage, deterioration or non-delivery of any consignment in following circumstances

- When such loss, destruction, damage, deterioration or non-delivery is due to false declaration.
- Where fraud is practiced by consignor/consignee/agent.
- In case of improper loading/ unloading by consignor/ consignee/ agent.
- Riot, civil commotion, strike, lock-out, stoppage or restraint of labour from whatever cause arising whether partial or general
- Any direct/indirect or consequential loss or damage or for loss of particular market

Terminal Network

Northern Region

Babarpur (Panipat), Ballabhgarh, Dct/Okhla, Dhappar, Ghari-Harsaru, Gotan, ICD DDL (Ludhiana), ICD Moradabad, ICD Tughlakabad (Delhi), Jaipur, Jodhpur, Kharia Khangar, Moga, Panipat, Phillaur, Rewari, Sonepat

Western Region

CFs Dronagiri - Concor-Drt (Navi Mumbai), CFs Mulund (West)-Exports(Mumbai), DCT Turbhe (Navi Mumbai), Icd Chinchwad (Pune), ICD MIRAJ, ICD New Mulund (Mumbai), ICD Pithampur (INDORE), ICD Ratlam, J.N. Port, Mumbai Port Trust

Eastern Region

Balasore, Concor Terminal Kopt Coal Dock Road, Durgapur, Fatuha, Haldia, ICD Amingaon, Kolkata Port, Raxaul, Shalimar Terminal, Tata Nagar Terminal

Southern Region

Container Freight Station Milavittan (Tuticorin), Container Freight Station Tondiarpet, Domestic Container Terminal Salem Market, HAL/CONCOR/MSIL/JWG, Inland Container Depot Kudalnagar (Madurai), Inland Container Depot Whitefield, Inland Container Depot, Irugur, Inland Container Depot, Tirupur, Port Side Container Terminal Harbour of Chennai, Port Side Container Terminal,Vallarpadam, Rail Side Container Terminal, Cochin

Central Region

Bhusawal, Daulatabad (Aurangabad), Inland Container Depot, Nagpur, Mandideep Container Terminal, Raipur

South Central Region

Dct Guntur, ICD Desur (Belgaum), ICD Visakhapatnam, Inland Container Depot, Sanathnagar (Hyderabad)

North Western Region

CFs/Gandhidham, ICD Sabarmati (Ahmedabad), ICD-Ankleshwar, ICD-Khodiyar (Ahmedabad), Mundra, Pipavav, RCT Vadodara

North Central Region

Agra, Dadri, Kanpur, Madhosingh (Mirzapur), Malanpur (Gwalior), Rawtha Road-Kota (RDT)

Hub and Spoke Services of CONCOR

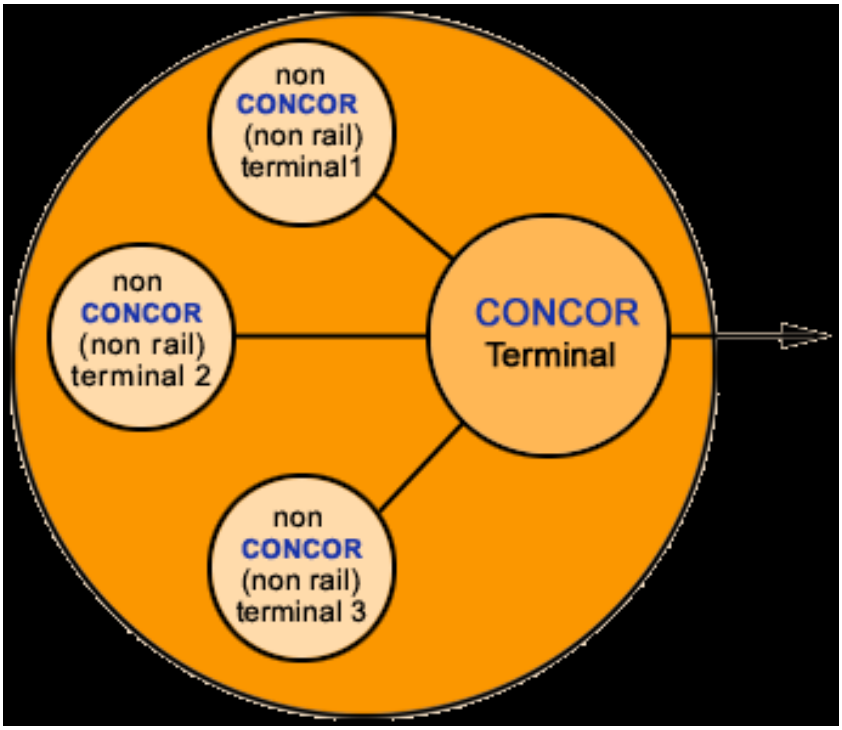
One of the areas in which **CONCOR** faces competition in the transportation of goods is from truck operators offering transportation by road. Competition with such operators is primarily on the basis of price and dependability.

The Company believes that it competes favorably with road transportation on the basis of price on movement of heavier cargoes over longer distances, although the truck operators may offer, among other things, greater flexibility with respect to the timing of shipments. Volvo trucks, with vastly reduced transit times as compared to conventional trucks, are challenging the rail transit times of **CONCOR** and are set to heighten competition.

In order to take full advantage of the rail linkages offered, while at the same time offering the reach and dependability of road services, the concept of "hub and spoke" operations are likely to become crucial in the company's long term development. Hub and Spoke operations are feasible for both the international and domestic business segments. Such operations involve the linking of road or short lead rail shuttle services within defined catchment areas, to long lead point to point train services.

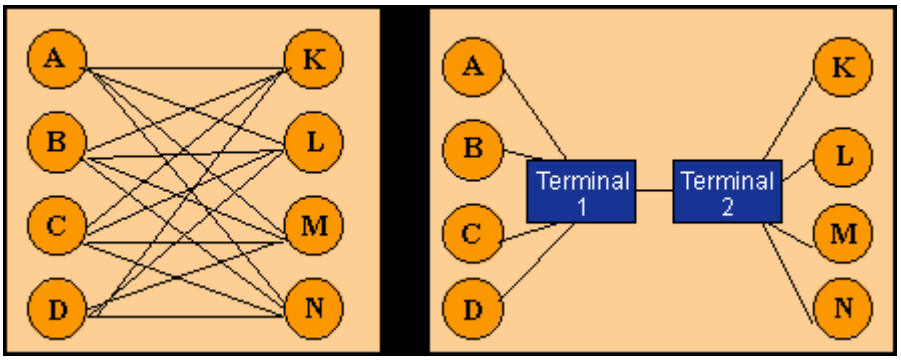
In the international domain, some hubs like Tughlakabad are fed by several satellite locations like Panipat or even Gwalior, until traffic justifies running a scheduled service from the satellite itself, as was done in the case of Ludhiana and Moradabad, both of which started out as remote locations linked to the hub terminal at Tughlakabad, but now function as stand alone terminals.

Competition in the field of container handling is increasing, especially in the metropolitan ports. Several companies have started operations in ports. In the deep hinterland, other operators have entered the market in the sense that new terminals have been set up. However, as **CONCOR** concentrates on its hub-spoke strategy, these developments can become complementary to **CONCOR's** operations, as our competitors in the CFS business often become customers for transport of containers from and to gateway ports.



Hub and Spoke Services of CONCOR

In the domestic arena as well, hub and spoke movements allow for a better utilization of transport potential and allow for long lead services to be generated on the basis of short lead traffic collections using road and rail shuttle services. This service can be especially useful for big corporates for whom production centers are concentrated in a single location, but distribution needs are national in scale. **CONCOR** has already successfully moved white cement as a commodity using this experiment, whereby the product has been distributed over various locations after being picked up from a single production center.



HUB & SPOKE

Transportation to become seamless and "door-to-door"

Integrated Freight Terminals

As part of the overall strategy for expansion of business and movement toward the provision of complete logistics services, the company is considering the option of moving into operating large railway goods-shed hubs. This will mean managing integrated freight terminals. To achieve this, **CONCOR** in the long term plans to set up District parks/ Freight Centers/ Trade Development Centers etc. at some of its terminals. The focus of providing such services will be on the backward and forward integration of various value added services with the core business of transport logistics, in which the company already has an established foothold.

Costal Shipping

As part of its overall strategy of expansion and entry into areas of business that would complement its position as a multi-model logistics service provider, Coastal Shipping is an area of business the company is examining for making an entry. **CONCOR's** interface with coastal shipping can be easily established by undertaking all port operations for coastal vessels or only taking up the rail interface for such vessels at port terminals and providing hinterland connectivity. For getting into Coastal shipping per se, we can pick up equity stake in sea-going vessels and identify a strategic partner with adequate experience and resources.

Cold Chains and Refrees

A key business area with high potential for growth is the provision of Cold Chains. This involves providing transportation to perishable products from source to end-user, while maintaining a certain temperature along the route. Today 85% of the cold storages are in the private sector and not a single complete cold chain solution provider is available in the market. Absence of Reefer container linkages and high and increasing power costs

are proving to be major impediments. **CONCOR** is already providing basic rail based reefer services between Delhi and Mumbai, and could get into providing cold chains by making a few arrangements that would expand its market presence. These would mainly include

- Tie up with an international major, preferably with developing country experience with both technology and equity commitment for bringing in the basic equipment.
- Organize terminal to factory transport, refrigerated warehouses-where needed, and delivery, while maintaining both temperature controlled environments, as well as transit commitments.
- Identify viable corridors for specific products. This will require tying up with producers and consumers independently or tie up with a food processing major to distribute its products. Return trips wherever possible make cold chain operations more profitable, and sometimes represent the difference between break even and loss.

Total Logistic Providers

The concept of total logistics, like that of marketing, has been somewhat alien to traditional Indian business ethos. Logistics signifies the integration of two or more activities for the purpose of planning, implementing and controlling efficient flow of raw materials, in-process inventory and finished goods from point of origin to point of consumption. Transportation is often the single largest cost in the logistics process. Logistics is a source of value addition. By streamlining transport, storage and handling operations, by reducing inventories (and the corresponding financial and storage costs) and by making the most cost-efficient use of available assets, logistics reduces the overall cost of the delivered goods while increasing their time and space utilities (right time, right place).

According to a study commissioned by **CONCOR**, presently in India there are about 15 players as logistics service providers out of which only 5 to 6 have turnover of ₹ 50 cores plus. Though there are over 1500 transportation companies in India, only about 25 offer third party logistics services. Others offering similar services are courier companies, freight forwarders, brokers and booking agents. In the market, about 75% of the revenue being generated by this segment is on account of transportation and balance 25% is on account of services. The study further showed that in-house logistics service arrangement is still predominant (80-90%). Major users of 3PL spend about 0.5% to 8% of their turnover on getting these services. Within the realm of logistics, transportation, customs brokerage, freight consolidation and freight forwarding as services are almost always outsourced, whereas Inventory management is the only key element of the logistics chain that is seldom outsourced.

List of Hazardous Commodities for Transportation In Containers by Rail

Transportation of hazardous cargo on containers by rail are subject to the statutory provisions of the IRCA Red Tariff. Railways have also accorded provisional permission for carriage of dangerous / hazardous / offensive goods which fall under the International Maritime Dangerous Goods (IMDG) Code in containers, subject to their packing and stuffing being as per specifications of the IMDG Code.

The following is the procedure that shall be followed by CONCOR in booking of hazardous cargo in containers

1. When a container is laden with a commodity classified as hazardous in IRCA Red Tariff or IMDG Code, CONCOR shall accept it for rail booking only on a pink forwarding note, and collect the prescribed additional surcharges.
2. There should be no restriction in acceptance of containers laden with commodities not classified as hazardous both as per IMDG Code as well as in IRCA Red Tariff.
3. In case, lines offer containers, containing some commodities with apparent dangerous / hazardous characteristics and if such commodities do not find any reference in either IRCA Red Tariff or IRCA Goods Tariff or IMDG Code, then such containers will be accepted for booking by rail after taking a specific undertaking from the shipping line that the cargo loaded in the containers is not hazardous.

For the list of dangerous / hazardous commodities notified in IRCA Red Tariff and IMDG Code.

Wagons

The Indian Railways provided approx. 7200 dedicated container wagons to **CONCOR** for moving containers. These were supplemented over a period of time by certain over-age rolling stock modified for container carriage. These wagons, however were technologically dated, and unable to provide the kind of transits and reliability that state-of-the-art inter-modal services required. **C**ONC**OR** therefore initiated procurement action for state-of-the-art, high-speed bogie low height container flat-wagons (type BLC) in service.

Over 5200 BLC wagons have been procured by **CONCOR** and inducted in service so far In the new BLC type wagons, the increased length (new rakes have 45 BLCs per train) results in an increased payload per train. These wagons are also equipped with superior characteristics such as automatic twist locks, low beds through reduced wheel diameter,

slack-less draw bars etc. The wagons are designed to run at 100 km/h, and have already revolutionized train transits between hinterland terminals and Mumbai gateway terminals of JNPT/NSICT. The reduced transit and turn round enhances earning potential while the negligible en-route detachments improve service reliability.

The main technical features of the new BLC Wagons are as follows

- Speed-100 kmph
- Low wheel diameter to permit
- Transportation of high cube containers at maximum speed
- Slackless draw bars
- Automatic twist locks (ATLs) and load sensing device (LSD).
- Anti-Pilferage device
- 90 teu's per train

A total of 405 longer high speed bogie low height container flats (type BLL) capable of transporting of 20', 22', 40' & 45' domestic containers have also been inducted in service. These have similar features viz. Retractable Anchor Locks, LSD etc. as BLC wagons.

During the period 1999 to 2001 **CONCOR** also acquired from Indian Railway 1357 BFKI type of container flats as a strategic move to control all dedicated container rolling stock. These have subsequently been upgraded and retrofitted with air brakes to improve their reliability and transit performance and are now designated as BFKN wagons. These wagons are mostly deployed in dedicated domestic CONTRACK circuits.

The present size of the wagon fleet in use on **CONCOR's** network is approximately 8374 wagons, of which more than 85% are owned by the company.

Information System

IT forms the backbone of any service industry, where information correlates directly with improved levels of efficiency. In the transport sector, antiquated, cumbersome paper-based procedures cause an enormous waste of time and money. All too often, goods move through transport systems at a frustratingly slow speed, especially in developing countries. The physical side of trade transactions should aspire to become as efficient as the electronic transfer of money. This can be done through working partnerships among all those involved to improve logistics services through the use of information and network technology.

A primary component of CONCOR's overall business strategy has been the development of an advanced information system. A container and cargo logistics information system went online at Company's Inland Container Depot at Tughlakabad in 1994 and most other facilities have been equipped with computer systems to monitor traffic movement and maintain inventory records.

CONCOR is using various online applications like Export/Import Terminal Management System (ETMS), Domestic Terminal Management System (DTMS), Oracle Financials-ERP, HR-Payroll system etc. which are based on Centralized architecture deployed through Citrix environment and running over VSAT based hybrid network.

CONCOR has been certified to ISO/IEC 27001 2005 standard for establishing and maintaining Information Security Management System (ISMS) for its IT functionality.

CONCOR has been awarded for its project titled "Web based Integrated Container/ Terminal Management System" which has been adjudged by AFACT (Asia Pacific Council for Trade Facilitation and Electronic Business) as winner for **e ASIA 2009 award** for the category " Electronic Business in Public Sector".

Facility for electronic filing (e-filing) of commercial documents for EXIM locations have been provided to customers. This facility enables customers like Shipping lines, Importers, Exporters and CHA's to file the required documents online for process and take necessary printouts of processed output through web from anywhere without physically coming to terminal/ ICD. Digital Signatures have been integrated with e-filing to make the system more secure.

Equipment

Handling Equipment

Successful operation of container terminals requires close attention to be provided in planning for the deployment of equipment that will be used in the handling operations at the terminal. Keeping in view the goal to provide efficient and satisfactory customer service, **CONCOR** has consistently been a leader in introducing and using the most modern handling equipment available at our terminals.

CONCOR's strategy in the development of a pool of equipment that can be used at its terminals has been two fold. For smaller terminals, we have generally sought to outsource the equipment while ensuring quality by setting stringent conditions on the

vintage of machines deployed, the number of moves to be carried out per hour or per shift, and also by imposing tough penalty conditions on non-performance. **CONCOR** has also been proactive in terms of offering financing support for acquiring modern equipment as a vendor development strategy.

In recent years, the company has also acquired equipment such as reach stackers directly, and outsourced the operations and maintenance activities. This has been done to ensure that the most modern and efficient equipment is deployed at our terminals, while keeping in check unnecessary manpower expansion, and ensuring operational efficiency by contracting equipment operations and maintenance and at the same time keeping a check on the maintenance and operating practices. At larger terminals, especially at the Flagship terminal of Tughlakabad, Dadri & Dhandari Kalan (Ludhiana), **CONCOR** has itself invested in procuring, operating and even maintaining heavy equipment like Gantry Cranes and Reachstackers. Over the years, **CONCOR** has developed an in-house technical department that is well equipped to handle not only the routine operation, but also the regular maintenance of these machines. At At present, there are more than 10 gantry cranes operating at Terminals of Tughlakabad, Dadri & Dhandari Kalan(Ludhiana)

Cargo Specific Containers

To meet the transportation requirements of domestic industry and to increase its market share for movement of domestic cargo in containers, **CONCOR** has to provide cargo-specific containers to the domestic customer. In order to meet the requirements of domestic users, **CONCOR** has also procured some Non-ISO Standard containers. Some of the Non-ISO Standard containers already in operation. In order to meet the growing and changing needs of the market, customization is the key, and it is in this area that **CONCOR** is focusing its plans for container acquisition **CONCOR** presently owns 3600 Containers. About 8000 containers are taken on operation lease bringing the total population to about 12000. While acquiring new containers, **CONCOR** is also replacing its old containers, which have either out-lived their life or are beyond repair.

Terminal Facilities

CONCOR started its operations by taking over 7 existing ICDs from the Indian Railways, and has now grown to a network of 57 terminals. Most of these terminals have been developed on land obtained on lease from the Indian Railways. Most of this land had been idling or identified as surplus land, and the inputs that have been put in by **CONCOR** have completely changed the face of these locations. Modern container handling terminals have been developed with state-of-the-art facilities for handling and amenities for the users.

Container handling terminals have been designed and built by **CONCOR's** in house engineering department. The design is invariably modular in nature. This means that the terminals have been developed keeping in mind the minimum investment while seeking to provide the best facilities. As the terminals have grown in terms of business handled, the utilized space has also been expanded by both adding facilities such as warehouses and paving, and/or by upgrading existing facilities to allow for the handling of higher volumes.

One of the major technological inputs put in by **CONCOR** in the area of terminal development has been the use of heavy duty paving using M-50 concrete blocks. This paving is not only easy to lay down, it also provides considerable long term savings due to minimum maintenance and upkeep requirements.In the area of warehousing as well, use of the latest technology has resulted in the development of state of the art facilities. At Bangalore, use of pre-fabricated structures resulted in the commissioning of warehouses within 3 months of starting construction. Facilities such as refrigerated warehouses, multi-tier stacking facilities, special handling areas for heavy cargo, hazardous cargo etc., have also contributed to making **CONCOR's** terminals the most modern logistics hubs in the country

Self Assessment Questions

1. Describe the main functions of CONCOR
2. How CONCOR support for International Trade of India?
3. Describe the special services offered by CONCOR with the support of Indian Railways.
4. Elaborate the Organisational Strcture of CONCOR
5. Bringout the freiht strcture of CONCOR
6. Classify the different types of containers used by the CONCOR
7. Emphasis the support of CONCOR for the international logistic support
8. How the information support system of CONCOR helps to do better international logistic management?

Lesson 2.4 - Dry Ports

Learning Objectives

After reading this chapter you should be able to

- Define Dry Port
- Understand the Need/ Significance of Dry Port
- List different Types of Dry Port
- Key logistics objectives
- To Know the Services Offered by Dry Port
- To Understand the future Prospects of Dry Port

Introduction

It is an inland terminal directly connected by road or rail to a seaport and operating as a centre for the transshipment of sea cargo to inland destinations. In addition to their role in cargo transshipment, dry ports may also include facilities for storage and consolidation of goods, maintenance for road or rail cargo carriers and customs clearance services. The location of these facilities at a dry port relieves competition for storage and customs space at the seaport itself. A dry port, also called sometimes an inland port or multimodal logistics centre. It consists of facilities like container yards, warehouses, railway sidings and cargo-handling.

Definition of Dry Port

The various terminologies used by UNCTAD and ECE for dry ports considering the common features and situation dry port is defined as follows

"A dry port provides services for the handling and temporary storage of containers, general and/or bulk cargoes that enters or leaves the dry port by any mode of transport such as road, railways, inland waterways or airports. Full customs-related services and other related services such as essential inspections for cargo export and import, whenever possible, should be put in place in a dry port."

A Definition of a Dry Port can be Found in a Danish Study Conducted in 2007

'A dry port is a port situated in the hinterland servicing an industrial/commercial region connected with one or several ports with rail-, road- or inland water transport and is offering specialized services between the dry port and the overseas destinations. Normally the dryport is container and multimodal oriented and has all logistic services and facilities needed for shipping and forwarding agents in a port.

Need for Dry Port/ Inland Port

Each inland port remains the outcome of the considerations of a transport geography pertaining to modal availability and efficiency, market function and intensity as well as the regulatory framework and governance. Their emergence underlines some deficiency in conventional inland freight distribution that needed to be mitigated. This mitigation includes

Land Value

Many deep sea terminal facilities have limited land available for expansion. This favors the intensification of activities at the main terminal and the search of lower value locations supporting less intensive freight activities.

Capacity and Congestion

Capacity issues appear to be the main driver of inland port development since a system of inland terminals increases the intermodal capacity of inland freight distribution. While trucking tends to be sufficient in the initial phase of the development of inland freight distribution systems, at some level of activity, diminishing returns such as congestion, energy and empty movements become strong incentives to consider the setting of inland terminals as the next step in regional freight planning.

Hinterland Access

Inland locations tend to be less serviced by intermodal transportation than coastal regions. Through long distance transport corridors, inland ports confer a higher level of accessibility because of lower distribution costs and improved capacity. These high-capacity inland transport corridors allow ports to penetrate the local hinterland of competing ports and thus to extend their cargo base. In such a setting, the inland port becomes a commercial and trade development tool that jointly increase imports, exports and intermodal terminal use.

Supply Chain Management

In addition to standard capacity and accessibility issues in the hinterland, an inland port is a location actively integrated within supply chain management practices, particularly in view of containerization. This takes many forms such as the agglomeration of freight distribution centers, custom clearance, container depots and logistical capabilities. The inland terminal can also become a buffer in supply chains, acting as a temporary warehousing facility often closely connected to the warehouse planning systems of nearby distribution centers. Purchasers can even be advantaged by such a strategy since they are not paying for their orders until the container leaves the terminal, delaying settlement even if the inventory is nearby and available.

Support for Inbound Logistics

The geographical characteristics linked with modal availability and the capacity of regional inland access have an important role to play in shaping the emergence and development of inland ports. Each inland market has its own potential requiring different transport services. Thus, there is **no single strategy** for an inland port in terms of modal preferences as the regional effect remains fundamental. In developed countries, namely North America and Europe, which tended to be at the receiving end of many containerized supply chains, a number of inland ports have been developed with a focus on inbound logistics.

Different Types of Dry Ports

- One dry port services one port
- One dry port services three different ports
- Different dry ports are servicing the same port

Dry ports can be on distant, mid-range or close-range to seaports. As mid-range and short-range dry ports are close to the seaport and transport distances are relatively short, inbound and outbound flows are mostly handled by road transport. Long distance dry ports are located further in the hinterland, the transport distance between the seaport and the dry port is much larger. Inland shipping and rail become more competitive on these longer transport distances.

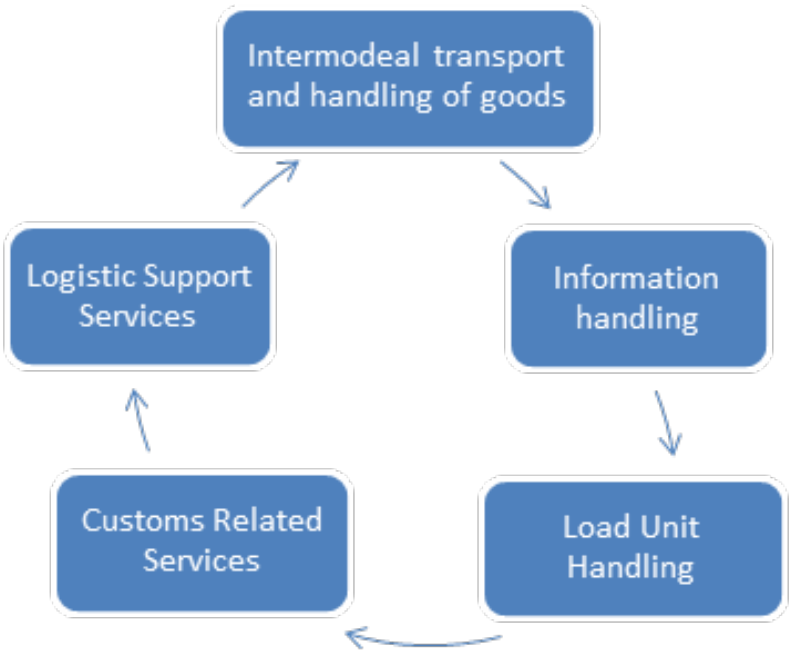
The following scheme shows the advantages and disadvantages of distant, mid-range or close range type of dry ports. For all three types of dry ports it can be concluded that

they increase inland access, strengthen multi-modal solutions, avoid traffic bottlenecks and reduce pollution.

Conventional inland terminals provide a basic service transshipment of goods. Full service dry ports on the other hand include functions like storage, consolidation, depot storage of empty containers, container maintenance and repair, custom clearance. Another difference is that the gates of the seaport are extended into the inland and that the shipper or forwarder sees the dry port as an adequate interface towards the port and the shipping lines. Furthermore a dry port can be more than just an intermodal terminal; a dry port is a concept combining activities that are performed by various parties, similar to the situation in a seaport.

Services provided in a Dry Port

In general the following services are provided in a Dry Port



Major Services provided in a Dry Port

Intermodal Transport and Handling

Goods in unit loads – containers, swap bodies or trailers – can be transported efficiently via the use of different modes. The quality of access to a dry port and the quality of the road/ rail/waterway interface determines the quality of terminal performance (i.e. transshipment costs, waiting times, and damage risk etcetera) and needs scheduled, reliable, transport by high capacity means to and from the seaport.

Information Handling

Freight transport involves different actors. In intermodal transport to and from a dryport this becomes more complicated as the number of actors increases shippers (goods owners), shipping lines, agents, transport operators (road, rail or inland waterway), customs, inland terminal and port terminal. Handling of information is crucial for moving the goods effectively and efficiently through the transport chain. Information comprises customs clearance, load lists, dangerous goods, invoicing and booking. The reliability of the goods flow (right place, time, quantity and condition) is to a great extent dependent on the accuracy of the handling of information within and between actors.

Load Unit Handling

Load unit handling concerns the depot- and the storage functions. The intermodal flow of containers, swap bodies, trailers, implies a need for short time storage (including dangerous goods, reefer containers) and maintenance (including cleaning). The manufacturing industry and retailers have focused on decreasing their own storage facilities. A consequence is that port terminals are used as storage areas. Congestion in ports does call for solutions and dry ports might play an important role in this respect. A contributing factor to goods being stored in port terminals is associated to the safety and security factor. With security standards as CSI and ISPS it is considered safer to store goods in port terminals than at factory sites. A dry port should therefore offer the same security level as a port terminal.

Customs Related Services

Import and export of goods are regulated by custom regulations. Especially imports are affected as customs include administration and the payment of various fees and taxes. Goods arriving from countries must cross the border at authorized points. Postponed administration of customs (import and export) to the dry port would bring with it improved port throughput and postponed payment of custom fees and taxes for the importer. A dryport terminal should therefore offer a customs storage area.

Logistics Support Services

The above mentioned storage functions are focused on the load units (full or empty). The logistics function is related to the handling of goods prior or after the transport in a load unit. Logistics services which a dry port should offer is stuffing and stripping, warehousing, value added services (i.e. assembly, packing) and distribution.

Dry Port Functions within Transport Chains

A functional and added value hierarchy has emerged for inland terminals as they try to replicate inland several services performed at a port terminal, namely customs clearance and container storage. In many instances, freight transport terminals fit within a hierarchy with a functionally integrated inland transport system of gateways and their corridors, where they service three major functions

- **Satellite terminals**. They tend to be close to a port facility, but mainly at the periphery of its metropolitan area (often less than 100 km), since they mainly assume a service function to the seaport facilities. They accommodate additional traffic and serves functions that either have become too expensive at the port such as warehousing and empty container depots or are less bound to a location near a deep sea quay. A number of satellite terminals only have a transport function transshipping cargo from rail/barge to trucks and vice versa, as is the case for the 'container transferium' concept of the port of Rotterdam or the Gateway Access Point (GAP) concept in Belgium. Satellite terminals can also serve as load centers for local or regional markets, particularly if economic density is high, in which case they form a multi-terminal cluster with the main port they are connected to through regular rail or barge shuttle services. For gateways having a strong import component, a satellite terminal can also serve a significant transloading function where the contents of maritime containers are transloaded into domestic containers or truckloads.

- **Freight distribution clusters (load centers)**. A major intermodal facility - load center - granting access to well defined regional markets that include production and consumption functions. It commonly corresponds to a metropolitan area where a variety of terminals serve concomitantly intermodal, warehousing, distribution and logistics functions. These tend to take place in logistics parks and free trade zones (or foreign trade zones). The inland terminal is thus the point of collection or distribution of a regional market. The more extensive and diversified the market, the more important is the load center. If the load center has a good intermediary location, such as being along a major rail corridor, then freight distribution activities servicing an extended market will be present.

- **Transshipment facilities**. Link large systems of freight circulation either through the same mode (e.g. rail-to-rail) or through intermodalism (rail-to-truck, or even rail-to-barge). In the later case, the inland terminal assumes the role of a load center. The origin or the destination of the freight handled is outside the terminal's market area, a function similar to that of transshipment hubs in maritime shipping

networks. Such transshipment terminals are often found near country borders in view of combining administrative processes linked to cross border traffic to value-added logistics activities. Although this function remains marginal in most parts of the world, ongoing developments in inland freight distribution, where the scale and scope of intermodal services are increasing, are indicative that transshipment services are bound to become more prominent.

These functions are **not exclusive**, implying that inland terminals can service several functions at once. Therefore, there is no single model for an inland port. For inbound or outbound freight flows, the inland terminal is the first tier of a functional hierarchy that defines its fundamental (activities it directly services) and extended (activities it indirectly services) hinterlands. Considering the potential mix of the functions of inland ports, five major criteria insure that they fulfill efficiently their role as an interface between global and regional freight distribution systems

- **Site and situation**. Like any transport facility of significance, an inland port requires an appropriate site with good access to the rail or the barge terminal as well as available land for development. Access to a large population base is of importance since it will be linked to the level of import and export activities handled by the inland port. Transportation remains the most significant logistics cost, underlining the importance of an accessible location. Several inland ports also have an airport in proximity which can help support a variety of freight activities.

- **Repositioning**. Since most long distance trade (and some domestic) is supported by containerization, there are numerous instances where a regional market imports more than it exports (or vice-versa). Under such circumstances, an inland port must provide the physical and logistical capabilities to insure that empty containers are repositioned efficiently to other markets if local cargo cannot be found. This can take the form of empty container depots and arrangements with freight forwarders to have slots available for repositioning.

- **Cargo rotation**. Whether there are imbalances in container flows or not, an inland port must insure that the inbound and outbound flows are reconciled as quickly as possible. A common way involves a cargo rotation from imports activities where containers are emptied to exports activities where containers are filled with goods. For container owners, let them be maritime shipping or leasing companies, a rapid turnover of their assets is fundamental and will secure a continuous usage of the inland port. Effective repositioning and cargo rotations strategies will insure higher revenue levels for both the container owners and the dry port operators.

- **Trade facilitation**. An inland port can also be a fundamental structure promoting both the import and export sectors of a region, particularly for smaller businesses unable to achieve economies of scale on their own. The hinterland massification opportunities offered by inland ports are associated with lower transport costs and a better accessibility. Through these, new market opportunities become possible as both imports and exports are cheaper.

- **Governance**. The way an inland port is owned and operated is indicative of its potential to identify new market opportunities and invest accordingly. In many cases, the commitment of a large private investor such as a port operator or a real estate developer can be perceived as a risk mitigation strategy in addition to provide expertise in the development of facilities and related activities. Sections of an inland port can be shared facilities (e.g. distribution centers) so that smaller players can get involved by renting space and equipment. This also applies to the appropriate strategies related to each stage in the life cycle of an inland terminal from its construction to its maturity where its potential has essentially been taped off. The setting of a Foreign Trade Zone (FTZ) is also an option to be considered.

Future Prospects for Dry Port

The setting of dry ports (inland ports) have been a dominant paradigm in the development of hinterland transportation as the growth of maritime transportation and its economies of scale have placed pressures on the inland segment of freight distribution. The prospects for inland ports remain positive with large continental markets like North America and Europe relying on a network of satellite terminals and load centers as a fundamental structure to support hinterland freight movements, particularly their massification. This entailed the emergence of extended gates and with them extended forms of supply chain management in which inland terminals play an active role.

As congestion increases, inland terminals will be even more important in maintaining efficient commodity chains. It can also be expected that resources will play a greater role within containerized trade with inland terminals, again underlining unique regional characteristics. This implies a set of repositioning strategies where inland terminals play a fundamental role either to improve the efficiency of this repositioning, by providing better cargo rotation opportunities, or by acting as an agent that can help promote containerized exports. Inland ports will take part of the ongoing intermodal integration between ports and their hinterland through long distance rail and barge corridors. They are likely to be more important elements within supply chains, particularly through their role of buffer where containerized consignments can be cheaply stored, waiting to be forwarded to their final destinations.

Like several stages in intermodal transport development, such as in port infrastructure, there is a potential of overinvestment, duplication and redundancy as many inland locations would like to claim a stake in global value chains

The decision of a rail company to build a new terminal or to expand existing facilities commonly marks the moment where regional stakeholders, from real estate developers to logistics service providers, readjust their strategies. In some instances, local governments will come with inland port strategies adjusting to existing commercial decisions in the hope to create multiplying effects.

The development of dry ports around the world has clearly underlined an emerging functional relation of port terminals and their hinterland. Based upon their regional setting, dry ports assume a variety of functions with co-location with logistical zones a dominant development paradigm. While the interest in dry ports has increased one has to be aware that no two dry ports are the same. Each dry port is confronted with a local/regional economic, geographical and regulatory setting which not only define the functions taken up by the dry port, but its relations vis-à-vis seaports. Best practices can only be applied successfully if one takes into account the relative uniqueness of each dry port setting.

Self Assessment Questions

1. Define Dry Port
2. Describe the different types of Dry Port
3. Emphasis the significance of Dry Port
4. Enumerate the different types of services offered in Dry Port
5. Establish Dry Port and its support in logistics movements

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Lesson 2.5 - Role of Logistic Intermediaries

Learning Objectives

After reading this chapter you should be able to

- Define Logistics Intermediaries
- Understand the Different types of Intermediaries
- List different activities of logistics Intermediaries
- Recognize the Third Party Logistics (3PL) Providers
- Understand the Fourth Party Logistics (4PL) Providers

Introduction

Today many internationally focused logistics service providers, including freight forwarders, customhouse brokers, ocean and air carriers, as well as logistics management companies, characterize themselves as third-party logistics providers capable of offering bundled services for the movement of international freight. The degree to which such offerings may be employed by major importing and exporting firms depends on several factors influencing the economies and utility of those services. These firms are referred to as facilitators or intermediaries. Intermediaries exist because they improve the efficiency of marketing channels. In addition to covering routine logistics functions, they perform literally hundreds of specialized tasks associated with import/export movements. Take translators, for example. They may be needed for verbal translations, say, in trade negotiations and in promotional videotapes, and for written translation of trade documents or users' manuals. A translator must be able to work with at least two different languages; consider the number of different language pairs for which translations might be needed! The best-known intermediaries in international trade are the freight forwarders.

Conventional wisdom continues to hold that they should be used by all first-time exporters. And many firms with long experience in exporting and importing continue to use forwarders for all but the most routine and repetitive of activities. Some companies use firms known as third-party logistics service providers, or "3PLs". These 3PL firms are capable of handling all or part of a firm's logistics service needs and are thus comprehensive

in scope. The term third-party logistics, or 3PL, is widely used in logistics circles these days, and it has a somewhat broader meaning—namely the outsourcing of all a firm's logistics activities to another firm that then manages them, without taking an ownership position in the inventories. Take the other example of one intermediary with whom readers may have dealt is the travel agent. The travel agent represents a client's desire to travel and finds the transportation and lodging accommodations best suited to his or her needs and pocketbook. Airlines and hotels pay the travel agent a commission for their selling efforts. Intermediaries abound in foreign trade, and they cement relationships between parties in the supply chain. Whole armies of specialists and generalists exist to help the firm with its export or import shipments.

Logistic Intermediaries

The following are the main logistics intermediaries play major role for the shipper in the international logistics operations.

Logistic Intermediaries

Clearing and Forwarding Agents (C&F Agents)

Freight Forwarders

The most common intermediary in international logistics is the freight forwarder. After the sale is completed, a freight forwarder can handle nearly of all the logistical aspects of the transaction. Indeed, large forwarders may assume responsibility for managing the firm's international distribution and supply channels. Smaller forwarders often specialize in air or ocean movements. Forwarders have a number of advantages, including daily pickup and distribution; global shipping capacity with choices from multiple carriers; local staff who are familiar with the shipper's needs; advice and preparation of documents; consolidation of freight from multiple shippers to a single destination, thus saving freight costs; and because of bulk booking of freight space, they will often have capacity available when the carrier reports "sold out."

According to **US Government Federal Maritime Commission** "A person carrying on the business of forwarding for a consideration who is not a shipper or consignee or a seller or purchaser of shipments to foreign countries nor has any beneficial interest therein, nor directly or indirectly controls or is controlled by such shipper or consignee or by any person having such a beneficial interest"

The Role of Freight Forwarder's

Export Management Companies

Export management companies (EMCs) are intermediaries that market another firm's products overseas. They have three to five-year exclusive representation contracts, investigate potential customers' credit standing, and can handle complementary, non-competitive products. EMCs are professional exporters. An EMC does not manufacture. The business of the EMC is finding and servicing markets overseas on behalf of domestic manufacturers. The following are the main services offered by Export Management Companies for their clients

- Preparing documentation
- Appointing forwarders
- Arranging for special packing
- Procuring insurance; providing special documents, such as consular documents; and negotiating rates are all functions provided by the EMC.
- In addition, and more important for many firms, the EMC provides a marketing and sales capability the manufacturer lacks.
- The EMC will conduct market research on behalf of the product and develop promotional materials designed specifically for the target market.
- The EMC will also advise the manufacturer on modifications needed in order to promote the success of the product. Fitting the product to the market is an essential part of international business.
- The EMC brings export finance and credit capability to the manufacturer.
- Commission arrangements with EMCs are an alternative to buy-sell contracts with export trading companies.
- The EMC simply represents the manufacturer in its marketing effort. The exporter sells and ships directly to the foreign buyer, assumes all of the credit risk and usually makes all of its own arrangements.

Export Packers

They are examples of a specialized intermediary. They assist the exporter with special packaging requirements needed to reach some export markets. Often 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 he or she delivers the goods to the importer's place of business.

Publication Distributors

Another example of specialized intermediaries are publication distribution firms. For example the Dutch airline, has a publications distribution service that includes wrapping, destination sorting, addressing, database management, and so on, for magazines. Also handled are business reply mail and collections of subscription payments in local currency. Magazines move overseas by air and then are turned over to post offices for delivery, saving on international postage costs. Sometimes, the wrapping and labeling is done in the country of destination to save the weight of wrapping materials going by air.

Goods Surveyors

Goods surveyors are frequently referred to in international trade. They are retained by the buyer, the seller, or both to inspect the quality of goods, measure the weight, or determine the extent of damage that may have occurred while the goods were in transit. This is necessary to consummate some sales agreements where there is an apparent discrepancy.

Parts Banks

Several firms, often airlines, offer a parts bank service. This permits manufacturers to store important repair parts throughout the world, where they can be quickly flown to customers with equipment "down."

Container Leasing Companies

Container leasing companies also facilitate intermodal 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. The largest container leasing company in the world is GE Seaco, with over 1.1 million TEUs available for lease. GE Seaco's website (http //www.geseaco.com) provides a wealth of information regarding container leasing and industry trends, including an interactive map showing container availability in ports worldwide. These companies lease containers on both a short- and long-term basis. Each retires between five and ten percent of its containers each year because of wear.

Export Trading Companies

Finally, one distinctly different intermediary is the Export Trading Company (ETC). ETCs go one step further. They actually buy the manufacturer's goods, take title, and then sell these goods in the export market. ETCs are not merely representatives. They 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, such as those associated with political instability, the importer's creditworthiness, the country's creditworthiness, and the risk of unavailability of foreign exchange. Instead, the creditworthiness of the ETC becomes the only issue.

Shipping Freight Broker

A broker is a businessman who buys or sells for another in exchange for a commission. On similar lines, a ship cargo freight broker is a businessman who acts as an agent between people wanting ships to transport the cargo they possess and cargo ship owners. Ship cargo freight brokering is a highly competitive field and as such a shipping freight broker is a much sought after professional in the shipping cargo business. A ship cargo freight broker might be operating on an individual basis or he might be a part of a professional organisation which has many such shipping freight brokers in its rosters. There are several pointers that a cargo broker needs to keep in mind in order to make sure that the best results for his client in terms of the shipping cargo transaction are obtained. A few of the same can be enumerated below

- The shipping freight broker's primary interest needs to be vested in his client i.e. the person/people in need of cargo ships
- This said the freight shipping brokers need to ensure that the deal that gets cut out between the clients and the ship owners is transparent and the client does not get cheated in any way. The ship's reliability and overall utility needs to be the first lookout for the cargo broker as any problems in these two areas could lead to a massive loss to his client and ultimately to the broker himself
- If the cargo ship freight broker is satisfied with all the elements of the prospective deal, then he prepares what is known as the Charter Party. In essence, this document states all the necessary terms and conditions to the deal and must be signed by both parties to the aforesaid transaction
- It becomes the shipping freight broker's responsibility and duty to be aware of the currently prevailing market scenario in the area of cargo shipping. If by any chance, there is a lack of knowledge on the broker's part, then he is expected to gain the requisite through fellow agents employed in the profession. This is so because any lack of knowledge on the broker's part would lead to a loss for his client. The client's trust in the broker's vouching as an established professional is faulted, as a resulting consequence
- The commission to the broker is paid by the cargo owner

Shipping Agents

A shipping agent is a person who deals with the transactions of a ship in every port that the ship visits or docks. In simple terms, it is a shipping agent who with a local expert acts as a representative of the owner of the ship and carries out all essential duties and obligations required by the crew of the ship. It is the ship agent who is entrusted with taking care of every need and requirement of the crew like getting local currency, getting the mail, any repairmen in case the ship requires major repairing, refilling the food and water containers and many other such duties.

Also along with the above mentioned duties it is also a shipping agent's responsibility that dues are paid and discharged especially when it comes to customs. The payment of the dues can also extend to those working on the ship on a contract basis and whose contract might have come to end after reaching that particular port. Keeping all these details in mind, a shipping agent cannot allow any scope of neglecting his duty. Ship owners can allow themselves to be free of all the details that are required to be processed each and every time a ship makes a port because of the presence of shipping agents. In the absence of shipping agents, a ship owner will have to be the one to rush from one port to another, across numerous countries trying to solve every problem and fit-in every new up-gradation to the ship.

Thus the career of a shipping agent is quite trendy as it allows him to interact with shipping companies and owners from not just his native country but from all over the world. Since a ship agent is a local person, it enables him to achieve the trust of a ship owner along with the trust of the crew of the ship. This in turn adds to him getting exposure because by this interaction, he will be able to understand and learn what the actual needs of the crew are. This understanding of his clients' necessities and supplying of the same, thus enables a ship agent to gain goodwill and secure more clientele for himself.

Another major thing that needs to be noted about the role and scope of shipping agents is that, it is a ship agent who is responsible for the ship's necessary papers when it comes to a port for docking. Adding this to the long line of services mentioned above, it is quite clear that the role of a shipping agent is not something that can be taken lightly. This is what the USP of a shipping agent is. He has the ability to offer far more than what a shipping company or a ship owner could ask or anticipate, thus making the profession a unique and singular one. In today's contemporary times where the shipping industry has managed to develop and stay on par with the times, it is the shipping agent who provides the incentive for it to stay alive and flourishing.

Port Agents

The main duty of the port agent is to represent the owner and assist the vessel for the owners account in order that it will have the best possible business. The port agent shall in all respect assist the ship's captain in his contacts with the local authorities like the customs and port, and he also has to procure the provisions and other necessities, communicate orders to and from owners etc.,

Linear Agents

The linear agents are an important group of functionaries in liner shipping. Whereas brokers and port agents rarely enter into written contracts with their principals, linear agents often enter into such written contracts- often under certain forms. A linear agent functions like a general agent within a geographical area. Linear agents represent the owner in differently ways. Their functions are

- To advertise about the arrival and departure of vessels
- Pay port dues and custom charges if any (like Indian lighthouse dues)
- Appoint a stevedore to load and unload the cargo,
- To arrange for the documentation relevant to various departments on behalf of the vessel and issue the bill of lading on behalf of the master
- Procure and supply provisions for the crew and the vessel

Third Party Logistics Providers (3PL Providers)

Third Party Logistic (TPL or 3PL) refers to the concept of outsourcing the logistics and distribution of a manufacturing or service firm to a logistics service provider so that the manufacturing company can focus on its core competencies of new product development, manufacturing them and marketing the products. These specialized companies offer a range of services to other organizations. The advantages of this arrangement are that specialized companies run the transport, leaving the organization to concentrate on its core operations. By using their skills and expertise the transport operators can give better services, or lower costs than own account transport. They might also be large enough to reduce costs through economies of scale, and they can get a number of operational benefits. Some manufacturing verticals are already heavily dependent on 3PLs. For instance, each of the Detroit Three automakers — General Motors, Ford Motor and Chrysler — use more than 30 third-party logistics providers.

- By make using the third party logistics company can concentrate on their core tasks and improve the customer satisfaction
- Companies resource constraints can be removed by make using third party logistics
- Outsourcing of logistical activities to 3PL allows companies to get into new businesses, new markets or a new channel of distribution quickly and with a limited outlay of budget.
- Logistics related problems can be solved through professional and scientific approach by make using the 3PL
- For efficient management of inventory resulting in better utilization of working capital
- In transportation by consolidating the smaller loads of goods into larger ones and reduce the number of trips between destinations, or they can co-ordinate journeys to give backhauls, where delivery vehicles are loaded with other materials for the return journey.

Services offered by Third party Logistics Providers (3PL Providers)

1.	Shipment Consolidation
2.	Carrier Selection
3.	Rate Negotiation
4.	Fleet Operations and Management
5.	Logistic Information System
6.	Handling Product Returns – Reverse Logistic Operation
7.	Order Processing and Order Fulfillment
8.	Re-labeling/ Repacking
9.	Customized delivery
10.	Inventory Management
11.	Product Testing and Assembly including up keep
12.	Multimodal transport support

Selection of Third Party Logistics (3PL) Providers

Deciding to a use a third party logistics company is a decision that depends on a variety of factors that differ from business to business. The decision to outsource certain business functions will depend on the company's plans; future objectives, product lines, expansion, acquisitions, etc. Once a decision has been made to outsource certain processes

then a company will begin a search for the right 3PL that fits all their requirements at the best possible price. There are three types of Third Party Logistics Company that operate today.

- Asset Based
- Management Based
- Integrated Providers

Asset based third party logistics companies' use their own trucks, warehouses and personnel to operate their business. Management based companies provide the technological and managerial functions to operate the logistics functions of their clients, but do so using the assets of other companies and do not necessarily own any assets. The third category, Integrated Providers, can either be asset based or management based companies that supplement their services with whatever services are needed by their clients. After the bids have been received by a company from the prospective 3PL's, an evaluation would take place where a multi-discipline team will review each bid based on a pre-defined set of criteria. These will include some of the following.

- Does the 3PL provide the services required?
- Does the 3PL have the technology required to perform the tasks required?
- Does the company have the required warehouse space, dock capacity, warehouse personnel, etc.?
- Is the 3PL financially sound?
- Are the 3PL's geographical locations suitable to cover the network?
- Does the 3PL have the flexibility to respond to changes?
- Are the 3PL's environmental policies compatible?
- Are the costs of the services detailed enough for comparison to other bids?
- Are the customer references acceptable?
- Is the 3PL a good cultural fit?

In addition to the above evaluation process the following factors normally considered in selection process of third party logistic providers;

1. Outline Areas of Opportunity

One reason to outsource is to gain the ability to enter new markets or adapt to competitive forces without building out costly distribution infrastructure, establish a team

to look at the current and future requirements of your business and critically assess your ability to meet those needs internally. This team should be comprised of key members from both your logistics organization and other areas like marketing and customer service. These additional departments can provide insight into future growth projections and shortcomings in the existing process and infrastructure."

2. Critically Assess Strengths and Weaknesses

Determining what you're good at, and more importantly, those areas where your company needs the most help, will enable you to find a complimentary partner, Blanchard says. Keep in mind, though, that potential partners will have their own distinct strengths and weaknesses.

"Some 3PLs are better at warehousing than transportation and vice versa. Others are great at managing the import process, but have less to offer in functional areas like inventory and order management. Merging your strengths with those of your partners will help ensure a robust result."

3. Decide what is on the Table

Once you've identified opportunities for partnering with a 3PL, determine which of these you are actually willing to pursue. Logistics functions like warehousing and transportation influence how your customers view your ability to execute. The decision to include some or all of these functions in your outsourcing project should be informed by a clear understanding of your company's willingness to turn over mission critical processes to a logistics partner." The success of your outsourcing project, he observes, will depend on how comfortable you are with the idea of a third party operating on your behalf.

4. Identify a 3PL Providers to Meet Requirements

At this point in the process, you should consider initiating a logistics network optimization study to identify optimal locations for import or export gateways, assembly, merge-in-transit and other specific operations. Your geographic needs may require a nationwide or global network or be more focused on specific regions. Create and distribute a concise request for information (RFI) designed to ask potential partners about their capabilities. From this, develop a list of providers that have experience in your industry and markets, as this process will reduce the number of potential partners quickly." Then, examine the network infrastructure of the remaining companies and compare your requirements with the capabilities of potential providers. It's also important that

you assess the technological infrastructure of potential partners, especially as it applies to such applications as warehouse management systems, order management systems or transportation management systems.

5. Consider the Human Element Carefully

Cultivating relationships between key personnel on both sides throughout the outsourcing process is critical," Blanchard notes. Ensuring not only a fit between corporate cultures, but individuals will contribute greatly to success. This is especially important during implementation and ongoing operations, but if you wait until this stage to identify issues, it will be too late. Remember you will trust your chosen partner with your livelihood.

Fourth Party Logistic (4PL) Providers

Forth Part Logistics (4PL) providers represent the next stage of development in the field of logistics service providers. The trend, even in India, is to outsource the non-value added activities to an outside party. More and more business processes are being outsourced. These may include

1. Bill payment,
2. Credit tracking,
3. Invoice generation,
4. HRD,
5. Transport and
6. Warehouse

But there are no single 3PLs that offer all of these processes with equal competence. For example warehouse, transportation and inventory management may be given out to one 3PL, other processes such as HRD, Security and product development are done by other 3PLs and linked via personnel and IT. So what is needed is an integrator that assembles the capital, technology and resources of its own organization and other complementary service providers to design, build and run supply chains. In simple words a 4PL manages other 3PLs.

The following points further distinguish 4PLs from 3PLs

1. 4PL delivers a comprehensive supply chain solution
2. 4PL delivers value through its ability to have an impact on the entire supply chain.

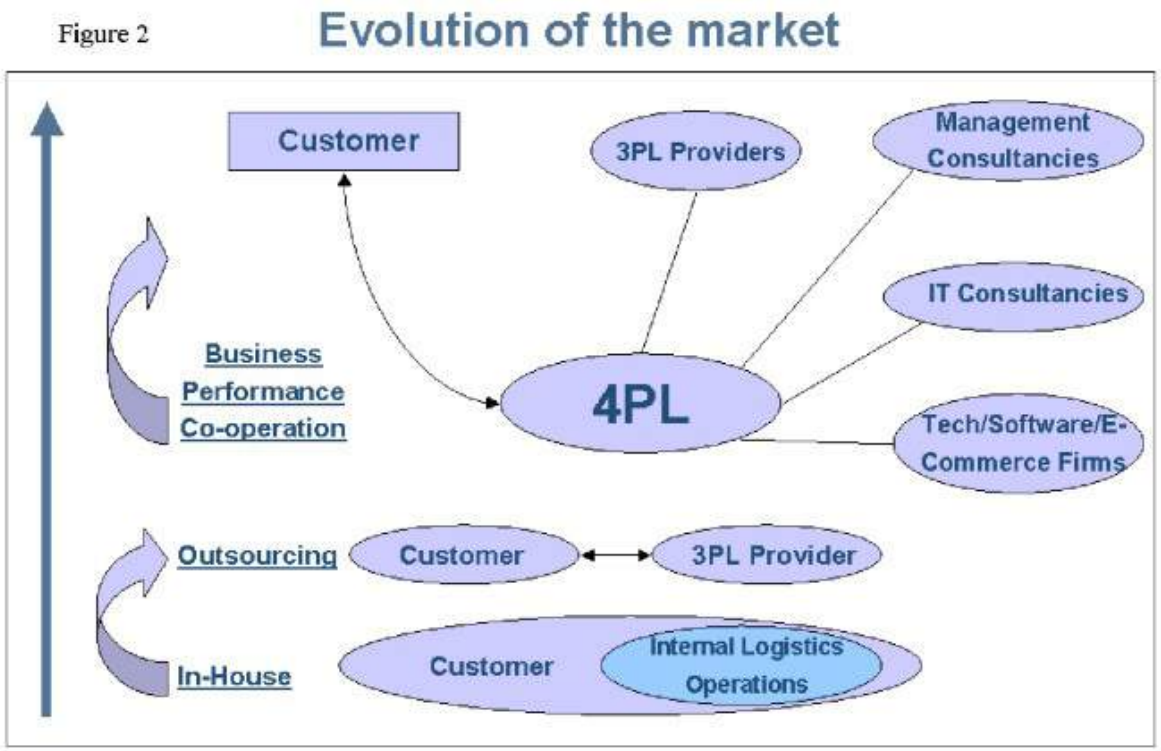
Development of Forth Party Logistics (4PL) Concept

Forth party logistics was a term coined by Accenture Consulting in the mid 90's. the term was coined as a result of an exhaustive survey carried out by the organization on customer satisfaction, which indicated that the customer expectation regarding costs using 3PLs service providers were not up to the mark. The survey also indicated that the balance of risk and reward on which the 3PL business model is based had titled the rewards unjustly in favour of the 3PL service providers while the risk were borne by the client organizations. This was because of the fee-based model of outsourcing that the companies adopted that resulted in inflated costs of operations with increase in the outsourcing business. As a result the supposedly dynamic nature of the 3PL service provider had become a dynamic one.

The **Accenture** defined the 4PL with the following definition

"An integrator that assembles the capabilities, technology and resources of its own organization and other organization to design, build and run comprehensive supply chain solutions".

Figure 2



Source: Frost & Sullivan

For a firm to be 4PL it must have exhaustive skills in investing and maintaining the infrastructure and resources that makes it the manager of multiple 3PL service providers crucial to the client organization. However, the definition of 4PL was misinterpreted by

many 3PL who thought 4PL as a kind of 3PL plus service and began providing some more value-added activities such as assembling, picking and then marketing themselves as 4PL providers.

Components of Forth Party Logistic Providers (4PLs)

The following are the key components of 4PL Service Providers

Act as Solution Integrator

The 4PL should be the instigator of continuous innovations that help in maximizing the use of 3PL service providers to the client organization. The process of innovation makes sure that the relationship between that of the 3PL and the client organization does not remain a static one and is evolving continuously for the benefit of the client organization. The change can come in process improvements or use of enhanced technology for efficient utilization of resources.

Act as Control Room

The control is the brain and intelligence of the 4PL. It is the decision-making components and should consist of experienced logisticians. Ideally, the control room components should contain people from partner and client organizations who can enhance returns with their collective intellect.

Act as Supply Chain Infomediary

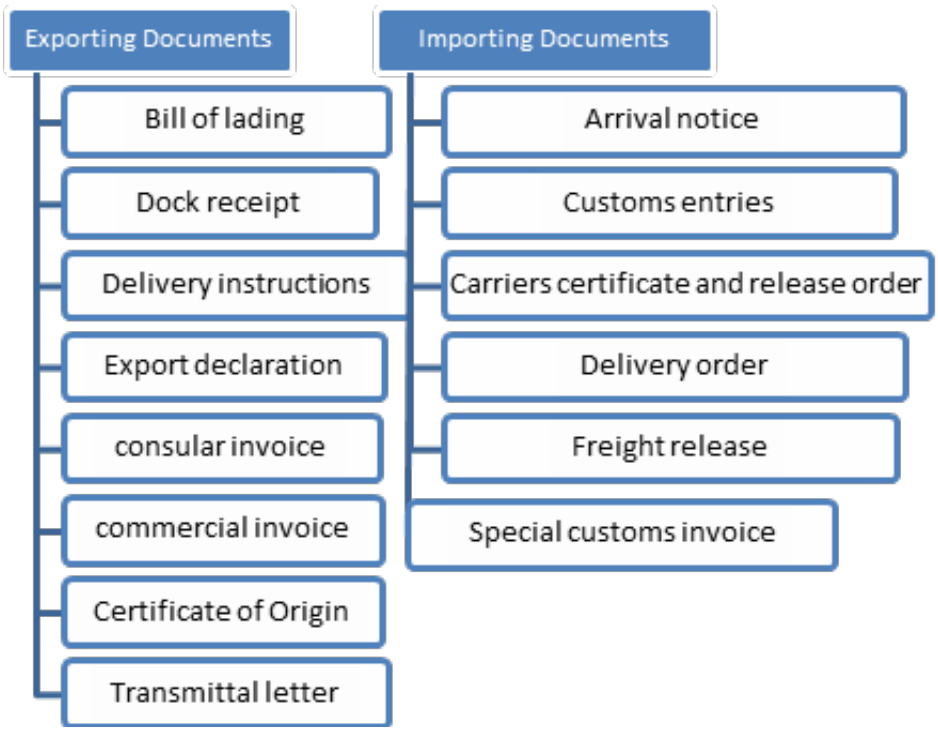
The 4PL should have extensive resources and capabilities for collecting and disseminating information to various partner organizations. It must use enhanced technologies like GPS, GIS to increase visibility of goods. The 4PL provider must also possess capabilities to integrate the disparate technologies of various 3PL and the client organization so that sharing of information is complete. The 4PL is also the nodal agency for converting raw data into meaningful information. An emerging trend for information sharing is the use of web-based tools.

Act as Resource Provider

The 4PL provider must also provide some sources that are critical to the functioning of the conventional supply chain solutions. These resources include warehousing, packaging etc.,

International Transport Documentation

Several documents are required to perform each transport movement. The three primary types are bill of lading, freight bills, and shipping manifests.



Transport Documentation

Bill of Lading

The bill of lading is the basic documents utilized in purchasing transport services. It serves as a receipt and documents commodities and quantities shipped. For this reason, accurate description and count are essential. In case of loss, damage, or delay, the bill of lading is the basis for damage claims. The designated individual or buyer on a bill of lading is the only bona fide recipient of goods. A carrier is responsible for proper delivery according to instruction contained in the document. In effect, title is transferred with completion of delivery.

The bill of lading specifies terms and conditions of carrier liability and documents responsibility for all possible causes of loss or damage except those defined as acts of god. It is important that terms and conditions be clearly understood so that appropriate actions can be taken in the event of substandard performance. These days' **uniform bill of lading** to be computerized and electronically transmitted between shippers and carriers. In addition to the uniform bill of lading, other commonly used types are order –notified, export, and government. It is important to select the correct bill of lading for a specific shipment.

An order notified or negotiable bill of lading is a credit instrument. It provides that delivery not be made unless the original bill of lading is surrendered to the carrier. The usual procedure is for the seller to send the order-notified bill of lading to a third party, usually a bank or credit institution. Upon customer payment for the product, the credit institution releases the bill of lading. The buyer then presents it to the common carrier, which in turn releases the goods. This facilitates international transport where payment for goods is a major consideration.

Export bill of lading permits domestic use of export rates, which are sometimes lower than domestic rates. Export rates may reduce total cost if applies to domestic origin or destination line haul transport.

Government Bills of lading may be used when the product is owned by the United States Government. They allow the use of section 22 rates, which are normally lower than regular rates.

Freight Bill

The freight bill represents a carrier's method of charging for transportation services performed. It is developed using information contained in the bill of lading. The freight bill may be either prepaid or collect. A prepaid bill means that transport cost must be paid prior to performance, whereas a collect shipment shifts payment responsibility to the consignee.

Shipping Manifest

The shipping manifest lists individual stops or consignees when multiple shipments are placed on a single vehicle. Each shipment requires a bill of lading. The manifest lists the stop, bill of lading, weight, and case count for each shipment. The objectives of the manifest are to provide a single document that defines the contents of the total load without requiring a review of individual bills of lading. For single-stop shipments, the manifest is the same as the bill of lading.

Dock Receipt

After the carrier has delivered the goods at the dock, the steamship agent issues a dock receipt indicating that the domestic carrier has delivered the shipment to the steamship company. This document can be used to show compliance with a letter of credit's payment requirements and to support damage claims.

Commercial Invoice

The commercial invoice, which the seller uses to determine the commodity's value less freight and other charges is basically the seller's invoice for the commodities sold. The letter of credit and companies or agencies often require this invoice to determine the correct value for insurance purposes and for assessing import duties.

Freight Claims

The freight claim is a document that the shipper files with the carrier t recoup monetary losses resulting from loss, damage, or delay to the shipment or to recover overcharge payments. The shipper must file in writing freight claims with the carrier within nine months of delivery or in the case of loss, within nine months of reasonable delivery

Export Declaration

After the buyer and seller reach an agreement as to sales and credit terms, the exporter files with exit port customs an export declaration, which provides the Department of Commerce with information concerning the export shipment's nature and value. The required information usually includes a description of the commodity, the shipping weight, a list of the marks and numbers on the containers, the number and dates of any required export license, the place and country of destination, and the parties to the transaction.

Carnet

When a seller makes a shipment in a sealed container, a carnet is often issued. A carnet indicates that the shipment has been sealed at its origin and will not be opened until it reaches its final destination. The container may then pass in transit through intermediate customs points without inspection. Carnets are very useful for intermodal shipments and for containers crossing several national boundaries between origin and destination

Self Assessment Question

1. Make a list of common international logistics channel intermediaries and their functions.
2. Explain the concept of a cost trade-off, and give an example from international logistics business practice.
3. Make lists of the common inbound and outbound international logistics functions. Which functions are common to both outbound and inbound movements?

4. Explain the relationship among demand forecasting, production scheduling, procurement, and inventory management. Give examples of cost trade-offs and information management issues that may affect the relationship among the four functions.
5. How are transportation management, warehouse location and management, and materials handling concepts related to each other? Give examples to illustrate your discussion.
6. What are the functions of a freight forwarder?
7. What are the functions of an NVOCC?
8. What are the functions of an export management company?
9. Describe three different logistics situations in which it would make good sense to choose (a) a freight forwarder; (b) an NVOCC; and (c) an export management company.
10. What is the main difference between an export management company and an export trading company?

CASE STUDY

Ram &Ram Herbal Farm

Ram &Ram settled down in farm near Bangalore after their 15 year stint at USA. They started a Dairy farm and were growing traditional crops for last ten years. The income fluctuated widely. However Rama who is agri science graduate took over a small field and started growing herbs more of a hobby in the beginning. She started selling the herbs to local people and also to tourist who come to stay in the farm house as well those on the way to Mysore. The herb business started growing with demand exceeding supply. Rama took over second field, growing exotic herbs and also opened a visitors centre where a demonstration was organized to enable them taste samples with herbs grown in the farm.

After about two years she converted some part of the farm house to accommodate "Herbs Kitchen" which prepared a ready to use mix of herbs in cooking and the product was promoted as "healthy stuff". Herb mixtures are traditionally said to have beneficial effects. The farm has become popular and attracted tourists. Rama was delivering 100 parcels a week to nearby areas and also send 200 parcels by courier to more distant customers. She has started accepting order through the web site and e-mails.

Thus the herb business became a main stay of Ram & Rama. Rama is contemplating to take a industrial shed closer to Bangalore to produce the herb mixes. A full fledged marketing team may be required. The couple estimated that in order to remain profitable they need ten times the current sales. Rama is also contemplating using catalog sales and increasing the use of website.

Questions

1. How does Rama currently organize her logistics? What do you think are her aims and priorities?
2. What would be the effect of expansion on logistics? What problems Rama would face and what options do she has to overcome them?

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UNIT – III

General Structure of Shipping

Unit Structure

Lesson 3.1 - Introduction to Shipping
Lesson 3.2 - Chartering Practices
Lesson 3.3 - Freight Structure and Practices in Ocean Shipping
Lesson 3.4 - International Maritime Organization (IMO)

Lesson 3.1 - Introduction to Shipping

Learning Objectives

After reading this chapter you should be able to

- Understand the Concept of Shipping
- List General Structure of Shipping
- Understand the Key Characteristics of Shipping
- To know different types of Ships
- To Understand the commodities Traded by Sea

Introduction

Historically, waterways are some of the world's oldest avenues of transporting cargo. Land routes over uncharted or unfriendly territory were fraught with peril, so ancient people turned to the relative safety and speed of the water to ship goods to their destinations. The tradition of shipping cargo across the water remains one of the most vital industries in the any economy. Carriage of goods through sea transport plays a major role

in physical movement of goods in international trade. Some research highlights says 75% of the goods are transported through ships to the expected destination. Other modes of transportation like road and rail though important as a link transport, are more suited for short distances and used in cases where either the exporting and importing countries are having geographical proximities or where use of sea transport is not possible. Similarly, use of air transport, though it has made rapid strides in recent years, sufferers space limitations and higher freight costs in case of most commodities. As against this ocean transport has the capability of carrying a large array of items in the same ship at comparatively cheaper freight rates, particularly over longer distances.

General Structure of Shipping

Shipping services are organized according to the nature and trading requirements of goods traffic in international trade. The goods traffic can be divided into two broad categories namely bulk cargo and break-bulk or general cargo.

- **Bulk Cargo**, whether dry or liquid, belongs to the category of primary commodities such as ores, fertilizers, food grains, crude oil, petroleum, edible oils etc., and move as ship loads.
- **The Break-bulk or General Cargo** on the other hand, refers to the manufactured or semi-manufactured, processed or semi processed goods that move invariably in different types of packing, like cases, creates, bales, drums, rolls, bags etc., In shipping parlance, these items are generally referred to as "general merchandise".

This above classification of goods traffic in international trade between 'bulk cargo' and 'general merchandise' is very important because of the differences in the nature and marketing characteristics of these two categories of cargos and consequently, in their transportation requirements.

Characteristics/Features /Significance of Shipping

- Shipping is an international activity perpetually exposed to change in the international environment
- It is subjected to periodic cycles of depression and buoyancy in business
- The highly capital intensive nature of the industry necessitates (i) large financial resources and (ii) adequate utilization of capacity
- International mobility of ships generates competition on global scale and renders its business most hazardous

- The commitment of liner shipping service requires an adequate and captive cargo base for ensuring its continuation on a stable and viable basis for effective support to the trade
- Traditionally, trade follows the established flags. But diversification of trade necessitates promotional shipping services under the protective umbrella of the State.
- The establishment and expansion of national shipping in the third world countries would positively require financial and cargo support in the face of preponderance and intrusion or well established shipping interests from developed countries with superior technology
- The efficiency of shipping services and their cost depend mainly on the available port facilities.

Types of Ship

The following are the major classification of different types of ships

1) Ocean Going Vessels

In this category mostly following type of ships are consider -

(A) Bulkers

In merchant ships bulkers are designed to transport unpackaged bulk cargo, such as grains, coals, cement and ore in its cargo holds. Following type of vessels are consider in ocean bulkers.

(a) Gearless Bulker

Gearless carriers are bulkers without cranes or conveyors. These ships depend entirely on the shore-based equipment of the ports they visit for loading and unloading. Due to their large size, they can only dock at the largest and most advanced ports.

The use of gearless bulkers avoids the costs of installing, operating, and maintaining cranes. These types of carriers depend on the on-shore facilities for providing the equipments to unload and load cargo. They do not carry gears of their own.

(b) Geared Bulker

These types of bulk carriers have got their own equipment or carrier to unload and load cargo in the form of cranes or derricks.

(c) Lakers Bulker

Lakers are the bulkers prominent on the Great Lakes, often identifiable by having a forward house which helps in transiting locks. Operating in fresh water, these ships suffer much less corrosion damage and have a much longer lifespan than saltwater ships. As of 2005, there were 98 Lakers of 10,000 dead weight tons or over. These types of carriers are commonly found on prominent lakes and they can be easily identified by a forward house which helps in transiting locks.

(d) Self-Discharger Bulker

Self-dischargers are bulkers with conveyor belts which allow them to discharge their cargo quickly and efficiently. These types of bulkers have a conveyer belt or excavator which is used to unload cargo quickly and efficiently.

(e) Combined Bulker

Combined carriers can carry ore and bulk simultaneously, and may carry oil in the wing tanks. Combined carriers require special design and are expensive. They are complex in design and are relatively costlier to make and maintain. They were prevalent in the 1970s, but their numbers have dwindled since 1990.

(f) BIBO Bulker

BIBO or "Bulk In, Bags Out" bulkers are specially equipped to provide the service of bagging cargo at loading time. The CHL Innovator, shown in the photo, is a BIBO bulker. In one hour, this ship can load and package 300 tons of bulk sugar into 50kg sacks. These types of carriers are specially equipped to provide the services of bagging cargo at loading time.

(B) Container Ships

The container ship dimensions, such as the ship breadth, depend on the number of containers placed abreast on deck and in the holds. The average loaded container weighs about 10-12 tons but, of course, this may vary, so the modern container ships are dimensioned for 12-14 dwt per TEU. Container ship capacity is normally expressed in

Twenty-foot Equivalent Units (TEU), which is defined as the number of 20' x 8' x 8'6" containers it can carry; or, similarly, in Forty-foot Equivalent Units. Following are types of container ships -

(a) Panamax Container Ship

Ships classified as **Panamax** are of the maximum dimensions that will fit through the locks of the Panama Canal. This size is determined by the dimensions of the lock chambers, and the depth of the water in the canal. Panamax is a significant factor in the design of cargo ships, with many ships being built to exactly the maximum allowable size.

(b) Post-Panamax Container Ship

Post-Panamax or "over-panamax" is the term for ships larger than Panamax, which do not fit in the original canal. On October 22, 2006 the ACP (Panama Canal Authority) with the support of the Electoral Tribunal held a referendum for Panamanian citizens to vote in favor or against the Panama Canal expansion. The expansion was approved by about 78% of the electorate and the projected cost is $5.3 billion. This sum is expected to be recovered within 11 years.

(c) Suezmax (ULCS) Container Ship

It is probable that Ultra Large Container Ships (ULCS) carrying some 12,000 teu containers can be expected. This ship size, with a breadth of 50 m / 57 m, and corresponding max. draught of 16.4 m /14.4 m for passing through the Suez Canal, may just meet the present Suezmax size.

(d) Post-Suezmax Container Ship

It is possible that in about 10 years the ULCS will perhaps be as big as 18,000 teu, with a ship breadth of 60 m and a max. draught of 21 m. Today, this ship size would be classified as a post-Suezmax ship, as the cross-section of the ship is too big for the present Suez Canal. It is claimed that the transportation cost per container for such a big ship may be about 30% lower than that of a typical 5,000-6,000 teu container vessel of today.

(C) Specialty Ships

Specialty ships are one of the category of ocean going vessel. Following vessels are considered in this range -

(a) Break Bulk

A ship with conventional holds for stowage of break-bulk cargo, below or above deck, and equipped with cargo-handling gear. Ships also may be capable of carrying a limited number of containers, above or below deck. A break bulk ship is one which transports cargo which is packed in cases, bales, cartons, drums, carboys etc., and this cargo is carried in the ship's cargo holds rather than in containers (although some loaded containers may be carried).

(b) Cable Layer

A cable layer or cable ship is a deep-sea vessel designed and used to lay underwater cables for telecommunications, electricity, and such. Cable ships are distinguished by large cable sheaves for guiding cable over bow or stern or both. Bow sheaves, some very large, were characteristic of all cable ships

(c) Heavy Lift

Heavy Lift Ships are specifically designed to carry oversized cargo. These ships meet the rising demand for lifting the items of hundreds. These are also known as a Float-on / Float-Off Ships of modular transportation for fully assembled plants and/or equipment. It performs ship-to-shore movement to damaged port or bare beach and port-to-port movement along the water's main supply route.

(d) Fish Processor

A fish processing vessel is a large ocean going vessel with advanced on-board facilities for processing and freezing caught fish. There are about 38,400 vessels greater than 100 tons in the world's factory fishing fleet. Fish processing ships consist of various types such as long line factory vessels, purse seine freezer vessels, stern trawlers, squid jiggers and freezer trawler.

(e) Ice Breaker

(f) DREDGE

A dredgers is a kind of equipment which can dig, transport and dump a certain amount of underwater laying soil in a certain time.

(i) Cutter Head

A dredge cutter has teeth that churn up the material. The sediment and water is suctioned up a long tube. The cutter is a stationary dredger equipped with cutter head which dig up the soil before it is sucked up by the flow of the dredge pump(s). Cutter power ranges from 50 kW up to 5000 kW, depending on the type of soil to be cut. It can be used for beach, canal, dam and channel dredging.

(ii) Dustpan

The Dustpan Dredge is like a big vacuum cleaner. It is particularly used on the Mississippi River. The suction head, approximately the width of the dredge, is lowered to the face of the material to be removed. High velocity water jets loosen the material which is then drawn by pump as slurry through the dredge pipe and floating pipeline where the material is deposited outside of the navigation channel.

(iii) Hopper

Usually a hopper dredger is used to deposits the dredged material storing it onboard, transporting it to the disposal area, and dumping it. Both mechanical and hydraulic designs are common for loading the hopper as well as for discharging the dredged material.

(iv) Side Caster

The side casting dredge is a shallow-draft seagoing vessel, especially designed to remove material from the bar channels of small coastal harbors. The body design is similar to that of a hopper dredge; however, side casting dredges do not usually have hopper bins. The side-casting dredge pumps the dredged material directly on-board through an elevated discharge boom; thus, its shallow draft is unchanged as it constructs or maintains a channel.

(v) Special Purpose

Special-purpose dredges are used in removing sediment with a high solid content and to minimize the re-suspension of the sediment. They may provide the alternative methods for unusual dredging projects, such as contaminated sediments.

(vi) Bucket

The bucket dredge is a kind of dipper dredge, the material being raised by a revolving chain of dippers or buckets, which scoop or dig into the deposit.

(vii) Dipper

A dipper dredge is basically a barge-mounted power shovel. It is equipped with a power driven ladder structure and operated from a barge-type body.

(g) RO-RO

(i) ROPAX

Ro-Ro, Ro-Pax and Ferries are used to carry primarily passengers, and sometimes vehicles and cargo as well, across a body of water. Most ferries operate on regular, frequent, return services. A passenger ferry with many stops, such as in Venice, is sometimes called a water bus or water taxi. On Ro-Ro, Ro-Pax and Ferries it is important to detect how the ships responds to weights to ensure efficient load and departure conditions without adding ballast.

(ii) CONRO

ConRO/Container Ro/Ro ships are hybrid of vessels that can accommodate both containerized and Ro-Ro cargo. The vessels may accommodate not only ordinary passenger vehicles, but also heavy equipment, and other oversized shipments. This type of vessel has a below-decks area used for vehicle storage while stacking containerized freight on the top decks.

(iii) ROLO

A **RoLo** (roll-on lift-off) vessel is another hybrid vessel type having tween-single ducker with stern ramp, strengthened for heavy cargo and fully fitted for carriage for containers. It is a ramps serving vehicle decks.

(h) Lash

The Lighter Aboard Ship (LASH) is is a specialized container ship having a single-decked vessel with large hatches, wing tank arrangements, and a clear access to the stern. The LASH has a gantry crane with a cargo handling capacity of approximately 450 LT. The function of this crane is to convey barges from the stowed location aboard the ship to the stern region and to lower the barges into the water. Some LASH ships are equipped with container gantry cranes for the handling of the onboard complement of containers. Different classes of LASH ships have capacities ranging from 64 to 89 barges or a mixture of LASH barges and military lighter.

(i) Reefer

Refrigerated cargo (or **reefer**) ships are basically fast general cargo ships with extensive refrigerated spaces for the transport of perishable commodities such as meat, fruit, and dairy products. Cargo may be carried frozen or chilled. Hold volume is less than an equivalent sized cargo ship because of the space taken by insulation-about 25 percent less for chilled cargo and about 35 percent less for frozen cargo. If all cargo spaces are refrigerated, the ship is called a fully refrigerated ship, or reefer. If only some of the holds are refrigerated, the ship is a partial reefer; the refrigerated holds are generally those closest to the machinery spaces.

(j) Livestock

Livestock ship is a large ship carries a variety of animals, such as cattle, sheep, horses, pigs and goats. . They are specially built new or converted from container ships.

(D) Tankers

A **tanker** is a ship used basically for transporting the huge amount of liquids. There are different types of tankers such as oil tanker, chemical tanker and liquefied natural gas tanker.

(a) ITB

Integrated tug/barge units are used widely in the US Gulf and east coast offshore trade. The stern is notched to accept a special tug which can be rigidly connected to the barge, forming a single vessel. The barge is built in the molded form of a normal ship's hull. In the most efficient systems, the tug is attached by trunion mountings protruding from the bow into sockets fitted along the inside of the barges recesses. Directional stability and control underway is far superior to that of a towed barge. No particular changes in the size or shape of the tug are required except for a higher pilot house, needed for improved visibility.

(b) LNG

LNG Carriers are among the most dangerous ships sailing around the seas. They are carrying compressed natural gas, which is flammable and easily exploding. The gas carriers are having large requirements for their machinery, their tanks and their support. Global LNG demand will increase to the equivalent of 31.1 billion cubic feet a day in 2011,

according to Barclays Capital. China, the world's biggest energy consumer, bought 87 percent more LNG in 2010, customs data show. While Asia led growth in demand last year, it will be Latin America and the Middle East this year, Barclay's estimates.

(c) Chemical

Chemical tankers are developed to carrier a wide range of different chemicals and have an average capacity of 37,000 TDW and an average overall length of 180m. The design of today's Chemical tankers is characterized by a relatively high speed and thus high propeller loading and high block coefficients with a relatively full aft body. This requires a low overall resistance and related good powering performance but also an excellent after body design, with a good flow towards the propeller(s) and rudder(s), without flow separation. During operation the ships sail at different loading, and therefore the design optimization is characterized by finding a compromise between different draughts.

(d) Product

Product tankers are characterized by having coated tanks to prevent the product from corroding the tanks. It is much smaller and designed basically to transport petrochemicals from refineries to the consumer markets.

(e) Crude Oil

This is among one of the categories of oil tanker. They used to move in bulk the crude oil or raw/ unrefined oil from its point of extraction, to the refineries where it's processed into fuel and other finished products.

(F) By Size

(i) Bunker

Bunker tanker is a ship designed to supply fuel to ships offshore. Bunker tanker are smaller vessels from 100 – 5 000 dwt and the design is the same as product tankers.

(ii) Lighter

Lighter tanker particularly used for transporting cargoes from ship to shore. Lightering involves the open water transfer of fuel from the tankers to several smaller vessels to distribute the load and reduce the draft of the tanker to an allowable entry depth.

Dredging minimizes costly "lightering" missions and maximizes offloading at docks, thus reducing overall transportation costs. This lightering, increased the overall number of ships coming into a harbor. It also creates a situation where oil is transferred in mid-bay

(iii) Handy

Handy size is a small bulk or oil tanker vessel that is suited to tie up at a T2 type pier. These vessels are a maximum of of 10,000 to 30,000 dwt. These vessels are more maneuverable and have shallower draft than larger vessels and therefore make up the majority of the world's ocean-going cargo fleet.

(iv) Handymax

Handymax is a small bulk or oil tanker vessel of 30,001 to 50,000 dwt that is a larger version of the popular Handysize vessel.

(v) VLCC

Very Large Crude Carrier is an ocean-going crude oil tanker of 200,000 to 299,999 dwt. These vessels have greater flexibility than ULCCs due to their smaller size and are used extensively in the Mediterranean, West Africa and the North Sea. These vessels can sometimes be ballasted through the Suez Canal.

(vi) Cape Size

Cape size is an ocean-going cargo vessel that is physically too large to fit through the locks of either the Panama or Suez Canals and therefore must voyage via Cape Horn at the southernmost tip of South America to get to or from the Atlantic and Pacific Oceans, or the Cape of Good Hope at the southernmost tip of South Africa to get to and from the Indian and Atlantic Oceans. Cape size vessels generally serve deep-water terminals handling raw materials, such as iron ore and coal.

(vii) ULCC

Ultra Large Crude Carrier (ULCC) is an ocean-going crude oil tanker of 300,000 to 550,000 dwt. These are the largest vessels in the world and are used for carrying crude oil on long haul routes from the Arabian Gulf to Europe, America and the Far East, via the Cape of Good Hope. These vessels require custom built terminals for loading and discharge.

(2) Fishing

(A) Trawler

Fishing trawler is a vessel used to operate fishing trawls/hunt. Trawling is a fishing method that involves dragging a trawl/fishing net through the bottom of the sea. It can operate with two or more trawl nets.

(B) Seiner

A Fishing Seiner uses a vertical fishing net for fishing activity. It ranges from open boats as small as 10 meters in length, to ocean going vessels.

(C) Drifter

A Fishing Drifter is a type of fishing boat having long drift net. Drift net is used to catch fishes in sea.

(D) Long Liner

Longline fishing is one of the most conservative methods of harvesting fish. Longline gear consists of a continuous mainline supported by float lines, with regularly spaced leaders that end with baited hooks. Longliners mainly target swordfish, sablefish, tuna, halibut and many other species.

(E) Crabber

Crab fishing is a dangerous practice because fatality rate among the fisherman is about 80 times the fatality rate of the average worker. The basic purpose of crabber fishing is to harvest the King Crab Fish. This fishing is carried out during the winter season.

Cable Ships

These ships are responsible for laying the cable for telecommunications, electricity, and transport in modern industries. Without the hard work and dedication of these ships and their crews the world would not have the ability to call across the oceans or enjoy the power provided by distant generating stations. Unfortunately, laying an undersea cable is dangerous and hazardous work, and many of the crewmembers of these ships suffer serious and debilitating injuries in the line of duty.

Cargo Ships

Cargo ships are a familiar sight to anyone who lives in or near a seaport. These vessels transport materials, goods, and products from their place of manufacture to anxious customers in faraway lands.

Although initially cargo referred to transported goods, while freight was the compensation for the cargo, but now both terms refer to the transport of goods.

Container Ships

Container ships which carry most of the world's manufactured goods and products, usually through scheduled liner services.

Container ships are cargo vessels that carry their payload in truck-sized boxes which makes them easy to ship as well as unload and transport once in port. These ships are designed so that no amount of space is wasted, but unfortunately large amounts of heavy cargo require dedicated port facilities where accidents and injury are as frequent and regular as the tide.

Dry Bulk Carriers

The work horses of the fleet, these transport raw materials such as iron ore and coal. Identifiable by the hatches raised above deck level which cover the large cargo holds.

These enormous ships are one of the most important vessels in modern shipping. Dry bulk carrier's ship and transport enormous supplies of rice, grain, wheat, and other vitally needed foodstuffs to a demanding and hungry world. These vessels are easily recognized by the large hatches its crew uses for loading and unloading cargo. Designed with no-frills and for maximum capacity, these ships are essentially giant ocean-going boxes with an engine attached.

Freighter Vessel

A freighter vessel is a type of craft that carries good or materials from one place to another. These ships range from small tramp steamers to huge bulk freighters that ply seas and make international trade possible. Freight used to refer to the compensation received by a ship for the cargo it delivered, but now freight and cargo are virtually interchangeable.

Roll-On/Roll-Off Ships

Roll-on/ Roll-off ships are special types of container ships that allow crews and dock workers to load and unload cargo through the use of dockside ramps. “Ro-Ros”, as they are called, have become the one of the most popular types of cargo vessels in use today, as they are flexible and relatively fast, compared to older ships. These containers can be unloaded at ports without dedicated crane facilities which in turn allows customers greater access to their goods.

Supply Boat Vessels

Supply boat vessels are the types of craft that provide larger ships, rigs, and other vessels with supplies when they cannot reach the shore themselves. Supply boats carry fuel, food, materiel, and people to and from larger vessels. Without these craft the modern world could not function, because bulk transport would be prohibitively difficult if not impossible.

Supply Boat

Supply boats are virtually identical to supply boat vessels, except that they lack the additional qualification of being a “vessel.” A vessel is traditionally considered to be “a craft capable of floating on water larger than a rowboat”, so most supply boats are tiny craft such as dinghies, life rafts, and other waterborne support vehicles that can bring provisions, fuel, and other supplies to larger craft.

Tankers

Transport crude oil, chemicals and petroleum products. Tankers can appear similar to bulk carriers, but the deck is flush and covered by oil pipelines and vents. Tankers are ships that are designed to carry large quantities of liquids. Petroleum, natural gas, water, chemicals, or any type of bulk fluid are the stock in trade of tankers the world over. These ships frequently have a hull within a hull in order to prevent leaks or spills should they run aground or suffer any other mishap. Tankers and their larger sisters Supertankers frequently account for some of the largest ships in the world.

The Commodities Traded by Sea

The shipping industry transports everything from a 4 million barrel parcel of oil to a cardboard box of Christmas gifts. The main seaborne commodity traded has arranged into

six groups reflecting the area of economic activity to which they are most closely related. These groups can be summarized as follows

1. ***Energy trades*** Energy dominates bulk shipping. This group of commodities, which accounts for close to half of seaborne trade, comprises crude oil, oil products, liquefied gas and thermal coal for use in generating electricity.

2. ***Agricultural trades*** A total of twelve commodities, accounting for 13 per cent of sea trade, are the products or raw materials of the agricultural industry. They include cereals such as wheat and barley, animal feedstuffs, sugar, molasses, refrigerated food, oil and fats and fertilizers.

3. ***Metal industry trades*** This major commodity group, which accounts for 25 per cent of sea trade, including raw materials and products of the steel and non-ferrous metal industries, including iron ore, metallurgical grade coal, non-ferrous metal ores, steel products and scrap.

4. ***Forest products trades*** Forest products are primarily industrial materials used for the manufacture of paper, paper board and in the construction industry. This section includes timber (logs and lumber) wood pulp, plywood, paper and various wood products, totaling about 145 meter. The trade is strongly influenced by the availability of forestry resources.

5. ***Other industrial materials*** There are a wide range of industrial materials such as cement, salt, gypsum, mineral sands, alumina, chemicals and many others. The total trade in these commodities accounted for 9 per cent of sea trade. They cover a whole range of industries.

6. ***Other Manufactures*** The final trade group comprises the remaining manufactures such as textiles, machinery, capital goods, vehicles, consumer goods, etc. The total tonnage involved in this sector accounts for only 3 per cent of sea trade, but many of these commodities have a high value so their share in value is probably closer to 50 per cent. They are the mainstay of the liner trades and their impact upon the shipping industry is much greater than the tonnage suggests.

Self Assessment Questions

1. Bring out the significance of ship operation in the growth of international trade?
2. Enumerate the salient features of commercial shipping and explain its importance for the development of international trade.

3. Describe the different types of ships used in international trade operation.
4. What are major types of goods handled by the ships in international trade?
5. Briefly discuss about the major international routes used by the shippers in their international logistic operation.
6. What do you understand by liner shipping? How does it differ from tramp shipping?
7. Outline the factors a shipper has to keep in view while selecting liner vessel.

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Lesson 3.2 - Chartering Practices

Learning Objectives

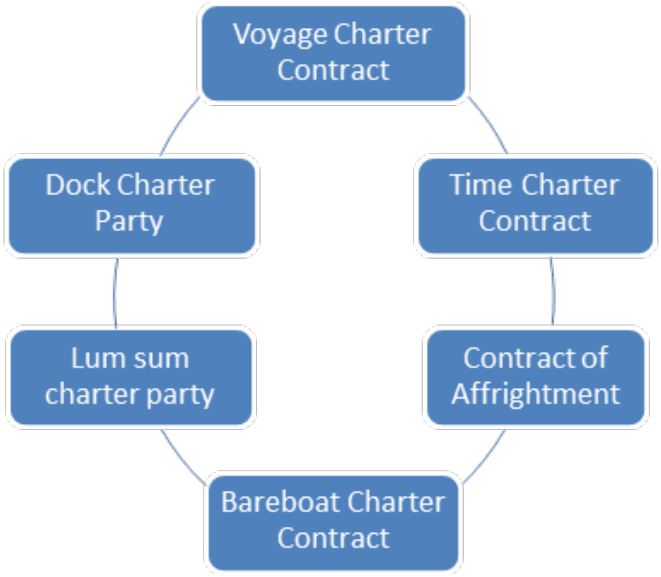
After reading this chapter you should be able to

- Define 'Chartering Practices'
- Understand the different forms of shipping services
- To know the different type of chartering practices
- To know the different types of shipping documents used

Introduction

Chartering is a term used in shipping for hiring a ship. A charter party is an agreement between two parties regarding lease of a cargo or a vessel. One party offers to lease its vessel or cargo to another party at stipulated rate or under decided conditions. It is a legal contract, made under the laws governing the shipping world between a cargo vessel owner and a charterer. Clauses for a different charter parties vary. It is these clauses that make different types of charter parties. Depending on these clauses, the charter parties are

Different Types of Charter Parties in the Shipping Industry/
Types of Chartering Contracts



"Voyage Charter" Contract

A Voyage Charter Contract is the hiring of a vessel and crew for a voyage between a load port and a discharge port. This is the most commonly used Charter Party. Under this particular agreement, the owner of the ship agrees to lease the cargo to the charterer for a particular voyage. The cost paid for such a lease includes costs like fuel, loading and unloading of the cargo etc. The vessel owner supplies the charterer with the vessel and sometimes the crew for a voyage to a designated port. However, there is a specific time limit under this kind of contract. The time mentioned in the lease contract includes the time needed for loading and unloading of the cargo, exceeding which may need the charterer to remunerate the owner in terms of compensation charges. Also, the charterer remains responsible for any incidental charges. Being a voyage bound trip with availability of crew, voyage charter party becomes one of the most famous charter parties

Negotiating and Concluding a Freight Contract

When a ship is chartered or a freight rate is agreed, the ship is said to be `fixed'. Fixtures are arranged in much the same way as any major international hiring or subcontracting operation. Ship-owners have vessels for hire, charterers have cargo to transport, and brokers put the deal together. For example, it may bea Panamax bulk carrier currently on a voyage from the US Gulf to deliver grain to Japan, so it will be `open' (available for hire) in Japan from the anticipated date at which the grain has been discharged, say 12 May. The shipper has a volume of cargo to transport from one location to another. The quantity, timing and physical characteristics of the cargo will determine the type of shipping contract required.

For example, the shipper may have a cargo of 50,000 tons of coal to ship from Newcastle, New South Wales, to Rotterdam. Such a cargo might be very attractive to a bulk carrier operator discharging coal in Japan and looking for a cargo to reposition into the North Atlantic, because he has only a short ballast leg from Japan to Australia and then a full cargo back to Europe. Most often the principal (i.e. the ship-owner or charterer) will appoint a shipbroker to act for him.

The broker's task is to discover what cargoes or ships are available; what the owners/ charterers want to be paid; and what is reasonable given the state of the market. With this information they negotiate the deal for their client, often intense competition with other brokers. Brokers provide other services including post fixture processing, dealing with disputes, and providing accounting services in respect of freight, other payments and receipts under the charter,etc.

Some owners or shippers carry out these tasks themselves. However, this requires a staff and management structure which only very large companies can justify. Since broking is all about information, brokers tend to gather in shipping centers. London remains the biggest, with other major centers in New York, Tokyo, Hong Kong, Singapore, Piraeus, Oslo, Hamburg, Copenhagen, Bergen etc. Three types of contractual arrangement are commonly used. Under a voyage charter, the ship-owner contracts to carry a specific cargo in a specific ship for a negotiated price per ton. Variants on the theme are the consecutive voyage charter and the contract of affreightment, in which the ship owner contracts to carry regular tonnages of cargo for an agreed price per ton.

Main Contract Terms (Voyage Charter Party)

The freight charters listed above will all be concluded with a contract drawn up between the shipper and the ship owner, often through the intermediation of a shipbroker. There are various standard contracts in common use. They typically include the following terms -

- Details of the ship and the contracting parties.
- A description of cargo to be carried, drawing attention to any special features.
- The load and discharge ports.
- The terms on which the cargo is to be carried. This important part of the voyage charter party
- Defines the commitments of the shipper and ship owner under the contract. This covers The terms of payment.
- Damages for non-performance.
- Administrative clauses, covering matters that may give rise to difficulties if not clarified in advance. These include the appointment of agents and stevedores, bills of lading, provisions for dealing with strikes, wars, ice, etc

The Consecutive Voyage Charter (CVC)

A Consecutive Voyage Charter is similar to a Voyage Charter, but the ship is contracted to undertake a series of cargo carrying voyages on a defined route. This is used when the shipper has a well defined schedule of cargoes to transport. To introduce some flexibility and allow for changing circumstances the charter party may incorporate options in terms of loading and or discharge ports, quantities and other contract terms.

The Contract of Affreightment (COA)

This type of charter party particularly suits to bulk cargos that often need more than one voyage for complete shipment. Under this contract, the owner offers to carry the mentioned cargo at a price decided at rate of per tonnage or per voyage. This type of contract is especially found in industrial cargos like that of coal, stones, building material, metallurgical materials etc.

The Contract of Affreightment (COA) is a little more complicated. It is a negotiated contract under which the ship owner agrees to carry a series of cargo parcels for a fixed price per unit/volume, generally without specifying the precise ship in which the cargo will be carried. However, the ship-owners will be under obligation to provide the necessary cargo carrying capacity to serve the agreed cargo volume and destinations.

For example, the shipper has a contract to supply ten consignments of 50,000 tons of coal from Colombia to Rotterdam at approximately two-monthly intervals. So he negotiates a Contract of Affreightment with a shipping company which agrees to undertake the transport at an agreed price per ton. Because details of each voyage and the ship used are left to the ship-owners, he can increase his efficiency by planning the operating pattern for his fleet in the most efficient manner.

For example by switching cargo between vessels and obtaining backhauls he may be able to reduce his overall cost per ton transported. Because ship owners are aware of the potential value of a guaranteed cargo stream, there is generally intense competition for these contracts, with the result that shippers are able to obtain some of the value added in reduced rates.

Companies who specialize in COAs sometimes describe their business as `industrial shipping' because their aim is to provide a service. Since a long-term contract is involved, COAs involve a greater commitment to marketing the service to the shipper and providing an efficient service.

There is COA business in the dry bulk market carrying cargoes of iron ore and coal and the major customers are the steel mills of Europe and the Far East. This system is also used in many of the specialised trades. The problem in negotiating COAs is that the precise volume and timing of cargo shipments is not generally known so cargo volumes may be specified as a range (e.g.`minimum x and maximum y tons17') while timing may rely on generalizations such as `The shipments under the contract shall be evenly spread over the contract period.'

Time Charter Party

A time charter is the hiring of a vessel for a specific period of time often confused with the previous charter party, this charter party refers to lease of a vessel by the owner to a charterer for a specified period of time. The owner only offers his vessel at a predetermined rate. The charterer agrees to bear all the expenses incurred on running of the vessel in return of availability of vessel for that time.

Procedures for Time Chartering a Ship

A time charter gives the charterer the use of the ship, while leaving ownership and management of the vessel in the hands of the ship-owner. In this case the ship-owner pays the capital and operating costs of the vessel, but not the voyage related costs. The length of the charter may be the time taken to complete a single voyage (trip charter) or a period of months or years (period charter). When on charter, the ship-owner continues to pay the finance costs and operating costs of the vessel (i.e. the crew, maintenance and repair) but the charterer directs the commercial operations of the vessel and pays all voyage expenses (i.e. bunkers, port charges and canal dues) and cargo handling costs.

With a time charter, the ship-owner has a clear basis for preparing the ship budget, since he knows the ship operating costs from experience and is in receipt of a fixed daily or monthly charter rate (e.g. $5,000 per day). Often the ship-owner will use a long time charter from a major corporation such as a steel mill or an oil company, as security for a loan to purchase the ship needed for the trade. Ship owners themselves may time charter vessels for a number of reasons, including if they are not able to finance ownership of more vessels, their own tonnage is committed or they want to spread risk by having a mix of owned / chartered vessels. Although simple in principle, in practice time charters involve risks for both parties. Details of the contractual agreement are set out in the `charter-party'.

The ship-owner must state the vessel's speed, fuel consumption and cargo capacity. The terms of hire will be adjusted if the ship does not perform to these standards. The charter-party will also set out the conditions under which the vessel is regarded as `off hire', for example during emergency repairs, when the charterer does not pay the charter hire. Long time charters also deal with such matters as the adjustment to the hire charge in the event of the vessel being laid up, and will set out certain conditions under which the charterer is entitled to terminate the arrangement, for example if the owner fails to run the ship efficiently.

There are three reasons why subcontracting/time chartering may be attractive.

- *First*, the shipper may not wish to become a ship owner, but his business requires the use of a ship under his control. The shipper may not want to be a ship owner for political, technical or financial reasons (avoiding tying up capital for example).
- *Second*, the time charter may work out cheaper than buying, especially if the owner has lower costs, due to lower overheads and larger fleet. This seems to have been one of the reasons that oil companies subcontracted so much of their transport in the 1960s.
- *Third*, the charterer may be a speculator taking a position in anticipation of a change in the market. Time chartering to industrial clients is a prime source of revenue for the ship owner. The availability of time charters varies from cargo to cargo (or commodity to commodity) and with business circumstances.

The Time Charter Trip

A time charter trip is the simplest form of time charter. A specific vessel is hired to undertake a trip from a specific starting point (for example Cape Hatteras) to the Pacific and back. During the time the vessel is on charter the owner is paid an agreed daily rate, for example During the period that it is on charter the vessel is directed by the shipper, who tells it where to load cargo, and where to discharge it. The advantage of the trip charter is that it allows the shipper to vary his itinerary and provides greater flexibility than a voyage charter under which the contract involves the transport of a specific Cargo Parcel.

The Period Time Charter

Under a period charter the ship is a hired out by the "ship-owner" to the "charterer" for a period of time specified in the contract ("charter party"). During this period the ship owner provides the crew and maintains the vessel, whilst the charterer directs its operations. Normally the charter party will specify a number of admissible days "off hire" each year for repairs and maintenance, and there will be an agreement in the contract for handling any additional time out of service. Typically these charters may be three months, six months, twelve months, two years or in a few cases as long as 10 or even 15 years. Time charters have many different uses. The ship may be chartered by a cargo owner, for example an oil company, to carry its own cargo. Or it might be chartered by a ship-owner who needs the vessel to meet cargo commitments, for example under a contract of a affreightment. Finally, some ship owners may period time charter a vessel in the hope of trading it on the voyage charter market at a higher rate.

Main Contract Terms (Time Charter)

Time charter-parties follow the same general principles as the voyage but also deal specifically with the ship's performance (i.e. fuel consumption, speed, quantity, trading limits, prohibited cargoes and allocation of voyage costs and prices of bunkers on delivery and redelivery) and equipment, and may exclude the items dealing with the cargo.$20,000 a day.

The Bareboat Charter Contracts

This is a typical agreement where there is no maintenance liability or any kind of claim on the vessel by the owner for the period of lease of the vessel. The owner agrees to lease the vessel without any administration, financial or technical responsibility for it. The charterer acts as the sole owner of the ship and is responsible for all the maintenance and functioning costs of the vessel including fuel, crew maintenance, repair, custom duties, port expenses etc for that time. It is the most suitable for tankers and bulk carriers.

Finally, if a company wishes to have full operational/technical control of the ship, but does not wish to own it, a bare boat charter is arranged. Under this arrangement the investor, not necessarily a professional ship owner, purchases the vessel and hands it over to the charterer for a specified period, usually seven to twenty years. The charterer manages the vessel and pays all operating (including crewing, maintenance, dry docking etc.) and voyage costs and the owner, who is often a financial institution, is not active in the operation of a vessel and does not require any specific maritime skills. At the end of the charter the ship is returned to the owner, although some bareboat charters include an option to purchase the vessel on termination of the charter.

Lump Sum Charter Party

In this particular type of charter party, the owner agrees to lease his vessel to the charterer for a specified cargo to be shipped to a specified port.

Dock Charter Party

This type of contract is made on the basis of the port or dock where the vessel is received by the charterer upon leasing or the owner while returning. The exchange happens in areas which are essentially suited to the size of vessel and are called commercial area of the port.

Shipping Companies Cooperation in Bulk and Specialized Sectors

One of the methods used by shipping companies to improve their efficiency is to form an alliance with other companies. These alliances may take the form of pools, joint ventures, or space charter agreement. There are eight areas of potential cooperation – capital investment; marketing; chartering; cargo contracts; logistics and productivity; operating cost efficiency; administration and training.

Joint Venture Agreements

A joint venture is a business arrangement in which two or more parties undertake a specific economic activity together. They are often bilateral in their nature. Whereas a pool is set up to accept a number of different members, a joint venture is usually restricted to a small number of partners who agree to work together on a specific project, or towards a specific goal. Joint ventures vary considerably in the amount of co-operation undertaken by the two parties.

Pool Arrangements

One of the most common arrangements for working together in the shipping industry is the "Pool". Shipping pools are currently used in almost all segments of the tramp/non-liner shipping market including products tanker business, the chemical tanker business, the LPG business, the bulk carrier business and the crude tanker business. A shipping pool can be defined as a collection of similar vessel types under various ownerships placed in the care of a central administration.

Space Charter Agreements

In the break-bulk era liner companies operated freight pools, particularly in thin trades, in order to spread operational costs. Containerization saw the introduction of consortia (sharing administrative and operating costs and revenue) and alliances (sharing vessel operating costs) as carriers sought to drive down operating costs and increase vessel size to access scale. Vessel sharing agreements, today's most common format, operate on the basis of slot swaps between participating carriers with inequalities of provision and usage settled by cash cross-payments at pre-determined prices. In addition, carriers sell slots to third parties, to competing lines without sufficient market support to start their own services, and to lines seeking to supplement their own service capacity as well as to container leasing companies seeking to reposition empty containers. Slot charters are generally on the basis of long term inter-line contractual arrangements, with slot prices set

for a fixed duration, but the slot prices for spot arrangements are fixed ad hoc. Needless to say, carriers prefer to restrict slot sales to capacity that they cannot themselves make profitable use of. Instances in which space is subcontracted to cargo interests are extremely rare or nonexistent. Space charter arrangements also exist in some of the specialized sectors. Considering the customer structure and the service requirements they place on the carriers it is a need to optimize capacity utilization, sailing frequencies and port coverage to the benefit of the customers. Carriers use both irregular ad hoc space charter arrangements mainly to cover short term fluctuations as well as more regular fixed positioning space charters.

Market Reporting & Information Flow

The rates at which charters are fixed depend on market conditions and the free flow of information reporting latest developments plays a vital part in the market. Shipping has one of the most extensive market reporting systems of any capital industry and the network of brokers and information providers ensure a high degree of transparency in all the contract negotiations discussed above.

The Sale and Purchase Market- Procedure for Buying and Selling a Ship

About 1,300 deep sea merchant ships are sold each year, representing an investment of $16.7 billion in 2003. The market is very open, with ship prices freely reported and subject to open competition. The participants in the sale and purchase market are the same mix of shippers, shipping companies and speculators who trade in the freight market. Most sale and purchase transactions are carried out through shipbrokers.

How Ship Prices are Determined

The sale and purchase market thrives on price volatility. Profits earned from well timed buying and selling activity are an important source of income for shipping investors. Prices are generally determined by supply and demand, which in turn depend on the cash flow pressures discussed in previous sections.

Forms of Shipping Services (Chartering Practices)

These days shipping companies' offers three different forms of services to the shippers (those who send the goods) as discussed below

Forms of Shipping Services (Chartering Practices)

Liner Shipping Services

A liner service implies a fleet of ships, under common ownership or management, which provides a fixed service, at regular intervals, between named ports, and offer themselves as general carriers of any goods requiring shipment between those ports. A fixed itinerary, inclusion in a regular service and the obligation to accept cargo from all comers and to sail, whether filled or not, on a date fixed by a published schedule; these, and not the size and speed of the ship are what distinguish the "liner" from the "tramp" – the ship which can be hired as a whole, by the voyage or the month, to load such cargo and to carry it between ports as the charterer may require.

This is similar to an air line or bus line(service), on a route with fixed stopping as per predetermined timetable. These services will continue to run irrespective of whether the airplane/bus is full or empty as they have to strictly keep their timings and route. Similarly cargo liners too have to stick to the fixed schedule and route irrespective of whether the vessel is full or not. In this forms of service the merchandise is carried by regular shipping lines. These shipping lines provide the shipping service by calling regularly at specified ports irrespective of quantity of cargo available. Such ships usually carry general cargo i.e. an accumulation of small loads belonging to many shippers.

Each shipper pays the freight accordance with the tariff based on volume, weight or the value of cargo. Example The UK/NWC continent service of MSC which has a fixed weekly schedule calling the South African ports of Durban, Cape Town and Port Elizabeth and carrying cargo to the UK/NWC ports of Felixstowe, Antwerp, Hamburg, Le Havre and Rotterdam..

Special Features of Liner Shipping

1. The **segment of the trad**e which is generally moved through liner ships consists of semi-processed or finished items in small and measured quantity such as leather, tea, readymade garments, machinery, electronic goods etc.,
2. Ship which have **fixed schedules** with adequate frequency and port coverage. The fixed frequencies, announced by the ship owners well in advance to help suppliers/ buyers to plan their trading, such information would generally include the name of the ship, port, dock/berth where ship will load, the date when the ship will ready to receive cargo, last date of the receipt of cargo, expected date of sailing.
3. **Freight rates** in liner trade are laid down in the tariff or sometimes negotiated. This provides an opportunity for shippers and importers to plan their shipment programme in advance at pre-determined freight rates.
4. The **departure and the arrival** of such sailing vessels being very erratic some times. Moreover, since the sailing vessels were monopolized by big time exporters, these ships could not accommodate the cargo of small exporters who would thus be deprived of the right trade with overseas buyers

Factors to be considered while selecting the Liner Ship

- Regularity of Sailing (timing, frequency, name of port etc.,)
- Carriage on liner terms
- Liabilities of the carrier operating liner vessels
- Conference membership for stability of freight rates
- Classified vessels with appropriate classification society
- Insurance approved vessels
- Check letter of credit for age of vessels
- Vessels do not call at any prohibited ports
- Nationality of the vessels should not under any UN sanction
- Sensitive/perishable cargo-desire facilities on vessel
- Availability of reefer plugs at pre-stack and on vessel
- Through bill of lading
- Issuance of Sea Way Bill
- Special security provided by carrier during transit in case or very high value cargo
- Availability of required containers
- Containers provided ISO and sea worthy

Tramp Shipping Services

The dry bulk and liquid cargoes are generally referred as 'Tramp Trades' and the vessels used to transport these cargoes are called 'Tramp Ships'. Tramp services will not have a fixed route. The ship goes from one port to other depending up on the cargo availability. Tramp services could be compared to a taxi service which is hired to go from one place to another for a single travel. After completing that trip, next employment must be seeked. Tramps are those ships which are usually used for transportation of homogenous cargo which is moved in bulk quantities.

For example commodities such as iron-ore, fertilizers, good grains, coal, crude oil, petroleum, LPG, chemicals, timber, wheat, sugar etc., are usually offered in ship loads. Such ships operate in single or consecutive voyages. Such ships work on inducement basis and ply indiscriminately between ports of the world depending upon the laws of demand and supply in market.

Example A ship that arrives at Durban from Korea to discharge cargo might carry some other cargo from Durban to the Oakland in the West Coast of USA which in an entirely different direction.. From Oakland say for example it could carry some cargo and go to Bremerhaven

Tramp Shipping is an irregular shipping, mainly over nonstandard routes, with no definite schedule. Tramp ships are used to transport bulk cargoes and break-bulk cargoes of low value that do not require fast delivery. The transportation of cargoes that are picked up or dropped off along the way plays a large role in tramp shipping. Tramp ships are slow and can transport a variety of cargoes. Specialized types of dry-cargo, liquid-cargo, and mixed-cargo ships are also used in tramp shipping. Tramp shipping plays an important role in the foreign trade of the capitalist countries. In the Soviet Union and other socialist countries tramp ships are not widely used, and cargoes are transported predominantly by line navigation.

Special Features of Tramp Shipping

1. The tramp ship is engaged for the carriage of cargo it is said to be under charter, as either the whole or the bulk of its space is hired by one charterer. Unlike the liner trade, tramp trade does not have any fixed ports of loading and discharge.
2. There no periodicity of shipments and tramps are engaged on terms and conditions including freight rate/hire charges, mutually agreed between the ship-owners and the charterers.

3. Tramp ship owners are always looking for ports where profitable cargo is likely to be found while charterers are looking for tramps which are available for hiring at competitive rates.
4. The freight rate/ hiring charge in tramp ship is generally decided by the laws of supply and demand of tonnage/cargoes and various other technical and commercial parameters.
5. Tramp ships loadability is often subjected to seasonal or periodic variations. The irregular and erratic movement of tramp ships reduced its potential for securing return cargo.

Shipping Documents

As with most aspects of international trade, using ocean shipping to transport goods involves the completion of specific documents. The list below shows the key documents, but is not comprehensive. One is need of an Export Cargo Shipping Instruction (ECSI). This is the document by which one provides the shipping company with details of goods and set out instructions for the shipment. It follows up on the initial booking, when space will have been confirmed on particular sailings.

The process is often concluded by telephone.

- If the goods are **hazardous**, a Dangerous Goods Note (DGN). This document details the nature of any dangerous goods in a consignment and the hazards presented by them.
- If the goods are **non-hazardous**, a Standard Shipping Note. This gives the port of loading the information it needs to handle your goods correctly. It's also used by the shipping company to check the actual information about the goods once they have been loaded into the container with the predicted information supplied beforehand.

Shipping Bill

A negotiable document whereby the master of a ship or his agent (the shipper) acknowledges receipt of a consignment of goods and undertakes to deliver them as stated on the terms of the bill. The following are the different types of shipping bills

- **Duty free shipping bill** – This type of shipping bill is printed on white paper and used for the goods for which neither duty nor cess is applicable. It is also used for the goods manufactured out of material imported under the duty free import.

- **Dutiable Shipping bill** - This type of shipping bill is used for the goods subject to export duty/cess on which duty drawback will be either allowed or not allowed. This is to be printed on yellow paper.

- **Drawback Shipping Bill** – This type of shipping bill is to be used for the export of goods on which Duty Drawback is available or to be made available for fixation. It is to be printed on green paper.

- **Shipping Bill for Shipment** of Excise Bond- This type of shipping bill is used when goods are imported for re-export and kept in bond. This is to be printed on blue paper.

- **Coastal Shipping Bill –** Export Coastal shipping Bill – This is used for shipment of goods from one port to another by sea within India.

Bill of Lading

The bill of lading is probably the single most important transportation document. It originates the shipment, provides all the information the carrier needs to accomplish the move, stipulates the transportation contract terms, acts as a receipt for the goods the shipper tenders to the carrier, and in some cases it shows certificate of title of the goods. A bill of lading is issued by the carrier, this serves three purposes - it shows that the carrier has received the goods, provides evidence of a contract of carriage, and serves as a document of title to the goods. The information on the bill specifies the name and address of the consignor and consignee, as well as routing instructions for the carrier. The bill also describes the commodities in the shipment, the number of items in each commodity description, and the commodity's class or rate. Many shippers provide their own bills of lading, which show the shipper's preprinted name and describe the commodities the company most commonly ships. In some cases electronic bills of lading are being used in situations where the carrier and shipper have a strategic alliance established. There are three types of bill of lading is used carriage of goods

Straight Bill of Lading

It is a nonnegotiable instrument which means that endorsement of the straight bill cannot transfer title to the goods the straight bill names. For firms using the straight bill of lading, the terms of sale upon which the buyer and seller agreed, the buyer and seller generally dictates where title to the goods passes. The carrier does not require presentation of the straight bill's original copy to effect delivery, the carrier must simply deliver the goods to the person or firm the straight bill of lading names as consignee.

Order Bill of Lading

It is a negotiable instrument showing certificate title to the goods it names. Using the order bill of lading enables the consignor to retain security interest in the goods. That is, the consignee must pay the good's invoice value to obtain the original copy of the order bill of lading that must be presented to the carrier for delivery.

Bill of Lading Contract Terms

The bill of lading contains the terms of contract for movement by common carrier. The contract is between the shipper and the common carrier for the movement of the freight that the bill of lading identifies to the consignee that the bill identifies. The bill of lading contract contains nine sections. Section 1 delineating the extent of the carrier's liability, is a primary contract terms discussed as follows

1. **Common carrier liability** the carrier is held liable for all loss, damage or delay to the goods except for the following
   - **The act of God** Loss resulting from any unavoidable natural catastrophe. If the carrier had sufficient opportunity to avoid the catastrophe, the carrier is liable and cannot use this exception.
   - **Act of public enemy** Loss resulting from armed aggression against the United States
   - **Act of shipper** Loss resulting from shipper's improper loading, packaging or concealment of goods being shipped.
   - **Act of public authority** loss resulting from public agencies taking or destroying goods by due process of law
   - **Inherent nature of goods** the normal or expected loss of the products (eg. Evaporation)
2. **Reasonable dispatch** the shipper holds the carrier liable for the actual loss or damage that results from an unreasonable delay in transit. No specific rule exists for determining reasonable time. The shipper examines the shipments specifies to see if the delay was unreasonable under given circumstances.
3. **Cooperage and baling** the owner pays such costs. The carrier may compress cotton or cotton linters and may commingle bulk grain shipments distained to a public elevator with other grain.

4. **Freight not accepted** the carrier may store at the owner's cost any property the consignee does not remove within the free time. After notifying the consignor, the carrier may sell at public auction property the consignee refuses.

5. **Article of extraordinary value** the carrier is not obligated to carry documents or articles of extraordinary value unless the classification or tariff specifically rates such items. This is one area where a common carrier can refuse to provide service.

6. **Explosives** the shipper shall give the carrier full written disclosure when shipping dangerous articles. If there is no disclosure, the shipper is held liable for any damage such goods cause.

7. **No recourse** the carrier has no legal recourse back to the shipper for additional charges after making delivery. If the shipper signs the no recourse clause and the carrier delivers the shipment, the carrier has recourse only to the consignee for additional freight charges for the shipment.

8. **Substitute bill of lading** when a bill of lading is an exchange or substitute for another, the subsequent bill of lading shall encompass the prior bill's statements regarding shipment value, election of common law liability, and consignor's signature.

9. **Water carriage** if water transportation is involved, the water carrier is liable for negligence in loading, and is responsible for making vessel seaworthy and for outfitting and manning the vessel.

10. **Alterations** the carrier's agent must note any changes, additions, or erasures to make such alterations enforceable

Electronic Bills of Lading

Efficiency of transportation has become linked to electronic adaptability of bills of lading. Modern bills of lading regimes define and permit electronic bills of lading. The objective is to expedite documentation so that it does not delay transportation. The special legal significance of signatures makes it important that electronic signatures be acceptable legally. The concern is that the electronic signature be authentic. This could be solved through adoption of statutory language that signature "means a handwritten signature, its facsimile or an equivalent authentication effected by any other means."50 The bill of lading should be adaptable to electronic processing.

The main concern is that an electronic recording of the information in the bill of lading be readily and permanently available for all purposes, both during the transportation and afterwards, in case of claims caused by loss, damage or delay. Therefore, adoption

of statutory language that the receipt or bill of lading "may be issued in any form that generates a permanent record," would be satisfactory. Furthermore, electronic data interchange (EDI), a computer-to-computer communication system based on prearranged and agreed terms of reference, should be acceptable. Notices (for example, carriers' notices to shippers, or shippers' notices to carriers of claims) and requests (for example, shippers' requests for information) should likewise be usable to other parties to the transaction in any form that generates a permanent record, so that the parties respond to the notices and requests during the transportation, and permanent records are available afterwards in case of claims. Computer storage could be designed to satisfy the requirement for establishing a permanent record.

Sea Waybill

This fulfils the same practical functions as the bill of lading, but does not confer title to the goods and is therefore quicker and easier to use. It's often used where there's a well-established trading relationship between buyer and seller or in transactions where ownership doesn't change hands between divisions of a single company.

Commercial Invoice

All commercial invoices must be on the letterhead of the exporting company. The invoice should contain names and addresses of consignor and consignee, accurate description of goods and components (trademarks, name of the vessel or airlines) and the date of sailing, port of loading and port of discharge, net and gross weight, quantity, unit price and extended price of each type of goods, total value of the shipment, contents of each package and container, currency, number of L/C (if applicable) and freight and insurance.

Take for example on May 18, 1996, the Saudi customs authorities have emphasized that commercial invoices issued by exporters should contain accurate description of goods being exported to the Kingdom, like

A) For Equipment

- Line, number, and size of exported item.
- Model number.
- Trademarks.
- Manufacturer's complete name.
- Any other information helpful in identifying the exported equipment.

B) For Other Exported Products

- Complete material description including type, size, eight, and percentage of its components if possible.
- Complete name(s) of manufacturer(s) or producer(s).
- Trademarks.
- Any other information pertaining to the type of the exported item to the Kingdom of Saudi Arabia.

In addition, all commercial invoices should be certified by a responsible official of the exporting firm as follows

"I certify this invoice to be true and correct and in accordance with our books, also that the goods referred to care of .....origin."

Certificate of Origin

This certificate must be issued by the manufacturer (or the exporting firm). In addition to the name of the vessel (airlines) and the date of sailing, name(s), nationality(ies), and full street address(es) of the manufacturer(s) of all items to be shipped to Saudi Arabia, and components thereof, must be declared. Furthermore, the origin of each item or component must be specified. A signed statement to the effect that the document is true and correct must be given. For example if the merchandise to be shipped to Saudi Arabia **is not** solely and exclusively originated in the U.S., then a notarized "**appended declaration to certificate of origin**" (available at any Saudi Consulate), must be attached to the certificate of origin. In addition, the certificate of origin must include name and address of the Saudi importer, description of the goods, and address of the shipping company.

Insurance Certificate

This certificate (issued by an insurance company in at least one original) must contain the following information actual amount of insurance, description and value of insured goods, name of vessel, port of loading and Saudi port of discharge, and name and address of beneficiary. Moreover, **the appended declaration to insurance policy** (form of which is available at any Saudi Arabian Consulate) should state that the insurance company has a duly qualified and appointed agent or representative in the Kingdom of Saudi Arabia, giving his name and full address. If the shipment is insured by an insurance company in Saudi Arabia, the exporter, on his letterhead, must state the name and address of said company.

Packing List

This includes names and addresses of consignor and consignee, description and value of the exported goods, net and total weight, number of packages and their contents, number of containers and contents, numbers of seals, and number of L/C (if applicable).

Steamship (or Airlines Company) Certificate

This certificate (**which is an appended declaration to bill of lading or the airway bill**) should be issued by the steamship (or airlines) company in at least one original. It **must be notarized** and contain the following information about the vessel (or plane), named in the Bill of Lading or the airline company certificate

(1) Name of vessel (plane), and previous name (if applicable).
(2) Nationality of vessel (plane).
(3) Owner of vessel (plane).
(4) Name(s) of ports (airports) that Vessel (plane) will call on en route to the Kingdom of Saudi Arabia

A- Port (airport) of loading .....

B- .....

C- .....

Port (airport) of discharge.....

Further, the steamship (airlines) company certificate should declare that said vessel (plane) shall not anchor or call on any other ports (airports) than those mentioned in it, and that all information provided in the certificate is true and correct. The standard form of the Appended Declaration to the Bill of Lading or airway bill is available at any Saudi Arabian Consulate.

Mate's Receipts

Rarely seen in trade circles, and rightly so, for this is merely a receipt for goods shipped abroad. Not being a document of title, it should be exchanged for the set of bills of lading by the shipper at the offices of the shipping company.

Cargo Insurance for Goods at Sea

As with any commercial transactions, there are risks associated with trading internationally and it's important to arrange appropriate insurance cover. You're likely to

see the phrase 'marine insurance'. This doesn't only apply to ocean shipping - it also covers transport by road, rail and air. Shipping companies' liability for the cargo they carry is set by various international conventions and does not always equate to the full value of the goods. The level of protection this offers varies from market to market, so you should check what the position is.

Contracts of Sale and Insurance

The main risks that arise in international trade are loss, damage and delay (including detention at customs). How these risks are shared between buyers and sellers should be covered in the contract of sale (not the contract of carriage), using Incoterms.

Incoterms are a standard set of trading terms that indicate precisely when responsibility for costs and risks shifts from seller to buyer. This affects your insurance, because the more costs you're responsible for, the greater the insurance cover you'll need. For example

- In an ex-works transaction, the seller is considered to have delivered the goods once they've been made available for collection at the factory or warehouse. From that point on, risk passes to the buyer, so the buyer should insure the journey from that point.

- With a delivered-duty-paid (DDP) sale, the risk only passes to the buyer once the goods have arrived at their place of destination and have been cleared for import. In this case, the seller should insure the journey up to that point. There is no obligation under DDP for either buyer or seller to contract for insurance. Only two terms in Incoterms - CIF and CIP - require insurance to be contracted - in both cases it is the seller's obligation. For all other Incoterms, it is recommended that buyer and seller agree who will be responsible for taking out insurance to cover the safe delivery of the consignment.

Documents in Electronic Form

International documentation is very costly and time consuming. These days efforts are being made to reduce the reliance on paper documents and to move toward the use of electronic documents. This is true of the industrialized nations, but many of the developing countries of the world are not technically advanced and the paper documents will retain the mainstay in these countries. Electronic data interchange (EDI) and the Internet hold much promise in achieving the goal of less international documentation. Importers and

exporters, as well as carriers and intermediaries, are beginning to exchange international documentation data via the Internet and EDI. For example the US Government as developed the Automated Brokerage System (ABS) to automate the import documentation process for customs house brokers.

These days' computer software programs are available to produce the international document required for a shipment to/ from a specific country. These programs can produce the document in the specified language and make as many copies as necessary. The completed documents can then be sent electronically to the importing country, carriers, intermediaries and financial institutions.

These type of electronic transfer of documents helps the company in terms of saving paper cost, personnel time, errors and shipping delays. Due to information technology impact now a day's Harmonized Commodity Description and Coding System has been evolved to identify specific products with an internationally accepted identification number. This system permits consistent classification for transportation elements such as documentation and duties.

Glossary of Chartering Terms

Shipper Individual or company with cargo to transport.

Charterer Individual or company who hires a ship.

Charter-party Contract setting out the terms on which the shipper contracts for the transportation of his cargo or the

charterer contracts for the hire of a ship.

Voyage charter Ship earns freight per ton of cargo transported on terms set out in the charter-party which specifies the precise nature and volume of cargo, the port(s) of loading and discharge and the lay time and demurrage. All costs paid by the ship owner.

Consecutive voyage charter Vessel hired to perform a series of consecutive voyages between A and B.

Contract of Affreightment (COA) Ship owner undertakes to carry quantities of a specific cargo on a particular route or

routes over a given period of time using ships of his choice within specified restrictions.

Period charter The vessels are hired for a specified period of time for payment of a daily, monthly or annual fee. There are three types, time charter, trip charter and consecutive voyage charter.

Time charter Ship earns hire, monthly or semi-monthly. The ship-owner retains possession and mans and operates ship under instructions from charterer who pays voyage costs

Trip charter Fixed on a time charter basis for the period of a specific voyage and for the carriage of a specific cargo.

Ship owner earns `hire' per day for the period determined by the voyage.

Bare boat charter The owner of the ship contracts (for a fee, usually long-term) to another party for its operation. The ship is then operated by the second party as if he owned it.

Lay time The period of time agreed between the party to a voyage charter during which the owner will make ship available for loading/discharging of cargo.

Demurrage The money payable to the ship owner for delay for which he is not responsible in loading and/or discharging beyond the lay time.

Dispatch Means the money which the owner agreed to repay if the ship is loaded or discharged in less than the lay time allowed in the charter-party (customarily demurrage).

Self Assessment Questions

1. What do understand by liner shipping? How does it differ from Tramp Shipping?
2. Outline the factors a shipper has to keep in view while selecting a liner vessel.
3. Enumerate the salient features of commercial shipping and explain its importance for the development of international trade.
4. Describe the function of the following documents bill of lading, freight bill, freight claim, certificate of origin, letter of credit, carnet, dock receipt, and airway bill.

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Lesson 3.3 - Freight Strcture and Practices in Ocean Shipping

Learning Objectives

After reading this chapter you should be able to

- Define 'Logistics' and Associated terms
- Understand the Concept of logistics
- List different activities of logistics and understand the relationship between them
- Key logistics objectives
- System elements of logistics
- Recognize the Significance of logistics

Introduction

The cost of freight represents a significant factor in the final price of the product to the consumer/buyer. It is a diverse area with individual transport modes having a differing structure. Hence the need for the exporter to comprehend the factors determining the freight rate to conduct effective negotiations with the carrier. There are two main elements to the cost of transporting goods by sea - the ocean freight charged by the carrier, and costs associated with handling and clearing the goods at the ports of loading and discharge. A number of factors can influence how these charges are calculated

- For liner traffic, freight is usually charged according to the shipping company's standard tariff, although larger or frequent shippers and freight forwarders may be able to negotiate preferential shipping rates
- Charter rates for other vessels depend on supply and demand conditions prevailing at the time when the charter is negotiated

However, there are many other factors that can impact on the final price, including

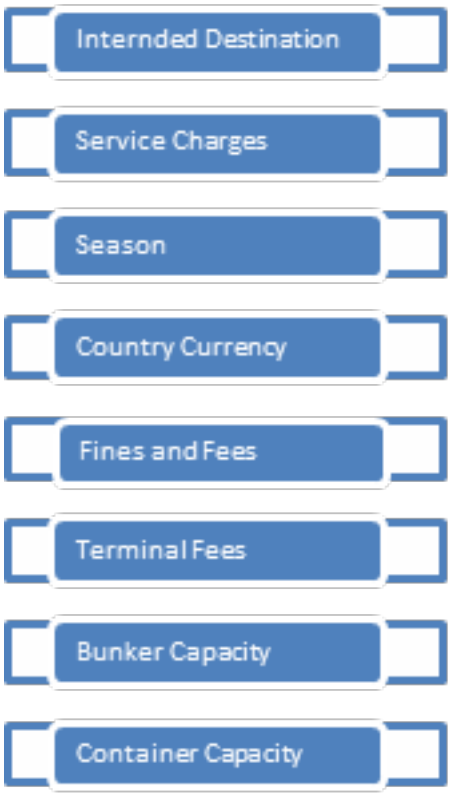
- Different rates for specific goods and general cargo
- Congestion charges at busy ports

- Currency adjustment factor, to take account of exchange rate changes during the journey - shipping costs are usually calculated and quoted in US dollars
- Bunker adjustment factor, to take account of fuel price fluctuation
- Surcharges (like a security surcharge) levied by ports and/or by the shipping company to cover the costs of particular regulatory regimes

Another factor that affects the cost of shipping containerized cargo is whether or not you have a full container load to transport. Shipping companies' tariffs are based on flat per-container rates, so it is clearly most economical to ship your goods in containers that are full. If you have a less-than-container-load consignment, it may be worth consolidating your cargo with that of other traders, so you'll only pay for the weight or volume (whichever is greater) of your own goods. Working out the most cost-effective way to ship your goods around the world can be a complicated task.

Factors that Affect Ocean Freight Rates

Understanding ocean freight rates and the ways and means of its applicability is important because if a shipper undertakes to transport the goods without proper knowledge, then he could end up making a huge loss. The following are **the factors affecting ocean freight rates**



Factors that Affect Ocean Freight Rates

1. **Intended destination** The intended destination is an important factor when it comes to calculating ocean freight rates. In simple terms, the longer the journey, the exorbitant the ocean shipping rates and vice-versa

2. **Service Charges** Any extra charge levied by port authorities like the security service charges also tends to affect the ocean freight rate

3. **Season** For certain goods, the season becomes a very important factor. Grains and fruits transported during a particular freight season will have higher cargo rates and vice versa

4. **Currency** In today's times, the common denomination used for international transaction purposes is the dollar. Ocean freight rate depends on the fluctuating rate of exchanges and therefore is likely to be levied on the latest prevailing exchange rate

5. **Fines and Fees** If there is any delay in ship reaching the port because of over-crowding, then there might be a fine imposed which affects the ocean shipping rates

6. **Terminal Fees** The ocean freight also depends on the fees to be paid while embarking the journey from a port and after reaching the intended destination. These fees known as terminal fees also affect ocean freight rate

7. **Bunker Capacity** Bunkers are containers to store the fuel. Rising fuel prices and the latest prevailing fuel rates will affect the freight charges

8. **Container Capacity** The containers used to store the goods function on the simple economic principle of *'economies of scale.'* If the shipper does not have enough goods to fill the containers to their optimum capacity, it will affect the freight charges by way of the shipper having to pay more in spite of lesser quantity

Ocean shipping rates are generally pre-set and are standardised. But frequent shippers can make use of client-business relationship to avail of discounts and waivers. In a similar manner, shippers who use chartered vessels to transport their goods have to pay an amount which is settled on the day the transporting agreement is made between both parties.

Ocean freight is a highly unpredictable area. Lately a lot of research has been done in order to provide a better insight on the field. This will enable shippers to carry out their transporting of goods in a better and simpler manner.

Sea freight calculations can broadly be divided into two main components;

1. Break-bulk and
2. Containerized

In this section we deal with how you should calculate the freight costs of both of these two types of sea freight.

Break Bulk Cargo Calculations

Break bulk cargo, is cargo that is unitized, palletized or strapped. This cargo is measured along the greatest length, width and height of the entire shipment. The cargo is also weighed. Shipping lines quote break bulk cargo per "freight ton", which is either 1 metric ton or 1 cubic meter, which ever yields the greatest revenue.

Example

A case has a gross mass of 2 Mt.

The dimensions of the cargo are

2.5 X 1 X 2 meters

The tariff rate quoted by the shipping line is USD 110.00 weight or measure (freight ton)

Step 1

Multiply the meters 2.5 X 1 X 2 = 5 meters Compare to the mass = 2 Mt.

Step 2

Calculate the freight with the greater amount either the mass or the dimension. 5 X USD 110.00 = USD 550.00

Freight would be paid on the measurement and not the weight. All shipping lines carrying cargo in a break-bulk form insist on payment based on a minimum freight charge which is equivalent to one freight ton, one cubic meter or one metric ton.

Full Container load calculations and surcharges

Freight rates for containers are based on the container as a unit of freight irrespective of the commodity or commodities loaded therein, (FAK) Freight All Kinds. The shipping

lines quote per box (container) either a six or twelve meter container. From time to time, abnormal or exceptional costs arise in respect of which no provision has been made in the tariffs. For example a shipping line cannot predict the movement of the US Dollar or the sudden increase of the international oil price. These increases have to be taken into account by the shipping line in order to ensure that the shipping line continues to operate at a profit. These increases are called surcharges. All shipping lines accordingly retain the right to impose an adjustment factor upon their rates taking into account these fluctuations. All surcharges are expressed as a percentage of the basic freight rate. Surcharges are regularly reviewed in the light of unforeseen circumstances, which may arise and bring cause for a surcharge increase.

Bunker Adjustment Factor (BAF)

"Bunkers" is the generic name given to fuels and lubricants that provide energy to power ships. The cost of bunker oil fluctuates continually and with comparatively little warning.

Example

Freight rate Port Elizabeth to Singapore
Freight rate US Dollar 1 250.00 per 6-M container
+ BAF 5.2%
US Dollar 1 250.00 X 5.2% = US Dollar 65.00
Add the two amounts together
Freight rate U S Dollar 1 315.00

Currency Adjustment Factor (CAF)

The currency adjustment factor is a mechanism for taking into account fluctuations in exchange rates, these fluctuations occur when expenses are paid in one currency and monies earned in another by a shipping company. The currency adjustment factor is a mechanism for taking into account these exchange rate fluctuations. It is always expressed as a percentage of the basic freight and is subject to regular review.

Example

Freight rate Port Elizabeth to Singapore
Freight rate US Dollar 1 250.00 per 6-M container
+ CAF 6.3%

US Dollar 1 250.00 X 6.3% = US Dollar 78.75

Add the two amounts together

Freight rate U S Dollar 1 328.75

War Surcharge

The outbreak of hostilities between nations can have a serious effect upon carriers servicing international trade even though they may sail under a neutral flag. Carriers sailing within the vicinity of a war zone may impose a war surcharge on freight to compensate for the higher risks involved and the higher levels of insurance premium, which they may be obliged to pay.

Example

Freight rate Port Elizabeth to Singapore

Freight rate US Dollar 1 250.00 per 6-M container

+ WAR 5%

US Dollar 1 250.00 X 5% = US Dollar 62.50

Add the two amounts together

Freight rate U S Dollar 1 35.50

All of the above surcharges may be applied to a single freight rate.

Example

Freight rate Port Elizabeth to Singapore

Freight rate US Dollar 1 250.00 per 6-M container

+ BAF 5.2%

+ CAF 6.3%

+ WAR 5%

Total amount of surcharge 16.5%

US Dollar 1 250.00 X 16.5% = US Dollar 206.25

(add to freight rate)

US Dollar 1 456.25

Port Congestion Surcharge

Congestion in a port for a period of time can involve considerable idle time for vessels serving that port. When a ship lies idle, this creates a huge amount of loss for the ship's owner. Shipping lines therefore have the right to impose a surcharge on the freight to recover revenue lost. Another factor which influences port congestion surcharge would be labour disputes. Port congestion surcharges are calculated as a percentage of the freight rate as expressed in the previous examples.

Consolidation Services

The consolidator or groupage operator hires a container from a shipping line and then sells that space to his clients/exporters. The benefit for the exporter is that small quantities which, would not fill a full container load, can be shipped by sea freight in a shipping container as an alternative to air freighting the goods. The consolidator would charge per metric ton or cubic metre, which ever yields the greatest. Example US Dollar 89.00 Weight or Measure. The shipping line would have a contract of carriage with the consolidator and in turn the consolidator would have a contract of carriage with the exporter. The consolidator would be issued with an combined through bill of lading from the shipping line and then present the exporter with a house bill of lading (See bill of lading below)

The Bill of Lading

The bill of lading performs the following functions

- A contract of carriage between the shipper of the cargo and the carrying shipping company.
- The name of the shipper and the receiver of the goods the consignee.
- The contents of the packages as declared by the shipper.
- Shipping details such as port of loading and the port of discharge.
- The bill of lading is a freight invoice and indicates if the freight costs have been prepaid by the exporter or will be paid by the importer, "freight collect".
- The bill of lading states the number of packages, weight and dimension of the shipment.
- It is a document of title to the goods stated thereon.

Every original bill of lading signed by or on behalf of the shipping company is a document of title to the underlying goods. This special function of a bill of lading is achieved by a form of words which state "In witness whereof the undersigned on behalf of the shipping company has signed three bills of lading all of this tenor and date, one of which being accomplished the others to stand void". "Accomplishing" the bill of lading requires the surrender to the shipping line or its agents in the port or place of destination one of the signed original bills of lading duly endorsed by the consignee/importer. Unless and until one of the original bills of lading as described above is surrendered, the shipping line will not release the cargo to the consignee/importer. Upon surrender of any one of the originals the other originals bills of lading become void.

Endorsed Bills of Lading

Bills of lading can only be issued with the words "shipped on board", if the cargo has actually been loaded onto the named vessel at the port of loading. By insisting that the exporter supplies the importer with a "shipped on board" bill of lading, the importer obtains conclusive evidence that the goods have been loaded on board the intended vessel.

Some importers insist that the exporter presents "shipped on board" bills as a condition for payment. "Received for shipment", bills of lading can be issued as soon as the goods have been delivered into the custody of the carrying shipping company or its agent either at the point of receipt or at the port of loading. Thus, a 'received for shipment", bill of lading will only indicate the ship in which the cargo is intended to be loaded on. The risk remains that the loading may, for many reasons delayed or the cargo may not be loaded at all.

Banks responsible for the payment of funds in payment for goods under letters of credit will not release the funds if the bill of lading has been endorsed "received for shipment".

Freight would be paid on the measurement and not the weight. All shipping lines carrying cargo in a break-bulk form insist on payment based on a minimum freight charge which is equivalent to one freight ton, one cubic meter or one metric ton.

Liner Terms

Liner operators quote their freight rates on a *liner term* basis. A series of highly specialized operations are required in the process of loading cargoes efficiently into a ship, and securing those cargoes in the ship's hold for safe transportation to the port of

destination. Another series of equally highly specialized operations must take place in order to extract the cargo from the ship's hold and place them safely on the quayside at the port of destination. All these costs are collectively known as terminal handling charges - THC.

Payment of Freight

The word "freight" has two alternative meanings it may be used to refer to the movement of the cargo; by road, rail sea or air, or it may be used to denote the charge raised by the carrier for the service of transportation.

Freight Currency

In the context of international carriage by sea, the "tariff currency", is the United States Dollar. It is common practice in the shipping industry that freight is payable as the consignment/cargo is loaded on board the intended vessel. Immediately the cargo has been placed on board, the shipping company is entitled to full payment, even though the ship may sink along the quayside at the loading berth. The amount of freight due is paid either at the port of loading in exchange for the issuance of the original bills of lading, or at the port of discharge in exchange for the release of the consignment from the shipping company's custody. When freight is paid in any currency other than the "tariff currency", the amount due in that "tariff currency", will be converted at the rate applicable on the date of shipment or such other date as agreed upon by the carrier.

Self Assessment Questions

1. Define shipping freight rate
2. Explain the factors considered in determination of ocean freight rate
3. What are the main components of shipping freight rates?
4. On what basis shipping firelight charges are made?
5. Describe the guidelines provided for charging freight rate for shipping goods?
6. How freight related issued are addressed in the shipping industry?

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Lesson 3.4 - International Maritime Organization (IMO)

Learning Objectives

After reading this chapter you should be able to

- Define IMO
- Understand the Need for IMO
- To know the Role played by IMO
- To know the Organizational Structure of IMO
- To Understand the List and Title of IMO Convention

Introduction

The International Maritime Organization is a specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. It is also involved in legal matters, including liability and compensation issues and the facilitation of international maritime traffic. It was established by means of a Convention adopted under the auspices of the United Nations in Geneva on 17 March 1948 and met for the first time in January 1959. It currently has 170 Member States. IMO's governing body is the Assembly which is made up of all 170 Member States and meets normally once every two years. It adopts the budget for the next biennium together with technical resolutions and recommendations prepared by subsidiary bodies during the previous two years. The Council acts as governing body in between Assembly sessions. It prepares the budget and work programme for the Assembly. The main technical work is carried out by the Maritime Safety, Marine Environment Protection, Legal, Technical Co-operation, Facilitation Committees and a number of sub-committees. The IMO slogan sums up its objectives **Safe, secure and efficient shipping on clean oceans**.

Need for International Maritime Organization (IMO)

Shipping is an international industry, if each nation developed its own safety legislation the result would be a maze of differing, often conflicting national laws. One nation, for example, might insist on lifeboats being made of steel and another of glass-

reinforced plastic. Some nations might insist on very high safety standards while others might be more lax, acting as havens for sub-standard shipping. The following are the major area in which IMO specially focuses

IMO in dealing Oil Pollution from Ships

In 1954 a treaty was adopted dealing with oil pollution from ships. IMO took over responsibility for this treaty in 1959, but it was not until 1967, when the tanker *Torrey Canyon* ran aground off the coast of the United Kingdom and spilled more than 120,000 tons of oil into the sea, that the shipping world realized just how serious the pollution threat was. Until then many people had believed that the seas were big enough to cope with any pollution caused by human activity. Since then IMO has adopted a whole series of conventions covering prevention of marine pollution by ships, preparedness and response to incidents involving oil and hazardous and noxious substances, prevention of use of harmful anti-fouling systems and the international convention on ballast water management to prevent the spread of harmful aquatic organisms in ballast water.

The Marine Environment Protection Committee (MEPC) deals with all issues relating to marine environment protection as it relates to shipping. Protecting the environment from shipping is not just about specific regulations preventing ships dumping oil, garbage or sewage. It is also about the improvements in safety - from mandatory traffic separation schemes to the International Safety Management (ISM) Code and improving seafarer training - which help to prevent accidents occurring.

Climate Change

IMO is heavily engaged in the fight to protect and preserve our environment - both marine and atmospheric - and is energetically pursuing the limitation and reduction of greenhouse gas emissions from shipping operations. The Marine Environment Protection Committee has developed energy efficiency measures, both for existing and new ships, to enable a comprehensive package of technical and operational measures to be agreed.

IMO Aim for the Lowest Common Denominator

IMO usually tries to act on a consensus basis. This is because it is important that measures adopted by the Organization, which can have a major impact on shipping, achieve as much support as possible. A treaty that was supported by only 51 per cent of the IMO membership, for example, would be opposed by nearly half the shipping world. Not only would they not ratify the treaty concerned but they might go off and adopt an alternative

treaty of their own, thereby dividing the maritime community. But this does not mean that the measures themselves are of a low standard. Governments that did not want high standards would not bother to join IMO.

The Governments that do join IMO do so because they support the Organization's aims. Experience has show that the treaties adopted by IMO represent an extremely high standard and their acceptability can be shown by the fact that many of them are now almost universal in their coverage. SOLAS, for example, has been accepted by more than 156 countries and covers all but a fraction of the world merchant fleet.

IMO have some sort of Police Function

It is sometimes said that IMO should have some sort of authority to enforce its regulations. This seems to imply the creation of a team of inspectors and a fleet of patrol boats crewed by officials with the right to board any ships they suspected of contravening IMO regulations.

In practice, the creation of such a force would be financially enormous - it would mean recruiting hundreds, probably thousands of people - and politically impossible most Governments would never agree to allow ships flying their flag to be boarded in international waters and any attempt to introduce a system of penalties and punishments would be even more unacceptable.

The "IMO" police force would duplicate the work being done already by individual Governments and there is no guarantee that it would make a significant impact on safety and pollution, certainly in relation to the cost involved. IMO has however been given the authority to vet the training, examination and certification procedures of Contracting Parties to the International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW), 1978.

IMO has now adopted the Voluntary IMO Member State Audit Scheme

The Audit Scheme is designed to help promote maritime safety and environmental protection by assessing how effectively Member States implement and enforce relevant IMO Convention standards, and by providing them with feedback and advice on their current performance. The first audits under the Voluntary IMO Member State Audit Scheme were completed at the end of 2006 but the IMO Assembly has agreed a programme to make this scheme mandatory, with the entry into force of the mandatory audit scheme likely to be in 2015.

IMO in Maritime Safety and Environmental Protection

In the 1950s shipping was dominated by a handful of traditional maritime countries. They built the ships, operated them, manned them - and provided the goods that were carried on them. Today most ships fly the flags of developing countries; their crews come from all over the world. Doubts have been expressed about the ability of some of these countries to maintain and operate ships to the high standards laid down in IMO regulations. Ships themselves have changed dramatically in size, speed and design and in addition economic factors mean that the average of ships today is much higher than it used to be. Despite these changes, safety standards around the world are generally good and have improved considerably since the late 1970s, when IMO treaties began to enter into force and the number of acceptances rose to record levels. Statistics do not always tell the whole story. In the early 1980s, for example, a study carried out in the United Kingdom showed that the number of collisions between ships was much the same as it had been ten years before, indicating that the introduction of traffic separation schemes and other measures had not had much impact. But closer examination showed that the number of collisions had fallen dramatically in areas where IMO approved schemes had been adopted - but had risen by the same number in areas where nothing had been done. Generally speaking, the rate of serious casualties has not greatly changed during the last ten years or so. But in view of the changes taking place in shipping - notably the steady ageing of the world fleet -this is an indication that IMO measures are having an impact. As far as pollution is concerned, the indications are that there has been a remarkable improvement in the amount of pollution caused by ships.

IMO in Maritime Security

Maritime security is now an integral part of IMO's responsibilities. A comprehensive security regime for international shipping entered into force on 1 July 2004.The mandatory security measures, adopted in December 2002, include a number of amendments to the 1974 Safety of Life at Sea Convention (SOLAS), the most far-reaching of which enshrines the new International Ship and Port Facility Security Code (ISPS Code), which contains detailed security-related requirements for Governments, port authorities and shipping companies.

IMO Action in Controlling Sea Piracy

The number of acts of piracy and armed robbery against ships reported to the Organization to have occurred in 2009 was 406, against 306 during 2008, representing an increase of 32.7%. In the first four months of 2010, 135 incidents had been reported. The

majority of actual attacks reported worldwide during 2009 had occurred in international waters, largely as a result of pirate activity in the waters off the coast of Somalia. Meanwhile, the numbers of attacks reported that had occurred in port facilities while the ships were at anchor or berthed, had shown a steady downward trend since the introduction of the International Ship and Port Facilities (ISPS) Code in 2004. Any act of piracy and armed robbery can impact on human life, the safety of navigation and the environment. Piracy is a criminal act, which not only affects the victims but also has severe financial repercussions. The three areas of concern to IMO, particularly relevant to the situation off Somalia and in the Gulf of Aden, can be summed up as

- The need to protect seafarers, fishermen and passengers;
- The need to ensure the uninterrupted delivery of humanitarian aid to Somalia effected by ships chartered by the World Food Programme; and
- The need to preserve the integrity of the Gulf of Aden - a lane of strategic importance and significance to international shipping and trade, both east and west of the Suez Canal, which is used by some 22,000 vessels annually, carrying around 8% of the world's trade, including more than 12% of the total volume of oil transported by sea, as well as raw materials and finished goods.

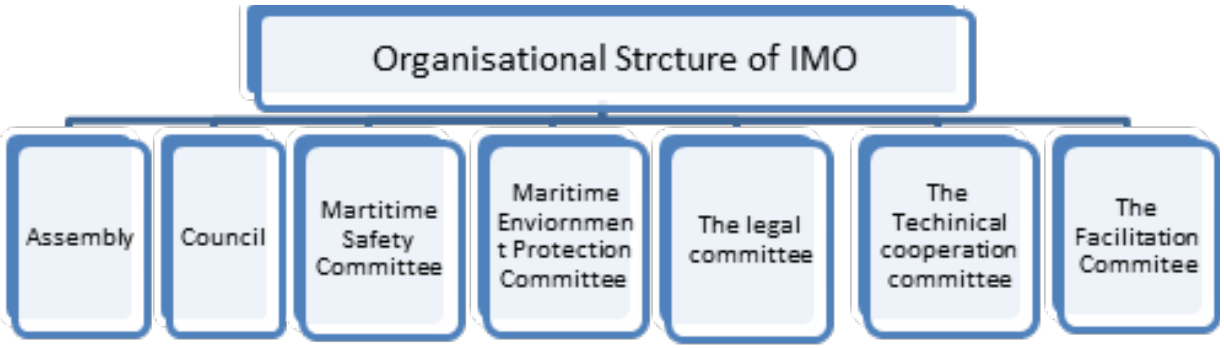
Regional cooperation among States has an important role to play in solving the problem of piracy and armed robbery against ships, as evidenced by the success of the regional anti-piracy operation in the Straits of Malacca and Singapore. The Regional Cooperation Agreement on Combating Piracy and Armed Robbery against ships in Asia (RECAAP), which was concluded in November 2004 by 16 countries in Asia, and includes the RECAAP Information Sharing Centre (ISC) for facilitating the sharing of piracy-related information, is a good example of successful regional cooperation which IMO seeks to replicate elsewhere.

IMO in Communication Building

The Global Maritime Distress and Safety System (GMDSS) is an integrated communications system using satellite and terrestrial radio communications to ensure that no matter where a ship is in distress, aid can be dispatched. Under the GMDSS, all passenger ships and all cargo ships over 300 gross tonnage on international voyages have to carry specified satellite and radio communications equipment, for sending and receiving distress alerts and maritime safety information, and for general communications. The GMDSS became fully effective from 1 February 1999.

Structure of IMO

The Organization consists of an Assembly, a Council and five main Committees the Maritime Safety Committee; the Marine Environment Protection Committee; the Legal Committee; the Technical Co-operation Committee and the Facilitation Committee and a number of Sub-Committees support the work of the main technical committees.



Organisational Structure of IMO

Assembly

This is the highest Governing Body of the Organization. It consists of all Member States and it meets once every two years in regular sessions, but may also meet in an extraordinary session if necessary. The Assembly is responsible for approving the work programme, voting the budget and determining the financial arrangements of the Organization. The Assembly also elects the Council.

Council

The Council is elected by the Assembly for two-year terms beginning after each regular session of the Assembly. The Council is the Executive Organ of IMO and is responsible, under the Assembly, for supervising the work of the Organization. Between sessions of the Assembly the Council performs all the functions of the Assembly, except the function of making recommendations to Governments on maritime safety and pollution prevention which is reserved for the Assembly by Article 15(j) of the Convention.

Other functions of the Council are to

(a) Co-ordinate the activities of the organs of the Organization;

(b) Consider the draft work programme and budget estimates of the Organization and submit them to the Assembly;

(c) Receive reports and proposals of the Committees and other organs and submit them to the Assembly and Member States, with comments and recommendations as appropriate;

(d) Appoint the Secretary-General, subject to the approval of the Assembly;

(e) Enter into agreements or arrangements concerning the relationship of the Organization with other organizations, subject to approval by the Assembly.

Maritime Safety Committee (MSC)

The Maritime Safety Committee (MSC) is the highest technical body of the Organization. It consists of all Member States. The functions of the Maritime Safety Committee are to "consider any matter within the scope of the Organization concerned with aids to navigation, construction and equipment of vessels, manning from a safety standpoint, rules for the prevention of collisions, handling of dangerous cargoes, maritime safety procedures and requirements, hydrographic information, log-books and navigational records, marine casualty investigations, salvage and rescue and any other matters directly affecting maritime safety".

The Marine Environment Protection Committee (MEPC)

The MEPC, which consists of all Member States, is empowered to consider any matter within the scope of the Organization concerned with prevention and control of pollution from ships. In particular it is concerned with the adoption and amendment of conventions and other regulations and measures to ensure their enforcement. The MEPC was first established as a subsidiary body of the Assembly and raised to full constitutional status in 1985.

Sub-Committees

The MSC and MEPC are assisted in their work by nine sub-committees which are also open to all Member States. They deal with the following subjects

- Bulk Liquids and Gases (BLG)
- Carriage of Dangerous Goods, Solid Cargoes and Containers(DSC)
- Fire Protection (FP)
- Radio-communications and Search and Rescue (COMSAR)
- Safety of Navigation (NAV)

- Ship Design and Equipment (DE)
- Stability and Load Lines and Fishing Vessels Safety (SLF)
- Standards of Training and Watchkeeping (STW)
- Flag State Implementation (FSI)

Legal Committee

The Legal Committee is empowered to deal with any legal matters within the scope of the Organization. The Committee consists of all Member States of IMO. It was established in 1967 as a subsidiary body to deal with legal questions which arose in the aftermath of the **Torrey Canyon** disaster.

The Legal Committee is also empowered to perform any duties within its scope which may be assigned by or under any other international instrument and accepted by the Organization.

Technical Co-operation Committee

The Technical Co-operation Committee is required to consider any matter within the scope of the Organization concerned with the implementation of technical co-operation projects for which the Organization acts as the executing or co-operating agency and any other matters related to the Organization's activities in the technical co-operation field. The Technical Co-operation Committee consists of all Member States of IMO, was established in 1969 as a subsidiary body of the Council, and was institutionalized by means of an amendment to the IMO Convention which entered into force in 1984.

Facilitation Committee

The Facilitation Committee (FC) was established as a subsidiary body of the Council in May 1972, and became fully institutionalized in December 2008 as a result of an amendment to the IMO Convention. It consists of all the Member States of the Organization and deals with IMO's work in eliminating unnecessary formalities and "red tape" in international shipping by implementing all aspects of the Convention on Facilitation of International Maritime Traffic 1965 and any matter within the scope of the Organization concerned with the facilitation of international maritime traffic. In particular in recent years the Committee›s work, in accordance with the wishes of the Assembly, has been to ensure that the right balance is struck between maritime security and the facilitation of international maritime trade.

Secretariat

The Secretariat of IMO consists of the Secretary-General and some 300 international personnel based at the headquarters of the Organization in London. The Secretary-General of the Organization is Mr. Koji Sekimizu of Japan who was appointed to the position with effect from 1 January 2012. IMO has now five regional coordinators/advisors for technical co-operation activities, in Côte d'Ivoire, Ghana, Kenya, Philippines and Trinidad and Tobago.

IMO implementation of Legislation

IMO was established to adopt legislation. Governments are responsible for implementing it. When a Government accepts an IMO Convention it agrees to make it part of its own national law and to enforce it just likes any other law. The problem is that some countries lack the expertise, experience and resources necessary to do this properly. Others perhaps put enforcement fairly low down their list of priorities. The result is that serious casualty rates - probably the best way of seeing how effective Governments are at implementing legislation - can potentially vary from flag to flag.

Adopting a convention, Entry into force, Accession, Amendment, Enforcement, Tacit Acceptance Procedure

The industrial revolution of the eighteenth and nineteenth centuries and the upsurge in international commerce which followed resulted in the adoption of a number of international treaties related to shipping, including safety. The subjects covered included tonnage measurement, the prevention of collisions, signalling and others. By the end of the nineteenth century suggestions had even been made for the creation of a permanent international maritime body to deal with these and future measures. The plan was not put into effect, but international co-operation continued in the twentieth century, with the adoption of still more internationally-developed treaties.

Adopting a Convention

This is the part of the process with which IMO as an Organization is most closely involved. IMO has six main bodies concerned with the adoption or implementation of conventions. The Assembly and Council are the main organs, and the committees involved are the Maritime Safety Committee, Marine Environment Protection Committee, Legal Committee and the Facilitation Committee. Developments in shipping and other related industries are discussed by Member States in these bodies, and the need for a new convention

or amendments to existing conventions can be raised in any of them.

Entry into Force

The adoption of a convention marks the conclusion of only the first stage of a long process. Before the convention comes into force - that is, before it becomes binding upon Governments which have ratified it - it has to be accepted formally by individual Governments.

Signature, Ratification, Acceptance, Approval and Accession

The terms signature, ratification, acceptance, approval and accession refer to some of the methods by which a State can express its consent to be bound by a treaty.

Signature

Consent may be expressed by signature where

- The treaty provides that signature shall have that effect;
- It is otherwise established that the negotiating States were agreed that signature should have that effect;
- The intention of the State to give that effect to signature appears from the full powers of its representatives or was expressed during the negotiations (Vienna Convention on the Law of Treaties, 1969, Article 12.1).

A State may also sign a treaty "subject to ratification, acceptance or approval". In such a situation, signature does not signify the consent of a State to be bound by the treaty, although it does oblige the State to refrain from acts which would defeat the object and purpose of the treaty until such time as it has made its intention clear not to become a party to the treaty (Vienna Convention on the Law of Treaties, Article 18(a)).

Signature Subject to Ratification, Acceptance or Approval

Most multilateral treaties contain a clause providing that a State may express its consent to be bound by the instrument by signature subject to ratification.In such a situation, signature alone will not suffice to bind the State, but must be followed up by the deposit of an instrument of ratification with the depositary of the treaty. This option of expressing consent to be bound by signature subject to ratification, acceptance or approval originated in an era when international communications were not instantaneous, as they

are today. It was a means of ensuring that a State representative did not exceed their powers or instructions with regard to the making of a particular treaty. The words "acceptance" and "approval" basically mean the same as ratification, but they are less formal and non-technical and might be preferred by some States which might have constitutional difficulties with the term ratification. Many States nowadays choose this option, especially in relation to multinational treaties, as it provides them with an opportunity to ensure that any necessary legislation is enacted and other constitutional requirements fulfilled before entering into treaty commitments. The terms for consent to be expressed by signature subject to acceptance or approval are very similar to ratification in their effect. This is borne out by Article 14.2 of the Vienna Convention on the Law of Treaties which provides that "the consent of a State to be bound by a treaty is expressed by acceptance or approval under conditions similar to those which apply to ratification."

Accession

Most multinational treaties are open for signature for a specified period of time. Accession is the method used by a State to become a party to a treaty which it did not sign whilst the treaty was open for signature. Technically, accession requires the State in question to deposit an instrument of accession with the depositary. Article 15 of the Vienna Convention on the Law of Treaties provides that consent by accession is possible where the treaty so provides, or where it is otherwise established that the negotiating States were agreed or subsequently agreed that consent by accession could occur.

Amendment

Technology and techniques in the shipping industry change very rapidly these days. As a result, not only are new conventions required but existing ones need to be kept up to date. For example, the International Convention for the Safety of Life at Sea (SOLAS), 1960 was amended six times after it entered into force in 1965 - in 1966, 1967, 1968, 1969, 1971 and 1973. In 1974 a completely new convention was adopted incorporating all these amendments (and other minor changes) and has itself been modified on numerous occasions. In early conventions, amendments came into force only after a percentage of Contracting States, usually two thirds, had accepted them.

This normally meant that more acceptances were required to amend a convention than were originally required to bring it into force in the first place, especially where the number of States which are Parties to a convention is very large. This percentage requirement in practice led to long delays in bringing amendments into force. To remedy the situation a new amendment procedure was devised in IMO. This procedure has been used in the case

of conventions such as the Convention on the International Regulations for Preventing Collisions at Sea, 1972, the International Convention for the Prevention of Pollution from Ships, 1973 and SOLAS 1974, all of which incorporate a procedure involving the "tacit acceptance" of amendments by States. Instead of requiring that an amendment shall enter into force after being accepted by, for example, two thirds of the Parties, the "tacit acceptance" procedure provides that an amendment shall enter into force at a particular time unless before that date, objections to the amendment are received from a specified number of Parties. In the case of the 1974 SOLAS Convention, an amendment to most of the Annexes (which constitute the technical parts of the Convention) is `deemed to have been accepted at the end of two years from the date on which it is communicated to Contracting Governments...' unless the amendment is objected to by more than one third of Contracting Governments, or Contracting Governments owning not less than 50 per cent of the world's gross merchant tonnage. This period may be varied by the Maritime Safety Committee with a minimum limit of one year. As was expected the "tacit acceptance" procedure has greatly speeded up the amendment process. Amendments enter into force within 18 to 24 months, generally Compared to this, none of the amendments adopted to the 1960 SOLAS Convention between 1966 and 1973 received sufficient acceptances to satisfy the requirements for entry into force.

Enforcement

The enforcement of IMO conventions depends upon the Governments of Member Parties. Contracting Governments enforce the provisions of IMO conventions as far as their own ships are concerned and also set the penalties for infringements, where these are applicable. They may also have certain limited powers in respect of the ships of other Governments. In some conventions, certificates are required to be carried on board ship to show that they have been inspected and have met the required standards. These certificates are normally accepted as proof by authorities from other States that the vessel concerned has reached the required standard, but in some cases further action can be taken.

The 1974 SOLAS Convention, for example, states that "the officer carrying out the control shall take such steps as will ensure that the ship shall not sail until it can proceed to sea without danger to the passengers or the crew".This can be done if "there are clear grounds for believing that the condition of the ship and its equipment does not correspond substantially with the particulars of that certificate". An inspection of this nature would, of course, take place within the jurisdiction of the port State. But when an offence occurs in international waters the responsibility for imposing a penalty rests with the flag State. Should an offence occur within the jurisdiction of another State, however, that State can either cause proceedings to be taken in accordance with its own law or give details of the

offence to the flag State so that the latter can take appropriate action. Under the terms of the 1969 Convention Relating to Intervention on the High Seas, Contracting States are empowered to act against ships of other countries which have been involved in an accident or have been damaged on the high seas if there is a grave risk of oil pollution occurring as a result. The way in which these powers may be used are very carefully defined, and in most conventions the flag State is primarily responsible for enforcing conventions as far as its own ships and their personnel are concerned.

The Organization Itself has no Powers to Enforce Conventions

However, IMO has been given the authority to vet the training, examination and certification procedures of Contracting Parties to the International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW), 1978. This was one of the most important changes made in the 1995 amendments to the Convention which entered into force on 1 February 1997. Governments have to provide relevant information to IMO's Maritime Safety Committee which will judge whether or not the country concerned meets the requirements of the Convention.

Relationship between Conventions and Interpretation

Some subjects are covered by more than one Treaty. The question then arises which one prevails. The Vienna Convention on the Law of Treaties provides in Article 30 for rules regarding the relationship between successive treaties relating to the same subject-matter. Answers to questions regarding the interpretation of Treaties can be found in Articles 31, 32 and 33 of the Vienna Convention on the Law of Treaties. A Treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose. When a Treaty has been authenticated in two or more languages, the text is equally authoritative in each language, unless the treaty provides or the parties agree that, in case of divergence, a particular text shall prevail.

Uniform Law and Conflict of Law Rules

A substantive part of maritime law has been made uniform in international Treaties. However, not every State is Party to all Conventions and the existing Conventions do not always cover all questions regarding a specific subject. In those cases conflict of law rules are necessary to decide which national law applies. These conflicts of law rules can either be found in a Treaty or, in most cases, in national law.

IMO Conventions

The majority of conventions adopted under the auspices of IMO or for which the Organization is otherwise responsible, fall into three main categories. The first group is concerned with maritime safety; the second with the prevention of marine pollution; and the third with liability and compensation, especially in relation to damage caused by pollution. Outside these major groupings are a number of other conventions dealing with facilitation, tonnage measurement, unlawful acts against shipping and salvage, etc.

List of IMO Conventions

Most important IMO Conventions

- International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended
- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997(MARPOL)
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) as amended, including the 1995 and 2010 Manila Amendments
- Other conventions relating to maritime safety and security and ship/port interface
- Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972
- Convention on Facilitation of International Maritime Traffic (FAL), 1965
- International Convention on Load Lines (LL), 1966
- International Convention on Maritime Search and Rescue (SAR), 1979
- Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation (SUA), 1988, and Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms located on the Continental Shelf (and the 2005 Protocols) International Convention for Safe Containers (CSC), 1972
- Convention on the International Maritime Satellite Organization (IMSO C), 1976
- The Torremolinos International Convention for the Safety of Fishing Vessels (SFV), 1977
- International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F), 1995

- Special Trade Passenger Ships Agreement (STP), 1971 and Protocol on Space Requirements for Special Trade Passenger Ships, 1973
- Other conventions relating to prevention of marine pollution
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION), 1969
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LC), 1972 (and the 1996 London Protocol)
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990
- Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol)
- International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS), 2001
- International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004
- The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009

Conventions Covering Liability and Compensation

- International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969
- 1992 Protocol to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND 1992)
- Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material (NUCLEAR), 1971
- Athens Convention relating to the Carriage of Passengers and their Luggage by Sea (PAL), 1974 Convention on Limitation of Liability for Maritime Claims (LLMC), 1976
- International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS), 1996 (and its 2010 Protocol)
- International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 Nairobi International Convention on the Removal of Wrecks, 2007

Other Subjects

- International Convention on Tonnage Measurement of Ships (TONNAGE), 1969
- International Convention on Salvage (SALVAGE), 1989

Titles of Conventions

- Convention on the International Maritime Organization (IMO CONVENTION) (in force);
- 1991 amendments to the IMO Convention which were adopted by the Assembly of the Organization on 7 November 1991 by resolution A.724(17) (IMO AMENDS -91) (in force);
- 1993 amendments to the IMO Convention which were adopted by the Assembly of the Organization on 4 November 1993 by resolution A.735(18) (IMO AMENDS-93) (in force);
- International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS 1974) (in force);
- Protocol of 1978 relating to the International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS PROT 1978) (in force);
- Protocol of 1988 relating to the International Convention for the Safety of Life at Sea, 1974 (SOLAS PROT 1988) (in force);
- Agreement concerning specific stability requirements for ro-ro passenger ships undertaking regular scheduled international voyages between or to or from designated ports in North West Europe and the Baltic Sea (SOLAS AGR 1996) (in force);
- Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREG 1972) (in force);
- Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, as amended (MARPOL 73/78);
- Annex III to MARPOL 73/78 (in force);
- Annex IV to MARPOL 73/78 (in force);
- Annex V to MARPOL 73/78 (in force);
- Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended (MARPOL PROT 1997) (in force);

- Convention on Facilitation of International Maritime Traffic, 1965, as amended (FAL 1965) (in force);
- International Convention on Load Lines, 1966 (LL 1966) (in force);
- Protocol of 1988 relating to the International Convention on Load Lines, 1966 (LL PROT 1988) (in force);
- International Convention on Tonnage Measurement of Ships, 1969 (TONNAGE 1969) (in force);
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969 (INTERVENTION 1969) (in force);
- Protocol relating to Intervention on the High Seas in Cases of Pollution by Substances other than Oil, 1973, as amended (INTERVENTION PROT 1973) (in force);
- International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC 1969) (in force);
- Protocol to the International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC PROT 1976) (in force);
- Protocol of 1992 to amend the International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC PROT 1992) (in force);
- Special Trade Passenger Ships Agreement, 1971 (STP 1971) (in force);
- Protocol on Space Requirements for Special Trade Passenger Ships, 1973 (SPACE STP 1973) (in force);
- Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material, 1971 (NUCLEAR 1971) (in force);
- Protocol of 1992 to amend the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (FUND PROT 1992) (in force);
- Protocol of 2000 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1972 (FUND PROT 2000) (in force);
- Protocol of 2003 to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (FUND PROT 2003) (in force);

- International Convention for Safe Containers, 1972, as amended (CSC 1972) (in force);
- Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974 (PAL 1974) (in force);
- Protocol to the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974 (PAL PROT 1976) (in force);
- Protocol of 1990 to amend the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974 (PAL PROT 1990) (not yet in force);
- Protocol of 2002 to the Athens Convention relating to the Carriage of Passengers and their Luggage by Sea, 1974 (PAL PROT 2002) (not yet in force);
- Convention on the International Mobile Satellite Organization, as amended (IMSO C 1976) (in force);
- Convention on Limitation of Liability for Maritime Claims, 1976 (LLMC 1976) (in force);
- Protocol of 1996 to amend the Convention on Limitation of Liability for Maritime Claims, 1976 (LLMC PROT 1996) (in force);
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW 1978) (in force);
- 2010 Manila amendments to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 and the Seafarers' Training, Certification and Watchkeeping (STCW) Code (2010 MANILA STCW AMDTS);
- International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F 1995) (not yet in force);
- International Convention on Maritime Search and Rescue, 1979 (SAR 1979) (in force);
- Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (SUA) (in force);
- Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf (SUA PROT) (in force);
- Protocol of 2005 to the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (SUA 2005) (in force 28 July 2010);

- Protocol of 2005 to the Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf (SUA PROT 2005) (in force 28 July 2010);
- The International COSPASSARSAT Programme Agreement (COSSAR 1988) (in force);
- International Convention on Salvage, 1989 (SALVAGE 1989) (in force);
- International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990, as amended (OPRC 1990) (in force);
- Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS 2000) (in force);
- Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977 (SFV PROT 1993) (not yet in force);
- International Convention on Liability and Compensation for Damage in connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996 (HNS 1996) (not yet in force);
- Protocol of 2010 to amend the International Convention on Liability and Compensation for Damage in connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996 (HNS PROT 2010) (opens for signature from 1 November 2010 to 31 October 2011);
- International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001 (BUNKERS 2001) (in force);
- International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001 (AFS 2001) (in force);
- International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM 2004) (not yet in force);
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, as amended (LC 1972) (in force);
- 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (LC PROT 1996) (in force);
- Nairobi International Convention on the Removal of Wrecks, 2007 (NAIROBI WRC 2007) (not yet in force); and

- Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009 (HONG KONG SRC 2009) (not yet in force).

Instruments which are in force or applicable but which are no longer fully operational because they have been superseded by later instruments

- International Convention for the Safety of Life at Sea, 1948 (SOLAS 1948)
- International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as amended (OILPOL 1954)
- International Convention for the Safety of Life at Sea, 1960 (SOLAS 1960)
- International Regulations for Preventing Collisions at Sea, 1960 (COLREG 1960)
- Protocol to the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971 (FUND PROT 1976)

Instruments not yet in force and not intended to enter into force

- International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 1973)
- Torremolinos International Convention for the Safety of Fishing Vessels, 1977 (SFV 1977)
- Protocol of 1984 to amend the International Convention on Civil Liability for Oil Pollution Damage, 1969 (CLC PROT 1984)

Self Assessment Questions

1. Define International Maritime Organization.
2. Bring out the organizational structure of IMO
3. List out the title of conventions on shipping?
4. What are the main roles played by IMO in developing international standards?
5. Bring out the role played by IMO in sea environment protection.

CASE STUDY

DENSO has to meet tough quality standards. First, it needs to satisfy Toyota's rigid quality standards by using TQM and by striving for zero defects. Second, it complies

with both ISO 9001 and QS 9000 certification so that it can qualify as a supplier for auto manufacturers in Europe and North America. QS 9000 is a quality standard specifically for the auto Industry. Chrysler, Ford and General Motors established QS 9000 in 1994 to provide requirements and measurable (events that can be quantified and specific measures that can be used to describe those events) for the automotive industry. QS9000 is derived from ISO 9001, but it is more specific to the auto industry. Under the guidelines, suppliers must adapt their quality systems to meet the expectations of the automakers. QS9000 is required for any supplier of Ford, General Motors and Daimler Chrysler.

(a) How has DENSO's relationship with Toyota affected its international strategy?

(b) What types of quality programs has DENSO adopted and how do you think they will affect DENSO's future as a global supplier?

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UNIT - IV

Air Transport

Unit Structure

Lesson 4.1 - Air Transportation
Lesson 4.2 - Air Freight Structure & operations

Lesson 4.1 - Air Transportation

Learning Objectives

After reading this chapter you should be able to

- Define Air Transportation
- Understand the Characteristics of Air Transportation
- List different Factors considered in Selecting Air Transportation
- To Know the Advantages and Disadvantages of Air Transportation

Introduction

Air cargo is growing in popularity as the medium of choice when it comes to shipping time sensitive goods, belongings, documents and information from one place to another. Air cargo refers to the act of using an air carrier as the transport vessel for shipment purposes.

The benefits of air cargo are the speed and convenience of using such a service. Air cargo can get your shipment to its overseas destination within a day in many instances and

it has become an integral and important part of the global logistics network chain. There are now plenty of airlines that offer air cargo services. Generally these airlines are dedicated to air cargo transport, however, a number of commercial passenger airlines have separate divisions offering cargo services. Some of these air cargo companies are in actuality feeder services for larger express delivery companies and merely work under contracts for the larger businesses.

Using air cargo can be a tricky question in many people's minds. After all there are a number of different shipping options when it comes to cargo. The determining factors for many businesses and individuals are time sensitivity, the fragility of the goods involved and the budget. While other forms of shipping are slow and cost efficient, air cargo is more expensive given its expediency.

If you are looking to accompany the goods as they are shipped, that is also possible as some air cargo planes are specially equipped to carry passengers as well as merchandise.

When looking to send a shipment overseas using air cargo, most businesses and individuals turn to freight forwarders to help them deal with the logistics and paperwork involved with the process.

Although you can always book the entire shipment by yourself, there are so many intricacies involved in the shipment of goods that it is best to retain the services of either a freight forwarder or arrange to have your goods sent by a big name delivery service.

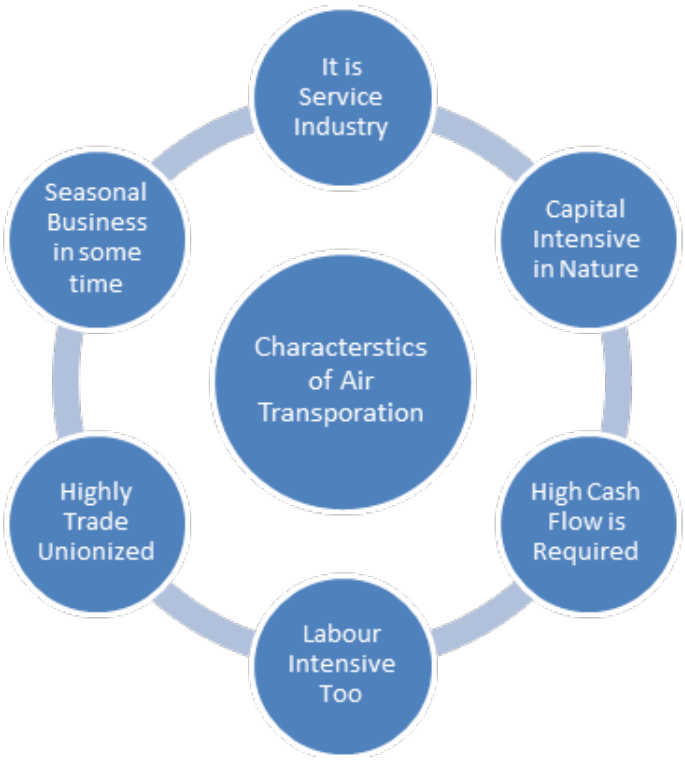
Among the things that you will have to arrange on your own if you wish to do so is insurance, customs forms, duty and payment. You will also have to arrange for the person receiving the goods at the final destination to receive them – either by picking it up themselves or paying for a third party to deliver it.

Many larger air cargo companies will offer freight forwarding services for smaller shipments and deliveries, but if you are planning on shipping large quantities of goods or you are planning the removal of an entire house then you are better of hiring a freight forwarder to help you with the logistics planning of your shipment.

Finding an air cargo supplier is not too complicated these days to a slew of highly visible and well-established businesses that offer air freight services. Continue reading to get a better understanding of how air cargo shipments work, how they can best be used to suit your needs and what you can expect from such services.

Characteristics of the Airline Transportation

The following are the main characteristics of Air Transportation



Characteristics of the Airline Transportation

Service Industry

Because of all of the equipment and facilities involved in air transportation, it is easy to lose sight of the fact that this is, fundamentally, a service industry. Airlines perform a service for their customers - transporting them and their belongings (or their products, in the case of cargo customers) from one point to another for an agreed price. In that sense, the airline business is similar to other service businesses like banks, insurance companies or even barbershops. There is no physical product given in return for the money paid by the customer, nor inventory created and stored for sale at some later date.

Capital Intensive

Unlike many service businesses, airlines need more than storefronts and telephones to get started. They need an enormous range of expensive equipment and facilities, from airplanes to flight simulators to maintenance hangars. As a result, the airline industry is a capital-intensive business, requiring large sums of money to operate effectively. Most equipment is financed through loans or the issuance of stock. Increasingly, airlines are also leasing equipment, including equipment they owned previously but sold to someone

else and leased back. Whatever arrangements an airline chooses to pursue, its capital needs require consistent profitability.

High Cash Flow

Because airlines own large fleets of expensive aircraft which depreciate in value over time, they typically generate a substantial positive cash flow (profits plus depreciation). Most airlines use their cash flow to repay debt or acquire new aircraft. When profits and cash flow decline, an airline's ability to repay debt and acquire new aircraft is jeopardized.

Labor Intensive

Airlines also are labor intensive. Each major airline employs a virtual army of pilots, flight attendants, mechanics, baggage handlers, reservation agents, gate agents, security personnel, cooks, cleaners, managers, accountants, lawyers, etc. Computers have enabled airlines to automate many tasks, but there is no changing the fact that they are a service business, where customers require personal attention. More than one-third of the revenue generated each day by the airlines goes to pay its workforce. Labor costs per employee are among the highest of any industry.

Highly Unionized

In part because of its long history as a regulated industry, the airline industry is highly unionized.

Thin Profit Margins

The bottom line result of all of this is thin profit margins, even in the best of times. Airlines, through the years, have earned a net profit between one and two percent, compared to an average of above five percent for U.S. industry as a whole.

Seasonal

The airline business historically has been very seasonal. The summer months were extremely busy, as many people took vacations at that time of the year. Winter, on the other hand, was slower, with the exception of the holidays. The result of such peaks and valleys in travel patterns was that airline revenues also rose and fell significantly through the course of the year. This pattern continues today, although it is less pronounced than in the past. The growth in the demand for air transportation since deregulation has substantially increased.

Factors considered while Selecting Air Cargo Transport

Choosing among the hundreds, if not thousands, of air cargo service providers currently offering their global services can be a confusing task. Each service offers something unique to entice clients to choose their company. When trying to decide between a subdivision of a large airline or an express delivery service, there are a few questions that will help you determine which supplier to choose. The following are the factors one should consider while selecting the air cargo transportation.

Factors considered in Selecting Air Cargo Transport

Firstly will the company act as your freight forwarder? Although it might seem like an obvious question, not all cargo companies will take care of your paperwork and the logistics of your shipment. Instead, they might subcontract the work to other delivery services or leave you to deal with all of the logistics yourself – if such is the case, then you better look for another company to deal with as you could end up with a huge mess on your hands if you file one even document incorrectly.

Secondly, you should find out if the company offers bulk discounts and/or other promotions or deals so that you are paying the best price possible for the shipment of your goods.

Next, find out what kind of insurance is offered by the air cargo supplier. If they tell you that you must arrange your own insurance then you might want to reconsider

your options. A good air cargo provider will have their own insurance coverage – at the very minimum they will offer insurance for the time that they take possession of your belongings up until they goods are landed and off-loaded. At that point if you have a freight forwarder, they can always arrange for supplementary insurance to cover the shortfall.

Security is another big factor when it comes to air cargo. You have to ascertain that the airline companies that you have shortlisted have tight security around the aircraft and can assure you that your shipment will not disappear on route to its final destination. The security of your air cargo provider is especially important in today's volatile global climate.

The quality and customer service offered by an air cargo provider will also speak volumes about their handling of shipments. If you receive polite, courteous treatment, then you can expect your goods to be handle respectfully as well. Plus, you can count on rapid service if your shipment happens to get lost or damaged along the way.

Lastly, a good air cargo supplier will have staff who know the business, know their pricing, know the ins-and-outs of air transport and who can offer you real solutions to your air cargo needs. While talking to the agent handling your file, you should feel confident that they are giving you're the best solution to your air cargo needs, otherwise you should take your business to a provider with whom you have more confidence.

Air cargo is the best way to get time-sensitive shipments to their destination on time. As long as you ask the proper questions and take the time to do a little bit of research on the company you eventually choose, you can rest assured that your goods will get to where they are going on time and in their original condition.

Advantages of Air Transportation

The transportation charges by air are generally higher than by surface or sea. However, such charges are only part of the long list of all the cost of distribution. Goods will be forwarded by air if this means offers the customers the following advantages.

Speed and Frequency

The most important factors that a customer will consider are no doubt speed and frequency, especially if he has some urgent shipments. The delivery to certain areas may take several weeks to arrive by ocean and land freight. Time sensitive or perishable goods, such as fresh seafood and flowers, often rely on the air freight.

Suitable Types of Cargo

The quickest method of sending goods to another country is by air. Apart from limitations on the size of individual consignments and on the carriage of dangerous goods (refer IEA for information), there are no goods which cannot be carried by air. There are, however, certain types of cargo which are particularly well suited to air freight. These include fresh fruit and flowers, livestock, perishable goods, fashion goods and newspapers; as well as small, high-value items such as diamonds, jewellery and electronic components. Emergency medical supplies or spare parts for a machine breakdown are also ideal for air freight, as time is the prime consideration.

Better Security

Air freight has a tighter control over its cargo, thus it has better security that reduces the cargo exposure to theft, pilferage and damage. With other modes of transport than the safety of air transport higher in 2001, the world's airlines carried 18 million flight sorties, only 11 cases of a serious accident; the risk rate is about 1/3000000. Air transport management system will also be more perfect low rate of damage of goods, if the use of air cargo transported in containers, then the more secure.

Reliability

Owing to the high cost of the airport facilities, these comes a need for maximum utility. As such, the arrival and departure times of flights are highly reliable.

Network of Destination and Interline Facilities

Nowadays, there are many airlines that have a large network which covers almost the entire world. Airlines also accept each other's air waybills and that means the shipper can send his shipment to nearly every destination using the same air waybill.

Warehousing

Using air cargo, the customer has less need for local warehousing and expensive stocks.

Financial Constraints

As air cargo is much more faster than surface or sea transportation, it can free the capital which would otherwise be tied up in the long transit time for the goods to arrive at the buyer's premises before the payment can be realized by the seller.

Insurance Coverage

More and more users of air cargo services are going for a package of services. In view of this, the carriers have always provided for insurance coverage on their own where one may declare a "value for carriage" and then a premium is levied by the carrier in case of eventualities occurring while the goods are in transit to the final destination. Nowadays, many air cargo agents have also undertaken the role of an insurance agent and provides coverage for marine and liabilities risks.

Insurance Premium

The insurance premium are lower for air cargo as the transportation time for air cargo is comparatively short. Further, the airports are considered high security areas, thus the lower premiums.

Less Packing Required

As the security conditions at airports are good, aircrafts requires delicate handling during loading and unloading, less packing materials are required when goods are transported by air. This brings about savings for the user in terms of costs as well as time to provide services for the additional packing.

Door to Door Delivery

As there are many landlocked countries, such as Nepal, Laos, Switzerland, Austria, Mali and many more in the former Soviet sub-continent, air transportation has provided new access into these countries for international trade. The air cargo agents also provide door delivery service for those customers that may require them.

Arranging Customs Clearance

With the Just in Time (JIT) concept, some users prefer that the goods move from the shipper's door to the consignee's door under one contract, thus the need for the air cargo agents to arrange Customs clearance of cargo.

Advice of Packing Problems

Air carriage may accept less packing material to save the weight (as air cargo is charged by weight in Kilogram) it is however not wise to over reduce the packaging material

as well as some goods may have to transit more than one airport prior to the arrival at the final destination. Most air cargo agents are even trained to provide advice on the packaging for Dangerous Goods (DG) of all classes.

The Ground Conditions are not Affected Inland Regions

Air Transport to use the sky of this natural channel, without geographical restrictions. For the harsh conditions on the ground inaccessible inland areas are very appropriate and beneficial to the export of local resources, promote local economic development. Air transport so that local and world connected to external wide area, and air transport compared to road transport and rail transport occupation of land is limited. The geographical small area development of external transport is undoubtedly a very appropriate.

Documentations

This is a large and important field where the IATA cargo agent backed by the worldwide organization can render most valuable services in knowing the required documentation in each country. The air cargo industry is moving speedily into the world of paperless documentations through the use of Electronic Data Interchange (EDI) of which the air carriers are amongst the most advance compare to carriers of other modes of transportation.

Save Packaging, Insurance, Interest and Other Expenses

Air freight requires less packaging because of faster delivery and better security. Less packaging may mean saving freight, packaging and labor costs. Air freight is faster and has better security than the land and ocean freight, thus the insurance premium rate generally is lower. Also, because air cargo transport safety, accuracy, cargo damage, cargo less poor, and insurance costs are lower. Compared with other modes of transport, air transport packaging simple, packaging cost reduction. All these are the hidden costs of the decline in business, revenue increases.

Shorter Collection Time in an Open Account Trade Arrangement

The time to collect payment in an open account trade arrangement most often runs from the time the customer receives the goods and not from the time the goods are dispatched. Air delivery is fast, thus the collection time is shorter.

Disadvantages of Air Transportation

- Airfreight transport is very expensive because of high capital investment and maintenance costs involved.
- As aircrafts have limited cargo capacity, bulky goods cannot be sent.
- Usually airports are located outside the cities, so road transport has to be arranged to carry the goods to and from the airport. This results in higher costs and wastage of time.
- Bad weather may restrict flights.

Self Assessment Questions

1. Bring out the significance of air cargo transportation
2. Describe the advantages and disadvantages of air cargo transportation
3. What are the factors considered while selecting air cargo transportation for the shipment of goods?
4. Critically examine the special features of air cargo transportation

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Lesson 4.2 - Air Freight Structure and Operation

Learning Objectives

After reading this chapter you should be able to

- Define Air Freight
- Understand the Freight Rate for Air Transportation
- List different Factors that affect Air Freight Rates
- Understand the Total Cost Approach in Air Transportation
- To Know the Carrier Consignee Liabilities in Air Cargo Transportation
- To Know Air Cargo Handling methods
- To Understand the Information Support System in Air Cargo Transportation

Introduction

The first consignment of cargo carried by air was transported between London and Paris in 1924. Since this first cargo flight the carrying capacity and efficiency of aircraft has developed and increased dramatically. The movement of cargo by air is a highly specialized business, which is, in many respects, very different from moving cargo by sea or overland. It is subject to restrictions that arise from the nature of the aircraft itself. Two major changes have taken place over recent years in many manufacturing industries and it is due to these changes that air freight is becoming a popular choice for transporting products internationally. The reason for this increase is

- The growing volume of technology-based products, these products are becoming lighter and smaller while their value is becoming greater justifying the expense of air freight
- The second is the rapidly increasing trend in many industries towards "just-in-time" (JIT) inventories JIT is most effective where the goods in question can be moved by air. The benefits of JIT ordering are a)A substantial reduction in capital requirements b) A substantial reduction in stockholding

Use of Air Transportation

While air freight cannot normally be recommended for the shorter journeys, nevertheless emergency shipments should be sent by air. This is the only way of ensuring a same day delivery to, for example, Paris or Frankfurt. Special arrangements to handle such a shipment will have to be made with the freight forwarder. Another factor influencing the choice between air freight and road is the distance from the consignor and consignee to the relevant airports. If there are no regular flights from the nearest airport, this factor would militate in favour of road. If, however, one of the airports with direct connections is easily accessible, air freight might be the preferred choice. Some of the European airlines now market a door-to-door delivery service which means that they collect the consignment, arrange all the documentation, dispatch the goods and deliver them to the customer overseas in accordance with a pre-determined timetable. The airlines also offer a daily on-board courier facility linking Ireland with most other commercial centers in Europe. The courier accompanies the goods, and this assists in speeding up customs formalities. However, this service is very expensive. Factors that affect the air freight rate change all the time. This happens because a great number of factors affect the cost of services and resources used in air freight. Learning about the different factors affecting the air freight rate could help to foretell changes in the price of service. This means that you will be able to maximize the costs of transportation.

Freight Rates for Air Cargo Transportation

Air cargo has to be specially prepared or modified to enable the cargo to fit into the aircraft. The upper and lower deck configuration, mass and dimension limitations, pressure and air temperature variations and the floor load factors must be taken into consideration by the shipper of the cargo. All aircraft have limited carrying capacity, and loading beyond the safety limit in terms of the mass and volume of the cargo is not permitted. The actual limitations vary from one type of aircraft to another. To facilitate quicker and safer loading, airline personnel group all air cargo into larger units on pallets or containers. These are collectively known as Unit Load Devices or ULD's. ULD's play an important part in the loading and discharging of aircraft. The floor of an aircraft is equipped with roller beds for ease of movement of the ULD's. Since the introduction of Unit Load Devices into the air freight industry, cargo is discharged quicker and theft and damages have been greatly reduced. Airlines that are members of the International Air Transport Association (IATA) are bound by their membership to comply with tariffs issued by IATA. However since 11th September 2002, airfreight rates are now extremely negotiable. Airfreight rates cover transportation from the airport of loading to the airport of discharge.

Determination of Air Freight Rates

Freight rates are normally expressed on a per kilo basis, and for overseas destinations, the rates are expressed in the currency of the exporting country. The factors determining air freight rates are

- The type of commodity;
- The distance;
- Frequency of services;
- Cargo capacity available on the route.

There are four basic types of air freight rates

(a) Specific Commodity Rate (SCR). An SCR relates to a specific commodity, and is a lower rate than the published standard rate. SCRs are less widely used than ten years ago, but are some times available. They exist when there is an established flow of traffic between two countries. For example, there are SCRs for newspapers and magazines leaving Ireland.

(b) Commodity Classification Rate (CLASS). A CLASS rate applies to a group of commodities, for example, live animals or human remains.

(c) General Cargo Rate (GCR). A General Cargo Rate applies to all commodities not covered by an SCR or a CLASS rate.

(d) Unit Load Device (ULD). This rate applies for complete units - either aircraft pallets or containers. Usually a forwarder books a complete ULD, and brings together freight from several customers for the same destination into the same container.

All the regulations about air freight rates appear in a series of three books - The Air Cargo Tariff (known commonly as TACT). The three books are

- TACT Rules Book;
- TACT Rates Book North America;
- TACT Rates Book Worldwide.

The rates books are updated every two months. They are also available on disc. For further information,contact IATA Netherlands Data Publications, PO Box 491170 AA Badhoevedorp Tel + 31 20 403 7993Fax +31 20 403 7981E-Mail tact.indp@iata.orgWebsite www.iata.org/tact

These Air Freight Rates do not include the following

- Collection of air cargo from the consignor's/exporters premises
- Delivery of cargo from the airport of destination to the consignee's premises
- Storage of cargo before or after loading
- Customs clearance in the country of destination
- Any duties and taxes that may have to be paid
- Insurance

Chargeable/Volumetric Weight

Airline freight rates are based on a "chargeable weight", because the volume or weight that can be loaded into an aircraft is limited. The chargeable weight of a shipment will be either the "actual gross mass" or the "volumetric weight", whichever is the highest. The chargeable weight is calculated as follows 1 metric ton = 6 cubic metres. In order to establish if the cargo will be a weight or volumetric based shipment.

Step 1

Measure the parcel/cargo along the greatest length, width and height of that parcel. For example; 100 cm (L) X 100 cm (W) X 100 cm (H) = 1 000 000 cm3. Next, weigh the parcel; assume it weighs 150kg.

Step 2

Now divide the 1 000 000 cm3 by 6 000 = 166,66 kg. You have now converted the centimeters (cm) into kilograms (kg)

Step 3

Now compare the weight to the volume. If the weight is 150 kg then the airline would base the freight on the higher amount being 166,66 kg

Air Freight Calculations

The airline calculates freight based on weight or volume, which ever yields the greatest amount. Airlines quote freight rates based on the following rate structures

- A basic minimum charge per shipment.

- General cargo rates quoted for per kilogram. This rate applies without reference to the nature or description of the parcel, which is to be freighted.
- Specific commodity rates apply to certain goods of specific descriptions, such as fresh produce. These rates are lower than the general cargo rate, and they provide breakpoints at which the level of the rate reduces further.

Example

0 - 50 Kg @ ₹22.00/per kg

50 - 100 Kg @ ₹ 19.00 per kg

100 - 150 Kg @ ₹ 17.00 per kg

Unit Load Device Charges

These rates are charged per container/ULD without reference to the commodity loaded therein. Calculation of freight rates

Let us assume the following figures

The freight rate is ₹18.00 per kg

The weight of the parcel is 300 kg

The dimensions are 114,6 cm X 120,4cm X 132,5 cm (round the cm's up or down)

Therefore 115 cm X 120 X 133 cm = 1 835 400 divide by 6 000 = 305.9 kg (having converted cm's to kg's now round up the kg's to the next half a kilogram = 306 kg. As the freight rate quoted by the airline is ₹ 18.00 per kg, we calculate the price as follows

306 kg X ₹ 18/kg = ₹ 508.00

The freight rate will not be calculated on the actual mass 300 kg X ₹ 18.00 = ₹ 400.00 as the airline will always use the greater amount either the kg, or volumetric weight.

Air Cargo Consolidation

Consolidation is an economical method of moving cargo by employing a consolidator. The consolidator receives cargo from a number of suppliers/shippers and then combines these cargoes into one consignment by packing the goods into a Unit Load Device. The consolidator then books the Unit Load Device with an airline. The supplier/shipper would have a contract of carriage with the consolidator of the cargo and in turn the airline would

have a contract of carriage with the consolidator. The airline would issue an air waybill to the consolidator when accepting the Unit Load Device and in turn the consolidator would issue the supplier/shipper with a house air waybill.

The Air Way Bill

The air waybill, unlike the ocean bill of lading is not a document of title to the goods described therein, however it does perform several similar functions these are

- It is a receipt for the goods
- It is evidence of the contract of carriage between the exporter and the carrier
- It incorporates full details of the consignor/shipper, the consignee/receiver and the consignment/goods
- It is an invoice showing the full freight amount
- It must be produced, be it in an electronic format, at the airport of discharge for clearing purposes

All copies of the air waybill, together with the commercial invoice, packing list, certificate of origin and any other document which may be necessary for clearing the goods through customs, these documents are carried in the flight captain's bag.

Air Transport Forwarders

If direct airlines are the wholesalers of space, air freight forwarders are the retailers. They are indirect air carriers. Forwarders function as consolidators of smaller shipments tendered to the airlines in volume lots under the forwarder's name as shipper. The difference between the volume or contract rate offered by the airline to the forwarder and the forwarder's own tariff rate to the shipper is the forwarder's gross yield on the shipment. From that yield must come all the Forwarder's handling, administrative, and sales costs. Forwarders offers specialized services for certain markets.

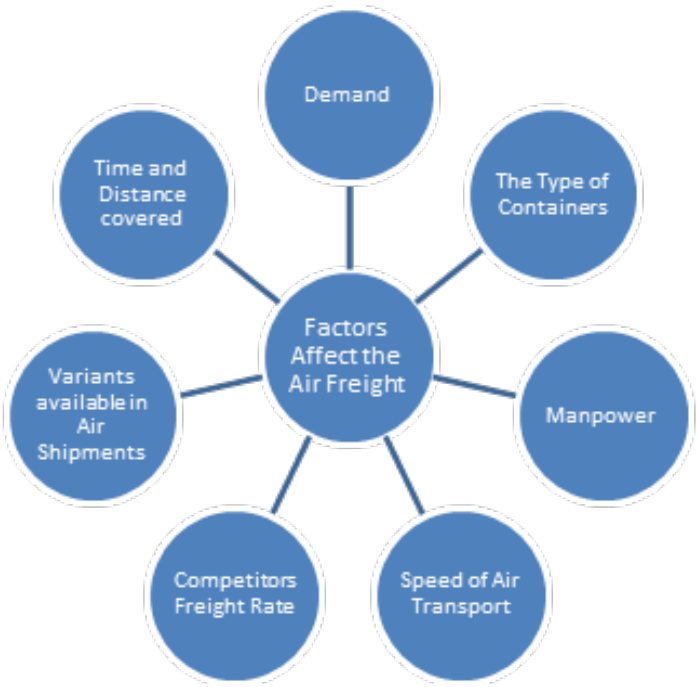
Air Freight Consolidation

Freight forwarders also organize consolidation services to most destinations. The air freight forwarder brings together goods from several different companies, loads them onto one pallet or into a container, and delivers the unit to the airline. The airline normally charges for the complete unit whereas the forwarder invoices each shipper for a proportion of the total cost plus a margin. Consolidation rates, shortened frequently to consol. rates,

are cheaper than when goods are consigned. Consolidation rates, shortened frequently to consol. rates, are cheaper than when goods are consigned via a forwarder directly to an airline. There are daily consolidations to nearly all the major trading centers around the world. Some forwarders offer consolidation services which use other European airlines, so goods are first taken to the Continent before on-forwarding overseas. The large freight forwarders, with offices around the country, operate a comprehensive range of export services about which they will be pleased to pass on information. There are also specialized freight forwarders who might deal specifically in more remote or complicated markets, such as South America. This information can often be obtained by word-of-mouth recommendation or through trade publications. Particularly at Dublin airport, there are freight forwarders established who can assist with all aspects of the shipment booking space, customs formalities, documentation and insurance as well as collection and delivery of the goods. The speed of growth of the market probably means that more and more companies will consign their goods to the air in the years ahead, so it is a method of transport which is well worth allocating the time to investigate.

Factors that Affect Air Freight Rates

There are a great number of other factors, which influence the air freight rates charged by different companies. These basic factors, however, should prove to be enough information in order to help and save certain sum of money. When the shippers of goods study the factors, you would be able to budget your money easier and maximize the return. This means that you can transport more items at lower air freight rates.



Factors that Affect Air Freight Rates

1) Demand

Demand affects the prices of each good. The more consumers want to get a certain service, the higher the price is going to be. This is the main principle of economics. When the demand for specific shipping services rises, the air freight rates rise with it.

2) The Containers

The transportation containers (known as the unit load devices) are engineered to protect the cargo from damages caused by the trip. Various items require different types of containers. If shippers are looking for a specific container to protect their things, it could add a bit more to air freight rate than what they expect. The containers used in an air freight service are usually suitable for different types of cargo. This means that the type of item they transport will influence the air freight prices. If they want to include extra security measures to protect their freight, then the cost of air freight service will be higher. This is often applicable to transporting of livestock, pets or works of art.

3) Manpower

The amount and specialization of people required to ship the items will also influence the air freight rate. This means that the form of service need will change the air freight rate. In some cases if goods to be handled by professionals that will take care of it, then they might need to pay extra money. Manpower also involves different people who will deal with the paperwork of freight. It will take the expertise of more than one expert to make sure that your freight is in good condition.

4) Speed

The factor is second only to demand on its effects on the air freight rate. It is often the case that firms have different air freight rates grounded on the speed by which they can deliver the goods. There are companies which offer faster delivery services for extra charges. There are companies that can deliver goods in 1 day, and the number of companies that can even deliver items within a couple of hours. The speed of delivery is very important characteristic because very often it's the main reason why people choose air freight services.

5. Competitors Rate

Some time due to competition in the air cargo segment the freight rates are differently charged. It all depends upon the number of players in the market, the rate for which the services offered etc., is always taken into consideration

6. Variatns Available in Air Shipment

When a person needs the service of shipping for much lager and much heavier things, he (she) might want to look into the variants covered by the freight shipments.

7. Time and Distance

The next form of air shipping available is the **ground or parcel transportation**. Since items of this type are larger and heavier than in the first 2 forms, the freight of items may take a larger period of time and may move anywhere from 500 miles a day to 700 miles. Most ground shipments weigh around 100 pounds or less and each item don't normally exceed 70 pounds.

8. Services Available

Depending on the available service variants, prices and type of delivery may vary including the duration of travel. The majority of items in this category travels certain expanse through air and may go coast to coast in some days or overnight.

Total Cost Concept in Air Transportation

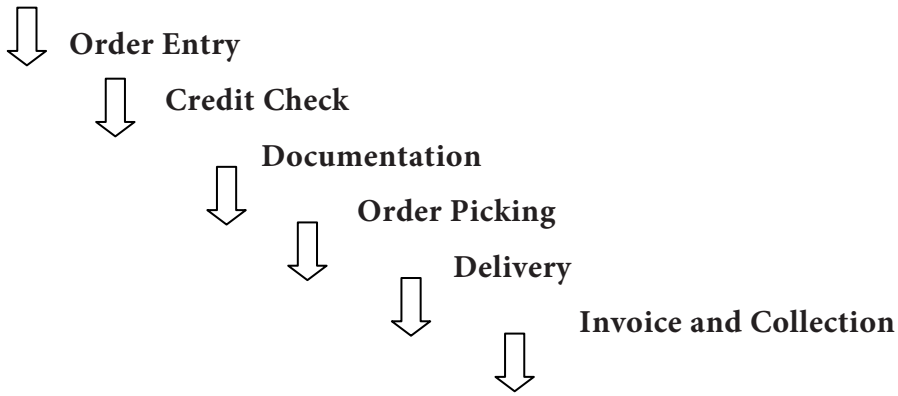
Many problems at the operational level in logistics management arise because all impact of specific decisions, both direct and indirect bare not taken into account thought the corporate system. Too often decision are taken in one area can lead to unforeseen results in other areas. Changes in policy on minimum order value, for example may influence ordering pattern and lead to additional costs. The problems associated with identifying the total system impact of distribution policies are immense. By its very nature the logistics cuts across traditional company organizational functions with cost impacts on most of the functions.

Conventional accounting system do not usually assist in the identification of these companywide impacts, frequently absorbing logistics related costs in other cost elements. The cost for processing orders for example in an amalgam of specific cost incurred in different functional areas of business which generally prove extremely difficult to bring together.

The following figure outlines the various costs elements involved in the complete order processing cycle, each of these elements having fixed and variable cost component which will lead to different total cost per order.

Total Cost Concept in Air Transportation

Order Placement and Communication



Carrier Consignee Liabilities

Air Carriers

The liability air carriers with respect to loss, damage and delay of air freight has been deregulated. The air carriers are subject to liability regimes based on the air common carrier liability regime, American Airlines v. Wolens, 513 U.S. 219 (1995). Thus in domestic air carriage, air carriers are liable for loss and damage if caused by the negligence of the carrier or its agents occurring while the shipment is in their care, unless they can prove the loss or damage resulted from one of the five common law exceptions or that the carrier was free from negligence. The terms of liability, including limitation, are presented by the carrier to the shipper in the air waybill, and are contractually accepted when shipment is made on that air waybill. Internationally, the Warsaw Convention of 1929, applicable to international air commerce, became effective for the United States in 1934. The Hague Protocol was adopted in 1955 as an Amendment to the Warsaw Convention, but it has not been ratified by the United States. Most other nations have adopted this revision of the Warsaw Convention. Under the Warsaw Convention, the air carrier is liable when loss or damage is caused by negligence. Here, the burden is on the carrier to prove that it was not negligent, tending to create a de facto strict liability regime. Liability is limited to $20 per kilogram. When the limitation is less than full value, for an additional charge, air carriers will provide the opportunity for the shipper to declare higher value. Furthermore, the liability limit is not applicable if the damage is caused by the willful misconduct of the carrier, or if the air waybill fails to contain essential information. The Departments of State and Transportation, have urged that Congress give its advice and consent to ratification of the 1975 Montreal Protocol No. 4, dealing with air cargo transport liability. The Protocol does not affect the current $20 per kilogram limit of liability, but would make a major

contribution in air cargo facilitation by electronic data transmission. It would eliminate several archaic requirements under the Warsaw Convention, particularly the requirement that a copy of the air waybill accompany the goods, and the requirement for completion of the air waybill before the carrier accepts the goods.

Cargo Handling

Once you have chosen your air cargo service provider and are ready to ship your goods to where they need to go you are nearly done with your shipping requirements. However, before signing off on any documents, be sure to go through the following checklist of reminders to make sure that nothing is forgotten and that your goods get to where they are going.

Is your shipment packed carefully?

Make sure that your shipment is carefully packed. If your carrier gave you packing guidelines to follow, make sure to follow them properly. If your shipment is delicate or fragile make sure to take extra care and to use top-quality cushioning materials.

Are all of your boxes clearly labeled?

Label all of your boxes clearly with your name, address and phone number and the name, address and phone number of the final destination. Also add if it is box number one of ten or three of seven – in other words number your boxes and indicate how many there should be in the set. You can also write down the name of your air cargo carrier and their phone number in case a box or case gets lost. Use a black permanent marker to write and protect the writing with either tape or a plastic cover so that it does not get erased.

Is your air waybill correct?

Check your air waybill to make sure that the details of the shipment are correct, including the weight, ultimate recipient information and custom details.

Proper number of boxes?

When the courier or agent comes to pick up your shipment make sure that they take the correct number of boxes; if you are dropping the boxes off at the carrier's office, then also count to ensure that you have not forgotten anything.

Verify tracking number

Get your shipment's tracking number so that you can check its progress as it makes its way from point A to point B.

Do you have your waybill? Keep your waybill copy in a safe place in case of mishap

Shipping goods using the services of an air cargo supplier is generally straightforward and easy to do. Once you have chosen the right company for your needs, you can rest assured that your goods will reach their destination. If you need to find a good air cargo company, One Entry can easily help with your search.

By filling out our one convenient form, we will then send you up to five free quotes from air cargo suppliers. Once you have received the quotes you can choose from the offers you get.

Handling Departure of Air Cargoes

While handling departure of air cargo the following things are performed

1. Submission of export documents with customs for processing
2. One copy of GR-I form along with a copy each of other documents are detached and kept by the customs
3. Computerized list is obtained
4. Documents are entered in the computer
5. Check-list is obtained from the computer after verifying the adequacy of the documents and the shipping bill number obtained
6. Goods are taken into Airports Authority of India terminal for examination
7. After the Examination Export Order is obtained from the customs
8. Location is allotted and the goods are handled over to the Airports Authority of India
9. Documents are handed over to the shipper
10. The export promotion copy of the shipping bill is obtained from the customs and sent to the shipper within a week of the date of shipment

Arrivals of Air Cargo for Clearance

The air cargoes arrival clearance is done in the following manners

1. Consignment arrives and intimation about its arrival is given by airliner/break bulk agent by issuing cargo arrival notice.
2. Importer obtains the delivery order from airline
3. Submitting a bill of entry on the electronic data interchange from Customs House Agent
4. Finalized bill of entry printout is received for payment of duty
5. After payment of duty, the location of cargo is given by Airports Authority of India and goods produced for examination by the customs inspector
6. Goods are examined by the customs. Out of charge is given both on EDI as well as on the hard copy
7. The Airports Authority of India's dues challan-cum-gate pass are obtained and payment made
8. The Gate pass is presented for delivery of goods obtained

Information Support System

While the demand for safe, reliable, and efficient aviation services is growing, the nation's ability to successfully manage air traffic is under severe strain given the status of current capabilities and resources. NextGen represents the long-term transformation of the National Airspace System (NAS), including our national system of airports, using 21st century technologies to ensure future safety, capacity and environmental needs are met. The transformation to NextGen will be realized through careful integration and collaboration of advanced concepts by private industry and Federal partner agencies, as well as investments in research and development, emerging technologies, and enhanced operations. NextGen focuses on leveraging innovative technologies, such as satellite-based navigation and surveillance, to create a NAS scalable enough to support a two- to three-fold increase in air vehicle operations, integrating security and national defense requirements, and ensuring that aviation remains an economically viable industry in the decades ahead. Furthermore, the vision involves a system that is flexible enough to manage variations in demand, capacity and aircraft fleet types, but also allows all communities to participate in the global marketplace, provides services tailored to individual customer needs and capabilities, and seamlessly integrates civil and military operations.

Provide Collaborative Capacity Management

Collaborative capacity management provides the ability to dynamically balance anticipated/forecasted demand and utilization, and allocate NAS resources through proactive and collaborative strategic planning with enterprise stakeholders and automation (e.g., decision support systems, etc.), using airspace and airport design requirements, standards and configuration conditions with the consideration of other air transportation system resources.

Provide Collaborative Flow Contingency Management

Flow contingency management provides optimal, synchronized, and safe strategic flow initiatives and ensures the efficient management of major flows of traffic while minimizing the impact on other operations in collaboration with enterprise stakeholders, through real or near real time resolutions informed by probabilistic decision making within established capacity management plans.

Provide Efficient Trajectory Management

Efficient trajectory management provides the ability to assign trajectories that minimize the frequency and complexity of aircraft conflicts within the flow through the negotiation and adjustment of individual aircraft trajectories and/or sequences when required by resource constraints.

Provide Flexible Separation Management

Flexible separation management establishes and maintains safe separation minimums from other aircraft, vehicles, protected airspace, terrain, weather, etc., by predicting conflicts and identifying resolutions (e.g., course, speed, altitude, etc.) in real time, and accommodates increasing capacity demands and traffic levels by using automation (e.g., decision support systems, etc.) while also introducing reduced separation standards.

Provide Integrated NextGen Information

Integrated NextGen information provides authorized aviation stakeholders timely, accurate, and actionable information (e.g., weather, surveillance, aeronautical information, operational and planning information, position, navigation and timing information, etc.) to shorten decision cycles and improve situational awareness using a net-centric environment managed American Institute of Aeronautics and Astronautics through enterprise services that meets the information exchange requirements of the NextGen stakeholder community.

Provide Air Transportation Security

Air transportation security provides the ability to identify, prioritize, and assess national defense and homeland security situations and appropriately adjust resources to facilitate the defeat of an evolving threat to critical NAS infrastructure and key resources using a layered, adaptive, and collaborative approach (e.g., appropriate tactics, techniques, procedures, etc.) without unduly limiting mobility, making unwarranted intrusions on civil liberties, and minimizing impacts to airline operations or aviation economics.

Provide Improved Environmental Performance

Improved environmental performance ensures environmental management considerations, including flexibility in identifying, preventing, and proactively addressing environmental impacts, are fully integrated throughout the air transportation system decision making process, through increased collaboration and improved tools, technologies, operational policies, procedures, and practices that are consistent and compatible with national and international regulations.

Provide Improved Safety Operations

Improved safety operations ensures safety considerations are fully integrated throughout the air transportation system through increased collaboration and information sharing, improved automation (e.g., decision support systems, etc.), prognostic safety risk analysis, and enhanced safety promotion and assurance techniques that are consistent and compatible with national and international regulations, standards and procedures.

Provide Flexible Airport Facility and Ramp Operations

Flexible airport facility and ramp operations provides the ability to reallocate or reconfigure the airport facility and ramp assets to maintain acceptable levels of service that will accommodate increasing passenger and cargo demand levels, or changes in operational requirements, through infrastructure development, predictive analyses, and improvements to technology (e.g., automation and decision support systems, etc.) and procedures. Many of the NextGen capabilities emphasize system flexibility, scalability, robustness and resiliency. They also stress the importance of distributed decision making, international coordination, increased user focus, and the provisioning of information to users while reducing the need for government intervention and resource control.

Air Cargo Terminology

ATA Actual Time of Arrival, or Airport-To-Airport, or Air Transport Association of America.

ATD Actual Time of Departure.

Air WayBill Basically a receipt that describes what contents of the shipment, where it is heading, from where it left, the name and address of the shipper, the name and address of the recipient, the weight, any pertinent details of the shipment, insurance information and tracking number. In essence it is a bill of lading and a contract between the shipper and the cargo company.

Aircraft Container A large storage device used for aircraft cargo.

Allotment The word used by forwarders/shippers that refers to the space the airlines reserve for their use.

CAF (Currency Adjustment Factor) International carriers can sometimes add a freight surcharge in order to compensate for foreign currency fluctuations. Generally the surcharge is a percentage of the freight.

Carnet A specific document issued by customs that will allow the holder to carry or send goods to a certain foreign countries temporarily for display, demonstration or other such purposes without having to pay duties or posting bonds.

Clean Bill of Lading A receipt that states the carrier received the goods in decent condition without damages or irregularities.

Combi Aircraft An airplane that can carry both passengers and cargo.

Customs The agency responsible for collecting the duties charged on a goods entering a country.

Customs Broker A person or business holding the proper license to clear shipments through customs.

DDP Deliver Duty Paid.

DDU Deliver Duty Unpaid.

Dangerous Goods A classification given by IATA describing the characteristics and nature of certain goods. The designation is for the safety of the carrier.

Dimensional Weight The size of the shipment calculated by total square feet by 6000. Cost is determined either on dimensional weight or the actual weight of the consignment – whichever is higher.

ETA Estimated Time of Arrival.

ETD Estimated Time of Departure

FCL or CY Full Container Load, also known as CY. CY is the abbreviation of Container Yard.

Free On Board (FOB) Term used to mean that the seller is responsible for the cost of goods until the point that it is loaded onto the aircraft's loading deck.

Freight Forwarder A company specialized in exporting shipments. The forwarder takes care of all the details of getting the goods from point A to point B.

Gateway Refers to a major airport.

HAWB House Air waybill issued by carrying airlines' agent, normally freight forwarder.

IATA International Air Transport Association (IATA) promotes safety, standardization in forms (baggage checks, tickets, weigh bills), and aids in establishing international airfares.

IATA Designator Two-character Airline identification assigned by IATA in accordance with provisions of Resolution 762. It is for use in reservations, timetables, tickets, tariffs as well as air waybill.

Insurance Certificate Document given to consignee to prove that insurance has been provided in case of loss or damage to the cargo while in transit.

LCL Less than Container Load, consolidated container load.

LD3 Lower deck type 3 container. This is the most commonly used container in passenger aircraft.

NVD No Value Declared.

POD Proof Of Delivery.

Project Cargo Refers to cargo that is not standard size, height, weight, etc.

Shipping Mark The letters, numbers or other symbols placed on the outside of cargo to facilitate identification.

Self Assessment Questions

1. What is the relationship between airlines' carriage of passengers and Carriage of freight?
2. What are some other large air freighters?
3. Why is air cargo containers used?
4. What are international airline "alliances?"
5. When is "charter" cargo flight used?
6. What are air express "integrators?"
7. What are air freight forwarders? What functions to they perform?
8. What are the Air Carrier consignee's liabilities? Explain
9. Illustrate the freight structure and practices followed in the Air Caro industry.
10. Bring out the advantages of air transportation
11. Critically examine the carrier consignee liabilities in air cargo transportation
12. How Information Support System helps air cargo transportation?
13. What are the factors that affect air freight rates in air cargo transportation?
14. Define Total Cost Approach in Air Transportation.

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UNIT – V

Inventory Control and Warehousing

Unit Structure

Lesson 5.1 - Inventory Control
Lesson 5.2 - Inventory Management
Lesson 5.3 - Warehousing
Lesson 5.4 - Total Cost Approach to Logistics

Lesson 5.1 - Inventory Control

Learning Objectives

After reading this chapter you should be able to

- To Understand the Reasons for Inventory Control
- To know Major Components of Inventory
- To describe Economic Ordering Quantity(EOQ)
- To describe ABC Analysis
- To Know Major Approaches to Inventory Control
- To understand the reasons for Controlling Inventory

Introduction

Control of inventory, which typically represents 45% to 90% of all expenses for business, is needed to ensure that the business has the right goods on hand to avoid stock-outs, to prevent shrinkage (spoilage/theft), and to provide proper accounting. Many businesses have too much of their limited resource, capital, tied up in their major asset,

inventory. Worse, they may have their capital tied up in the wrong kind of inventory. Inventory may be old, worn out, shopworn, obsolete, or the wrong sizes or colors, or there may be an imbalance among different product lines that reduces the customer appeal of the total operation.

The ideal inventory and proper merchandise turnover will vary from one market to another. Average industry figures serve as a guide for comparison. Too large an inventory may not be justified because the turnover does not warrant investment. On the other hand, because products are not available to meet demand, too small an inventory may minimize sales and profits as customers go somewhere else to buy what they want where it is immediately available. Minimum inventories based on reordering time need to become important aspects of buying activity. Carrying costs, material purchases, and storage costs are all expensive. However, stock-outs are expensive also. All of those costs can be minimized by efficient inventory policies.

Inventory Control

Inventory control involves the procurement, care and disposition of materials. There are three kinds of inventory that are of concern to managers

- **Raw materials** the materials, parts and components that have been delivered to an organization, but are not yet being used
- **In-process or semi-finished goods** materials that have started, but not yet finished their journey through the production process.
- **Finished goods** goods that have finished the process and are waiting to be shipped out to customers
- **Spare parts** for machinery, equipment and so on
- **Consumables** such as oil, fuel, paper and so on

If a manager effectively controls these three types of inventory, capital can be released that may be tied up in unnecessary inventory, production control can be improved and can protect against obsolescence, deterioration and/or theft,

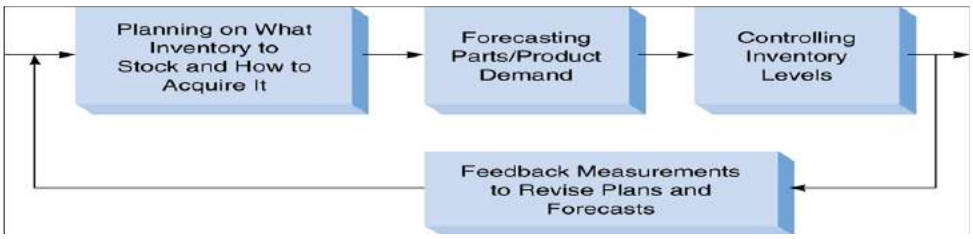
The reasons for inventory control are

- Helps balance the stock as to value, size, color, style, and price line in proportion to demand or sales trends.
- Help plan the winners as well as move slow sellers

- Helps secure the best rate of stock turnover for each item.
- Helps reduce expenses and markdowns.
- Helps maintain a business reputation for always having new, fresh merchandise in wanted sizes and colors.

Inventory Planning and Control

For maintaining the right balance between high and low inventory to minimize cost



Major Components of Inventory

The objectives behind proper inventory management are to ensure the availability of materials at the right time, in the right place, at the right cost. The various elements of inventory costs are

1. Cost of items
2. Cost of ordering
3. Cost of carrying or holding inventory
4. Cost of stock outs
5. Cost of safety stock (extra inventory held to help avoid stock outs)

Economic Order Quantity (EOQ)

The EOQ was developed early last century and has remained a dominant theme for the control of independent demand system. It remains the best way of tackling a wide range of inventory problems. It is flexible and easy to use, and gives good guidelines for a wide range of circumstances.

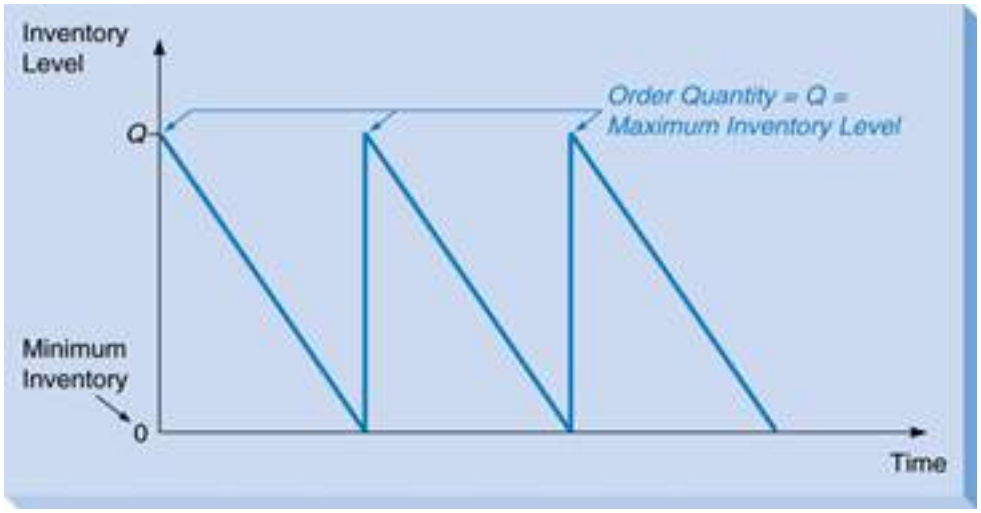
Determining How Much to Order

- One of the oldest and most well known inventory control techniques
- Easy to use
- Based on a number of assumptions

Assumptions of the EOQ Model

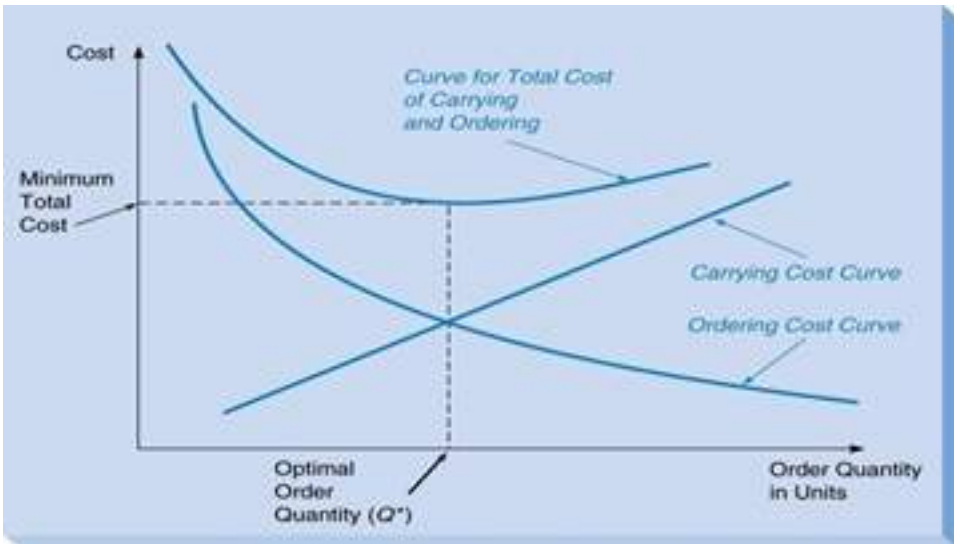
1. Demand is known and constant
2. Lead time is known and constant
3. Receipt of inventory is instantaneous
4. Quantity discounts are not available
5. Variable costs are limited to ordering cost and carrying (or holding) cost
6. If orders are placed at the right time, stock outs can be avoided

Inventory Level over Time Based on EOQ Assumptions



Minimizing EOQ Model Costs

EOQ Model Total Cost



At optimal order quantity (Q*)

Carrying cost = Ordering cost

- Only ordering and carrying costs need to be minimized (all other costs are assumed constant)
- As Q (order quantity) increases
  - Carry cost increases
  - Ordering cost decreases (since the number of orders per year decreases)

Finding the Optimal Order Quantity

Parameters

Q^* = Optimal order quantity (the EOQ)
D = Annual demand
C_o = Ordering cost per order
C_h = Carrying (or holding) cost per unit per yr
P = Purchase cost per unit

Two Methods for Carrying Cost

Carry cost (C_h) can be expressed either

1. As a fixed cost, such as
   C_h = \$0.50 per unit per year
2. As a percentage of the item's purchase cost (P)
   $C_h = I \times P$
   I = a percentage of the purchase cost

EOQ Total Cost

Total ordering cost = $(D/Q) \times C_o$
Total carrying cost = $(Q/2) \times C_h$
Total purchase cost = $P \times D$
= Total cost

Note

- (Q/2) is the average inventory level
- Purchase cost does not depend on Q

Finding Q*

Recall that at the optimal order quantity (Q*)

Carry cost = Ordering cost

$(D/Q^*) \times C_o = (Q^*/2) \times C_h$

Rearranging to solve for Q*

$$Q^* = \sqrt{(2DC_o/C_h)}$$

EOQ Example Sumco Pump Co

Buys pump housing from a manufacturer and sells to retailers

D = 1000 pumps annually

C_o = $10 per order

C_h = $0.50 per pump per year

P = $5

Q* = ?

Using Excel Modules for Inventory

- Worksheet for inventory models in Excel Modules are color coded
  - Input cells are yellow
  - Output cells are green
- Select "Inventory Models" from the Excel Modules menu, then select "EOQ"

Go to file 12-2.xls

Average Inventory Value

After Q* is found we can calculate the average value of inventory on hand

Average inventory value = P x (Q*/2)

Calculating Ordering and Carrying Costs for a Given Q

- Sometimes C_o and C_h are difficult to estimate

- We can use the EOQ formula to calculate the value of C_o or C_h that would make a given Q optimal

  $C_o = Q^2 \times C_h/(2D)$

  $C_h = 2DC_o/Q^2$

Sensitivity of the EOQ Formula

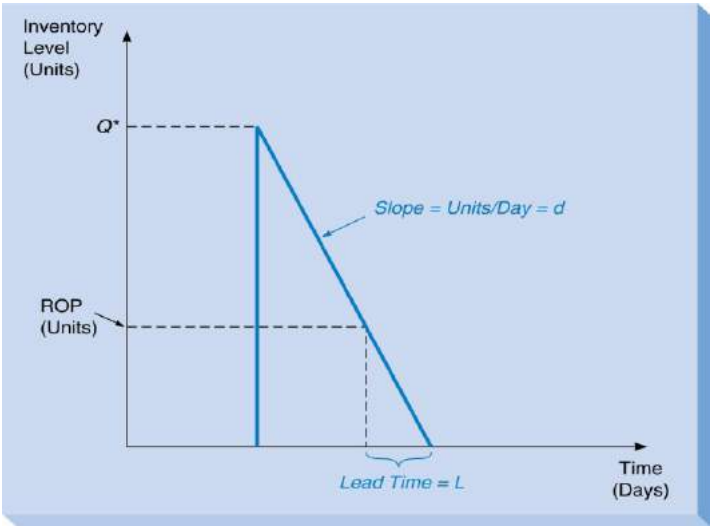
- The EOQ formula assumes all inputs are know with certainty
- In reality these values are often estimates
- Determining the effect of input value changes on Q* is called **sensitivity analysis**

Sensitivity Analysis for Sumco

- Suppose C_o = \$15 (instead of \$10), which is a 50% increase
- Assume all other values are unchanged
- The new Q* = 245 (instead of 200), which is a 22.5% increase
- This shows the nonlinear nature of the formula

Reorder Point Determining When to Order

- After Q* is determined, the second decision is when to order
- Orders must usually be placed *before* inventory reaches 0 due to order lead time
- Lead time is the time from placing the order until it is received
- The reorder point (ROP) depends on the lead time (L)



Reorder Point (ROP)

Sumco Example Revisited

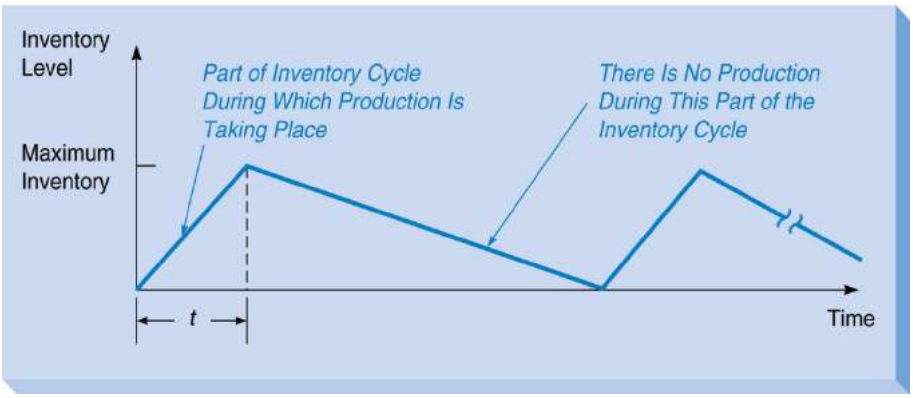
- Assume lead time, L = 3 business days
- Assume 250 business days per year
- Then daily demand,
  d = 1000 pumps/250 days = 4 pumps per day
  ROP = (4 pumps per day) x (3 days)
  = 12 pumps

Go to file 12-3.xls

Economic Production Quantity Determining How Much to Produce

- The EOQ model assumes inventory arrives instantaneously
- In many cases inventory arrives gradually
- The **economic production quantity** (EPQ) model assumes inventory is being produced at a rate of p units per day
- There is a **setup cost** each time production begins

Inventory Control With Production



Determining Lot Size or EPQ
Parameters

Q^*	=	Optimal production quantity (or EPQ)
C_s	=	Setup cost
D	=	annual demand
d	=	daily demand rate
p	=	daily production rate

Average Inventory Level

- We will need the average inventory level for finding carrying cost
- Average inventory level is ½ the maximum

  Max inventory = Q x (1- d/p)

  Ave inventory = ½ Q x (1- d/p)

Total Cost

Setup cost = (D/Q) x C_s

Carrying cost = [½ Q x (1- d/p)] x C_h

Production cost = P x D

= Total cost

As in the EOQ model

- The production cost does not depend on Q

The function is nonlinear

Finding Q*

- As in the EOQ model, at the optimal quantity Q* we should have

  Setup cost = Carrying cost

  (D/Q*) x C_s = [½ Q* x (1- d/p)] x C_h

Rearranging to solve for Q*

$$Q^* = \sqrt{(2DC_s)/[C_h(1-d/p)]}$$

EPQ for Brown Manufacturing

Produces mini refrigerators (has 167 business days per year)

D = 10,000 units annually

d = 1000 / 167 = ~60 units per day

p = 80 units per day (when producing)

C_h = $0.50 per unit per year

C_s = $100 per setup

P = $5 to produce each unit

Go to file 12-4.xls

Length of the Production Cycle

- The production cycle will last until Q* units have been produced
- Producing at a rate of p units per day means that it will last (Q*/p) days
- For Brown this is

  Q* = 4000 units

  p = 80 units per day

  4000 / 80 = 50 days

Quantity Discount Models

- A **quantity discount** is a reduced unit price based on purchasing a large quantity
- Example discount schedule

TABLE 12.2

Quantity Discount Schedule

DISCOUNT NUMBER	DISCOUNT QUANTITY	DISCOUNT	DISCOUNT COST
1	0 to 999	0%	$5.00
2	1,000 to 1,999	4%	$4.80
3	2,000 and over	5%	$4.75

Four Steps to Analyze Quantity Discount Models

1. Calculate Q* for each discount price
2. If Q* is too small to qualify for that price, adjust Q* upward
3. Calculate total cost for each Q*
4. Select the Q* with the lowest total cost

Brass Department Store Example
Sells toy cars

D = 5000 cars annually

C_o = $49 per order

C_h = $0.20 per car per year

Quantity Discount Schedule

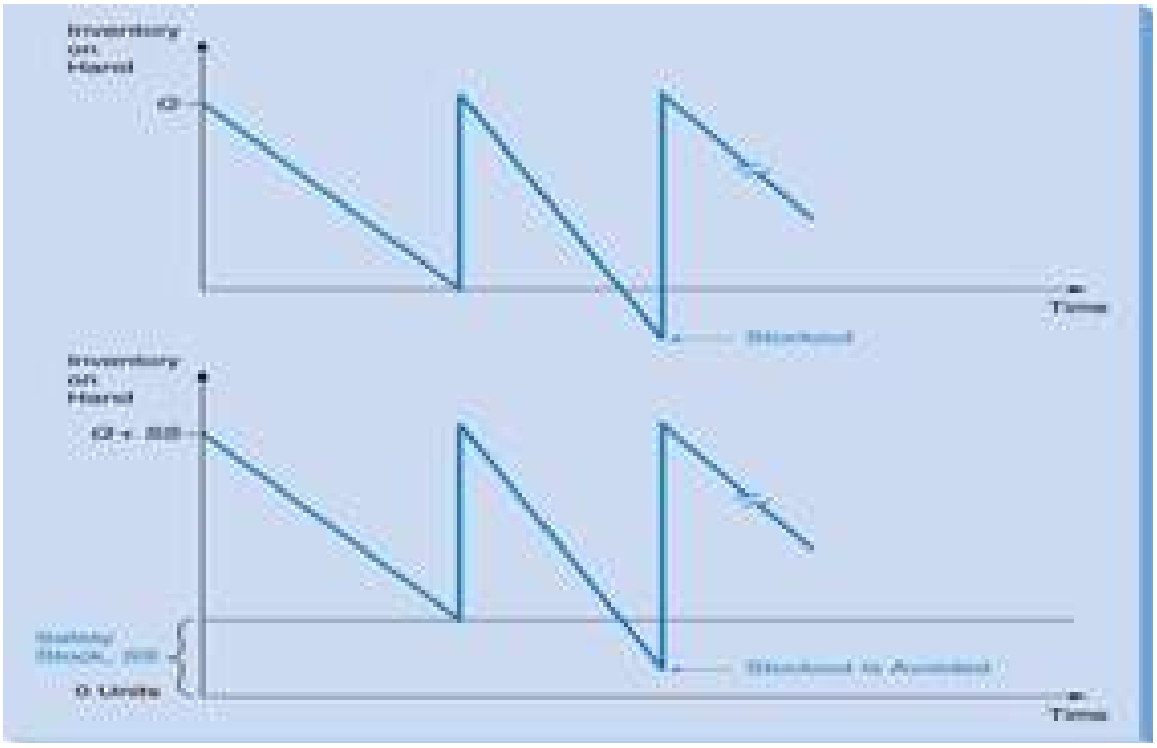
TABLE 12.2

Quantity Discount Schedule

DISCOUNT NUMBER	DISCOUNT QUANTITY	DISCOUNT	DISCOUNT COST
1	0 to 999	0%	$5.00
2	1,000 to 1,999	4%	$4.80
3	2,000 and over	5%	$4.75

Use of Safety Stock

- Safety stock (SS) is extra inventory held to help prevent stock outs
- Frequently demand is subject to random variability (uncertainty)
- If demand is unusually high during lead time, a stock out will occur if there is no safety stock



Use of Safety Stock

Determining Safety Stock Level

Need to know

- Probability of demand during lead time (DDLT)
- Cost of a stock out (includes all costs directly or indirectly associated, such as cost of a lost sale and future lost sales)

ABCO Safety Stock Example

- ROP = 50 units (from previous EOQ)
- Place 6 orders per year
- Stock out cost per unit = $40
- C_h = $5 per unit per year
- DDLT has a discrete distribution

TABLE 12.3

Probability of Demand During Lead Time for ABCO, Inc.

NUMBER OF UNITS	PROBABILITY
30	0.2
40	0.2
ROP → 50	0.3
60	0.2
70	0.1
	1.0

Analyzing the Alternatives

- With uncertain DDLT this becomes a "decision making under risk" problem
- Each of the five possible values of DDLT represents a decision alternative for ROP
- Need to determine the economic payoff for each combination of decision alternative (ROP) and outcome (DDLT)

Stock out and Additional Carrying Costs

	Stockout Cost	Additional Carrying Cost
ROP = DDLT	0	0
ROP < DDLT	$40 per unit short per year	0
ROP > DDLT	0	$5 per unit per year

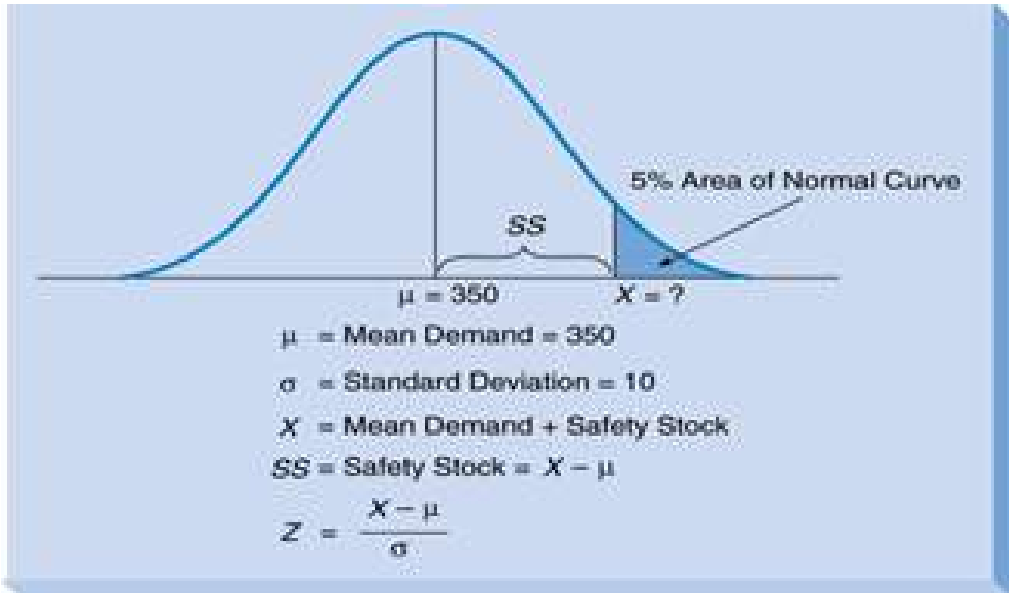
Safety Stock with Unknown Stock out Costs

- Determining stock out costs may be difficult or impossible
- Customer dissatisfaction and possible future lost sales are difficult to estimate
- Can use **service level** instead

  Service level = 1 – probability of a stock out

Hinsdale Co. Example

- DDLT follows a normal distribution
  ($\mu = 350, \sigma = 10$)
- They want a 95% service level (i.e. 5% probability of a stock out)
  SS = ?



Safety Stock and the Normal Distribution

Calculating SS

From the standard Normal Table,

$Z = 1.645 = \frac{X - 350}{10}$ so X= 366.45

and, SS = 16.45 (which could be rounded to17)

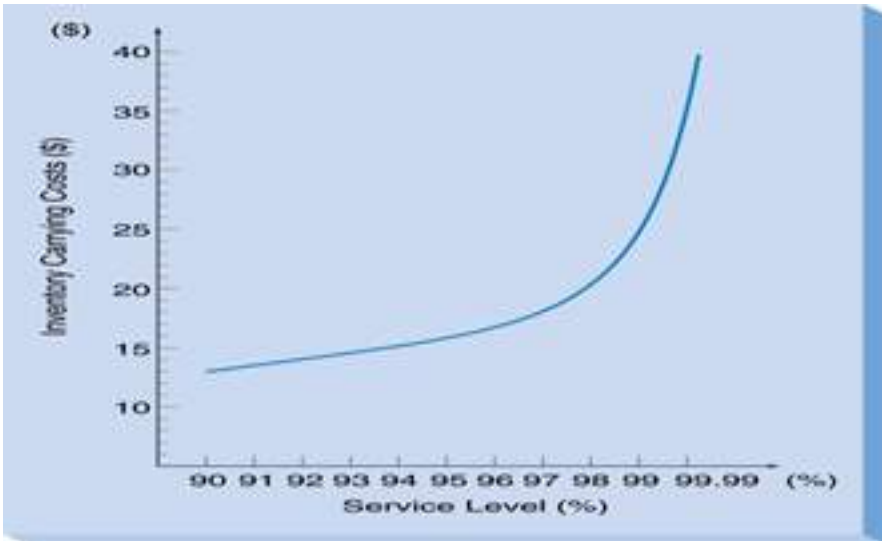
Hinsdale's Carrying Cost

- Assume Hinsdale has a carrying cost of $1 per unit per year
- We can calculate the SS and its carrying cost for various service levels

TABLE 12.4
Cost of Different Service Levels

SERVICE LEVEL	Z VALUE FROM NORMAL CURVE TABLE	SAFETY STOCK (UNITS)	CARRYING COST
90%	1.28	12.8	$12.80
91%	1.34	13.4	$13.40
92%	1.41	14.1	$14.10
93%	1.48	14.8	$14.80
94%	1.55	15.5	$15.50
95%	1.65	16.5	$16.50
96%	1.75	17.5	$17.50
97%	1.88	18.8	$18.80
98%	2.05	20.5	$20.50
99%	2.33	23.3	$23.20
99.99%	3.72	37.2	$37.20

Cost of Different Service Levels



Carrying Cost versus Service Level

ABC Analysis

- Recognizes that some inventory items are more important than others
- A group items are considered critical (often about 70% of dollar value and 10% of items)
- B group items are important but not critical (often about 20% of dollar value and 20% of items)
- C group items are not as important (often about 10% of dollar value and 70% of items)

Silicon Chips Inc. Example

- Maker of super fast DRAM chips
- Has 10 inventory items
- Wants to classify them into A, B, and C groups
- Calculate dollar value of each item and rank items

TABLE 12.6
Inventory Data for Silicon Chips, Inc.

ITEM NUMBER	PART NUMBER	ANNUAL VOLUME (UNITS)	UNIT COST
Item 1	01036	100	$ 8.50
Item 2	01307	1,200	$ 0.42
Item 3	10286	1,000	$ 90.00
Item 4	10500	1,000	$ 12.50
Item 5	10572	250	$ 0.60
Item 6	10867	350	$ 42.86
Item 7	11526	500	$154.00
Item 8	12572	600	$ 14.17
Item 9	12760	1,550	$ 17.00
Item 10	14075	2,000	$ 0.60

Inventory Items for Silicon Chips

Major Approaches in Inventory Control

Three major approaches can be used for inventory control in any type and size of operation. The actual system selected will depend upon the type of operation, the amount of goods.

The Eyeball System

This is the standard inventory control system for the vast majority of small retail and many small manufacturing operations and is very simple in application. The key manager stands in the middle of the store or manufacturing area and looks around. If he or she happens to notice that some items are out of stock, they are reordered. In retailing, the difficulty with the eyeball system is that a particularly good item may be out of stock for sometime before anyone notices. Throughout the time it is out of stock, sales are being lost on it. Similarly, in a small manufacturing operation, low stocks of some particularly critical item may not be noticed until there are none left. Then production suffers until the supply of that part can be replenished. Such unsystematic but simple retailers and manufacturers to their inherent disadvantage.

Reserve Stock (or Brown Bag) System

This approach is much more systematic than the eyeball system. It involves keeping a reserve stock of items aside, often literally in a brown bag placed at the rear of the stock bin or storage area. When the last unit of open inventory is used, the brown bag of reserve stock is opened and the new supplies it contains are placed in the bin as open stock. At this time, a reorder is immediately placed. If the reserve stock quantity has been calculated properly, the new shipment should arrive just as the last of the reserve stock is being used.

In order to calculate the proper reserve stock quantity, it is necessary to know the rate of product usage and the order cycle delivery time. Thus, if the rate of product units sold is 100 units per week and the order cycle delivery time is two weeks, the appropriate reserve stock would consist of 200 units (I00u x 2w). This is fine as long as the two-week cycle holds. If the order cycle is extended, the reserve stock quantities must be increased. When the new order arrives, the reserve stock amount is packaged again and placed at the rear of the storage area. This is a very simple system to operate and one that is highly effective for virtually any type of organization. The variations on the reserve stock system merely involve the management of the reserve stock itself. Larger items may remain in inventory but be cordoned off in some way to indicate that it is the reserve stock and should trigger a reorder.

Perpetual Inventory Systems

Various types of perpetual inventory systems include manual, card-oriented, and computer- operated systems. In computer-operated systems, a programmed instruction referred to commonly as a trigger, automatically transmits an order to the appropriate vendor once supplies fall below a prescribed level. The purpose of each of the three types of perpetual inventory approaches is totally either the unit use or the dollar use (or both) of different items and product lines. This information will serve to help avoid stock-outs and to maintain a constant evaluation of the sales of different product lines to see where the emphasis should be placed for both selling and buying.

Stock Control

A stock control system should keep you aware of the quantity of each kind of merchandise on hand. An effective system will provide you with a guide for what, when, and how much to buy of each style, color, size, price and brand. It will reduce the number of lost sales resulting from being out of stock of merchandise in popular demand. The system will also locate slow selling articles and help indicate changes in customer preferences. The

size of your establishment and the number of people employed are determining factors in devising an effective stock control plan.

With the observation method (the eyeball system), unless the people using it have an unusually sharp sense of quantity and sales patterns, it is difficult to keep a satisfactory check on merchandise depletion. It means that you record shortages of goods or reorders as the need for them occurs to you. Without a better checking system, orders may only be placed at the time of the salesman's regular visit, regardless of when they are actually needed. Although it may be the simplest system, it also can often result in lost sales or production delays. Detachable stubs or tickets placed on merchandise provide a good means of control. The stubs, containing information identifying the articles, are removed at the time the items are sold. The accumulated stubs are then posted regularly to the perpetual inventory system by hand or through the use of an optical scanner.

A checklist, often provided by wholesalers, is another counting tool. The checklist provides space to record the items carried, the selling price, cost price, and minimum quantities to be ordered of each. It also contains a column in which to note whether the stock on hand is sufficient and when to reorder. This is another very simple device that provides the level of information required to make knowledgeable decisions about effective inventory management.

Most smaller operations today, except for the very smallest, are using some form of a perpetual online system to record the movement of inventories into and out of their facilities. In a retail operation, the clerk at the register merely scans the ticket with a reader, and the system shows the current price and removes the item from the inventory control system. A similar process occurs in a manufacturing operation, except that the "sale" is actually a transfer of the inventory from control to production. This is a particularly critical system in a large operation such as a grocery store where they regularly maintain 12,000 plus items. Often a vendor will provide on-site or computerized assistance needed to help their smaller customers maintain a good understanding of their own inventory levels and so keep them in balance

Inventory Control Records

Inventory control records are essential to making buy-and-sell decisions. Some companies control their stock by taking physical inventories at regular intervals, monthly or quarterly. Others use a dollar inventory record that gives a rough idea of what the inventory may be from day to day in terms of dollars. If your stock is made up of thousands of items, as it is for a convenience type store, dollar control may be more practical than physical

control. However, even with this method, an inventory count must be taken periodically to verify the levels of inventory by item.

Perpetual inventory control records are most practical for big-ticket items. With such items it is quite suitable to hand count the starting inventory, maintain a card for each item or group of items, and reduce the item count each time a unit is sold or transferred out of inventory.

Periodic physical counts are taken to verify the accuracy of the inventory card.

Out-of-stock sheets, sometimes called want sheets, notify the buyer that it is time to reorder an item. Experience with the rate of turnover of an item will help indicate the level of inventory at which the unit should be reordered to make sure that the new merchandise arrives before the stock is totally exhausted.

Open-to-buy records help to prevent ordering more than is needed to meet demand or to stay within a budget. These records adjust your order rate to the sales rate. They provide a running account of the dollar amount that may be bought without departing significantly from the pre- established inventory levels. An open-to-buy record is related to the inventory budget. It is the difference between what has been budgeted and what has been spent. Each time a sale is made, open-to-buy is increased (inventory is reduced). Each time merchandise is purchased; open-to-buy is reduced (inventory is increased). The net effect is to help maintain a balance among product lies within the business, and to keep the business from getting overloaded in one particular area.

Purchase order files keep track of what has been ordered and the status or expected receipt date of materials. It is convenient to maintain these files by using a copy of each purchase order that is written. Notations can be added or merchandise needs updated directly on the copy of the purchase order with respect to changes in price or delivery dates.

Supplier files are valuable references on suppliers and can be very helpful in negotiating price, delivery and terms. Extra copies of purchase orders can be used to create these files, organized alphabetically by supplier, and can provide a fast way to determine how much business is done with each vendor. Purchase order copies also serve to document ordering habits and procedures and so may be used to help reveal and/or resolve future potential problems.

Returned goods files provide a continuous record of merchandise that has been returned to suppliers. They should indicate amounts, dates and reasons for the returns. This information is useful in controlling debits, credits and quality Issues.

Price books, maintained in alphabetical order according to supplier, provide a record of purchase prices, selling prices, markdowns, and markups. It is important to keep this record completely up to date in order to be able to access the latest price and profit information on materials purchased for resale.

Controlling Inventory

Controlling inventory does not have to be an onerous or complex proposition. It is a process and thoughtful inventory management. There are no hard and fast rules to abide by, but some extremely useful guidelines to help your thinking about the subject. A five step process has been designed that will help any business bring this potential problem under control to think systematically thorough the process and allow the business to make the most efficient use possible of the resources represented. The final decisions, of course, must be the result of good judgment, and not the product of a mechanical set of formulas.

STEP 1 Inventory Planning

Inventory control requires inventory planning. Inventory refers to more than the goods on hand in the retail operation, service business, or manufacturing facility. It also represents goods that must be in transit for arrival after the goods in the store or plant are sold or used. An ideal inventory control system would arrange for the arrival of new goods at the same moment the last item has been sold or used. The economic order quantity, or base orders, depends upon the amount of cash (or credit) available to invest in inventories, the number of units that qualify for a quantity discount from the manufacturer, and the amount of time goods spend in shipment.

STEP 2 Establish Order Cycles

If demand can be predicted for the product or if demand can be measured on a regular basis, regular ordering quantities can be setup that takes into consideration the most economic relationships among the costs of preparing an order, the aggregate shipping costs, and the economic order cost. When demand is regular, it is possible to program regular ordering levels so that stock-outs will be avoided and costs will be minimized. If it is known that every so many weeks or months a certain quantity of goods will be sold at a steady pace, then replacements should be scheduled to arrive with equal regularity. Time should be spent developing a system tailored to the needs of each business. It is useful to focus on items whose costs justify such control, recognizing that in some cases control efforts may cost more the items worth. At the same time, it is also necessary to include low return items that are critical to the overall sales effort.

If the business experiences seasonal cycles, it is important to recognize the demands that will be placed on suppliers as well as other sellers.

A given firm must recognize that if it begins to run out of product in the middle of a busy season, other sellers are also beginning to run out and are looking for more goods. The problem is compounded in that the producer may have already switched over to next season's production and so is not interested in (or probably even capable of) filling any further orders for the current selling season. Production resources are likely to already be allocated to filling orders for the next selling season. Changes in this momentum would be extremely costly for both the supplier and the customer.

On the other hand, because suppliers have problems with inventory control, just as sellers do, they may be interested in making deals to induce customers to purchase inventories off-season, usually at substantial savings. They want to shift the carrying costs of purchase and storage from the seller to the buyer. Thus, there are seasonal implications to inventory control aswell, both positive and negative. The point is that these seasonable implications must be built into the planning process in order to support an effective inventory management system.

STEP 3 Balance Inventory Levels

Efficient or inefficient management of merchandise inventory by a firm is a major factor between healthy profits and operating at a loss. There are both market-related and budget-related issues that must be dealt with in terms of coming up with an ideal inventory balance

- Is the inventory correct for the market being served?
- Does the inventory have the proper turnover?
- What is the ideal inventory for a typical retailer or wholesaler in this business?

To answer the last question first, the ideal inventory is the inventory that does not lose profitable sales and can still justify the investment in each part of its whole.

An inventory that is not compatible with the firm's market will lose profitable sales. Customers who cannot find the items they desire in one store or from one supplier are forced to go to a competitor. Customer will be especially irritated if the item out of stock is one they would normally expect to find from such a supplier. Repeated experiences of this type will motivate customers to become regular customers of competitors.

STEP 4 Review Stocks

Items sitting on the shelf as obsolete inventory are simply dead capital. Keeping inventory up to date and devoid of obsolete merchandise is another critical aspect of good inventory control. This is particularly important with style merchandise, but it is important with any merchandise that is turning at a lower rate than the average stock turns for that particular business. One of the important principles newer sellers frequently find difficult is the need to mark down merchandise that is not moving well.

Markups are usually highest when a new style first comes out. As the style fades, efficient sellers gradually begin to mark it down to avoid being stuck with large inventories, thus keeping inventory capital working. They will begin to mark down their inventory, take less gross margin, and return the funds to working capital rather than have their investment stand on the shelves as obsolete merchandise. Markdowns are an important part of the working capital cycle. Even though the margins on markdown sales are lower, turning these items into cash allows you to purchase other, more current goods, where you can make the margin you desire.

Keeping an inventory fresh and up to date requires constant attention by any organization, large or small. Style merchandise should be disposed of before the style fades. Fad merchandise must have its inventory levels kept in line with the passing fancy. Obsolete merchandise usually must be sold at less than normal markup or even as loss leaders where it is priced more competitively. Loss leader pricing strategies can also serve to attract more' consumer traffic for the business thus creating opportunities to sell other merchandise as well as well as the obsolete items. Technologically obsolete merchandise should normally be removed from inventory at any cost.

Stock turnover is really the way businesses make money. It is not so much the profit per unit of sale that makes money for the business, but sales on a regular basis over time that eventually results in profitability. The stock turnover rate is the rate at which the average inventory is replaced or turned over, throughout a pre-defined standard operating period, typically one year. It is generally seen as the multiple that sales represent of the average inventory for a given period of time.

Turnover averages are available for virtually any industry or business maintaining inventories and having sales. These figures act as an efficient and effective benchmark with which to compare the business in question, in order to determine its effectiveness relative to its capital investment. Too frequent inventory turns can be as great a potential problem as too few. Too frequent inventory turns may indicate the business is trying to overwork a

limited capital base, and may carry with it the attendant costs of stock-outs and unhappy and lost customers.

Stock turns or turnover, is the number of times the "average" inventory of a given product is sold annually. It is an important concept because it helps to determine what the inventory level should be to achieve or support the sales levels predicted or desired. Inventory turnover is computed by dividing the volume of goods sold by the average inventory. Stock turns or inventory turnover can be calculated by the following equations

If the inventory is recorded at cost, stock turn equals cost of goods sold divided by the average inventory. If the inventory is recorded at sales value, stock turn is equal to sales divided by average inventory. Stock turns four times a year on the average for many businesses. Jewelry stores are slow, with two turns a year, and grocery stores may go up to 45 turns a year.

If the dollar value of a particular inventory compares favorably with the industry average, but the turnover of the inventory is less than the industry average, a further analysis of that inventory is needed. Is it too heavy in some areas? Are there reasons that suggest more inventories are needed in certain categories? Are there conditions peculiar to that particular firm? The point is that all markets are not uniform and circumstances may be found that will justify a variation from average figures.

Stock Turn = Cost of Goods Sold

Average Inventory at Cost

Stock Turn = Sales

Average Inventory at Sales Value

In the accumulation of comparative data for any particular type of firm, a wide variation will be found for most significant statistical comparisons. Averages are just that, and often most firms in the group are somewhat different from that result. Nevertheless, they serve as very useful guides for the adequacy of industry turnover, and for other ratios as well. The important thing for each firm is to know how the firm compares with the averages and to deter- mine whether deviations from the averages are to its benefit or disadvantage.

STEP 5 Follow-up and Control

Periodic reviews of the inventory to detect slow-moving or obsolete stock and to identify fast sellers are essential for proper inventory management. Taking regular and

periodic inventories must be more than just totaling the costs. Any clerk can do the work of recording an inventory. However, it is the responsibility of key management to study the figures and review the items themselves in order to make correct decisions about the disposal, replacement, or discontinuance of different segments of the inventory base.

Just as an airline cannot make money with its airplanes on the ground, a firm cannot earn a profit in the absence of sales of goods. Keeping the inventory attractive to customers is a prime prerequisite for healthy sales. Again, the seller's inventory is usually his largest investment. It will earn profits in direct proportion to the effort and skill applied in its management.

Inventory quantities must be organized and measured carefully. Minimum stocks must be assured to prevent stock-outs or the lack of product. At the same time, they must be balanced against excessive inventory because of carrying costs. In larger retail organizations and in many manufacturing operations, purchasing has evolved as a distinct new and separate phase of management to achieve the dual objective of higher turnover and lower investment. If this type of strategy is to be utilized, however, extremely careful attention and constant review must be built into the management system in order to avoid getting caught short by unexpected changes in the larger business environment. Caution and periodic review of reorder points and quantities are a must. Individual market size of some products can change suddenly and corrections should be made.

Self Assessment Questions

1. Define inventory management and its objectives
2. What are the different types of inventories?
3. Explain the different costs involved in Inventory Management
4. Explain the symptoms of poor inventory management and how to improve it?
5. Explain inventory control and need of it.
6. Bring out the role of inventory management in international marketing

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Lesson 5.2 - Inventory Management

Learning Objectives

After reading this chapter you should be able to

- To Know the objectives of inventory management
- Understand why organizations hold stocks
- Analyze the costs of holding costs
- To find out the role of Inventory Manager
- To know activities of successful inventory management
- To understand the Types of inventory
- Describe symptoms of Poor Inventory Management
- To know Inventory Management in a Global Market

Introduction

"Inventory" to many business owners is one of the more visible and tangible aspects of doing business. Raw materials, goods in process and finished goods all represent various forms of inventory. Each type represents money tied up until the inventory leaves the company as purchased products. Likewise, merchandise stocks in a retail store contribute to profits only when their sale puts money into the cash register. In a literal sense, inventory refers to stocks of anything necessary to do business. These stocks represent a large portion of the business investment and must be well managed in order to maximize profits. In fact, many small businesses cannot absorb the types of losses arising from poor inventory management. Unless inventories are controlled, they are unreliable, inefficient and costly.

Objectives of Inventory Management

- Keeps a good list of items including inventory, packages, and services to make it easier for users creating orders and proposals.
- Make items inactive that are no longer used.

- Keep accurate inventory counts.
- Prepare parts required for orders (service, install, and itemized invoices).
- Maximize inventory "turns" while still providing good response to customer service.
- Establish minimum level inventory levels and maintain these levels.
- Keep Purchase Orders (PO's) flowing so that PO's are sent to vendors and tracked as received in SME.
- Manage Just in Time (JIT) inventory so parts are ordered as needed, especially for parts that become obsolete quickly such as computer parts.
- Monitor approved Proposals so you are aware of upcoming orders.
- Manage customer or vendor returns.
- Manage vendor and subcontractor lists.

Reasons for Holding Stocks

Improve Customer Service

Operating system may not be designed to respond to customer requests for product or services in an instantaneous manner. Inventories provide a level of product or service availability, which, when located in the proximity of the customer, can meet high customer expectations for product availability. The availability of these inventories to customers can not only maintain sales, but they can also increase them.

Reduce Costs

Holding inventories may encourage economies of production by allowing larger, longer, and more level production runs. Production output can be decoupled from the variation in demand requirements when inventories exist to act as buffers between the two. Holding inventories fosters economies in purchasing and transportation. A purchasing department may buy in quantities beyond the firm's immediate needs in order to realize price-quantity discounts.

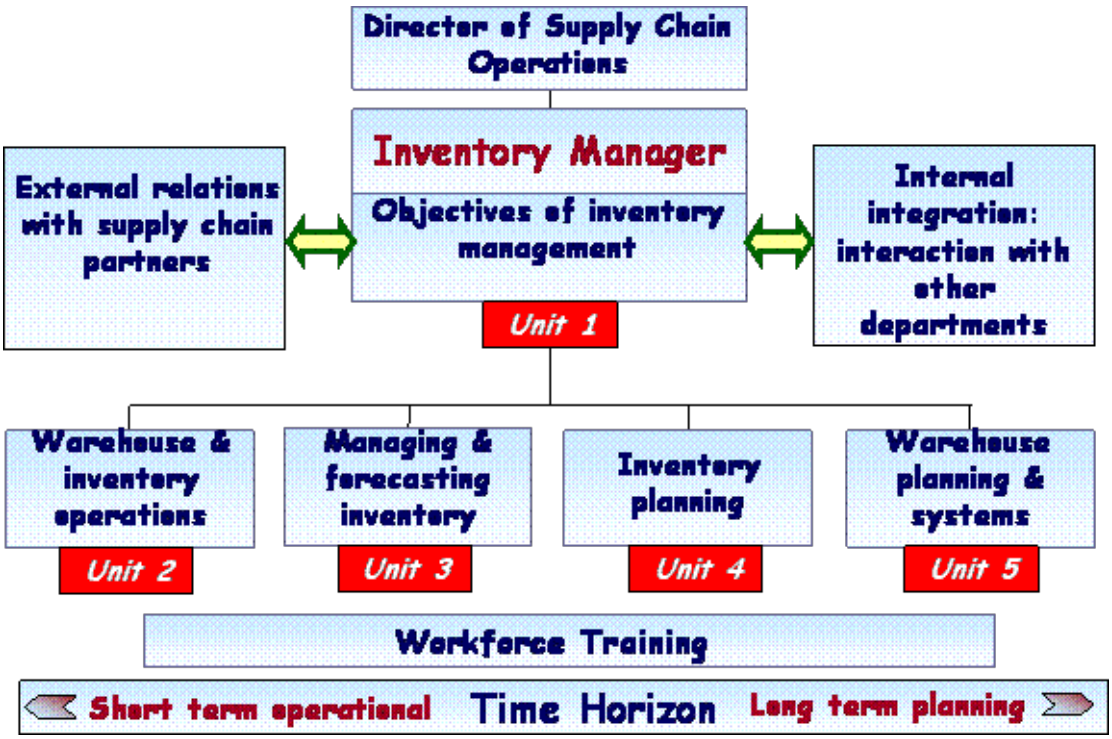
Arguments against Inventories

- Being overstocked is much more defensible from criticism than being short of supplies. The major portion of inventory-carrying costs is of an opportunity cost nature and, therefore, goes unidentified in normal accounting reports. To the extent that inventory levels has been too high for the reasonable support of operations,

- Inventory is considered wasteful. They absorb capital that might otherwise be put to better use, such as to improve productivity or competitiveness. In additions, they do not contribute any direct value to the firm's products, although they do store value
- The stock can mask quality problems. When quality problems occur, reducing existing inventories to protect the capital investment is often a first consideration. Correcting quality problems can be slow.
- Using inventories promotes an insular attitude about the management of the supply channels as a whole. With inventories, it is often possible to isolate on stage of the channel from another. The opportunities arising from integrated decision making that considers the entire channel are not encouraged. Without inventories, it is difficult to avoid planning and coordinating across several echelons of the channel at one time.

The Role of Inventory Manager

- Optimizing inventory levels
- Reducing holding costs and parts variety
- Reaching or surpassing international quality and traceability standards
- Maximizing service levels and inventory turnover while minimizing error rates



The Role of Inventory Manager

Successful Inventory Management

Successful inventory management involves balancing the costs of inventory with the benefits of inventory. Many small business owners fail to appreciate fully the true costs of carrying inventory, which include not only direct costs of storage, insurance and taxes, but also the cost of money tied up in inventory. This fine line between keeping too much inventory and not enough is not the manager's only concern. Others include

- Maintaining a wide assortment of stock — but not spreading the rapidly moving ones too thin;
- Increasing inventory turnover — but not sacrificing the service level;
- Keeping stock low — but not sacrificing service or performance.
- Obtaining lower prices by making volume purchases — but not ending up with slow-moving inventory; and
- Having an adequate inventory on hand — but not getting caught with obsolete items.

The degree of success in addressing these concerns is easier to gauge for some than for others. For example, computing the inventory turnover ratio is a simple measure of managerial performance.

This value gives a rough guideline by which managers can set goals and evaluate performance, but it must be realized that the turnover rate varies with the function of inventory, the type of business and how the ratio is calculated (whether on sales or cost of goods sold). Average inventory turnover ratios for individual industries can be obtained from trade associations.

Types of Stock

- **Raw materials** the materials, parts and components that have been delivered to an organization, but are not yet being used.
- **Work in progress** materials that have started, but not yet finished their journey through the production process
- **Finished goods** goods that have finished the process and are waiting to be shipped out to customers
- **Spare parts** for machinery, equipment and so on
- **Consumables** such as oil, fuel, paper, and so on

Symptoms of Poor Inventory Management

The following section deals with how to recognize situations where inventories are not being managed properly.

Some of the symptoms may be associated with poor inventory management are

1. Increasing numbers of back orders
2. High customer turnover rate
3. Increasing number of orders being cancelled
4. Periodic lack of sufficient storage space
5. Wide variance in inventory turnover among distribution centers and among major inventory items
6. Deteriorating relationship with intermediaries, as typified be dealer cancellations and declining orders and
7. Large quantities of obsolete items

Inventory Management in a Global Market

Managing inventory becomes much more complex when dealing with the distances and differently customer's requirements of internationally dispersed markets. The technical side of inventory management remains the same and it is equally applicable in a domestic or global setting. The challenge is that different approaches required for different markets. The long retail channels and multiple middlemen still common in Japan, for example the use of higher inventory levels is there in Northern Europe than in the United Nations where the channels seem to be getting shorter.

Supporting customers in developing nations can necessitate the placement of inventory in that country, or staging it somewhere between the point of manufacture and the point of consumption. So the reality is that an organization may have multiple inventory strategies intended to support different customers around the world.

The common threads typing these policies together must be an awareness of customer needs and an appreciation for the cost of utilizing inventory to cover-up other logistic problems.

Self Assessment Question

1. Define inventory management
2. Critically examine the different objectives of inventory management?
3. Describe the reasons for holding stocks in the international organization
4. What are the symptoms of poor inventory management
5. Critically evaluate the inventory management in a global market
6. Bring out the different role of inventory manager
7. What are the factor determine the success of inventory management?

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Lesson 5.3 - Warehousing

Learning Objectives

After reading this chapter you should be able to

- Define 'Logistics' and Associated terms
- Understand the Concept of logistics
- List different activities of logistics and understand the relationship between them
- Key logistics objectives
- System elements of logistics
- Recognize the Significance of logistics

Introduction

Warehousing is an essential part of product distribution. Whenever a product is produced and exported to another country there arises a need for warehousing before making the final distribution of the product. These days companies are involved in international operation it may like store the items whose demand is likely to rise in future. A highly volatile price may make companies to use warehousing as a protection against losses. Some time market opportunities for certain products may escalate their demand for a short while; companies need to store such products in order to meet the higher demand. Certain type of products produced in a particular season but sold throughout the year. In order to meet the demand throughout the year, warehousing becomes very important. The following are the aims of warehousing.

Aims of Warehousing

- In general, the aims of a warehouse are to support the broader logistics function by giving a combination of high customer service and low costs. More specific aims include
- Providing necessary storage at key points in a supply chain
- Giving secure storage of the type needed by materials

- Keeping all materials in good condition and with minimal damage
- Giving high customer service
- Doing all necessary activities efficiently and with low costs
- Getting high productivity and utilization of resources
- Controlling all movements of materials effectively and without errors
- Sorting materials arriving and quickly transferring them into storage
- Picking materials departing, quickly transferring them out of storage and consolidating deliveries
- Being able to store the whole range of materials needed
- Being flexible enough to deal efficiently with variations in stock levels
- Allowing for special conditions, rotation of stock, and so on
- Giving safe working conditions, and compliance with regulations

Role of Warehousing in Export Marketing

The role of warehousing in the export operations becomes necessary because of the following reasons

Break and Bulk Operations

Are those operations wherein the exporter ships the goods in bulk and then repacks them into small consignments according to the orders received from the individual customers. In exports, this system is less costly especially when the individual orders are so small that they do not fulfill the minimum space stipulation of shipping line. The exporter has to pay the minimum freight even if minimum space is not booked.

Timely Supply

In order to lower the inventories and distribute the product at short notice, it is necessary to store the products to compete with other firms and to make timely supply at a very short notice.

Reassembly Operations

These operations are necessary for many export items, for engineering goods. In order to save shipping space many items are exported in CKD (completely knocked down) condition. There are some countries where the governments insist that the goods must be

exported in CKD condition. When shipments are made on this basis, the exporter needs warehousing facility in the importing country where the goods can be reassembled.

Supply of Spares and After Sales Service

The importer of some sophisticated engineering goods insist on timely supply of spares and other types of after sales- services. In fact, timely availability of spare parts of the goods imported is a pre-condition for the success of an exporter in a foreign market. A large plant may be completely out of operation for want of a single spare part. It is therefore essential for an exporter to warehouse sufficient stock of spare parts.

To Meet Competition from other Firms

In the present day market set-up when competition has increased manifold, the market opportunities can be cultivated only when a ready stock is at call. This problem can be solved only by warehousing.

To meet the Demand and Supply

Warehousing provides an opportunity to an exporter to reduce the supply of the product in the market when the prices are low and increase the supply of the product when the prices are high. Though warehousing, a firm can enjoy good opportunities provided by the market, at the same time it can help to reduce the loss that may otherwise accrue to the business firm. Warehousing can also be utilized to reduce the fluctuations in the market.

Types of Warehouses

Commodity Warehouses

these warehouses limits their services to storing and handling certain commodities, such as lumber, cotton, tobacco, grain, and other products that easily spoil.

Bulk Storage Warehouses

Some warehouses offer storage and handling of products in bulk, such as liquid chemicals, oil, highway salts, and syrups. They also mix products and break bulk as part of their service

Temperature-Controlled Warehouses

These are warehouses that control the storage environment. Both temperature and humidity may be regulated. Perishables, such as fruits, vegetables and frozen foods, as well as dome chemicals and drugs, require this type of storage.

Household Goods Warehouses

Storage and handling of household items and furniture are the specialty of these warehouses. Although furniture manufacturers may use these warehouses, the major users are the household goods moving companies.

General Merchandise Warehouses

These warehouses, the most common type, handle a broad range of merchandise. The merchandise usually does not require the special facilities or the special handling as noted above.

Mini Warehouses

These are small warehouses, having unit space from 20 to 200 square feet and are often grouped together in clusters. They are intended as extra space, and few services are provided. Convenient location to renters is an attraction, but security may be a problem.

Virtual Warehousing

An extension of the concept of a virtual inventory is the virtual warehouse. Whereas virtual inventories satisfy customer requests from alternate inventories in a company's logistic system, a virtual warehouse is one where not all items for sale are stocked in a company's warehouse. Rather, selected items are shipped directly to customers from supplier inventories with no intention of a company stocking them. Some items that are stock out in the warehouse may be handled in a similar manner. Consider a company such as Amazon, which stocks high volume book titles in its own warehouses but cannot practically stock low-volume and rare titles.

Alternatively, the handling is contracted to third parties or shipments are made directly from vendors. The result is that less investment is needed in the logistics infrastructure while high levels of customer service are maintained.

Activities within a Warehouse

Basic Activities

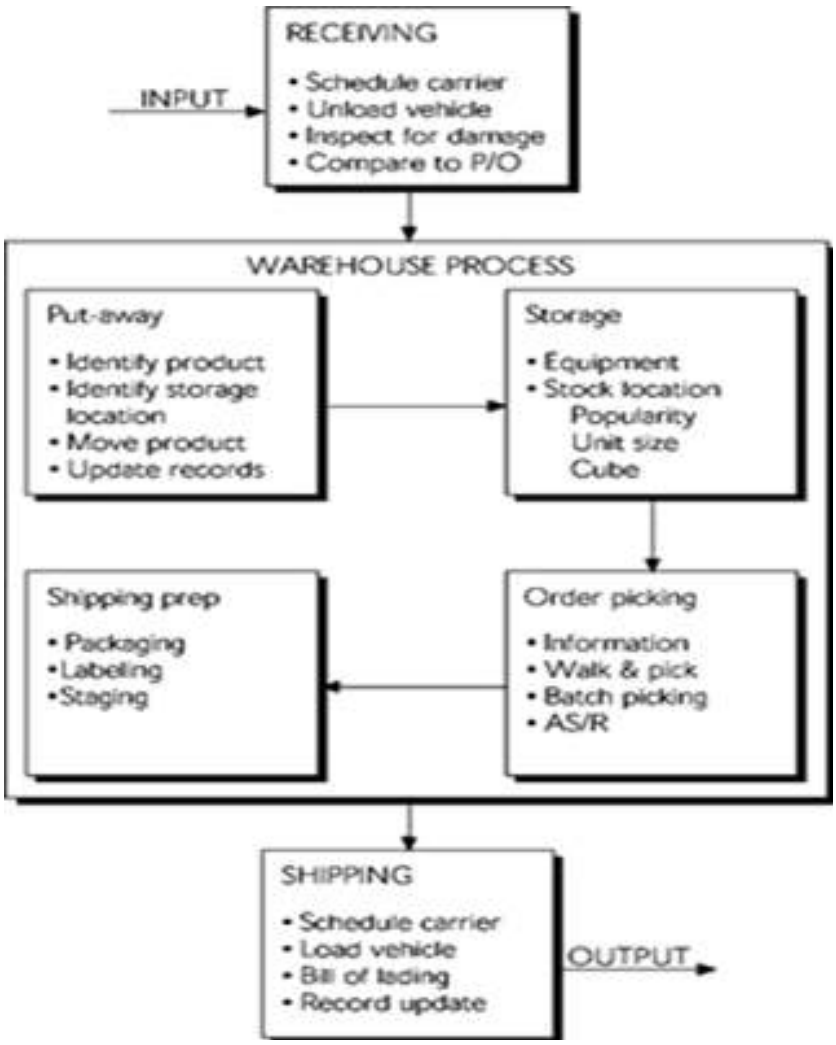
The basic function of a warehouse to to store goods. This means that they receive deliveries from upstream suppliers, do any necessary checking and sorting, store the materials until they are needed and then arrange delivery to downstream customers. The following are the list of activities offered by warehousing

- Receiving goods from upstream suppliers
- Identifying the goods, matching them to order and finding their intended use
- Unloading materials from delivery vehicles
- Doing necessary checks on quantity, quality and condition
- Labeling materials usually with bar codes so they can be identified
- Sorting goods as needed
- Moving goods to bulk storage area
- Holding them in stock until needed
- When necessary, moving materials from bulk storage to a smaller picking store
- Picking materials from this sore to meet orders
- Moving the materials to a marshalling area
- Assembling materials into orders
- Packing and packaging as necessary
- Loading delivery vehicles and dispatching the order
- Controlling all communications and related systems, such as inventory control and finance

Other Activities in Warehouses

Traditionally warehouses were seen as places for the long-term storage of goods. Now organizations try to move materials quickly through the supply chain, so their role has changed.

They are now viewed more as staging points through which materials move as quickly as possible. As their role is long-term storage has decreased, they have become convenient locations to do a range of other jobs. They are, fro example, the best place for sorting materials, packing and consolidating deliveries.



Activities within a Warehouse

Materials Handling at Warehouses

A lot of the work in a warehouse moves materials from one location to another. Everything has to be taken from delivery vehicles, moved around the warehouse – often several times and eventually put onto departing vehicles.

The activities involved form part of materials handling. Every time an item is moved its costs money, takes time, and gives an opportunity for damage or mistake. Efficient warehouses reduce the amount of movement to a minimum, and make the necessary movements as efficient as possible.

Some objectives of materials handling include

- Moving materials around a warehouse as required
- Moving materials quickly, reducing the number and length of movements

- Increasing storage density, by reducing the amount of wasted space
- Reducing costs, by using efficient operations
- Making few mistakes, with efficient material management systems

Most materials handling take place in the warehouses either in hand or with little equipment like trolleys and baskets. Other warehouses have forklift trucks and cranes for moving heavy items. In today scenario manual, mechanized and automated warehouses managing the goods.

Manual Warehouses

This is probably the easiest arrangement to imagine, and is still one of the most common. Items are stored on shelves or in bins. People go around and pick items from the shelves, and put them into some sort of container for movement like super market trolley.

There may be some aids like hand trucks for moving pallets, or carousels to bring materials to pickers, but essentially people control all aspects of movements.

Mechanized Warehouses

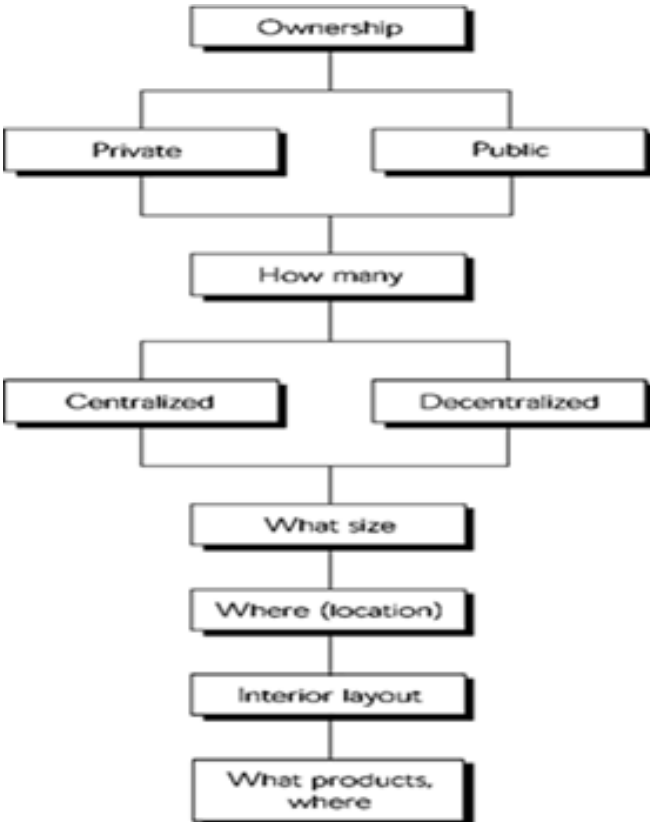
Mechanized warehouses replace some of the muscle power of manual warehouses by machines. Typical example of mechanized equipments are reach trucks, order picking machines, forklift trucks, cranes, conveyors, tractors or trains, carousls etc.,

Automated Warehouses

Traditional warehouses, even mechanized ones, tend to have high operating costs. These operating costs can be reduced, as well as improving aspects of service, by using automation. Unfortunately, this needs a very high investment in equipment, and is only really worthwhile for very big stores that move large amounts of materials.

Automated warehouses work in the usual way, but they include the following components automatic equipment to access storage areas, equipment to move materials around the warehouse, equipment to automatically pick materials, equipment to transfer materials, management system to record material location and control all movements.

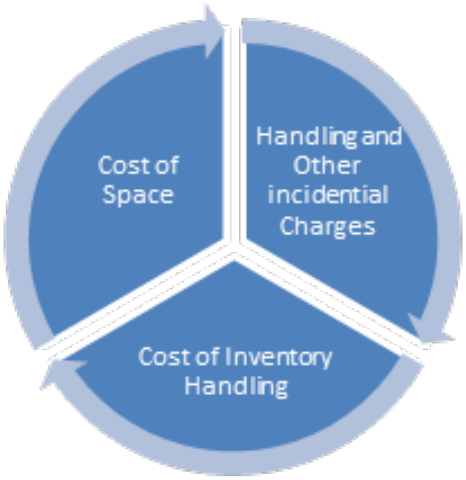
Basic Warehousing Decisions



Basic warehousing decisions

Costs of Warehousing

The maintenance of a warehouse in the international market is different and also very expensive. The exporter must be clear about the additional costs associated in making the use of warehousing facilities selectively. The costs involved in warehousing can be classified into three heads



Costs of Warehousing

Cost of Space

There are two alternaives arrange for warehousing space- the firm may decide to set-up its own warehousing facilities abroad, this involves two elements, fixed cost i.e. investment in creating warehousing facilities and rent, i.e. the amount which can be fetched if the space is let out to some other independent warehousing firms. Such firms charge rent on the basis of the value of goods warehoused.

Handling and Other Incidental Charges

The product need to be offloaded from the ship, transported to the warehouse, stored and finally disposed off to the users, a number of handling operations are involved as and when the sale materializes. These handling operations need several documents which involve costs. The exporter needs to bear in mind these costs, too.

Cost of Inventory Handling

For the purpose of warehousing, the goods are exported on consignment basis. Until the goods are sold, the capital remains blocked. If the turnover rate is slow and the rate of interest is high, the cost of inventory holding if goods are exported on a letter of credit basis, because the exporter gets immediate payment and no capital is blocked.

A successful attempt to reduce these costs provides the firm an edge over its competitors in the foreign market. A proper distribution logistics can go a long way in the success of an export firm.

Self Assessment Question

1. If the flow of materials is properly co-ordinate there is no need for stock and, therefore no need for warehouses. When do you think that warehouses will disappear from the supply chain?
2. Why is the layout of warehouses important? Supermarkets are really one type of warehouse, so the same factors will be important in each. Is this true?
3. Many organizations are using specialist third party suppliers for warehousing. What are the benefits of this? What are the different types of arrangements for third party warehousing?
4. How is storage in transit an alternative to conventional warehousing?

5. Why does the logistician consider the storage system an economic convenience rather than a necessity?
6. How does warehousing contribute to the time value of goods? Explain
7. Explain the logistician should generally know about the storage and materials handling system?
8. What is virtual warehousing? When it is likely to be used? What is required for it to work well?
9. Critically examine the role of warehousing in international marketing
10. Explain the different types of warehousing
11. "Warehousing is the back bone of international marketing" - Comment

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Lesson 5.4 - Total Cost Approach to Logistics

Learning Objectives

After reading this chapter you should be able to

- Define Total cost in Logistics
- Understand the approaches of total cost in logistics

Introduction

Total cost analysis is the key to managing the logistics function. Management should strive to reduce the total cost of logistics rather than the cost of each activity. So logistics must be viewed as an integrated system rather than the cost of each activity. So logistics must be viewed as an integrated system rather than the individual system, because reduction in one cost invariable lead to increase the cost of other components. Effective management and real cost savings can be accomplished only by viewing logistics as an integrated system and minimizing its total cost given the firms customer service objectives. So the main costs which are involved are

- Customer service level
- Transportation costs
- Warehousing costs
- Order processing and information costs
- Lot quantity costs
- Inventory carrying costs

The two types of accounting systems used by companies are

1. The Financial Accounting System
2. The Managerial Accounting System

Organizations following the Financial Accounting System provide reports such as balance sheet, income statements and cash flow statements to outside parties like

investors and stock holders. But this system may fail to meet the needs of managers of the organization. The second system called the Managerial Accounting System serves the internal company needs. The Logistics Accounting System is a type of Managerial Accounting System. It can help managers to plan, implement and control logistics system. Logistics accounting information is useful for budgeting which is an important part of the logistics planning process. It also helps in allocation of resources for implementing the plans. Logistics accounting statements are not standardized like financial accounting statements because the integrated information needs of one manager often differ from those of another. Logistics accounting system generally allows the user to analyze decisions, based on Logistical Costing.

Total Cost Approach in Logistics

Today the marketing view point of any organization is that the Customer is the King of the market. Hence at whatever cost, the customer must be satisfied. Thus the importance of customer service has grown day in and day out. Today a customer, well become the reason for a manufacturer's downfall. For Example if a customer has received goods which have been damaged in transit and which he is unable to return or if the goods are of very poor and which, too he is unable to return, or which he finds great difficulty in returning, he is likely to remain a onetime customer. He may further even publicize his adverse opinion to his colleagues, friends and others and caution them to be careful while purchasing goods from this particular manufacturer. On the other hand, a satisfied customer would recommend a particular product and a manufacturer and even give unsolicited testimonial to prospective customers. Thus it has become important to keep the customer satisfied through good customer service, which requires an up-to-date logistics system. The logistics system may require huge investments and at times may become a large portion of the total cost incurred by the company. The various costs involved in developing and maintaining a successful logistics system are

Inventory Cost

Inventory costs are directly affected by such factors as the mode of transport, the number of warehouses planned, the levels of inventory maintained to ensure a certain level of service, etc. The inventory costs are the cost of the money locked-up in the cost of goods, insurance, occupation of space, pilferages, losses, damages, etc., as well as the maintenance of inventory. These costs are increased by the cost of the obsolescence of a product over a period of time, especially when the company makes rapid changes in product models or when products are perishable. In this connection, the costs of a low inventory must also be taken into account. When the manufacturer is unable to produce goods because of lack of

raw materials or is unable to supply goods because of inadequate finished products stock, he loses particular sales.

Warehousing Costs

Goods have to be stored for sometime after production, however small that time interval may be. This is done either at the production center, or in the marketing area, or somewhere in between or at all the three locations. The warehousing of raw materials either steps up the cost of their supply or of the cost of distribution of finished product. As a manufacturer wishes to approach the objective of zero stock-out of the finished products or zero loss of production, adequate warehousing capacity becomes essential; and this pushes the firm in higher fixed and operating costs of warehousing. Also, to improve customer service to certain levels, it becomes necessary to increase the number of warehouses. Accordingly, the company management has to arrive at the optimum number of warehouses which is consistent with the minimum total cost of distribution, taking into account the effect on the other elements of cost in the total logistical system.

Production or Supply Costs

Production costs tend to decrease with an increase in the volume of production. Also, these costs vary between various production points. If a manufacturer has several plants producing the same product, he has to make a decision to vary the supplies or production from certain plants – a move which inevitably affects the cost of production itself as well as the cost of transportation, transit times, warehouse and inventory costs.

Channels of Distribution Costs

Various alternatives for distribution are available to a manufacturer. This distribution may be through a sole selling agent at the nation level, Or through regional distributors or through wholesale dealers, or by direct supplies to dealers and retailers and even to customer. Mail order sales or catalogue sales at different retail outlets of a manufacturer are direct sales to the customer, which automatically involve decisions on the establishment of stockiest and storage points or warehouses. In the traditional marketing concept, the manufacturer is interested in scaling down the discount to the distributor to reduce the total cost. But if the distributor's discount is low, he may not, perhaps because of his low profit margin, distribute the goods either in sufficient volume or he may not render satisfactory customer service. This may bring about a loss of present and future sales to the manufacturer. Similarly, changes in the distribution system may take place by alternative use of space, say, for inventory, or for marketing or for production centre. This may also

affect customer service in one way or the other. Therefore, a company has to carefully select channels of distribution since it affects decisions relating, ultimately, to customer service and satisfaction.

Communication and Data Processing Costs

An effective distribution system requires continual of order pricing, inventory control, accounts receivable, dispatches, etc. An increased number of distribution points would certainly improve customer service, but would make processing of information more cumbersome and expensive. The same time, if the time taken to process the information is decreased, it is likely to lead better customer service. A manufacturer has, to decide about the speed and convenience with which information may be processed. One of the ways is use of computers having advanced software.

Transportation Costs

The cost of transport varies generally with the speed with which goods are transported. Water transport is the cheapest, while air transport is the most expensive. Rail transport is cheaper than road transport, beyond a certain distance. Both rail and road transport stand somewhere in between water and air in terms of the cost of transport.

Material Handling Costs

A suitable material handling system should be designed to reduce the cost of material handling to the minimum. This would require the consideration of several possible combinations of manual and mechanized handling of the goods and materials. But material handling operations have an impact on other distribution aspects, such as the cost of packaging as well as damages and losses that results form material handling. The design of the material handling system and the consideration of its cost also affect the selection of the mode of transport to be used and hence the cost of transport gets affected.

Packaging Costs

Decisions on packaging are affected by decisions on such factors as type of product, the mode of transport and type of material handling equipment used. A total cost approach would make it necessary for us to select packaging version, which takes into account other distribution factors as well. Thus it would not be sufficient merely to reduce the cost of packaging to the minimum.

Customer Service Costs

If the manufacturer or supplier guarantees the satisfaction with goods and agrees to give a refund on returned goods or exchange the returned goods, he must arrange for the movement of defective or returned goods from the customer (or retailer) back to the supply warehouse or manufacturing centre. Complaints of defects or of the deficiencies pointed out by the customer in the goods that are returned may therefore be utilized as a management feedback to improve the quality of service. Incidentally, with such a guaranteed service the manufacturer on a permanent basis, would win the customer's loyalty. Guaranteed customer service, therefore, involves certain costs to the organization but it also leads to certain benefits in the long run. It increases the value of the company in the market.

Self Assessment Question

1. Explain the role of different cost approach in logistics
2. What are the different costs involved in logistics?
3. How the total cost approach is relevant in the case of international business?

CASE STUDY

Dry Ice Inc. is a manufacturer of air conditioners that has seen its demand grow significantly. They anticipate nationwide demand for the year 2001 to be 1,80,000 units in the South, 1,20,000 units in the Midwest, 1,10,000 units in the East and 1,00,000 units in the West. Managers at Dry Ice are designing the manufacturing network and have selected four potential sites- New York, Atlanta, Chicago and San Diego. Plants could have a capacity of either 2,00,000 or 4,00,000 unit. The annual fixed cost at the four locations are (New York $6 Million, Atlanta $5.5 million, Chicago $5.6 million and San Diego $6.1 million) along with the cost of producing and shipping an air conditioner to each of the four markets.

(a) Where should Dry Ice build its factories

(b) How large should they be?

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REFERENCES

1. **Adland, R.** (2002) THE STOCHASTIC BEHAVIOR OF SPOT FREIGHT RATES AND THE RISK PREMIUM IN BULK SHIPPING. Thesis (Ph.D.). *Massachusetts Institute of Technology.*

2. AIR TRANSPORT AUXILIARY, AIR TRANSPORT AUXILIARY. (Handbook) **White Waltham**, *England Reminder Book, 1945.*

3. **Allemang, A.** (2006). "SUPPLY CHAIN SECURITY AND THE BUSINESS BENEFITS" *Panelist remarks*,

4. **Arnold J.R.T** (1996) INTRODUCTION TO MATERIAL MANAGEMENT (2nd Edition) *Prentice Hall, Englewood Cliffs, NJ.*

5. ASTM SHIPPING CONTAINER STANDARDS AND RELATED TECHNICAL MATERIAL, *5th edition, 2007, ASTM*

6. **Bamford C.** (2001) TRANSPORT ECONOMICS, *Heinemann, London*

7. **Bardi, Edward; John Coyle and Robert Novack** (2006). MANAGEMENT OF TRANSPORTATION. *Thomson South-Western. ISBN 0-324-31443.*

8. **Berglund, M., Laarhoven, P. van, Sharman, G. E Wandel, S.,** 1999. THIRD-PARTY LOGISTICS IS THERE A FUTURE? THE INTERNATIONAL JOURNAL OF LOGISTICS MANAGEMENT, *10, (1), pp. 59-70.*

9. **Bossel, H.**, 1999. INDICATORS FOR SUSTAINABLE DEVELOPMENT THEORY, METHOD, APPLICATION. *International Institute for Sustainable Development (IISD)*

10. **Cannella S., Ciancimino E.** (2010) Up-to-date Supply Chain Management the Coordinated (S,R). In "ADVANCED MANUFACTURING AND SUSTAINABLE LOGISTICS". **Dangelmaier W.** et al. (Eds.) 175-185. *Springer-Verlag Berlin Heidelberg, Germany.*

11. CAREERS IN LOGISTICS (*Oak Brook,IL Council of Logistics Management, pp.3)*

12. **Chandrashekaran N** (2006) "TOWARDS LOGISTICS EFFECTIVENESS IN INDIA" *Material Management Review, pp.10*

13. **Chase R. and Jacobs F.R** (2006) "OPERATION MANAGEMENT FOR COMPETITIVE ADVANTAGE 10TH EDITION, *Tata McGraw Hill, New Delhi, pp.24-31*

14. **Chopra, Sunil and Peter Meindl** (2007). SUPPLY CHAIN MANAGEMENT. Pearson. *ISBN 0-13-208608-5.*

15. **Chow, G. and W.G. Waters** (1993) INTERMODAL TRANSPORTATION AND FREIGHT MODE CHOICE MODELS REVIEW AND DIRECTIONS FOR RESEARCH, *Report prepared for Economic Analysis Branch, Transport Canada (Dec.)*

16. **Christopher M.** (1996) EMERGIN ISSUES IN SUPPLY CHAIN MANAGEMENT, *Proceedings of the logistics, Academic Network Inagugral Workshop, Warwick.*

17. CONCEPT OF OPERATIONS FOR THE NEXT GENERATION AIR TRANSPORTATION SYSTEM", *Joint Planning and DevelopmentOffice, Washington, DC, June, 2007.*

18. **Connolly, Kate P., Sullivan, Erin.,** 2005. INTERNATIONAL SUPPLY CHAIN MANAGEMENT A WALK AROUND THE ELEPHANT. *The Irish Journal of Management. Vol. 26, Issue 1, pp. 141-162.*

19. CONTAINERISATION INTERNATIONAL YEARBOOK (VARIOUS YEARS) NATIONAL MAGAZINE COMPANY, *London.*

20. CONTAINERIZATION INTERNATIONAL YEARBOOK. 2001 (*London Informa Group)*

21. COUNCIL OF LOGISTIC MANAGEMENT, *Promotional Material and Website at www.clm.org.*

22. **Crum, M., Allen, B. and Ross, T.,** "MOTOR FREIGHT TRANSPORT THIRD-PARTY SERVICE SHIPPER AND CARRIER PERSPECTIVES", *Transportation Practitioners Journal, Vol. 60 No. 1, Autumn 1992, pp. 37-59.*

23. **Delfmann, Werner; Albers, Sascha,** 2000. SUPPLY CHAIN MANAGEMENT IN THE GLOBAL CONTEXT, WORKING PAPER NO. 102, DEPT. OF GENERAL MANAGEMENT, *Business Planning and Logistics of the University of Cologne, Cologne.*

24. DELOITTE AND TOUCHE CONSULTING GROUP (1996) CANADIAN TRENDS IN SUPPLY CHAIN MANAGEMENT AND LOGISTICS SERVICE OUTSOURCING, *Deloitte and Touche, Toronto.*

25. DEPARTMENT OF DEFENSE ARCHITECTURE FRAMEWORK VERSION 1.5", *Department of Defense, April, 2007.*

26. DESIG*N CRITERIA FOR SPECIALIZ*ED SHIPPING CONTAINERS, *US DoD, Mil-Std 648C, 1999*

27. **Douglas M. Lambert and James R.** Stock(1993), STRATEGIC LOGISTICS MANAGEMENT, *3rd Edition, Homewood III, Irwin, pp.378-79*

28. **Dullaert, W., B. Vernimmen, E. Aghezzaf and B. Raa** (2007) "REVISITING SERVICE-LEVEL

29. ENTERPRISE ARCHITECTURE FOR THE NEXT GENERATION AIR TRANSPORTATIO*N* SYSTEM", *Joint Planning and Developme**nt** Office, Washington, DC, June, 2007.*

30. **Fawcett, S.E. and Birou, L.,** "EXPLORING THE LOGISTICS INTERFACE BETWEEN GLOBAL AND JIT SOURING", *International Journal of Physical Distribution & Logistics Management, Vol. 22 No. 1, 1992, pp. 3-14.*

31. **Fayle**, Ernest (1932) A SHORT HISTORY OF THE WORLD'S SHIPPING INDUSTRY" **George, Allen & Unwin**, *London page 254*

32. FEDERAL ENTERPRISE ARCHITECTURE CONSOLIDATED REFERENCE MODEL VERSION 2.2", EXECUTIVE OFFICE OF THEPRESIDENT, *Washington, DC, July, 2007.*

33. FINANCIAL DICTIONARY, *formerly at http //www.specialinvestor.com/terms/1072.html, Special Investor*

34. **Gary Forger,** "BAR CODE LABEL STANDARDS", *Modern Materials Handling (November 1990), pp.43*

35. **Girishchandra Tripathi and Ruchi Jain** (2006) 'RFID-A Competing Technology' *Material Management Review, pp 13-24.*

36. **Glen, D. and Martin** (1998) CONDITIONAL MODELING OF **TA**NKER MARKET RISK USING ROUTE SPECIFIC FREIGHT RATES. *Maritime Policy and Management, 25(2), 117-128.*

37. **Graham Sharman**(1991), "GOOD LOGISTICS IS COMBAT POWER." *McKinsey Quarterly, No.3, pp.3-21*

38. **Grainger A** (2000) GLOBALIZATION – IMPLICATIONS FOR SUPPLY CHAINS, *Logistics and Transport Focus, 2(2), 46-7.*

39. **Grainger A.** (2000), GLOBALIZATION – IMPLICATIONS FOR SUPPLY CHAIN ISSUES, *Logistics and Transport Focus, Vol.2 (9), pp.40-43.*

40. **Greene J.H.**(1997) PRODUCTION AND INVENTORY CONTROL HANDBOOK, 3rd Editions, *McGraw-Hill, New York.*

41. **Greenwood P.N** (1997), How will a warehouse management system benefit me? Logistics Focus, 5 (4), 10-13.

42. **Hoffman, Michael L.** "Ship Organization Nears Final Form; U.N. Maritime Body Expected to Have 3 Principal Organs — Panama in Opposition," New York Times. March 4, 1948.

43. **Huber, Mark** (2001). "Ch. 9 Chartering and Operations". TANKER OPERATIONS A HANDBOOK FOR THE PERSON-IN-CHARGE (PIC). CAMBRIDGE, *MD Cornell Maritime Press. ISBN 0-87033-528-6.*

44. INNOVATORS IN SUPPLY CHAIN SECURITY BETTER SECURITY DRIVES BUSINESS VALUE. *The Manufacturing Institute (Aug. 1).*

45. **Jerry A.Davis, Jerome G. Lawrence, Peter Rector, and Herbert S.Shear,** "REVERSE LOGISTICS PIPELINE", Annual Conference Proceedings (San Diego, CA Council of Logistics Management, *October 8-11, 1995), pp.427.*

46. **Jonathan Coulter and Andrew W. Shepherd** [2], INVENTORY CREDIT – AN APPROACH TO DEVELOPING AGRICULTURAL MARKETS, *FAO, Rome, 1995*

47. **Jules Dupuit,** "ON THE MEASUREMENT OF THE UTILITY OF PUBLIC WORKS" REPRINTED IN INTERNATIONAL ECONOMIC PAPAERS, No.2, translated from the French By R.H. Barback, *Macmillainand Co., Ltd., 1952, Landon.*

48. **Kavussanos, M. G.** (1996) COMPARISONS OF VOLATILITY IN THE DRY-CARGO SHIP SECTOR. Spot versus time charters and smaller versus larger vessels. Journal of Transport Economics and Policy, *January, 67 – 82.*

49. **Kavussanos, M. G. and Alizadeh, A.** (2001) THE EXPECTATIONS HYPOTHESIS OF THE TERM STRUCTURE AND RISK PREMIA IN DRY BULK SHIPPING FREIGHT MARKETS. *Forthcoming in Journal of Transport Economics and Policy.*

50. **Kieso, DE; Warfield, TD; Weygandt, JJ** (2007). INTERMEDIATE ACCOUNTING 8TH CANADIAN EDITION. *Canada John Wiley & Sons. ISBN 0-470-15313-X.*

51. **Lambert, Douglas M. and Cooper, Martha C.,** 2000. ISSUES IN SUPPLY CHAIN MANAGEMENT. *Industrial Marketing Management. Volume 29, Issue 1, pp. 65-83.*

52. **Larson, Paul D. and Halldorsson, Arni,** 2004. LOGISTICS VERSUS SUPPLY CHAIN MANAGEMENT AN INTERNATIONAL SURVEY. *International Journal of Logistics Research and Applications. Vol. 7, No. 1.*

53. Lay, Maxwell G (1992). WAYS OF THE WORLD A HISTORY OF THE WORLD'S ROADS AND OF THE VEHICLES THAT USED THEM. *Rutgers University Press. ISBN 0-8135-2691-4.*

54. Lee, Hau L., Padmanabhan, V., Seungjin, Whang, 1997. THE BULLWHIP EFFECT IN SUPPLY CHAINS. *Sloan Management Review, pp. 93-102.*

55. Levitt T. (1983), "THE GLOBALIZATION OF MARKETS, *Harvard Business Review, May-June, pp.35.*

56. Lewis C (2000) FORTUNE FAVORS THE BRASH, *Logistics and Transport Focs, 2(4), 26-8.*

57. Lieb, R., "THE USE OF THIRD-PARTY LOGISTICS SERVICES BY LARGE AMERICAN MANUFACTURERS", *Journal of Business Logistics, Vol. 13 No. 2, 1992, pp. 29-42.*

58. Mankabady, Samir. (1986). THE INTERNATIONAL MARITIME ORGANIZATION. *London Routledge. 10-ISBN 0-7099-3591-9; 13-ISBN 978-0-7099-3591-9*

59. Maritime knowhow website time charter

60. Mark Crone (2006) " ARE GLOBAL SUPPLY CHAINS TOO RISKY?", *Supply Chain Management Review, pp.28-32*

61. Mas-Collel, A., Whinston, M. D., Green, J. R., 1995. MICROECONOMIC THEORY. *Oxford University Press, Inc.*

62. MEASUREMENT FOR AN INVENTORY SYSTEM WITH DIFFERENT TRANSPORT MODES" *Transport Reviews, 1 -11.*

63. Muller E.J. (1991), "*The Greening of Logistics," pp.32.*

64. Murphy, P., Dalenburg, D. and Daley, J., "ANALYZING INTERNATIONAL WATER TRANSPORTATION THE PERSPECTIVE OF LARGE US INDUSTRIAL CORPORATIONS", *Journal of Business Logistics, Vol. 12 No. 1, 1991, pp. 169-90.*

65. Murray R.E. (1980) *Strategic distribution planning, Proceedings of the Eighteenth Annual Conference of the National Council of Physical Distribution Management.*

66. NEXT GENERATION AIR TRANSPORTATION SYSTEM INTEGRATED PLAN", *Joint Planning and Development Office, Washington, DC, December, 2004.*

67. NEXTGEN JOINT PLANNING ENVIRONMENT", *URL http //jpe.jpdo.gov (cited October, 2008).*

68. **Nordq*uist, My*ron H. and John Morton Moore.** (1999). CURRENT MARITIME ISSUES AND THE INTERNATIONAL MARITIME ORGANIZATION. *The Hague Martinus Nijhoff Publishers. 10-ISBN 90-411-1293-6; 13-ISBN 978-90-411-1293-4 OCLC 42652709*

69. **Olsen D.R.**(1996) WAREHOUSING TRENDS FOR THE NEXT GENERATION, *Logistic Focus, 4(2), 6-8.*

70. PERSONAL PAGE OF THE SECRETARY-GENERAL, *accessed 30 January 2012*

71. **Pontrandolfo, P.**; et al. GLOBAL SUPPLY CHAIN MANAGEMENT A REINFORCEMENT LEARNING APPROACH. *International Journal of Production Research. Vol 40 No. 6 pp. 1299-1317.*

72. **Porter, Michael,** 1991. TOWARDS A DYNAMIC THEORY OF STRATEGY. *Strategic Management Journal, Vol. 12, pp. 95-117.*

73. PRESS-BRIEFING "POSITIONAL CHANGES AT IMO SECRETARIAT", *accessed 30 January 2012*

74. **Rahul Altekar** (2005) "SUPPLY CHAIN MANAGEMENT- CONCEPTS AND CASES", *Prentice Hall India Pvt. Ltd., New Delhi.*

75. **Rober Goodell Brown**(1982), ADVANCED SERVICE PARTS INVENTORY CONTROL, 2nd Edition, *Materials Management System, pp.155.*

76. **Robert B. Handifield and Ernest L. Nichols Jr**, INTRODUCTION TO SUPPLY CHAIN MANAGEMENT PRINCE HALL, *1999, pp.2-8.*

77. **Robert V.Delaney and Rosalyn Wilson**, "11TH ANNUAL STATE OF LOGISTIC REPORT", *Cass Information System and ProLogis (2000), pp.12*

78. **Roger Moarton**, "DIRECT RESPONSE SHIPPING(1996), "*Transportation and Distribution, pp.32-36*

79. **Roy Dale Voorhees and Merrill Kim Sharp**, "PRINCIPLES OF LOGISTICS REVISITED" *Transportation Journal (Fall 1978) pp.69-84.*

80. **Saxena R. S.** (1 December 2009). INVENTORY MANAGEMENT Controlling in a Fluctuating Demand Environment. *Global India Publications. pp. 24–. ISBN 978-93-8022-821-1. Retrieved 7 April 2012.*

81. **Shashikumar N.,** 1998 Container port dilemma on the US East Coast An analysis of causes and consequences, paper presented at World Conference on Transportation Research, *Antwerp*.

82. Silver E.A, Pyke D.F. and Peterson R.(1998), INVENTORY MANAGEMENT AND PRODUCTION PLANNING AND SCHEDULING, *3rd Edition, John Wiley, New York.*

83. Slack B., 1998 INTERMODAL TRANSPORTATION. In Hoyle B. and Knowles R. (eds), Modern Transport Geography. *John Wiley, Chichester, pp. 263–289.*

84. Smith R.J(2000) THE LOGISTIC MISSION, MEMBERS DIRECTORY, *pp.22-27, the Institute for Logistics and Transport, Corby.*

85. Stanley E. Fawcett and Gregory M. Magan(2002), "THE RHETORIC AND REALITY OF SUPPLY CHAIN INTEGRATION", *International Journal of Physical Distribution and Logistics Management, Vol.32, No.5, pp.339-361*

86. Stopford, Martin (1997). MARITIME ECONOMICS. LONDON ROUTLEDGE. *ISBN 0-415-15310-7.*

87. SustainableShipping (S) News - IMO targets greenhouse gas emissions (17 Jun 2008) - The forum dedicated to marine transportation and the environment

88. T K Sarangan, op cit, Ch VIII. 10 Speech delivered by H M Trivedi, Chairman, Karmahom Conference, Bombay, on "Freight Rates 'and Export Promotion", at the Conference on Development of Indian Shipping and Foreign Trade held under the auspices of the All India Manufactur[in]g Organization, *at Bombay on March 30, 1969.*

89. T K Sarangan, "LINER SHIPPING IN INDIA'[S] OVERSEAS TRADE", *United Nations Publication, Sales No 67 II D 25, p 71.*

90. Tempelmeier, Horst, INVENTORY MANAGEMENT IN SUPPLY NETWORKS, 3rd Edition, *Norderstedt (Books on Demand) 2011*

91. Theo Notteboom and Jean-Paul Rodrigue, Containerisation, Box Logistics and Global Supply Chains The Integration of Ports and Liner Shipping Networks, *Maritime Economics & Logistics (2008) 10, 152–174.*

92. Thomas E. (1985), PRODUCTION/OPERATION MANAGEMENT, 9th Edition, *Handbook III, Irwin, pp.173.*

93. Turpin, Edward A.; McEwen, William A. (1980). "CH. 18 UNITED STATES NAVIGATION LAWS AND SHIP'S BUSINESS". *Merchant Marine Officers' Handbook. Centreville, MD Cornell Maritime Press. ISBN 0-87033-056-X.*

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