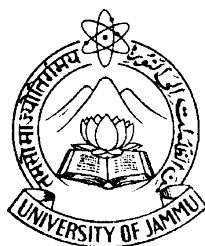


Directorate of Distance Education

UNIVERSITY OF JAMMU

JAMMU



SELF LEARNING MATERIAL

B.A SEMESTER-IV

SUBJECT : MARKETING MANAGEMENT

UNIT - I - V

COURSE NO. MK-401

LESSON NO. 1-23

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COURSE CO-ORDINATOR

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MARKETING MANAGEMENT

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MARKETING MANAGEMENT

Paper - 4

Total Marks - 100

Course No.: MK-401

Internal Marks : 20

Examination : 3 Hrs

External Marks : 80

The syllabus is for examinations of BA Marketing Management Semester IV to be held in May 2020, May 2021, May 2022

Objective: The course acquaints the student to the concept and importance of Channel Management and material logistics and distribution task like transportation and warehousing

UNIT I

Introduction to Channel Management , The Concept of Channel Management, Channel Management Activities, Current Challenges in Channel Management, Objectives in Channel Management, Competition in Marketing Channels, Typical Channel Management Decision

UNIT II

Managing Single Channels, A Typology of Marketing Channels, In-House vs. Outsourced distribution, Management of Intermediaries , Multi Channel Management, Designing the Channel Mix, Implementation of New Channels and Touchpoints, Managing Channel Conflict, Customer Channel Preferences and Right-Channeling, Channel Performance Measurement

UNIT III

Material Logistics: Concept and Importance of Material Logistics. Inventory Control. Logistic Planning: Major Aspects and Factors. E-Logistics Structure and Operation, Logistic Resource Management (LRM), Transportation: A Brief Study of different modes of transport used for movement of materials, their relative advantages, disadvantages and suitability. Road Transport: Road System, Role of Road Transport in Movement of Materials, Role of National Highway Authority of India, Limitations of Road Transport System, Consignment Note. Rail transport: India Railway Network and Role in Transportation of Materials and Cargo, Consignment Note.

UNIT IV

Air transport: Role of Air Transport in Domestic and International Transportation of Goods. Role of Ministry of Civil Aviation, Airport Authority of India and Directorate General of Civil Aviation, Air Waybill, Contract of Freightment. Water transport: Inland Water Transport: Role of Inland Water Transport Inland Waterways: Inland Waterways Authority of India. Ocean transport: Role of Ocean Transport in International Trade, Structure of Shipping Services Liner Shipping and Tramp/Charter Shipping, Conference System and Determination of Rates, Bill of Lading and Charter Party.

UNIT V

Multi-Modal Transport System: Concept and Advantages of Multi-Modal Transport System Containerization: Need and Advantages of Containerization, Inland Container Depots (ICDs) and Container Freight Stations (CFSs). Warehousing: Concept of Warehousing (Warehouse, Depositor and Warehouseman), Elements and Functions of Warehousing. Role of Warehousing in Economic Development, Types of Warehousing, Advantages of a Public Warehouse, Costs Associated with Warehousing. Warehousing Corporations in India, Objectives and Functions of Warehousing Corporations.

Note for Paper Setter : The paper setter is requested to set 10 questions in all with at least 2 questions from each unit. All the questions shall carry equal marks. The students are required to attempt 3 questions selecting one from each unit necessarily i.e. internal choice is available.

Suggested Reading :

1. Kotler, P. & Keller, K. L.: Marketing Management, Pearson.
2. Kotler, P., Armstrong, G., Agnihotri, P. Y., & Uhaq, E.: Principles of Marketing: A South Asian Perspective, Pearson
3. Dutta A.K., Materials Management: Procedures, Text and cases, Prentice Hall of India Pvt. Ltd., New Delhi.
4. Gopalakrishnan, P. and Sundareson. M., Materials Management: An Integrated Approach, Prentice Hall of India Pvt. Ltd., New Delhi
5. Varma, M.M., Essentials of Storekeeping and Purchasing. Sultan Chand and Sons, New Delhi.
6. Shah N.M. An Integrated concept of Materials Management, Indian Institute of Materials Management, Baroda Branch, Baroda.

C. No. : MK-401**UNIT I**

SEMESTER : IV**LESSON : 1**

INTRODUCTION TO CHANNEL MANAGEMENT AND THE CONCEPT OF CHANNEL MANAGEMENT

STRUCTURE

- 1.1 Introduction
- 1.2 Objectives
- 1.3 Introduction to Channel Management
- 1.4 The Concept of Channel Management
 - 1.4.1 What is a Channel of Distribution?
 - 1.4.2 Flows in Marketing Channels
 - 1.4.3 Functions of Distribution Channels
- 1.5 Summary
- 1.6 Glossary
- 1.7 Self-Assessment Questions
- 1.8 Lesson End Exercise
- 1.9 Suggested Readings

1.1. INTRODUCTION

Channel management helps in developing a program for selling and servicing customers within a specific channel. The aim is to streamline communication between a business and the customer. To do this, you need to segment your channels according to

the characteristics of your customers: their needs, buying patterns, success factors, etc. and then customize a program that includes goals, policies, products, sales, and marketing program (1). The goal of channel management is to establish direct communication with customers in each channel. If the company is able to effectively achieve this goal, the management will have a better idea which marketing channel best suits that particular customer base. The techniques used in each channel could be different, but the overall strategy must always brand the business consistently throughout the communication (2).

A business must determine what it wants out of each channel and also clearly define the framework for each of those channels to produce desired results. Identifying the segment of the population linked to each channel also helps to determine the best products to pitch to those channels.

1.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- meaning and definition of Channel Management
- flows in marketing Channels
- functions of Distribution Channels

1.3 INTRODUCTION TO CHANNEL MANAGEMENT

The term Channel Management is widely used in sales marketing parlance. It is defined as a process where the company develops various marketing techniques as well as sales strategies to reach the widest possible customer base. The channels are nothing but ways or outlets to market and sell products. The ultimate aim of any organization is to develop a better relationship between the customer and the product.

Channel management helps in developing a program for selling and servicing customers within a specific channel. The aim is to streamline communication between a business and the customer. To do this, you need to segment your channels according to the characteristics of your customers: their needs, buying patterns, success factors, etc. and then customize a program that includes goals, policies, products, sales, and marketing program (1). The goal of channel management is to establish direct communication with customers in each channel. If the company is able to effectively achieve this goal, the

management will have a better idea which marketing channel best suits that particular customer base. The techniques used in each channel could be different, but the overall strategy must always brand the business consistently throughout the communication (2).

A business must determine what it wants out of each channel and also clearly define the framework for each of those channels to produce desired results. Identifying the segment of the population linked to each channel also helps to determine the best products to pitch to those channels.

1.4 THE CONCEPT OF CHANNEL MANAGEMENT

Different people perceive marketing channels in different ways, some see it as a route taken by a product as it moves from the producer to the consumer, and others describe it as a loose coalition of business firms that have come together for purpose of business. Customers may view marketing channels as simply 'a lot of middlemen' standing between the producer and the product. Given all these different perspectives it is not possible to have one single definition for marketing channels. Marketing channels can be defined as the external contractual organisation that management operates to achieve its distribution objectives.

There are four terms in this definition that has to be given a special mention namely *external, contractual organization, operates and distribution objectives*. The term **external** means that the marketing channel exists outside the firm. Managing of the marketing channel therefore involves the use of inter-organisational management (managing more than one firm) rather than intra-organisational management (managing one firm). The term **contractual organisation** refers to those firms who are involved in the negotiatory function as the product moves from the producer to the end user. The function of these firms involves buying, selling and transferring of goods and services. Transportation companies, public warehouses, banks ad agencies do not come under these and are referred to as facilitating agencies. The third term **operates** suggests the involvement of management in the channels and this may range from the initial development of the channel structure to the day-to-day management. Finally the **distribution objectives** explain the distribution goals the organization has in mind. When the objectives change, variations can be seen in the external contractual organisations and the way in which the management operates. In simpler terms a channel then consists of producer, consumer and any intermediary. Marketing

channel strategy is one of the major strategic areas of marketing. In most cases eliminating middlemen will not reduce prices, because the amount that goes to the intermediaries compensates them for the performance of tasks that must be accomplished regardless of whether or not an intermediary is present. In simple terms, *a company can eliminate intermediaries but cannot eliminate the functions they perform.*

1.4.1 What is a Channel of Distribution?

A channel of distribution is an organised network or a system of agencies and institutions which, in combination, perform all the activities required to link producers with users and users with producers to accomplish the marketing task.

Definitions

“The structure of intra company organisation units and extra company agents and dealers, wholesale and retail, through which a commodity, product or service is marketed.”

- *American Marketing Association*

“A set of independent organisations involved in the process of making a product or service available for use or consumption.”

- *Professor Philip Kotler*

In other words, it stands for the path or route traced in the direct or indirect transfer of title to a product, as it moves from a producer to the ultimate consumer or industrial users.

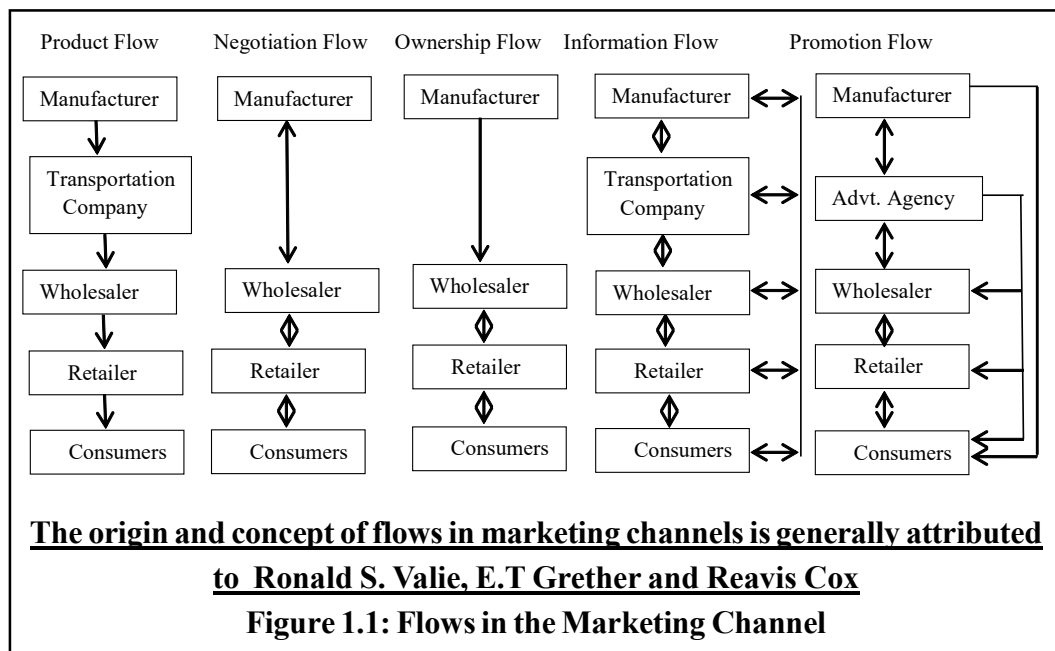
Thus, a channel of distribution is a path-way directing the flow of goods and services from producers to consumers composed of intermediaries through their functions and attainment of the mutual objectives.

1.4.2 Flows in Marketing Channels

As discussed a conventional channel of distribution consist of a manufacturer, a wholesaler, a retailer and the ultimate consumer. Not all the channels include all these marketing institutions. At times the product passes directly from the manufacturer to consumer. When a marketing channel has been developed a series of flows emerge. These

flows provide the links that tie channel members and other agencies together in the distribution of goods and services. There are five most important flows namely:

- Product flow
- Negotiation flow
- Ownership flow
- Information flow
- Promotion flow



The **Product flow** refers to actual physical movement of the product from the manufacturers through all the parties who take physical possessions of the product from the point of production to the final consumer.

In the **negotiation flow**, this represents the interplay of the buying and the selling functions associated with the transfer of title. If you note the diagram you find the transportation firm is not included in the flow because it does not participate in the negotiation function, also you can find the arrows flow in both the directions, indicating the negotiation

is mutual at all levels of the channels. The ownership flow shows the movement of the title to the product as it is passed along from the manufacturer to the consumer, here as well we find the transportation function missing since the transportation firm does not take title or is actively involved in the facilitating function. It merely involves in transporting physical products.

In case of the **Information flow**, we can see that the transportation function has reappeared and all the arrows are two-directional. All the parties participate in the exchange of information. For example Coke may obtain information from the transportation company about its shipping schedules and the rates, while the transportation firm may seek information regarding when and in what quantities it plans to ship its products. Sometimes the information bypasses the transportation company directly to the wholesaler or the retailer when the information does not concern the transportation firm. If there is an offer, or a price reduction these information are not needed by the transportation firms.

Finally, the **Promotion flow** refers to the persuasive communication in the form of advertising, personal selling, publicity. There is a new component that is added to the flow and that is the advertising agency and this actively provides and maintains the information flow. The organizations work closely with the promotional organizations so we find a two-directional arrow.

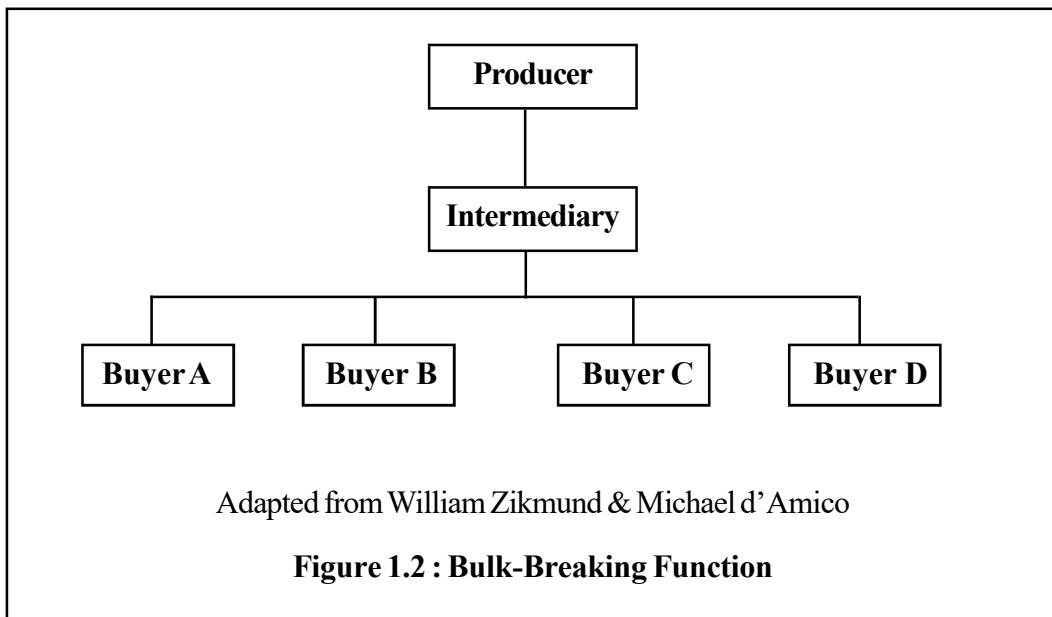
From the management view, the concept of channel flows provides a useful framework for understanding the scope and complexity of channel management. Changing scenario does make the role of the firms' complex, as a result of which innovative channel strategies and effective channel management are needed to make this happen.

1.4.3 Functions of Distribution Channels

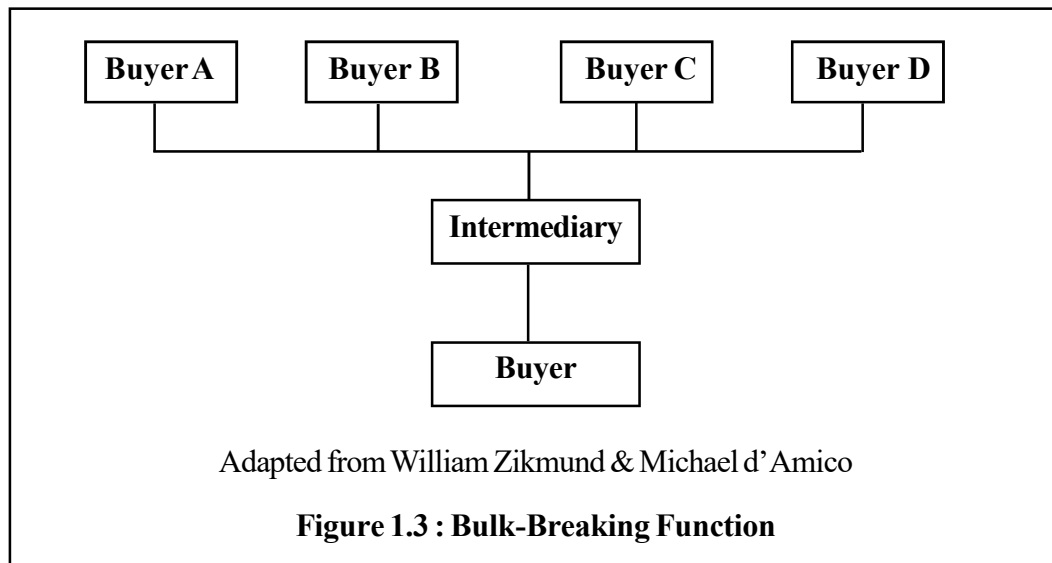
Some of the major functions performed by the intermediaries are mainly physical distribution, communication and facilitating functions. When we talk about physical functions, they include braking bulk, accumulating bulk, creating assortments, reducing transactions and transporting and storing.

- **Breaking bulk:** One of the important role intermediaries perform is bulk-breaking function. Here these organizations buy in large quantities and break them into smaller quantities and pass them to the retailers, wholesalers or even to the

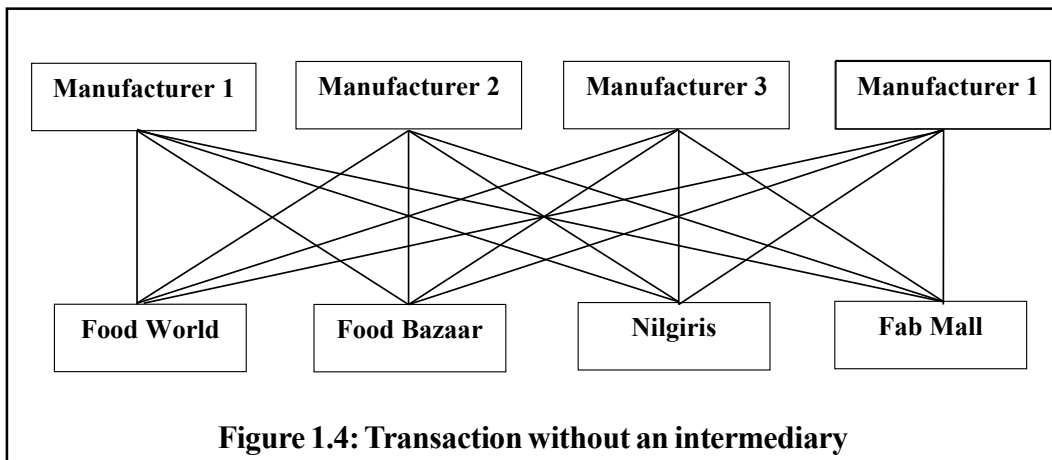
customers. By doing so, the intermediaries reduce the cost of distribution for the manufacturers as well as the consumers. This particular function is also termed as ‘resolution of economic discrepancies’. Figure 1.2 gives a pictorial description of bulk breaking.



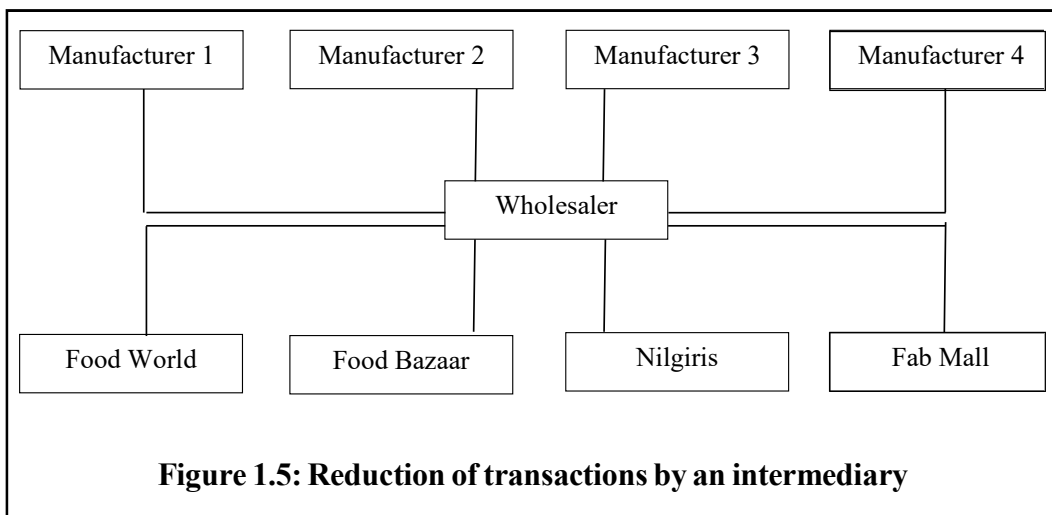
- **Accumulating Bulk:** At times the intermediaries also do the task of accumulating the bulk. The intermediaries may buy bulk from different small producers accumulate them and offer to those buyers who prefer large quantities. The intermediaries in accumulating the bulk are mostly found in the agricultural businesses, whereby the intermediary will procure vegetables from local farmers and assemble them and sell it to the wholesalers. Figure 1.3 gives a clear picture on accumulating bulk. Once the marketers accumulate bulk they start to sort the products identifying differences in the quality, grades and classify them into different categories.



- **Creating Assortments:** The third important function of the intermediaries is creating assortment. When we take the case of magazines, on an average there are around thousands of magazines being published in a month and it is impossible for a particular newsstand to get it going, here big distributors and agents work in creating assortments and enable a speedy process. This needs a lot of teamwork and timing. Certain magazines become outdated within certain period of time.
- **Reducing Transactions:** One of the biggest reasons that keep the economy moving and the customer smiling is the presence of intermediaries, they reduce the number of transactions necessary to accomplish the exchange of goods. Figure 1.4 shows the complicated nature of the transaction if an intermediary does not come in place.



In the above figure, we find that it becomes a complicated process for the manufacturers to work on with different retailers, when an intermediary comes in the form of a wholesaler we find the whole situation becomes different. Intermediaries do not only reduce the number of transactions but also help in the reduction of the geographical distances that both buyers and sellers have to cover. Channel intermediaries doing the roles of a buying agent for their customer and selling agents for the manufacturers does simplify the process of transaction considerably. From figure 1.5, we find the reduction in the number of transactions that happen between the manufacturer and the retailer.



- **Transporting and Storing:** Apart from breaking, accumulating, creating assortments and reducing transactions they also perform two key marketing functions namely transporting and storing. The final product has to be moved from the point of production to the point of consumption. This means it involves storing the product along the way till it is delivered. Most of the big retailers hold enough of the product in order to cater to the consumers.
- **Credit Services:** Apart from the function of physical distribution the intermediaries also help in offering credit services. Even though there are firms like Metro, which are predominantly cash and carry kind of intermediaries, most of the intermediaries provide credit facility or even paying in parts. Many intermediaries offer about 30 to 45 days to the retailers for paying back.
- **Risk Taking:** one of the vital functions of the intermediaries is risk taking. Not every product finds favor in the eyes of the customer, much fallout within few months, as a result of which the intermediaries would be at risk. An uncontrollable factor like floods, earthquakes or even contamination or fire could pose a serious threat. The intermediaries have to bear these risks along with the market risks. These are some of the core functions intermediaries perform enabling goods and services to reach consumers at the right time.

1.5 SUMMARY

Channels are different branches used by companies to take its products to the public market. On the other hand, from an advertising perspective, channels are also the different means employed to communicate a given marketing campaign, as is the case for newspapers, TV, digital media and social networks, among others. From a product distribution angle, the company can administrate how its products and services reach its target customers by establishing alliances and partnerships with different other companies or individuals. The most common channels are agents, wholesalers and retailers. Companies can classify its distribution process depending on how many players are between the manufacturer and the consumer. These different stages are called levels.

Channel management involves managing channels associated with reaching and satisfying the customer, managing partners who help with the distribution process and

managing vendors who keep your internal controls working smoothly. Channel management successfully gains and maintains the cooperation of various organizations by aligning the enterprise as a whole with customer needs in mind. Each department and flow of information has the potential to impact customer service, affecting your entire organization and your reputation.

1.6 GLOSSARY

- **Communication:** *Communication* is simply the act of transferring information from one place, person or group to another.
- **Channel Management:** Channel management is a marketing management activity that involves handling the different streams employed by a company to sell its products or services.
- **Organisation:** An organised group of people with a particular purpose, such as a business or government department.
- **Intermediary:** A person who acts as a link between people in order to try and bring about an agreement. Firm or person (such as a broker or consultant) who acts as a mediator on a link between parties to a business deal, investment decision, negotiation, etc.

1.7 SELFASSESSMENT QUESTIONS

1. Discuss the meaning and concept of channel management.

2. Explain the various flows in marketing channels.

1.8 LESSON AND EXERCISE

1. Discuss the functions of distribution channels.

2. What is channel of distribution?

1.9 SUGGESTED READINGS

- Kotler, P. and Armstrong, G. *Principles of Marketing*. Pearson Prentice Hall.
- Kotler, P., Armstrong, G., Saunders, J. and Wong, V. *Principles of Marketing*. Prentice Hall Europe.
- Kotler, P. *Marketing Management*. Prentice-Hall, Inc. A Pearson Education Company. Upper Saddle River, New Jersey

C. No. : MK-401**UNIT I**

SEMESTER : IV**LESSON : 2**

**CHANNEL MANAGEMENT ACTIVITIES, CURRENT CHALLENGES IN
CHANNEL MANAGEMENT AND OBJECTIVES IN CHANNEL
MANAGEMENT**

STRUCTURE

- 2.1 Introduction
- 2.2 Objectives
- 2.3 Channel Management Activities
- 2.4 Current Challenges in Channel Management
- 2.5 Objectives in Channel Management
- 2.6 Summary
- 2.7 Glossary
- 2.8 Self-Assessment Questions
- 2.9 Lesson End Exercise
- 2.10 Suggested Readings

2.1 INTRODUCTION

Few producers sell their goods directly to final users. Instead, most use intermediaries to bring their products to market. They try to forge a marketing channel (or distribution channel)—a set of interdependent organizations that help make a product or service available for use or consumption by the consumer or business user.

A company's channel decisions directly affect every other marketing decision. Pricing depends on whether the company works with national discount chains, uses high-quality specialty stores, or sells directly to consumers via the Web. The firm's sales force and communications decisions depend on how much persuasion, training, motivation, and support its channel partners need. Whether a company develops or acquires certain new products may depend on how well those products fit the capabilities of its channel members. For example, Kodak initially sold its EasyShare printers only in Best Buy stores because of the retailer's on-the-floor sales staff and their ability to educate buyers on the economics of paying a higher initial printer price but lower long-term ink costs.

Companies often pay too little attention to their distribution channels—sometimes with damaging results. In contrast, many companies have used imaginative distribution systems to gain a competitive advantage. Enterprise revolutionized the car-rental business by setting up off-airport rental offices. Apple turned the retail music business on its head by selling music for the iPod via the Internet on iTunes. And FedEx's creative and imposing distribution system made it a leader in express delivery.

Distribution channel decisions often involve long-term commitments to other firms. For example, companies such as Ford, McDonald's, or HP can easily change their advertising, pricing, or promotion programs. They can scrap old products and introduce new ones as market tastes demand. But when they set up distribution channels through contracts with franchisees, independent dealers, or large retailers, they cannot readily replace these channels with company-owned stores or Web sites if the conditions change. Therefore, management must design its channels carefully, with an eye on both tomorrow's likely selling environment and today's.

2.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- the channel management activities
- current challenges in channel management
- objectives of channel management

2.3 CHANNEL MANAGEMENT ACTIVITIES

Because distribution is one of the last stages of developing a marketing plan, it often doesn't get the attention it deserves. Without changing your product, price or methods of promotion, you significantly increase your sales and profits — or damage your business — by how you manage your distribution activities. A regular review of your selling methods and locations will help you reach your sales and profit potentials.

- **Analysis**

One of the main distribution channel activities you should perform at least annually is a review of the choices you are using and the ones you aren't. Some distribution channels increase your sales volume but have higher costs that reduce your margins. Some are more expensive, but increase your gross profits. Where you sell your product sends a message to consumers about your brand. If you haven't already, review the effect of every distribution channel available to you based on each one's effect on your sales volumes, profit margins, gross profits, brand and office support necessary. Do this for channels you've previously decided against using to determine if you've made the right choice based on all the available information.

- **Contract Negotiations**

If you use a wholesaler, retailers, distributors, independent sales reps or sales firms, telemarketing firms, online affiliates or any other form of non-direct sales channel, review your contract terms each year. When you first negotiate a contract, neither party knows exactly how well the product will sell. Once you see how your product sells, you might have more leverage to improve the terms of your contract. If a sales partner is ordering more from you, it's a good sign they want your business. You might be able to negotiate a lower commission or higher purchase price, or more support in the form of in-store promotions, better display or shorter credit terms for inventory that partners order.

- **Promotion**

Both you and your distribution partners have a responsibility to promote your product if you both want maximum sales. Educate your partners to ensure they know who your target customer is, what your unique selling benefit is and what your branding goals are. Ask if your distributors need in-store signage, occasional discounts, different packaging,

rebates or other promotional support that will create destination or impulse buys. Visit the locations and websites of your partners to determine if they are promoting you the same way you would. If not, give them specific suggestions for how they can increase sales of your products.

- **Ranking**

Rank the performance of your distribution channels in a variety of categories to determine if it's time to drop some, boost your participation in others or tweak certain channels. Rank your distribution channels by the following: cost of sales, profit margin, gross profit, sales volume, returns, receivables turnover and administrative resources needed to maintain the channel. While gross profits might seem to be your main goal, addressing issues such as low volumes or margins or high cost of sales or returns might help turn lower-ranked channels into your best performers.

2.4 CURRENT CHALLENGES IN CHANNEL MANAGEMENT

Channel management is complex primarily because of what it tries to manage. The word “management” implies some level of control to achieve performance from an individual or from a team, either through inspiration or through some level of enforcement. The meaning of “management” varies greatly when it comes to an organisation's structure—depending on whether it's a startup, a more mature company or a governmental organisation like the military. However, in every one of those instances there is a direct relationship between the manager and the subordinate or employee or team member. In the case of a reseller network or a partner network, that relationship is very different, and it presents some unique challenges. Let's take a moment to explore those challenges.

a) Channel partners are companies, not people.

Ordinarily when we talk about management, where there is some level of control over employees or consultants or contractors, we are exerting some level of control over people. But when we talk about managing a channel, the level of control is much lower: first of all because it's an indirect sales force and, second, as I've already noted, we're managing companies, not people. Of course those companies are made up of people—sales people, technical people, marketing people—but in the end we're trying to manage

an entity rather than individuals. That's an important difference that creates a huge amount of complexity.

b) Channel partners do not report to vendors.

In the case of a direct sales force, there is a hierarchy. You have a manager who reports to a director who may report to a VP, but with a channel organization, you have a company reporting to a channel account manager or a partner business manager. That reporting relationship is indirect. If some partners don't perform over one or two or three quarters, they don't get fired for missing their mark. They may miss some incentives, but they don't get fired for poor performance. Eventually, if a partner doesn't perform over a long period of time, that partner may be replaced, but it doesn't happen as quickly as it would when you're managing a direct sales force.

c) Channel partners have their own priorities.

The challenge here is that those priorities do not necessarily align with the priorities of a vendor. If a vendor is trying to promote a specific product or trying to penetrate a specific market—say, verticals like manufacturing or healthcare or whatever—it may or may not be in the interest of the partner to carry out those activities. So it's crucial for the organization to understand what the priorities of those partners are instead of randomly pushing programs and deploying resources.

d) There are different types of partners, and they require different engagement models.

Some partners sell to small and medium-size businesses (SMBs), some partners sell to midmarket organizations, some sell to enterprises and some sell to all or a combination of two or more segments. For an organization to align behind the needs of various types of partners, have appropriate programs and make them meaningful requires a significant level of thinking and homework which, a lot of times, companies skip. Therefore, many of the initiatives that are rolled out in the channel don't really have an impact. In addition to differences in types of partners—what we might call practices or areas of focus—there are also differences in relationship based on revenue. Partners who are larger—larger in the sense that they carry a bigger portion of a vendor's revenue—tend to be more important to the vendors than those partners who don't carry a lot of products. Aligning the appropriate

level of resources with high-velocity and high-volume partners vs. low-velocity, low-volume partners is critical, and that can make **channel management** quite complex.

e) A partner's loyalty is driven by financial motives.

Just like in a startup environment, where people may be partly motivated by a belief in a cause or inspiration but are ultimately driven by the prospect of financial gain, most of the time the relationship between a partner and a vendor is fundamentally driven by financial gain. If the path toward that financial gain is not clearly defined, it can cause a lot of friction. Similarly, if the expectations change or are realigned with respect to an initiative, that can create complexity.

f) Partner success depends on their competencies in an ecosystem.

Very rarely does a partner—especially in the technology or solution domain—sell only one product. So, for example, if a partner is selling to the construction industry or the technology sector or manufacturing or other areas of high tech, that partner may carry two, three, four or as many as 50 different vendors. A partner's competencies play a big role in determining its interest in a specific set of solutions. Understanding that and aligning behind those competencies is critical for success. One last point: While many companies have alliance programs, and they tend to apply them to solution selling, they do not apply much to franchise or retail businesses. Therefore, if an organization is addressing those types of markets, the level of complexity can be quite high.

g) Forecasting is very hard when it comes to run rate and large-deal businesses.

One of the major challenges in channel marketing is developing forecasts, especially if a company is growing. In cases where there is a revenue business, and the revenue doesn't change much from quarter to quarter—which may be the typical scenario with retail and franchises—it's relatively easy to predict within a few percentage points what the demand is going to be. However, if the economy is in distress, or certain product categories are growing faster, one of the big challenges is to work with the partner base and come up with a forecasting model. This is where understanding various types of partners, their own sales velocity and the mix behind that velocity is critical. Without proper systems and processes in place, it is incredibly difficult for vendors to come up with these forecasts.

These seven major **channel management** challenges are common across every type of channel. Of course, there are other types of challenges that may be very specific to a market segment or a country. However, if these seven challenges are not addressed consistently in each market in which a vendor participates, the maturity of the channel and the realization of the potential may vary greatly.

So let's talk a bit about the solutions for overcoming these challenges when it comes to **channel management**.

Solutions

a) A structured channel program.

Every company needs a structured channel program. It may not be a single program but a set of programs aligned behind different types of partners—by their verticals, their competencies, by their sales mix, by their location: different strokes for different folks. Thinking that through in a systematic way can reduce a lot of waste and frustrations for both parties involved as you try to grow your business.

b) Ease of doing business – doing less to get more done via channel.

Ease of doing business comes up as a major factor when it comes to channel management on both the partner side and the vendor side. Often the account manager ends up spending an enormous amount of time fielding emails, phone calls, etc. from partners. That problem can be addressed through a proper structure. That may mean sales concierges or partner marketing concierges, or it can be a combination of inside, outside and field support, but thinking through that structure and optimising the productivity of the organization is critical. Many times when smaller organizations get acquired by larger ones, by default the larger organisation tends to roll the acquired organization into their existing structure, and even though on the surface this integration may make sense, in reality a lot of the supporting infrastructure that was actually working and making the smaller entity successful falls apart. This is why a lot of acquisitions that occur in the technology space don't realise their potential, because when it comes to ease of doing business, that structure gets changed dramatically.

c) Systems for partner relationship management and partner marketing management.

While enterprise resource automation—as well as sales force automation and more recently marketing automation—has been around for a while, very few companies have deployed structured systems when it comes to partner relationship management and partner marketing management. With a little bit of investment and structure in this area, a company can realize significant returns and reduce labor costs, increase ease of doing business and create a structure around their channel programs. This leads to my fourth point:

d) Program alignment – training, product promotions, incentives.

When we think about partner training, product promotions, incentives related to rewards, rebates, market development funds and so on, it is very important to think through these programs in a systematic way. Throwing out a bunch of incentives just for the sake of doing it—we see it all the time: \$100 rewards for certain activities, \$1,000 prizes, opportunities to win an iPad—really doesn't make a lot of sense for partners. That's because, fundamentally, if the incentives are not aligned with selling a product or service, they will not go the extra mile for the sake of winning an iPad or whatever. But when programs are aligned and a channel is performing, it's a different story, which leads to my last solution:

e) Celebrate success – make it fun. Many vendors do have annual partner conferences where they award a premier partner or two or perhaps more across certain categories. That is incredibly important, and it's quite common. But it's not enough. For a channel to maintain its energy and its direction and its commitment, it needs continuous management through celebration of success. Sales is a competitive sport. Making it fun, making it relevant and allowing the partners—especially when it comes to the individual (sales reps, marketing folks, technical people)—celebrating success by sharing good news, by touting the fact they have done something tangible for a specific vendor by posting on social media or through other channels, can have a profound impact and create excitement.

2.5 OBJECTIVES IN CHANNEL MANAGEMENT

A distribution channel is a network of firms that are interconnected in their quest to provide sellers a means of infusing the marketplace with goods and buyers a means of

purchasing those goods, doing all as efficiently and profitably as possible.

The channels of distribution are designed to achieve following objectives:

1. *Product Availability:*

The first objective is to make available the product to the consumer who wants to buy it. The availability has two aspects – the desired level of coverage in terms of appropriate retail outlets and secondly, the positioning of the product within the store. Product availability is important for consumer convenience goods, where customer does not wait to buy a particular brand. However, for unique and important products immediate availability is less critical.

2. *Meeting Customers' Service Requirements:*

To meet the service requirements and create differentiation over competitors, channels become critical. Some of the service requirements may include – order cycle time (how long it takes to receive, process and deliver an order), dependability (consistency and reliability of delivery), communication between buyer and seller (to sort out problems spontaneously), convenience ((to accommodate the special needs of different customers), and post-sale (installation, user training, help lines, repair, and spare parts availability).

3. *Promotional Support:*

It includes strong support from the channel member for the firm's product, including the use of local media, in-store displays, and cooperation in special promotion events. This kind of support is especially important in case of highly competitive market phenomenon, complex and expensive consumer durables or industrial goods, or a differentiator defender is trying to attain a competitive advantage.

4. *Market Information:*

Since intermediaries are in the marketplace and near to consumers they are the best and first hand source of getting feedback with regard to sales trends, inventory levels, competitors' moves and customers' reactions.

5. *Cost-Effectiveness:*

Costs to be incurred to attain the firm's channel objectives should not be too much in relation to gains. There is often a tradeoff between channel costs, associated with physical distribution activities such as transportation and inventory storage, and achieving high levels of performance on many other objectives.

6. *Flexibility:*

A flexible channel is one where it is relatively easy to switch channel structures or add new types of middlemen without generating costly economic or legal conflicts with existing channel members.

2.6 SUMMARY

In the field of marketing, channels of distribution indicates routes or pathways through which goods and services flow, or more from producers to consumers.

We can define formally the distribution channels as the set of interdependent marketing institutions participating in the marketing activities involved in the movement the flow of goods or services from the primary producers to ultimate consumers.

A channel of distribution is a path traced in the direct or indirect transfer of ownership of a product as it moves from producers to consumers.

A channel is pipeline through which a flows on its way to the consumers. The manager put his products into the pipeline marketing channels and it moves towards various marketing people and reaches the ultimate consumer which is the other end of the channels.

Distribution channels are pathways along which products travel from producers and manufacturers to ultimate consumers. They are routes along which products, information, and finance flow. While some manufacturers deal directly with their customers, most manufacturers use a distribution channel to take products to consumers. Considerable thought, effort, and investment are required to create and maintain a distribution channel.

2.7 GLOSSARY

- **Channel Management:** Channel management is a marketing management activity that involves handling the different streams employed by a company to sell its products or services.
- **Channel Partner:** A *channel partner* is a company that *partners* with a manufacturer or producer to market and sell the manufacturer's products, services, or technologies.
- **Competency:** The combination of observable and measurable knowledge, skills, abilities and personal attributes that contribute to enhanced employee performance and ultimately result in organisational success.
- **Forecasting:** A planning tool that helps management in its attempts to cope with the uncertainty of the future, relying mainly on data from the past and present and analysis of trends. *Forecasting* starts with certain assumptions based on the management's experience, knowledge, and judgment.

2.8 SELFASSESSMENT QUESTIONS

1. Discuss the channel management activities.

2. Write a note on current challenges in channel management.

2.9 LESSON AND EXERCISE

1. Discuss the solutions for overcoming the challenges of channel management.

2. What are the objectives of channel management?

2.10 SUGGESTED READINGS

- Kotler, P. and Armstrong, G. *Principles of Marketing*. Pearson Prentice Hall.
- Kotler, P., Armstrong, G., Saunders, J. and Wong, V. *Principles of Marketing*. Prentice Hall Europe.
- Kotler, P. *Marketing Management*. Prentice-Hall, Inc. A Pearson Education Company. Upper Saddle River, New Jersey

C. No. : MK-401**UNIT I**

SEMESTER : IV**LESSON : 3**

COMPETITION IN MARKETING CHANNELS AND TYPICAL CHANNEL MANAGEMENT DECISION

STRUCTURE

- 3.1 Introduction
- 3.2 Objectives
- 3.3 Competition in Marketing Channels3.3.1 Types of Channel competition
- 3.4 Typical Channel Management Decisions
- 3.5 Summary
- 3.6 Glossary
- 3.7 Self-Assessment Questions
- 3.8 Lesson End Exercise
- 3.9 Suggested Readings

3.1 INTRODUCTION

Competition is the rivalry between companies for market share in a target market where the customers have similar needs and wants. **Competition** is the rivalry between companies selling similar products and services with the goal of achieving revenue, profit, and market share growth. Market competition motivates companies to increase sales volume by utilizing the four components of the marketing mix, also referred to as the four P's. These P's stand for product, place, promotion, and price. Knowing and understanding your competition is a critical step in designing a successful marketing strategy. If you are not aware of who the competition is and knowledgeable about their strengths and

weaknesses, it's likely that another firm could enter the picture and provide a competitive advantage, such as product offerings at lower prices or value added benefits. Identifying your competition and staying informed about their products and services is the key to remaining competitive in the market and is crucial to the survival of any business.

A marketer's job doesn't ends at serving the needs and wants of the target customers. There may other companies as well who may see the same needs and wants. They may enter the same market with similar kind of products. The competition can be from an existing firm or the competitor may enter after the organisations product launch.

Competitor analysis forms an integral part of the marketing strategy. The analysis is based on the threats and opportunities basis the strengths and weaknesses of the existing or emerging competitors.

The firms counter competition by making changes to the marketing program or the 4P's – Product, Price, Place, and Promotion.

For example, with the increasing demand of smart phones there is a stiff competition to market leaders like Samsung and Apple from new brands like LeEco, Xiomi, Oppo, and Micromax. Basis the market predictions in developing countries like India with a population of over a billion, many smart phone manufacturers are leaving no stone unturned to increase their market share. Motorola too entered the Indian market few years back to tap the opportunities available amid competition from Samsung, htc, Sony and Apple.

3.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- the competition in marketing channels
- types of channel competition
- typical channel management decisions
- Channel power
- Channel partnerships

3.3 COMPETITION IN MARKETING CHANNELS

In everyday life, we buy goods from retail stores. However, it is rarely the case that we buy only goods from them. There are various kinds of accompanying services such as providing product information, delivery, wrapping, and repair services. Location and amenity of their stores are also important retail services, making shopping easy and pleasant. Product quality is a kind of services, which are very important for us, since we want products being just right for us. In other words, retail stores are competing each other intensely with various aspects of retail services, as well as their price.

In channel competition efforts are made by marketer within a channel of distribution, or by channels as a whole, to establish dominance over the others. For example, the restaurants in a downtown district compete with each other for customers as well as for the best locations and suppliers. The same restaurants also compete as a group against home/office meal delivery services. A restaurant can gain an advantage by differentiating itself from the rest of the competitors in the channel. For example, it might offer a formal lunch club opens to members' only or guaranteed 15-minute service for informal lunches. It can be difficult for a marketer to determine when a company that used to be part of a different distribution channel becomes a competitor within the same channel, such as in the case of Sears versus Wal-Mart or Continental versus Southwest Airlines.

3.3.1 Types of Channel competition

i. Horizontal Channel Conflicts

A horizontal conflict refers to a disagreement among two or more channel members at the same level. For example, suppose a toy manufacturer has deals with two wholesalers, each contracted to sell products to retailers in different regions. If one wholesaler decides to branch its operations into the other wholesaler's region, a conflict will result. If the toy manufacturer doesn't help solve the problem, its business dealings with both the wholesalers – and the downstream retailers, as well – might be in jeopardy.

ii. Vertical Channel Conflicts

Vertical conflicts involve a disagreement between two channel members on consecutive levels. For example, if the toy manufacturer discovers its products are arriving at retail stores later than scheduled, a conflict might develop between the

manufacturer and the wholesaler responsible for shipping to retailers. At the same time, the retail stores might be in conflict with the wholesaler due to its inability to ship products on time.

iii. Intertype Conflict

It refers to competition among different types of intermediaries at the same level in the channel. This kind of competition has intensified since the advent of 'scrambled merchandising' by retailers (where retailers add new product lines that are unrelated to their normal lines of business) e.g. supermarkets have added homewares and clothing to their product lines, offering consumers a wider product range and attaining higher margins. Intertype conflict is significant as it reflects a way in which industries remain efficient and respond to changing market conditions.

iv. Multichannel Conflicts in Separate Marketing Channels

Multichannel conflicts refer to disagreements among members in separate marketing channels. While neither strictly horizontal nor vertical, these conflicts can affect all members of every channel. For instance, suppose the toy manufacturer participates in two marketing channels. In the first channel, the manufacturer sells its products directly to consumers via its official website.

In the second channel, the manufacturer sells its products to wholesalers for resale to retailers. If the toy manufacturer's website sells the products for much lower prices than retail stores, sales in the second channel will plummet. The resulting conflict will require some solution that works for both channels.

3.4 TYPICAL CHANNEL MANAGEMENT DECISIONS

After a company has chosen a channel system, it must select, train, motivate and evaluate individual intermediaries for each channel. It must also modify channel design and arrangements over time. As the company grows, it can also consider channel expansion into international markets.

(i) Selecting Channel Members

To customers, the channels are the company. Consider the negative impression

customers would get of McDonald's Shell Oil or Mercedes-Benz if one or more of their outlets or dealers consistently appeared dirty, inefficient or unpleasant.

To facilitate channel member selection, producers should determine what characteristics distinguish the better intermediaries-number of years in business, other lines carried, growth and profit record, financial strength, cooperativeness, and service reputation. If the intermediaries are sales agents, producers should evaluate the number and character of other lines carried and the size and quality of the sales force. If the intermediaries are department stores that want exclusive distribution, their locations, future growth potential, and type of clientele will matter.

ii) **Training and Motivating Channel Members**

A company needs to view its intermediaries the same way it views its end users. It should determine their needs and wants and tailor its channel offering to provide them with superior value.

Carefully implemented training, market research and other capability-building programs can motivate and improve intermediaries' performance. The company must constantly communicate that intermediaries are crucial partners in a joint effort to satisfy end users of the product. Microsoft requires its third-party service engineers to complete a set of courses and take certification exams. Those who pass are formally recognised as Microsoft Certified Professionals and can use this designation to promote their own business. Other firms use customer surveys rather than exams.

CHANNEL POWER

Producers vary greatly in their skill in managing distributors. Channel power is the ability to alter channel members' behaviour so they take actions they would not have taken otherwise. Manufacturers can draw on the following types of power to elicit cooperation:

- ***Coercive power.*** A manufacturer threatens to withdraw a resource or terminate a relationship if intermediaries fail to cooperate. This power can be effective, but its exercise produces resentment and can lead the intermediaries to organise countervailing power.

- **Reward power.** The manufacturer offers intermediaries an extra benefit for performing specific acts or functions. Reward power typically produces better results than coercive power, but intermediaries may come to expect a reward every time the manufacturer wants certain behaviour to occur.
- **Legitimate power.** The manufacturer requests a behaviour that is warranted under the contract. As long as the intermediaries view the manufacturer as a legitimate leader, legitimate power works.
- **Expert Power.** The manufacturer has special knowledge the intermediaries acquire this expertise, however, expert power weakens. The manufacturer must continue to develop new expertise so intermediaries will want to continue cooperating.
- **Referent power.** The manufacturer is so highly respected that intermediaries are proud to be associated with it. Companies such as IBM, Caterpillar and Hewlett-Packard have high referent power.

Coercive and reward power are objectively observable, legitimate, expert and referent power are more subjective and depend on the ability and willingness of parties to recognize them.

Most producers see gaining intermediaries' cooperation as a huge challenge. They often use positive motivators, such as higher margins, special deals, premiums, cooperative advertising allowances, display allowances and sales contests. At times they will apply negative sanctions, such as threatening to reduce margins, slow down delivery, or terminate the relationship. The weakness of this approach is that the producer is using crude, stimulus-response thinking.

In many cases, retailers hold the power. Manufacturers offer the nation's supermarkets between 150 and 250 new items each week, of which store buyers reject over 70 percent. Manufacturers need to know the acceptance criteria buyers, buying committees and store managers use. ACNielsen interviews found that store managers were most influenced by (in order of importance) strong evidence of consumer acceptance, a well-designed advertising and sales promotion plan and generous financial incentives.

CHANNEL PARTNERSHIPS

More sophisticated companies try to forge a long-term partnership with distributors. The manufacturer clearly communicates what it wants from its distributors in the way of market coverage, inventory levels, marketing development, account solicitation, technical advice and service and marketing information and may introduce a compensation plan for adhering to the policies.

To streamline the supply chain and cut costs, many manufacturers and retailers have adopted *efficient consumer response (ECR) practices* to organise their relationships in three areas: (1) *demand side management* or collaborative practices to stimulate consumer demand by promoting joint marketing and sales activities, (2) *supply side management* or collaborative practices to optimize supply (with a focus on joint logistics and supply chain activities), and (3) *enablers and integrators*, or collaborative information technology and process improvement tools to support joint activities that reduce operational problems, allow greater standardization and so on.

Research has shown that although ECR has a positive impact on manufacturers' economic performance and capability development, manufacturers may also feel they are inequitably sharing the burdens of adopting it and not getting as much as they deserve from retailers.

iii) Evaluating Channel Members

Producers must periodically evaluate intermediaries' performance against such standards as sales-quota attainment, average inventory levels, customer delivery time, treatment of damaged and lost goods and cooperation in promotional and training programs. A producer will occasionally discover it is overpaying particular intermediaries for what they are actually doing. One manufacturer compensating a distributor for holding inventories found the inventories were actually held in a public warehouse at its own expense. Producers should set up functional discounts in which they pay specified amounts for the trade channel's performance of each agreed upon service. Underperformers need to be counseled, retrained, motivated or terminated.

iv) Modifying Channel Design and Arrangements

No channel strategy remains effective over the whole product life cycle. In competitive markets with low entry barriers, the optimal channel structure will inevitably change over time. The change could mean adding or dropping individual market channels or channel members or developing a totally new way to sell goods.

Channel Evolution

A new firm typically starts as a local operation selling in a fairly circumscribed market, using a few existing intermediaries. Identifying the best channels might not be a problem; the problem is often to convince the available intermediaries to handle the firm's line.

If the firm is successful, it might branch into new markets with different channels. In smaller markets, the firm might sell directly to retailers; in urban areas, with limited-line merchants. It might grant exclusive franchises or sell through all willing outlets. In one country, it might use international sales agents; in another, it might partner with a local firm.

Early buyers might be pay for high-value-added channels, but later buyers will switch to lower-cost channels. Small office copiers were first sold by manufacturers' direct sales forces, later through office equipment dealers, still later through mass merchandisers and now by mail-order firms and internet marketers.

In short, the channel system evolves as a function of local opportunities and conditions, emerging threats and opportunities, company resources and capabilities and other factors.

v) Channel Modification Decisions

A producer must periodically review and modify its channel design and arrangements. The distribution channel may not work as planned, consumer buying patterns change, the market expands, new competition arises, innovative distribution channels emerge and the product moves into later stages in the product life cycle.

Adding or dropping individual channel members requires an incremental analysis. Increasingly detailed customer databases and sophisticated analysis tools can provide guidance into those decisions. A basic question is: What would the firm's sales and profits look like with and without this intermediary?

Perhaps the most difficult decision is whether to revise the overall channel strategy. Avon's door-to-door system for selling cosmetics was modified as more women entered the workforce. Despite the convenience of automated teller machines, online banking and telephone call centers, many bank customers still want "high touch" over "high tech", or at least they want the choice. Banks are thus opening more branches and developing cross-selling and up-selling practices to capitalize on the face-to-face contact that result.

vi) Global Channel Considerations

International markets pose distinct challenges, including variations in customers' shopping habits, but opportunities at the same time. In India, sales from "organised retail" – hypermarkets, supermarkets and department stores - make up only 4 percent of the \$322 billion market. Most shopping still takes place in millions of independent grocery shops or kirana stores, run by an owner and one or perhaps two other people. Many top global retailers such as Germany's Aldi, the United Kingdom's Tesco and Spain's Zara have tailored their image to local needs and wants when entering a new market.

Franchised companies such as Curves women's fitness centers and Subway sandwich shops have experienced double-digit growth overseas, especially in developing markets such as Brazil and Central and Eastern Europe. In some cases, master franchisees pay a significant fee to acquire a territory or country where they operate as a "mini-franchiser" in their own right. More knowledgeable about local laws, customs and consumer needs than foreign companies, they sell and oversee franchises and collect royalties.

But many pitfalls exist in global expansion and retailers must also be able to defend their home turf from the entry of foreign retailers. Selling everything from food to televisions, France's Carrefour, the world's second-biggest retailers, has encountered stiff competition in its home markets from smaller supermarkets for groceries and from specialist retailers such as IKEA or Fnac for other goods. Although strong in parts of Europe, Asia and Latin America, Carrefour (which means "crossroads" in French) has been forced to cease operations in a number of countries, such as Japan, South Korea, Mexico, Czech Republic, Slovakia, Russia, Switzerland, and Portugal. Another of France's mega-retailers the Walmart-like Auchan, has been quite successful in entering emerging markets like China while unable to crack markets in the United States or Britain.

The first step in global channel planning, as is often the case in marketing, is to get close to customers. To adapt its clothing lines to better suit European tastes, Philadelphia-based Urban Outfitters set up a separate design and merchandising unit in London before it opened its first store in Europe. Although they increased costs, the blended American and European looks helped the retailers stand out. Crossing the Atlantic the other way, Tesco introduced its Fresh & Easy gourmet mini supermarkets into California after 20 years of research that included spending time with U.S. families and videotaping the contents of their refrigerators. The retailer had gone through similar steps before entering China.

A good retail strategy that offers customers a positive shopping experience and unique value, if properly adapted, is likely to find success in more than one market. Take Topshop for instance.

Topshop: Founded by Sir Richard Green in the United Kingdom in 1994, clothing retailer Topshop is a chain of 310 UK stores and 116 international franchisees that commands intense loyalty from its trendy, style-obsessed customer base. Selling primarily party clothes, accessories and daywear to women, Topshop blends English street fashion, reasonable prices and fun services. A higher-end, quirkier version of fast-fashion chains H&M and Zara, Topshop allows middle-market consumers to dress upscale affordably. Partnering with style icons Kate Moss, Stella Vine, and Celia Birtwell to create the latest designs, Topshop offers style advisors, Topshop-to-Go (a Tupperware-type party that brings a style advisor to a customer's home with outfits for up to 10 people) and Topshop Express (an express delivery service via Vespa scooters for fashion "emergencies"). The 60,000 square foot store on Broadway in New York City is Topshop's second biggest and first flagship store outside the United Kingdom.

3.5 SUMMARY

We now look at several channel decisions manufacturers face. In designing marketing channels, manufacturers struggle between what is ideal and what is practical. A new firm with limited capital usually starts by selling in a limited market area. Deciding on the best channels might not be a problem: The problem might simply be how to convince one or a few good intermediaries to handle the line.

If successful, the new firm can branch out to new markets through existing intermediaries. In smaller markets, the firm might sell directly to retailers; in larger markets, it might sell through distributors. In one part of the country, it might grant exclusive franchises; in another, it might sell through all available outlets. Then it might add a Web store that sells directly to hard-to-reach customers. In this way, channel systems often evolve to meet market opportunities and conditions.

For maximum effectiveness, however, channel analysis and decision making should be more purposeful. Marketing channel design calls for analyzing consumer needs, setting channel objectives, identifying major channel alternatives, and evaluating those alternatives.

3.6 GLOSSARY

- **Competition:** Competition is the rivalry between companies selling similar products and services with the goal of achieving revenue, profit, and market share growth.
- **Competition Analysis:** It is the analysis is based on the threats and opportunities basis the strengths and weaknesses of the existing or emerging competitors.
- **Horizontal Conflict:** A horizontal conflict refers to a disagreement among two or more channel members at the same level.
- **Vertical conflicts:** Vertical conflicts involve a disagreement between two channel members on consecutive levels.
- **Intertype Conflict:** It refers to competition among different types of intermediaries at the same level in the channel.
- **Multichannel conflicts:** Multichannel conflicts refer to disagreements among members in separate marketing channels.

3.7 SELF-ASSESSMENT QUESTIONS

1. Discuss the different types of channel competition.

2. Explain typical channel management decisions.

3.8 LESSON AND EXERCISE

1. Write a note on channel power.

2. What do you mean by channel competition?

3.9 SUGGESTED READINGS

- Kotler, P. and Armstrong, G. *Principles of Marketing*. Pearson Prentice Hall.
- Kotler, P., Armstrong, G., Saunders, J. and Wong, V. *Principles of Marketing*. Prentice Hall Europe.
- Kotler, P. *Marketing Management*. Prentice-Hall, Inc. A Pearson Education Company. Upper Saddle River, New Jersey

**MANAGING SINGLE CHANNELS, A TYPOLOGY OF MARKETING
CHANNELS AND IN-HOUSE VS. OUTSOURCED DISTRIBUTION**

STRUCTURE

- 4.1 Introduction
- 4.2 Objectives
- 4.3 Managing Single Channels
 - 4.3.1 Advantages of Single-channel Management
 - 4.3.2 Disadvantages of Single-channel Management
- 4.4 A Typology of Marketing Channels
- 4.5 In House Vs. Outsourced Distribution
- 4.6 Summary
- 4.7 Glossary
- 4.8 Self-Assessment Questions
- 4.9 Lesson End Exercise
- 4.10 Suggested Readings

4.1 INTRODUCTION

Companies often pay too little attention to their distribution channels. Managers who see channel functions merely as the physical transportation, storage and distribution of finished goods to the end-user fail to utilize the channel of distribution as a competitive weapon.

AH we saw in the case of Economos, like the rest of its competitors in the seal-making industry, the firm had relied on the use of a rigid distribution channel system. Constraints in materials and production technologies were generally accepted to rule out speed and flexibility in small-order delivery. However, by forceful investment in techno-logical innovations, Economos overcame these barriers and found a means of creating superior channel advantage - closeness to customers, flexibility, no order-size restriction, faster customer-order response time, international reach, lower costs, higher margins and rewards for its distributors and entrepreneurial franchises. It had used a more imaginative distribution system to gain a competitive advantage.

Distribution channel decisions often involve long-term commitments to other firms. For example, companies can easily change their advertising, pricing or promotion programmes. They can scrap old products and introduce new ones as market tastes demand. But when they set up distribution channels through contacts with franchises, independent dealers or large retailers, they cannot readily replace these channels with company-owned stores if conditions change. Therefore, management must design its channels carefully, with an eye on tomorrow's likely selling environment as well as today's. In the case of Economos, the use of franchises has enabled it to expand its distribution network outside Austria, but these intermediaries must be properly managed if they are successfully to maintain sales, the Seal-Jet brand name and market position. Economos has to revise its channel strategy to maintain cost-effective service delivery to customers. Single market reforms in the European Union have forced many companies to review their entire distribution strategy. The use of third-party as opposed to in-house distribution in the grocery retailing sector, for example, is on the increase, and current operators in Europe must look for new ways to differentiate their services by taking advantage of the trend.

4.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- managing of single channels
- advantages and disadvantages single channel management
- typology of marketing channels
- In-house Vs. Outsourced distribution

4.3 MANAGING SINGLE CHANNELS

Think again about your own shopping behavior. Perhaps you're frequently in-store to see the products in-person. Maybe you shop on-line, visiting the store or brand's websites? Are you connected with retailers or brands on Facebook? Do you follow them on Twitter to learn about new items, special releases or sales? Have you checked on Instagram to find them? Do you participate in fan boards or blogs to track updates or read reviews?

It's possible that many, if not all, of these activities are reflected in your shopping behavior. Many of these behaviors are very common, as shopper behavior has undergone radical change, supported by greater access to technology and heightened expectations around service and responsiveness.

Why then, with so many channels available, would a brand or retailer choose to engage in anything other than the multi-channel? Simply, there are certain advantages and disadvantages to each channel strategy. That is, not all firms have the need or are capable of managing the expense of maintaining multiple channels well, especially knowing consumers' requirements for accessibility, consistency and service.

Single channel refers to a producer or retailer's effort to reach customers through only one distribution option, regardless of whether it's online, catalogue, mail-order, face-to-face selling or traditional retail. This approach reduces marketing investments and organizational complexity. However, the risk with this approach is missed selling opportunities as customers shop alternative channels. This is particularly risky, given how connected and empowered consumers are in the digital age. Weber Grills and Jacuzzi Hot Tubs are both examples of manufacturers that sell through established dealer distribution networks.

When marketers use single-channel marketing strategies, they tend to focus your business on a single means of reaching your customers. Organizations wanting to make the most of their marketing efforts must explore the options of single-channel marketing approaches, such as direct mail, and integrated marketing techniques, which combine direct mail with social media elements predominantly on dominant platforms such as Facebook. Whether the goal is to increase business sales or, in the case of some non-profit organizations, simply to find the most effective way to communicate messages to the right audiences, it's important to establish which method gives you the best ROI.

4.3.1 Advantages of Single-channel Management

Single-channel marketing is preferred by many marketers because of the presumed lower costs of marketing via a single channel such as direct mail. It is often assumed that it is quicker to execute a single-channel marketing campaign than it is a multichannel marketing campaign.

- **Lower Costs:** Single-channel marketing can help minimize your marketing expenses. It has been estimated that a single-channel marketing strategy can cost as much as one-third less than multiple-channel strategies. A single-channel marketing campaign also lends itself to being developed and launched more quickly than multiple-channel campaigns.
- **Maintaining Dominance:** If you're lucky enough to dominate the market for your product or service, a single-channel strategy can help you keep that control. De Beers, for example, continued its single-channel strategy in the diamond business well past the change of most industries to multiple-channel strategies. The drawback to using a single-channel market dominance strategy is that success is most likely if your business is either a global power or you control a small local market.

4.3.2 Disadvantages of Single-channel Management

- **Missed Opportunities:** In this digital age, mobile devices, social media, and emerging communication technologies bring additional marketing channels into play. These new technologies also change the shopping, buying and peer-influence behaviors of your customers. The profound focus of a single-channel strategy comes at the expense of missed opportunities in the huge variety of other channels your target customers might be using.
- **Channel Limitations:** A single-channel marketing strategy will only let your business grow as far as your chosen marketing channel is capable of reaching. For example, having a local or regional retail presence will give your brand strong visibility in those communities, but will cost your business from online shoppers in other locations. On the other hand, using online sales as your single channel is

often less effective at building relationships with your customers. Each channel has its strengths and limitations.

4.4 A TYPOLOGY OF MARKETING CHANNELS

Marketing channel refers to the means through which the physical distribution of goods takes place from the manufacturer to the customers, either directly or through intermediaries. Multi-Channel marketing can also be adopted by the manufacturer if he finds it suitable for his product and the business. In simple words, marketing channels are a medium to facilitate the effective physical exchange of goods or services. Marketing channels are the ways that goods and services are made available for use by the consumers. All goods go through channels of distribution, and the marketing depends on the way your goods are distributed. The route that the product takes on its way from production to the consumer is important because a marketer must decide which route or channel is best for his particular product. The following are the different typology of marketing channels:

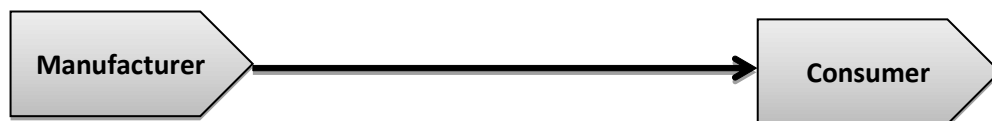
- ***Consumer Channels***

Manufacturers may reach out to consumers either directly, i.e., without using distribution channels, or by using one or more distribution channel members.

(i) Manufacturer to consumer:

Direct marketing includes use of personal selling, direct mail, telephone selling and internet. Avon cosmetics, Tupperware, Aqua guard and Amazon.com are examples of companies engaged primarily in direct marketing.

The company contacts customers directly through salespersons, mail, telephone, or internet and makes sales. The products are sent directly to customers by the manufacturers.



(ii) Manufacturer to retailer to consumer:

Retailers have grown in size. Growth in retailer size means that it has become economic for manufacturers to supply directly to retailers rather than through wholesalers.

Supermarket chains and corporate retailers exercise considerable power over manufacturers because of their enormous buying capabilities. Wal-Mart uses its enormous retail sales to pressurize manufacturers to supply products at frequent intervals directly to their store at concessional prices.



(iii) *Manufacturer to wholesaler to retailer to consumer:*

For small retailers with limited order quantities the use of wholesalers makes economic sense. Wholesalers buy in bulk from producers and sell smaller quantities to numerous retailers.

But large retailers in some markets have the power to buy directly from manufacturers and thus cut out the wholesalers.

These big retailers are also able to sell at a cheaper rate to consumers than retailers who buy from the wholesaler. Wholesalers dominate where retail oligopolies or monopolies are not dominant.



(iv) *Manufacturer to agent to wholesaler to retailer to consumer:*

A company uses this channel when it enters foreign markets. It does not have enough sales to warrant the setting up of a sales and distribution infrastructure, and therefore, it delegates the task of selling its product to an agent who does not take title to the goods. The agent contacts wholesalers in the foreign market and receives commission on sales.

Companies want to sell to larger number of customers, and hence are increasingly using multiple channels to distribute their products.

A company's product may be found in a company-owned store, an exclusive store, a multi-brand store and a discount store simultaneously. Companies have realized that all customers of a product do not buy from the same retailer.



- ***Industrial Channels***

Industrial channels are usually shorter than consumer channels. Direct selling is prevalent due to closer relationship between the manufacturer and the customer, as well as due to the nature of the product sold.

(i) Manufacturer to industrial customers:

This is a common channel for expensive industrial products like heavy equipment's and machines. There needs to be close relationship between the manufacturer and the customer, because the product affects the operations of the buyer.

The seller has to participate in many activities like installation, commissioning, quality control and maintenance jointly with the buyer. The seller is responsible for many aspects of the operations of the product long after the product is sold.

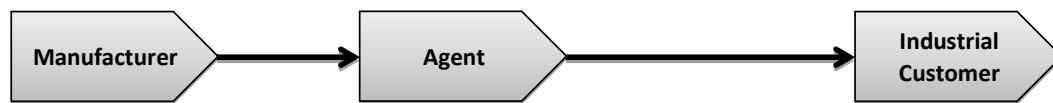
The nature of the product requires a continuing relationship between the seller and the buyer. The large size of the order makes direct selling and distribution economical.



(ii) Manufacturer to agent to industrial customers:

A company that sells industrial products can employ the services of an agent who may sell a range of products from several producers on a commission basis. Such an arrangement spreads selling costs and is beneficial to companies who do not have the resources to set up their own sales and distribution operation.

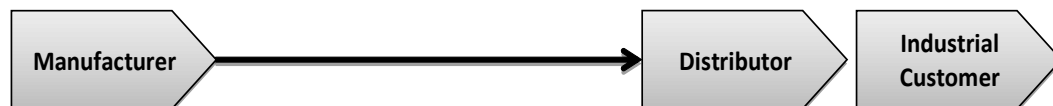
The arrangement allows the seller to reach a large number of customers without having to invest in a sales team. But the company does not have much control over the agent, who does not devote the same amount of time and attention as a company's dedicated sales team.



(iii) Manufacturer to distributor to industrial customers:

For less expensive, more frequently purchased products, distributors are used. The company has both internal and field sales staff. Internal staff deals with customer and distributor generated enquiries and order placing, order follow-up and checking inventory levels. Outside sales staff is proactive.

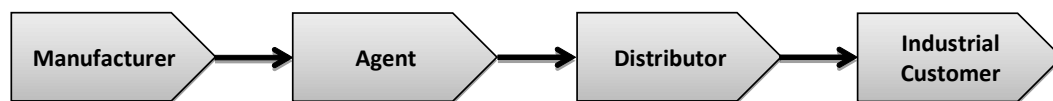
They find new customers, get product specifications, distribute catalogues and gather market information. They also visit distributors to address their problems and keep them motivated to sell the company's products. Distributors enable customers to buy small quantities locally.



(iv) Manufacturer to agent to distributor to industrial customers:

The manufacturer employs an agent rather than a dedicated sales force to serve distributors mainly because it is less expensive to do so.

The agent may sell the goods of several suppliers to an industrial distributor, who further sells it to the business user. This type of channel may be required when business customers require goods rapidly, and when an industrial distributor can provide storage facilities.



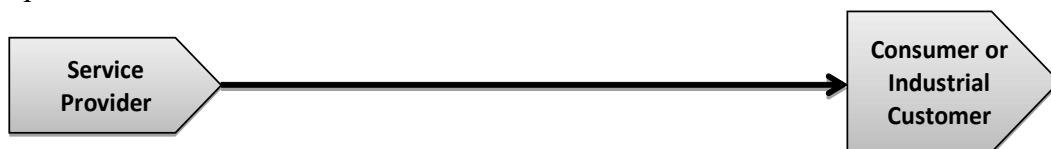
- ***Service Channels***

Distribution channel for services are usually short, and are either direct or use an agent. Since stocks are not held, the role of wholesalers, retailers or industrial distributors does not apply.

(i) Service provider to consumer or industrial customer

Close relationship between service provider and customer means that service supply has to be direct, for instance, healthcare.

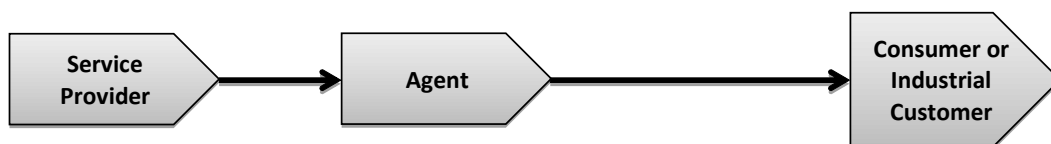
The service provider operates several outlets to reach out to the final consumer or to the industrial buyer. Many service providers such as banks, retail outlets, service centers operate via this distribution channel.



(ii) Service provider to agent to consumer or industrial customer

Agents are used when the service provider is geographically away from customers and when it is not economical for the provider to establish its own local sales team.

For instance, many financial institutions are using this distribution channel to cross sell their services to customers by using a database of existing or potential customers.



(iii) Service provider via internet to consumer or industrial customer

Increasingly, services like music, software solutions and financial information are being distributed via the internet. This distribution channel is successful in case of products which can be downloaded. It is a very useful channel for information products. Nowadays, e-tickets have become very popular.

4.5 IN HOUSE VS. OUTSOURCED DISTRIBUTION

There will come a time in all product-driven businesses when there's a need to re-evaluate the profile and performance of warehousing and distribution operations. This pause-for thought could be kick started by rapid expansion, or the need to lower overheads at a time of increased market pressure. As a business owner or executive manager you will

probably already have some instinct on which route is best for your business, and we thought we would perhaps help clarify your mind by defining what we see being the pros and cons to outsourcing versus owning and operating.

PRO'S

(i) Reduced Capital Investment

If you are to start or grow your own site operation, there are the obvious up-front costs to bear. But in addition to buying or renting space, you will become responsible for securing that space 24/7-365, recruiting and training staff, buying and maintaining plant equipment, installing the racking, and introducing the right HR and IT infrastructure to handle it all. There's sure to be a substantial learning curve that comes with the big bill too!

(ii) Shipping Costs

Naturally, tapping into the accounts of a pallet or courier network provider can pass on significant cost savings to individual businesses. For example, we are able to offer reduced costs to our clients due to the relationships we have built with our networks and representatives and via the economies of scale that are derived by providing that service to numerous individuals.

(iii) Single point-of-contact

If anything goes wrong or you simply want clarification on a matter, you will have one point of contact to sort it out. We will assign you with an Account Manager right from the get-go who's job it is to take much of the headache out of running a product supply or ecommerce business away from you.

(iv) International Orders

At PDX we are well versed in dealing with overseas distribution. At great pains we have discovered but have overcome all the potential pit falls and red tape of importing and exporting goods. We are now so experienced in these areas that if we don't know the answer we know someone who does, so you don't have to worry! For example, trawling through Import Tariff Codes to ensure you pay the correct Duty & VAT is a nightmare and if you get it wrong it can be very costly.

(v) Focus

If your sales are growing and you're keen to capitalise on your potential for expansion, then it's no longer viable to micro-manage the business. Outsourcing your warehousing, distribution and fulfillment operations will leverage your time so substantially, you will probably wish you had done it sooner.

CON'S

(i) Control

For some owners and managers, being able to physically walk amongst their stock on a regular basis, seeing exactly where their investment lies and what shape it's in, gives them a greater sense of ownership and security. We fully understand this but if that's you, maybe instead of jumping in with both feet by moving all your stock to PDX, you could consider outsourcing just your fastest moving product, or a single product line just to test our processes and see how far our performance and provision of real-time online inventory management software might go to alleviate your concerns.

(ii) Low Volumes

Outsourcing your operations to a third-party isn't suitable for all businesses. If you are running a fledgling business and are worried that the cost per cubic feet for storage space will eat into your profits, there is still no harm in talking to one of our experts to see if we can help as the flip side of that coin is, to remember you will also be investing in buying back the time you have lost to DIY and instead can focus on growing your business and increasing sales.

(iii) Costs

We always strive to be competitive in our industry but just like any other business our costs can fluctuate. Therefore it's best to make sure that the financials of outsourcing aren't small but significant. That way if we have to review our prices, you remain in a strong and profitable position.

(iv) Data Protection

We understand that sharing your sales data with a third-party can be a cause for

concern. However we take our contract with you very seriously and we promise never to share your information with anyone.

(v) *Learning Curve*

Never underestimate the time and energy it takes to introduce new teams, processes and equipment into your business. Whilst you may think it will be worth it in the long run, the hard journey to get there might just prove to be your undoing.

Conclusion

Our analysis takes the conclusion that the Pro's out way the Con's. Outsourcing may not be suitable for all companies, but for those of a certain size who are looking to expand it often is, similarly, those who wish to cut fixed costs also see the advantages of outsourcing their order fulfillment.

4.6 SUMMARY

Marketing channels are set of mutually dependent organizations involved in the process of making product or service available for utilization. It is established in academic studies that Marketing channels are the means by which goods and services are made available for use by the customers. All goods go through channels of distribution, and marketing will depend on the way goods are distributed. The direction that the product takes on its way from production to the consumer is imperative because a marketer must choose which channel is best for his particular product. It can be said that channel is the link between manufactures and purchasers. Decisions about the marketing channel system are decisive for management.

The marketing channels chosen by marketers influence all other marketing decisions. The firm's sales force and advertising decisions depend on how much training and inspiration dealers need. Further, channel decisions involve comparatively long-term commitments to other firms. Holistic marketers guarantee that marketing decisions in all these different areas are made to jointly maximize value.

4.7 GLOSSARY

- **Single Channel:** Single channel refers to a producer or retailer's effort to reach customers through only one distribution option, regardless of whether it's online, catalogue, mail-order, face-to-face selling or traditional retail.
- **Marketing Channel:** Marketing channel refers to the means through which the physical distribution of goods takes place from the manufacturer to the customers, either directly or through intermediaries.

4.8 SELF-ASSESSMENT QUESTIONS

1. Write the pros and cons of outsourcing versus in-house distribution.

2. Discuss the typology of marketing channels.

4.9 LESSON AND EXERCISE

1. What are the advantages and disadvantages of single channel management.

2. What do you mean by single channel management?

4.10 SUGGESTED READINGS

- Kotler, P. and Armstrong, G. *Principles of Marketing*. Pearson Prentice Hall.
- Kotler, P., Armstrong, G., Saunders, J. and Wong, V. *Principles of Marketing*. Prentice Hall Europe.
- Kotler, P. *Marketing Management*. Prentice-Hall, Inc. A Pearson Education Company. Upper Saddle River, New Jersey

**MANAGEMENT OF INTERMEDIARIES, MULTI-CHANNEL
MANAGEMENT AND DESIGNING THE CHANNEL MIX**

STRUCTURE

- 5.1 Introduction
- 5.2 Objectives
- 5.3 Management of Intermediaries
 - 5.3.1 Designing a Channel of Distribution
 - 5.3.2 Motivating Intermediaries
 - 5.3.3 Evaluation and control of intermediaries
- 5.4 Multi Channel Management
- 5.5 Designing the Channel Mix
- 5.6 Summary
- 5.7 Glossary
- 5.8 Self-Assessment Questions
- 5.9 Lesson End Exercise
- 5.10 Suggested Readings

5.1 INTRODUCTION

Many producers do not sell products or services directly to consumers and instead use marketing intermediaries to execute an assortment of necessary functions to get the product

to the final user. These intermediaries, such as middlemen (wholesalers, retailers, agents, and brokers), distributors, or financial intermediaries, typically enter into longer-term commitments with the producer and make up what is known as the marketing channel, or the channel of distribution. Manufacturers use raw materials to produce finished products, which in turn may be sent directly to the retailer, or, less often, to the consumer. However, as a general rule, finished goods flow from the manufacturer to one or more wholesalers before they reach the retailer and, finally, the consumer. Each party in the distribution channel usually acquires legal possession of goods during their physical transfer, but this is not always the case. For instance, in consignment selling, the producer retains full legal ownership even though the goods may be in the hands of the wholesaler or retailer—that is, until the merchandise reaches the final user or consumer.

Channels of distribution tend to be more direct—that is, shorter and simpler—in the less industrialized nations. There are notable exceptions, however. For instance, the Ghana Cocoa Marketing Board collects cacao beans in Ghana and licenses trading firms to process the commodity. Similar marketing processes are used in other West African nations. Because of the vast number of small-scale producers, these agents operate through middlemen who, in turn, enlist sub-buyers to find runners to transport the products from remote areas. Japan’s marketing organization was, until the late 20th century, characterized by long and complex channels of distribution and a variety of wholesalers. It was possible for a product to pass through a minimum of five separate wholesalers before it reached a retailer.

Companies have a wide range of distribution channels available to them, and structuring the right channel may be one of the company’s most critical marketing decisions. Businesses may sell products directly to the final customer, as is the case with most industrial capital goods. Or they may use one or more intermediaries to move their goods to the final user. The design and structure of consumer marketing channels and industrial marketing channels can be quite similar or vary widely.

5.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- management of intermediaries

- multi-channel management
- designing the channel mix

5.3 MANAGEMENT OF INTERMEDIARIES

Intermediaries, also known as distribution intermediaries, marketing intermediaries, or middlemen, are an extremely crucial element of a company's product distribution channel. Without intermediaries, it would be close to impossible for the business to function at all. This is because intermediaries are external groups, individuals, or businesses that make it possible for the company to deliver their products to the end user. For example, merchants are intermediaries that buy and resell products.

There are four generally recognized broad groups of intermediaries: agents, wholesalers, distributors, and retailers.

- ***Agents/Brokers***

Agents or brokers are individuals or companies that act as an extension of the manufacturing company. Their main job is to represent the producer to the final user in selling a product. Thus, while they do not own the product directly, they take possession of the product in the distribution process. They make their profits through fees or commissions.

- ***Wholesalers***

Unlike agents, wholesalers take title to the goods and services that they are intermediaries for. They are independently owned, and they own the products that they sell. Wholesalers do not work with small numbers of product: they buy in bulk, and store the products in their own warehouses and storage places until it is time to resell them. Wholesalers rarely sell to the final user; rather, they sell the products to other intermediaries such as retailers, for a higher price than they paid. Thus, they do not operate on a commission system, as agents do.

- ***Distributors***

Distributors function similarly to wholesalers in that they take ownership of the product, store it, and sell it off at a profit to retailers or other intermediaries. However, the key

difference is that distributors ally themselves to complementary products. For example, distributors of Coca Cola will not distribute Pepsi products, and vice versa. In this way, they can maintain a closer relationship with their suppliers than wholesalers do.

- ***Retailers***

Retailers come in a variety of shapes and sizes: from the corner grocery store, to large chains like Wal-Mart and Target. Whatever their size, retailers purchase products from market intermediaries and sell them directly to the end user for a profit.

5.3.1 Designing a Channel of Distribution

Channel objectives will be determined by the organisation's positioning strategy. The "place" element of the marketing mix must be consistent with the remaining marketing tools used by the marketing manager to gain a sustainable competitive advantage. Three options can be identified:

- ***intensive distribution***. Generally used for FMCGs and other relatively low-priced or impulse purchases
- ***exclusive distribution***. Here, distribution may be limited to a small number of intermediaries who gain better margins and exclusivity.
- ***selective distribution***. This represents a compromise between intensive and selective distribution. The manufacturer is looking for adequate market coverage, but still hopes to select supportive dealers.

There are a number of key influences on channel selection strategies:

- ***Buyer behaviour*** (what do customers expect in terms of location and assortment etc.),
- ***producer's needs***, (an important constraint is the resources that are available to the manufacturer to bring the product to market. Some companies will lack the finances to recruit and reward a salesforce and so will use a wholesaler instead.
- ***product type*** (e.g. fresh produce that is highly perishable requires fairly short channels)

- **Competition** (e.g. if competitors have exclusive deals with certain intermediaries, then the support of other channel members with similar marketplace penetration may be sought)

A systematic process for design of a channel is important. An “end-user” analysis will result in the creation of an “ideal” channel system which offers a multi-channel format catering for the service level demands of each customer segment. This should be evaluated in terms of the company’s objectives and its positioning relative to the competition. A constraints analysis is needed to identify limits which have to be built into any proposed channel structure.

Managers can choose from among three generic marketing channels:

- **direct marketing.** This involves reaching customers via communications media such as telesales, mailshots, catalogues or advertisements with tear-off reply slips.
- **salesforce.** Here a company might build its own team of salespeople, or perhaps hire an independent contract sales force.
- **channel intermediary:** alternative channels used in order to reach industrial(organisational) customers. In general, these channels are shorter than those for consumer goods. In the case of services, it is not possible to “own” a service and their delivery cannot be easily separated from the service provider. These factors, and the inability to hold an “inventory” of unsold services, means that the role of channel intermediary can be very different for services compared to goods. Companies in both consumer and business-to-business markets use a variety of channels to distribute their products.

5.3.2 Motivating Intermediaries

It is frequently necessary to motivate channel members. This is so because of the differing needs of intermediaries and producers: these needs do not necessarily coincide (e.g., a manufacturer may seek exclusive distribution of its products at high prices, whereas a retailer may be pursuing a strategy of market penetration through budget pricing of a wide range of goods). The situation is further complicated by the fact that intermediaries and producers often have different perceptions about their own roles in the supply chain. Doyle suggests two levels of motivator: promotional and partnership.

Promotional channel motivators are usually short-term inducements to support the supplier's goods (e.g. trade discounts for large order volumes or providing point-of-sale display materials).

Partnership motivators, on the other hand, seek to build a longer-term relationship between suppliers and channel participants (e.g. through sharing of market research information and providing training to a distributor's sales staff).

5.3.3. Evaluation and control of intermediaries

Evaluation of channel performance is necessary to decide which intermediaries to retain and which to motivate, or even, where necessary, to discard. Criteria for evaluation are obviously similar to those used in the initial selection decision (see above). Once the relationship between organisations has been established, criteria can include: the sales volume and value of the producer's goods that are generated through the intermediary's outlets, the profitability of servicing that intermediary, the stock levels the intermediary is prepared to hold, the quality of customer service offered, feedback provided about the marketplace and the intermediary's attitude to inter-channel co-operation. However, the scope for evaluation maybe severely limited if power lies with the channel member rather than the producer.

5.4 MULTI CHANNEL MANAGEMENT

Many businesses begin with single-channel distribution. That sole channel could be a brick-and-mortar store or an e-commerce website. In either case, all sales flow through one outlet.

The advantage of a single-channel distribution management system is simplicity. There's only one channel to manage, one channel to stock, and one channel to market to customers. As a business expands, however, the single-channel model can limit growth.

For example, a local coffee roaster may exhaust the supply of potential customers in a single market. By adding an e-commerce website with nearly unlimited reach, it could make its beans available to every coffee drinker in every city.

While that potential growth may be exciting, it can also be challenging. How will a local company compete with existing national retailers? How can it maintain the appropriate

supply of beans to keep customers—near and far—happy?

Multi-channel management is the art and science behind decoding the subtle nuances of who, what, where, when and why people are buying from you on each individual channel you sell your products on.

It's about creating balance, and understanding when and where to amplify and show restraint throughout your channel mix, so you won't overwhelm your following or burn your marketing dollars trying to convert people when they're not interested.

Definition

When distributing a product, each “channel” is an additional avenue to reach customers. Thus, multi-channel distribution management is a strategy to provide customers with multiple ways to purchase the same product.

A multi-channel distribution management system is the set of business processes that enable profitable, sustainable development of multiple distribution channels.

Many multi-channel distribution systems benefit from the support of technology. However, the “system” includes more than just software that supports the execution of a multi-channel strategy. It also includes strategic business planning to help shape the creation and improvement of that execution.

Why Some Businesses Opt for Multi-Channel Distribution

Given the potential challenges of managing a multi-channel distribution strategy, why do some businesses choose this more complex route? The simple answer is growth. However, while the long-term goal is the growth of sales, the near-term outcome may be the growth of a customer base or purchasing options.

These are common reasons why businesses shift to a multi-channel strategy:

In-store sales have peaked. Even for a popular brick-and-mortar location, there are limits to revenue. A store is open for a certain number of hours per day, can handle a certain number of customers, and can stock only a certain quantity of goods. (Consider how an online store could keep a local retailer from running out of a hot product.) These limitations hamper growth-focused businesses from expansion.

Customers want more purchasing options. The popularity of a brick-and-mortar store may also work against it. For example, a butcher shop may frustrate customers with long lines after the workday or over weekends. Providing a second channel like home delivery could give those same customers another, more convenient channel to get a steak or leg of lamb. This effort to create a seamless purchasing experience across all channels is known as omni-channel management.

Businesses want to reach new customers. This desire often provides the biggest opportunity for growth. The need to seek out new customers is what can turn a local brand into a regional or national one. Many fast-food franchises began as local brands before expanding their customer reach through the sale of individually-owned-and-operated stores throughout the country.

While each of these needs may inspire the development of a multi-channel strategy, all focus on increasing sales and revenue. A neighborhood shop may have no desire to expand its presence beyond the local community. But for companies with ambitious long-term goals, the decision to adopt a multi-channel strategy is usually a question of “when” not “if.”

Potential Challenges

There are potential challenges to the multi-channel management of a large, complex operation. If not handled properly, poor management can undermine certain channels or even the overarching business.

For example, channels may begin to compete with one another. An online store may prove so convenient for customers that foot traffic to their brick-and-mortar counterparts begins to dwindle. Professional sports teams also face this challenge. Many fans prefer the television viewing experience to attending a game in person. As a result, teams must work to improve the in-person experience to continue to fill billion-dollar arenas.

When consumers have multiple purchasing channels, maintaining a cohesive pricing structure presents another challenge. If an online sale is more profitable than one at a local store, should the prices for each channel reflect that difference? Local breweries sometimes charge more for a beer at the brewery—despite lower distribution costs—to

protect their relationships with retailers, who sell most of their product. This decision may confuse or frustrate consumers who expect to save money by buying directly from the source.

How to Market a Multi-Channel Distribution System

To develop a successful multi-channel system, businesses must achieve multi-channel integration of elements beyond production and distribution. The marketing component is critical to identify the most valuable channels and build relationships with partners that play a role in product distribution.

Identify the right partners. Some businesses have multi-tiered distribution networks. A protein bar manufacturer may sell its product to a distributor, who then sells it to a grocery store chain. To maintain a successful multi-channel distribution program, each partner must benefit from the relationship. This requires businesses to detail the benefits to each partner clearly through a tailored marketing strategy.

Identify the right type of partnership. To develop a tailored marketing strategy, businesses need to consider the most valuable benefit they can provide to their multi-channel partners. This may be marketing materials that reinforce the value of the partnership, or informational content that helps a partner convince their partner to continue to support the product's distribution. Some partner marketing materials even include training for end-of-line sales staff to help them inform potential customers.

Measure results effectively. The measurement of results can support multi-channel marketing in two ways. For one, it can help a business understand which channel partners are most valuable to the enterprise. That knowledge, in turn, can help allocate marketing resources to continue to build on the most lucrative partnerships.

Good measurement can also help a business show its partners how valuable the partnership is for both parties. For instance, if a business can tie a national television campaign to an increase in sales at a partner store, it helps demonstrate the value of its marketing efforts to the partner.

5.5 DESIGNING THE CHANNEL MIX

We now look at several channel decisions manufacturers face. In designing marketing channels, manufacturers struggle between what is ideal and what is practical. A new firm with limited capital usually starts by selling in a limited market area. Deciding on the best channels might not be a problem: The problem might simply be how to convince one or a few good intermediaries to handle the line.

If successful, the new firm can branch out to new markets through existing intermediaries. In smaller markets, the firm might sell directly to retailers; in larger markets, it might sell through distributors. In one part of the country, it might grant exclusive franchises; in another, it might sell through all available outlets. Then it might add a Web store that sells directly to hard-to-reach customers. In this way, channel systems often evolve to meet market opportunities and conditions.

For maximum effectiveness, however, channel analysis and decision making should be more purposeful. Marketing channel design calls for analyzing consumer needs, setting channel objectives, identifying major channel alternatives, and evaluating those alternatives.

- **Analyzing Consumer Needs**

As noted previously, marketing channels are part of the overall customer-value delivery network. Each channel member and level adds value for the customer. Thus, designing the marketing channel starts with finding out what target consumers want from the channel. Do consumers want to buy from nearby locations or are they willing to travel to more distant and centralized locations? Would customers rather buy in person, by phone, or online? Do they value breadth of assortment or do they prefer specialization? Do consumers want many add-on services (delivery, installation, repairs), or will they obtain these services elsewhere? The faster the delivery, the greater the assortment provided, and the more add-on services supplied, the greater the channel's service level.

Providing the fastest delivery, the greatest assortment, and the most services may not be possible or practical. The company and its channel members may not have the resources or skills needed to provide all the desired services. Also, providing higher levels of service results in higher costs for the channel and higher prices for consumers. For example, your local hardware store probably provides more personalized service, a more

convenient location, and less shopping hassle than the nearest huge Home Depot or Lowe's store. But it may also charge higher prices. The company must balance consumer needs not only against the feasibility and costs of meeting these needs but also against customer price preferences. The success of discount retailing shows that consumers will often accept lower service levels in exchange for lower prices.

- **Setting Channel Objectives**

Companies should state their marketing channel objectives in terms of targeted levels of customer service. Usually, a company can identify several segments wanting different levels of service. The company should decide which segments to serve and the best channels to use in each case. In each segment, the company wants to minimize the total channel cost of meeting customer-service requirements.

The company's channel objectives are also influenced by the nature of the company, its products, its marketing intermediaries, its competitors, and the environment. For example, the company's size and financial situation determine which marketing functions it can handle itself and which it must give to intermediaries. Companies selling perishable products may require more direct marketing to avoid delays and too much handling.

In some cases, a company may want to compete in or near the same outlets that carry competitors' products. For example, Maytag wants its appliances displayed alongside competing brands to facilitate comparison shopping. In other cases, companies may avoid the channels used by competitors. Mary Kay Cosmetics, for example, sells directly to consumers through its corps of more than two million independent beauty consultants in more than 35 markets worldwide rather than going head-to-head with other cosmetics makers for scarce positions in retail stores. GEICO primarily markets auto and homeowner's insurance directly to consumers via the telephone and the Internet rather than through agents.

Finally, environmental factors such as economic conditions and legal constraints may affect channel objectives and design. For example, in a depressed economy, producers want to distribute their goods in the most economical way, using shorter channels and dropping unneeded services that add to the final price of the goods.

- **Identifying Major Alternatives**

When the company has defined its channel objectives, it should next identify its major channel alternatives in terms of the types of intermediaries, the number of intermediaries, and the responsibilities of each channel member.

Types of Intermediaries

A firm should identify the types of channel members available to carry out its channel work. Most companies face many channel member choices. For example, until recently, Dell sold directly to final consumers and business buyers only through its sophisticated phone and Internet marketing channel. It also sold directly to large corporate, institutional, and government buyers using its direct sales force. However, to reach more consumers and match competitors such as HP, Dell now sells indirectly through retailers such as Best Buy, Staples, and Walmart. It also sells indirectly through value-added resellers, independent distributors and dealers who develop computer systems and applications tailored to the special needs of small- and medium-sized business customers.

Using many types of resellers in a channel provides both benefits and drawbacks. For example, by selling through retailers and value-added resellers in addition to its own direct channels, Dell can reach more and different kinds of buyers. However, the new channels will be more difficult to manage and control. And the direct and indirect channels will compete with each other for many of the same customers, causing potential conflict. In fact, Dell often finds itself “stuck in the middle,” with its direct sales reps complaining about competition from retail stores, while its value-added resellers complain that the direct sales reps are undercutting their business.

Number of Marketing Intermediaries

Companies must also determine the number of channel members to use at each level. Three strategies are available: intensive distribution, exclusive distribution, and selective distribution. Producers of convenience products and common raw materials typically seek **intensive distribution**—a strategy in which they stock their products in as many outlets as possible. These products must be available where and when consumers want them. For example, tooth-paste, candy, and other similar items are sold in millions of outlets to provide maximum brand exposure and consumer convenience. Kraft, Coca-Cola,

Kimberly-Clark, and other consumer goods companies distribute their products in this way.

By contrast, some producers purposely limit the number of intermediaries handling their products. The extreme form of this practice is **exclusive distribution**, in which the producer gives only a limited number of dealers the exclusive right to distribute its products in their territories. Exclusive distribution is often found in the distribution of luxury brands. For example, exclusive Bentley automobiles are typically sold by only a handful of authorized dealers in any given market area. By granting exclusive distribution, Bentley gains stronger dealer selling support and more control over dealer prices, promotion, and services. Exclusive distribution also enhances the brand's image and allows for higher markups.

Between intensive and exclusive distribution lies **selective distribution**—the use of more than one but fewer than all the intermediaries who are willing to carry a company's products. Most television, furniture, and home appliance brands are distributed in this manner. For example, Whirlpool and GE sell their major appliances through dealer networks and selected large retailers. By using selective distribution, they can develop good working relationships with selected channel members and expect a better-than-average selling effort. Selective distribution gives producers good market coverage with more control and less cost than does intensive distribution.

Responsibilities of Channel Members

The producer and the intermediaries need to agree on the terms and responsibilities of each channel member. They should agree on price policies, conditions of sale, territory rights, and the specific services to be performed by each party. The producer should establish a list price and a fair set of discounts for the intermediaries. It must define each channel member's territory, and it should be careful about where it places new resellers.

Mutual services and duties need to be spelled out carefully, especially in franchise and exclusive distribution channels. For example, McDonald's provides franchisees with promotional support, a record-keeping system, training at Hamburger University, and general management assistance. In turn, franchisees must meet company standards for physical facilities and food quality, cooperate with new promotion programs, provide requested information, and buy specified food products.

- **Evaluating the Major Alternatives**

Suppose a company has identified several channel alternatives and wants to select the one that will best satisfy its long-run objectives. Each alternative should be evaluated against economic, control, and adaptability criteria.

Using economic criteria, a company compares the likely sales, costs, and profitability of different channel alternatives. What will be the investment required by each channel alternative, and what returns will result? The company must also consider control issues. Using intermediaries usually means giving them some control over the marketing of the product, and some intermediaries take more control than others. Other things being equal, the company prefers to keep as much control as possible. Finally, the company must apply adaptability criteria. Channels often involve long-term commitments, yet the company wants to keep the channel flexible so that it can adapt to environmental changes. Thus, to be considered, a channel involving long-term commitments should be greatly superior on economic and control grounds.

5.6 SUMMARY

The channel design is based on the level of service desired by the target consumer. There are five primary service components that facilitate the marketer's understanding of what, where, why, when, and how target customers buy certain products. The service variables are quantity or lot size (the number of units a customer purchases on any given purchase occasion), waiting time (the amount of time customers are willing to wait for receipt of goods), proximity or spatial convenience (accessibility of the product), product variety (the breadth of assortment of the product offering), and service backup (add-on services such as delivery or installation provided by the channel). It is essential for the designer of the marketing channel—typically the manufacturer—to recognize the level of each service point that the target customer desires. A single manufacturer may service several target customer groups through separate channels, and therefore each set of service outputs for these groups could vary. One group of target customers may want elevated levels of service (that is, fast delivery, high product availability, large product assortment, and installation). Their demand for such increased service translates into higher costs for the channel and higher prices for customers.

5.7 GLOSSARY

- **Intermediaries:** Intermediaries are external groups, individuals, or businesses that make it possible for the company to deliver their products to the end user.
- **Agents/Brokers:** Agents or brokers are individuals or companies that act as an extension of the manufacturing company.
- **Channel intermediary:** Alternative channels used in order to reach industrial (organisational) customers.

5.8 SELF-ASSESSMENT QUESTIONS

1. Discuss the different groups of intermediaries.

2. Describe the steps involved in managing the intermediaries.

5.9 LESSON AND EXERCISE

1. Write a note on Multi-channel management.

2. Discuss the designing of channel mix.

5.10 SUGGESTED READINGS

- Kotler, P. and Armstrong, G. *Principles of Marketing*. Pearson Prentice Hall.
- Kotler, P., Armstrong, G., Saunders, J. and Wong, V. *Principles of Marketing*. Prentice Hall Europe.
- Kotler, P. *Marketing Management*. Prentice-Hall, Inc. A Pearson Education Company. Upper Saddle River, New Jersey

**IMPLEMENTATION OF NEW CHANNELS AND TOUCHPOINTS AND
MANAGING CHANNEL CONFLICT**

STRUCTURE

- 6.1 Introduction
- 6.2 Objectives
- 6.3 Implementation of New channels and Touchpoints
 - 6.3.1 Touchpoints
 - 6.3.2 Types of Touchpoints
- 6.4 Managing Channel Conflicts
 - 6.4.1 How to manage conflicts
- 6.5 Summary
- 6.6 Glossary
- 6..7 Self-Assessment Questions
- 6.8 Lesson End Exercise
- 6.9 Suggested Readings

6.1 INTRODUCTION

A firm's distribution objectives will ultimately be highly related—some will enhance each other while others will compete. For example, as we have discussed, more exclusive and higher service distribution will generally entail less intensity and lesser reach. Cost has

to be traded off against speed of delivery and intensity (it is much more expensive to have a product available in convenience stores than in supermarkets, for example).

The extent to which a firm should seek narrow (exclusive) vs. wide (intense) distribution depends on a number of factors. One issue is the consumer's likelihood of switching and willingness to search. For example, most consumers will switch soft drink brands rather than walking from a vending machine to a convenience store several blocks away, so intensity of distribution is essential here. However, for sewing machines, consumers will expect to travel at least to a department or discount store, and premium brands may have more credibility if they are carried only in full service specialty stores.

Distribution provides a number of opportunities for the marketer that may normally be associated with other elements of the marketing mix. For example, for a cost, the firm can promote its objective by such activities as in-store demonstrations/samples and special placement (for which the retailer is often paid). Placement is also an opportunity for promotion—e.g., airlines know that they, as “prestige accounts,” can get *very* good deals from soft drink makers who are eager to have their products offered on the airlines. Similarly, it may be useful to give away, or sell at low prices, certain premiums (e.g., T-shirts or cups with the corporate logo.) It may even be possible to have advertisements printed on the retailer's bags (e.g., “Got milk?”).

6.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- implementation of new channels and touch points
- meaning and types of touchpoints
- managing channel conflicts

6.3 IMPLEMENTATION OF NEW CHANNELS AND TOUCH POINTS

1. Evaluate If You Should Pursue Adding a New Distribution Channel

Distribution is a key element of your marketing strategy - it's how you access your market. It's common to use multiple channels of distribution: direct via the web, sales team or retail location, or indirect through wholesalers, distributors, value-added resellers or consultants.

Adding new channels can be a great way to launch a new product to large market, grow revenue quickly, speed cash flow, and improve your brand's experience with your end users.

By analyzing your business goals and evaluating your existing channels, you can determine whether a new distribution channel can help you achieve your goals, or whether improving the performance of an existing channel will be a more effective strategy.

2. Define What Your Channel Will Look Like

As you're considering your business goals and the design of your new channel, it's helpful to define the true needs of your customers and how you would expect a channel to work.

Do the channel partners need any type of guidance, training or support? Are channel partners required to hold inventory? If you're selling direct, what are your requirements to create and fulfill orders?

Answers to these questions will help you determine what type of channel to create, as well as the channel structure and the channel logistics.

3. Find Channel Partners and Create Your Channel Plan

Before approaching potential new channel partners, it's a good idea to define the specific elements of the channel.

What is its purpose? How will it benefit your end-users? What are the channel logistics? How are orders processed? Who handles inventory?

Answers to these questions will help you create the criteria for potential channel partners that would support your distribution goals. Then, it's time to approach potential partners, secure a deal, and create your plan for managing the relationship.

4. Create Your Channel Pricing Strategy

Channel pricing can be tricky, especially for companies who also sell direct.

The main focus of your pricing strategy is to minimize pricing conflicts. You'll ensure that you've carefully mapped out the price for each step in your channel and included a fair profit for each type of partner.

Comparing the end-customer pricing from all of your channels will help reduce the potential for pricing conflict, which can jeopardize your entire distribution strategy.

5. Drive Revenue Through the Channel

It's important to support your channel partners and treat them as customers - so they support your brand and promote your offering. After all, your channel partners may also be selling other products and services.

A good way to support your channel partners is with marketing campaigns - by running campaigns to generate leads for your partners, providing training or sales tools and literature or by providing partners with marketing funds or special materials to promote your offerings.

6. Manage Your Channel Partners and Improve Channel Performance

Channel management is often a hot issue in marketing. While most companies agree that their distribution channels are a critical element in their marketing, it's common for channel management to fall to the bottom of the priority list.

By creating a detailed channel management plan to identify ways to improve your channels' performance, measure channel ROI, and identify solutions to resolve channel conflict, you'll ensure that you're properly supporting one of the key components of your go-to-market strategy.

6.3.1 Touchpoints

A touchpoint can be defined as any way a consumer can interact with a business, whether it be person-to-person, through a website, an app or any form of communication. When consumers come in contact with these touchpoints it gives them the opportunity to compare their prior perceptions of the business and form an opinion. Touchpoints in marketing communications are the varying ways that a brand interacts and displays information to prospective customers and current customers. Touchpoints allow customers to have experiences every time they "touch" any part of the product, service, brand or organization, across multiple channels and various points in time. Customers opinions and perceptions are largely influenced by the contact that is made with these touchpoints, which can be positive or negative depending wholly on the individual person. Touchpoints

have the ability to influence a consumers buying or intent to purchase, all throughout the five stages of the buyer purchasing decision-making process: Problem recognition, information search, the evaluation of alternatives, purchase decision, and post-purchase behaviour. Touchpoints can happen in both a Business-to-Business setting and a Business-to-Consumer setting. A touchpoint is a message or way a brand reaches out to their target market providing engagement as it allows the brand to be seen by the prospective customer in a favorable way. The goal effective touch points is that it will create opportunity for the purchaser to choose their brand over another competitor.

6.3.2 Types of Touchpoints

- **Company-created touchpoints**

A company-created touchpoint is one that is created and controlled by the company or brand (Brand Customer Touch Points, 2007). These touchpoints are pre-planned modes of communicating a message through physical channels, such as banner adverts and in store decorations. These methods are used to publicize certain directives to customers. These types of touch points operate in a traditional manner, visibly advertising a message the brand wants to convey.

- **Intrinsic touchpoints**

These intrinsic touchpoints are in use when a customer is in store or in the act of purchasing a product or service (EClub News, 2012). Touch points such as timely and adept customer service is in constant use during the purchase period. These touch points are often human oriented, messages being communicated between customer service operator or staff and actual customers. This type of touch point is vital for communicating a brand's message and modus operandi, be it a family store that looks after customers on a personal level or a slick global company that can offer the best prices (Brand Customer Touch Points, 2007).

- **Unexpected touchpoints**

Unexpected touchpoints are out of the control of the brands themselves but can be influenced by good business practices. These touch points are the communication from outside stake-holders, often dissatisfied or satisfied customers. These shareholders communicate between themselves, higher powers within the brand or company and

review websites. These communications are touch points which hugely affect the reputation of the brand. The unexpected touch points of a company are out of their hands but also reliant on the decisions made by customers in regards to their pre purchase, in store and post purchase experiences. It's not only customers but employees that also create unexpected touch points, speaking about their treatment within a company, pay rates and other customers with family or friends (EClub News, 2012). This all has unexpected consequences to a brand, either positive or negative, that can affect reputation of their product or service.

- **Customer-initiated touchpoints**

Much like the unexpected touchpoints, customer-initiated touchpoints are a communication between customer and brand directly, without purchase. Unlike other touchpoints, these customer-initiated touchpoints are created solely by customers relaying the experiences they received from the brand/company directly back to the brand/company. Again, these are particularly difficult to control directly yet can be managed effectively and can portray a positive message to customers through actions such as a help desk or suggestions line. These touch points, created by customers and transferred directly to companies/brands are effective ways of keeping in communication with customers even after they have finished their purchasing, evolving a brand and growing a customer base.

6.4 MANAGING CHANNEL CONFLICTS

Channel conflicts are customarily described as competitive disputes between channel organizations over customers. These disputes boil down to: "Whose customer is it and who gets the profits and/or commissions from this order?" They can produce squabbling that undermines profits or loses customers. Some manufacturers attempt to eliminate channel conflicts altogether by tightly controlling which channel organization or which individual handles each customer. Their channel agreements specify which customers a particular organization can sell to based on customer characteristics such as location, industry, application, or the dollar level of business. Manufacturers may assign the largest accounts to their direct channels, and divide the smaller accounts by territory or industry among the other channels. Channel organizations in turn attempt to eliminate conflicts among their sales professionals by assigning them "exclusive" rights to specific customers.

Attempts to eliminate channel conflicts through exclusive rights are often counterproductive. They reflect a lack of understanding and respect for customers and channel organizations, and for the intrinsic and useful nature of some conflicts in an effective marketing system. Even the customary description of the conflicts as “channel conflicts” is misleading. The conflicts occur between individuals in the marketing system because of overlapping or competing interests in the same customers.

Myth:

- All channel conflicts are unhealthy.
- Manufacturers are always responsible for them.

Reality:

- The majority of channel conflicts are unhealthy and preventable.
- Some channel conflicts are healthy. A marketing system without channel conflicts is probably losing a significant part of its market.
- Channel organizations and customers also cause channel conflicts.
- Channel organizations share the responsibility for managing conflicts.

In this chapter we’ll describe some typical conflicts, the reasons for them, and steps that manufacturers and channel organizations can take to manage them within sustainable win-win business relationships.

Examples of conflicts

Among sales professionals within a channel organization

Example 1: A telemarketing agent for a software manufacturer, who works on a commission basis, responds to leads generated by company mailers. She works with a specific prospect over several weeks answering questions, sending literature, and supplying a demonstration copy of the software. That prospect eventually orders 10 copies of software for \$1500 and the telemarketing agent receives her commission. A field sales agent, for the territory in which the account is located, learns about the order, visits the account, and schmooze the decision makers. He discovers that they are about to place an

order for an additional 250 copies of the software. He writes a quotation for price and delivery, books the order, and gets the commission that the telemarketing agent would have gotten otherwise.

Example 2: Thirty-five years ago I bought my first auto insurance policy in Pasadena California from an agent of Allstate. He just happened to be the agent on duty when I walked in the door. It turns out that Allstate had a rule that made me the “property” of that agent. I didn’t know the rule existed for the first ten years because I lived within 20 miles of Pasadena and simply renewed the policy by mail each year. I learned about the rule when I moved to Northern California and tried to change agents. I was informed in writing that I couldn’t do so. I was irritated, but continued with Allstate anyway. From time to time I had to call “my” agent long distance with questions and policy changes. Over the next decade the agent’s attitude deteriorated and his helpfulness declined. In fact, he became churlish and critical. I suspect that he had developed physical ailments or mental problems. After one call I was so angry at his critical and inappropriate remarks, I was prepared to change to another company at the next annual renewal. Shortly thereafter I received a notice that “my” agent had retired and I was free to choose a new one. I selected the next Allstate agent very carefully.

All state created a rule that rewarded the agent who acquired my business. However, the rule was customer hostile, and must have lost customers for Allstate over the years. It left me with an unpleasant choice: continue with an unsatisfactory agent or buy my insurance from another company. I still feel hostile towards Allstate for treating me like a piece of property, even though I’m happy with how they’ve handled policy claims.

Many Real Estate agencies and car dealerships have similar rules for “walk-in” clients. A walk-in client becomes the property of the agent on duty. Unfortunately, if the client isn’t happy with that agent, her only competitive alternative is to take her business to a competitor.

Distributors vs. Reps or Direct

Example: A customer with a rapidly growing business has bought its power transistors from a specific Distributor for several years. The customer will need 200,000 units of a particular power transistor over the next twelve months. The Distributor, who buys these transistors from the manufacturer at a distributor price of \$2.75 each, quotes the customer

\$3.25 each for an annual buy of 200,000 units. The manufacturer's direct sales organization quotes the customer \$2.50 each. The customer places the order with the manufacturer.

Direct vs. Sales Reps: House accounts

Example: A Manufacturer of power transistors stipulates in its Rep agreements that it can re-assign accounts that does over \$100,000 per year to its Direct sales organization. These accounts become House accounts. Rep Commissions for House accounts will only be paid for orders on the books within 60 days of the time the account becomes a House account.

Distributors vs. VARs

Example: A VAR designs and proposes to assemble and install a sales-office automation system for a customer. The system includes IBM compatible personal computers and HP printers, which constitute roughly half the cost of the system. The VAR's proposal shows these products at the manufacturer's unit list prices. The customer asks the VAR to supply the system without the printers and the personal computers because he can buy those components from a Distributor at 20% less and install them himself.

Distributor vs. Distributor: The Gray Market

Example: An authorized Distributor of a manufacturer's telephone headsets pays the manufacturer \$55 each for a specific model of telephone headset and usually resells it at \$75 each. A major credit card organization requests a quote on 10,000 headsets for its new telemarketing center. The Distributor sharpens his pencil and quotes \$60 each. A second, gray market distributor quotes \$53 each and wins the order. The second distributor negotiated a special 'deal' with a major OEM customer of the manufacturer, who paid \$45 each, and bought 10,000 more headsets than it needed.

Origins of conflicts

Channel conflicts are caused by manufacturers, channel organizations, and/or customers. Some causes are non-productive and should be eliminated. Other causes are tied to legitimate interests and useful benefits; these are productive conflicts when they are properly managed.

Manufacturers

Manufacturers cause channel conflicts through:

1. Poorly conceived pricing

- Steep, volume based, discount curves that encourage arbitrage among channel organizations
- Inconsistent pricing: a) between channel organizations, b) between channel organizations and major customers, and c) from one order to the next
- Pricing that favors one channel at the expense of others

2. Poorly conceived compensation policies

- Compensating reseller organizations entirely with discounts
- Paying commissions to Direct people or to Manufacturers Reps for sales into reseller inventories
- Inadequate compensation for acquiring customers; too much for maintaining them

3. Improper design and staffing of the marketing system

- Too many channels
- Too many channel organizations
- Organizations with too little integrity
- Sales management structure with intrinsic conflicts of interest

4. Bloating the inventories of channel organizations

A product isn't really sold until it's working successfully in the end-user's application. Until then, it is in someone's inventory and hasn't made a real, dependable profit for anyone. It can come back to haunt the manufacturer's marketing system as a stock return, as excess or obsolete inventory, or as a gray market product that undermines user pricing and marketing system enthusiasm.

5. Hostile policies and procedures for returns

Manufacturer's return policies can be so onerous that they drive OEMs and other resellers to unload their products on the gray market. The gray market drives the street price lower and steals business from authorized channel organizations.

6. Ignorance

The interrelationships within a marketing system and between the marketing system and the manufacturer are very complex. It is easy solve specific problems in ways that unintentionally create channel conflicts. For example, management may attempt to simplify manufacturing planning and to compensate for manufacturing lead times by giving substantial discounts to large orders that have deliveries scheduled months in advance. However, if a customer who has placed one of these orders can't use all the product he commits to, his inventory can wind up in the gray market. A more appropriate solution, to this example, is to develop a just-in-time (JIT) manufacturing process that accommodates changes in customer requirements on a timely basis and minimizes inventory and inventory fluctuations.

7. Lack of integrity

When management acts unfairly, selfishly, or dishonestly towards customers, sales professionals, or channel organizations, people become hyper-sensitive and simple issues become bones-of- contention. Very frequently the real issue is lack of management integrity. The channel conflicts are simply culturally accepted scapegoats used to vent frustrations.

Channel Organizations and Sales Professionals

The manufacturer's policies and procedures may create conflicts, but channel organizations or sales professionals create their share because they:

1. Don't "sell" their value added services to customers

Most channel organizations that I've dealt with don't deliberately and systematically educate and sell their customers on all the unique values that they add to the transactions. They lump together technical support, service, account management and selling and expect to recoup all the costs from product markups. This makes

them vulnerable to other channel organizations who don't provide the services, have lower costs, and undercut their prices. Unless the customers are educated to the services and their value, they see the price differentials, but don't appreciate the legitimate differences in value.

2. Play *I lose* — *you* win with customers

A channel organization decides to “buy the business” by taking a loss on the initial order and then expects to make it up on re-orders. A second channel organization, with no investment to recoup, underbids the first organization on the re-orders. The first organization thinks that either the manufacturer or the customer owes them something, but they only have themselves to blame because they gave things away.

A sales professional gives away samples, provides free technical support and drops prices to get orders at any cost. He becomes a gopher for his prospects, willing to do anything (for nothing) in hopes they'll feel indebted to him and give him orders.

3. Sell products at little or no profit

Distributors, VARs and OEMs are free to resell specific products at prices of their own choosing. They may use certain products as loss leaders to attract other, profitable business from their customers. They may also bomb a product's price to increase their sales rate and meet the sales volume requirements of their manufacturer's agreement.

4. Sell specific products at a loss to improve cash flow

Sometimes the most important benefit of selling is cash flow, not profits. A quick way to convert bloated inventories to cash is to cut prices and steal business from those channel organizations who are trying to maintain a legitimate markup.

5. Are ignorant

Some channel organization personnel are poor managers, poor businessmen, and poor sales professionals because of ignorance. They don't know how to do their

jobs and they usually blame manufacturers or other sales organizations for problems their own ignorance produces.

6. Lack integrity

There are innumerable self-serving, destructive ways to make a quick buck in sales and distribution. Certain people, motivated only by money, unencumbered by any sense of ethics, and unable to make it through law school, vigorously pursue them.

Customers

Customers create channel conflicts because they:

1. Want competitive alternatives

They don't want to become the property of any channel organization or any particular sales professional when they buy specific products. Competitive alternatives are reassuring benchmarks for evaluating the organizations with which they are doing business. Customers are the most satisfied with their transactions when they can choose what to buy, who to buy from, and how to buy. When a manufacturer gives a customer only one alternative in all three areas, then the customer's competitive alternatives all involve not buying that manufacturer's products. A manufacturer might have the most desirable product, but if the customer is unwilling to buy anything from that manufacturer's authorized sales channel, the sale will be lost.

2. Change needs and wants from one order to the next

The first time customers buy a product, they usually require extensive sales, account management, and technical support. When they reorder that product, they need relatively little of those services, so they usually focus on price and delivery to determine from whom they buy it.

3. Change decision makers from one order to the next

The initial order may be driven by the user-buyer and later orders by a technical buyer, purchasing. People come and go from a particular buying process due to

hiring, termination, or promotions. New people bring different understandings of what is best and who to deal with.

4. Are ignorant

Some customers don't know what they need, what it costs or what it's worth to them. Consequently they have no basis upon which to build confidence in their supplier and respect for what they do. A sure sign of ignorance is when a user-buyer doesn't know what it really costs him not to buy and what it really costs him to make rather than buy.

5. Lack integrity

A few customers go beyond evaluating competitive alternatives to manipulating destructive relationships with their suppliers. They make a practice of playing one channel organization against another to win at their suppliers' expense. One way they do it is to get a quote or proposal from one channel organization and then shop it around to other organizations with a promise to buy from the lowest bidder.

6.4.1 How to manage conflicts

There are two ways to manage conflicts: proactively with consistent well-designed policies and reactively on a case-by-case basis. As in everything else, the old saying "an ounce of prevention is worth a pound of cure" applies to conflict management. This section has recommendations for how manufacturers and channel organizations can proactively manage most conflicts.

Pricing and Discounts

- **Be consistent with prices and discount curves.**

Setup a pricing structure and stick with it. Avoid the end-of-quarter discounts, discounts to keep production flowing smoothly, and similar temporary deals. Consistent pricing enables channel organizations to plan ahead, confident that they know what the playing field is. When they suspect that prices or discounts will fluctuate, they waste time and energy trying to anticipate and take advantage of the changes instead of selling the product.

- **Have the same discounts for all channel organizations and then pay for special services (as they are performed) with credits against future purchases.**

One reason discounts vary from one channel organization to the next is that manufacturers use additional discounts to compensate some channel organizations for specific services they provide. Unfortunately, the added discounts give them cost advantages when they don't provide the services. Their most profitable strategy is to use their cost advantages to steal customers (who don't need the services) from other channel organizations.

A more constructive approach is to issue monthly or quarterly credits or payments for services after they are performed. Whenever possible, the manufacturer should issue credits against future purchases of its products. This approach has three advantages over blanket discounts:

1. It gives the organization obvious incentives to provide the service, such as advertising, technical support, or maintenance.
2. The organization uses the credits to order more products.
3. It gives the manufacturer a say in the planning and quality of the services it pays for. The manufacturer can also vary (or negotiate) the amount of these incentives (rather than product discounts) to encourage or support specific actions on the part of specific channel organizations.

For example, when a channel organization does advertising on your behalf, compensate it with co-op advertising credits or payments which amount to an agreed to percentage of advertising costs. Also, find out how the channel organization budgets and manages its advertising. Then issue the payments or credits appropriately. That is, if their advertising department is a cost center with an annual budget, issue your payments to that department rather than to the purchasing department. It makes the advertising department look better. It also avoids having them treat the credit as a reduction in their cost of goods which they can use to bomb their prices.

When a channel organization trains technical people on your products, or provides warranty services, issue appropriate payments or credits for those services as they occur.

There are some caveats about using credits. They include:

- i) *Avoid tying strings to how they may use your credits.* Don't put restrictions on when credits can be used or applied to orders. Make the credits the same-as-cash in payment for product orders.
- ii) *Resist the temptation to micro-manage through credits.* Keep the terms for earning credits consistent and straightforward. Let the channel organization manage how it does its job. When in doubt pay, pay promptly, and pay with a smile.
- iii) *Don't overuse the credit concept.* Stipulate in each channel organization's agreement no more than five services for which you'll pay credits. Leave the rest to the overall profitability of the relationship.

- **Avoid using large “step function” discounts, credits, or bonuses to motivate specific levels of sales.**

Lump-sum incentives tempt distributors and OEMs to do things that stimulate unproductive conflicts. For example, if a distributor receives a large rebate (or avoids a large bill-back) by reaching a specified volume of annual business, the distributor may bomb prices and steal business from other resellers, or sell to other resellers (temporarily stealing their business from the manufacturer) in order to reach that volume of business.

- **Keep volume discount curves relatively flat to minimize conflicts, undesirable arbitrage, and a gray market.**

Let's face it, volume-based discounts aren't justified by improvements in cost-of-goods. I wonder how many people have actually analyzed the cost basis for volume discounts. The reality is:

Unless a specific customer or channel organization accounts for more than 10% of a manufacturer's output, its volume of business has little impact on the product's cost of goods.

The costs that do vary with a customer's or a distributor's order volume are the per-unit costs of doing business with it. However, when volume discounts significantly increase channel conflicts, the per-unit costs of doing business increases.

Commissions

- **Pay more and pay longer for “acquiring” end-user customers.**

If I were to choose the single compensation change that would have the most beneficial impact on selling it would be to pay more for “acquiring” each end-user customer and less for acquiring resellers or maintaining existing customers. As a part of that compensation change I would: a) continue to pay the sales professional or sales organization an “acquisition” commission on major accounts for as long as those accounts reordered products on specific projects, b) pay that commission regardless of which channel organization shipped and billed the orders, and c) normally pay that commission beyond termination of the individual or sales organization.

Getting business from a customer is like pumping water from a well. It takes a lot of pumping to get the first glass of water, but after that a steady, gentle pumping produces a steady flow of water. It might take a sales person a year or more of hard work to land a major account. However, under typical commission programs, he won't profit from his investment if: a) the customer orders from a distributor or reseller, b) the factory takes the account direct, or if c) the sales professional or his organization is terminated. The typical commissions thereby encourage activities that take little effort and have short-term results, and discourage long-term investments in developing major accounts.

At Pro-Log we compensated acquisition costs to some degree by paying a 5% bonus on the first \$12,000 in orders from a new account. That front-loaded compensation helped to stimulate new account development.

- **Pay more commission for sales to user-customers and much less for sales to resellers.**

Commissioned sales people who manage resellers should be paid to generate “pull” from end users. They should not be rewarded for “pushing” inventory onto resellers' shelves. In order to reward appropriately for “pull,” a manufacturer has to develop a program with its resellers in which they periodically report their inventories and the number

of units shipped to end-users. The end-user shipments should be identified by ship-to organization and zip code. The manufacturer needs to know where the shipments went and which ones went to end-users.⁴¹ Many resellers will be reluctant to provide this information, especially if there's nothing in it for them. One way to promote cooperation in obtaining this vital data is to issue credits (equal to a 2-4% discount) for sales to end-users that are identified by company and zip code. Sometimes these reports contain surprises for the manufacturer. At Pro-Log these reports uncovered companies and individuals who were purchasing for resale in international markets.

Hiring policies

Certain individuals and certain channel organizations thrive on predatory practices that steal business from others. The organizations are well known in the industry, and easy to identify. The individuals can be identified by competent managers. Don't hire these organizations or these people. If one of these organizations is already a part of your distribution network, terminate it. There is nothing worthwhile a manufacturer can do to manage such an organization because its management lacks integrity. Similarly, there is no way to successfully manage a sales professional who lacks integrity.

Customer selection policies

It's as important to select customers as it is to select sales professionals and channel organizations. Customers who are incompetent or dishonest should be screened out. They are intrinsically unprofitable, and one way they undermine profits is by creating channel conflicts.

Education and Training

- **Customers**

If a customer has access to more than one of a manufacturer's authorized channel organizations, the manufacturer can provide a neutral source of information on the benefits provided by each organization, encourage the customer to choose one, then support that organization's success with the customer. This doesn't guarantee that the customer won't switch later on, but it does increase commitment and improve customer satisfaction.

Novell, a leading supplier of Local Area Networks, does something along this line. It categorizes its VARs on the basis of proven (by periodic training, testing, and customer evaluations) technical competence as Gold or Platinum (the highest level) resellers. It clearly defines the meaning and value of these labels to its customers and prospects, it reserves some products and services to Platinum Resellers, and it gives them more and better leads.

- **Channel personnel**

Managers in channel organizations can develop organizational marketing plans that educate prospects and customers about the costs and value-added benefits of their organization. This marketing process must begin with the first contact with a prospect and continue with each contact, mailing, quotation, or proposal. Then they have to continually educate and encourage their field sales and inside sales professionals to sell these costs and benefits to their customers.

They should also hone their quotes and proposals to make it clear what the customer gets by dealing with them. If some of their services are included in the product's price, then itemize them, specify their value in dollars and then show them as "Included at No Charge." This process is valuable in two ways: it helps sell the customer on the value of the channel organization's services, and it helps sell the channel's people on the value of the services. I've found that good sales professionals can usually sell at a higher price if they personally believe it's justified and if they can present a rational case for it.

Bob Dietz, CEO of M&D Controls Company, and founder of the Association of High Technology Distributors, implemented an extremely successful organizational marketing program for his company. He developed a Menu of Services (Reprinted with Bob's permission in Appendix A) which is supplied to each prospect and customer. It defines what his organization does and specifies the unbundled rates for the technical services it supplies, including engineering services, on-site services, non-warranty repair services, configuration services, and training services. This document establishes a reference point, early in the relationship, for services that may be quoted or included at no charge in a proposal. He typically bids some of the services at no charge, but spells them out, and their unbundled costs. That reminds the customer of what he's getting besides the product and keeps the door open for Bob's company to re-quote if another supplier should quote

a major buy-out item at a lower price. This approach makes it easier for the customer to pay M&D Controls more than he'd pay the distributor. If the customer decides to buy a major item from another party, M&D Controls still makes the services available, at the quoted rates.

When Bob first introduced the concept of charging customers for technical services, his sales force resisted. They were convinced that it would cost them business not to give these things away. Now it is their accepted and successful way of doing business, has made selling easier, and has reduced the amount of business lost to low-ball prices from other sources.

6.5 SUMMARY

Multichannel systems are a way of life for manufacturers today. Whether you are managing a mix of direct and indirect channels or a spectrum of high-support to low-support resellers, the reality is that channel conflict will be an ongoing issue in your marketplace. As the number of internet sites (potentially including your own) that offer your product for sale proliferates, this multi-channel structure becomes more complex and the channel conflict potential more pervasive.

A limited amount of channel conflict is healthy. It indicates that you have adequate market coverage. However, once the balance between coverage and conflict is lost, destructive channel conflict can quickly undermine your channel strategy, market position and product line profitability.

Conflict can show up in the market in a variety of ways. A point of confusion for many manufacturers is whether problems are truly symptoms of destructive channel conflict or other marketing or channel strategy issues. When faced with potential indicators of destructive conflict, you should audit your market position to identify the true cause and then quickly act to address it.

Channel conflict is managed by a combination of economics and controls. Economic solutions compensate channels fairly for functions performed and help direct channels away from actions that create destructive conflict. Controls put structure around a channel strategy to limit the potential for undue destructive conflict.

6.6 GLOSSARY

- **Channel Strategy:** A channel strategy is a vendor's plan for moving a product or a service through the chain of commerce to the end customer.
- **Channel Partner:** A *channel partner* is a company that *partners* with a manufacturer or producer to market and sell the manufacturer's products, services, or technologies.
- **Touchpoints:** A touchpoint can be defined as any way a consumer can interact with a business, whether it be person-to-person, through a website, an app or any form of communication.
- **Channel Conflicts:** *Channel conflict* is a situation in which *channel* partners have to compete against one another or a vendor's internal sales department.

6.7 SELF-ASSESSMENT QUESTIONS

1. Discuss the steps involved in the implementation of new distribution channels.

2. Explain the meaning of touchpoints and its type.

6.8 LESSON AND EXERCISE

1. Write a note on channel conflicts.

2. How the conflicts are managed?

6.9 SUGGESTED READINGS

- Lee, Edwin (1996). The Handwork of Channel Marketing. Available at: <http://www.eleu.com/Handbook%20of%20Channel%20Marketing.pdf>.
- Kotler, P. and Armstrong, G. *Principles of Marketing*. Pearson Prentice Hall.
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CHANNEL PERFORMANCE MEASUREMENT**STRUCTURE**

- 7.1 Introduction
- 7.2 Objectives
- 7.3 Consumer preferences and right channelling
- 7.4 Channel performance measurement
- 7.5 Summary
- 7.6 Glossary
- 7.7 Self-Assessment Questions
- 7.8 Lesson End Exercise
- 7.9 Suggested Readings

7.1 INTRODUCTION

Channel performance measurement is a key activity when a sales organization employs different types of channel partners. In more complex multi-channel structures, it becomes even more important due to the number of people, processes, and roles involved. The performance of a channel can be measured across multiple dimensions. The parameters that are measured usually are effectiveness, efficiency, productivity, equity and profitability of the channel.

7.2 OBJECTIVES

After reading this lesson you shall be able to understand:

- Concept of consumer preference and right channelling
- Meaning of channel performance measurement

7.3 CONSUMER PREFERENCES AND RIGHT CHANNELING

Consumers' preferences for customer service channels are rapidly changing. And it's not just the younger generation of consumers - there's disruption and change across all ages and demographics. Here are some key data points:

- **Customers want companies to value their time.** 71% of consumers say that valuing their time is the most important thing a company can do to provide them with good service.
- **Voice is the most used communication channel for service.** Voice, which 73% of customers use for customer service, is still the most widely used channel. However, web self-service and digital channels like chat and email are following close behind.
- **Chat is increasingly popular.** Online chat adoption among customers has risen from 30% in 2009 to 43% in 2012. In addition, it has the highest satisfaction rating of any channel used, after voice.
- **The demise of email is premature.** Email remains the third most widely used communication channel among US online adults. In the past three years, email usage has increased by two percentage points, from 56% to 58%.
- **Social channels are increasingly important.** Online communities and Twitter have seen increases in usage rates in the past three years. However, satisfaction remains low for these channels, as companies have not invested in best practices for managing interactions on these channels.

What this means is that companies must understand their customers' communication channel preferences and be prepared for them to change over time. This also means that companies must choose technology ecosystems that provide the business agility and flexibility to meet customer channel demands today and in the future.

While right-channeling may be a well-worn phrase within customer service departments, it is one that is only just beginning to enter the lexicon of marketers.

From a service and support standpoint, the goal of right-channeling is to serve each customer via the most appropriate channel for that specific relationship and that specific interaction. The concept dates back to the early 2000's, when the initial euphoria with web self-service began to subside. Although customer service departments had hoped to lower costs by driving as many inquiries as possible to web self-service, they quickly realised that the channel was only appropriate for certain customers and certain interactions.

Right-channeling emerged as a way to restore the balance between resources and value. High-cost channels, such as the call centre, still had an important place in the mix, but they were reserved primarily for high-value interactions and high-value customers. A retail bank, for instance, would encourage calls from its VIP or platinum customers, as well as people inquiring about high-value products like mortgages. On the other hand, routine questions, such as account balance inquiries, would be deflected to interactive voice response (IVR) or web self-service, where they could be resolved quickly - and at significantly lower cost.

Like customer service departments, marketing organisations today face the same strategic imperative to align costs with value, or return on investment (ROI). Moreover, certain marketing messages and/or customer segments are naturally better suited for certain channels. Consequently, there is a legitimate need to apply the right-channeling concept to marketing, as it can help drive optimal results from marketing campaigns. Right-channeling requires a true cross-channel approach to marketing campaign management. In other words, marketers must be able to drive a single marketing campaign with a consistent message that can be rendered and delivered across any channel (e.g. email, direct mail, web, mobile, call centre, or even social media) based on a set of pre-defined business rules. The result is that businesses are able to deliver the right message to the right customer via the right channel.

There are a variety of criteria marketers can use to right-channel their marketing messages. To get you thinking about how to apply the concept to your own marketing programs and campaigns, here are seven common approaches:

1. **Campaign type** – What type of marketing campaign are you planning and does it lend itself to particular channels? For instance, direct mail and telemarketing wouldn't be very appropriate for a flash sale, given its time-sensitive nature. Email, mobile, and social media, on the other hand, would.
2. **Customer value** – Not all customers are created equally. You might set up your marketing campaigns so that platinum customers receive a message via one channel, gold customers via another, and everyone else via a third. This approach allows you to balance value with cost.
3. **Channel preference** – When possible, customers should receive messages through their preferred channel. If credit card customers have indicated that they would like to receive fraud alerts via their mobile, don't send them an email (unless you've also sent them a text message). Adhering to customer preference can help maintain satisfaction and boost response rates.
4. **Customer intimacy** – Customer intimacy can play a role in deciding which channels to use in your marketing campaigns. For instance, because it's more intrusive, mobile might not be appropriate for customers that don't have a strong relationship with your brand.
5. **Response history** – If a customer consistently responds to messages via one channel but not another, use this response data to drive channel selection for subsequent campaigns. Past performance can be a strong indicator of future success.
6. **Channel capacity** – Telemarketing generates good results for many organisations, but the channel is limited by capacity. You could pass a specific percentage of customers to the call centre based on available capacity, and then funnel the rest to another channel.
7. **Cost/budget** – Higher-cost channels like direct mail should be spent on customers and/or campaigns with the highest revenue potential. If a customer hasn't responded

to previous campaigns, for instance, you might send them email versus squandering direct mail budget.

The biggest obstacle to effective right-channeling is channel integration. Historically, marketers have relied on point solutions to market via individual channels, such as email, web, and mobile. This patchwork of tools has several limitations. The data needed to build the 360-degree customer view essential to right-channelling is trapped in silos - many of which reside outside the organisation. The business' understanding of customer interests, preferences, and behaviour is therefore incomplete.

Moreover, with separate applications, defining and automating integrated cross-channel campaigns simply isn't possible. Marketers have to use an email service provider (ESP) to send emails, another tool to send mobile messages, and so on. They might try to right-channel manually, but this approach cannot scale and the results are bound to be less than optimal.

True right-channeling is only possible with a marketing platform with the following four attributes: a real-time, 360-degree customer view encompassing all known and inferred information; seamless channel integration, which allows a single campaign or message to be rendered and delivered across channels; a central offer engine containing the business rules that drive message or offer selection across channels; and high-volume automation for effectively scaling right channelling, no matter how large the customer base.

One example of successful right-channeling comes from Debenhams, the second largest retail department store chain in the UK. Debenhams sends its customers personalised marketing communications via email and mobile. Because both channels are managed from a single marketing platform, the retailer is able to channel select according to customer opt-ins and preferences, as well as execute cross-channel campaigns driven by a centralised marketing database. Benefiting from greater personalisation and cross-channel execution, Debenhams reports that its email conversion rates are up 75% and email-driven sales volumes are up 200%.

Despite its incredible potential, the concept of right-channeling is only now beginning to make headway in marketing organisations. When you think about it, though, right-channeling is essentially another take on more recognised terms like one-to-one marketing

or conversational marketing. Whatever it's called, the goal is to provide each customer with a relevant, personalised, and interactive experience across channels. As more and more businesses are discovering, the benefit of creating such exemplary experiences is greater share of mind - and wallet.

7.4 CHANNEL PERFORMANCE MEASUREMENT

Channel performance measurement is a key activity when a sales organization employs different types of channel partners. In more complex multi-channel structures, it becomes even more important due to the number of people, processes, and roles involved. The performance of a channel can be measured across multiple dimensions. The parameters that are measured usually are effectiveness, efficiency, productivity, equity and profitability of the channel.

The various channels have different purposes in the value chain; however, each task needs to support the overall corporate goals. As the number of channel partners increases, it is difficult to ensure that the channel partners are performing their specific roles as effectively as required. For example, the goal of a business might be to increase the number of strategic accounts. However, in order to gather maximum possible commission, channel partners might be engaged in getting the maximum number of accounts possible with total disregard towards prioritizing the acquisition of strategic accounts. It is therefore important to audit the channel partners and incentivize them for activities that are aligned with the corporate goals. The channel performance should also be judged on the ability to fulfill given tasks. A few carefully chosen metrics can give a good indication of the performance of each channel.

The channel performance measurement is primarily a four-step process.

1. Define the Sales Objectives
2. Determine Channel Performance Metrics
3. Set Channel Partner Targets
4. Manage Channel Performance

- **Define Sales Objectives**

The first step in channel performance measurement is to define the sales objectives for the company. These objectives are outlined and discussed in sales meetings to ensure a shared understanding between members of the marketing and sales teams.

- **Determine Channel Performance Metrics**

Evaluating the performance of a distribution channel depends largely on the agreed upon performance metrics. Choosing the right number and type of performance metrics can help to monitor and improve the performance of channel partners. These metrics provide an understanding of how well the channel partner is doing in reaching its performance targets.

Though it is possible to evaluate a channel on hundreds of performance metrics, this would make reporting and analysis of the performance a cumbersome job. When determining channel performance metrics, a key performance driver, such as sales or units sold, should be chosen to identify and measure the most important tasks. A series of performance metrics are then decided based on the key performance driver.

- **Set Channel Partner Targets**

After overall sales objectives are defined, it is important to assign specific targets to each of the channel partners to ensure they are in alignment with the overall objectives. Properly set targets provide a benchmark to measure channel success, monitor performance, and take corrective action to meet expectations. Each channel partner has a specific role towards fulfilling the overall sales objectives. Performance targets should be set to reflect the channel partner's contribution to the overall objectives

- **Manage Channel Performance**

This is the final step in channel performance measurement. It uses the agreed upon goals, assigned performance targets, and identified performance metrics to manage channel performance on an on-going basis and to identify the performance shortfalls of the channel partners. During this step, management gains an understanding of the strengths and weaknesses of each channel. Management can then take corrective action to ensure efficient performance of the channel.

The success of a channel and its efficiency are determined by the efficiency of channel intermediaries in delivering goods and services to customers and the quality of services offered in the process. Developing a comprehensive marketing plan that provides clear and concise direction about marketing activities and strategy is critical to the organization's success.

7.5 SUMMARY

Channel performance measurement is used to define the sales performance for the company. Evaluating the performance of a distribution channel depends largely on the agreed upon performance metrics. Choosing the right number and type of performance metrics can help to monitor and improve the performance of channel partners. The success of a channel and its efficiency are determined by the efficiency of channel intermediaries in delivering goods and services to customers and the quality of services offered in the process. Developing a comprehensive marketing plan that provides clear and concise direction about marketing activities and strategy is critical to the organization's success.

7.6 GLOSSARY

- **Channel preference** – Customers should receive messages through their preferred channel. Adhering to customer preference can help maintain satisfaction and boost response rates.
- **Customer intimacy** – Customer intimacy can play a role in deciding which channels to use in your marketing campaigns.

7.7 SELFASSESSMENT QUESTIONS

1. What do you mean by Consumer preference?

7.8 LESSON END EXERCISE

1. What are the steps involved in channel performance measurement.

2. Write a note on consumer preference and right channelling?

7.9 SUGGESTIVE READINGS

The *Logistics Handbook: A Practical Guide for the Supply Chain Management*

C. No. : MK-401**UNIT III**

SEMESTER : IV**LESSON : 8**

MATERIAL LOGISTICS

STRUCTURE

- 8.1 Introduction
- 8.2 Objectives
- 8.3 Concept and Importance of material Logistics
- 8.4 Inventory control
- 8.5 Logistic planning
 - 8.5.1 Major aspects and factors of Logistic planning
- 8.6 Summary
- 8.7 Glossary
- 8.8 Self-Assessment Questions
- 8.9 Lesson End Exercise
- 8.10 Suggested Readings

8.1 INTRODUCTION

The management of goods from the end of product line to the consumers and in some cases, includes the movement of raw materials from the source of supply to the beginning of the production line. Efficient logistics systems throughout the world economy are a basis for trade and a high standard of living for all of us. It means having accurate, complete and timely inventory transactions record and avoiding differences between accounting and real inventory levels. Inventory Control is defined as the supervision of

supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply.

8.2 OBJECTIVES

After completion of this lesson you shall be able to understand:

- Concept and Importance of material Logistics
- Major aspects and factors of Logistic planning

8.3 CONCEPT AND IMPORTANCE OF MATERIAL LOGISTICS

“Logistics is the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of confirming the customer requirement”. This definition clearly points out the inherent nature of logistics and it conveys that Logistics is concerned with getting products and services where they are needed whenever they are desired. In trade Logistics has been performed since the beginning of civilization: it’s hardly new. However implementing best practice of logistics has become one of the most exciting and challenging operational areas of business and public sector management. Logistics is unique, it never stops! Logistics is happening around the globe 24 hours a day’s Seven days a week during fifty-two weeks a year. Few areas of business involve the complexity or span the geography typical of logistics. Word, Logistics is derived from French word “loger”, which means art of war pertaining to movement and supply of armies. Basically a military concept, it is now commonly applied to marketing management. Fighting a war requires the setting of an object, and to achieve this objective meticulous planning is needed so that the troops are properly deployed and the supply line consisting, interalia, weaponry, food, medical assistance, etc. is maintained. Similarly, the plan should be each that there is a minimum loss of men and material while, at the same time, it is capable of being altered if the need arises. As in the case of fighting a war in the battle-field, the marketing managers also need a suitable logistics plan that is capable of satisfying the company objective of meeting profitably the demand of the targeted customers. From the point of view of management, material logistics has been described as planning, implementing and controlling the process of physical flows of materials and final products from the point of origin to the point of use in order to meet customer’s needs at a profit. As a concept it means the art of

managing the flow of raw materials and finished goods from the source of supply to their users. In other words, primarily it involves efficient management of goods from the end of product line to the consumers and in some cases, includes the movement of raw materials from the source of supply to the beginning of the production line. These activities include transportation warehousing, inventory control, order processing and information monitoring. These activities are considered primary to the effective management of logistics because they either contribute most to the total cost of logistics or they are essential to effective completion of the logistics task. However, the firms must carry out these activities as essential part of providing customer with the goods and services they desire.

Importance of Material Logistics

The important of a logistics system lies in the fact that it leads to ultimate consummation of the sales contract. The buyer is not interested in the promises of the seller that he can supply goods at competitive price but that he actually does so. Delivery according to the contract is essential to fulfilling the commercial and legal requirements. In the event of failure to comply with the stipulated supply of period, the seller may not only get his sale amount back, but may also be legally penalized, if the sales contract so specifies. There is no doubt that better delivery schedule is a good promotional strategy when buyers are reluctant to invest in warehousing and keeping higher level of inventories. Similarly, better and/or timely delivery helps in getting repeat orders through creation of goodwill for the supplier. Thus, as effective logistics system contributes immensely to the achievements of the business and marketing objectives of a firm. It creates time and place utilities in the products and thereby helps in maximizing the value satisfaction to consumers. By ensuring quick deliveries in minimum time and cost, it relieves the customers of holding excess inventories. It also brings down the cost of carrying inventory, material handling, transportation and other related activities of distribution. In nutshell, an efficient system of physical distribution/logistics has a great potential for improving customer service and reducing costs.

Logistics has gained importance due to the following trends

- Raise in transportation cost.
- Production efficiency is reaching a peak

- Fundamental change in inventory philosophy
- Product line proliferated
- Computer technology
- Increased use of computers
- Increased public concern of products growth of several new, large retail chains or mass merchandise with large demands & very sophisticated logistics services
- Reduction in economic regulation
- Growing power of retailers
- Globalization: As a result of these developments, the decision maker has a number of choices to work out the most ideal marketing logistics system.

Essentially, this system implies that people at all levels of management think and act in terms of integrated capabilities and adoption of a total approach to achieve pre-determined logistics objectives. Logistics is also important on the global scale. Efficient logistics systems throughout the world economy are a basis for trade and a high standard of living for all of us. Lands, as well as the people who occupy them, are not equally productive. That is, one region often has an advantage over all others in some production specialty. An efficient logistics system allows a geographical region to exploit its inherent advantage by specializing its productive efforts in those products in which it has been an advantage by specializing its productive to other regions. The system allows the products landed cost (production plus logistics cost) and quality to be competitive with those from any other region. Common examples of this specialization have been Japan's electronics industry, the agricultural, computer and aircrafts industries of United States and various countries dominance in supplying raw materials such as oil, gold, bauxite, and chromium.

Furthermore Material Logistics has gained importance marketing due to the following reasons:

1. Transform in the customers attitude towards the total cost approach rather than direct cost approach.

2. Technological advancement in the fields of information processing and communication.
3. Technological development in transportation and material handling.
4. Companies are centralizing production to gain economies of scale.
5. Most of the MNC organizations are restructuring their production facilities on a global basis.
6. In many industries, the value added by manufacturing is declining as the cost of materials and distribution climbs.
7. High volume data processing and transmission is revolutionizing logistics control systems.
8. With the advancement of new technologies, managers can now update sales and inventory planning faster and more frequently, and factories can respond with more flexibility to volatile market conditions.
9. Product life cycles are contracting. Companies that have gone all out to slash costs by turning to large scale batch production regularly find themselves saddled with obsolete stocks and are unable to keep pace with competitors new-product introductions.
10. Product lines are proliferating. More and more product line variety is needed to satisfy the growing range of customer tastes and requirements, and stock levels in both field and factory inevitably rise.
11. The balance of power in distribution chain is shifting from the manufacturers to the trader.

8.4 INVENTORY CONTROL

“Inventory control involves managing the inventory that is already in the warehouse, stockroom or store. That is knowing, what products are “out there”, have much you have each item and where it is. It means having accurate, complete and timely inventory transactions record and avoiding differences between accounting and real inventory levels.

Inventory Control is defined as the supervision of supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply.

Inventory Control” focuses on the *process* of movement and accountability of inventory. This consists of *strict policies and processes* in regards to:

1. The physical and systemic movement of materials
2. Physical Inventory and cycle counting
3. Measurement of accuracy and tolerances
4. Good Accounting Practices

“Inventory Management” focuses on inventory as an *asset or an instrument of value creation*. Inventory is managed to maximize value, exposure and/or profit while minimizing cost and spend. This consists of:

1. Product smoothing and leveraging
2. Selective product placement
3. Velocity and turns calculation development
4. Inventory reduction and product rationalization
5. MRP

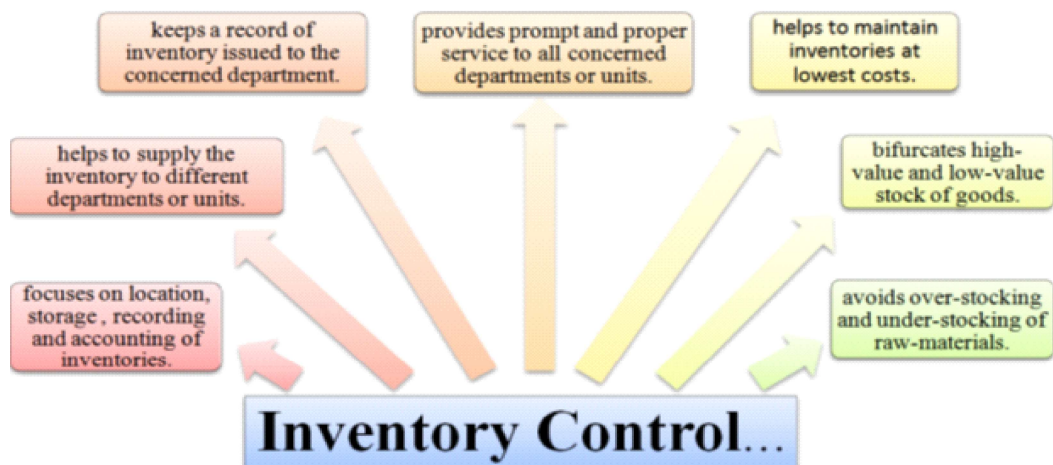


Fig. 8.1

The simple meaning of inventory in dictionary is “detailed list of all the goods in stock.”

- In short, inventory can be defined as the “a stockpile of goods an organization is offering for sale and components that are used in the manufacturing process.”

It includes:

- a) Finished goods
- b) Raw materials (works in process)
- c) Supplies
- Organizations such as hospitals provide the consumer with finished goods i.e. medicines and drugs. Inventory is purchased in salable form and used without any further processing.
- Inventory exists because supply and demand are difficult to synchronize perfectly.
- Different types of costs are associated with inventory like item cost, ordering costs, holding cost and stock-out cost.

Need for inventory control

- Inventories constitute the most significant part of the current assets, representing as much as 50%-70% of the capital investment. Therefore it is absolutely imperative to manage inventories effectively and efficiently in order to avoid unnecessary investment in them.
- If a company’s inventory level is too low, it risks delays in fulfilling it’s customers orders.

If the inventory level is too high, it is using up money that can be better used in other areas. It also risks obsolescence and spoilage.

- In hospital, about one-third of the annual expenditure budget is spent on buying medicines (Kant S., et al; 1997). To minimize the inventory investment, the hospital may keep the medicines inventory low, but on the other hand, maximum service to

the patients can not be provided and the lack of medicines for patients in critical condition may cause serious problem.

Objectives of Inventory control

- The objective of inventory management is to have the appropriate amounts of materials in the right place, at the right time, and at low cost.

Inventory management is the methods that are used for organizing, holding and replenishing of stock. The main goal is to keep the inventories on optimal level, without stock outs and excesses. For this, two controversial but simultaneously mutually dependent tasks should be solved:

- To have enough inventories to fulfill orders of outer and inner clients in a manner satisfying them. Or with other words – assure high level of customer service. Usually this customer service level is measured as availability (fill rate).
- To minimize inventory carrying costs, first of all capital tied into inventories for maximizing the company's profitability. Trade-off should be found for achieving these two goals simultaneously.

8.5 LOGISTIC PLANNING

Logistics planning is generally the detailed organization and implementation of a complex operation. In a general business sense, logistics planning is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The resources managed in logistics planning may include tangible goods such as materials, equipment, and supplies, as well as food and other consumable items. The logistics of physical items usually involves the integration of information flow, materials handling, production, packaging, inventory, transportation, warehousing, and often security. Planning is the process of thinking about the activities required to achieve a desired goal. It is the first and foremost activity to achieve desired results.

In military science, logistics planning is concerned with maintaining army supply lines while disrupting those of the enemy, since an armed force without resources and transportation is defenseless. Military logistics was already practiced in the ancient world

and as modern military have a significant need for logistics solutions, advanced implementations have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed. Logistics also plays a key role in the economy in that it supports the movement and flow of many economic transactions. It is an important activity with regard to the facilitation of the sale of practically all goods and services. In order to identify with this role of logistics, consider the fact that if goods do not arrive on time, customers cannot buy them. If goods do not arrive in the correct place or condition, no sale can be made. All economic activity throughout the supply chain would suffer if the logistics function failed to fulfil this role.

8.5.1 Major Aspects and Factors of Logistic Planning

- Advances in technological and quantitative techniques
- Significant opportunities presented by e-commerce potential
- Development of the systems approach and total cost analysis concept
- Recognition of the role of logistics in a company's customer service programme
- Erosion of companies' profits because of their failure to examine functional areas where cost savings might be realised
- Profit leverage resulting from increased logistics efficiency
- Recognition of the role of logistics in creating competitive advantage in the marketplace, particularly in the face of domestic and foreign competition, saturated markets, government regulation
- Consolidation of companies thus increasing the importance of sound logistics practices and continued strategic planning as companies are reorganised and product lines are combined
- Markets, and logistics policies and practices of suppliers of consumer products, being driven by the large retailers
- Distributors stocking less with respect to industrial products, and depending more on their suppliers' stocks than in the past

- Customer requirements for value-added services continuing to drive costs up
- Increasing interest in third-party providers that handle all or part of a company's logistics function, particularly with increased penetration into major trade areas
- Inventories continuing to be at high levels irrespective of improved forecasting, inventory and make-to-order software available.
- Gaps in logistics support left by enterprise resource planning (ERP) systems, resulting in the need for additional bolt-on systems in the near future
- Customer service activities continuing to be centralised and consolidated
- Increased focus on computer technology and distribution software.

8.6 SUMMARY

Logistics planning is generally the detailed organization and implementation of a complex operation. In a general business sense, logistics planning is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations.

8.7 GLOSSARY

- **Inventory control:** The supervision of supply, storage and accessibility of items in order to ensure an adequate supply without excessive oversupply.

8.8 SELFASSESSMENT QUESTIONS

1. What do you mean by marketing logistics?

8.9 LESSON END EXERCISE

1. Describe the major aspects and factors of logistic planning.

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-
2. Write a detail note on Inventory control.
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-
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8.10 SUGGESTIVE READINGS

The *Logistics Handbook: A Practical Guide for the Supply Chain Management*

E-LOGISTICS

STRUCTURE

- 9.1 Introduction
- 9.2 Objectives
- 9.3 E-logistics
- 9.4 Logistic resource management
- 9.5 Summary
- 9.6 Glossary
- 9.7 Self-Assessment Questions
- 9.8 Lesson End Exercise
- 9.9 Suggested Readings

9.1 INTRODUCTION

E-logistic is the logistical process that governs everything related to the online marketplace. It is a relatively novel concept. It is a dynamic set of communication computing and collaborative technologies that transform key logistical processes to be customer-centric by sharing data, knowledge and information with supply chain partners. It helps in coping with newly arising logistics challenges. E-logistics is that party of the supply chain process that designs, implements and controls the proficient, powerful stream and capacity of merchandise, benefits and related data from the purpose of origin to the point of utilization to meet clients. The key elements of e-logistics are multi channel operation, cross border

functionality, warehouse layout and inventory, planning and forecasting and performance management. E-logistics is defined to be the mechanism of automating logistics processes and providing an integrated, end-to-end fulfillment and supply chain management services to the players of logistics processes. Those logistics processes that are automated by e-logistics provide supply chain visibility and can be part of existing E-commerce or Workflow systems in an enterprise.

9.2 OBJECTIVES

The objective of study is to understand the concept of E-logistics and Logistic resource management.

9.3 E-LOGISTIC- STRUCTURE AND OPERATIONS

E-logistic is the logistical process that governs everything related to the online marketplace. It is a relatively novel concept. It is a dynamic set of communication computing and collaborative technologies that transform key logistical processes to be customer-centric by sharing data, knowledge and information with supply chain partners. It helps in coping with newly arising logistics challenges. E-logistics is that party of the supply chain process that designs, implements and controls the proficient, powerful stream and capacity of merchandise, benefits and related data from the purpose of origin to the point of utilization to meet clients. The key elements of e-logistics are multi channel operation, cross border functionality, warehouse layout and inventory, planning and forecasting and performance management. E-logistics is defined to be the mechanism of automating logistics processes and providing an integrated, end-to-end fulfillment and supply chain management services to the players of logistics processes. Those logistics processes that are automated by e-logistics provide supply chain visibility and can be part of existing E-commerce or Workflow systems in an enterprise. The typical e-logistics processes include Request for Quotes (RFQ), Shipping, and Tracking. As shown in Figure 1, e-logistics interacts with the business process manager in an E-commerce server. E-Logistics is a dynamic set of communication, computing, and collaborative technologies that transform key logistical processes to be customer centric, by sharing data, knowledge and information with the supply chain partners. E-logistics also enables synchronization of events and right decision-making. The ultimate objective is to deliver the right products in right quantities at the right place and time to the right customers. E-Logistics leverages the power of the internet and other technologies

(such as wireless) to provide robust information to supply chain participants and offer unprecedented levels of visibility across the entire supply chain. A growing number of e-logistics solution providers and service companies are tapping into this opportunity by addressing logistics issues such as supplier selection, asset utilization, pricing, inventory management, order visibility, and order fulfillment. Start-ups, software companies, and “old economy” logistics providers are bringing to market a variety of products and services that address the huge logistics inefficiencies burdening today’s supply chains. While these companies may indeed provide value to Chinese shippers, the Descartes can provide the level of global connectivity required to create value through networked communities. The key attractions of this networked community are (1) fewer integration points required to connect to network members; (2) an exponential increase in value for each member as more participants join the community; and (3) a common infrastructure for the communication and exchange of information. Imagine for a moment a world without a global telecommunications network where instead phone users strung a separate line to each new person they wished to speak with. The Descartes’ Global Logistics Services Network (GLSN) provides technology to ensure consistency and integrity of communication throughout supply chain communities. It is an information platform encompassing thousands of transportation carriers, logistics intermediaries, and users of transportation services around the globe. The network securely registers, connects, and manages participants. In addition to providing a standard for inter-enterprise business connectivity, it acts as a logistics process framework for end to-end shipping management. The GLSN enables organizations to build high-performance supply chains, providing real-time visibility and decision support. Its open architecture allows trading partner systems to seamlessly integrate with logistics-critical data and business rules, wherever and however they reside. It enables organizations to connect with a single, simple mechanism that incorporates security, so only preauthorized users access information, applications and documents. The GLSN manages the integration of the hundreds of data communication standards, and maintains responsibility for data monitoring, quality and integrity. And recognizing that each participant may have different technological abilities and needs, it supports all common communication protocols, leveraging comprehensive embedded dictionaries for translation. Tapping into this global network can provide Chinese shippers and their customers with visibility of orders (not just shipments) across their supply chains. Manufacturers can use the Descartes network to “link” together their manufacturing order systems with shipment tracking systems

to provide a single, unified view into the status of orders as they make their way from PO to final delivery. With true order visibility, shippers, buyers, and logistics providers understand where goods and inventories reside across the supply chain and can make intelligent, proactive logistics decisions based on this information. Beyond the obvious benefits of order visibility across the supply chain, access to accurate, real-time logistics information provided by the Descartes Network allows companies to undertake various improvement initiatives that can drive savings, increase revenues and improve their overall competitive advantage.

Structure and Operations involved in e-logistics

Following are the structure and operations of e-logistics are as follows:

- 1) Method of payment
- 2) Check product availability
- 3) Arrange shipments
- 4) Insurance
- 5) Replenishment
- 6) Contact with customers
- 7) Returns

In the background of changing situation on local and global markets of delivery and sales companies more often use the Internet tools, letting realization of electronic transactions with partners in supply chain. Changes in management of supply chain happen with development of clients' needs and technological possibilities of cooperating partners. Globalization of economic companies' cooperation (e.g. in delivery, production and distribution processes), technological growth and innovative manners of economic activity, as well as stronger competition and shorter products life cycles on markets have caused pressure on changes of dimensions of supply chains' acts — shorter time of order's realization, global scope of activity, bigger elasticity and durability. One of the fundamental tools of supporting business processes have become electronic data interchange through the Internet. It has caused an epoch-making change for clients' values — an independent

access to information about products' flow and localization of supply chain's partners. The growth of share of electronic commerce in commerce in general (all over the world and in Poland) has caused a need of an online access to logistic services amid suppliers and recipients on market. Growth of electronic commerce evaluating towards e-business has brought about a natural need of the growth of processes of the commodity flow service, in the area of the company front-office (e.g. sales, marketing, client service), as well as back-office (purchasing, warehousing, transport, production and co-production). The electronic data interchange between partners let them cooperate in real time and create an integrated supply chain. Efficient, reliable and effective functioning of supply chains requires beyond good management of physical products flow, set under functional and organizational aspect, a system of information flow (flow and computerization)

The most often used tools of cooperation in the virtual scope of e-logistics are:

The Internet portal, electronic platform, electronic catalogue, data warehouses, information services, systems of offers and purchasing, transactions systems, systems and communication tools, systems and software, e.g. applications of supply chains' planning, dictionaries, digital maps, e-learning systems, etc.

9.4 LOGISTIC RESOURCE MANAGEMENT

The Council of Logistics Management defines Logistics Resource Management as follows: "Logistics Resource Management is part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements". However, there is no clear consensus in literature on the definition of LM. Many authors refer to Logistics Resource Management as Supply Chain Management (SCM), i.e. they considered that LRM is logistics taken across inter-organizational boundaries; and use these terms interchangeably. Simchi-Levi, Kaminski and Simchi-Levi (2000) gave the following definition: "Supply Chain Management is a set of approaches utilized to efficiently integrated suppliers, manufactures, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements.

Johnson et al. (1999) also presented the following definitions. They maintained that “Logistics Resource Management define the entire process of materials and products moving into, through, and out of a firm. Inbound logistics covers the movement of materials received by the suppliers. Material management describes the movements of materials and components within a firm. Physical distribution refers to the movement of goods outwards from the end of the assembly line to the customer. Finally, supply-chain management is a somewhat larger concept than logistics resource management, because it deals with managing both the flow of materials and the relationships among channel intermediaries from the point of origin of raw materials through to the final consumer.” Logistic Resource Management can further defined as the management of all logistics activities throughout a firm and supply chain. We give special emphasis to relationships with other functions of the organization, such as marketing and finance, and to the integration of the logistics activities in the entire supply chain, including those with suppliers and customers. We consider, like Cooper, Lambert and Pagh (1997), that, SCM covers a wider area than LRM, but that LRM is also of major importance to efficient SCM. In LRM, the planning, coordinating and controlling of all logistics activities must be done by taking into account the remaining elements of the supply chain. Every firm, whether involved in manufacturing or services, belongs to at least one supply chain. The key success of LRM, may lie in the system’s integration, i.e. requiring emphasis on integration of logistics activities, cooperation, coordination, and information sharing throughout the entire supply chain.

The key to success in Logistics Resource Management (LRM) requires heavy emphasis on integration of activities, cooperation, coordination and information sharing throughout the entire supply chain, from suppliers to customers. To be able to respond to the challenge of integration, modern businesses need sophisticated decision support systems (DSS) based on powerful mathematical models and solution techniques, together with advances in information and communication technologies. There is no doubt that quantitative models and computer based tools for decision making have a major role to play in today’s business environment. This is especially true in the rapidly growing area of logistics management. These computer-based logistics systems can make a significant impact on the decision process in organizations. That is why both industry and academia alike have become increasingly interested in using LRM and logistics DSS as a means of responding to the problems and issues posed by changes in the area. Many well-known algorithmic

advances in optimization have been made, but it turns out that most have not had the expected impact on decisions for designing and optimizing logistics problems. For example, some optimization techniques are of little help in solving complex real logistics problems in the short time needed to make decisions. Also, some techniques are highly problem-dependent and need high expertise. This leads to difficulties in the implementation of the decision support systems which contradicts the trend towards fast implementation in a rapidly changing world. In fact, some of the most popular commercial packages use heuristic methods or rules of thumb. The area of heuristic techniques has been the object of intensive studies in the last few decades, with new and powerful techniques, including many meta heuristic methods, being proposed to solve difficult problems. There is therefore, on the one hand, the need for sophisticated logistics DSS to enable organizations to respond quickly to new issues and problems faced in LRM, and, on the other, there are advances in the area of meta heuristics that can provide an effective response to complex problems.

The following are key issues in LRM:

- Logistics integration and coordination.
- Facility location and network design.
- Transportation and vehicle routing.
- Material handling and order picking.
- Customer service.
- Product design.
- Logistics of production and operations.
- Warehouse management and distribution strategies.
- Inventory management.
- Information System and DSS.
- E-commerce and e-logistics.
- Reverse and green logistics.

1. Logistics Integration and Coordination: Logistics coordination and integration within a supply chain has become a core issue in LM, not just integration within the organization but integration upstream with suppliers and downstream with distributors and customers. Coordination and integration means many different things, but basically all authors agree that it refers to collaborative working and implies joint planning, joint product development, mutual exchange of information and integrated information systems, cross coordination on several levels in the companies on the network, long term cooperation, fair sharing of risks and benefits, etc., Skoett-Larsen (2000). One enormous advantage of an integrated supply chain is the reduction of the so-called bullwhip-effect, Lee, Padmanabhan and Whang (1997), where small changes or decisions, on one level of the network, may result in large fluctuations, large amounts of stock, and/or increased lead times on other levels of the supply chain. However, as the process becomes more integrated within a supply chain, the complexity of the logistics decisions also increases. There are two main aspects involved in the integration of logistics decisions. The first of these are the information systems. Without integration of information systems between the different players, there can be no translation or sharing of information, which is the basis for any possible integration between departments or firms. With today's technology, the integration of information systems is possible and has been implemented by many firms. The second aspect is the use of optimization systems to achieve an integrated management of the logistics activities. As more and more industries decide to integrate their information systems, the need for sophisticated tools to help the decision makers to evaluate possible alternatives, decisions and their impact in the whole supply chain also increases.

2. Facility Location and Network Design: The firm must balance the costs of opening new warehouses with the advantages of being close to the customer. Warehouse location decisions are crucial determinants of whether the supply chain is an efficient channel for the distribution of the products. It seems that some of these models are quite simple when representing real problems in the design of an actual supply chain. For example, most of them do not take into account warehouse capacity, warehouse handling and operational costs (most of them just take into account the initial fixed cost of the warehouse) or warehouse service level requirements, which can be connected to inventory issues. Also, when designing a supply chain that involves several countries, import and export taxes, different transportation options, cultural and legal issues and several others must be

taken into consideration. Another important aspect is the relationship between network design and demand management. Aspects such as the seasonal nature of demand has never been taken into account, as far as we know. However, it could be an interesting research area since many firms are interested in designing their supply networks in partnership with other firms that have products with completely different seasonal behavior, e.g. air conditioning and heating equipment. The incorporation of all the aspects mentioned above into a location or network design model can make a significant difference to the analysis of the logistics on a supply chain and the decisions with respect to location and supply chain design.

3. Transportation and Vehicle Routing: One of the central problems of supply chain management is the coordination of product and material flows between locations. A typical problem involves bringing products located at a central facility to geographically dispersed facilities at minimum cost. For example, the product supply is located at a plant, warehouse, cross-docking facility or distribution center and must be distributed to customers or retailers. The task is often performed by a fleet of vehicles under the direct control, or not, of the firm. Transportation is an area that absorbs a significant amount of the cost in most firms. Therefore, methods for dealing with the important issues in transportation, such as mode selection, carrier routing, vehicle scheduling and shipment consolidations are needed in most companies. One important aspect in transportation management is coordination with the remaining activities in the firm, especially within warehouse and customer service. In some cases transport is the last contact with the customer and companies should therefore take care to meet the customer expectations. Logistics Management and use this relationship to improve their sales. The transport coordination within the different elements of a supply chain, involving different companies, can be of great strategic importance, since all of them most likely benefit by offering fast delivery to a specific customer. Therefore, many issues in the integration of transportation with other activities in the network can be a challenge to academic and industrial communities. One basic and well-known problem in transportation is vehicle scheduling and routing. A vehicle scheduling system should output a set of instructions telling drivers what to deliver, when and where. An “efficient” solution is one that enables goods to be delivered when and where required, at the lowest possible cost, subject to legal and political constraints. The legal constraints relate to working hours, speed limits, regulations governing vehicle construction and use,

restrictions for unloading and so on. With the growth in Internet sales, this problem is gaining momentum, since delivery times are usually very short, customers can be dispersed in a region, every day there is a different set of customers and with very short product delivery time - windows.

4. Warehouse Management and Distribution Strategies: Warehousing is an integral part of every logistics system and plays a vital role in providing a desired level of customer service. Warehousing can be defined as the part of a supply chain that stores products (raw materials, parts, work-in-process and finished goods) at and between points of production and points of consumption, and also provides information to management on the status and disposition of items being stored. The basic operations at a warehouse are receiving, storage-handling, order picking, consolidation – sorting and shipping. The main objectives are to minimize product handling and movement and store operations as well as maximize the flexibility of operations. Given the actual importance of the activities related to order picking we dedicate a subsection to it. Traditional warehouses are undergoing enormous transformations due to the introduction of direct shipment and cross-docking strategies. The latter may be more effective in distributing the products among retailers or customers. However, in order to be successful, these strategies require a high level of coordination and information systems integration between all elements in the supply chain: manufacturers, distributors, retailers and customers, a definite volume of goods to be transported and a fast and responsive transportation system, to give just the most important requirements. Deciding which is the best distribution strategy for a particular product of a company can make an enormous impact on the success of that company. Therefore, there is the need for a DSS that helps executive managers to select the best distribution strategies and, at the warehouse level, to exercise decisions to make the movement and storage operations more efficient.

5. Inventory Management: The importance of inventory management and the relationship between inventory and customer service is essential in any company. As for the location issues, inventory management has been well studied in OR literature; however, the use of inventory systems in helping decision-making processes has been less widespread. Most of the well known models in literature are simple and do not, for example, consider multi-product inventory management that requires the same resources, or, in some cases, do not treat all the complexities involved in inventory management such as demand

uncertainty, returns and incidents. So far, the better known inventory models and systems consider a single facility managing its inventories in such a way as to minimize its own costs. As we have mentioned, one major challenge in LRM is the integration and coordination of all logistics activities in the supply chain, a particularly important issue being inventory management within the whole supply chain in order to minimize system wide costs. This requires models and DSS that are able to aid decisions and suggest policies for inventory management in the whole supply chain. To solve such a complex issue, we will argue that DSS which combine simulation and metaheuristics techniques can be of great help.

2.6 Product Design

Products are a main element in the supply chain, which should be designed and managed in such a way as to enable efficient flow of these products. This approach is known as “design for supply chain” and is likely to become frequently used in the future. The characteristics of the product, such as weight, volume, parts, value, perishability, etc., influence the decisions made in relation to a supply chain, since the need for warehousing, transportation, material handling and order processing depend on these attributes. Products designed for efficient packaging and storage obviously make an impact on the flow in the supply chain and cost less to transport and store. During the design process of a new product, or changes to an existing one, the requirements of the logistics relating to product movements should be taken into consideration. Also, the need for short lead times and the increased demand from customers for unique and personalized products put pressure on efficient product design, production and distribution. Postponement is one successful technique that can be applied to delay product differentiation and also lead to an improvement in the logistics of the Logistics Management. The use of information systems and simulation techniques that help to analyze the impact on the supply chain of a certain design of a specific product can be of great help to managers.

6. Material Handling and Order Picking :Material handling is a broad area that basically encompasses all activities relating to the movement of raw material, work in process or finished goods within a plant or warehouse. Moving a product within a warehouse is a no value-added activity but it incurs a cost. Order processing or picking basically includes the filling of a customer order and making it available to the customer. These activities can be quite important since they have an impact on the time that it takes to process customer orders in the distribution channel or to make supplies available to the production function. They are cost absorbing and therefore need attention from the managers.

Packaging is valuable both as a form of advertising and marketing, as well as for protection and storage from a logistical perspective. Packaging can ease movements and storage by being properly designed for the warehouse configuration and material handling equipment. The major decisions in this area include many activities, such as facility configuration, space layout, dock design, material-handling systems selection, stock locator and arrangement, equipment replacement, and order-picking operations. Most of the models and techniques available these days consider the above decision processes as activities independent of the remaining ones in the whole system. Therefore, DDS that analyze the impact of material handling and order picking activities on the logistics system and enable the decision-maker to make the best decision for the whole network, are an important and essential tool.

7. Logistics of Production and Scheduling: The most common definition of production and operations management (POM) is as follows: the management of the set of activities that creates goods and services through the transformation of inputs into outputs. The interaction between POM and LM is enormous, since production needs raw materials and parts to be able to produce a commodity, and then this commodity must be distributed. Therefore, coordination between both areas is fundamental to an efficient supply chain. The techniques required to plan and control the production in an integrated supply chain go beyond the MRP (Material Requirement Planning) so popular in industries. The need to take into consideration manufacturing or service capacity, labor and time constraints has given importance to the Scheduling area. This field is extremely wide; however research at a scientific level has focused mainly on the formalization of specific problem types, leading to standard problems like the flow-shop scheduling problem, job-shop scheduling problems, etc. A significant amount of research has been dedicated to the classification of problem difficulty by deriving complexity results for a large variety of problem variants and the development of efficient solution techniques for standard scheduling problems. Research efforts in the latter area have shown that in the case of many problems, the use of heuristic algorithms, which cannot guarantee optimal solutions, but were able, in a large number of experiments, to find extremely high quality solutions in a short time, are currently the most promising techniques for solving difficult scheduling problems. Despite efforts in academic scheduling research, there is still a considerable gap in the application to practical problems of the techniques developed on the academic side. Scheduling problems are already quite

hard to solve per se, and their extension to include aspects of the whole supply chain significantly increases their complexity. Moreover, in many supply chains, the bottleneck activity is production, therefore efficient planning and managing of production and scheduling activities within the coordination of the supply chain is of great importance to an efficient supply chain. The development of production and scheduling models and solving techniques that consider the logistics activities related are a challenge for both academia and industry. Some ERP providers have already incorporated metaheuristics for solving complex scheduling problems, such as SAP (www.sap.com) with its product APS (Advanced Planning and Scheduling). We do believe that in the future many more Information Technology companies will make use of metaheuristic techniques to solve those very difficult problems, such as those relating to integrated logistics and production scheduling.

8. Information Systems and DSS: Computer and information technology has been utilized to support logistics for many years. Information technology is seen as the key factor that will affect the growth and development of logistics, Tilanus (1997). It is the most important factor in an integrated supply chain, also playing an important role in the executive decision-making process. More sophisticated applications of information technology such as decision support systems (DSS) based on expert systems, simulation and metaheuristics systems will be applied directly to support decision making within modern businesses and particularly in LM. A DSS incorporates information from the organization's database into an analytical framework with the objective of easing and improving the decision making. A critical element in a DSS for logistics Logistics Management decisions is the quality of the data used as input for the system. Therefore, in any implementation, efforts should be made to ensure the data is accurate. Consequently, modeling and techniques can be applied to obtain scenarios and analysis of the logistics situations within the environment of the company and, can be used to support the managers and executives in their decision processes. We believe that metaheuristics, when incorporated into a DSS for LM, can contribute significantly to the decision process, particularly when taking into consideration the increased complexity of the logistics problems previously presented. DSS based on metaheuristics are not currently widespread, but the technique appears to be growing as a potential method of solving difficult problems such as the one relating to LM.

9. E-commerce and E-logistics: In just a few short years, the Internet has transformed the way in which the world conducts business and business partners interact between themselves. E-business and electronic commerce are some of the hottest topics of our days. In ecommerce, business partners and customers connect together through Internet or other electronic communication systems to participate in commercial trading or interaction. We will not discuss e-commerce in detail at this stage, but it certainly makes new and high demands on the company's logistics systems, calling in, in some cases, completely new distribution concepts and a new supply chain design. Companies are looking for DSS, such as the one relating to e-commerce and e-business that help them to make the best decisions in an uncertain and rapidly changing world. Many of the problems can be seen as extensions of the ones described above, such as, for example, transportation management, while others are completely new with some added complexities such as the uncertainties associated with the evolution of commerce on the web. An example of new problems that can appear relate to home distribution, generated by business-to-consumer (B2C), during non-labour hours and the search for a solution which will allow an efficient distribution. An example of this is the inclusion of 24-hour dropping-points, where transportation companies can leave a package that will be collected later by the customer, thus avoiding the need for distribution during night time or on Saturdays and Sundays. Questions as to the location and size, for example, of these dropping-points, frequency of visits, partnership with stores, etc. are issues that have not yet been dealt with in metaheuristics and logistics literature.

9.5 SUMMARY

E-logistic is the logistical process that governs everything related to the online marketplace. It is a relatively novel concept. It is a dynamic set of communication computing and collaborative technologies that transform key logistical processes to be customer-centric by sharing data, knowledge and information with supply chain partners. It helps in coping with newly arising logistics challenges. E-logistics is that party of the supply chain process that designs, implements and controls the proficient, powerful stream and capacity of merchandise, benefits and related data from the purpose of origin to the point of utilization to meet clients. The key elements of e-logistics are multi channel operation, cross border functionality, warehouse layout and inventory, planning and forecasting and performance management.

9.6 GLOSSARY

- **E-logistic:** E-logistic is the logistical process that governs everything related to the online marketplace.
- **Logistics Resource Management:** It defines the entire process of materials and products moving into, through, and out of a firm.

9.7 SELFASSESSMENT QUESTIONS

1. What do you mean by e- Logistics?

9.8 LESSON END EXERCISE

1. Describe in detail the structure and operations involved in e- Logistic.

2. Write a detail note on Logistic Resource Management.

9.10 SUGGESTIVE READINGS

The *Logistics Handbook: A Practical Guide for the Supply Chain Management*

TRANSPORT

STRUCTURE

- 10.1 Introduction
- 10.2 Objectives
- 10.3 Transportation
 - 10.3.1 Modes of Transportation
 - 10.3.2 Transportation process
- 10.4 Advantages and Disadvantages
- 10.5 Summary
- 10.6 Glossary
- 10.7 Self-Assessment Questions
- 10.8 Lesson End Exercise
- 10.9 Suggested Readings

10.1 INTRODUCTION

Transport or transportation is the movement of humans, animals and goods from one location to another. In other words, the action of transport is defined as a particular movement of an organism or thing from a point A to a Point B. Modes of transport include air, land (rail and road), water, cable, pipeline and space. The field can be divided into infrastructure, vehicles and operations. Transport enables trade between people, which is essential for the development of civilizations. Transport infrastructure consists of the fixed

installations, including roads, railways, airways, waterways, canals and pipelines and terminals such as airports, railway stations, bus stations, warehouses, trucking terminals, refueling depots (including fueling docks and fuel stations) and seaports. Terminals may be used both for interchange of passengers and cargo and for maintenance. Vehicles traveling on these networks may include automobiles, bicycles, buses, trains, trucks, helicopters, watercraft, spacecraft and aircraft. Operations deal with the way the vehicles are operated, and the procedures set for this purpose, including financing, legalities, and policies. In the transport industry, operations and ownership of infrastructure can be either public or private, depending on the country and mode. Passenger transport may be public, where operators provide scheduled services, or private. Freight transport has become focused on containerization, although bulk transport is used for large volumes of durable items. Transport plays an important part in economic growth and globalization, but most types cause air pollution and use large amounts of land. While it is heavily subsidized by governments, good planning of transport is essential to make traffic flow and restrain urban sprawl.

10.2 OBJECTIVES

After go through this lesson you are able to comprehend:

- Meaning of Transportation
- Modes and process of transportation
- Advantages and disadvantages of transportation

10.3 TRANSPORTATION

Transportation is one of the most visible elements of logistics operations. The role of transport in national economy is very crucial. Every business firm, regardless of what it produces or distributes, requires the movement of goods from one point to another and, therefore, is involved in transportation. Transportation essentially concerns the spatial dimension of the business firm. “The spatial dimension refers to geographical relationships and reflects the combination of firms with respect to their materials sources, markets, and competitors, plus the spatial relations of the latter to their sources and markets”. The purpose or function of transportation is to serve as a connecting link between the spatially separated units within a firm’s own organization (such as between plants and warehouses) and between units of the firm and units of other firms and individuals (such as suppliers and

customers). Good transportation has the effect of holding to a minimum the time and cost involved in the spatial relationships of the firm. Transportation utility: In economic theory terms, transportation's function is to create place utility for the goods produced or distributed by the firm. The word "utility" means usefulness or ability to give satisfaction. Place utility exists when goods are in the place where they can be consumed. Goods that are not in the place where they are needed have less than full value and so transportation creates value by creating place utility. Along with the necessity to have goods in the right place, the goods must be there at the right time (time utility) and in the right form (form utility) and in the possession or ownership of the person(s) who wants to consume them (possession utility). Whether it is delivering goods to a warehouse to serve markets, moving goods into storage for future use, or forming an integral part of a Just-In-Time system and delivering goods at the exact point in time they are needed. Our current consumer driven economy is driven by our ability to offer a wide choice of competing products with wide scale or "intensive" distribution. Without place, time, form, and possession utility, goods have no value to the customer. In a broad sense, the production process is really not complete until all four utilities have been created because until then goods are not capable of giving satisfaction and would not prompt a customer to exchange something of value for something with no value. Thus, transportation is an essential part of the total production process that cannot be overlooked. Transportation in production and marketing: In production, transportation function is looked after by executives of materials management department or general administration department or general department. Undoubtedly a part of the transportation function can be tagged on to purchase of materials, but the total transportation planning concept requires higher in-depth skills and expertise than are contributed by a purchase executive who is even otherwise preoccupied with the responsibilities of his complex purchase function. Boggled down in routine procedures of purchase, he is unable to plan adequately for transportation of various types of materials, plants and machinery in such a way as to optimize the expenditure of his own efforts and monetary resources. Transport of the finished product is often left to the marketing manager. However, a marketing manager is oriented more towards marketing of the product and development of market than towards optimization of transportation cost, time or effort. The responsibility for estimates of arrival times at loading and unloading points of machinery, raw materials, etc., is often entrusted to those executives who have no personal knowledge of the subject, but who collect second-hand information on it from different sources.

Moreover, while construction of a plant may be assigned considerable importance, movement of the finished product, raw materials and project materials may not be adequately provided for in a project report. Problems of transport of the finished product are sought to be attended to only at a later date.

10.3.1 Modes of Transportation

Modes of transportation used in national and international logistics and supply chain management can be grouped under five models. They are rail, highway, water, pipeline, and air. The relative importance of each mode can be measured in terms of system mileage, traffic volume, revenue, and the nature of traffic composition. Each mode is discussed with respect to these measures.

1. Motor Carriers

Highway transportation has expanded rapidly since the end of World War II. To a significant degree the rapid growth of the motor carrier industry results from door-to-door operating flexibility and speed of intercity movement. Motor carriers have flexibility because they are able to operate on all types of roadways. In comparison to railroads, motor carriers have relatively 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. Labor requirements are also high because of driver safety restrictions and the need for substantial dock labor. In comparison to railroads, motor carriers are best suited to handle small shipments moving short distances. The characteristics of motor carriers favor 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 labor rates influence all modes of transport, motor carriers are more labor-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 labor intensity and, thus cost. Specialty carriers include package haulers 'such as Federal Express and United Parcel Service. These firms focus on specific requirements of a market or product. Despite the aforementioned problems, it is quite apparent that highway transportation will continue to function as the backbone of logistical operations for the foreseeable future.

2. Rail Network

Historically, railroads have handled the largest number of ton-miles continental. As a result of the early establishment of a comprehensive rail network connecting almost all cities and towns, railroads dominated intercity freight tonnage until after World War II. This early superiority resulted from the capability to transport large shipments economically and to offer frequent service, which gave railroads a somewhat monopolistic position. However, with the advent of serious motor carrier competition following World War II, the railroads' share of revenues and ton-miles started to decline. The capability to efficiently transport large tonnage over long distances is the main reason railroads continue to handle significant intercity tonnage and revenue. 38 Railroad operations incur high fixed costs because of expensive equipment (track), switching yards, and terminals. However, rail experiences relatively low variable operating costs. The replacement of steam by diesel power reduced the railroads' variable cost per ton-mile, and electrification offers potential for more reductions. New labor agreements have reduced workforce requirements, further decreasing variable costs.

3. Water Transport

Water is the oldest mode of transportation. The original sailing vessels were replaced by steamboats in the early 1800s and by diesel power in the 1920s. A distinction is generally made between deep-water and navigable inland water transport. The main advantage of water transportation is the capacity to move extremely large shipments. Water transport employs two types of vessels. Deep-water vessels, which are generally designed for ocean and Great Lakes use, are restricted to deepwater ports for access. In contrast, diesel-towed barges, which generally operate on rivers and canals, have

considerably more flexibility. Water transport ranks between rail and motor carrier in respect to fixed cost. Although water carriers must develop and operate their own terminals, the right of way is developed and maintained by the government and results in moderate fixed costs compared to rail and highway. The main disadvantages of water transport are the limited range of operation and speed. Unless the origin and destination of the movement are adjacent to a waterway, supplemental haul by rail or truck is required. The capability of water to carry large tonnage at low variable cost places this mode of transport in demand when low freight rates are desired and speed of transit is a secondary consideration. Typical inland water freight includes mining and basic bulk commodities such as chemicals, cement, and selected agricultural products. In addition to the restrictions of navigable waterways, terminal facilities for bulk and dry cargo storage and load unload devices limit the flexibility of water transport. Labor restrictions on loading and unloading at docks create operational problems and tend to reduce the potential range of available traffic. Finally, a highly competitive situation has developed between railroads and inland water carriers in areas where parallel routes exist.

4. Pipelines

It operates on a twenty-four-hour basis, seven days per week, and are limited only by commodity changeover and maintenance. Unlike other modes, there is no empty “container” or “vehicle” that must be returned. Pipelines have the highest fixed cost and lowest variable cost among transport modes. High fixed costs result from the right-of-way, construction and requirements for control stations, and pumping capacity. Since pipelines are not labor-intensive, the variable operating cost is extremely low once the pipeline has been constructed. An obvious disadvantage is that pipelines are not flexible and are limited with respect to commodities that can be transported: only products in the form of gas, liquid, or slurry can be handled.

5. Air Transport

The newest but least utilized mode of transport is air freight. Its significant advantage lies in the speed with which a shipment can be transported. A coast-to coast shipment via air requires only a few hours contrasted to days with other modes of transportation. One prohibitive aspect of air transport is the high cost. However, this can be traded off for high speed, which allows other elements of logistical design, such as warehousing or inventory,

to be reduced or eliminated. Air transport still remains more of a potential opportunity than a reality. Although the mileage is almost unlimited, airfreight accounts for significantly less than 1 percent of all intercity ton-miles. Air transport capability is limited by lift capacity (i.e., load size constraints) and aircraft availability. Traditionally, most intercity airfreight utilized scheduled passenger flights. While this practice was economical, it resulted in a reduction of both capacity and flexibility. The high cost of jet aircraft, coupled with the erratic nature of freight demand, has limited the assignment of dedicated planes to all-freight operations. However, premium air carriers such as Federal Express and United Parcel Service Overnight provide dedicated global freight operation. While this premium service was originally targeted at documents, it has expanded to include larger parcels. For example, both United Parcel and Federal Express have extended their air freight service to include overnight delivery from a centralized distribution center located at their air hub. This is an ideal service for firms with a large number of high-value products and time-sensitive service requirements. The fixed cost of air transport is low compared to rail, water, and pipeline. In fact, air transport ranks second only to highway with respect to low fixed cost. Airways and airports are generally developed and maintained with public funds. Likewise, terminals are normally maintained by local communities. The fixed costs of airfreight are associated with aircraft purchase and the requirement for specialized handling systems and cargo containers. On the other hand, air freight variable cost is extremely high as a result of fuel, maintenance, and the labor intensity of both in flight and ground crews.

10.3.2 Transportation Process

Whether the movement of material and equipment is by rail, sea, air or road, adequate facilities for their free flow to and from the factory must be ensured. In general the following activities are performed by the transport in logistics.

1. Terminal Facilities: One of the major activities of transportation is making terminal arrangement. Besides the trade growth in India terminal facilities are usually reluctantly provided. The main reason could be of lack of infrastructural facilities. Another reason for this is that any delay in the unloading of trucks or wagons, or any inconvenience caused to truck operators, is not considered to affect adversely the interests of the project and therefore are not believed to be a loss to the carrier. In some cases, this may be true. Actually, however, if these facilities are liberally provided, a reduction can be obtained in

freight rates. Also, the process can be minimized, if not eliminated. Adequate reception and dispatch facilities are generally not planned for even for major projects. Sometimes, there is a conscious or subconscious antagonism against the common carrier .

Major facilities available in terminals: Adequate storage space, Loading and unloading arrangements, Storage facilities. It has not been recognized by the planners of individual projects that considerable savings can be affected by providing adequate terminal facilities because of the low quotation of rates by the transporter who can “come in” and “get out” fast from the factory instead of waiting for hours to unload or load the goods. The overall savings in transport rates would more than justify the expenditure incurred on the provision of additional facilities. For rail movement, not only sufficient number of loading lines, but also sufficient number of marshalling, examination and holding lines must be planned for. These lines must be suitably connected with one another to ensure smooth shunting operations. The configuration of lines (yard design) is more important than the mere number of lines in the yard, for the requirements of prime mover (shunting engines) can also be cut down by a suitable design of yard.

2. Fleet management: An important feature of movement of finished products of major projects is the type of vehicle used for movement. The vehicle dimensions, capacity, type and its special characteristics, if any, have to be examined with reference to the quality and quantity of goods to be moved. In the case of sea transport, the size, speed and the type of ship to be used are very important. In the case of road transport, capacity, moving dimensions, and the speed of the trucks are of great significant. In the case of rail movement, the capacity, type and general availability of wagons must be closely examined. The capacity of vehicles and send their sectional speed together determine the throughput on a particular section. While planning movement of raw materials and finished products, it must be recognized that some sections of roads or the railways in the country have limited spare sectional capacity. With saturated sectional capacity, introduction of more vehicles tends to reduce their speed and, therefore, the total throughput. Planned movement on any section must take into account utilization of the existing sectional capacity, the expected general growth in traffic on the section, and the possible on a saturated section is inevitable, line Capacity of the section must be increased.

3. **Key Movers:** The motive power utilized for the internal handling of vehicles and transportation to destinations is another important component of the total movement system. In the case of rail movement, locomotives required for shunting and marshalling of wagons within the plant must be of such weight, horsepower and performance characteristics as will match the specific tasks of shunting and reception and dispatch of wagons. In the case of road movement, suitable design and layout of conveyors and mechanical loaders can reduce the drudgery of annual labour and make pre-dispatch and post receipt handling operations more efficient.

4. **Routing:** Another important aspect of transport preparation is the routes for streams of traffic, viz., roadways, railways, waterways and airways. The goal of efficient fleet management is to ensure on-time deliveries and pick-ups while reducing costs. Solving the vehicle routing problem is critical to efficient fleet management. In order to reduce cost and guarantee timeliness, routes must be created to reduce driving time and/or driving distance. The routes or pathways must have adequate capacities. Generally speaking, because of lack of understanding of the transportation subject, executives take it for granted that capacity of routes is unlimited. For example, they generally feel that the problem of rail transport is solved fully and finally by the supply of adequate number of wagons by the railways. They are not able to appreciate that these wagons have also to be moved over a section of railways after loading has been completed. Again, positioning of a large number of trucks at the factory gate cannot be taken as the full and final solution of the problem of road transport just as chartering and berthing of vessels for sea transport is not the full and final solution of the problem of movement of cargo by sea. A very important but invisible component of movement activity is sectional capacity, which is dependent on permissible sectional speed and other characteristics of a section. In turn, sectional speed depends on the geometrics of the road (track in the case of the railway, sea route in the case of ships, type of road surface, carriage way, gradients and curves in the case of roads). Over a section of railways or roadways between two stations A and B, only a limited number of wagons, trucks, or vessels can be pushed through, depending on the availability of terminal facilities to handle these vehicles, the facilities to enable these vehicles to move on the section, and availability of sufficient number of vehicles. Unless sufficient capacity is developed on each of the different routes to move the vehicles, the additional number of vehicles provided would not necessarily lead to higher levels of transport

availability. On the contrary, movement may become more sluggish. Very often, restrictions are imposed by the railways on certain routes. In the case of road transport, the carrier quotes higher rates for routes which are highly congested, or poorly maintained, or of poor design. 5. Transit time management: The relative locations of a plant and the customers or suppliers determine largely the transit time of raw materials, spare parts and finished goods. Transit time generally never receives adequate attention in the planning of major projects. There is a general impression that, if need be, transit time can be drastically cut any time by air-lifting a consignment. Apart from the fact that the neglect of transportation planning on account of this erroneous assumption leads to overall higher cost of transport, in practice, reduction in transmits time actually achieved may not justify that heavy cost of air transport. Rough estimates of transit time from unreliable information sources are generally utilized by “technical experts” for planning movements of goods. Although more detailed information may be readily available with appropriate authorities, it may not be solicited from them.

5. Distribution Pattern: The pattern of movement of the finished product by road or rail must be planned properly. For example, when the requirements of the number of rail wagons are not to be worked out, it is not sufficient to take the average lead or distance for the whole country for calculating fleet requirements. It is also not sufficient to use the figure of the existing average lead of general goods, or even that pertaining to a specific commodity. Generally speaking, on the basis of the information supplied by the project management, the common carrier plans for the movement of goods to a specific destination, or region. However, when it comes to actual transport, because of imprecise preplanning, the manufacturer wants the common carrier to transport goods to anywhere and everywhere in the country. This presents a difficult problem. This manufacturer may feel that by providing information must be supplied to the carrier so that the carrier can plan the movement in entirety. The special variability of the movement and its impact on overall transport availability must be duly recognized.

6. Nature of Product: Another aspect, which is often disregarded by project managements as well as the common carrier, is the variability arising out of the specialized nature of products to be moved. The generally low level of sophistication in transport planning in the country has made it difficult for planners to appreciate the fact that transport capacity is influenced by the nature of goods, their packing and other specialized

requirements, such as special handling equipment, etc. It is imperative that we understand that the modern logistics structure rests on efficient transportation. Techniques such as JIT (Just In Time) and Efficient Consumer Response (ECR) would not be possible without the highly developed transportation industry.

7. **Asset Tracking:** In order to serve the customer firms are in a position to update them regarding the progress in movement of goods. The technologies like GSM really provide an enormous information that allows the service providers to identify the distance covered by any shipment as well as its current location. GPS technology is used to determine exact location. Furthermore, the actual condition of the goods can be controlled.

10.4 ADVANTAGES AND DISADVANTAGES

Advantages of Road Transport:

1. **Less Investment:** Roads need less capital than the railways. Laying of railway line needs much capital than road. So it is cheaper.
2. **Door to Door Service:** Railways have the drawback that they cannot go to each village while road transport provides door to door service. So it is more beneficial.
3. **Flexibility in Service:** Unlike railways, the road transport provides flexible service to men and materials.
4. **Employment:** Road transport provides employment to many persons directly and indirectly.
5. **Useful for Small Distances:** While railways are useful in long distances, road transport is useful in small distances.
6. **Complementary to Rail Transport:** Road transport is helpful to rail transport. People reach railway station taking the help of road transport so it provides feeder service to rail transport.
7. **Helpful in Production of Perishable Goods:** Road transport is helpful in production of perishable goods as it facilitates the distribution of perishable goods from point of production to point of consumption.

8. **Beneficial to Industries:** Industries which are situated away from railway links, the road transport helps them a lot. It facilitates the mobility of men and materials for these industries.

Disadvantages of Road Transportation

In spite of various merits, road/motor has some serious limitations:

1. **Seasonal Nature:** Motor transport is not as reliable as rail transport. During rainy or flood season, roads become unfit and unsafe for use.
2. **Accidents and Breakdowns:** There are more chances of accidents and breakdowns in case of motor transport. Thus, motor transport is not as safe as rail transport.
3. **Unsuitable for Long Distance and Bulky Traffic:** This mode of transport is unsuitable and costly for transporting cheap and bulky goods over long distances.
4. **Slow Speed:** The speed of motor transport is comparatively slow and limited.
5. **Lack of Organisation:** The road transport is comparatively less organised. More often, it is irregular and undependable. The rates charged for transportation are also unstable and unequal.
6. **Heavy Taxes:** There is heavy tax burden on motor transport in India. Tax burden per motor vehicle in India is Rs. 3500 while in America it is Rs. 860.
7. **Poor Maintenance of Roads:** Roads are not maintained properly in India. Less than 0.1 percent of national income is spent on the maintenance of roads in India, while in Japan it is 3 percent of the national income.
8. **Rising Cost of Petrol and Diesel:** Due to high prices of petroleum products and diesel, operational costs of road transport are rising and making the mode of transport more costly.
9. **Unsuitable for Long Distances and Bulky Goods:** Road transport is unsuitable for long distances as it is uncomfortable as compared to railways. It is also not suitable for bulky goods.

10.5 SUMMARY

Transportation is one of the most visible elements of logistics operations. The role of transport in national economy is very crucial. Every business firm, regardless of what it produces or distributes, requires the movement of goods from one point to another and, therefore, is involved in transportation. Transportation essentially concerns the spatial dimension of the business firm. “The spatial dimension refers to geographical relationships and reflects the combination of firms with respect to their materials sources, markets, and competitors, plus the spatial relations of the latter to their sources and markets”.

10.6 GLOSSARY

- **Transportation:** *Transportation* is the movement of humans, animals and goods from one location to another.

10.7 SELFASSESSMENT QUESTIONS

1. What are the steps involved in process of transportation?

10.8 LESSON END EXERCISE

1. Explain the merits and demerits of transportation.

2. Describe in detail the modes of transportation.

10.10 SUGGESTIVE READINGS

Osório, L. A., Camarinha-Matos, L. M., & Afsarmanesh, H. (2015, October). ECoNet platform for collaborative logistics and transport. In *Working Conference on Virtual Enterprises*(pp. 265-276). Springer, Cham.

ROAD TRANSPORT

STRUCTURE

- 11.1 Introduction
- 11.2 Objectives
- 11.3 Road system
- 11.4 Role of road transport in movement of material
- 11.5 Role of National Highway Authority of India
- 11.6 Limitations of road transport system
- 11.7 Summary
- 11.8 Glossary
- 11.9 Self-Assessment Questions
- 11.10 Lesson End Exercise
- 11.11 Suggested Readings

11.1 INTRODUCTION

Road transport or road transportation is a type of transport by using roads. Transport on roads can be roughly grouped into the transportation of goods and transportation of people. In many countries licensing requirements and safety regulations ensure a separation of the two industries. Movement along roads may be by bike or automobile, truck, or by animal such as horse or oxen. Standard networks of roads were adopted by Romans, Persians, Aztec, and other early empires, and may be regarded as a

feature of empires. Cargo may be transported by trucking companies, while passengers may be transported via mass transit. Commonly defined features of modern roads include defined lanes and signage. Within the United States, roads between regions are connected via the Interstate Highway System.

The nature of road transportation of goods depends, apart from the degree of development of the local infrastructure, on the distance the goods are transported by road, the weight and volume of an individual shipment, and the type of goods transported. For short distances and light, small shipments a van or pickup truck may be used. For large shipments even if less than a full truckload a truck is more appropriate. In some countries cargo is transported by road in horse-drawn carriages, donkey carts or other non-motorized mode. Delivery services are sometimes considered a separate category from cargo transport. In many places fast food is transported on roads by various types of vehicles. For inner city delivery of small packages and documents bike couriers are quite common.

People are transported on roads. Special modes of individual transport by road such as cycle rickshaws may also be locally available. There are also specialist modes of road transport for particular situations, such as ambulances. Road transportation has expanded rapidly since the end of World War II. To a significant degree the rapid growth of the motor carrier industry results from door-to-door operating flexibility and speed of intercity movement. Motor carriers have flexibility because they are able to operate on all types of roadways. In comparison to railroads, motor carriers have relatively 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. Labor requirements are also high because of driver safety restrictions and the need for substantial dock labor. In comparison to railroads, motor carriers are best suited to handle small shipments moving short distances. The characteristics of motor carriers favor 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.

11.2 OBJECTIVES

After completing this lesson you are able to grasp:

- The meaning of road system
- Role of road transport in movement of material
- Role of National Highway Authority of India

11.3 ROAD SYSTEM

The first evidence of road development in the Indian subcontinent can be traced back to approximately 2800 BC from the ancient cities of Harrapa and Mohenjodaro of the Indus Valley Civilization. Ruling emperors and monarchs of ancient India had constructed roads to connect the cities. Archaeological excavations give us fresh information about road connectivity in ancient India. The Grand Trunk Road was built by the Mauryan Empire and expanded over many different dynasties until being completely revived by Emperor Sher Shah Suri in 1540-45 connecting Sonargaon near Dhaka in Bangladesh with Peshawar in modern-day Pakistan linking several cities from in India. It was also further expanded by the Mughal Empire. In the 1830s the East India Company started a programme of metalled road construction, for both commercial and administrative purposes. The Grand trunk road, from Calcutta, through Delhi to Peshawar was rebuilt at a cost of £1000 / mile, roads from Bombay to Pune Camp, Bombay to Agra, and Bombay to Madras, were constructed, and a Public Works Department, and the Indian Institute of Technology Roorkee founded, to train and employ local surveyors, engineers, and overseers, to perform the work, and maintain the roads. The programme resulted in an estimated 2,500 km (1,600 miles) of metalled roads being constructed by the 1850s. In December 1934 the Indian Road Congress (IRC) was formed, on the recommendations of the Indian Road Development Committee (Jayakar Committee) of the Government of India. They proposed a twenty-year plan, in 1943, to increase the road network from 350,000 km (220,000 miles), to 532,700 km (331,000 miles) by 1963, to achieve a road density of 16 km, per 100 km of land. The construction was to be paid in part through the

duty imposed, since 1939, on petrol sales, and became known as the Nagpur Plan. The construction target was achieved in the late 1950s. In 1956 a Highways Act was passed, and a second twenty-year plan proposed for the period 1961-1981, with the ambition of doubling road density to 32 km, per 100 km². This second plan became known as the Bombay Road Plan. India inherited a poor road network infrastructure at the time of its independence in 1947. Beyond that, between 1947 and 1988, India witnessed no new major projects, and the roads were poorly maintained. Predominantly all roads were single lane, and most were unpaved. India had no expressways, and less than 200 kilometers of 4-lane highways. In 1988, an autonomous entity called the National Highways Authority of India was established in India by an Act of Parliament, and came into existence on 15 June 1989. The Act empowered this entity to develop, maintain and manage India's road network through National Highways. However, even though the Authority was created in 1988, not much happened till India introduced widespread economic liberalization in the early 1990s. Since 1995, the authority has privatized road network development in India. One of the most ambitious projects to improve roads in India was under the National Highways Development Project (NHDP) started in the year 1998 by then Prime Minister Atal Bihari Vajpayee. The flagship project of the NHDP is the Golden Quadrilateral, a total of 5,846 km long 4/6 laned highways connecting the four major cities of Delhi, Mumbai, Chennai and Kolkata. Total cost of the project is Rs.300 billion (US\$6.8 billion), funded largely by the government's special petroleum product tax revenues and government borrowing. In January 2012, India announced the four-lane GQ highway network as complete. Another important road project is the 7,142 km long 4/6 laned North-South and East-West Corridor comprising national highways connecting four extreme points of the country. The North-South and East-West Corridor connects Srinagar in the north to Kanyakumari in the south, including spur from Salem to Kanyakumari (via Coimbatore and Kochi) and Silchar in the east to Porbandar in the west. As of 31 October 2016, 90.99% of the project had been completed, 5.47% of the project work is under Implementation and 3.52% of the total length is left. As of May 2017, under NHDP about 28,915 kilometers of 4/6 lane highways has been constructed (including the GQ and E-W/N-S Corridor), while a total of 48,793 km of road has been planned to be 4/6 laned under the NHDP. Road transport is vital to India's economy. It enables the country's transportation sector to contribute 4.7 percent towards India's gross domestic product, in comparison to railways that contributed 1 percent, in 2009-2010. Road transport has

gained its importance over the years despite significant barriers and inefficiencies in inter-state freight and passenger movement compared to railways and air. The government of India considers road network as critical to the country's development, social integration and security needs of the country. India's road network carries over 65 percent of its freight and about 85 percent of passenger traffic. Indian road network is administered by various government authorities, given India's federal form of government.

11.4 ROLE OF ROAD TRANSPORT IN MOVEMENT OF MATERIAL

The movement of material by road involves adequate facilities for free flow transportation. In general the following activities are performed by the transport of material by road.

1. Terminal Facilities: One of the major activities of transportation is making terminal arrangement. Besides the trade growth In India terminal facilities are usually reluctantly provided. The main reason could be of lack of infrastructural facilities. Another reason for this is that any delay in the unloading of trucks or wagons, or any inconvenience caused to truck operators, is not considered to affect adversely the interests of the project and therefore are not believed to be a loss to the carrier. In some cases, this may be true. Actually, however, if these facilities are liberally provided, a reduction can be obtained in freight rates. Also, the process can be minimized, if not eliminated. Adequate reception and dispatch facilities are generally not planned for even for major projects. Sometimes, there is a conscious or subconscious antagonism against the common carrier .

Major facilities available in terminals: Adequate storage space, Loading and unloading arrangements, Storage facilities. It has not been recognized by the planners of individual projects that considerable savings can be affected by providing adequate terminal facilities because of the low quotation of rates by the transporter who can "come in" and "get out" fast from the factory instead of waiting for hours to unload or load the goods. The overall savings in transport rates would more than justify the expenditure incurred on the provision of additional facilities. For rail movement, not only sufficient number of loading lines, but also sufficient number of marshalling, examination and holding lines must be planned for. These lines must be suitably connected with one another to ensure smooth shunting operations. The configuration of lines (yard design) is more important than the

mere number of lines in the yard, for the requirements of prime mover (shunting engines) can also be cut down by a suitable design of yard.

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3. Key Movers: The motive power utilized for the internal handling of vehicles and transportation to destinations is another important component of the total movement system. In the case of rail movement, locomotives required for shunting and marshalling of wagons within the plant must be of such weight, horsepower and performance characteristics as will match the specific tasks of shunting and reception and dispatch of wagons. In the case of road movement, suitable design and layout of conveyors and mechanical loaders can reduce the drudgery of annual labour and make pre-dispatch and post receipt handling operations more efficient.

4. Routing: Another important aspect of transport preparation is the routes for streams of traffic, viz., roadways, railways, waterways and airways. The goal of efficient fleet management is to ensure on-time deliveries and pick-ups while reducing costs. Solving the vehicle routing problem is critical to efficient fleet management. In order to reduce cost and guarantee timeliness, routes must be created to reduce driving time and/or driving distance.. The routes or pathways must have adequate capacities. Generally speaking,

because of lack of understanding of the transportation subject, executives take it for granted that capacity of routes is unlimited. For example, they generally feel that the problem of rail transport is solved fully and finally by the supply of adequate number of wagons by the railways. They are not able to appreciate that these wagons have also to be moved over a section of railways after loading has been completed. Again, positioning of a large number of trucks at the factory gate cannot be taken as the full and final solution of the problem of road transport just as chartering and berthing of vessels for sea transport is not the full and final solution of the problem of movement of cargo by sea. A very important but invisible component of movement activity is sectional capacity, which is dependent on permissible sectional speed and other characteristics of a section. In turn, sectional speed depends on the geometrics of the road (track in the case of the railway, sea route in the case of ships, type of road surface, carriage way, gradients and curves in the case of roads). Over a section of railways or roadways between two stations A and B, only a limited number of wagons, trucks, or vessels can be pushed through, depending on the availability of terminal facilities to handle these vehicles, the facilities to enable these vehicles to move on the section, and availability of sufficient number of vehicles. Unless sufficient capacity is developed on each of the different routes to move the vehicles, the additional number of vehicles provided would not necessarily lead to higher levels of transport availability. On the contrary, movement may become more sluggish. Very often, restrictions are imposed by the railways on certain routes. In the case of road transport, the carrier quotes higher rates for routes which are highly congested, or poorly maintained, or of poor design.

5. Transit time management: The relative locations of a plant and the customers or suppliers determine largely the transit time of raw materials, spare parts and finished goods. Transit time generally never receives adequate attention in the planning of major projects. There is a general impression that, if need be, transit time can be drastically cut any time by air-lifting a consignment. Apart from the fact that the neglect of transportation planning on account of this erroneous assumption leads to overall higher cost of transport, in practice, reduction in transit time actually achieved may not justify that heavy cost of air transport. Rough estimates of transit time from unreliable information sources are generally utilized by “technical experts” for planning movements of goods. Although more detailed

information may be readily available with appropriate authorities, it may not be solicited from them.

6. Distribution Pattern: The pattern of movement of the finished product by road or rail must be planned properly. For example, when the requirements of the number of rail wagons are not to be worked out, it is not sufficient to take the average lead or distance for the whole country for calculating fleet requirements. It is also not sufficient to use the figure of the existing average lead of general goods, or even that pertaining to a specific commodity. Generally speaking, on the basis of the information supplied by the project management, the common carrier plans for the movement of goods to a specific destination, or region. However, when it comes to actual transport, because of imprecise preplanning, the manufacturer wants the common carrier to transport goods to anywhere and everywhere in the country. This presents a difficult problem. This manufacturer may feel that by providing information must be supplied to the carrier so that the carrier can plan the movement in entirety. The special variability of the movement and its impact on overall transport availability must be duly recognized.

7. Nature of Product: Another aspect, which is often disregarded by project managements as well as the common carrier, is the variability arising out of the specialized nature of products to be moved. The generally low level of sophistication in transport planning in the country has made it difficult for planners to appreciate the fact that transport capacity is influenced by the nature of goods, their packing and other specialized requirements, such as special handling equipment, etc. It is imperative that we understand that the modern logistics structure rests on efficient transportation. Techniques such as JIT (Just In Time) and Efficient Consumer Response (ECR) would not be possible without the highly developed transportation industry.

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11.5 ROLE OF NATIONAL HIGHWAY AUTHORITY OF INDIA

National Highways Authority of India (NHAI), which was set up by an act of the Parliament namely the NHAI Act 1988, has been entrusted with the responsibility of the National Highways Development Project, which along with other minor projects, has vested in it 50329 kms of National Highways for development, maintenance and management. NHAI's objective is to ensure that all contract awards and procurements conform to the best industry practices with regard to transparency of process, adoption of bid criteria to ensure healthy competition in award of contracts. Implementation of projects conforms to best quality requirements and the highway system is maintained to ensure best user comfort and convenience. In view of the challenging task of construction, development, and management of National highways being undertaken by NHAI

NHAI has a three-tier structure. The Headquarters (HQ), the Regional Offices (ROs) and the Project Implementation Units (PIUs). The PIUs, headed by Project Directors, are responsible for implementation of projects assigned to them and ROs, headed by a CGM level officer, have been set-up in various parts of the Country for decentralizing and strengthening the field level operations in NHAI. The HQ is responsible for overall supervision of the works assigned to NHAI.

III. COMPOSITION OF NHAI BOARD

- The Authority consists of a Chairman and not more than six full-time and six part-time Members.
- Chairman and Members of the Authority are appointed by Central Government.
- The four part-time (Govt) Members of the Authority include : Secretary, Ministry of Road Transport & Highways Secretary, Department of Expenditure, Secretary, Department of Economic Affairs DG (Road Development) & Special Secretary, MoRTH
- The two part-time (non-Govt) members are to be appointed from the professionals having knowledge or experience of financial management, transportation planning or any other relevant discipline.

Role, Objectives and Functions:

The following functions are entrusted to NHAI under the National Highways Authority of India Act, 1988:

- a) Subject to the rules made by the Central Government in this behalf, it shall be the function of the Authority to develop, maintain and manage the national highways and any other highways vested in, or entrusted to it by the Government;
- b) Survey, develop, maintain and manage highways vested in, or entrusted to it;
- c) Construct offices or workshops and establish and maintain hotels, motels, restaurants and rest-rooms at or near the highways vested in, or entrusted to it;
- d) Construct residential buildings and townships for its Employees;
- e) Regulate and control the plying of vehicles on the highways vested in or entrusted to it for the proper management thereof;
- f) Develop and provide consultancy and construction services in India and abroad and carry on research activities in relation to the development, maintenance and management of highways or any facilities thereat;
- g) Provide such facilities and amenities for the users of the highways vested in, or entrusted to it as are in the opinion the Authority, necessary for the smooth flow of traffic on such highways;
- h) Form one or more companies under the Companies Act, 1956 to further the efficient discharge of the functions imposed on it by this Act;
- i) Engage, or entrust any of its functions to, any corporation or body corporate owned or controlled by the Government;
- j) Advise the Central Government on matters relating to highways;
- k) Assist, on such terms and conditions as may be mutually agreed upon, any State Government in the formulation and implementation of schemes for highway development;
- l) Collect fees on behalf of the Central Government for services or benefits rendered under section 7 of the National Highways Act, 1956, as 15 amended from time to time, and such other fees on behalf of the State Governments on such terms and conditions as may be specified by such State Governments; and m) Take all such steps as may be necessary or convenient for, or may be incidental to, the exercise

of any power or the discharge of any function conferred or imposed on it by this Act.

11.6 LIMITATIONS OF ROAD TRANSPORT SYSTEM

In spite of various merits, road/motor has some serious limitations:

- **Seasonal Nature:** Motor transport is not as reliable as rail transport. During rainy or flood season, roads become unfit and unsafe for use.
- **Accidents and Breakdowns:** There are more chances of accidents and breakdowns in case of motor transport. Thus, motor transport is not as safe as rail transport.
- **Unsuitable for Long Distance and Bulky Traffic:** This mode of transport is unsuitable and costly for transporting cheap and bulky goods over long distances.
- **Slow Speed:** The speed of motor transport is comparatively slow and limited.
- **Lack of Organisation:** The road transport is comparatively less organised. More often, it is irregular and undependable. The rates charged for transportation are also unstable and unequal.

11.7 SUMMARY

Road transportation has expanded rapidly since the end of World War II. To a significant degree the rapid growth of the motor carrier industry results from door-to-door operating flexibility and speed of intercity movement. Road transport or road transportation is a type of transport by using roads. Transport on roads can be roughly grouped into the transportation of goods and transportation of people. In many countries licensing requirements and safety regulations ensure a separation of the two industries. Movement along roads may be by bike or automobile, truck, or by animal such as horse or oxen. Standard networks of roads were adopted by Romans, Persians, Aztec, and other early empires, and may be regarded as a feature of empires. Cargo may be transported by trucking companies, while passengers may be transported via mass transit. Commonly defined features of modern roads include defined lanes and signage. Within the United States, roads between regions are connected via the Interstate Highway System. Road transportation have flexibility because everyone can operate on all types of roadways. In comparison to railroads, road transportation have relatively 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. Labor requirements are also high because of driver safety restrictions and the need for substantial dock labor. In comparison to railroads, road transportation are best suited to handle small shipments moving short distances. The characteristics of road transportation favor 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.

11.8 GLOSSARY

- **Road transport:** Road transport is a type of transport by using roads.
- **NHAI** (National Highways Authority of India): It is an autonomous agency of the Government of India, responsible for management of a network of over 50,000 km of National Highways out of 1,15,000 km in India. It is a nodal agency of the Ministry of Road Transport and Highways.

11.9 SELFASSESSMENT QUESTIONS

1. What do you mean by road transportation?

11.10 LESSON END EXERCISE

1. Explain the role of road transport in movement of material.

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2. Describe the role of National Highway Authority of India.
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11.11 SUGGESTIVE READINGS

Osório, L. A., Camarinha-Matos, L. M., & Afsarmanesh, H. (2015, October). ECoNet platform for collaborative logistics and transport. In *Working Conference on Virtual Enterprises*(pp. 265-276). Springer, Cham.

Maddison, D., Johansson, O., & Pearce, D. W. (1996). *True costs of road transport* (Vol. 5, No. 5). Earthscan.

CONSIGNMENT NOTES

STRUCTURE

- 12.1 Introduction
- 12.2 Objectives
- 12.3 Rail transport
- 12.4 Indian Railway Network and Role in transportation of materials and cargo consignment note
- 12.5 Summary
- 12.6 Glossary
- 12.7 Self-Assessment Questions
- 12.8 Lesson End Exercise
- 12.9 Suggested Readings

12.1 INTRODUCTION

Consignment note is a document prepared by a consignor and countersigned by the carrier as a proof of receipt of consignment for delivery at the destination. Used as an alternative to bill of lading (specially in inland transport), it is generally neither a contract of carriage nor a negotiable instrument. It contains document containing particulars of goods for shipment and which provides proof that the consignment has been received by the carrier for delivery. To outline the terms of the transaction, who will get paid how much when and how certain facts are handled. It is also a record that the transaction occurred in

case the consigned goods are lost or stolen and how that situation is handled. The importance of the consignment note is sometimes underestimated. However, since all parties are benefitted by the proper use and archiving of consignment notes, we would like to bring this to your attention. In addition to the fact that the carrier needs a consignment note, this document also provides the sender and consignee with useful information concerning the transport agreements. Often, it is also the first and most important document to be requested when determining liability in the event of lost or damaged goods. The carrier will sign the consignment note upon receipt of the goods when loading them, and the consignee will also sign the consignment note upon receiving the goods. Should the consignee notice any damage to the goods upon delivery, he will also have to report this on the consignment note so that it will not be possible for the carrier to plead innocent later. Should the consignee sign for receipt of the goods in good condition, however, it will often be difficult to recover damages from the carrier. International courier services often use shipping labels that are adhered to the packages. In this case, there is no document to be signed. Instead, the carrier scans the label as proof that the shipment has been collected. If the scan fails, however, the sender has nothing to fall back on. This is why we always recommend having the carrier actually sign a document such as a manifest generated by the air waybill.

12.2 OBJECTIVES

After completion of this lesson you are able to understand:

- The meaning of rail transport
- Indian Railway Network and Role in transportation of materials and cargo consignment note

12.3 RAIL TRANSPORT

Rail transport is a means of transferring passengers and goods on wheeled vehicles running on rails, which is also known as tracks. It is also commonly referred to as train transport. In contrast to road transport, where vehicles run on a prepared flat surface, rail vehicles (rolling stock) are directionally guided by the tracks on which they run. Tracks usually consist of steel rails, installed on ties (sleepers) set in ballast, on which the rolling stock, usually fitted with metal wheels, moves. Other variations are also possible, such as slab track. This is where the rails are fastened to a concrete foundation resting on a prepared

subsurface. Rolling stock in a rail transport system generally encounters lower frictional resistance than rubber-tired road vehicles, so passenger and freight cars (carriages and wagons) can be coupled into longer trains. The operation is carried out by a railway company, providing transport between train stations or freight customer facilities. Power is provided by locomotives which either draw electric power from a railway electrification system or produce their own power, usually by diesel engines. Most tracks are accompanied by a signalling system. Railways are a safe land transport system when compared to other forms of transport. Railway transport is capable of high levels of passenger and cargo utilization and energy efficiency, but is often less flexible and more capital-intensive than road transport, when lower traffic levels are considered.

The oldest known, man/animal-hauled railways date back to the 6th century BC in Corinth, Greece. Rail transport then commenced in mid 16th century in Germany in the form of horse-powered funiculars and wagonways. Modern rail transport commenced with the British development of the steam locomotives in the early 19th century. Thus the railway system in Great Britain is the oldest in the world. Built by George Stephenson and his son Robert's company Robert Stephenson and Company, the Locomotion No. 1 is the first steam locomotive to carry passengers on a public rail line, the Stockton and Darlington Railway in 1825. George Stephenson also built the first public inter-city railway line in the world to use only the steam locomotives all the time, the Liverpool and Manchester Railway which opened in 1830. With steam engines, one could construct mainline railways, which were a key component of the Industrial Revolution. Also, railways reduced the costs of shipping, and allowed for fewer lost goods, compared with water transport, which faced occasional sinking of ships. The change from canals to railways allowed for "national markets" in which prices varied very little from city to city. The spread of the railway network and the use of railway timetables, led to the standardisation of time (railway time) in Britain based on Greenwich Mean Time. Prior to this, major towns and cities varied their local time relative to GMT. The invention and development of the railway in the United Kingdom was one of the most important technological inventions of the 19th century. The world's first underground railway, the Metropolitan Railway (part of the London Underground), opened in 1863.

In the 1880s, electrified trains were introduced, leading to electrification of tramways and rapid transit systems. Starting during the 1940s, the non-electrified railways

in most countries had their steam locomotives replaced by diesel-electric locomotives, with the process being almost complete by the 2000s. During the 1960s, electrified high-speed railway systems were introduced in Japan and later in some other countries. Many countries are in the process of replacing diesel locomotives with electric locomotives, mainly due to environmental concerns, a notable example being Switzerland, which has completely electrified its network. Other forms of guided ground transport outside the traditional railway definitions, such as monorail or maglev, have been tried but have seen limited use.

12.4 INDIAN RAILWAY NETWORK AND ROLE IN TRANSPORTATION OF MATERIALS AND CARGO CONSIGNMENT NOTE

Rail transport is an important mode of transport in India. All main-line rail operations in India are handled by Indian Railways (IR), a state-owned organization of the Ministry of Railways. As of March 2017, the rail network comprises 121,407 km (75,439 mi) of track over a route of 67,368 km (41,861 mi) and 7,349 stations.[1] It is the fourth-largest railway network in the world (after those of the United States, Russia and China). Forty nine percent of the routes are electrified with 25 KV AC electric traction while thirty-three percent of them are double or multi-tracked. It is one of the busiest networks in the world, transporting 8.107 billion passengers and over 1.108 billion tonnes of freight annually, as of 2017. Indian Railways is the world's eighth largest employer, with more than 1.308 million employees as of March 2018. As of March 2017, IR's rolling stock consisted of 277,987 freight wagons, 70,937 passenger coaches and 11,452 locomotives. IR owns locomotive and coach-production facilities at several locations in India. The urban rail transit systems across the country are operated independently of Indian Railways. There are currently 11 operational rapid transit (also called 'metro') systems in ten cities in India. As of November 2017, India has 425 kilometres (264 miles) of operational metro lines and 347 stations. A further 500+ km of lines are under construction.

1832–1852: Industrial railways

The first proposals for railways in India were made in Madras in 1832. The first train in India ran from Red Hills to Chintadripet bridge in 1837. It was called Red Hill Railway and used a rotary steam locomotive manufactured by William Avery. The railway was built by Sir Arthur Cotton and was mainly used for transporting granite stones for

road-building work in Madras. In 1845 Cotton built the Godavari Dam Construction Railway at Dowleswaram in Rajahmundry, used to supply stones for construction of a dam over Godavari. On 8 May 1845, Madras Railway was incorporated, and East India Railway (EIR) was incorporated the same year. On 1 August 1849 Great Indian Peninsular Railway (GIPR) was incorporated by an Act of Parliament. A “Guarantee System” providing free land and guaranteeing rates of return (5%) to private English companies building railways was finalized on 17 August 1849. In 1851 the Solani Aqueduct Railway was built in Roorkee, hauled by a steam locomotive called Thomason, named after a British officer. It was used for transporting construction materials for an aqueduct over the Solani river. In 1852 the Madras Guaranteed Railway Company was incorporated. The first passenger train in India ran between Bombay (Bori Bunder) and Thane on 16 April 1853. The 14-carriage train was hauled by three steam locomotives: Sahib, Sindh and Sultan. It carried 400 people and ran on a line of 34 kilometres (21 mi) built and operated by GIPR. This line was built in 1,676 mm (5 ft 6 in) broad gauge, which became the standard for railways in the country. In May 1854 the Bombay–Thane line was extended to Kalyan by building India’s first railway bridges, the Thane viaducts, over Thane creek. In Eastern India, the first passenger railway train ran from Howrah (near Calcutta) to Hoogly on 15 August 1854. The 39-kilometre (24 mi) line was built and operated by EIR. In August 1855, EIR Express and Fairy Queen steam locomotives started hauling trains. The first passenger train in South India ran from Royapuram and Veyasarapady (Madras) to Wallajah Road (Arcot) on 1 July 1856 on a 97-kilometre (60 mi) line built and operated by Madras Railway. On 24 February 1873 the first tramway, a 3.8-kilometre (2.4 mi) horse-drawn tramway, opened in Calcutta between Sealdah and Armenian Ghat Street. On 9 May 1874 a horse-drawn tramway began operation in Bombay between Colaba and Parel. In 1880 Calcutta Tramways Company was incorporated. GIPR started its first workshops in Byculla in 1854 and Madras Railway set up their first workshop at Perambur in 1856. The railway boom continued with the incorporation of Bombay, Baroda, and Central India Railway (BB&CI) in 1855, Eastern Bengal Railway in 1858,[16] and East Coast State Railway in 1890. Great South Indian Railway (GSIR) and Carnatic Railway merged in 1874 to form the South Indian Railway. In 1897 lighting in passenger coaches was introduced by many railway companies. In 1902 the Jodhpur Railway became the first to introduce electric lights as standard fixtures. In 1920 electric lighting of signals was introduced between Dadar and Currey Road in Bombay. The first railway budget was presented in

1925. The Oudh and Rohilkhund Railway was merged with EIR in the same year. In 1930, the route of the Grand Trunk Express was changed to Delhi-Madras. On 3 February 1925 India's first electric passenger train ran between Victoria terminus and Kurla, on 1500 V DC overhead traction[19] with locomotives provided by Cammell Laird and Uerdingenwagonfabrik companies. Later that year the VT–Bandra section was electrified with an elevated platform at Sandhurst Road. Kurla–Kalyan and lines to Poona and Igatpuri were electrified in 1926 and the Bandra–Virar section was electrified by January 1928. On 1 June 1930 the Deccan Queen began running, hauled by a WCP-1 (No. 20024, old No. EA/1 4006) with 7 coaches, on the GIPR's electrified route from Bombay VT to Poona. The Frontier Mail made its inaugural run in 1928 between Bombay VT and Peshawar. In 1929 the Grand Trunk Express began running between Peshawar and Mangalore and Punjab Limited Express began running between Mumbai and Lahore. Technical advancements saw automatic colour-light signals first become operational on GIPR's lines between Bombay VT and Byculla in 1928 and were extended to the Byculla–Kurla section the following year.

1951–1983: Zonal re-organisation and further developments

India's railways were re-organised into regional zones beginning in 1951 with the creation of Southern Railway on 14 April and Central Railway and Western Railway on 5 November. The post of Chief Commissioner of Railways was abolished and the Railway Board adopted the practice of making its senior-most member Chairman. Also in 1951, the government of West Bengal entered into an agreement with the Calcutta Tramways Co. to take over its administrative functions. On 14 April 1952 Northern Railway, Eastern Railway and North-Eastern Railway were created. On 1 August 1955 South-Eastern Railway was split from Eastern Railway, and the following year divisional systems of administration were set up for the various regional zones. In 1958 the North-Eastern Railway split to form a new Northeast Frontier Railway. In 1952 fans and lights were mandated for all compartments in all classes of passenger accommodation and sleeping accommodation was introduced in coaches. In 1956 the first fully air-conditioned train was introduced between Howrah and Delhi. In 1966 the first containerized freight services began, between Bombay and Ahmedabad. In 1957 India Railways took a decision to adopt 25 KV AC electrification and chose SNCF (French National Railway) as technical consultant. The Main Line Electrification Project was established in the same year. Raj

Kharswan–Dongoposi became the first section to be electrified with 25 kV AC traction with the first train running on 11 August 1960. In 1966 electrification of several suburban tracks around Delhi, Madras and Calcutta was completed with the 25 kV AC system. In 1979 the Main Line Electrification Project was reconstituted into Central Organization for Railway Electrification (CORE). Calcutta Metro became the first metro in the country with the 24 October 1984 line between Esplanade and Bhowanipur (now the Netaji Bhawan station). In 1988 the first Shatabdi Express was introduced between New Delhi and Jhansi (later extended to Bhopal), and was the fastest train at the time. In 1993 air-conditioned 3-tier coaches were introduced as well as a sleeper class separate from second class. In 1999 South East Central was constituted. On 6 July 2002 the East Coast, South Western, South East Central, North Central, and West Central zones were created. On 5 April 2016 Gatiman Express, India's fastest train at a maximum speed of 160 km/h (99 mph), made its first run from Delhi to Agra.

India's first computerized ticketing and reservation was introduced at New Delhi in 1986. In 1990 the first self-printing ticket machine (SPTM) was introduced. In September 1996 the CONCERT computerized reservation system was fully deployed at New Delhi, Mumbai and Chennai, and was completed nationwide on 18 April 1999. In 1998 coupon validating machines (CVMs) were introduced at Mumbai CST. Credit cards were accepted for booking tickets and reservations starting in 1999. Indian Railways launched its web site in February 2000[35] and began taking online train reservations and ticketing on 3 August 2002, which was extended to many cities in December. On 26 September 2013 the Tatkal system of ticketing extended to ordinary trains. On 16 January 1995 the first regularly scheduled services using the 2×25 kV system of traction started on Bina–Katni. On 5 February 2012 Western Railway switched completely to 25 kV AC traction, ending its use of 1.5 kV DC traction. On 11 April 2016 Central Railway completed switching to 25 kV AC traction, ending the use of DC traction on the country's main-line rail network. Indian Railways announced on 31 March 2017 that the entire rail network would be electrified by 2022. The number of goods wagons was 205,596 on 31 March 1951 and peaked at 405,183 on 31 March 1980, after which it declined to 239,321 on 31 March 2012.[citation needed] The number is far less than that required for demand and Indian Railways loses freight traffic to road carriers. The railway carried 93 million tonnes of goods in 1950–51, increasing to 1010 million tonnes in 2012–13. However, its share in

goods traffic is much lower than road traffic. In 1951, its share was 65%, and the share of the road was 35%. Now the shares have been reversed, and the proportion of railways has declined to 30% while the share of road has increased to 70%. Since the 1990s, Indian Railways has stopped single-wagon consignments and provides only full-rake freight trains. As of March 2017, IR network spans 121,407 km (75,439 mi) of track length, while the route length is 67,368 km (41,861 mi). Track sections are rated for speeds ranging from 80 to 200 km/h (50 to 124 mph), though the maximum speed attained by passenger trains is 180 km/h (110 mph). As of March 2017, most of the broad-gauge network is equipped with long-welded rails, pre-stressed concrete (PSC) sleepers and high tensile strength 52kg/60kg 90 UTS rails. 1,676 mm (5 ft 6 in) broad gauge, is the predominant gauge used by IR and spans 61,680 km (38,330 mi) of route (92% of total route network). It is the broadest gauge in use across the world for passenger movement.[45] Broad gauge generated 100% of the freight output (Net tonne-Kilometres) and more than 99% of the passenger output (Passenger Kilometres) in the fiscal year 2016-17. The 1,000 mm (3 ft 3 3/8 in) metre gauge tracks; 762 mm (2 ft 6 in) and 610 mm (2 ft) narrow gauge tracks are present on decreasing number of routes. All of these routes, except the heritage routes, are being converted to broad gauge. The metre gauge tracks were 3,479 kilometres (2,162 mi) (5% of total route network) and narrow gauges tracks were 2,208 km (1,372 mi) (3% of total route network) as of 31 March 2017. Urban rail transit systems in India mostly use standard gauge tracks. These systems are operated by metro/tram rail corporations which are independent of Indian Railways. Trams in Kolkata, the only remaining tram service in the country uses standard gauge tracks. The Line 1 of Kolkata Metro and Delhi Metro use same broad gauge tracks as main-line railways. All other metro lines- constructed, under construction, future — use standard gauge tracks. Metro trains operate in Delhi, Bangalore, Chennai, Mumbai, Hyderabad, Jaipur, Kochi and Lucknow. Gurgaon has a Metro system operated by a private organisation. Metro tracks are being constructed or planned in all million-plus cities in the country. Trains are sorted into categories which dictate the number of stops on a route, their priority on the network and their fare structure. Each express train is identified by a five-digit number. If the first digit is 1 or 2 in the train number, they are long-distance express trains. If the first digit is 0, the train is a special train which will operate for a limited period of time with a different fare structure. A first digit of 5 denotes a passenger train. The second digit indicates the zone operating the train. However, for high-speed trains, the second digit is either 0 or

2 (the first remains 1 or 2). The third digit denotes the division within the zone which is responsible for maintenance and cleanliness, and the last two digits are the train's serial number. The train numbering system was changed from four digits from December 2010, to accommodate an increasing number of trains. Trains travelling in opposite directions along the same route are usually labelled with consecutive numbers. However, there is considerable variation in train numbers; some zones, such as Central Railway, have a less-systematic method of numbering trains. Trains are classified by average speed. A faster train has fewer stops (halts) than a slower one and is usually used for long-distance travel. Most express trains have special names to identify them easily. The names of the trains usually denote the regions they connect, the routes they traverse; a famous person or a tourist spot connected with the train. Rail freight transport is the use of railroads and trains to transport cargo as opposed to human passengers. A freight train or goods train is a group of freight cars or goods wagons (International Union of Railways) hauled by one or more locomotives on a railway, transporting cargo all or some of the way between the shipper and the intended destination as part of the logistics chain. Trains may haul bulk material, intermodal containers, general freight or specialized freight in purpose-designed cars. Rail freight practices and economics vary by country and region.

When considered in terms of ton-miles or tonne-kilometers hauled per unit of energy consumed, rail transport can be more efficient than other means of transportation. Maximum economies are typically realized with bulk commodities (e.g., coal), especially when hauled over long distances. However, shipment by rail is not as flexible as by the highway, which has resulted in much freight being hauled by truck, even over long distances. Moving goods by rail often involves transshipment costs, particularly when the shipper or receiver lack direct rail access. These costs may exceed that of operating the train itself, a factor that practices such as containerization aim to minimize. IR carries the entire gamut of goods, ranging from parcel traffic and small consignments, agricultural products, raw materials like iron ore and petroleum, and finished goods like automobiles. Over the last few decades, IR has made an effort to move away from small consignments or piecemeal freight, and to increase the number of block rakes where a shipper contracts for an entire rake assigned to carry a shipment. These are more profitable for IR as the rake does not have to be split up into or amalgamated from individual wagons going to or coming from different points, saving on marshalling time, transit time, and scheduling. Most of IR's

freight revenue now comes from such block rakes carrying bulk goods such as coal or cement. A typical load (full rake) consists of 40 BCN wagons (2200t). Sometimes half loads (mini-rake) of 20 BCN wagons (1100t) are also available for contracts (see below for more on the mini-rake scheme). Of course, IR does also carry container traffic and also smaller consignments, and there has been talk recently [10/01] of possibly re-entering the piecemeal freight business actively. Some dedicated parcel trains have been introduced. Parcel vans are still used a lot for small consignments; these vans are generally attached to passenger trains. They used to be more numerous in the past, but had been diminishing in importance in the 1980s and 1990s as IR focused on larger loads of freight.

[4/00] High-capacity parcel vans ('Green Parcel Vans') have been used in special-purpose rakes intended for carrying fruits and vegetables. The high-capacity parcel van carries 23t as opposed to the ordinary parcel van which carries 18t of goods. Single high-capacity parcel vans have been seen attached to passenger trains (e.g., GT, Lokshakti and Karnataka Exps., Saurashtra Mail, Flying Raneer); the vans are marked 'Blue Parcel Service' and have a dark-blue livery. Recently [1/03] new parcel vans formed by converting old general passenger stock (GS coaches) have been spotted at various places. These are being used for transporting cars and other automobiles.

Refrigerated parcel van service is available on a few sections. One such service proposed [2/03] for the Ernakulam-Thiruvananthapuram Jan Shatabdi will have a refrigerated parcel van that can accommodate 5t of frozen goods at -20C and 12t of chilled goods at +4C. This coach, manufactured by RCF, has a maximum allowable speed of 130km/h and has a diesel-powered refrigeration unit that can run for 15 days without refuelling. Similar services are expected to be introduced on most major routes. RCF plans to produce 9 of these refrigerated vans in 2003. CR and WR are also introducing such services. Now [10/04] IR has around 10 of these new design refrigerated vans.

In addition, a mini-rake scheme has been introduced [7/03] where loads smaller than full freight rakes (usually half-size, i.e., 20 wagons, also known as half rakes) are booked for transport by IR at full train-load prices, for distances up to about 300km with connecting services for transshipment to road transport. Not only is the half-rake service more convenient for many industrial concerns, the number of sidings at goods sheds and

transshipment points where half-rakes can be loaded or unloaded is much larger than the number of sidings where full rakes can be handled.

Bulk freight transport rates also vary based on the number of times a rake may be loaded or unloaded. A so-called two-point rake is one that can be loaded or unloaded at two points, usually a half-rake at a time, at approved combinations of two loading or unloading locations.

Some freight rates are used continuously in dedicated operations over a closed loop journey. These are known as closed-circuit rakes, and typically consist of 40 BCN or BCNA wagons (cement), or 58 BOXN wagons (coal), or 48 BTPN tankers (petroleum products). Much of the bulk goods movement of SCR, for instance, occurs on such closed-circuit rakes. These rakes are often also subjected to a more rigorous maintenance regime, known as the super-intensive examination, and have brake power certificates (BPC) issued for 6000km / 35 days at a time. The 'Green Bogey' (Green Bogie) service provides for the transport of perishable agricultural products (fruits and vegetables) in refrigerated and non-refrigerated wagons attached to passenger trains. There are a few other timetabled and guaranteed delivery time parcel operations run by IR, such as the 'Tej Shree Parcel Sewa' services (introduced [9/09]) run by NR between Patel Nagar (earlier, Tughlakabad) to Vapi and to Howrah. The parcel trains run on the allocated route, and customers can book parcel vans ('VP') for attachment/detachment at specified stations along the route. The rakes are assigned names in alphabetic sequence starting with a name that begins with an 'A' for the first formation out of a marshalling yard after 0100 hrs, along with a number. This designation can change if the rake is broken up at another yard and regrouped. Thus, freight trains have names such as 'Ahmedabad 10', or 'Bombay 21', or 'India 38'. The letters 'J' and 'U' are not used, so that there are 24 letters available, one for each hour of the day. The number following the alphabetic part of the name indicates the time (minutes past the top of the hour) when the train departed the yard; e.g., 'India 38' is a freight train that left the yard at 0938 hrs. Trains leaving between midnight and 0100 hrs use the letter 'Z'. The words used to signify the letters of the alphabet are not standardized; 'Z' could be indicated by 'Zebra' or 'Zimbabwe'. Some special freight trains are named differently (e.g. the Shalimar Special out of Mumbai (Wadi Bunder to Shalimar near Calcutta), or the 'Salt Cotours' freight (Wadi Bunder to Salt Cotours near Chennai)); these tend to be 'privileged' trains and they carry goods with guaranteed delivery schedules. The

‘Ahmedabad Arrow’ used to run between Bombay and Ahmedabad. Other such named freight trains (past and present) include the ‘Green Arrow’, ‘Blue Flame’, ‘Red Star’, ‘Black Gold’, and ‘Green Bullet’. Other special freight trains include the ‘Freight Chief’ and the ‘Super Link Expresses’. CONCOR introduced several new dedicated timetabled container trains in 2000 (Shalimar - Chennai, Shalimar - Hyderabad, Cossipore - New Delhi) and 2001 (Cossipore - Haldia, for international container freight), with more planned (Shalimar - Mumbai, Shalimar - Nagpur). Recently [12/00] special timetabled parcel trains have been introduced by SER. One is the ‘Dakshin Parcel Express’ between Calcutta and Chennai, and another is the ‘Pashchim Parcel Express’ between Calcutta and Mumbai. These run at 90-105km/h. The ‘Millennium Parcel Express’ is slated [5/01] to run between Chennai and New Delhi, and also perhaps Shalimar - Ahmedabad, Shalimar - Sanatnagar, Sanatnagar - Tughlakabad, and Turbhe (New Bombay) - Shalimar. Most rail container traffic in India is handled by CONCOR (the Container Corporation of India) which until recently was the only such organization. CONCOR is a public-sector concern, but it maintains its own fleet of wagons and other assets that are separate from IR’s, although the traffic moves on IR’s tracks. Recently [2/06] the government has given approval to the Pipavav Rail Corporation (PRCL) to offer container services in India. It is expected that PRCL will run container services from the ports of Pipavav, Mundra, Chennai/Ennore, Vishakhapatnam, and Kochi (Cochin). PRCL is a joint venture between IR and the Gujarat Pipavav Port Ltd. Originally, PRCL was set up to construct and operate a 270km BG railway line between Pipavav port and Surendranagar on the Western Railway. Private operators [8/07] Private companies have only very recently been given approval to operate in India. Generally speaking the private companies are given limited licences to operate container services on specific routes and for a specific number of years. In April 2007, Boxtrans Logistics, belonging to the JM Baxi Group, became the first private player to operate container services, with a rake of 45 Texmaco flat wagons running between Cossipore (ER) and Loni near New Delhi and Mundra port (Gujarat). The initial runs carried about 90 TEUs. Boxtrans also expects to run services on the Loni - Vishakhapatnam route. Its licence allows it to run on all routes except the premier New Delhi - JNPT route. It is expected to maintain 3 rakes of its own. Another company, APL (formerly American President Lines), belonging to the Singapore-based Neptune Orient Lines began container operations in May 2007 with a rake from Loni to JNPT. APL holds a so-called ‘Category 1’ licence allowing it to run container services on all routes in India, for a period of 20

years. APL is initially buying seven 45-flat-wagon rakes from Titagarh Industries. A joint venture between Hind Terminals (of the Sharaf Group, UAE) and MSC Agency (belonging to the Mediterranean Shipping Company, Geneva) also has a Category 1 licence. Another private operator, Innovative B2B Logistic Solutions, has a limited licence to run container services on some routes. Other licensees include Reliance Infrastructure Engineers, Adani Logistics, Central Warehousing Corporation, and Delhi Assam Roadways Corp. Other private operators are gradually entering the field. Arshiya International, a supply-chain management company, began operations in Jan. 2009 with dedicated rakes and custom-built containers to carry freight for Vedanta Aluminium Ltd. The Dedicated Freight Corridor is a project for new railway lines exclusively for carrying freight isolated from normal IR traffic and passenger trains. Conceived in 2004-2005, planning began in 2006, and in 2007 initial proposals have been drawn up. The entire DFC project will include 2,700km or so of exclusive freight lines (new construction), and about 5,000km of feeder lines that will include some new construction and many existing lines that will be upgraded. In the first phase, the Western Corridor will connect the Jawaharlal Nehru Port to New Delhi via Vadodara, Ahmedabad, Palanpur, Jaipur, and Rewari and further on to Tughlakabad and Dadri. There will also be a link between Dadri and Khurja, and feeder routes connecting other ports of Gujarat. There will also be four logistic terminals, one each near New Delhi, Jaipur, Ahmedabad, and Vadodara. The Western Corridor is expected to carry mainly container traffic. The Western Corridor is expected to be unelectrified, using diesel traction. The Eastern Corridor is expected to connect Ludhiana to Sonnagar via Ambala, Saharanpur, Khurja, Shahjahanpur, Lucknow, Allahabad, and Mughalsarai. The primary feeder routes for this will be from Sonnagar to Durgapur via Gomoh, Sonnagar to Tatanagar via Garhwa Road, and Barkakana to Bokaro via Chandrapura. Eventually the Eastern Corridor will be extended to Dankuni, near Kolkata, where there will be a new freight terminal, and to a new (to be built) deep-water port off the coast of West Bengal near Kolkata, with a total length of 1,805km. The Eastern corridor will be single line on the Ludhiana-Khurja portion (426km) and double line on the remaining portions. The Eastern Corridor is expected to carry more heavy mineral traffic and less container traffic. The Eastern Corridor is expected to be electrified. Work on the Eastern Corridor was inaugurated on Feb. 10, 2009, with construction commencing on a 105km section between New Ganjkhwaja near Mughalsarai to New Karwandia near Sonnagar. It is expected that trains running on the DFC lines will be up to 1.5km long (100 wagon rakes) and running at up to 100km/h. Double-stacking

of containers is expected to be the rule, especially on the Western Corridor which will be unelectrified. Transit time for freight between Mumbai and New Delhi is expected to drop to about 36 hours from the current 60 hours. In the busiest freight routes such as Ahmedabad - Marwar, the number of freight trains running is expected to rise from 15 each way each day (currently) to 72 each way; between JNP and Vadodara the increase will be from 9 to 49. Expected completion time for the first phase of the DFC project (the routes described above) is around 5-7 years (i.e., completion by 2012-2014). RITES is the agency carrying out the initial feasibility studies for the project. Currently [7/00] a trial Wabash / Kirloskar roadrailer runs between Konkan Railway (or JNPT) and Nagpur. Konkan Railway has also made some trials of TOFC (trailer on flat car). Intermodal cars are used quite a bit. They are configured with 6 trucks for 5 cars, but double-stacking is not used as the floor height of the cars is usually the same as for regular COFC (container on flat car) services. CONCOR does have flat cars with low bed height for Tallboy containers.

Konkan Railway pioneered the 'roll-on, roll-off' ('RORO' or 'RO-RO') concept in India on its route between Mumbai (Kolad) and Goa (Verna). Starting in 1999 with 5 trucks being transported at a time, today [1/05] the service handles 50 trucks on its route each day. In this service, trucks belonging to commercial private trucking companies loaded with their goods drive on to a rake of flat cars and are carried (trucks and their cargo, and their drivers!) by train to the destination where they simply drive off the train; this obviously eliminates a lot of time lost in intermodal transshipment. Loading and unloading at either end can be as short as 10-15 minutes. The RORO rake normally achieves speeds of about 75km/h. The Kolad-Verna stretch takes about 10 hours with RORO while it can be a full day's driving or more if the trucks take the road instead. The trucks are restricted to 25 tonnes for 2-axle trucks and 40 tonnes for 4-axle trucks. RORO service is also available now until Mangalore (Surathkal) on the KR route. Recently [7/04] it was proposed that KR get monopoly rights to operate such RORO services on the rest of the IR network. Mumbai-Ahmedabad and Mumbai-Kochi are said to be among the routes being considered for this.

Goods trains are classified into a few different categories. Departmental trains are trains run for internal purposes of the railway, such as track maintenance or conveying equipment. They may be ballast trains or other material trains. Breakdown trains and

other special-purpose trains for dealing with accidents are also considered to be departmental trains.

Work trains are trains used for short-distance movements of freight, especially small packages ('smalls') transshipped from long-distance freight trains. Shunting trains are used for moving wagons to different stations in a section, and are involved only in attaching and detaching such wagons. They are also known as section trains (especially on CR) and pick-up trains elsewhere. They are known as pilots if they run for a very short distance, for just a few stations. Trains with wagons that are actually loaded or unloaded with smalls at various stations are called Road Vans, or transship trains (CR) or smalls quick transit (SQT) on ER. Road vans are a vanishing breed these days with the widespread use of block rakes and container traffic and increasing reliance on transshipment of goods from freight terminals to road transport for onward delivery rather than transporting smalls by rail.

Through goods trains are freight trains transporting goods from one goods yard to the next without stoppage at intermediate points. Long-distance goods, also known as solid trains include various special long-distance freight trains that get precedence, such as the Freight Chief or other Express Goods trains with timetabled operations and guaranteed delivery time (including QTS or Quick Transit Service goods), Jumbo trains, and Sherpa trains. The remainder of the through goods trains, which run at lower precedence, are known as Ordinary Through trains.

12.5 SUMMARY

Rail transport is a means of transferring passengers and goods on wheeled vehicles running on rails, which is also known as tracks. It is also commonly referred to as train transport. In contrast to road transport, where vehicles run on a prepared flat surface, rail vehicles (rolling stock) are directionally guided by the tracks on which they run. Tracks usually consist of steel rails, installed on ties (sleepers) set in ballast, on which the rolling stock, usually fitted with metal wheels, moves. Other variations are also possible, such as slab track. This is where the rails are fastened to a concrete foundation resting on a prepared subsurface. Rolling stock in a rail transport system generally encounters lower frictional resistance than rubber-tired road vehicles, so passenger and freight cars (carriages and

wagons) can be coupled into longer trains. The operation is carried out by a railway company, providing transport between train stations or freight customer facilities.

12.6 GLOSSARY

- **Rail transport:** Rail transport is a means of transferring passengers and goods on wheeled vehicles running on rails, which is also known as tracks. It is also commonly referred to as train transport.

12.7 SELFASSESSMENT QUESTIONS

1. Briefly explain the concept of rail transport.

12.8 LESSON END EXERCISE

1. Describe the role of Indian railway network in transportation of materials and cargo consignment note.

12.9 SUGGESTIVE READINGS

Bussieck, M. R., Winter, T., & Zimmermann, U. T. (1997). Discrete optimization in public rail transport. *Mathematical programming*, 79(1-3), 415-444.

AIR TRANSPORT**STRUCTURE**

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13.1 INTRODUCTION – Air Transport

From the beginning of history, human sensitivity has revealed an urge for mobility leading to a measure of Society's progress. The history of this mobility or transport is the history of civilization. For any country to develop with right momentum modern and efficient Transport as a basic infrastructure is a must. It has been seen throughout the history of any nation that a proper, extensive and efficient Road Transport has played a major role. 'Transporters' perform one of the most important activities, at every stage of advanced civilization. Where roads are considered as veins and arteries of a nation, passenger and goods transported are likened to blood in circulation. Passenger Road Transport Service (PRTS) is an essential connected to the economic development. Transport is the essential convenience with which people not just connect but progress. Throughout history, people's progress has been sustained on the convenience, speed and safety of the modes of transport. Road transport occupies a primary place in to-day's world as it provides a reach unparalleled by any other contemporary mode of transport.

Air routes are practically unlimited but are multi-dimensional and include the site, the climate, fog and aerial currents. Air activities are linked to the tertiary and quaternary sectors notably finance and tourism which learn on the long distance mobility of people. Air transport has been accommodating growing quantities of high value freight and is playing a growing role in global logistics.

13.2 TRANSPORT

Transport (British English) or transportation (American English) is the movement of people and goods from one place to another. The term is derived from the Latin trans (“across”) and portare (“to carry”).

13.3 FUNCTIONS OF TRANSPORT

- Air transport is an important enabler to achieving economic growth and development. It facilitates integration into global economy and provides vital connectivity on a national, regional and international scale. It helps to generate trade, promote tourism and create employment opportunities. The following are the functions of transport :

1. Transport contributes in Growth of industries whose product requires quick marketing. Perishable articles like fish and green vegetables are carried to various consumers quickly even in distant markets through transport.

2. Transport helps in increase in the demand for goods. Through transport newer customers in newer places can be easily contacted and products can be introduced to them. Today markets have become national or international only because of transport.

3. Transport creates place utility. Geographical and climatic factors force industries to be located in particular places far away from the markets and places where there may not be any demand for the products. Transport bridges the gap between production and consumption centers.

4. Transport creates time utility. Of late transport has started creating the time utility also. It has been made possible by virtue of the improvements in the speed of transport. It helps the product to be distributed in the minimum possible time.

5. Transport helps in stabilization of price. Transport exerts considerable influence upon the stabilization of the prices of several commodities by moving commodities from surplus to deficit areas. This equalizes the supply and demand factor and makes the price of commodities stable as well as equal.

6. Transport ensures even flow of commodities into the hands of the consumers through out the period of consumption.

7. Transport enables the consumers to enjoy the benefits of goods not produced locally. This increases the standard of living, an essential factor for further development of marketing and economy.
8. Transport intensifies competition, which in turn, reduces prices. Prices are also reduced because of the facilities offered by transport for large-scale production. Advantages of large-scale production is possible only due to transport.
9. Transport increases mobility of labor and capital. It makes people of one place migrate to other places in search of jobs. Even capital, machineries and equipments are imported from foreign countries through transport alone.
10. Transport transfer messages and information for rapid movement of goods and sources.

13.4 HISTORY OF AIRPORT AUTHORITY OF INDIA

The Government of India constituted the International Airports Authority of India (IAAI) in 1972 to manage the nation's international airports while the National Airports Authority (NAA) was constituted in 1986 to look after domestic airports. The organisations were merged in April 1995 by an Act of Parliament, namely, the Airports Authority of India Act, 1994 and has been constituted as a Statutory Body and was named as Airports Authority of India (AAI) working under the ministry of civil aviation is responsible for creating, upgrading, maintaining and managing civil aviation infrastructure in India. This new organisation was to be responsible for creating, upgrading, maintaining and managing civil aviation infrastructure both on the ground and air space in the country.

The Airports Authority of India (AAI) was formed on 1st April 1995 by merging the International Airports Authority of India and the National Airports Authority with a view to accelerate the integrated development, expansion, and modernization of the operational, terminal and cargo facilities at the airports in the country conforming to international standards.

- Design, Development, Operation and Maintenance of international and domestic airports and civil enclaves.

- Control and Management of the Indian airspace extending beyond the territorial limits of the country, as accepted by ICAO.
- Construction, Modification and Management of passenger terminals.
- Development and Management of cargo terminals at international and domestic airports.
- Provision of passenger facilities and information system at the passenger terminals at airports.
- Expansion and strengthening of operation area, viz. Runways, Aprons, Taxiway etc.
- Provision of visual aids.
- Provision of Communication and Navigation aids, viz. ILS, DVOR, DME, Radar etc. services over Indian air space and adjoining oceanic areas.

The **Airports Authority of India** or **AAI** is a statutory body (created through the Airports Authority of India Act, 1994) working under the Ministry of Civil Aviation is responsible for creating, upgrading, maintaining and managing civil aviation infrastructure in India. It provides Air traffic management (ATM) services over Indian airspace and adjoining oceanic areas. It also manages a total of 125^[1] Airports, including 11^[1] International Airports, 8 Customs Airports, 81 Domestic Airports and 25 Civil enclaves at Military Airfields. AAI also has ground installations at all airports and 25 other locations to ensure safety of aircraft operations. AAI covers all major air-routes over Indian landmass via 29 Radar installations at 11 locations along with 700 VOR/DVOR installations co-located with Distance Measuring Equipment (DME). 52 runways are provided with Instrument landing system (ILS) installations with Night Landing Facilities at most of these airports and Automatic Message Switching System at 15 Airports.

AAI's implementation of Automatic Dependence Surveillance System (ADSS), using indigenous technology, at Kolkata and Chennai Air Traffic Control Centres, made India the first country to use this technology in the South East Asian region thus enabling Air Traffic Control over oceanic areas using satellite mode of communication. Performance Based Navigation (PBN) procedures have already been implemented at Mumbai, Delhi

and Ahmadabad Airports and are likely to be implemented at other Airports in a phased manner. AAI is implementing the GAGAN project in technological collaboration with the Indian Space Research Organisation (ISRO), where the satellite based system will be used for navigation. The navigation signals thus received from the GPS will be augmented to achieve the navigational requirement of aircraft. First phase of technology demonstration system was completed in February 2008.

AAI has four training establishments viz. The Civil Aviation Training College (CATC) at Prayagraj, National Institute of Aviation Management and Research (NIAMAR) at Delhi and Fire Training Centres (FTC) at Delhi & Kolkata. An Aerodrome Visual Simulator (AVS) has been provided at CATC and non-radar procedural ATC simulator equipment is being supplied to CATC Allahabad and Hyderabad Airport. AAI has a dedicated Flight Inspection Unit (FIU) with a fleet of three aircraft fitted with flight inspection system to inspect Instrument Landing Systems up to Cat-III, VORs, DMEs, NDBs, VGSI (PAPI, VASI) and RADAR (ASR/MSSR). In addition to in-house flight calibration of its navigational aids, AAI undertakes flight calibration of navigational aids for the Indian Air Force, Indian Navy, Indian Coast Guard and other private airfields in the country.

THE AIRPORTS AUTHORITY OF INDIA ACT, 1994 NO. 55 OF 1994 As Amended by the Airports Authority of India (Amendment) Act 2003 An Act to provide for the constitution of the airports Authority of India and for the transfer and vesting of the undertakings of the International Airports Authority of India and the National Airports Authority to and in the Airports Authority of India so constituted for the better administration and cohesive management of airports and civil enclaves whereat air transport services are operated or are intended to be operated and of all aeronautical communication stations 1 “for the purposes of establishing or assisting in the establishment of airports” and for matters connected therewith or incidental thereto. Be it enacted by Parliament in the Forty-fifth Year of the Republic of India as follows:- (1) This Act may be called the Airports Authority of India Act, 1994. (2) It shall come into force on such date as the Central Government may, by notification in the Official Gazette, appoint. (3) It applies to- (a) all airports whereat air transport services are operated or are intended to be operated, other than airports and airfields belonging to, or subject to the control of, any armed force of the Union; Added by section 2 of AAI Amendment Act, 2003 “(aa) all private airports in so far as it relates to providing air traffic service, to issue directions under Section 37 to them and for the

purposes of Chapter VA”. (b) all civil enclaves; (c) all aeronautical communication stations; and (d) all training stations, establishments and workshops relating to air transport services.

In this Act, unless the context otherwise requires,-

- (a) “aeronautical communication station” means a station in the aeronautical communication service which includes aeronautical practicing service, aeronautical fixed service, aeronautical mobile service and aeronautical radio communication service;
- (b) “airport” means a landing and taking off area for aircrafts, usually with runways and aircraft maintenance and passenger facilities and includes aerodrome as defined in clause (2) of section 2 of the Aircraft Act, 1934;
- (c) “airstrip” means an area used or intended to be used for the landing and take-off of aircrafts with short take-off and landing characteristics and includes all buildings and structures thereon or appertaining thereto’
- (d) “air traffic service” includes flight information service, alerting service, air traffic advisory service, air traffic control service, area control service, approach control service and airport control service;
- (e) “air transport service” means any service, for any kind of remuneration, whatsoever, for the transport by air of persons, mail or any other thing, animate Added by section 3 of AAI Amendment Act, 2003. or inanimate, whether such service relates to a single flight or series of flights;
- (f) “appointed day” means such date as the Central Government may, by notification in the Official Gazette, appoint for the purposes of section 3;
- (g) “Authority” means the Airports Authority of India constituted under section 3;
- (h) “Chairperson” means the Chairperson of the Authority appointed under clause (a) of subsection (3) of section 3;
- (i) “civil enclave” means the area, if any, allotted at an airport belonging to any armed force of the Union, for use by persons availing of any air transport services from such airport or for the handling of baggage or cargo by such service, and includes land comprising of any building and structure on such area;

(j) “heliport” means an area, either at ground level or elevated on a structure, used or intended to be used for the landing and take-off of helicopters and includes any area for parking helicopters and all buildings and structures thereon or appertaining thereto;

(k) “International Airports Authority” means the International Airports Authority of India constituted under section 3 of the International Airports Authority Act, 1971;

(l) “member” means a member of the Authority and includes the Chairperson, but does not include, for the purposes of sections 4, 5, 6 and 7, an ex officio member referred to in clause (b) of sub-section (3) of section 3;

(m) “National Airports Authority” means the National Airports Authority constituted under section 3 of the National Airports Authority Act, 1985;

(n) “prescribed” means prescribed by rules made under this Act’ 3 “(nn) ‘private airport’ means an airport owned, developed or managed by - (i) any person or agency other than the Authority or any State Government, or (ii) any person or agency jointly with the Authority or any State Government or both where the share of such person or agency as the case may be in the assets of the private airport is more than fifty per cent “ (o) “regulations” means regulations made under this Act.

(1) With effect from the appointed day, the Central Government shall, by notification in the Official Gazette, constitute an authority to be called the Airports Authority of India.

(2) The Authority shall be a body corporate by the name aforesaid having perpetual succession and a common seal, with power, subject to the provisions of this Act, to acquire, hold and dispose of property both movable and immovable, and to contract and shall by the said name sue and be sued.

(3) The Authority shall consist of- (a) a Chairperson to be appointed by the Central Government; 3 Added by section 4 of AAI Amendment Act, 2003 6 (b) the Director General of Civil Aviation, or an officer not below the rank of the Deputy Director General of Civil Aviation, to be appointed by the Central Government, ex officio; (c) not less than eight and not more than fourteen members to be appointed by the Central Government.

(4) The Chairperson shall be a whole-time member and other members referred to in clause (c) of sub-section (3) may be appointed as whole-time or part-time members as

the Central Government may think fit.

(5) The Chairperson and the members referred to in clause (c) of sub-section (3) shall be chosen from among persons who have special knowledge and experience in air transport of any other transport services, industry, commercial or financial matters or administration and from among persons who are capable of representing organizations of workers and consumers. A person shall be disqualified for being appointed as a member if he- (a) has been convicted and sentenced to imprisonment for an offence, which, in the opinion of the Central Government, involves moral turpitude; or (b) is an undercharged insolvent; or (c) is of unsound mind and stands so declared by a competent court; or (d) has been removed or dismissed from the service of the Government or a body corporate owned or controlled by the Government; (e) has in the opinion of the Central Government such financial or other interest in the Authority as is likely to affect prejudicially the discharge by him of his functions as a member.

(1) Subject to the provisions of section 6,—

- (i) every whole-time member (other than the ex officio member) shall hold office for a period of five years from the date on which he assumes office or till he attains the age of sixty years, whichever is earlier, and
- (ii) every part-time member (other than the ex-officio member) shall hold office for a period of three years from the date on which he assumes office: Provided that the Central Government may— (a) terminate the appointment of any whole-time member, who is not a servant of the Government, after giving him notice for a period of not less than three months or, in lieu thereof, on payment of an amount equal to his salary and allowances, if any, for a period of three months; (b) terminate the appointment of any part-time member who is not a servant of the Government after giving him notice for such period as may be prescribed; and (c) terminate at any time the appointment of any member who is a servant of the Government.

(2) The other conditions of service of the members shall be such as may be prescribed.

(3) Any member may resign his office by giving notice in writing for such period as may be prescribed to the Central Government and, on such resignation being notified in the Official Gazette by the Government, such member shall be deemed to have vacated his office. The Central Government shall remove a member if he—

- (a) becomes subject to any of the disqualifications mentioned in section 4: Provided that no member shall be removed on the ground that he has become subject to the disqualification mentioned in the clause (e) of that section, unless he has been given a reasonable opportunity of being heard in the matter; or
- (b) refuses to act or becomes incapable of acting; or
- (c) is, without obtaining leave of absence from the Authority, absent from three consecutive meetings of the Authority; or
- (d) in the opinion of the Central Government, has so abused his position as to render his continuance in office detrimental to the public interest: Provided that no member shall be removed under this clause unless he has been given a reasonable opportunity of being heard in the matter.

Any person ceasing to be a member shall, unless disqualified under section 4, be eligible for reappointment.

(1) The Authority shall meet at such times and places, and shall observe such rules of procedure in regard to the transaction of the business at its meetings (including the quorum at such meetings) as may be provided by regulations.

(2) The Chairperson, or, if for any reason he is unable to attend any meeting of the Authority, any other member chosen by the members present at the meeting shall preside at the meeting.

(3) All questions which come up before any meeting of the Authority shall be decided by a majority of the votes of the members present and voting, and, in the event of an equality of votes, the Chairperson, or in his absence, the person presiding, shall have and exercise a second or casting vote. No act or proceeding of the Authority shall be invalid merely by reason of—

- (a) any vacancy in, or any defect in the constitution of, the Authority; or
- (b) any defect in the appointment of a person acting as a member of the Authority; or
- (c) any irregularity in the procedure of the Authority not affecting the merits of the case.

(1) For the purpose of enabling it efficiently to discharge its functions under this Act, the Authority shall, subject to the provisions of section 18 and to such rules as may be made in this behalf, appoint (whether on deputation or otherwise) such number of officers and other employees as it may consider necessary: Provided that the appointment of such category of officers, as may be specified after consultation with the Chairperson in such rules, shall be subject to the approval of the Central Government.

(2) Subject to the provisions of section 18, every officer or other employee appointed by the Authority shall be subject to such conditions of service and shall be entitled to such remuneration as may be determined by regulations. In the discharge of its functions under this Act, the Authority shall act, so far as may be, on business principles.

(1) Subject to the rules, if any, made by the Central Government in this behalf, it shall be the function of the Authority to manage the airports, the civil enclaves and the aeronautical communication stations efficiently.

(2) It shall be the duty of the Authority to provide air traffic service and air transport service at any airport and civil enclaves.

(3) Without prejudice to the generality of the provisions contained in sub-sections (1) and (2), the Authority may—

- (a) plan, develop, construct and maintain runways, taxiways, aprons and terminals and ancillary buildings at the airports and civil enclaves; “establish airports, or assist in the establishment of private airports by rendering such technical, financial or other assistance which the Central Government may consider necessary for such purpose”.
- (b) plan, procure, install and maintain navigational aids, communication equipment, beacons and ground aids at the airports and at such locations

as may be considered necessary for safe navigation and operation of aircrafts;

- (c) provide air safety services and search and rescue, facilities in co-ordination with other agencies;
- (d) establish schools or institutions or centres for the training of its officers and employees in regard to any matter connected with the purposes of this Act; Added by section 5 of AAI Amendment Act, 2003 (e) construct residential buildings for its employees;
- (f) establish and maintain hotels, restaurants and restrooms at or near the airports;
- (g) establish warehouses and cargo complexes at the airports for the storage or processing of goods;
- (h) arrange for postal, money exchange, insurance and telephone facilities for the use of passengers and other persons at the airports and civil enclaves;
- (i) make appropriate arrangements for watch and ward at the airports and civil enclaves;
- (j) regulate and control the plying of vehicles, and the entry and exit of passengers and visitors, in the airports and civil enclaves with due regard to the security and protocol functions of the Government of India;
- (k) develop and provide consultancy, construction or management services, and undertake operations in India and abroad in relation to airports, air-navigation services, ground aids and safety services or any facilities thereat;
- (l) establish and manage heliports and airstrips;
- (m) provide such transport facility as are, in the opinion of the Authority, necessary to the passengers travelling by air;
- (n) form one or more companies under the Companies Act, 1956 or under any other law relating to companies to further the efficient discharge of the functions imposed on it by this Act;

- (o) take all such steps as may be necessary or convenient for, or may be incidental to, the exercise of any power or the discharge of any function conferred or imposed on its by this Act;
 - (p) perform any other function considered necessary or desirable by the Central Government for ensuring the safe and efficient operation of aircraft to, from and across the air space of India;
 - (q) establish training institutes and workshops;
 - (r) any other activity at the airports and the civil enclaves in the best commercial interests of the Authority including cargo handling, setting up of joint ventures for the discharge of any function assigned to the Authority.
- (4) In the discharge of its functions under this section, the Authority shall have due regard to the development of air transport service and to the efficiency, economy and safety of such service.
- (5) Nothing contained in this section shall be construed as-
- (a) authorizing the disregard by the Authority of any law for the time being in force; or
 - (b) authorizing any person to institute any proceeding in respect of duty or liability to which the Authority or its officers or other employees would not otherwise be subject.
- (1) Notwithstanding anything contained in this Act, the Authority may, in the public interest or in the interest of better management of airports, make a lease of the premises of an airport (including buildings and structures thereon and appertaining thereto) to carry out some of its functions under section 12 as the Authority may deem fit: Added by section 6 of the AAI Amendment Act, 2003 Provided lease shall not affect the functions of the Authority under section 12 which relates to air traffic service or watch and ward at airports and civil enclaves.
- (2) No lease under sub-section (1) shall be made without the previous approval of the Central Government.

(3) Any money, payable by the lessee in terms of the lease made under sub-section (1), shall form part of the fund of the Authority and shall be credited thereto as if such money is the receipt of the Authority for all purposes of section 24.

(4) The lessee, who has been assigned any function of the Authority under sub-section (1), shall have all the powers of the Authority necessary for the performance of such functions in terms of the lease”

(1) On and from the appointed day, there shall be transferred to, and vest in, the Authority constituted under section 3, the undertakings of the International Airports Authority and the National Airports Authority.

(2) The undertaking of the International Airports Authority or the National Airports Authority which is transferred to, and which vests in, the Authority under sub-section (1) shall be deemed to include all assets, rights, powers, authorities and privileges and all property movable and immovable, real or personal, corporeal or incorporeal, present or contingent, of whatever nature and where so ever situate, including lands, buildings, machinery, equipments, works, workshops, cash balances, capital, reserves, reserve funds, investments, tenancies, leases and book debts and all other rights and interests arising out of such property as were immediately before the appointed day in the ownership, possession or power of the International Airports Authority, or as the case may be, the National Airports Authority, in relation to its undertaking, whether within or outside India, all books of account and documents relating thereto and shall also be deemed to include all borrowings, liabilities and obligations of whatever kind then subsisting of the International Airports Authority, or as the case may be, the National Airports Authority in relation to its undertaking.

(1) All contracts, agreements and working arrangements subsisting immediately before the appointed day and affecting the International Airports Authority, or as the case may be, the National Airports Authority shall, in so far as they relate to the International Airports Authority, or as the case may be, the National Airports Authority, cease to have effect or be enforceable against the International Airports Authority, or as the case may be, the National Airports Authority and shall be of as full force and effect against or in favour of the Authority in which the undertakings have vested by virtue of this Act and enforceable as fully and effectually as if, instead of the International Airports Authority, or as the case

may be, the National Airports Authority, the Authority had been named therein or had been a party thereto.

(2) Any proceeding, suit or cause of action pending or existing immediately before the appointed day by or against the International Airports Authority or the National Airports Authority in relation to its undertakings may, as from that day, be continued and enforced by or against the Authority in which it has vested by virtue of this Act, as it might have been enforced by or against the International Airports Authority or the National Airports Authority if this Act had not been passed, and shall cease to be enforceable by or against the International Airports Authority, or as the case may be, the National Airports Authority. With effect from the appointed day, all licenses, permits, quotas and exemptions, granted to the International Airports Authority or the National Airports Authority in connection with the affairs and business of the International Airports Authority, or as the case may be, the National Airports Authority, under any law for the time being in force, shall be deemed to have been granted to the Authority in which the undertakings of the International Airports Authority and the National Airports Authority have vested by virtue of this Act.

(1) Where any exemption from, or any assessment with respect to, any tax has been granted or made or any benefit by way of set off or carry forward, as the case may be, of any unabsorbed depreciation or investment allowance or other allowance or loss has been extended or is available to the International Airports Authority or the National Airports Authority, under the Income-tax Act, 1961, such exemption, assessment or benefit shall continue to have effect in relation to the Authority in which the undertakings of the International Airports Authority and the National Airports Authority have vested by virtue of this Act.

(2) Where any payment made by the International Airports Authority or the National Airports Authority is exempted from deduction of the tax at source under any provision of the Income-tax Act, 1961, the exemption from tax will continue to be available as if the provisions of the said Act made applicable to the International Airports Authority or the National Airports Authority were operative in relation to the Authority in which the undertakings of the International Airports Authority and the National Airports Authority have vested by virtue of this Act.

(3) The transfer and vesting of the undertakings or any part thereof in terms of section 13 shall not be construed as a transfer within the meaning of the Income-tax Act, 1961 for the purposes of capital gains. Any guarantee given for or in favour of the International Airports Authority or the National Airports Authority with respect to any loan or lease finance shall continue to be operative in relation to the Authority in which the undertakings of the International Airports Authority and the National Airports Authority have vested by virtue of this Act.

(1) (a) Every officer or other employee of the International Airports Authority serving in its employment immediately before the appointed day shall, in so far as such officer or other employee is employed in connection with the undertaking which has vested in the Authority by virtue of this Act, becomes, as from the appointed day, an officer or, as the case may be, other employee of the International Airports Division of the Authority.

(b) Every officer or other employee of the National Airports Authority serving in its employment immediately before the appointed day shall, in so far as such officer or other employee is employed in connection with the undertaking which has vested in the Authority by virtue of this Act, becomes, as from the appointed day, an officer or, as the case may be, other employee of the National Airports Division of the Authority.

(2) Every officer or other employee of the International Airports Authority or the National Airports Authority who becomes an officer or, as the case may be, other employee of the Authority, as referred to in sub-section (1), shall hold his office or service therein by the same tenure, at the same remuneration, upon the same terms and conditions, with the same obligations and with the same rights and privileges as to leave, passage, insurance, superannuation scheme, provident fund, other funds, retirement, pension, gratuity and other benefits as he would have held under the International Airports Authority or, as the case may be, the National Airports Authority if its undertaking had not vested in the Authority and shall continue to do so as an officer or other employee, as the case may be, of the Authority or until the expiry of a period of one year from the appointed day if such officer or other employee opts not to be the officer or other employee of the Authority within such period: Provided that if the Authority thinks it expedient to extend the period so fixed, it may extend the same up to a maximum period of one year.

(3) Where an officer or other employee of the International Airports Authority or the National Airports Authority opts under sub-section (2) not to be in the employment or service of the Authority in which the undertakings of the International Airports Authority and the National Airports Authority have vested, such officer or other employee shall be deemed to have resigned from the respective cadre.

(4) Notwithstanding anything contained in the Industrial Disputes Act, 1947 or in any other law for the time being in force, the transfer of the services of any officer or other employee of the International Airports Authority or the National Airports Authority to the Authority shall not entitle such officer or other employee to any compensation under this Act or under any other law for the time being in force and no such claim shall be entertained by any court, tribunal or other authority.

(5) The officers and other employees who have retired before the appointed day from the service of the International Airports Authority or the National Airports Authority and are entitled to any benefits, rights or privileges shall be entitled to receive the same benefits, rights or privileges from the Authority in which the undertaking of the International Airports Authority and the National Airports Authority have vested.

(6) The trusts of the Provident Fund and Group Insurance and Superannuation Scheme of the International Airports Authority or the National Airports Authority and any other bodies created for the welfare of officers or employees would continue to discharge their functions in the Authority as was being done hitherto in the International Airports Authority or the National Airports and tax exemption granted to Provident Fund or group Insurance and Superannuation Scheme would continue to be applied to the Authority.

(7) After the expiry of the period of one year, or the extended period, as referred to in sub-section (2), all the officers and other employees transferred and appointed to the Authority, other than those opting not to be the officers or employees of the Authority within such period, shall be governed by the rules and regulations made by the Authority in respect of the service conditions of the officers and other employees of the said Authority. Any land required by the Authority for the discharge of its functions under this Act shall be deemed to be needed for a public purpose and such land may be acquired for the Authority under the provisions of the Land Acquisition Act, 1894 or of any other corresponding law for the time being in force. Subject to the provisions of section 21, the Authority shall be

competent to enter into and perform any contract necessary for the discharge of its functions under this Act.

(1) Every contract shall, on behalf of the Authority, be made by the Chairperson or such other member or such officer of the Authority as may be generally or specially empowered in this behalf by the Authority and such contracts or class of contracts as may be specified in the regulations shall be sealed with the common seal of the Authority: Provided that no contract exceeding such value or amount as the Central Government may, from time to time, by order, fix in this behalf shall be made unless it has been previously approved by the Authority: Provided further that no contract for the acquisition or sale of immovable property or for the lease of any such property for a term exceeding thirty years and no other contract exceeding such value or amount as the Central Government may, from time to time, by order, fix in this behalf shall be made unless it has been previously approved by the Central Government.

(2) Subject to the provisions of sub-section (1), the form and manner in which any contract shall be made under this Act shall be such as may be specified by regulations.

(3) No contract which is not in accordance with the provisions of this Act and the regulations shall be binding on the Authority.

ACCOUNTS AND AUDIT

The Authority may,- (i) With the previous approval of the Central Government, charge fees, or rent-

- (a) for the landing, housing or parking of aircraft or for any other service or facility offered in connection with aircraft operations at any airport, heliport or airstrip; Explanation. - In this sub-clause “aircraft” does not include an aircraft belonging to any armed force of the Union and “aircraft operations” does not include operations of any aircraft belonging to the said force;
- (b) for providing air traffic services, ground safety services, aeronautical communications and navigational aids and meteorological services at any airports and at any aeronautical communication station;

- (c) for the amenities given to the passengers and visitors at any airport, civil enclave, heliport or airstrip;
- (d) for the use and employment by persons of facilities and other services provided by the authority at any airport, civil enclave heliport or airstrip;
 - (ii) with due regard to the instructions that the Central Government may give to the authority, from time to time, charge fees or rent from persons who are given by the authority any facility for carrying on any trade or business at any airport, heliport or airstrip. “ The Authority may, after the previous approval of the Central Government in this behalf, levy on, and collect from, the embarking passengers at an airport, the development fees at the rate as may be prescribed and such fees shall be credited to the Authority and shall be regulated and utilized in the prescribed manner, for the purposes of-
 - (a) funding or financing the costs of up gradation, expansion or development of the airport at which the fee is collected; or
 - (b) establishment or development of a new airport in lieu of the airport referred to in clause (a); or
 - (c) investment in the equity in respect of shares to be subscribed by the Authority in companies engaged in establishing, owning, developing, operating or maintaining a private airport in lieu of the airport Inserted by section 7 of the AAI Amendment Act, 2003. referred to in clause (a) or advancement of loans to such companies or other persons engaged in such activities. The Central government may, after due appropriation made by Parliament by law in this behalf,-
 - (a) provide any capital that may be required by the Authority for the discharge of its functions under this Act or for any purpose connected therewith on such terms and conditions as that Government may determine; (b) pay to the Authority, on such terms and conditions as the Central Government may determine, by way of loans or grants such sums of money as that Government may consider necessary for the efficient discharge by the Authority of its functions under this Act.

(1) The Authority shall have its own fund and all receipts of the Authority shall be credited thereto and all payments of the authority shall be made there from.

(2) The Authority shall have power, subject to the provisions of this Act, to spend such sums as it thinks fit to cover all administrative expenses of the authority and on objects or for purposes authorized by this Act and such sums shall be treated as expenditure out of the fund of the Authority.

(3) All moneys standing at the credit of the Authority which cannot immediately be applied as provided in sub-section (2), shall be- (a) deposited in the State Bank of India or any such Scheduled bank or banks or other public financial institutions subject to such conditions as may, from time to time, be specified by the Central Government; and (b) invested in the securities of the Central Government or in such manner as may be prescribed. Explanation- In this sub-section. "Scheduled bank" has the same meaning as in clause (e) of section 2 of the Reserve Bank of India Act, 1934.

(1) The Authority may, from time to time, set apart such amounts as it thinks fit as a reserve fund or funds for the purpose of expanding existing facilities or services or creating new facilities or services at any airport, civil enclave, heliport or airstrip or for the purpose of providing against any temporary decrease of revenue or increase of expenditure from transient causes or for purposes of replacement or for meeting expenditure arising from loss or damage from fire, cyclone, air-crash or other accident or for meeting any liability arising out of any act or commission in the discharge of its functions under this Act: Provided that without prejudice to the right of the Authority to establish specific reserves for one or more specific purposes, the Authority shall also have the power to establish a general reserve: Provided further that the sums set apart annually in respect of each or any of the specific and general reserves and the aggregate at any time of such sums shall not exceed such limits as may, from time to time, be fixed in that behalf by the Central Government.

(2) After making provision for such reserve fund or funds and for bad and doubtful debts, depreciation in assets and all other matters which are usually provided for by companies registered and incorporated under the Companies Act, 1956, the Authority shall pay the balance of its annual net profits to the Central Government.

(1) The Authority shall, before the commencement of each financial year, prepare a statement of the programme of its activities during the forthcoming financial year as well as financial estimate in respect thereof.

(2) The statement prepared under sub-section (1) shall, not less than three months before the commencement of each financial year, be submitted for approval to the Central Government.

(3) The statement and the financial estimates of the Authority may, with the approval of the Central Government, be revised by the Authority.

(1) The Authority may, with the consent of the Central Government or in accordance with the terms of any general or special authority given to it by the Central Government, borrow money from any source by the issue of bonds, debentures or such other instruments as it may deem fit for discharging all or any of its functions under this Act.

(2) The Central Government may guarantee in such manner as it thinks fit, the repayment of the principal and the payment of interest thereon with respect to the loans borrowed by the Authority under sub-section (1) (3) Subject to such limits as the Central Government may, from time to time, lay down, the Authority may borrow temporarily by way of overdraft or otherwise such amounts as it may require for discharging its functions under this Act.

(1) The Authority shall maintain proper accounts and other relevant records and prepare an annual statement of accounts including the profit and loss account and the balance-sheet in such form as may be prescribed by the Central Government in consultation with the Comptroller and Auditor General of India. (2) The accounts of the authority shall be audited annually by the Comptroller and Auditor-General of India and any expenditure incurred by him in connection with such audit shall be payable by the Authority to the Comptroller and Auditor-General of India.

(3) The Comptroller and Auditor-General of India and any person appointed by him in connection with the audit of the accounts of the Authority shall have the same rights and privileges and authority in connection with such audit as the Comptroller and Auditor-General has in connection with the audit of Government accounts and, in particular shall have the right to demand the production of books, accounts, connected vouchers, documents and papers and inspect any of the offices of the Authority.

(4) The accounts of the Authority as certified by the Comptroller and Auditor-General of India or any other person appointed by him in this behalf together with the audit report thereon shall be forwarded annually to the Central Government and that Government shall cause the same to be laid before both Houses of Parliament.

VA EVICTION OF UNAUTHORISED OCCUPANTS, ETC., OF AIRPORT PREMISES

- (a) “airport premises” means any premises-
- (i) belonging to airport;
 - (ii) taken on lease for the purposes of airport;
 - (iii) acquired for the Authority under the provisions of the Land Acquisition Act, 1894 or any other corresponding law for the time being in force. Added by section 8 of the AAI Amendment Act, 2003 Explanation. – For the removal of doubts, it is hereby declared that for the purposes of this clause, “airport” includes private airport;
- (b) “eviction officer” means an officer of the Authority appointed as such by it under section 28B;
- (c) “premises” means any land or building or part of a building, and includes-
- (i) the garden, grounds and outhouses, if any, appertaining to such building or part of a building; and
 - (ii) any fittings affixed to such building or part of a building for more beneficial enjoyment thereof;
- (d) “rent”, in relation to any airport premises, means the consideration payable periodically for the authorised occupation of the premises, and includes-
- (i) any charge for electricity, water or any other service in connection with the occupation of the premises; and
 - (ii) any tax, by whatever name called, payable in respect of the premises;

- (e) “Tribunal” means the Airport Appellate Tribunal established under sub-section (1) of section 28-I;
- (f) “unauthorized occupation”, in relation to any airport premises, means the occupation by any person of the airport premises without authority for such occupation and includes the continuance in occupation by any person of the airport premises after the authority (whether by way of grant or any other mode of transfer) under which he was allowed to occupy the premises has expired or has been determined for any reason whatsoever. The Authority may, by general or special order in writing, appoint such number of its officers, as it thinks fit, to be eviction officers for the purposes of this Chapter, and define the local limits within which, or the categories of airport premises in respect of which, the eviction officers shall exercise the powers conferred and perform the duties imposed, on eviction officers
- (1) If the eviction officer is of the opinion that any persons are in unauthorised occupation of any airport premises and that they should be evicted, the eviction officer shall, in the manner hereinafter provided, issue a notice in writing calling upon all persons concerned to show cause why an order of eviction should not be made.
- (2) The notice shall-
- (a) specify the grounds on which the order of eviction is proposed to be made; and
 - (b) require all persons concerned, that is to say, all persons who are or may be, in occupation of, or claim interest in, the airport premises-
 - (i) to show cause, if any, against the proposed order on or before such date as is specified in the notice, being a date not earlier than seven days from the date of issue thereof, and
 - (ii) to appear before the eviction officer on the date specified in the notice along with the evidence which they intend to produce in support of the cause shown and also for personal hearing, if such hearing is desired.

(3) The eviction officer shall cause the notice to be served by having it affixed on the outer door or some other conspicuous part of the airport premises and in such other manner as may be prescribed, where upon the notice shall be deemed to have been duly given to the persons concerned.

(4) Where the eviction officer knows or has reasons to believe that any person is in occupation of the airport premises, then, without prejudice to the provisions of sub-section (3), he shall cause a copy of the notice to be served on every such person by post or by delivering or tendering it to that person or in such other manner as may be prescribed.

(1) If, after considering the cause, if any, shown by any person in pursuance of a notice under section 28C and any evidence produced by him in support of the same and after personal hearing, if any, given under sub-clause (ii) of clause (b) of sub-section (2) of section 28C, the eviction officer is satisfied that the airport premises are in unauthorised occupation, the eviction officer may make an order of eviction, for reasons to be recorded therein, directing that the airport premises shall be vacated, on such date as may be specified in the order, by the persons who may be in occupation thereof, and cause a copy of the order to be affixed on the outer door or some other conspicuous part of the airport premises.

(2) If any person refuses or fails to comply with the order of eviction on or before the date specified in the order or within fifteen days of the date of publication under sub-section (1), whichever is earlier, the eviction officer or any other officer duly authorised by the eviction officer in this behalf may, after the date so specified or after the expiry of the period aforesaid, whichever is earlier, evict that person from, and take possession of, the airport premises and may, for that purpose, use such force as may be necessary. (1) Where any persons have been evicted from any airport premises under section 28D, the eviction officer may, after giving ten days' notice to the persons from whom possession of the airport premises has been taken and after publishing the notice in at least one newspaper having circulation in the locality, remove or cause to be removed or dispose of by public auction any property remaining on such premises. (2) Where any property is sold under sub-section (1), the sale proceeds thereof shall, after deducting the expenses of the sale and the amount, if any, due to the Central Government or the corporate authority on account of arrears of rent or damages or costs, be paid to such person or persons as may appear to the eviction officer to be entitled to the same: Provided that where the eviction officer is unable to decide as to the person or persons to whom the balance of the amount

is payable or as to the apportionment of the same, he may refer such dispute to the Tribunal and the decision of the Tribunal thereon shall be final. (1) No person shall- (a) erect or place or raise any building or any movable or immovable structure or fixture; (b) display or spread any goods; (c) bring or keep any cattle or other animal, on or against or in front of any airport premises except in accordance with the authority (whether by way of grant or any other mode of transfer) under which he was allowed to occupy such airport premises.

(2) Where any building or other immovable structure or fixture has been erected, placed or raised in any airport premises in contravention of the provisions of sub-section (1), the eviction officer may serve on the person erecting such building or other structure or fixture, a notice requiring him either to remove or show cause why he shall not remove such building or other structure or fixture to or from the airport premises within such period, not being less than seven days but not exceeding thirty days as may be specified in the notice, and on the omission or refusal of such person to show cause, or to remove such building or other structure or fixture from the airport premises, or where the cause shown is not, in the opinion of the eviction officer, sufficient, the eviction officer may, by order, remove or cause to be removed the building or other structure or fixture from the airport premises and the cost of such removal shall be recoverable from such person as an arrear of land revenue.

(3) Where any movable structure or fixture has been erected, placed or raised, or any goods have been displayed or spread or any cattle or other animal has been brought or kept on any airport premises in contravention of the provisions of sub-section (1) by any person, the eviction officer may, by order, remove or cause to be removed without notice, such structure, fixture, goods, cattle or other animal, as the case may be, from the airport premises and the cost of such removal shall be recoverable from such person as an arrear of land revenue.

(1) Where any person is in arrears of rent payable in respect of airport premises, the eviction officer may, by order, require that person to pay the same within such time and in such instalments as may be specified in the order.

(2) Where any person is, or has at any time been, in unauthorised occupation of any airport premises, the eviction officer may, having regard to such principles of assessment of damages as may be prescribed, assess the damages on account of the use and occupation

of such premises and may, by order, require that person to pay the damages within such time and in such instalments as may be specified in the order.

(3) While making an order under sub-section (1) or subsection (2), the eviction officer may direct that the arrears of rent or, as the case may be, damages shall be payable together with simple interest at such rate as may be prescribed. No order under sub-section (1) or sub-section (2) shall be made against any person until after the issue of a notice in writing to the person calling upon him to show cause within such period not being less than seven days but not exceeding thirty days as may be specified in the notice as to why such order should not be made, and until his objections, if any, and any evidence he may produce in support of the same have been considered by the eviction officer. An eviction officer shall, for the purpose of holding any inquiry into this Chapter, have the same powers, as are vested in a civil court under the Code of Civil Procedure, 1908, while trying a suit in respect of the following matters, namely:-

- (a) summoning and enforcing the attendance of any person and examining him on oath;
- (b) requiring the discovery and production of documents;
- (c) any other matter which may be prescribed.

(1) The Central Government shall, by notification in the Official Gazette, establish a Tribunal, to be known as the Airport Appellate Tribunal, to exercise the jurisdiction, powers and authority conferred on it by or under this Act.

(2) The Tribunal shall consist of a Chairperson (hereinafter referred to in this Act, as the Chairperson of the Tribunal).

(3) The head office of the Tribunal shall be at New Delhi: Provided that the Tribunal may hold its sittings at other places as the Chairperson of the Tribunal may decide, from time to time, having taken into consideration the convenience to decide the appeals before the Tribunal.

(4) The Chairperson of the Tribunal shall be appointed by the Central Government after consultation with the Chief Justice of India.

- (5) A person shall not be qualified for appointment as Chairperson of the Tribunal unless he is, or has been, or is qualified to be, a Judge of a High Court.
- (6) The Chairperson of the Tribunal shall hold office as such for a term of three years from the date on which he enters upon his office or until he attains the age of sixty-two years, whichever is earlier.
- (7) The salaries and allowances payable to, and other terms and conditions of service of, the Chairperson of the Tribunal shall be such as may be prescribed: Provided that neither the salary and allowances nor other terms and conditions of service of the Chairperson of the Tribunal shall be varied to his disadvantage after his appointment.
- (1) The Chairperson of the Tribunal may, by notice in writing under his hand addressed to the Central Government, resign his office: Provided that the Chairperson of the Tribunal shall, unless he is permitted by the Central Government to relinquish his office sooner, continue to hold office until the expiry of three months from the date of receipt of such notice or until a person duly appointed as his successor enters upon his office or until the expiry of his term of office, whichever is the earliest.
- (2) The Chairperson of the Tribunal shall not be removed from his office except by an order made by the Central Government on the ground of proved misbehaviour or incapacity after an inquiry made by a Judge of the Supreme Court in which such Chairperson had been informed of the charges against him and given reasonable opportunity of being heard in respect of those charges.
- (3) The Central Government may, by rules, regulate the procedure for the investigation of misbehaviour or incapacity of the Chairperson of the Tribunal.
- (1) Any person aggrieved by an order of the eviction officer under the Chapter may, within fifteen days from the date of such order, prefer an appeal to the Tribunal in such form as may be prescribed: Provided that the Tribunal may entertain any appeal after the expiry of the said period of fifteen days, but not after the period of 32 thirty days from the date aforesaid it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

- (2) On receipt of an appeal under sub-section (1), the Tribunal shall, after giving the appellant and the eviction officer an opportunity of being heard, pass such order as it thinks fit.
- (3) The Tribunal shall dispose of the appeal within thirty days from the date of filing the appeal: Provided that the Tribunal may, for reasons to be recorded in writing, dispose of the appeal within a further period of fifteen days.
- (4) An order of the Tribunal passed under sub-section (2) shall be executable as a decree of a civil court and for executing the same the Tribunal shall send a copy thereof to the civil court having jurisdiction which shall execute the same, as expeditiously as may be possible, as if such order is a decree passed by that court.
- (5) On and from the date which any jurisdiction, powers and authority becomes exercisable under this Chapter by the Tribunal in relation to any matter, no court (except the Supreme Court under article 136 and the High Court under articles 226 and 227 of the Constitution) shall have, or be entitled to exercise any jurisdiction, powers or authority in relation to such matter.
- (1) The Tribunal shall not be bound by the procedure laid down in the Code of Civil Procedure, 1908 but shall be guided by the principles of natural justice, and, subject to the other provisions of this Act and of any rules made by the Central Government, the Tribunal shall have power to lay down and regulate its own procedure including the fixing of places and times of its inquiry and deciding whether to sit in public or in private.
- (2) The Tribunal shall have, for the purpose of discharging its functions under this Chapter, the same powers as are vested in a civil court under the 33 Code of Civil Procedure, 1908, while trying a suit in respect of the following matters, namely:-
- (a) Summoning and enforcing the attendance of any person and examining him on oath;
 - (b) Requiring the discovery and production of documents;
 - (c) Any other matter which may be prescribed.

(3) Any proceeding before the Tribunal shall be deemed to be a judicial proceeding within the meaning of sections 193 and 228, and for the purposes of section 196, of the Indian Penal Code and the Tribunal shall be deemed to be a civil court for all the purposes of section 195 and Chapter XXVI of the Code of Criminal Procedure, 1973. Subject to the provisions of this Act, every order made by an eviction officer or the Tribunal under this Chapter shall be final and shall not be called in question in any suit, application, execution or other proceeding and no injunction shall be granted by any court or other authority in respect of any action taken or intended to be taken in pursuance of any power conferred by .

(1) Whoever, unlawfully occupies any airport premises, shall be punishable with imprisonment for a term which may extend to six years and with fine.

(2) Whoever fails to comply with any order of the eviction officer or the Tribunal under this Chapter shall be punishable with imprisonment for a term which may extend to seven years and with fine.

(3) If any person who has been evicted from any airport premises under this Chapter again occupies the premises without authority for such occupation, he shall be punishable with imprisonment for a term which may extend to ten years and with fine.

(4) The court may, while convicting a person under subsection (3), make an order for evicting that person summarily and he shall be liable to such eviction without prejudice to any other action that may be taken .

(1) Where any offence under this Chapter has been committed by a company, every person who, at the time the offence was committed, was directly in charge of, and was responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly: Provided that nothing contained in this sub-section shall render any such person liable to any punishment provided , if he proves that the offence was committed without his knowledge or he has exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in subsection(1), where an offence under this Chapter has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to, any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly. Explanation - For the purposes of this section,-

- (a) “Company” means anybody corporate and includes a firm or other association of individuals; and
- (b) “director”, in relation to a firm, means a partner in the firm. No court shall take cognizance of any offence except on a complaint made by the Authority, eviction officer or any other officer authorised by it and no court inferior to that of a Metropolitan Magistrate or a Judicial Magistrate of the first class shall try any offence punishable. If the eviction officer has reason to believe that any persons are in an unauthorised occupation of any airport premises, he or any other officer authorised by him in this behalf may require those persons or any other person to furnish information in relation to the names and other particulars of the persons in occupation of the airport premises and every person so required shall be bound to furnish the information in his possession. It shall be the duty of all the officers of the Government including police officers and any local authority to aid and assist the eviction officer or other officers of the Authority in the discharge of their functions.’

(1) The Authority shall, as soon as may be after the end of each financial year, prepare and submit to the Central Government in such form as may be prescribed a report giving an account of its activities during that financial year and the report shall also give an account of the activities which are likely to be undertaken by the Authority during the next financial year.

(2) The Central Government shall cause such report to be laid before both Houses of Parliament as soon as may be after it is submitted. The Authority may, by general or special order in writing, delegate to the Chairperson or any other member or to any officer

of the authority, subject to such conditions and limitations, if any, as may be specified in the order, such of its powers and functions under this Act, (except the powers under section 42) as it may deem necessary. All orders and decisions of the Authority shall be authenticated by the signature of the Chairperson or any other member authorized by the Authority in this behalf and all other instruments executed by the Authority shall be authenticated by the signature of an officer of the Authority authorized by it in this behalf. All officers and employees of the Authority shall, while acting or purporting to act in pursuance of the provisions of this Act or of any rule or regulation made there under, be deemed to be public servants within the meaning of section 21 of the Indian Penal Code. No suit, prosecution or other legal proceeding shall lie against the authority or any member or any officer or other employee of the Authority or the Chairperson of the Tribunal for anything which is in good faith done or intended to be done in pursuance of this Act or of any rule or regulation made there under or for any damage sustained by any aircraft or vehicle in consequence of any defect in any of the airports, civil enclaves, heliports, airstrips, aeronautical communication stations or other things belonging to or under the control of the Authority. Subject to such regulations as the Authority may make in this behalf, the authority shall provide for securing the safe custody and restoration of any property which, while not in proper custody, is found on any premises belonging to the Authority or under its overall control or in any aircraft on any such premises. For the purposes of the Income-tax Act, 1961 or any other enactment for the time being in force relating to income-tax or any other tax on income profits or gains, the Authority shall be deemed to be a company within the meaning of the Income-tax Act, 1961 and shall be liable to tax accordingly on its income, profits and gains. The Authority may undertake to carry out on behalf of any person any works or services or any class of works or services on such terms and conditions as may be agreed upon between the Authority and the person concerned.

(1) The Authority or any officer specially authorized by it in this behalf may, from time to time, by order, issue directions, consistent with the provisions of the Aircraft Act, 1934, and the rules made there under, with respect to any of the matters specified in clauses (f), (h), (i), (j), (k), (m), (p), (qq) and (r) of 8 Added by section 9 of the AAI Amendment Act, 2003 sub-section (2) of section 5 of that Act, to any person or persons engaged in aircraft operations or using any airport, heliport, airstrip or civil enclave, in any case where the

Authority or the officer is satisfied that in the interests of the security of India or for securing the security of the aircraft it is necessary to do so.

(2) Every direction issued under sub-section (1) shall be complied with by the person or persons to whom such direction is issued.

(3) If any person will fully fails to comply with any direction issued under this section, he shall be punishable with imprisonment for a term which may extend to six months or with fine which may extend to five thousand rupees, or with both. (1) If, at any time, the Central Government is of opinion that in the public interest it is necessary or expedient so to do, it may, by order, direct the Authority to entrust the administration, management or similar other functions of any airport, heliport, airstrip, civil enclave, aeronautical communication station, or any other agency or department of any airport, heliport, airstrip civil enclave or aeronautical communication station with effect from such date and to such person as may be specified in the order and the Authority shall be bound to comply with such direction: Provided that before an order is made under this sub-section the Authority shall be given a reasonable opportunity of being heard in the matter. (2) Where the management of any airport, heliport, airstrip, civil enclave or aeronautical communication station or any other agency or department thereof is entrusted to any person specified under sub-section (1) (hereafter referred to in this section as the authorized person), the Authority shall cease to exercise and discharge all its powers and functions under this Act in relation to such airport, heliport, airstrip, civil enclave or aeronautical communication station or any other 38 agency or department thereof and such powers and functions shall be exercised and discharged by the authorized person in accordance with the instructions, if any, which the Central Government may give to the authorized person from time to time: Provided that no such power or function as may be specified by the Central Government by a general or special order shall be exercised or discharged by the authorized person except with the previous sanction of the Central Government. (3) An order made under sub-section (1) shall, unless rescinded, be in operation for a period of six months from the date on which the management of the airport, heliport, airstrip, civil enclave or aeronautical communication station or any other agency or department thereof is entrusted to the authorized person: Provided that the Central Government may extend such period for a further period or periods not exceeding eighteen months. (4) During the operation of an order made under subsection (1), it shall be competent for the Central Government to

issue, from time to time, such directions to the authority as are necessary to enable the authorized person to exercise the powers and discharge the functions of the Authority under this Act in relation to the airport, heliport, airstrip, civil enclave or aeronautical communication station, or any other agency or department thereof the management of which has been entrusted to him and in particular to transfer any sum of money from the fund of the Authority to the authorized person for the management of the airport, heliport, airstrip civil enclave or aeronautical communication station or any other agency or department thereof and every such direction shall be complied with by the Authority. (5) On the cesser of operation of any order made under sub-section (1) in relation to any airport, heliport airstrip, civil enclave or aeronautical communication station, or any other agency or 39 department thereof the authorized person shall cease to exercise and perform the powers and functions of the authority under this Act in relation to such airport, heliport, airstrip, civil enclave or aeronautical communication station or any other agency or department thereof and the Authority shall continue to exercise and perform such powers and functions in accordance with the provisions of this Act. (6) On the cesser or operation of any order made under sub-section (1) in relation to any airport, heliport, airstrip, civil enclave or aeronautical communication station, or any other agency or department thereof the authorized person shall hand over to the Authority any property (including any sum of money or other asset) remaining with him in connection with the management of such airport, heliport, airstrip, civil enclave or aeronautical communication station. (7) Anything done or any action taken lawfully by the authorized person in relation to any airport, heliport, airstrip, civil enclave or aeronautical communication station or any other agency or department thereof during the period of operation of an order made under sub-section (1) shall be deemed to have been done or taken by the Authority and shall be binding on the Authority. (1) If, at any time, the Central Government is of opinion- (a) that on account of a grave emergency, the Authority is unable to discharge the functions and duties imposed on it by or under the provisions of this Act; or (b) that the Authority has persistently made default in complying with any direction issued by the Central Government under this Act or in the discharge of the functions and duties imposed on it by or under the provisions of this Act and as a result of which default the financial position of the Authority or the administration of any airport, heliport, airstrip, civil enclave or aeronautical communication station has deteriorated; or (c) that circumstances exist which render it necessary in the public interest so to do, the Central Government may, by notification in the Official Gazette,

supersede the Authority for such period, not exceeding six months, as may be specified in the notification: Provided that before issuing a notification under this sub-section for the reasons mentioned in clause (b), the Central Government shall give a reasonable opportunity to the Authority to show cause why it should not be superseded and shall consider the explanations and objections, if any, of the Authority. (2) Upon the publication of a notification under subsection (1) superseding the Authority,- (a) all the members shall, as from the date of supersession, vacate their offices as such; (b) all the powers, functions and duties which may, by or under the provisions of this Act, be exercised or discharged by or on behalf of the Authority, shall until the Authority is re-constituted under sub-section (3), be exercised and discharged by such person or persons as the Central Government may direct; (c) all property owned or controlled by the Authority shall, until the authority is reconstituted under sub-section (3), vest in the Central Government. (3) On the expiration of the period of supersession specified in the notification issued under subsection (1), the Central Government may, (a) extend the period of supersession for such further term not exceeding six months, as it may consider necessary; or (b) re-constitute the Authority by fresh appointment and in such case the members who vacated their offices under clause (a) of sub-section (2) shall not be deemed disqualified for appointment: Provided that the Central Government may, at any time before the expiration of the period of supersession, whether as originally specified under sub-section (1) or as extended under this sub-section, take action under clause (b) of this subsection. (4) The Central Government shall cause a notification issued under sub-section (1) and a full report of any action taken under this section and the circumstances leading to such action to be laid before both Houses of Parliament at the earliest opportunity. (1) Without prejudice to the foregoing provisions of this Act, the Authority shall, in the discharge of its functions and duties under this Act, be bound by such directions on questions of policy as the Central Government may give in writing to it from time to time: Provided that the Authority shall, as far as practicable, be given opportunity to express its views before any direction is given under this sub-section. (2) The decision of the Central Government whether a question is one of policy or not shall be final. (3) The Central Government may, from time to time, issue directions to the Authority regarding the discharge of any functions to it under clause (e) of sub-section (3) of section 12 and the Authority shall be bound to comply with such directions.

(1) The Central Government may, by notification in the Official Gazette, make rules for carrying out the provisions of this Act.

(2) In particular and without prejudice to the generality of the foregoing power, such rules may provide for- (a) the period of notice as may be given by the Central Government to terminate the appointment of any part-time member of the Authority under clause (b) of proviso to subsection (1) of section 5; (b) the conditions of service of the members of the Authority under sub-section (2) of section 5; (c) the period of notice as may be given by any member to resign his office under subsection

(3) of section 5; (d) the provisions subject to which officers and other employees may be appointed by the Authority and the category of officers to be appointed after approval of the Central Government under the proviso to subsection (1) of section 10; (e) the provisions subject to which the Authority may manage the airports, civil enclaves and aeronautical communication stations under sub-section (1) of section 12; the rate of development fees and the manner of regulating and utilizing the fees under section 22A (f) the manner in which the authority may invest its funds under clause (b) of subsection (3) of section 24; (g) the form in which the annual statement of accounts shall be prepared by the Authority under sub-section (1) of section 28: Added by section 10 (a) of the AAI Amendment Act, 2003 (gi) the other manner of serving notice under sub-section (3) of section (gii) the other manner of serving notice under sub-section (4) of section 12(giii) the principles of assessment of damages under sub-section (2) of section (giv) the rate of simple interest under subsection (3) of section 14(gv) any other matter under clause (c) of section 15(gvi) the salaries and allowances payable to, and other terms and conditions of service of, the Chairperson of the Tribunal under sub-section (7) of section 28-I (gvii) the procedure for the investigation of misbehavior or incapacity of the Chairperson of the Tribunal under subsection (3) of section 28J (gviii) the form of appeal under sub-section (I) of section 28K 18(gix) any other matter under clause (c) of sub- section (2) of section 28L Added by section 10(b) of the AAI Amendment Act, 2003 Added by section 10(b) of the AAI Amendment Act, 2003 12 Added by section 10(b) of the AAI Amendment Act, 2003 13 Added by section 10(b) of the AAI Amendment Act, 2003 14 Added by section 10(b) of the AAI Amendment Act, 2003 Added by section 10(b) of the AAI Amendment Act, 2003 Added by section 10(b) of the AAI Amendment Act, 2003 Added by section 10(b) of the AAI Amendment Act, 2003 Added by section 10(b) of the AAI Amendment Act, 2003

Amendment Act, 2003 (h) the form in which a report giving an account of its activities shall be prepared and submitted by the Authority to the Central Government under sub-section (1) of section 29; and (i) any other matter which is to be, or may be, prescribed.

(1) The Authority may make regulations not inconsistent with this Act and the rules made there under to provide for all matters for which provision is necessary or expedient for the purpose of giving effect to the provisions of this Act. (2) Without prejudice to the generality of the foregoing power, such regulations may provide for- (a) the time and places of the meetings of the Authority and the procedure to be followed for the transaction of business including the quorum at such meetings under subsection (1) of section 8; (b) the conditions of service and the remuneration of officers and other employees to be appointed by the Authority under sub-section (2) of section 10; (c) the construction of residential accommodation for the officers and other employees appointed by the Authority under clause (e) of sub-section (3) of section ; (d) the storage or processing of goods in any warehouse established by the Authority under clause (g) of sub-section (3) of section 12 and the charging of fees for such storage or processing; (e) the contracts or class of contracts which are to be sealed with the common seal of the Authority and the form and manner in which a contract may be made by the Authority under sub-section (1) of section 21; (f) the custody and restoration of lost property and the terms and conditions under which lost property may be restored to the persons entitled thereto under section 34; (g) the disposal of any lost property in cases where such property is not restored; (h) securing the safety of aircraft, vehicles and persons using the airport or civil enclave and preventing danger to the public arising from the use and operation of aircraft in the airport or civil enclave; (i) preventing obstruction within the airport or civil enclave for its normal functioning; (j) prohibiting the parking or waiting of any vehicle of carriage within the airport or civil enclave except at places specified by the Authority; (k) prohibiting or restricting access to any part of the airport or civil enclave; (l) preserving order within the airport or civil enclave and preventing damage to property therein; (m) regulating or restricting advertising within the airport or civil enclave; (n) requiring any person, if so directed by an officer appointed by the Authority in this behalf, to leave the airport or civil enclave or any particular part of the airport or civil enclave; and (o) generally for the efficient and proper management of the airport or civil enclave. (3) Any regulation made under any of the clauses (h) to (o) (both inclusive) of subsection (2) may provide that a contravention thereof shall be punishable with fine which may extend to five hundred rupees and in the case of a continuing

contravention with an additional fine which may extend to twenty rupees for every day during which such contravention continues after conviction for the first such contravention. (4) No regulation made by the Authority under this section shall have effect until it has been approved by the Central Government and published in the Official Gazette. (5) Notwithstanding anything contained in this section, the first regulations under this Act shall be made by the Central Government and shall have effect on being published in the Official Gazette. (6) The first regulations framed under subsection (5) shall remain in force until such time the Authority has made regulations and they are published in the Official Gazette.

43. Every rule and every regulation made under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or regulation, as the case may be, or both Houses agree that the rule or regulations, as the case may be, should not be made, the rule or regulation shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule or regulation. (1) If any difficulty arises in giving effect to the provisions of this Act, the Central Government may, by general or special order published in the Official Gazette, make such provisions not inconsistent with the provisions of this Act as appear to it to be necessary or expedient for the removal of the difficulty: Provided that no such order shall be made after the expiration of one year from the commencement of this Act. (2) Every order made under sub-section (1) shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the order or both Houses agree that the order should not be made, the order shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that order. In section 5 of the Aircrafts Act, 1934, in sub-section (2),- (a) in clause (b), for the words and figures “the International Airports Authority Act, 1971 or the National Airports Authority Act, 1985”, the words and figures “the Airports Authority of India Act, 1994” shall be

substituted; (b) proviso to clause (b) shall be omitted. 46. (1) On and from the appointed date,- (i) the International Airports Authority Act, 1971 and the National Airports Authority Act, 1985 shall stand repealed; (ii) the International Airports Authority and the National Airports Authority constituted under the aforesaid Acts shall cease to exist. (2) Notwithstanding such repeal, anything done or any action taken or purported to have been done or taken under the aforesaid Acts so repealed shall, in so far as it is not inconsistent with the provisions of this Act, be deemed to have been done or taken under the corresponding provisions of this Act. A.C.C. UNNI, Additional Secretary to the Govt. Of India.

13.5 AIR TRANSPORT – MEANING

It is the gift of twentieth century to the world and is the most modern, the quickest and the latest addition to the modes of transport. It is the fastest mode of transport for long-distance passengers and high-value light goods. As far as the world trade is concerned, it is still dominated by sea transport because air transport is very expensive and is also unsuitable for carrying heavy, bulky goods. However, transportation of high value light goods and perishable goods is increasingly being carried out by air transport. Air transport is mainly used for international transport and in emergency rather than in normal times. With an increasing globalized economy, countries and companies are exporting and importing all kinds of goods from everywhere in the world. So the importance of air transport increases and plays a very significant role in countries economic growth. Both passenger and freight are the two backbones of air transport

Air transport is an aircraft design for transporting passengers and freight from one location to another in the air using airplanes, jets, rockets , helicopters and drones. Each of these type of air transport has a unique way of achieving speed and the sustainability of it voyage, however, there are other types of air transport which may or may not be used for conveying goods, but could be used for recreational purposes, they include, hot air balloons, blimps, gliders, hang gliding, parachuting, etc.

13.6 AIR TRANSPORT SCENARIO IN INDIA

One of the fastest growing aviation industries in the world is Indian aviation industry. Owing to globalization and liberalization, India's aviation industry has witnessed a revolution with the revocation of the monopoly of government owned airlines and emergence of a

new generation of low cost airlines. Air transport has contributed to the rapid growth of India's international trade in recent decades by offering a reliable and faster mode of transport services to move products and personnel services. It indicates that air transport is going to play an important role in the country's future economic development. Growth in the passenger and cargo traffic in India requires significant investments in terms of construction of new airports, expansion and modernization of existing airports, improvement in connecting infrastructure and better air space management.

13.7 AIRPORTS IN INDIA

Airports as nuclei of economic activity, assume a significant role in the national economy. The airport infrastructure plays a decisive role in shaping a nation's competitiveness and the inflow of foreign investment. It is also significant in the country's booming economic growth. In India airports are managed by the Airport Authority of India. The Airport Authority of India is the government authority that was formed on 1st April 1995 by merging the International Airport Authority of India and the National Airports Authority with a view to accelerating the integrated development, expansion and modernization of the operation, terminal and cargo facilities at the airports in the country confirming to international standards.

13.8 IMPORTANCE OF AIR TRANSPORT

Air transport is an important enabler to achieving economic growth and development. Air transport facilitates integration into the global economy and provides vital connectivity on a national, regional and international scale. It helps generate trade, promote tourism, and create employment opportunities. The world bank has financed aviation – related projects for over sixty years . today, the WBG remains actively engaged in every region on projects related to air transport policy and regulation, safety, infrastructure rehabilitation, institutional strengthening and capacity building.

To assist clients in establishing a safe, functional , efficient, affordable, and reliable air transport network, the bank is mandated to undertake the following activities:

- Operational work through projects and technical assistance
- Economic sector work, research, and knowledge dissemination on air transport related issues.

- External relations and collaboration with partner organisations.
- Internal services (e.g., the airline advisory service for WBG staff).

These activities are detailed in a comprehensive annual report, which aims to outline the objectives, instruments and outcomes of the WBG's development activities in the field of air transportation in the early days, the world bank financed equipment such as aircraft for state owned airlines, and undertook standalone infrastructure projects. With the liberalisation of the air transport sector worldwide, and the privatisation of many state owned airlines, the world bank shifted its pure investment focus to incorporate capacity building , policy and regulatory support. The air transport portfolio includes around 26 projects or project components through the international bank for reconstruction and development (IBRD) and international development association (IDA) , as well as the international finance corporation (IFC) portfolio of lending and investment advisors in the aviation sector.

Major ongoing projects include the Pacific Aviation Investment Program, which is helping to promote safe and efficient air travel in the Pacific Islands by improving aviation infrastructure, management, and operations. The World Bank continues to finance large airport projects, such as the Cairo Airport Development Project – TB2. The IFC is engaged in the sector through the provisions of loans, equity and advisory services to stimulate private sector investment, for example, Zagreb International Airport, Croatia and Queen Alia International Airport, Jordan.

13.9 ADVANTAGES OF AIR TRANSPORT

- **High speed:** It is the fastest mode of transport and therefore, suitable for carriage of goods over a long distance. It requires less time.
- **Quick service:** It provides comfortable , efficient and quick transport services. It is regarded as best mode of transport for transporting perishable goods.
- **No Infrastructure Investment:** It does not give emphasis on construction of tracks like railways. As no capital investment in surface track is needed, it is a less costly mode of transport.

- **Easy access:** Air transport is regarded as the only means of transport in those areas which are not easily accessible to other modes of transport. It is therefore, accessible to all areas regardless the obstruction of land.
- **No Physical Barrier:** It is free from physical barriers because it follows the shortest and direct routes where seas, mountains and forests do not obstruct.
- **Natural route:** It travels to any place without any natural obstacles or barriers because the custom formalities are compiled very quickly. It avoids delay in obtaining clearance.
- **National defence:** It plays a significant role in the national defense of the country because modern wars are conducted with the help of aeroplanes . airways has a upper hand a destroying the enemy in a short period.

13.10 DISADVANTAGES OF AIR TRANSPORT

- **Risky:** Air transport is the most risky form of transport because a minor accident may put a substantial loss to the goods, passengers and the crew. The chances of accidents are greater in comparison to other modes of transport.
- **Very costly:** It is considered costlier as compare to the other modes of transport. The operating cost of aeroplanes are higher and it involves a great deal of expenditure on the construction of aerodromes and aircraft. Because of this reason the fare of air transport are high that common people cannot afford it.
- **Small Carrying Capacity:** The aircrafts have small carrying capacity and therefore these are not suitable for carrying bulky and cheaper goods. The load capacity cannot be increased as it is found in case of rails.
- **Unreliable:** Air transport is unreliable as it depends of the weather forecast. Normally, if the weather is not certain the flight may got delayed.
- **Huge Investment:** It requires huge investment for construction and maintenance of aerodromes. It also requires trained, experienced and skilled personnel which involves a substantial investment.

13.11 TYPES OF AIR TRANSPORT

1. Commercial airplanes
2. Helicopters
3. Private planes
4. Blimps
5. Gliders
6. Hang gliders
7. Zeppelin
8. Parachute

1. Commercial airplanes: these are the common ways in which people travel through the air, the commercial planes provide a fast means of transportation compared to other modes of transport such as **road transport, rail transport** and water transport. Airplanes are capable of carrying hundreds of people from one location to another at a time; the seating is sometimes divided into two or four classes. For instance, most domestic flights usually have two classes which are: First Class and Economy Class. While international flights may have up to four classes such as First Class, Club Class, Business Class, Premium Economy and Economy Class.

2. Helicopters: helicopters are another fast means of air transport; these move people through the air. Helicopters when compared with commercial airplanes are much more limited when it comes to passengers space and can only transport a few people at a time, whereas some commercial airplanes can transport hundreds of people at a time.

3. Private planes: private planes are made to provide transportation service for a single person or at most five (5) people at a time. Private planes range from the smallest Cessna to luxury jets such as the Citation CJ1, which carries up to five people in leather-seated comfort. These planes provide comfort and privacy during the trip and these could travel from one location to another for a business purpose or for pleasure.

4. Blimps: blimps and hot air balloons are used to transport people for recreational purposes. They cover a limited area that enables tourists to see a location on a larger

scope than if they tried to view the area from the ground. Blimps used to be a form of commercial transport but are no longer used for that.

5. Glider: a glider, which is also called sail plane, is a type of glider aircraft used in the sport of gliding or for recreational activity. Sailplanes are aerodynamically streamlined and are capable of gaining altitude when flown in rising air. Some modern gliders are made of an aluminium, alloy or composite frame covered with synthetic sail cloth which forms the wings.

6. Rocket: a rocket is any vehicle that uses a rocket engine; it includes a missile, spacecraft, aircraft or other vehicle. Rockets have been used at least since the 13th century for small-scale military applications and recreational displays. Rockets work more in space than in the atmosphere, the engines work by action and reaction of pushing the rockets forward simply by expelling their exhaust in the opposite direction at high speed, and can therefore work in the vacuum of space.

7. Zeppelin: a Zeppelin was a type of rigid airship named after the German Count Ferdinand von Zeppelin, it consists of a cigar-shaped, trussed, and covered frame supported by internal gas cells. Count Ferdinand von Zeppelin designed Zeppelin in the early 20th century. Zeppelins almost look like blimps but they differ by two points: Zeppelins have a metal skeleton with a rigid covering, and they use hydrogen gas to float. These two elements made zeppelins larger when compared to blimps.

8. Parachute: this is a cloth canopy that is filled with air and allows a person, package or a heavy object attached to it to descend slowly when dropped from an aircraft, or which is released from the rear of an aircraft on landing to act as a brake. Back then, the military developed parachuting technology as a way of saving aircrews from emergencies aboard balloons and aircraft in flight, and later as a way of delivering soldiers to the battlefield. Nowadays, parachuting is performed as a recreational activity and as a competitive sport in various places.

13.12 DEVELOPMENT OF AIR TRANSPORT

Air transport is the newest means of transport; this means of transport was introduced in 1903 but developed into full means of transporting people and freights in the

1930s. The greatest of air transportation started after the Second World War (WWII). This means of transportation can be used for both domestic and international flights.

Of all transport development of the 20th century, those in air transport have been the most striking ones. Who would have thought that when the Wright brothers made their historic flight in 1903, that aircraft would become one of the most important means of passengers transport within just three generations? Improvements have indeed been rapid: jet engines replaced propellers, radar was introduced, the size of aircraft has grown to jumbo proportions; supersonic speeds have been achieved and vertical take-off is now possible.

Today, across the world, air transport is used extensively both for passengers and freight. Broadly, there are two types of services: Those operating for particular purposes on an ad hoc basis and those operating on regular schedules. Into the first category, you will have the flights. (For example, those for tourists in summer and for mineral deposits between inaccessible mines and industrial regions), however, into the latter category would come those services run by British Airways and the other world airlines. Increasingly, the routes of both types radiate from the developed regions and especially from the great capital cities and industrial centres of the world. Whenever possible they mark the shortest distance between places and thus use the Great Circle routes to economize both time and fuel. Many cities including London, New York, Cairo and Bangkok possess major international airports and many others are developing their own international airport facilities. In low areas, where there is difficult terrain, air transport provides the only communication possible and assumes a correspondingly greater significance.

13.13 ROLE OF AIR TRANSPORT IN DOMESTIC AND INTERNATIONAL TRANSPORTATION OF GOODS

Logistics Management in international trade means management of logistics activities in international trade. It is the art of managing international flow of goods and services. Globalization and liberalization of trade policy has brought about many changes in the business environment and companies are forced to think and act globally to survive in this globalized environment. So to remain competitive in the world market, international firms have begun to implement various strategies and considered logistics as one of the key strategies. Logistics is changing the face of international trade by providing workable systems

geared up to fulfilling global needs by supplying goods to the right destination in the right quantity, at right time¹⁵. International trade logistics include those activities that are inherent to the movement of goods and paper work from one country to another, those activities that constitute the basis of or exports and imports activities and operations. The definition given by the Council of Supply Chain Management Professionals (CSMP) can be logically modified to define international logistics by including the elements of the international environment. International Logistics is the process of planning, implementing, and controlling the flow and storage of goods, services and related information from a point of origin to a point of consumption located in a different country

1. Trivandrum International Airport

Trivandrum International airport is the oldest and the foremost of the three international airports in Kerala and also the first international airport outside the four metros in India. It is one of the major airports in South India. It is located at a distance of 4 Kilometers (approximately) from downtown Trivandrum. This airport is located close to the Shankumugham beach. It was established as a part of the flying club, in the year 1932. Its International operations were launched by Air India to Middle Eastern cities like Dubai, Abu Dhabi, Doha, Kuwait city, Baharain and Dhahran, during the latter half of the 1970s and early 1980s. It became an International airport after its upgrade in 1991. With this Trivandrum Airport became the first international airport in India to be located outside metropolitans' cities. Now it has daily flights to many international cities like Kuwait, Dubai, Singapore, Male, Colombo, Sharjah, Muscat, Bahrain Doha, Dammam, Jeddah, Kuala Lumpur and Abu Dhabi. The airport is a convenient connecting point to neighbouring SAARC nations like Sri Lanka and the Maldives as well as Middle East and South East Asian Countries. It plays a major role in the world aviation map, connecting and controlling about nine international Air- Routes and provides approach control service to eight major and minor aerodromes. There are two separate terminals for handling international traffic and domestic traffic, with a total area of 9000m² covering ground and first floor. The international Terminal has a peak hours passenger capacity of 800 and domestics terminal 500 for both arrival and departure passengers put together 29. The New Terminal Building (NITB) was inaugurated by Dr. Manmohan Singh, the Hon'ble Prime Minister of India, on 12th February 2011. International flights from Trivandrum airports stand shifted to new

Airport Terminal with effect from first March 2011. Customs friendly services provided by the companies at Trivandrum airport at competitive rates is one of the major attractions for importers and exporters to opt for Trivandrum airport for the business purpose. Trivandrum Air cargo Terminal is the major centre for exports of perishables from South India. It has also obtained quality certification from the Bureau of Indian Standards as per: ISO 9001-2000 standards, as early in the year 2003. It is the first its kind in India to receive the ISO 9001-2000 certification. The AAI has agreed to give its backing for a Multimodal Hub at this airport .

Air India, Air India Express, Indian Airlines, Jet Airways, Kingfisher Airlines, and Paramount airways are the domestic airlines and Air Arabia, Air India, Air India Express, Emirates, Etihad Airways, Gulf Air, Indian Airlines, Jet Airways, Maldivian, Monarch Airlines, Oman Air, Qatar Airways, Silk Air, Sri Lankan Airlines, Thomas Cook Airlines, Thomson Airways, and Saudi Airlines are the international airlines currently operating from Trivandrum airport. Middle East continues to be the major destination of international flights.

2 Calicut International Airport:

Calicut Airport which also called as Karipur International Airport is one of the three international airports located in Kerala. It is located at Karippur in Malappuram district, which is about 27 kms from Calicut, Kerala, India. The airport , was sanctioned after a long period of struggle which began in 1977 under the leadership of freedom fighter late K.P.Kesava Menon. It was commissioned on 13th April 1988 on a Vishu (Malayalam New Year) by Airport Authority of India. Funds were collected from Gulf Malayalys for its development in the 1990s when the Union Government said it did not have funds. The Malabar International Airport Development Society was established to help to raise the funds for the same. The first flight was from Bombay, initially only four flights operated per week. The first international flight to Sharjah started from this airport on 15th February 1992, placing this airport on the international map and got the status of international airport on 2nd February 2006, thereby paving the way for the improvement of the infrastructure there for handling international flights. Today Calicut Airport is the Gateway to Malabar Region for the whole world. It is the third busiest airport in Kerala and 12th busiest airport in terms of passenger traffic and 11th in cargo handling. It has been declared the best among the 11 airports under the AAI. At present Calicut Airport has a total built up area of

7130 sq.mtrs. The airport have 2 passenger Terminals and one Cargo Terminal. Air India, Air India Express, Indian Airlines, Jet lite, and Kingfisher Airlines are the domestic airlines currently operating from this airport. Air Indi, Emirates, Saudi Airlines, Qatar Airways, Air Arabia, Oman Air, Jet lite, Etihad, Air India Express, Bahrain Air, Rak Air and Kingfisher Airlines are the international airlines currently operating from this airport. Middle East being the major destination of international flights Cochin International Airport (CIAL) Cochin International Airport is also known as Nedumbassery Airport. It is country's youngest Airport and is the first Airport in which is constructed by private participation . It has been built in tune with the Government of India's open sky policy to boost the aviation industry in the country as well as to meet expectation of the people. CIAL is located at Nedumbassery, Cochin, the airport is just 20 kms from Sea port, 15 kms from Cochin Economic Zone and 10 kms from industrial and commercial capital of Kerala, The Tirupur-Coimbatore cargo hub which is key cargo market for South India is only 225 kms from this Airport. It is located about 30kms from Kochi city. CIAL is the first Greenfield airport in India to be built under a Public Private participation (PPP). It is the second largest runway in India with a length of around 3400 m. It is the 4th busiest airports in India in number of international passenger, the other three being Mumbai, Delhi and Chennai . It is the fourth busiest airport in India in terms of international traffic, seventh busiest airport in terms of general traffic and also the busiest airport in Kerala in terms of domestic and international flight. It is one of the country's youngest airports with modern facilities. With equity participation from the Government of Kerala, Industrialists, NRIs, Financial Institutions, Airport Service Providers and the Public, the Cochin International Airport Limited thus came into being as a model enterprise with the first International Airport in India outside the ambit of the Government of India, the first of its kind in the history of civil aviation in India.

The first aircraft by Air India commenced its international operation on 10th June 1999 to Damam. The Air India Jumbo Jet Boeing 747 touched down for the first time in Kerala on 21 June 1999. Domestic flight started on 01st July 1999. Cargo operation at CIAL commenced in October 1999. At that time Air India was the custodian of cargo operation. CIAL took over the cargo custodianship from Air India on December 2000. Air India, Air India Express, Go Air Indian Airlines, Indigo Airlines, Jet Airways, Jet Lite, Kingfisher Airlines, Paramount Airways, and Spice Jet are the domestic airlines currently

operating from CIAL. Silk Air, Saudi Arabian Airlines, Qatar Airways, Oman Air, Kuwait Airways, Indian Airlines, Gulf Air, Etihad Airways, Emirates Airline, Bahrain Air, Air India Express, Air India, and Air Arabia are the International airlines currently operating from CIAL. Middle East being the major destination of international flights.

13.14 CLASSIFICATION OF AIRPORTS IN INDIA

India has jumped to 9th position in world's aviation market from 12th in 2006. Presently India has 454 airports and airstrips, of which 125 are owned by the Airport Authority of India in which 11 are International airports, 86 are Domestic airports and 28 are Civil Enclaves²². Airports in India are classified in the following ways

- a) **International Airports:** An international airport is an airport that can accommodate international flights. They are typically equipped with customs and immigration facilities. Such airports are usually larger, and often feature longer runways and facilities to accommodate the larger aircraft commonly used for international travel and available for scheduled international operations by Indian and foreign carriers. These are Chennai, HAL Bangalore, Calcutta, Ahmadabad, Goa, Trivandrum, Calicut, Jaipure, Srinagar, Nagpur and Amritsar.
- b) **Domestic Airports:** Domestic airport is an airport which handles only domestic flights or flights within the same country. Domestic airports do not have customs and immigration facilities and are therefore incapable of handling flights to or from a foreign airport.
- c) **Joint Venture International Airports :** There are joint venture international airports and available for operations by India and foreign airlines. These are Mumbai, Delhi, Cochin, Bangalore and Hyderabad
- d) **Customs Airports with limited international operations:** These have customs and immigration facilities for limited international operation by national carriers and for foreign tourists and cargo charter flights.
- e) **Model Airports :** These are domestic airports which have a minimum runway length of 7500 feet and adequate terminal capacity to handle Airbus 320 type aircraft. These can cater for a limited international traffic also, if required. These include Bhubaneswar, Gwahati, Nagpur, Vadodara, Imphal and Indore.

13.15 AIR CARGO LOGISTICS

Air cargo has been one of the fastest growing sector in the world economy for the last four decades and plays a vital role in the economic development of a nation²³. Air cargo logistics means using aircraft and warehousing services for the transport of goods quickly from point of origin to point of consumption for satisfying the requirements of customers. Air cargo is used mostly for shipping goods that are highly valuable, time-sensitive and perishable. Globally, more than one third of the value of goods traded internationally is transported by air and therefore air cargo industry is considered as a barometer of global economic health. It is the fastest mode of transport and offers benefits of secure handling, speed and geographical and temporal flexibility. But it is relatively expensive. One kilogram costs average six times than ocean container freight. That high cost is compensated by reduced inventory and warehousing costs.

13.16 AIR CARGO LOGISTICS PROCESS

Air cargo logistics process is a time- definite endeavour that requires the coordination of multiple parties, namely shippers, freight forwarders, carriers, customs, warehousing agents, ground handlers and consignees.

it is clear that the following parties are involved in air cargo supply chain and all are crucial to the efficiency of the air cargo process.

- a) **Shipper/Consignor:** The person or firm who requests the service in transporting the cargo through air.
- b) **Freight Forwarders:** Freight Forwarders are air cargo agents they typically purchase transport capacity from carriers in bulk and sell it to their shipper. They are also called Third Party Logistics (3PL) service providers.
- c) **Carrier:** The firm which provides the service of air delivery of cargo from the origin airport to the destination airport. There are two type of carrier: all cargo carrier and combination carrier. Carrier that is exclusively for freight is called all cargo carriers and the carrier that carries both passenger and cargo that is stored in the bellies of aircraft is called combination carrier.
- d) **Ground Handlers:** An agent at an airport that physically handles the cargo.

- e) **Consignee:** The receiving party that the goods are sent.

13.17 PROCESS OF INTERNATIONAL AIR CARGO

Transportation flow International air cargo transportation is not only a system of transporting cargo using air carrier, but it also needs to handle the issue before and after shipping, and lot of works are to be done. The basic exports process takes the following steps and structure.

- 1) The shipper sends request to the forwarder and the forwarder arranges transportations for the shipper
- 2) The freight forwarder books cargo space in the carrier
- 3) When the exportation is permitted, the customs broker does customs clearance. In case of clearing and forwarding agents, both cargo spaces booking and customs clearance done by this agents.
- 4) the shipper moves cargo to the airport waiting for loading. In case of import cargo the process is 1) when airlines moves cargo to the destination country and unloads the cargo. 2) Customs broker does customs declaration, and move cargo to consignee when import is permitted.

13.18 AIR CARGO TRAFFIC IN INDIA

The air cargo industry came of age only during the late 1980s in India. The 'Air Cargo Open Sky Policy' adopted in 1990 and abolishment of regulatory regime over cargo rates for major export commodities made tremendous increase in air cargo growth across India. Air freight traffic constituted less than 2 per cent of all tonnage transported. However, it represents over one third of the aggregate value of all international trade. The major drivers for the air cargo growth are the entry of low cost airlines, strong economic growth, increased Foreign Direct Investment, increased cargo movement, strong business growth and supporting government policies. Increasing globalization, establishment of manufacturing facilities and India's growing might in the Information Technology (IT) space have contributed to the boom in the country's economy. This has resulted in an increased aggregate demand from India, driving the air cargo services market. In 1978, the total volume of international exports and imports cargo was 45,000tons, which has grown to

one million tons at present. This highlights the fast growth of air cargo industry in India²⁶. One of the main reasons for the rapid growth in air cargo in recent years is the unique competitive advantages that can be gained by shipping by air rather than by ground. The growth rate of cargo in the last 5 years has been 10.5 per cent for international cargo and 25.1 per cent for domestic cargo. The overall growth has been 15.3 per cent. According to IATA, air cargo represents about 10 per cent of the airline industry's revenues.

13.19 SUMMARY

With an increasing globalized economy, countries and companies are exporting and importing all kinds of goods from everywhere in the world. So the importance of air transport increases and plays a very significant role in countries economic growth. Both passenger and freight are the two backbones of air transport. Air transport is an aircraft design for transporting passengers and freight from one location to another in the air using airplanes, jets, rockets, helicopters and drones. Each of these type of air transport has a unique way of achieving speed and the sustainability of it voyage, however, there are other types of air transport which may or may not be used for conveying goods, but could be used for recreational purposes, they include, hot air balloons, blimps, gliders, hang gliding, parachuting, etc.

One of the fastest growing aviation industries in the world is Indian aviation industry. Owing to globalization and liberalization, India's aviation industry has witnessed a revolution with the revocation of the monopoly of government owned airlines and emergence of a new generation of low cost airlines. Air transport has contributed to the rapid growth of India's international trade in recent decades by offering a reliable and faster mode of transport services to move products and personnel services. It indicates that air transport is going to play an important role in the country's future economic development. Growth in the passenger and cargo traffic in India requires significant investments in terms of construction of new airports, expansion and modernization of existing airports, improvement in connecting infrastructure and better air space management.

Air transport is an important enabler to achieving economic growth and development. Air transport facilitates integration into the global economy and provides

vital connectivity on a national, regional and international scale. It helps generate trade, promote tourism, and create employment opportunities. The world bank has financed aviation – related projects for over sixty years . today, the WBG remains actively engaged in every region on projects related to air transport policy and regulation, safety, infrastructure rehabilitation, institutional strengthening and capacity building.

13.20 GLOSSARY

Passenger Road transport service, airport authority of India , civic aviation, gagan project, ADSS, Blimps zeppelin , CSMP

13.21 SELFASSESSMENT QUESTIONS

1. What is air transport and give its scenario in India

2. Give the importance of air transport.

3. Give the role of air transport in domestic and international transportation of goods

4. What is air cargo logistics.

-
5. Give the process of international air cargo logistics

13.22 LESSON END EXERCISES

1. Give the function of air transport

2. Give the advantages and disadvantages of air transport

3. What is the classification of air transport in India.

4. What are the types of air transport

5. Give the development of air transport.

13.23 SUGGESTED READINGS

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3. Dutta A. K . Material Management Procedures Text and cases
4. Gopalakrishnan ,P and Sundarson M. Material Management
5. Shah N M , An Integrated Concept of Material Management Indian Institute of Material Management.

AIRPORT AUTHORITY AND AIRWAY BILL

STRUCTURE

- 14.1 Introduction**
- 14.2 Organisational Set Up of Airport Authority of India**
- 14.3 Central Government Guidelines**
- 14.4 State Government Guidelines**
- 14.5 Directorate of General Civil Aviation**
- 14.6 Infrastructure, Equipment and Personal Requirement**
- 14.7 Licence Fee- Meaning**
- 14.8 Air way Bill Meaning**
- 14.9 Types of Airway Bill**
- 14.10 How an Airway Bill Works**
- 14.11 Requirements of an Airway Bill**
- 14.12 Difference between Airway Bill and Bill of Lading**
- 14.13 Contract of Affreightment**
- 14.14 Summary**
- 14.15 Glossary**
- 14.16 Self assessment Questions**

14.17 Lesson End Questions

14.18 Suggested Readings

14.1 INTRODUCTION

The Indian Aviation industry completed 100 years in 2011. Over the last 100 years, the civil aviation sector in India has grown manifold. Over the years, the Government has taken several initiatives to overcome the challenges in the sector and today, the sector holds the distinction of being one of the fastest growing sectors in the world. Indian Aviation is now being rightly referred to as a “sunrise sector.” With the sector’s growth, there has been a larger participation of private capital in the development of airport infrastructure. In order to provide the right institutional framework to encourage private participation in the development of greenfield airports, the Ministry of Civil Aviation had notified its greenfield airports policy in 2008. The Steering Committee set up under this policy reviews the proposal for setting up of a greenfield airport and recommends the grant of “in-principle approval” for the project after due inter-ministerial consultation. Thereafter, this committee is also responsible for monitoring the development of the airport for which “in-principle approval” has been granted by the competent authority. Over the last few years, several approvals have been granted for the development of greenfield airports in the country. However, it has been felt that more clarity is required by developers about the process to be adopted after the “in-principle approval,” so as to ensure the time-bound development of airports. In an attempt to provide necessary guidance to developers and other stakeholders, the Ministry of Civil Aviation has undertaken the initiative to prepare a useful guide for potential investors, developers, and stakeholders interested in participating in one of the growing sectors. This compendium provides a quick reference to interested investors on the various steps to be undertaken and the guidelines to be followed for setting up greenfield airports. While understanding the requirements of various Central Government agencies in connection with Greenfield airports, interactions were held with the following Central Government agencies:

- a) Directorate General of Civil Aviation,
- b) Airports Authority of India,
- c) Airports Economic Regulatory Authority,

- d) Bureau of Civil Aviation and Security,
- e) Indian Meteorological Department,
- f) Central Board of Excise and Customs,
- g) Bureau of Immigration,
- h) Ministry of Health and Family Welfare,
- i) Directorate of Plant Protection, Quarantine & Storage, Ministry of Agriculture, and
- j) Animal Quarantine & Certification Services, Department of Animal Husbandry Dairying and Fisheries. The compendium would act as a ready reckoner-cum-guide and specify the instructions/requirement of Central Government agencies and the terms on which the services (if any) of these agencies would be provided in the development/operation of greenfield airports across India. The compendium provides a quick reference to steps that have to be undertaken by an airport company to set up a greenfield airport. The document is expected to serve as a valuable tool for all investors interested in the development of greenfield airports in India. The second chapter of this compendium outlines the context and the guidelines which an airport company has to follow for the development of a greenfield airport. The second chapter covers in detail Central and State guidelines and the process that an airport company has to follow to start an airport. In addition, it contains a summary of the reserved services that have to be provided by the Central Government agencies at these airports. These chapters deal with the key common requirements of all the agencies, and cover the following:
 - a) Details of services provided by the agencies;
 - b) Infrastructure, equipment and personnel requirements of the agencies at the airport;
 - c) Agreements/Memorandum of Understanding, if any, to be signed with the airport company by the Central Government agencies,
 - d) Recovery of cost by the Central Government agency,
 - e) Application format and timelines to be followed by the airport company, and

f) Contact details of these agencies. This compendium captures the contact details for all the state governments as the airport company planning to set up a greenfield airport in a state or union territory will require to liaison with the Civil Aviation Department of the respective state government. The last chapter charts out the details of annexures, which cover various Airport Authority of India committee reports, the Greenfield Airport Policy, the Communications, Navigation and Surveillance/Air Traffic Management (CNS ATM) agreement, the Airport Security Program, application formats for Central Government agencies, and the State Support Agreement.

14.2 ORGANISATION SET UP OF AIRPORT AUTHORITY OF INDIA

Located at Rajiv Gandhi Bhavan at the Safdarjung Airport in New Delhi, the Ministry of Civil Aviation is responsible for formulation of national policies and programmes for the development and regulation of the Civil Aviation sector in the country. It is responsible for the administration of the Aircraft Act, 1934, Aircraft Rules, 1937 and various other legislations pertaining to the aviation sector in the country. This Ministry exercises administrative control over attached and autonomous organizations like the Directorate General of Civil Aviation, Bureau of Civil Aviation Security and Indira Gandhi Rashtriya Udan Academy and affiliated Public Sector Undertakings like National Aviation Company of India Limited, Airports Authority of India and Pawan Hans Helicopters Limited. The Commission of Railway Safety, which is responsible for safety in rail travel and operations in terms of the provisions of the Railways Act, 1989 also comes under the administrative control of this Ministry. Attached-Autonomous Organisations-Directorate General of Civil Aviation DGCA

The Directorate General of Civil Aviation (DGCA) is the regulatory body in the field of Civil Aviation, primarily dealing with safety issues. It is responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety, and airworthiness standards. The DGCA also co-ordinates all regulatory functions with the International Civil Aviation Organisation (ICAO).

Private operators were allowed to provide air transport services. However, no foreign airline could directly or indirectly hold equity in a domestic airline company. By 1995, several private airlines had ventured into the aviation business and accounted for more than 10 percent of the domestic air traffic. Today, Indian aviation industry is dominated

by private airlines and these include low cost carriers, who have made air travel affordable. The Government nationalized nine airline companies vide the Air Corporations Act, 1953. These government-owned airlines dominated Indian aviation industry till the mid-1990s. In April 1990, the Government adopted open-sky policy and allowed air taxi- operators to operate flights from any airport, both on a charter and a non charter basis and to decide their own flight schedules, cargo and passenger fares. As part of its open sky policy in 1994, the Indian Government ended the monopoly of IA and AI in the air transport services. Private operators were allowed to provide air transport services. However, no foreign airline could directly or indirectly hold equity in a domestic airline company. By 1995, several private airlines had ventured into the aviation business and accounted for more than 10 percent of the domestic air traffic. Today, Indian aviation industry is dominated by private airlines and these include low cost carriers, who have made air travel affordable.

- Registration of civil aircraft;
- Formulation of standards of airworthiness for civil aircraft registered in India and grant of certificates of airworthiness to such aircraft
- Licensing of pilots, aircraft maintenance engineers and flight engineers, and conducting examinations and checks for that purpose;
- Licensing of air traffic controllers
- Certification of aerodromes and CNS/ATM facilities;
- Granting of Air Operator's Certificates to Indian carriers and regulation of air transport services operating to/from/within/over India by Indian and foreign operators, including clearance of scheduled and non-scheduled flights of such operators;
- Conducting investigation into accidents/incidents and taking accident prevention measures including formulation of implementation of Safety Aviation Management programmes.
- Carrying out amendments to the Aircraft Act, the Aircraft Rules and the Civil Aviation Requirements for complying with the amendments to ICAO Annexes, and initiating proposals for amendment to any other Act or for passing a new Act

in order to give effect to an international Convention or amendment to an existing Convention;

- Coordination at national level for flexi-use of air space by civil and military air traffic agencies and interaction with ICAO for provision of more air routes for civil use through Indian air space;
- Keeping a check on aircraft noise and engine emissions in accordance with ICAO Annex 16 and collaborating with the environmental authorities in this matter, if required;
- Promoting indigenous design and manufacture of aircraft and aircraft components by acting as a catalytic agent;
- Approving training programmes of operators for carriage of dangerous goods, issuing authorizations for carriage of dangerous goods, etc.

Bureau of Civil Aviation Security - BCAS



The Bureau of Civil Aviation Security (BCAS) was initially set up as a Cell in the DGCA in January 1978 on the recommendation of the Pande Committee. The BCAS was reorganized into an independent department under the Ministry of Civil Aviation on 1st April, 1987. The main responsibilities of BCAS include laying down standards and measures with respect to security of civil flights at international and domestic airports in India. BCAS Head quarter is located at “A” Wing, I-III floor, Janpath Bhavan, Janpath, New Delhi-110001. It has got four Regional Offices located at International airports i.e. Delhi, Mumbai, Kolkata and Chennai.

- Laying down Aviation Security Standards in accordance with Annex 17 to Chicago Convention of ICAO for airport operators, airlines operators, and their security agencies responsible for implementing AVSEC measures

- Monitoring the implementation of security rules and regulations and carrying out survey of security needs.
- Ensure that the persons implementing security controls are appropriately trained and possess all competencies required to perform their duties.
- Planning and coordination of Aviation security matters.
- Surprise/Dummy checks to test professional efficiency and alertness of security staff.
- Mock exercise to test efficacy of Contingency Plans and operational preparedness of the various agencies.
- **Commission of Railway Safety - CRS**



The Commission of Railway Safety (CRS) , working under the administrative control of the Ministry of Civil Aviation of the Government of India, deals with matters pertaining to safety of rail travel and train operation and is charged with certain statutory functions as laid down in the Railways Act (1989), which are of an inspectorial, investigatory & advisory nature. The Commission functions according to certain rules viz. statutory investigation into accidents rules framed under the Railways Act and executive instructions issued from time to time. The most important duties of the Commission is to ensure that any new Railway line to be opened for passenger traffic should conform to the standards and specifications prescribed by the Ministry of Railways and the new line is safe in all respects for carrying of passenger traffic. This is also applicable to other works such as gauge conversion, doubling of lines and electrification of existing lines. Commission also conducts statutory inquiry into serious train accidents occurring on the Indian Railways and makes recommendations for improving safety on the Railways in India.

- **Air India Ltd**



Air India Ltd. was incorporated under the Companies Act 1956 on 30 March 2007 and is owned by the Government of India. The Company was created to facilitate the merger of the two main state-owned airlines in India: Air India, with its subsidiary Air-India Express and Indian Airlines, together with its subsidiary Alliance Air.

- Hotel Corporation of India Limited
 - Air India Air Transport Services Limited
 - Air India Engineering Services Limited
 - Air India Charters Limited
 - IAL Airport Services Limited
 - Airline Allied Services Limited [1]
 - Vayudoot Limited
- **Airports Authority of India - AAI**



The Airports Authority of India (AAI) was formed on 1st April 1995 by merging the International Airports Authority of India and the National Airports Authority with a view to accelerate the integrated development, expansion, and modernization of the

operational, terminal and cargo facilities at the airports in the country conforming to international standards.

- Design, Development, Operation and Maintenance of international and domestic airports and civil enclaves.
- Control and Management of the Indian airspace extending beyond the territorial limits of the country, as accepted by ICAO.
- Construction, Modification and Management of passenger terminals.
- Development and Management of cargo terminals at international and domestic airports.
- Provision of passenger facilities and information system at the passenger terminals at airports.
- Expansion and strengthening of operation area, viz. Runways, Aprons, Taxiway etc.
- Provision of visual aids.
- Provision of Communication and Navigation aids, viz. ILS, DVOR, DME, Radar etc.
- **Pawan Hans Helicopters Ltd. - PHHL**



The Pawan Hans Helicopters Ltd. (PHHL) is one of the leading helicopter companies in India and is known for its reliable helicopter operations. Its objective is to provide helicopter support services to the Oil Sector for its off-shore exploration operations, services in remote and hilly areas as well as charter services for promotion of travel and

tourism. The Registered Office of the Company is located at New Delhi and its Regional offices are at Mumbai and New Delhi. PHHL is the first ISO 9001: 2000 certified Aviation Company in India. Pawan Hans has played a vital role in the growth story of the Helicopter Industry in India.

14.3 CENTRAL GOVERNMENT GUIDELINES

The Central Government may, from time to time, notify guidelines to be followed by DGCA for grant of licence to operate a green field airport. While granting a licence, DGCA would keep these guidelines in view. At present, the following conditions shall be kept in view by DGCA while granting a licence: a. No green field airport would be allowed within an aerial distance of 150 km of an existing civilian airport. b. In case a green field airport is proposed to be set up within 150 km of an existing civilian airport, the impact on the existing airport would be examined. Such cases would be decided by the government on a case-to-case basis. In the case of any green field airport to be developed under these policy guidelines, activities relating to Air Traffic Services (ATS), security, customs and immigration would be reserved for Central Government agencies. Provision for these services would be governed by the policy to be laid down by the Central Government from time to time. The requirement for the same has been dealt with in subsequent chapters.

14.4 STATE GOVERNMENT GUIDELINES

In case a state government wishes to promote the setting up of airports in the state, it could either: a. Apply to DGCA for a licence itself, in which event the state government would be responsible for the development and operation of the airport; or b. An entity of the state government could apply for a licence to DGCA, in which event such an entity would be responsible for the development and operation of the airport; or c. The state government or its corporation may select a private entity and form a Joint Venture Company (JVC) in the private sector; in such an event, the JVC would be responsible for the development and operation of the airport under a licence from DGCA; or d. Allot land to a private airport company for the development and operation of an airport under a licence from DGCA. In case a state government wishes to facilitate the setting up of the airport, it could provide the following incentives to an airport company: a. Land, concessional or otherwise; b. Real estate development rights in and around the airports; c. Airport

connectivity, rail, and road; d. Fiscal incentives by way of exemptions from state taxes; and e. Any other assistance that the state government may deem fit.

State governments may evolve their respective policies for providing any or all of the aforesaid incentives to an airport company. If the selection of a private entity or JVC partner is to be made by the state government or any of its entities, it shall be done through open competitive bidding. While granting land and other benefits, the state government may, if it deems fit, stipulate the rights and obligations of the airport company as conditions of such grants.

State governments cannot enter into any concession agreements with the airport companies as they do not have the powers to grant airport concessions under the Constitution. As noted above, the power to grant a licence for operating an airport rests solely with the Central Government under the provisions of the Aircraft Act, 1934. However, the state governments can provide any or all of the incentives/assistance

State governments can also provide land to AAI for the development of green field airports through concessions, to be granted to private entities in accordance with the provisions of the AAI Act. States may also provide any of the above concessions to AAI for facilitating the development of airports in their respective states.

14.5 DIRECTORATE GENERAL OF CIVIL AVIATION

Details of Services Provided The Directorate General of Civil Aviation (DGCA) is the regulatory body in the field of civil aviation, responsible for facilitating the airport operator for licences, providing specifications for standards and designs for the airport, and dealing with safety issues. Section 4 of the Aircraft Act, 1934 enables the Central Government to make rules to implement conventions relating to international civil aviation including any annex thereto relating to international standards and recommended practices, as amended from time to time. The Director General, in accordance with Rule 133A of the Aircraft Rules, 1937, may issue, inter alia, civil aviation requirements not inconsistent with the Aircraft Act, 1934 and the rules made there under. The broad principles of law contained in the Aircraft Rules, 1937, Civil Aviation Requirements (CAR) are issued to specify the detailed requirements and compliance procedures for the following: to fulfill the duties and obligations of India as a contracting state under the convention relating to international civil aviation signed at Chicago on 7th December, 1944. CAR provides specifications on air

transport, air safety, airworthiness standards, aerodrome standards as well as licensing, design standards, flight crew standards, training and licensing, aircraft operations, air space, aviation environment protection, and safe transport of dangerous goods by air.

14.6 INFRASTRUCTURE, EQUIPMENT AND PERSONNEL REQUIREMENTS

Being a regulatory body, it has no specific requirement of space, office or personnel for its own operations. However, the private operator has to meet all regulatory requirements and specifications provided at the DGCA website (<http://www.dgca.gov.in>) under the head Rules.

It should be noted that CAR is subject to both the International Civil Aviation Organization's and the Government of India's guidelines which may change from time to time depending on the situation. Therefore, the present CAR is just an indicative list and the private operator is advised to contact the DGCA office for latest information in this regard.

1. **Licensing:** The following section deals with Aerodrome Licensing (Section 4, Series F, Part I of Civil Aviation Requirements). CAR lays requirements to be fulfilled by an applicant for grant of aerodrome licence under the Aircraft Rules and is issued under the power conferred vide Sub-Rule (1) of Rule 83 and Rule 133A of the Aircraft Rules, 1937. These requirements pertain to the technical parameters needed to be fulfilled only for the licensing of the aerodrome (including heliports for public use). The grant of licence is also subject to clearance from the Central Government and instructions Government. The aerodrome shall be licence
a. For public use — This means that the aerodrome, when available for open aircraft, shall be so available to all persons on equal terms and conditions. b. For private use — This means it will be open to specifically authorized by the Note: Usage of a private airport (non flights there from. A brief of the various steps that the private operator has to follow to secure a licence from DGCA has been presented through the following diagram. The same has been detailed in subsequent paragraphs. The requirements to be fulfilled by an applicant Aircraft Rules are explained in detail in the following paragraphs. 1. Site Selection

- a. The potential owner/operator shall submit an application which can be downloaded from the DGCA site, the aerodrome site. Compendium of Central Government Services and Regulations for Greenfield Airport and instructions issued from time to time on the subject by the Central licenced in one of the following categories, namely: This means that the aerodrome, when available for open aircraft, shall be so available to all persons on equal terms and conditions. This means it will be open to use by the licensee and by the licensee.

Note: Usage of a private airport (non-commercial) excludes the operation of scheduled The requirements to be fulfilled by an applicant Aircraft Rules are explained in detail in the following paragraphs. 1. Site Selection . The potential owner/operator shall submit an application which can be downloaded from the DGCA site, the aerodrome site.

- b. The applicant may forward, along with the application form, attested copies of the clearances/permission* from the following:
- i. Ministry of Defence;
 - ii. Ministry of Environment and Forests, Government of India;
 - iii. Owner of the land; and
 - iv. Local authority such as municipal corporation/committee or urban land development board/authority of the state or its country and town planning department. The copies of the clearances / permissions issued by the above authorities are required to be endorsed by DGCA. While granting clearances/permission, the military authorities should examine and indicate that the proposed aerodrome is not causing operational constraints to defence activities due to the proximity of the site to a military aerodrome/ establishments and is not considered a security hazard. Conditions for use of the site as an aerodrome, if any, may also be indicated after a flight operation assessment, if considered necessary. The local authorities should also indicate that a suitable mechanism

has been evolved and/or exists to regulate construction around the proposed aerodrome, so that the obstacle limitation surfaces as defined in SO 1589(E) can be continuously maintained.

- c. In case of the existing Government aerodromes, clearances mentioned in Paragraph B above are not required. However, clearances from the Ministry of Environment for the expansion of an aerodrome shall be applicable as per instructions issued by them in this regard.
- d. The site may be inspected for its suitability by DGCA officials along with representatives of other agencies, as considered necessary. The applicant shall make arrangements to facilitate the site inspection.
- e. The decision of the site approval shall be communicated to the applicant. The approval of the site does not absolve the applicant from observing the statutory requirements of other official bodies (as mentioned in Paragraph b).

2. Construction of Aerodrome

- a) Once the site has been approved, the applicant has to submit his intention and plan including a project report for the construction of the aerodrome. Note: The permission for the construction of the aerodrome shall be granted only after the requisite clearances, indicated above in Paragraph b, have been submitted.
- b) The project report shall include the aerodrome facilities to be made available and the assurance that these services and equipment shall be provided in accordance with the requirements specified in the Civil Aviation Requirement, Section 4 Series B Part – I and III.
- c) Architectural and infrastructure-related requirement for the optimal implementation of security requirement shall be integrated in the design of the aerodrome as per the BCAS guidelines issued in this regard from time to time. The applicant would also require an approval from COSCA for airport design/infrastructure after getting an approval from BCAS.

- d) The applicant is required to demonstrate and satisfy the DGCA about the quality assurance system being applied for the construction of the aerodrome and the procurement and installation of equipment, etc.
- e) DGCA officials may carry out inspections during the period of construction, as considered appropriate, to assess the progress and quality assurance system adopted by the applicant.
- f) Guidelines (April 2009) issued by the Planning Commission, GOI on “Norms and Standards for capacity of Airport Terminals”, laying down norms relating to unit area and service standards, should be followed while formulating developmental plans. While finalizing airside plans, the issue of land required for the provision of two parallel runways with taxiways must be addressed.
- g) The airport company must ensure that the construction at site commences within one year of the approval of DGCA and the new airport becomes operational with all requisite licences within five 5 years after the grant of approval by DGCA, failing which the permissions granted may be revoked.

3. Application for Grant of Licence

- a) The application for the grant of an aerodrome licence shall be made in the prescribed Form CA 96(A) which can be downloaded from the site. The schedule for the issue of the aerodrome licence can be downloaded from the site to the DGCA, along with the fee prescribed in the Aircraft Rules 1937. The fee shall be remitted by a crossed Demand Draft drawn in favour of Pay & Accounts Office, DGCA, Ministry of Civil Aviation, New Delhi.
- b) The applicant seeking the aerodrome licence under the Public Use category is required to submit a safety assessment report along with the application, demonstrating that the aerodrome and its facilities are safe for aircraft operation.
- c) The application for an aerodrome licence shall be accompanied with an Aerodrome Manual, prepared in accordance with the requirement contained in Rule 81 of the Aircraft Rules 1937, including the establishment of an effective Safety Management System. The Aerodrome Manual is the means by which all aerodrome operating staff are informed about their duties and responsibilities, aerodrome services and

facilities, operating procedures, and restrictions on aerodrome availability. d. The aerodrome operator shall employ an adequate number of employees, competent to perform their duties regarding all critical activities involved in an aerodrome's operations and maintenance. The aerodrome In-charge / Airport Director / Chief Operating Officer, who is responsible for the day-to-day operations of the aerodrome, shall be the designated 'ACCOUNTABLE MANAGER' for the licensing authority. e. The minimum period required for processing the application is about three months from the date of receipt of the application along with a properly formulated aerodrome manual. This would allow for detailed consideration and inspection of the aerodrome before the issue of a licence.

- f) The applicant shall submit a compliance check list in respect of the requirements contained in CAR, issued on the subject of aerodrome design and operations. Other International Civil Aviation Organization (ICAO) documents and those of CAR on aeronautical telecommunications, aeronautical information services, and other relevant civil aviation requirements shall also be kept in view while preparing the compliance statement. The statement shall indicate whether the requirement has been met or not and if not, the extent of the deviation thereto. The supporting material shall also be provided.
- g) The applicant for an aerodrome to be licenced for public use shall demonstrate the functional arrangements and their integration for the provision of CNS-ATM, RFF, AIS, meteorological and security services.
- h) Final inspection shall be undertaken for on-site verification of data, and checking of the aerodrome facilities, services, equipment, and procedures to verify and ensure that they comply with the requirements.
- i) The aerodrome licence shall be issued by the Aerodrome Standard Directorate after securing the approval of the Director General under the appropriate category, if the DGCA is satisfied that the applicant has complied with all the relevant requirements. In case of non-compliance of the requirement by the applicant, the licence may either be refused or granted with limitations/ restrictions/ conditions as deemed appropriate by the DGCA, provided that in such cases, overall safety is not compromised.

- j) An aerodrome licence shall be valid for a period of two years as prescribed in the Aircraft Rules 1937 unless it is surrendered by the licence holder or is suspended or cancelled by the Director General for non-adherence to the relevant rules and requirements or for any other reason. The licence shall remain valid, subject to adherence of all applicable rules or regulations and conditions/limitations, if any, attached to the licence.
 - k) The agency providing the CNS (navigational and landing aids) shall ensure that all such aids are provided in accordance with CAR Section 4, Series X Part I dated 4.2.1994. 1. During the currency of the licence, the DGCA may depute his representatives at any time for audit/inspection of the aerodrome. The licence-holder shall provide all necessary assistance for the conduct of inspection/audit of the aerodrome by the DGCA representative. Deficiencies observed during such audit/inspection shall promptly be addressed and rectified within the period specified by the DGCA.
4. Renewal of Licence
- a) The licence-holder shall submit the application for the renewal of licence CA96 (B) along with the prescribed fee, at least two months prior to the date of expiry for public use aerodromes and one month in the case of private use.
 - b) A copy each of the last self-inspection reports and the last calibration report on navigation and landing aids shall also be submitted with the application. The selfinspection should be completed within 30 days preceding the renewal application.
5. Change in the Category of Licence
- a) Application for change in the category of licence should be submitted three months prior to the intended conversion of the licence category.
 - b) In such cases, application in CA-96(A) for the issue of a fresh licence shall be made along with the fee prescribed in Aircraft Rules 1937 for the category.

6. Change of Aerodrome Licence-Holder

- a) An aerodrome licence is granted to a named 'legal person' (an individual or a company or any other legally constituted authority or body) as admissible under Rule 79 of the Aircraft Rules 1937, who satisfies the criteria for the issue of the licence. Once a licence is granted, the licensee has to ensure that the aerodrome continues to meet the requirements. An aerodrome licence is not transferable.
- b) If the owner or the operator of the licenced aerodrome has to be changed, a fresh application along with the requisite fee for the issue of a new licence is to be submitted to DGCA by the prospective licensee. The prospective licensee shall also fulfill all requirements for the issue of a licence.
- c) A minimum notification of three months is required for change of owner or operator of the aerodrome. During the change, the outgoing licensee shall be responsible for the operation of the aerodrome until the grant of aerodrome licence to the new applicant.
- d) A change in the name of the licensee does not constitute a change of identity; the licensee should apply for the variation of the licence to reflect the name change and provide a copy of the relevant 'certificate of incorporation on change of name.'

7. Discontinuation / Surrender of Licence

- a) The licence-holder must give a written notice to DGCA not less than 60 days from the date on which the licence is to be discontinued/surrendered in order that suitable promulgation action can be taken.

14.7 LICENCE FEE

DGCA provides its obligatory services to the airport operator which falls under the category of "Core Sovereign Service" of the Government of India. DGCA charges a licensing fee from the airport operator which is renewable at the end of every second year. The fee structure for the grant of a licence for an aerodrome is presented below.

Parameter Fees

When the licence is granted for private use Rs. 1,00,000

When the licence is granted for public use Rs. 5,00,000 up to runway length of 5,000 feet plus Rs. 2,00,000 for every 1,000 feet or part thereof.

Compendium of Central Government Services and Regulations

for Greenfield Airport The fee chargeable for renewal of licence of an aerodrome shall be fifty percent of the fee for a licence referred to in Sub-Rule (1). The fee shall be payable by a bank draft, drawn in favour of the Pay and Accounts Office, Director General of Civil Aviation, Ministry of Civil Aviation, New Delhi.

Application format and Timelines

The application for aerodrome site approval (Form 93 (A)) and for the grant of an aerodrome licence shall be made in the prescribed Form CA 96(A) has been attached as Annexure V can also be downloaded from the DGCA website (<http://www.dgca.gov.in>). The minimum period required for processing the application is about three months from the date of receipt of the application along with a properly formulated aerodrome manual to allow for detailed consideration and inspection of the aerodrome before the issue of the licence.

Airport Authority of India

Details of Services Provided The Aircraft Act, 1934 (the “Aircraft Act”) and the Rules made there under by the Central Government govern the development, maintenance and operation of all airports, including green field airports. Under the Act, the Central Government has the sole right to grant a licence for setting up an airport, and the operations of the airport would be subject to its licensing conditions (Rule 78 of the Aircraft Rules). The Airports Authority Act (the “AAI Act”) was enacted by the Central Government in 1994. It stated that all government airports are to be developed, financed, operated, and maintained by the Airports Authority of India (“AAI”). However, the AAI Act enables AAI to grant a concession to a private entity who has been given the tasks of financing, development, operation, and maintenance of the airport by AAI. As such, greenfield airports to be developed by the Central Government could adopt the concession route if private participation was envisaged. Airports other than those managed by AAI are governed by the provisions of the Aircraft Act and the Rules made thereunder. An entity other than AAI can set up an airport. The Airports Authority of India (AAI) manages 125 airports, which include 11 international airports, 8 customs airports, 81 domestic airports, and 25 civil enclaves at defence airfields. AAI also provides Air Traffic Management Services (ATMS) across the entire Indian air space and adjoining oceanic areas with ground installations at all airports and 25 other locations to ensure the safety of aircraft operations. The scope of

work in CNS/ATM at the greenfield airports shall be as follows: AAI services: AAI shall at all time (including twenty-four hours each day), during the term thereof, in accordance with the relevant standards prescribed in the relevant ICAO annexes and documents, and at its own cost: Provide CNS/ATM services; Maintain the AAI equipment including carrying out of periodic flight calibration of the AAI equipment and other tests; Upgrade the AAI equipment from time to time to comply with the relevant provisions contained in the relevant ICAO annexes and documents, and as a result of the expansion/up-gradation of the airport; Purchase such equipment as may be required from time to time to enable AAI to provide the CNS/ATM services at the airport in accordance with the standards prescribed by the ICAO Annexes and also in accordance with the standards to be maintained by the AAI according to this agreement; Procure meteorological facilities and services from the India Meteorological Department (IMD) for the provision of CNS/ATM services at the airport in accordance with the practices established or recommended from time to time pursuant to the Chicago convention and on the same terms as AAI provides such services at all other AAI airports, and till such time that GOI decides to nominate some other agency in the place of AAI; the applicant will have to enter into an agreement with IMD for the provision of meteorological services at the proposed airports. The meteorological services would be provided on “cost recovery” basis and IMD would publish a standard agreement for this purpose. The airport company would also provide the required infrastructure to IMD, free of cost, for the provision of meteorological services. Relocate AAI equipment for its operative convenience, provided such relocation does not affect the private operator’s obligations under the agreement signed by the private operator and/or smooth operations of the airport. ATM, en-route and other Services: If AAI requires, it may at its own cost, (continue to) situate at the airport or on the airport site (or relocate as necessary) any radars, equipment, buildings, works or facilities necessary for the provision of en-route air navigation services. In relocating such radars, equipment, buildings, works or other facilities at the airport, AAI shall take appropriate measures to avoid any disruption to the normal operations of the airport. For avoidance of doubt, AAI shall not be held liable for any disruption in the normal operations of the airport arising on account of such relocation for the purpose of the provision of CNS/ATM services. If during the initial stages of project planning, i.e., site selection, orientation of runway, finalization of scope of project, etc. and subsequently, during the implementation stage, the services and expertise of AAI are required, the same shall be provided at a cost as prescribed by AAI.

Cost would include expenses on travelling, accommodation, daily allowances, expenses of AAI officials for attending meetings, etc., plus consultancy charges. The airport company shall remit the amount in advance, prior to the undertaking of visit(s) by AAI officials.

No Objection Certificate (NOC) cases:

For the purpose of controlling growth and the height of buildings/structures in the vicinity of the airport as per Aerodrome and Ground Aids (AGA) criteria, it is clarified that the responsibility of working out permissible heights, assessing obstructions from the aviation point of view, etc., would lie with AAI. However, implementation and enforcement responsibility would vest with the airport company.

Infrastructure, Equipment and Personnel Requirements

AAI has constituted a committee (the report of the committee the report as Annexure I) to formulate the standard requirements for (Air Traffic Controller) ATC-cum-Technical Block at various airports. The report includes details of facilities/services and area requirements keeping in view the level of operations at various airports, and also an analysis of the details of facilities, services, and space requirements, based on the level of operations. The committee met on eight occasions; the key decisions taken unanimously are as follows:

1. At present, AREA CONTROL CENTRES have been established at 11 airports which are as follows: North: Delhi and Varanasi South: Chennai, Trivandrum, Hyderabad and Mangalore East: Kolkatta West: Mumbai, Ahmedabad and Nagpur North-East: Guwahati For design/area requirements, the following categories of ATC-cum-Technical Blocks are proposed for development in the future. While finalising these recommendations, the existing four metros, viz., Delhi, Mumbai, Chennai and Kolkata, have not been considered.
 - a) Airports with Area Control Centres are classified as Category I.
 - b) Other international airports without Area Control Centres, i.e., Jaipur, Lucknow, Amritsar, Calicut, etc. fall in Category II.
 - c) Other major airports, i.e., Rajkot, Udaipur, Khajuraho, Ranchi, Bhubhneshwar, etc. where aircrafts up to AB 320 operate fall in Category III

- d) Airports like Simla and Bhuntar (Kulu) where smaller aircraft like Dornier DO-228 and ATR type operate, and where further expansion of runway is not possible due to terrain conditions are included in Category IV.
2. The Control Tower cabin should have ideally a 360 degree view and it is desirable that the Control Tower be centrally located to have a clear view of all the approaches of different runways.
 3. One percent of the total length of the runway could be the criteria for determining the height of the Control Tower. For instance, a 3,000 meter runway will require a 30-meter-high Control Tower. However, the same should be subjected to the approval of the authorities.
 4. For larger airports of Code 3C or above, the ATC-cum-Technical block and the Administrative Block should be separate.
 5. The ATS reporting office must be housed in a large room/hall in the Technical block for briefing pilots prior to every flight. Meteorological personnel, along with ATC personnel and Communication Personnel, would be accommodated.
 6. For airports operating 50-seater capacity aircrafts and which have no scope for further expansion of runways due to terrain conditions/land constraints, an integrated complex for a fire station and a control tower-cum-technical Block shall be constructed.
 7. The committee recommends consolidated requirements for an ATC tower-cum-Technical block for four different categories which have been listed in this Draft Report. While designing the building, the following co-relations should not be disturbed: Flight crew briefing room must be on the ground floor. Anti-hijacking room is to be on the second floor. While designing, shifting of various facilities can be rearranged floor-wise. Room sizes are indicated for various facilities, and carpet areas for categories I to III. Recommendations on Standard Requirements for ATC Tower and drawings, given in Annex I, are to be considered as illustrative only. The airport developer/operator shall follow the Central Public Works Department's (CPWD) norms in the case of provisioning of space for AAI.

Agreement/Memorandum of Understanding

The private operator/operator will have to enter into a CNS/ATM Agreement with AAI for the provision of Air Traffic Services (ATS) at the proposed airport. ATS would be provided on a cost recovery basis and AAI publishes a standard agreement for this purpose. The Airport Company would provide the required infrastructure to AAI free of cost for the provision of Air Traffic Services. A standard CNS/ATM agreement is placed.

Recovery of Cost AAI shall, in consideration of its performing the relevant services, be entitled to recover: a) Route Navigation Facilities Charges, and b) Terminal Navigational Landing Charges directly from an airline. In the event of failure by any airline to pay the Route Navigation Facilities Charges and Terminal Navigational Landing Charges, AAI shall be entitled to suspend the provision of services to such an airline and take such steps as it deems fit to recover its Route Navigation Facilities Charges and Terminal Navigational Landing Charges, thus indicating that the airport operator is not liable for any of these charges.

Application Format and Timelines

On getting in-principle approval from MoCA as per the flowchart in Clause 2.2, the private operator shall enter into a CNS/ATM agreement with the AAI. (The agreement has been attached as Annexure III). It is expected that the minimum time AAI shall require to provide its concurrence to the proposal of the Airport Operator will be eight weeks; however, the same shall be subject to change.

14.8 AIRWAY BILL MEANING

An air waybill (AWB) is a document that accompanies goods shipped by an international air courier to provide detailed information about the shipment and allow it to be tracked. The bill has multiple copies so that each party involved in the shipment can document it. An air waybill (AWB), also known as an air consignment note, is a type of bill of lading. Transport document issued by a carrier for air transportation. If issued by the actual carrier, it is a master air waybill. If issued by an air freight consolidator or forwarder it is a house air waybill. The document is issued in three originals and is not negotiable so it cannot be issued to the order; it is always nominative and non-endorsable. Since it is not

negotiable, and it does not evidence title to the goods, in order to maintain some control of goods not paid for by cash in advance, sellers often consign air shipments to their sales agents, or freight forwarders' agents in the buyer's country. The standard form was designed to enhance the application of computerized systems to air freight processing for both the carrier and the shipper. Model of Air Waybill.

14.9 TYPES OF AIRWAY BILL

Bar Code Label Industry is rapidly embracing the use of bar coded labels to further enhance efficiency and streamlining in the handling of air cargo. To this extent IATA has published "Resolution 606" specifying requirements and providing standard guidelines for bar coded labels. A Bar code may be Primary or Secondary Primary Bar Code: Is one that contains the Master Air Waybill and piece number. (Consolidated Shipment) Secondary Bar Code: Contains other information and may be included on the same or separate label. There will be a secondary label for each shipment mentioned on the Master Air Waybill indicating specifically what's in the specific shipment in detail. (Specific Consignment in consolidated shipment)

14.10 HOW AN AIR WAYBILL WORKS

An air waybill (AWB) serves as a receipt of goods by an airline (the carrier), as well as a contract of carriage between the shipper and the carrier. It's a legal agreement that's enforceable by law. It becomes an enforceable contract when the shipper (or shipper's agent) and carrier (or carrier's agent) both sign the document.

The AWB will also contain the shipper's name and address, consignee's name and address, three letter origin airport code, three letter destination airport code, declared shipment value for customs, number of pieces, gross weight, a description of the goods and any special instructions (e.g., "perishable").

It also contains the conditions of the contract that describe the carrier's terms and conditions, such as its liability limits and claims procedures, a description of the goods, and applicable charges.

14.11 REQUIREMENTS FOR AN AIR WAYBILL

The International Air Transport Association (IATA) designs and distributes air waybills. There are two types of AWBs—an airline-specific one and a neutral one. Each airline air waybill must include the carrier's name, head office address, logo and air waybill number. Neutral air waybills have the same layout and format as airline AWB, they just aren't prepopulated.

An air waybill has 11 numbers and came with eight copies of varying colors. With the Multilateral Electronic Air Waybill Resolution 672, paper air waybills are no longer required. Dubbed the e-AWB, it's been in use since 2010 and became the default contract for all air cargo shipments on enabled trade lines as of 2019.

14.12 DIFFERENCE BETWEEN AIRWAY BILL AND BILL OF LADING

After introduction of this website, I have been receiving many enquiries and clarifications on different subjects on daily basis. Please accept my apology on my inability to reply individually for all questions. However, I treat each question of you a valuable one. You can certainly expect reply on all of your questions in this website as articles which will be posted time to time.

This week, I am clarifying on the questions asked by beginners (among beginners) to this industry related to basics of import and export . So let us discuss the following comparisons on simple terms in international trade:

Bill of lading and airway bill are the document issued by the carrier of goods while booking cargo with them by shipper.

Airway bill is issued by air carrier of goods on receipt of goods after completion of export customs formalities of the country. Shipper obtains airway bill once after handing over cargo to them. Since the cargo reaches by air and transit time is too less compared to sea shipment, a set of airway bill is sent along with the cargo for immediate reference on transit and for import customs clearance at destination port by importer. Once after completion of customs formalities at load port customs location, cargo transfer manifest (CTM) issued by IATA agent along with airway bill and other required documents for transportation submits to air carriers. Original airway bills are issued in quintuplicate which is meant for carrier, importer, shipper and additional copies. Once after arrival of cargo at

destination, the importer or his cargo agent approaches the destination office of air carrier and collect airway bill and other required documents sent by shipper along with cargo for necessary documentation for import customs clearance procedures and other references. Importer may also collect copies of documents by courier or mail from shipper before arrival of goods.

The shipper also can arrange to send airway bill and other documents through his bank to meet LC requirements or he desires.

The major difference between bill of lading and Airway bill is that, Airway bill is not a document of title. However, airway bill can be prepared in such a way to treat as document of title and negotiable document.

Bill of lading is a document issued by sea carrier of goods on receipt of cargo to him from the shipper. Bill of lading is issued to shipper after completion of export customs clearance procedures at load port customs location of the country.

After completion of export customs formalities, shipper hands over cargo to sea shipping carrier or his agent. As proof of receipt of goods, sea carrier or his agent issues a document which is called bill of lading. Bill of lading is generally issued in triplicate with non negotiable copies. BL also is issued in quintuplicate on special request by shipper.

Once after obtaining original bill of lading from the sea carrier, shipper submits bill of lading with other documents with his bank, in turn bank sends to importer through importer's bank. Importer collects bill of lading and other required documents from his bank and arranges for import customs clearance procedures. The shipper can surrender original bill of lading at load port where BL has been released and arranges to send a OBL release message to the counterpart office of sea carrier and advise them to release cargo without insisting for original bill of lading from consignee. The shipper also can release Seaway bill where in no original bill of lading procedures involved.

In short, Airway bill is a document of proof of receipt issued by air carrier of goods to shipper on receipt of goods for on carriage. Where as bill of lading is a document of proof of receipt issued by sea carrier of goods to shipper on receipt of goods for on carriage.

14.13 CONTRACT OF AFFREIGHTMENT

A *contract of affreightment* is a contract between a *ship-owner* and another person (called the *charterer*), in which the ship-owner agrees to carry goods for the charterer in the ship, *or* to give the charterer the use of the whole or part of the ship's cargo-carrying space for the carriage of goods on a specified voyage or voyages or for a specified time. The charterer agrees to pay a specified price, called *freight*, for the carriage of the goods or the use of the ship.

A ship may be let, like a house, to a person who takes possession and control of it for a specified term. The person who hires a ship in this way occupies during the specified time the position of ship-owner. The contract under which a ship is so let may be called a charter-party—but it is not, properly speaking, a contract of affreightment, and is mentioned here only to clarify the distinction between a charter-party of this kind, which is sometimes called a *demise of the ship*, and a charter-party that is a *contract of affreightment*.

Rules of law

The law with regard to the contract of affreightment is a branch of the general law of contract. The rights and obligations of the ship-owner and the freighter depend, as in the case of all parties to contracts, upon the terms of the agreement entered into between them.

The law, however, interferes to some extent in regulating the effect to be given to contracts. Certain contracts are forbidden by the law, and being illegal are therefore incapable of enforcement. The most important example of illegality in the case of contracts of affreightment is when the contract involves trading with an enemy.

The law interferes again with regard to the interpretation of the contract. The meaning of words in the contract, or—in other words—its construction, when a dispute arises about it, are determined by a judge or court. The result is that certain more-or-less common clauses in affreightment contracts have come before the courts, and decisions in these cases are treated practically though perhaps not logically—as rules of law that determine the meaning of certain common expressions in shipping contracts.

The law acts in a third way—by laying down rules that regulate rights of the parties in the absence of an express contractual stipulation that such rules cover. This is done either by statutory enactment, as by Part VIII of the Merchant Shipping Act 1804, which deals with the liability of ship-owners—or by established rules of *common law*, as, for instance, the rule that the common carrier is absolutely responsible for the safe delivery of the goods carried, unless prevented by an act of God or enemies of the Queen.

These rules of law, whether common law or statute law, that regulate the obligations of carriers of goods by sea, are of most importance in cases in which there is an affreightment without any written agreement. It is, therefore, convenient to consider first cases of this kind where there is no express agreement, oral or written, except as to the freight and destination of the goods, and where, consequently, the rights and obligations of the parties as to all other terms of carriage depend wholly upon the rules of law, remembering always that these same rules apply when there is a written contract, except insofar as they are qualified or negated by the terms of such contract.

14.14 SUMMARY

The airport company planning to set up a greenfield airport in a state or union territory will require to liaison with the Civil Aviation Department of the respective state government. The last chapter charts out the details of annexures, which cover various Airport Authority of India committee reports, the Greenfield Airport Policy, the Communications, Navigation and Surveillance/Air Traffic Management (CNS ATM) agreement, the Airport Security Program, application formats for Central Government agencies, and the State Support Agreement.

Located at Rajiv Gandhi Bhavan at the Safdarjung Airport in New Delhi, the Ministry of Civil Aviation is responsible for formulation of national policies and programmes for the development and regulation of the Civil Aviation sector in the country. It is responsible for the administration of the Aircraft Act, 1934, Aircraft Rules, 1937 and various other legislations pertaining to the aviation sector in the country. This Ministry exercises administrative control over attached and autonomous organizations like the Directorate General of Civil Aviation, Bureau of Civil Aviation Security and Indira Gandhi Rashtriya Udan Academy and affiliated Public Sector Undertakings like National Aviation Company of India Limited, Airports Authority of India and Pawan Hans Helicopters Limited. The

Commission of Railway Safety, which is responsible for safety in rail travel and operations in terms of the provisions of the Railways Act, 1989 also comes under the administrative control of this Ministry. Attached-Autonomous Organisations-Directorate General of Civil Aviation DGCA

The Directorate General of Civil Aviation (DGCA) is the regulatory body in the field of Civil Aviation, primarily dealing with safety issues. It is responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety, and airworthiness standards. The DGCA also co-ordinates all regulatory functions with the International Civil Aviation Organisation (ICAO).

Private operators were allowed to provide air transport services. However, no foreign airline could directly or indirectly hold equity in a domestic airline company. By 1995, several private airlines had ventured into the aviation business and accounted for more than 10 percent of the domestic air traffic. Today, Indian aviation industry is dominated by private airlines and these include low cost carriers, who have made air travel affordable. The Government nationalized nine airline companies vide the Air Corporations Act, 1953. These government-owned airlines dominated Indian aviation industry till the mid-1990s. In April 1990, the Government adopted open-sky policy and allowed air taxi- operators to operate flights from any airport, both on a charter and a non charter basis and to decide their own flight schedules, cargo and passenger fares.

14.15 GLOSSARY

Air traffic management , international civic aviation organisation, merchant shipping act, 1804

14.16 SELFASSESSMENT QUESTIONS

1. What is airway bill.

2. What are the government guidelines under state and centre.

3. Give the infrastructure , equipment and Personal requirement in detail.

4. Give the types of Airway bill

5. What is contract of Affraightment

14.17 LESSON END EXCERCISES

1. What is Bill of Lading.

2. Difference between Airway bill and Bill of Lading.

3. How an Airway Bill Works.

4. What is Directorate of general of civic aviation.

5. What are the requirement for an airway bill.

14.18 SUGGESTED READINGS

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WATER TRANSPORT

STRUCTURE

- 15.1 Water Transport Meaning
- 15.2 Meaning of Inland Water Transport
- 15.3 Summary
- 15.4 Glossary
- 15.5 Self Assessment Questions
- 15.6 Lesson End Exercises
- 15.7 Suggested Readings

15.1 WATER TRANSPORT MEANING

Water transport is the cheapest and the oldest form of transport for heavy goods and bulk cargoes. Waterways are the natural gifts, hence it does not require large amount of capital expenditure for the construction of road and railway tracks, except canal transport, as in the case of land transport. In addition to that the cost of running is also very less. **Water transport** is the process of moving people, goods, etc. by barge, boat, ship or sailboat over a **sea**, ocean, lake, canal, **river**, etc. water transport is the most easy and cheap mode of transport. Unlike, rail and road transport we do not have to construct water ways because river and seas are given by nature. Water transport plays an important role in case of international trade. During natural calamities like heavy rain and flood, when rail and road transport are not workable, rescue operations are undertaken by water transport. Before independence, there were many private shipping companies, but after

independence, eastern shipping corporation was established in 1950's, in 1956 western shipping corporation was set up . In 1961, Indian shipping corporation was set up merging the two corporations. This category does not include articles on the **transport of water** for the purpose of consuming the **water**

A INLAND WATERWAYS

Inland waterways may be subdivided into

River Transport: Rivers are the water highways given by nature. River Transport is suitable for small boats and steamers. It was highly developed in the pre-railway days. But with the development of railways, river transport was neglected and decayed gradually

Canal Transport: Canals are the artificial waterways constructed for the purpose of navigation and irrigation.

B OCEAN TRANSPORT

Ocean Transport or shipping may be subdivided into

Coastal Shipping: Coastal shipping is a cheaper, speedy, flexible and economical form of transport for the movement of bulky and heavy cargoes. Usually coastal shipping trade is reserved for the national shipping. In India also from 1951 and onwards the coastal shipping trade is extremely reserved for the national ships.

Overseas Shipping: On the basis of their working, overseas shipping may be divided into The Liner (those ships which follow defined routes with fixed places and fixed time table), The Tramps (those ships which have no set routes or fixed time table) and The Oil Tanker (special sea carriers of crude oil in very large quantity). The Liners may again be subdivided into Passenger Liners and the Cargo Liners.

15.2 MEANING OF INLAND WATER TRANSPORT

Navigable Inland Waterways - A stretch of water, not part of the sea, over which craft of a carrying capacity not less than 50 tonnes can navigate when normally loaded. This term covers both navigable rivers and lakes (natural water courses, whether or not they have been improved for navigation purposes) and canals (water ways constructed primarily for the purpose of navigation). The length of rivers and canals is measured in mid channel and length of lakes, as well as lagoons, is counted as the length between the most

distant points between which the transport is performed. An inland waterway forming a common frontier between two countries is reported by both. National Waterways means an Inland Waterway of India designated as a National Waterway by the Government. Major Port vis a vis Non-Major Port-The words “major”, “intermediate” and “minor”, do not have a strict association with the traffic volumes served by these ports. As an example, Mundra Port, a newly developed minor port in the state of Gujarat registered a cargo traffic of around 28.8 million tonnes per annum during the financial year of 2008, which is higher than that of many major ports. The classification of Indian ports into major, minor and intermediate has an administrative significance. Indian government has a federal structure, and according to its constitution, maritime transport falls under the “concurrent list”, to be administered by both the Central and the State governments. While the Central Shipping Ministry administers the major ports, the minor and intermediate ports are administered by the relevant departments or ministries in the nine coastal states of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat. Several of these 185 minor and intermediate ports are merely “notified”, with little or no cargo handling actually taking place. These ports have been identified by the respective governments to be developed, in a phased manner, a good proportion of them involving Public-private partnership

Water transport can be divided into following two categories:

- (i) Inland waterways, and**
- (ii) Ocean transport.**

1. Inland Waterways:

There are three types of inland waterways, namely, rivers, rivers which have been modified or canalised, and specially constructed canals. In earlier times much, perhaps most, of the inland carriage of commodities was by water.

This was possible when vessels were small, the volume of traffic limited, and the time factor was not particularly pressing. But during the 18th century, ships began to grow in size, trade began greatly to expand, and speed of carriage came to be of greater importance.

In order to overcome the limitations of many rivers and, also, to provide many inland towns with water communications, canals began to be built. In England, a pioneer in canal

construction, the building of these new man-made waterways became almost a mania. Canal building on the Continent came somewhat later, although there are some examples of early canals, e.g., the Canal du Midi in southern France was constructed in 1681.

In 19th century, there was some decline in inland water transport due to development of railways and road transport. But after sometime, water transport has tended to make a comeback, this is closely linked with the cheapness and capacity for bulk carriage of water transport – witness the recent and current developments of the Albert Canal, the canal between Zeebrugge and Ghent, the canalisation of the Moselle, the Rhone Valley Scheme, etc. Inland waterways have both advantages and disadvantages.

The chief advantages are:

- (i) There is no track to lay or maintain, although dredging may be necessary in the case of natural waterways;
- (ii) They may provide the only practicable routes, e.g., in very difficult, mountainous country or in areas of very dense tropical forest.
- (iii) Waterways, under favourable conditions, provide cheap transport for heavy, bulky, imperishable commodities such as coal, ore, timber, cement.

The principal disadvantages of inland waterways are:

- (i) Rivers may involve devious journeys and may flow in the wrong direction from the point of view of trade;
- (ii) Otherwise navigable rivers may be interrupted by falls or rapids while canals require locks if there are differences in level;
- (iii) River levels may change seasonally and freezing may occur in winter causing stoppages in navigation;
- (iv) Canal construction involves heavy capital outlay and canals require constant maintenance and sometimes dredging, and may also require a water supply;
- (v) Transport by water is slow in comparison with most other forms of overland transport and carriage by water is generally unsuitable for perishable produce; and

- (vi) Waterways are less flexible than either roads or railways which can more easily adapt themselves to changing industrial location.

Although water transport is carried on to a greater or lesser degree the world over, there are only six major navigable systems of inland waterways: the rivers of Western and Central Europe, the Volga-Don system, the North American rivers, the Amazon system, the Parana-Paraguay system, and the Chinese waterways.

Inland waterways are best developed in Europe and North America; in other continents their development is moderate.

A brief review of inland waterways is as follows:

Europe:

In Europe, France, Germany, Belgium, Netherlands as well as Russia, have very extensive inland waterways including rivers and canals. France is having 5,600 km of navigable rivers and another 4,800 km of canals.

The major French rivers, e.g., Loire, Garonne, Seine, Rhone, Meuse and Moselle have been modified and are linked by canal systems so as to travel entirely by river and canals from Mediter-ranean Sea to English Channel or from Rhine to Atlantic Ocean. On the other hand, Germany is having 7,040 km of inland waterways.

The important inland waterways of Europe are:

The Rhine Waterway:

The Rhine is the busiest navigable river of the world. On both sides of it have developed heavy industries which benefit from cheap water transport. The river is navigable by ocean-going steamers of small size. From the point of economic geography, the rivers prolong the great ocean routes into the interior of lands.

Of the “flowing roads” the Rhine is one of the most remarkable. It leads from the ocean into the very heart of the Continent. The Rhine is a “coal river”. The lignite of the Aachen basin and the coal of the Ruhr furnish the greater part of the river freight.

The Rhine is one of the rivers most favoured by nature for navigation. The greatest difference between the Rhine from Basle to Strasbourg and the Rhine from below Strasbourg is the

heavy gradient in the upstream stretch, which causes a very swift current.

Above Strasbourg the traffic is slight owing to a rapid current, low water and a rock ledge near Istein. But below that point there is a slow current except in the gorge of the Slate Mountain (between Bingen and Bonn). The volume of water is uniform during summer. Rhine navigation is stopped during the months of winter owing to low water.

The Rhine from Basle to Strasbourg is characterised by a torrential regimen betraying its Alpine origin. The seasonal variations – summer floods and winter low water – are the more pronounced and rapid as the gradient increases from Basle to Strasbourg.

A barge which carries a full cargo to Strasbourg in summer must discharge half en route in winter. The Rhine navigators invariably allow a margin of 30 cm between boat-keel and river-bed to guard against sudden fall in the waters which may be very rapid in case of drought.

The Rhine empties into a tributary sea of the North Atlantic which lies at the beginning of the largest current of world commerce. This is a privileged position as compared with most other rivers of Europe. To take advantage of this, other rivers near the Rhine have been connected to it by means of canals. The result is that there is no other river in Europe which has so many canal connections as the Rhine.

Waterways of the Germanic-Baltic Lowlands:

An extensive network of waterways consisting of east-west canals joining the north-south flowing rivers crosses the northern German plain. The Mittelland Canal, also known as the Midland Canal was built in 1938, joins the three major rivers of Ems, Weser and Elbe. Kiel Canal is 96 km long, links the Elbe estuary to the Baltic Sea. The Dortmund-Ems canal runs north-south and links the Rhine with ports of Bremen and Emden.

Waterways of Southern Germany:

Danube is the main river, which flows through seven countries – Germany, Austria, Czech Republic, Hungary, Yugoslavia, Romania and Bulgaria and navigable for about 2,400 km. Canals like Ludwing Canal, Rhone—Rhine Canal provide a good inland waterway.

In Belgium, total length of inland waterway is 1,535 km. Albert Canal (built in 1940) and also other canals on coastal plain serve the towns of Ghent, Bruges, Zeebrugge and Ostend. Netherlands, at the mouth of Rhine, is criss-crossed by its distributaries, and also has extensive man-made waterways.

The former Soviet Union has developed a system of navigable waterways totaling 1,44,000 km. Most of these waterways are located in European Russia. The Baltic and White Sea Canal, the Moscow-Volga Canal and Volga-Don shipping canals are nodal.

There are several rivers like Volga, Dvina, Don, Dnieper and Dneister, which are navigable in many parts. But many Russian rivers remained blocked during winter season. In spite of such defects Russian rivers are very important for domestic and foreign trade.

North America:

In North America the rivers of most use for navigation are the Mississippi and Missouri and the most important canals are those of St. Lawrence, which unites

the Ontario and St. Lawrence; the Sault Sainte Marie canal, between Superior and Huron; the canal which links the Chesapeake to the Ohio; the New York canal; and the canals between North Allegheny and Erie.

The length of navigable waterways in United States is over 36,072 km. The Mississippi river system, largest of all, provides more than 8,000 kilometres of waterways with depths of 3 metres or more, including the main river trunkline from Minneapolis to the Gulf of Mexico — a distance of more than 12,880 kilometres. The Missouri, a tributary of Mississippi, is navigable for 1,216 km to Sioux City, Iowa.

On the recommendations of The Ralph M. Parsons Company, a private engineering and construction enterprise with headquarters in Los Angeles was set up under the project to carry out technical assessment of water and power potential of North America. The project is referred to by the company as NAWAPA – the North American Water and Power Alliance.

The basic idea behind ‘NAWAPA’ is to capture the surplus waters of the Fraser, Yukon, Peace, and Athabaska river systems in north-western North America and to direct,

via an elaborate system of canals, reservoirs and tunnels, the surplus water to deficit areas of Canada and United States.

The St. Lawrence Waterway:

The St. Lawrence, with the great lakes, forms a very important commercial route into the heart of North America. The river is, however, ice-bound for about four months every year, and has various rapids and falls which have necessitated the cutting of canals to enable sea-going vessels to reach Lake Superior.

Large ocean vessels can pass about a thousand kilometres up the river to Montreal; but here goods have to be transhipped to smaller vessels, because rapids occur, and the canals made to avoid them are not over 3-5 metres deep.

The Canadian government built a 3-5 metres deep canal around the rapids that permitted shallow draft boats to negotiate the St. Lawrence between Lake Ontario and the sea. After the Welland canal and its eight locks were completed in 1931, interest in the Great Lakes — St. Lawrence Seaway was renewed.

The St. Lawrence enters the ocean by a deep estuary due to submergence in the past, but navigation is rendered difficult by the prevalence of fogs and the rapidity of the current. The valley of the St. Lawrence is fertile, and the whole length is lined with villages and towns.

Another canal has been made to avoid the falls of Niagara, though a great deal of trade is diverted at Buffalo to the Erie Canal and Mohawk-Hudson route to New York. The Sault Sainte Marie or 500 canals were necessitated by rapids between Lake Superior and Lake Hudson, and the traffic on these canals is enormous.

Asia:

Asia is not having elaborate system of inland waterways, but rivers in many countries are used as inland waterways.

In China, the rivers have made a significant contribution to the development of commerce. The three great rivers, the Hwang-ho, the Yang-tse-kiang and the Sikiang, cross the country from west to east. China's greatest river is the

Yang-tse-kiang, the most important waterway for navigation in the country. It is doubtful whether there is another equally extensive region of wealth in the world where the people depend as solely upon a single artery of traffic and upon one entrepot as do the inhabitants of the Yangtse basin.

About half of the populations of China live in this fertile area, utilising the river, its tributaries and its network of canals as their chief means of communication.

The Yang-tse-kiang rises in Tibet, and with its tributaries drains the heart of China. It is navigable by steamers up to the port of Hankow. The Sikiang rises in the highlands of Yunan and has a fairly direct course eastward to its mouth. It is navigable for the greater part of its course. The Pei-ho is important for communication and can be navigated up to Tientsin.

Northern India is especially endowed with three large navigable rivers. These rivers are the Ganga, the Brahmaputra and the Jamuna. The Ganga can be navigated by steamers as far as Kanpur from its mouth. This river flows through the most densely populated and fertile plain of India and naturally commands much traffic.

Before the development of railways the Ganga was of considerable importance for the movement of goods and persons. The development of railways has greatly reduced the importance of steam navigation, especially in the upper Ganga.

The Lower Ganga is even now very important, and there is traffic all the year round. The Brahmaputra flows through Assam and Bangladesh and is navigable as far as Dibrugarh. Its tributary, the Surma, has made steam navigation possible in Sylhet and Cachar. The Indus in Pakistan is navigable by steamer up to Dera Ismail Khan in the North Western Frontier Province. The river mostly handles wheat, cotton and wool. The frequent shifting of its bed and the formation of sand-bars has caused steam navigation in the Indus to be neglected.

Burma is very fortunate in having a large number of navigable rivers. The Irrawaddy, the most important and the largest, is navigable by steamers for more than 800 km from its mouth and country boats can proceed farther.

Africa:

In Africa, some rivers are navigable, that too for a very limited length. The Nile is the most important river in north-east Africa, but its great defect is the succession of cataracts. In its upper course the Nile has rapids and falls; in its middle course there are cataracts. It is navigable in the delta and in its lower course.

The rivers of South Africa are of little use for traffic. The Zambesi is navigable for only 350 km, while the Limpopo can be navigated only for a short distance. The Orange is not navigable. In tropical Africa, the Congo provides a magnificent system of waterways. It rises in the highlands between the lakes Tanganyika and Nyasa.

But at several places navigation is interrupted by rapids and falls. The Ubun, the chief tributary of the Congo can be navigated almost up to its head. In West Africa the Niger is easily navigable for 500 miles and in the wet season navigation is continued further. The Gambia is navigable for 260 km from its mouth.

South America:

South America is having some long rivers but their use as inland waterways is limited. Amazon River is the longest river of the continent. But till now the Amazon system is of relatively little use, because the region through which the river flows is densely forested, scantily populated, undeveloped and largely unexplored. The

Orinoco which flows through Venezuela is a long waterway. But the most useful in South America is the Parana system which penetrates the heart of Argentina, Paraguay, Uruguay and South Brazil. In the southern side of South America the river Rio Negro drains the sheep-rearing land of Patagonia.

Australia:

Australia is deficient in waterways. Her river-system consists of small streams flowing from the highlands to the coast, thus not suitable for navigation purpose. The two most important rivers are Murray and Darling. Darling River remains almost dry during winter and spring seasons. River Murray is partially used as a waterway.

2. Ocean Transport:

Ocean transport is the most important water transport, because it has certain advantages over land carriage. The sea offers a ready-made carriageway for ships which, unlike the roadway or railway, requires no maintenance.

Water surfaces are two-dimensional and, although sea-going vessels frequently keep to shipping lanes, ships can travel, within a limited number of constraints, in any direction.

Because of floatability and reduced friction, ocean vessels are capable of carrying far greater loads and far greater weights than can be handled even by the longest railway train, the most powerful lorry and trailer, or the largest aircraft; accordingly, ocean transport is usually the cheapest of all forms of transport.

Again, except for fog and floating ice, and occasionally stormy weather which may hinder progress, ocean-going vessels have fewer physical obstacles to surmount than those which so often handicap overland transport.

Ships have been used for transport right from early times. During Graeco-Roman times a fundamental distinction was made between longships or galleys, used for military purposes, and round-ships for trade. The Vikings had a similar distinction.

During more recent times ships have shown an even greater specialisation and several distinct types of commercial vessels gradually evolved. Today about half a dozen main types of merchant ships are recognised – passenger liners, cargo-liners, bulk-carriers, tramps and coasters, and short-sea traders.

The most spectacular development, however, has been the appearance of bulk-carriers, the most important of which are tankers, the product of the oil age. Recent years have witnessed a tremendous growth in the size of tankers, a number of which now exceed 5, 00,000 tons dead-weight.

Today, more than half of the world's merchant shipping tonnage comprises tankers, a fact indicative of the great importance of oil in the modern world.

Although ships have freedom of movement and are capable of going virtually anywhere on the ocean surface, they tend to keep to certain “lanes”. They do so because of: (i) physical conditions, and (ii) economic considerations.

Clearly, ships will go only where there are goods or people to be carried and the most important shipping routes are those linking the most productive and most populous regions. Certain physical conditions also help to determine the routes followed by ships, e.g., the availability of harbours and ports on coasts, weather conditions such as fog and storm occurrence, and oceanographically factors such as sea ice and icebergs, submarine banks, and shallow waters.

The principal ocean trade routes of the world are as follows

The North Atlantic Ocean Route:

The North Atlantic Ocean Route has the greatest traffic of all ocean routes. Nearly one-fourth of the tonnage of the world’s merchant vessels serves this route. In volume and variety of cargo, this route far exceeds any other.

This route connects the ports of Western Europe with those on the east coast of North America. These two regions are the most populous and highly developed regions in the world.

North America and Western Europe are the world’s greatest producers of goods of quantity and diversity. Ports on the western coast of Europe are Glasgow, Liverpool Manchester, Southampton, London, Rotterdam, Bremen, Bordeaux and Lisbon. Ports on the eastern coast of the USA are Quebec, Montreal Halifax, St. John, Boston, New York, Baltimore, Charleston Galveston and New Orleans.

This oceanic route is the busiest trade route of the world. Large quantities of manufactured items: textiles, chemicals, machinery, fertilizers, steel, wine, etc., are exported from these ports across the North Atlantic to the United States and Canada.

The exports of Canada and the USA to Europe are timber, fish, wheat, raw cotton, tobacco, oil, machinery and vehicles, metals, paper and chemicals.

The Suez Canal or Mediterranean Asiatic Route:

This route is second to the North Atlantic in respect of volume of traffic. It commands the markets of eastern Africa, Iran, Arabia, India, the Far East, Australia and New Zealand. In fact, the route passes through the heart of the world and touches more lands and serves more people than any other route. Throughout its many ports of call, it reaches about three-quarters of the total population of the globe.

After crossing the Red Sea, the route follows two directions – one along the eastern coast of Africa to Durban; another to farther east – to India, Australia, etc. Ports of departure are London, Liverpool, Southampton, Hamburg, Rotterdam, Lisbon, Marseilles, Genoa and Naples. The ports of call are Aden, Mumbai, Kolkata, Rangoon, Penang, Singapore, Manila, Hong Kong, Perth, Adelaide, Melbourne, Sydney, Mombasa, Zanzibar, Mozambique and Durban.

This route is used by Asiatic countries to send raw materials and some food products to the western markets and receive in return manufactured articles – the products of the Far East are rice, tea, sugar and silk; those of India are coffee, tea, pig iron, manganese ore, jute goods, indigo, spices, cotton, teak, silk, skins, leather and oil-seeds and those of Middle East are petroleum, coffee, and dried fruits. From Australia meat, timber, wheat, flour, fruit, wool, butter and wine are sent. China, Australia, New Zealand and countries of South and South-East Asia now use this route for both export and import of commodities.

The Cape of Good Hope Route:

This route was once the subsidiary alternative to Suez Canal route, but because of its long and circuitous journey, was avoided by most of the shipping companies. During the closure of Suez Canal in 1967 all the ships had no choice but to take this route.

Even after Suez Canal reopened in 1975, much trade continues to follow this route because tankers and other vehicles nowadays are much larger. As the Suez Canal can only accommodate ships of around 20,000 tons capacity and toll charges are high, the Cape route is growing in importance.

It has several other advantages. With the greater economic development of the recently independent African nations and the exploitation of their rich natural resources such as gold, copper, diamonds, tin, chromium, manganese, cotton, oil palm, groundnuts,

coffee and fruits, the volume of traffic round the Cape of Good Hope and from ports in both East and West Africa is on the increase.

The Panama Canal: West Indian Central American Route:

The construction of Panama Canal was completed in 1913. The Panama Canal is 'the gateway to the Pacific' and eliminated the long and hazardous voyage round the Cape Horn. It has benefited on both Atlantic and Pacific seaboard, facilitating trade in minerals, oil, foodstuffs, raw materials, and manufactured products. But the greatest benefits have accrued to traffic between the east and west coasts of USA.

The Panama route has also greatly facilitated trade in the West Indian islands and the Pacific states of North, Central and South America, especially the Andean states which are rich in mineral resources and have good markets in North America. The Latin American states import manufactured goods and mining equipment from the USA and the western European countries.

Much trade destined for the Far East, the Pacific islands and Australasia from North America and Western Europe also goes through the Panama Canal. With the greater economic development of East Asian countries especially China, Japan and the South-East Asian states, the Panama route is assuming a greater role in the exchange of products between the East and West. The distance saved from Auckland to New York via Panama, instead of Cape Horn, is more than 4,000 km.

The South Atlantic Route:

This route leads to West Indies, Brazil and Argentina. The chief ports of call on the route are Kingston (Jamaica), Havana, Vera Cruz, Tampico, Pernambuco, Bahia, Rio de Janeiro, Santos, Montevideo, Buenos Aires and Rosario. The exports along the route are sugar, bananas, raw cotton, mahogany, tobacco, coffee, grain, wool and meat, while the imports are manufactured goods.

This route maintains trade connections between Europe on the one hand and West Indies, Caribbean seaboard, Brazil, Uruguay and Argentina on the other.

The Trans-Pacific Route:

There are several routes in North Pacific which converge at Honolulu for refuelling and servicing. The direct route further north is a great circle which links Vancouver and Yokohama without calling the Hawaiian Island, reduces the travelling distance by half.

The North Pacific trade includes Vancouver, Seattle, Portland, San Francisco and Los Angeles on the American side, dealing with wheat, timber, paper and pulp, fish, dairy products and manufactured goods. The destinations across the 7,200 km (4,500 mile) wide Pacific are usually Yokohama, Kobe, Shanghai, Guangzhou (Canton), Hong Kong, Manila and Singapore. The east-bound trade from East Asia to North America consists mainly of manufactured goods, e.g., textiles, electrical equipment, from Japan, Hong Kong, S. Korea, and Taiwan, and tropical raw materials from South-East Asia, e.g., rubber, copra, palm oil, teak, tin and tea. In addition to international links the North Pacific is an important domestic route-way from the US mainland to the isolated states of Alaska, in the north, and Hawaii in the mid-Pacific.

In the South Pacific, the traffic consists mainly of ships travelling via the Panama Canal between either West Europe or North America and Australia, New Zealand and the scattered Pacific islands. Goods transported are mostly wheat, meat, wool, fruits, dairy products and manufactured articles.

The other important routes are eastern North American-east South American (from New York to Cape Sao Roque), North American-western South American (from New York to Punta Arenas via Panama Canal), North American-Australasian (from New York and Vancouver to Sydney and Wellington via Honolulu), etc.

The analysis of ocean transport cannot be completed without detailed description of Suez and Panama Canals. These two canals have changed the entire pattern of oceanic trade, therefore, it is essential to know the characteristics and importance of these canals.

The Suez Canal:

The Suez Canal is one of the great international waterways of the world — cuts across the Isthmus of Suez and provides navigational facilities between the Mediterranean Sea and the Indian Ocean.

The history of a canal connecting the Mediterranean with the Red Sea dates back to 13th century B.C. when Nile-Red Sea canal is known to have been in use until the end of 8th century AD. From 16th century onward one or the other of European powers became interested in the idea of either reopening the old waterway or cutting a new one from the Mediterranean.

In 1834, Ferdinand de Lesseps, a member of the French Consular service at Alexandria was interested in the Suez Canal scheme. In 1854, he discussed the project with the Viceroy of Egypt (Khedive) and got his approval. A concession to run for 99 years from the date of the canal's opening was granted to de Lesseps, author-ing him to form an International Company for the purpose of constructing a waterway.

The excavation was started in 1859 under de Lesseps, who took full ten years to construct the canal. It was opened in November, 1869. It is about 160 km long (including distance of lakes) and is 11 to 15 metres deep. The width of the floor is 40 m and varies at the surface. Suez Canal links the Mediterranean Sea with Red Sea. Port Said is located at Mediter-ranean Sea; while Port Suez is on the Red Sea.

As a ship enters the canal from the Mediterranean Sea, it will pass Port Said, one of the greatest ports in the world and proceeding south will enter Lake Tunisa on the bank of which is the city of Ismailia. From Lake Tunisa to Suez city, a ship will pass through Geat Bitter Lake and Little Bitter Lake.

No single human enterprise during the past century has done more to affect the destinies of nations through a physical geographical change than the Suez Canal. The opening of Suez Canal route saved approximately 5,820 kilometres on the voyage from London to Mumbai as compared to the Cape route.

The opening of Suez Canal had a tremendous affect not only on world trade and commerce but also on international politics, besides opening up to western countries a new route to Africa, Asia and Australia.

The usual trade route between the eastern coast of North America and the Far East was through the Cape of Good Hope. The Suez Canal saved a great deal of distance by diverting the traffic from the Cape of Good Hope route to itself and thus, benefited

North America greatly. More than 12,000 vessels pass through the Suez Canal every year.

The Suez Canal has provided not only the fastest but also the most economical line of transit between Europe and the East. Politically the Suez route is vital because of the oilfields in the Middle East countries on whose products the economy of Western Europe is dependent.

There are some problems of the Suez Canal. The canal needs improvements in regard to depth, width, diversion to avoid crossing of ships in the narrow part of canal. The deposition of silt that comes along winds blown from desert also needs regular cleaning. The second problem is the high canal dues levied on ships which pass through the canal.

It has been observed that when speed is not essential, many cargo liners follow the Cape of Good Hope route to avoid the high dues. Now many cargo vessels are so big in size that they cannot pass through the Suez Canal. Political instability in adjoining states of the canal is also a cause of concern. Although, Suez Canal according to international convention is free and open, in time of war as in time of peace, to every vessel of commerce or of war, without distinction of flag.

The Panama Canal:

The Panama Canal connects the Atlantic and the Pacific oceans by means of two bays, an artificial lake, a natural lake, and three systems of locks. It has been constructed across the narrow Isthmus of Panama where the long Continental Divide dips to one of the lowest points. The canal is 72 km long from deep water to deep water in the oceans. It was opened on 15 August, 1914 (Figure 13.8).

All the locks are double, so that ships can pass in both directions without any congestion of traffic. The depth of the channel varies from 12 to 26 metres and the width varies from 91 to 305 metres. The time taken to pass through the canal from Panama to Colon is 14 hours.

The Panama Canal passes through a rough country and the engineering difficulties have been much greater than in the case of the Suez Canal, which passes through a level country and needs no locks. The Panama Canal generates its own hydroelectric power

with which not only lighting of the region is done, but also electric locomotives are supplied to pull ships through the locks.

The Panama Canal is 'the gateway to the Pacific'. It has benefited countries on both Atlantic and Pacific seaboards, facilitating the trade in minerals, oil, foodstuffs, raw materials and manufactured products. Its greatest benefits have accrued to traffic between the east and west coasts of the United States.

The canal shortens the distance between New York and San Francisco by about 12,596 km by sea, and lessens very considerably the distance between Western Europe and western America, and between the northern and middle parts of East America and East Asia.

It also slightly shortens the distance between Europe and New Zealand, but it does not lessen that between Europe and Asia or Europe and Australia. Eastern North America and north-western Europe very definitely gained as a result of the canal, for they were placed much nearer by this route to all of western North America, western South America, and New Zealand.

For eastern North America the canal has meant a great reduction in the distance to Japan and to all of China north of Hong Kong, a factor that has unquestionably contributed to the rapid growth of trade with East Asia.

Advantages of Water transport

1. Less Maintenance Cost: Maintenance cost in rail and road transport is quite high but maintenance cost of water transport is quite less.
2. Cheap : The transport channel is quite cheap as compared rail and road transport
3. Useful for bulky goods: Heavy and bulky goods can be transported easily at little cost through water transport.
4. Useful during natural calamities: During natural calamities like flood rains, when rail and road transport is disrupted , relief operations can be operated through water transport.
5. Helpful in defence: Development of shipping is essential for the defence of the country also. It is also called second line of defence.

6. Important for foreign trade: Water transport plays important role in foreign trade. India's foreign trade is mainly dependent on water transport.

Disadvantages of water transport

1. Slow Speed: It is slow means of transport. Failure of monsoon results into fall in the water level of rivers making navigation difficult.
2. More risky: Water transport is more risky as compared to other means because there is always danger of sinking ships or boats.
3. Uncertain : Sailing boat, motor boat, steamer, ship etc become impractical in waterways , because the water in rivers, lakes, canals dries off. They are affected by seasonal changes. They become shallow which is risky in sailing the means of transport
4. Unsuitable for perishable goods: Water transport is not suitable for transporting perishable goods, because it takes long time to reach the destination.

15.4 SUMMARY

It is considered a very important mode of transport, and its all due to shipping and the role it plays in business, retail , society and travel, primarily to travel long distances. There are various types of water vehicles. These include cruise ships, racing boats, off – road riding boats, windsurfer boats, river boats, jet skis, battle ships, etc. its important to remember that water transportation is not only required for use on the sea/ ocean but also for inland rivers and canals. It is the process of transport a water craft, such as barge, boat, ship or sailboat. The need for buoyancy unites watercraft, and makes the hull a dominant aspect of its construction, maintenance and appearance.

It is the oldest means of transport in india. Prior to the advent of rail and road transport, goods and people were moved from one place to another through water transport. It refers to the movement of goods and passengers on waterways by using various means . since, the goods and passengers move inside the country, this type of transport is called inland water transport.

15.5 GLOSSARY

Inland waterways, cape of Good hope route, panama canal

15.6 SELFASSESSMENT QUESTIONS

1. What is water transport

2. What are the merits of water transport

3. Give demerits of water transport

4. Is water a cheapest mode of transport . write short note.

5. What are the various types of water transport

15.7 LESSON END EXERCISES

1. Write short note on water transport.

2. What is inland water transport.

3. What is ocean transport.

4. Give advantages of water transport.

5. Write three demerits of water transport.

15.8 SUGGESTED READINGS

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INLAND WATERWAYS AUTHORITY OF INDIA**STRUCTURE**

- 16.1 Inland water ways authority of India
- 16.2 Types of inland waterways authority of India
- 16.3 Waterways identified by new transport policy
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- 16.6 History of Inland water ways of india.
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16.1 INLAND WATERWAYS AUTHORITY OF INDIA

India has an extensive network of **inland waterways** in the form of rivers, canals, backwaters and creeks that can be used for transportation in place of or in addition to roads and rails. Through the ages, rivers have served as effective waterways, carrying people and goods over long distances. Even today, many countries depend heavily on inland water transport, especially for large and bulky cargo, as it is cheaper, more reliable and less polluting than transporting goods by road or rail. The total navigable length is 14,500 km, out of which about 5200 km of the river and 4000 km of canals can be used by mechanised crafts. Freight transportation by waterways is highly under-utilised in India compared to other large countries and geographic areas like the United States, China and the European Union. The total cargo moved (in tonne kilometres) by the inland waterway was just 0.1% of the total inland traffic in India, compared to the 21% figure for United States. Cargo transportation in an organised manner is confined to a few waterways in Goa, West Bengal, Assam, and Kerala. *Inland Waterways Authority of India* (IWAI) is the statutory authority in charge of the waterways in India.^[1] Its headquarters is located in Noida, UP. It does the function of building the necessary infrastructure in these waterways, surveying the economic feasibility of new projects and also administration. On 31st August 2018, IWAI made 13 standardised state-of-art design public for the transportation of cargo and passengers keeping in mind Ganges complex river morphology, hydraulics, acute bends, currents etc. in National Waterway - 1. The first implementation will be between Varanasi-Haldia stretch in assistance and investment from World Bank.

India has about 14,500 km of navigable and potentially navigable waterways of which around 55% is used regularly. India's Inland Waterways are un-utilized compared to other countries in the World. The total cargo moved (in tonne kilometres) by the inland waterway was just 0.1% of the total inland traffic in India.

The Inland Waterways Authority of India (IWAI) came into existence on 27th October 1986 for development and regulation of inland waterways for shipping and navigation. Its headquarters is located in Noida, Uttar Pradesh. The IWAI declared five National Waterways in India and also proposed a sixth one.

16.2 TYPES OF INLAND WATERWAYS OF INDIA

There are Five Inland Waterways in India.

Inland Waterway Stretch Rivers Length

National Waterway – 1 Allahabad – Haldia Stretch Ganges-Bhagirathi-Hooghly River
1620 Km

National Waterway – 2 Sadiya Dhubri Stretch Brahmaputra River 891 Km

National Waterway – 3 Kollam-Kottapuram Stretch West Coast Canal and Champakara
and Udyogmandal canals 205 Km

National Waterway – 4 Kakinada – Pondicherry Stretch Godavari and Krishna 1095
Km

National Waterway – 5 Talcher – Dhamra Stretch Matai and Mahandai 623 Km

National Waterway 6 is the proposed waterway in Assam state and will connect Lakhimpur
to Bhanga in river Barak. The 121 km long waterway will help in trading between town of
Silchar to Mizoram State.

Inland Waterways Authority of India (IWAI) was constituted in October 1986,
for the development and regulation of inland waterways for shipping and navigation. The
Authority undertakes various infrastructure development works on national waterways. It
also carries out feasibility studies and prepares proposals for declaration of other waterways
as National Waterways. It also assists States in development of IWT sector and provides
subsidy to IWT operators for acquiring IWT fleet for transportation of cargo and
passengers. An efficient transport sector is vital for development of the economy of any
country. In a large country like India, efficient transportation becomes pivotal to stimulate
competitive business environment. Indian transport system comprises various modes, viz;
Railways, Roadways, Inland Waterways, Coastal Shipping and Airways.

Inland Water Transport (IWT) is a fuel efficient, environment friendly and cost
effective mode of transport having potential to supplement the over burdened rail and
congested roads. For this, however, it is necessary that IWT mode is developed with
public funding at least to a threshold level at which private sector would get attracted to
this mode.

In the 19th century and first half of 20th century, IWT was an important mode of transport and navigation by power crafts/country boats played significant role in the development of trade and commerce along several rivers and canals. The advent of railways and extension of its network made a dent in share of water transport in India. Rapid growth of roads, coupled with inadequate development of IWT sector over the years gave a decisive set back to IWT and in the later years of 20th century, except in a few areas namely, Assam, Goa, Kerala, Mumbai, West Bengal, and some other coastal areas (where it has natural advantage and no developmental intervention was needed), the IWT sector was marginalized. However, considering its inherent advantages, the need for systematic development of IWT sector was always felt which is evident from the fact that since independence, several Committees studied IWT system of the country from time to time and advocated systematic development of the mode. National Transport Policy Committee in its report (1980) accordingly recommended for setting up of an Authority for development and regulation of inland waterways, which led to formation of Inland Waterways Authority of India (IWAI) in 1986 for development and regulation of inland waterways.

IWAI undertakes infrastructure development and maintenance works on National Waterways. It also takes up techno-economic feasibility studies and prepares proposals for declaration of other waterways as National Waterways. It also advises Central Government on matters related to IWT and assists States in development of IWT sector.

As per constitutional provisions, only those waterways which are declared as National Waterways come under the purview of Central Government while rest of waterways remain in the purview of respective State Government. Since formation of IWAI, five waterways namely:

1. Ganga
2. Brahmaputra
3. West Coast Canal with Udyogmandal and Champakara Canals
4. Kakinada-Puducherry Canals system along with Godavari and Krishna rivers
5. East Coast Canal with Brahmani river and Mahanadi delta have been declared as National Waterways.

6. One more waterway namely Barak river is under consideration of the Central Government for declaration as a National Waterways.

16.3 WATERWAYS IDENTIFIED BY NATIONAL TRANSPORT POLICY COMMITTEE

Waterways Identified by National Transport Policy Committee for consideration for declaration as National Waterways

The National Transport Policy Committee (1980) recommended the following principles for declaration of a national waterway.

- It should possess capability of navigation by mechanically propelled vessels of a reasonable size.
- It should have about 45 m wide channel and minimum 1.5m depth.
- It should be a continuous stretch of 50 kms. The only exception to be made to waterway length is for urban conglomera-tions and intra-port traffic.
- It should pass through and serve the interest of more than one State (or).
- It should connect a vast and prosperous hinterland and Major Ports (or).
- It should pass through a strategic region where development of navigation is considered necessary to provide logistic support for national security (or).
- It should connect places not served by any other modes of transport.

The National Transport Policy Committee considered the following waterways as having the potential for declaration as national waterway

- The Sunderbans
- The Mahanadi
- The Narmada
- The Mandovi, Zuari rivers and Cumberjua Canal in Goa
- The Tapi,

Hydrographic surveys and techno economic feasibility studies are the Pre-requisites for establishing the potential and viability of a waterway. Extensive surveys and investigations have been carried out on all the above waterways based on which three waterways have been so far declared as national waterways namely the Ganga, the Brahmaputra and the West Coast Canal. Development of many more new waterways as national waterways are planned during the 9th Plan period.

16.4 DEVELOPMENT OF NATIONAL WATERWAYS

Three basic IWT related infrastructure for development of waterways are:

1. Fairway or navigational channel with desired width and depth.
2. Navigational aids for safe navigation and
3. Terminals for berthing of vessels, loading/unloading of cargo and for providing interface with road and rail.

The fourth component for operationalising a viable IWT system is ‘inland vessels’ for transportation of goods and passengers. It is envisaged that once the fairway, terminals and navigational aids are provided to a threshold level, private sector investment in inland vessels, will increase dictated by market forces resulting in increase in inland fleet. Various projects for providing/maintaining fairway, terminals and navigational aids are being executed on National Waterways.

National Waterways No. 1 and 2 are typical alluvial rivers with characteristics of braiding, meandering and large water level fluctuation (both horizontal and vertical) between summer and monsoon months. On these rivers, several shallow areas (shoals) come up during low water season and maintenance of 2m Least Available Depth, particularly in upper reaches, becomes a difficult task. In these rivers, conservancy works (dredging and bandalling) are to be repeated every year on the shoals since after every monsoon the shoals are to be identified afresh and corrective measures (River Conservancy works) taken up. NW-3 on the other hand, is a tidal canal with predictable and uniform tidal variation in water level. On this waterway, therefore, once the desired depth is provided by capital dredging, it can be maintained for a number of years by undertaking nominal maintenance dredging from time to time as per actual requirement. NW-4 and 5 consist of both canal and river stretches. While canal portions need to be extensively dredged once

to provide depth, on Godavari and Krishna rivers yearly dredging will be required and on Brahmani river five barrages with navigational locks have been proposed. Works of NW-4 and 5 will commence after completion of their DPR's, approval of development projects by competent authorities and allocation of adequate funds by the Government of India. PIB note for development of NW-4 has already been prepared and submitted to Ministry of Shipping for approval.

16.5 IMPORTANCE OF INLAND WATER TRANSPORT

The water transport is one of the oldest means of transport in India. Waterways are the cheapest means of transport and are most suitable for carrying low cost heavy and bulky materials to long distances. It is a fuel-efficient and environment friendly mode of transport. Waterways are of two types—a. Inland waterways, and b. Seaways or Oceanways.

The Inland Waterways:

The inland waterways refer to using inland water bodies, such as rivers, canals, creeks, backwaters, etc. for transporting goods and people from one place to another. A number of rivers, like Ganga, Brahmaputra, Yamuna, Mahanadi, Godavari, Krishna, Kaveri, Narmada, Tapi, etc. were the main arteries of inland waterways in India.

The decline of river transport began with the development of roads and railways. The diversion of river water to irrigation canals made many of these rivers unsuitable for navigation. At present, the inland waterways in India are about 14,500 km in length. Out of this about 3,700 km are navigable by mechanised boats.

In order to increase the significance of inland waterways and to improve their efficiency, the Inland Waterways Authority of India (IWAI) was set up in 1986. The following inland waterways have been declared as National Waterways by the IWAI.

NW-1:

The Ganga River between Allahabad-Haldia (1,620 km long). It is navigable upto Patna by mechanized boats and by ordinary boats upto Haridwar.

NW-2:

The Brahmaputra River between Sadiya and Dhubri (891 km long). It is navigable by steamers upto Dibrugarh and is shared by India and Bangladesh.

NW-3:

The West Coast Canal in Kerala between Kottapuram and Kollam (205 km long).

The Inland Waterway Authority of India has also identified ten other inland waterways, which could be upgraded and developed. These include:

- i. The Barak River,
- ii. The delta and lower courses of the Mahanadi, Godavari and Krishna rivers,
- iii. The lower courses of Narmada and Tapi rivers,
- iv. The Zuari and Mandavi rivers in Goa,
- v. The backwaters and lagoons in Kerala, and
- vi. The Buckingham Canal in Andhra Pradesh and Tamil Nadu.

Uttar Pradesh has the highest length of inland waterways, followed by West Bengal, Andhra Pradesh, Assam, Kerala and Bihar.

The IWAI has drawn up a 20 year plan for the development of inland water transport in India.

The role of private sector will be focused on the fleet of vessels and warehousing facilities. The central and state governments will take up the dredging and desalting works, besides building the barrages and terminals.

16.6 HISTORY OF INLAND WATERWAYS OF INDIA

Inland Waterways authority of India was created by government of India on 27th October, 1986 for development and regulation of inland waterways for shipping and navigation. The authority primarily undertakes projects for development and maintenance of inland waterways terminal infrastructure on national waterways through grant received

from ministry of shipping, road transport and highways. The head office is at Noida. The authority also has its regional offices at Patna, Kolkata, Guwahati and Kochi and sub-offices at Prayagraj, Varanasi, Bhagalpur , Farrakka and Kollam.

16.7 FUNCTIONS AND POWERS OF THE AUTHORITY

1. Carry out surveys and investigation for the development, maintenance and better utilisation of the national waterways and the appurtenant land for shipping and navigation and prepare scheme in this behalf .
2. Provide or permit setting up of infrastructure for national waterways
3. Carry out conservancy measures and training works and do all other acts necessary for the safety and convenience of shipping and navigation and improvement of the national waterways.
4. Control activities such as throwing rubbish, dumping or removal of material, in or from the bed of the national waterways and appurtenant land , in so far as they may affect safe and efficient, shipping and navigation , maintenance of navigable channels, river training and conservancy measures.
5. Provide for the regulation of navigation and traffic (including the rule of the road)on national waterways.
6. Regulate the construction or alteration of structures on, across or under the national waterways.
7. Disseminate navigational meteorological information about national waterways.
8. Ensure co-ordination of inland water transport on national waterways with other modes of transport
9. Establish and maintain pilotage on national waterways.
10. Advise the central government on matters relating to inland water transport.
11. Study the transport requirement with a view to co- ordination inland water transport with other modes of transport.
12. Carry out hydrographic surveys and publish river charts.

13. Arrange programme of technical training for inland water transport personnel within and outside the country
14. Lay down the standards for classification of inland waterways.
15. Assist on such terms and conditions as may be mutually agreed upon, any state government in formulation and implementation of scheme for inland water transport development

16.8 ADVANTAGES OF INLAND WATERWAYS

- It needs and consumes low energy. It is claimed that, the quantity of energy that is consumed in inland waterway is less than 30 percent of that used in road transportation and around 80 percent of the energy amount used by rail transportation.
- Massive size of goods and products can be transported with great ease using inland waterways.
- It needs small lands.
- It causes the minimum environmental pollution including noise pollution and CO₂ emission in comparison with other modes of transportation.
- It has high labor productivity per unit of transport output.
- Low material requirement per unit of transport volume. It is demonstrated that, the material requirement of inland waterway transport is less than half of railway and smaller than quarter of highway transport.
- It has the lowest accident occurrence compare with other forms of transportation.

16.9 APPLICATIONS OF INLAND WATERWAYS

In addition to water navigation, inland waterways can also be used for other applications. The following section will discuss these applications of navigation waterways:

- Employ water power in plants constructed close to the navigation locks.
- Provide flood protection on trained rivers.

- Offer off take facility for water supply.
- Drainage of adjacent land
- Waste water disposal
- Lastly, provision of recreational facilities and general enhancement of the environment.

The utilization of inland waterway for purposes other than water transport cause some problems for example when plants are operating at peak rate, then a sudden and powerful force caused by released water would be imposed on the on the canal and canalized river.

This force could lead to serious problems in the inland waterways. So, it is necessary to take necessary measures to prevent the deterioration that may be experienced by the inland waterways while the plant operate at its ultimate rate.

These measures could be mechanical or electrical; an example of the former is disconnecting the connection between guide and runner vanes of Kaplan turbines. An example of the latter case is switching off the generator outlet to water resistance.

These measures cannot eliminate the influence of sudden and effective force that affect the inland waterways but rather decrease the danger on the inland waterways.

16.10 PROTOCOL ON INLAND WATER TRANSIT AND TRADE

An Inland Water Transit and Trade protocol exists between India and Bangladesh under which inland vessels of one country can transit through the specified routes of the other country. The existing protocol routes are :

- Kolkata-Pandu-Kolkata,
- Kolkata-Karimganj-Kolkata,
- Rajshahi-Dhulian-Rajshahi and
- Pandu-Karimganj-Pandu.

For inter-country trade, four ports of call have been designated in each country namely, Haldia, Kolkata, Pandu and Karimganj in India and Narayanganj, Khulna, Mongla and Sirajganj in Bangladesh.

With a view to providing an impetus for development for inland water transport mode, the Government of India had approved an Inland Water Transport Policy which includes fiscal concessions, and policy guidelines for rapid development of the mode and to encourage private sector participation in development of infrastructure and ownership and operation of inland vessels.

For exploring possibility of joint ventures and BOT projects in IWT sector, interactions were held with many interested firms and thereafter, some priority projects having potential of Joint Venture projects were short-listed. For some of these projects, bids were invited by IWAI. This initiative of IWAI has succeeded in attracting some private player to IWT sector and four Memorandum of Understanding (MOU)'s have been signed between IWAI and respective successful bidders for setting up and management of jetties at Bandel, Kolaghat and Budge-Budge in West Bengal and for acquisition, operation and management of barges on O-D pairs of Kolkata-Mongla, Kolkata-Dhubri and Kolkata-Pandu. 3 Joint Venture Companies have already been incorporated and the 4th is being incorporated to execute the aforesaid projects.

National Inland Navigation Institute

An institute of national importance, viz. National Inland Navigation Institute (NINI), Patna, became functional from February 2004. This is the first institute of its kind in the country. About 300 trainees have successfully completed the vessel crew training course from this Institute so far.

Central Inland Water Transport Corporation (CIWTC)

The Central Inland Water Transport Corporation (CIWTC) with its headquarters at Kolkata was set up as a public undertaking in May 1967. The CIWTC is mainly engaged in transportation of goods by inland waterways in the Ganga-Bhagirathi-Hooghly, Sunderbans and Brahmaputra rivers. They are operating regular cargo services between Kolkata and Pandu (near Guwahati), between Kolkata and Karimganj (Assam), Kolkata-

Bangladesh and between Haldia and Patna. The Government has decided to disinvest the corporation and the process for disinvest has been initiated.

Ancient works

Most of the improvement of rivers and construction of artificial waterways in antiquity was for irrigation purposes. In the 7th century BCE the Assyrian king Sennacherib built a 50-mile (80-km) stone-lined canal 66 feet (20 metres) wide to bring fresh water from Bavian to Nineveh. The work, which included a stone aqueduct 300 yards (330 metres) long, was constructed in one year and three months, according to a plaque that survives on the site. Surprisingly advanced techniques were used, including a dam with sluice gates allowing regulation of the flow of the water stored. The Phoenicians, Assyrians, Sumerians, and Egyptians all constructed elaborate canal systems. The most spectacular canal of this period was probably Nahrawān, 400 feet wide and 200 miles long, built to provide a year-round navigation channel from near Sāmarrā³/₄ to Al-Kūt, using water provided by damming the unevenly flowing Tigris. Many elaborate canals are known to have been built in Babylonia. In Egypt the Nile was dammed to control its floodwaters, and an extensive system of basin irrigation was established. The Persian king Darius in the 5th century BCE cut a canal from the Nile River to the Red Sea. The Romans were responsible for very extensive systems of river regulation and canals in France, Italy, the Netherlands, and Great Britain for military transport. The legions in Gaul canalized one of the mouths of the Rhône to protect their overseas supply route. In the 1st century CE the Roman consul Marcus Livius Drusus dug a canal between the Rhine and Yssel to relieve the Rhine of surplus water, and the Roman general Corbulon linked the Rhine and Meuse with a canal 23 miles (37 km) long to avoid the stormy North Sea passage from Germany to the coast. Attempting to reclaim the Fens in England, the Romans connected the River Cam with the Ouse by an 8-mile canal, the Nene with the Witham by one 25 miles long, and the Witham with the Trent by the Fosse Dyke (ditch), still in use.

Outside Europe and the Middle East, between the 3rd century BCE and the 1st century CE, the Chinese built impressive canals. Outstanding were the Ling Canal in Kuangsi, 90 miles long from the Han capital; Changan (Sian) to the Huang He (Yellow River); and the Pien Canal in Honan. Of later canals the most spectacular was the Grand Canal, the first 600-mile section of which was opened to navigation in 610. This waterway

enabled grain to be transported from the lower Yangtze and the Huai to Kaifeng and Luoyang. These canals had easy gradients (changes in water levels); and at about three-mile intervals there were single gates of stone or timber abutments with vertical grooves up or down along which the logclosure was manually hauled by ropes to hold or release the water, thus controlling the water level. A few more elaborate gates had to be raised by windlasses. Where water level changes were too great for such simple devices, double slipways were built and vessels were hauled up the inclines.

Medieval revival

In Europe, canal building, which appears to have lapsed after the fall of the Roman Empire, was revived by commercial expansion in the 12th century. River navigation was considerably improved and artificial waterways were developed with the construction of stanches, or flash locks, in the weirs (dams) of water mills and at intervals along the waterways. Such a lock could be opened suddenly, releasing a torrent that carried a vessel over a shallow place. The commercially advanced and level Low Countries developed a system of canals using the drainage of the marshland at the mouths of the Schelde, Meuse, and Rhine; about 85 percent of medieval transport in the region went by inland waterway.

Because shipping was handicapped where barges had to be towed over the weirs with windlasses or manually, the lock and lock basin were evolved to raise boats from one level to another. Although a primitive form of lock had been in operation as early as 1180 at Damme, on the canal from Brugge to the sea, the first example of the modern pound lock, which impounded water, was probably that built at Vreeswijk, Netherlands, in 1373, at the junction of the canal from Utrecht with the Lek River. Outer and inner gates contained a basin, the water level of which was controlled by alternatively winding up and lowering the gates. In the 15th century the lock-gate system was much improved with the addition of paddles to control the flow of water in and out of the lock chamber through sluices in the gates or sides of the lock.

Commercial needs soon encouraged canal construction in less ideal locations. The Stecknitz Canal, built in Germany (1391–98), ran 21 miles from Lake Möllner down to Lübeck, with a fall of 40 feet controlled with four stanches; the canal was later extended south to Lauenburg on the Elbe to establish a link between the Baltic and the North Sea.

To deal with a fall from the summit to Lauenburg of 42 feet in 15 miles, two large locks were built, each capable of holding 10 small barges.

Italy, the other principal commercial region of medieval Europe, also made important contributions to waterway technology. The Naviglio Grande Canal was constructed (1179–1209) with an intake on the Ticino River, a fall of 110 feet in 31 miles to Abbiategrasso and Milan, the water level being controlled by sluices. To facilitate transport of marble from the quarries for the building of the Milan cathedral, the canal was linked with an old moat, and in Italy the first pound lock with mitre instead of the earlier portcullis gates was constructed to overcome differences in water level.

China may have been ahead of Europe in canal building. Between 1280 and 1293 the 700-mile northern branch of the Grand Canal was built from Huai'an to Beijing. One section, crossing the Shantung foothills, was in effect the first summit-level canal, one that rises then falls, as opposed to a lateral canal, which has a continuous fall only. The Huang He (Yellow River) was linked with a group of lakes about 100 miles south, where the land rose 50 feet higher; and, to overcome water lost through operation of the lock gates, two small rivers were partially diverted to flow into the summit level.

16.11 SUMMARY

Inland waterways is a network in the form of rivers, canals , backwaters and creeks that can be used for transportation in place of or in addition to roads and rails. Through, the ages, rivers have serves as effective waterways, carrying people and goods over long distances. Even today, many countries depend heavily on inland water transport, especially for large and bulky cargo, as it is cheaper, more reliable and less polluting than transporting goods by road or rail.

India has yet to develop this cheaper and greener mode of transportation. Goods still travel by congested road and rail networks, slowing the movement of cargo, adding to uncertainties , and increasing the costs of trade. so much so that logistics costs in india are estimated to account for as much as 18 % of the country's GDP.

16.12 GLOSSARY

National transport policy , River Conservancy works, national Inland navigation
Institutue

16.13 SELFASSESSMENT QUESTIONS

1. What is inland water ways authority of india.

1. Give short note on applications of inland waterways

2. What is protocol on inland water transport and trade

3. Give advantages of inland waterways

4. Give functions and powers of the authority

16.14 LESSON END QUESTIONS

1. What is development of national waterways.

2. Give short note on history of inland water transport

3. give types of inland waterways of india

4. What is inland waterways authority of india.

5. Give importance of inland water transport.

16.15 SUGGESTED READINGS

1. Kotler P. & Keller K.L. Marketing Management , Pearson
2. Kotler P. Armstrong G. Agnihotri , Principles of Marketing, South Asian Prespective, Pearson
3. Dutta A. K . Material Management Procedures Text and cases
4. Gopalakrishnan ,P and Sundarson M. Material Management
5. Shah N M , An Integrated Concept of Material Management Indian Institute of Material Management.

OCEAN TRANSPORT**STRUCTURE**

- 17.1 Ocean transport system
- 17.2 Advantages of ocean transport
- 17.3 Disadvantages of ocean transport
- 17.4 Importance of ocean transport
- 17.5 Role of ocean transport in international trade
- 17.6 Types of ocean transport in maritime transportation
- 17.7 structure of shipping services.
- 17.8 Linear services – Meaning
- 17.9 Features of linear shipping services.
- 17.10 Tramp Shipping service – Meaning
- 17.11 Features of Tramp shipping service.
- 17.12 Summary
- 17.13 Glossary
- 17.14 Self Assessment questions
- 17.15 Lesson end questions
- 17.16 Suggested readings

17.1 OCEAN TRANSPORT MEANING

Ocean transport is the key element of multinational transportation. WLSC is the established global forwarder and agent that will move cargo with custom crafted shipping plans. WLSC organises, plans, books, and delivers your cargo anywhere in the world. Ocean transportation is one of the most familiar components of the international supply chain. It is used by businesses for the delivery of goods from distant suppliers. Most sea transportation is conducted in container which vary in size. Goods can be grouped into a container or fill a container . sea tankers are used for bulk shipments of loose goods such as oil, grain and coal.

17.2 ADVANTAGES OF OCEAN TRANSPORT

1. **Less maintenance cost:** Maintenance cost in rail and road transport is quite high but maintenance cost of water transport is quite less.
2. **Cheap:** The transport channel is quite cheap as compared trail and road transport.
3. **Useful for bulky goods:** Heavy and bulky goods can be transported easily at little cost through water transport.
4. **Useful during natural calamities:** During natural calamities like flood and rains, when rail and road transport is disrupted, relief operations can be operated through water transport.
5. **Helpful in defence:** Development of shipping is essential for the defence of the country also. It is also called second line of defence.
6. **Important for foreign trade:** Water transport plays important role in foreign trade. india's foreign trade is mainly dependent on water transport.

17.3 DISADVANTAGES OF OCEAN TRANSPORT

1. **Slow Speed:** It is a slow means of transport. Failure of monsoon results into fall in the water level of rivers making navigation difficult.
2. **More risky:** It is more risky as compared to other means because there is always danger of sinking ships or boats.
3. Difficult to monitor exact location of goods in transit

4. Customs and excise restrictions Could be costly.

17.4 IMPORTANCE OF OCEAN TRANSPORT

Travel by ship was the only means to travel overseas till the middle of the twentieth century. We can broadly divide water borne transport into short sea ferry transport and ocean going cruises.

Ferry transportation is only option in the case of remote and small islands which have no airport. Since ocean transport is responsible for carriage of 90 per cent of the world trade, making it the largest means of transport in international trade. the bulk transport of raw material for import and export of affordable food and manufactured goods would not have been possible without shipping.

It provides the most efficient and remarkable services of transporting of the goods to the different places all over the world and as oceans naturally cover most of the areas of our planet, it is the most efficient and easy mode of transportation. This mode of shipping is quite remarkably used by the world's most of the industrialised countries because this shipping through ocean includes variety of the advantages like they are cost effective in comparison to the different air freight service providers. Ocean freight services are greatly affordable and equally reliable. Ocean transport services are also very much eco friendly than the air freight services as aeroplane consume a lot of fuel and then leave large amount of carbon footprint that is quite dangerous to our environment. We efficiently offer the most trustworthy and cost effective shipping services by comprising shipping of all variety of items. Ocean transport is the most easy and cheap mode of transport . unlike rail and road transport we do not have to construct water ways because river and seas are given by nature.

It plays important role in case of international trade. During natural calamities like heavy rain and flood, when rail and road transport are not workable , rescue operations are undertaken by water transport. Before independence, there were many private shipping companies. But after independence , eastern shipping corporation was established in 1950 . In 1956, western shipping corporation was set up . In 1961, Indian shipping corporation was set up merging the two corporations. Oceanic transport helps in the movement of ships between the countries through sea routes. India's international trade is carried on by

oceanic transport. On the eve of independence, there were only 42 ships with less than 10 lakhs gross registered tonnage (GRT).

Government appointed a shipping policy committee in 1947. The committee recommended that india should secure 100 % of her coastal trade and 50 % of her overseas trade. due to this policy, shipping tonnage had increased. Port trust of india (PTI) managed 11 major and 139 minor ports in india. In 1961, shipping corporation of india came into existence with the merger of eastern shipping corporation and western shipping corporation.

17.5 ROLE OF OCEAN TRANSPORT IN INTERNATIONAL TRADE

Rapid increases in international trade have led to the congestion in many of the world's ports and have raised concern over the ability of transportation networks to handle the increased volumes. Increased volumes and the resulting congestion may impact trade flow patterns by affecting choices of importers and exporters. Trade flow patterns are most certainly determined by a wide variety of factors that include the internal (intra-country) and external (inter country) transport costs, as well as the costs of interchange (Port costs).

Since , ocean transport is responsible for carriage of 90 % of the world trade, making it the largest means of transport in international trade. The bulk transport of raw material for import and export of affordable food and manufactured goods would not have been possible without shipping. It is the low cost availability and efficiency of maritime transport that has made it possible to shift industrial production to low cost countries. Costs of ocean transport are very competitive due to continuous improvement in technology and efficiency. Ocean transport is the oldest mode of international business, a large number of shipping practices are derived by the customs of trade. an international sales agreement and arrangement of transport goes hand in hand.

17.6 TYPES OF OCEAN CARGO IN MARITIME TRANSPORTATION

Bulk: Cargo that is loaded in bulk, without mark or count, in a loose unpackaged form, having homogenous characteristics is termed as bulk cargo. To be loaded on a containership, bulk cargo is put in containers first. It could also be stowed in bulk instead of being loaded into containers. Examples of such cargo are coal, iron ore, fertilizers, grains, oil, etc.

Break bulk: It refers to packaged cargo that is loaded and unloaded on a piece by piece basis i.e, by number or count. This can be containerized or prepared in groups of packages covered by shrink wrap. Examples are coffee, rubber, steel, etc.

Neo – bulk: Certain types of cargo that are often moved by specialised vessels, e.g, auto, and logs are termed as neo- bulk.

Containerised: It refers to the cargo loaded at a facility away from the pier or at a warehouse into a metal container usually 20 to 40 feet long, 8 feet high, and 8 feet wide. The container is then delivered to a pier and loaded onto a containership for transportation. Some cargo cannot be containerised e.g, automobiles, bulk products, etc.

17.7 STRUCTURE OF SHIPPING SERVICES

A shipping or logistic company is a kind of a company which is involved in courier services, shipping of various products and logistics services. There is lot of documentation, communication and coordination involved in running such a company and all of this cannot be done without the involvement of various departments and employees.

There is certain hierarchical structure followed within a shipping company according to which the jobs and responsibilities are divided department wise and position wise.

The top level executives: The top level executives of a shipping company are the individuals who are responsible for running the organisation, looking after the various operations and making sure that the finances and accounts are handled well. They include the board of directors, president, general manager, chairman and other C –Level employees. The following are the various top level positions in a shipping company Viz.; Chairman, board of directors, director, general manager, partners, owner.

The technical team:

The technical team of a shipping company is the team of workers who handle the technical aspect of the business and make sure that departments like fleet, repairs, etc. are run smoothly. The following are some of the job positions of the technical team viz.; technical superintendents, technical president, fleet managers, technical staff, repair men, auto maintenance.

Purchase and procurement

Another important department of a shipping company is the purchase and procurement department. The main job of this department is to communicate with suppliers, ship chandlers and other such entities to procure licenses, purchase new fleet. This team works in guidance and collaboration with the technical team.

The operations team

This is the department which is responsible for ensuring that all operations of shipping take place smoothly, on time and within budget. The operations team is headed by an operational head and may have several other employees as well. The employees of this team are required to get port clearances, local agent appointment, etc.

The finance and marketing departments

The finance and marketing departments are engaged respectively in the finance and marketing related activities. The following are some of the job positions of this department viz; the finance director, the marketing manager, marketing executives, finance executives, accounting head, advertising manager.

The fleet personnel department

This is the department which is concerned with the recruitment and management of the sailing staff. They make sure that the fleet personnel are qualified, well trained and competent.

The HSSE and training department: HSSE stands for Health Safety Security and Environment. This department along with the fleet personnel department, ensures that people going on board have the correct competence required. They will also ensure that all the required audits, memorandum with the different flags, etc are up to date so that the vessel or the office does not lapse with any statutory requirements.

The marketing team:

Vessels need to be marketed and need to be in charter so that they make money. The marketing team does that. The owners may directly be involved in this team.

17.8 LINEAR SERVICES- MEANING

It is a service that operates with in a schedule and has a fixed port rotation with published dates of calls at the advertised posts. A linear service generally fulfils the schedule unless in cases where a call at one of the ports has been unduly delayed due to natural or man made causes. For example, The UK/NWC continent container 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 Feilxstowe, Antwerp, Hamburg, Le Havre and Rotter dam. Linear shipping relates not just to containers, but also to the other types of cargoes which have a regular and fixed routing / service like Roro Services, Bulk Cargo Services on a COA or long term charter.

17.9 FEATURES OF LINER SHIPPING SERVICE:

1. Liner ship is designed to carry a variety of cargo, with spaces for bales, bundles, boxes, barrels , drums, etc as well as for reefer (refrigerated) cargo. The designs of the holds and number of decks in cargo will be different from those of a tramp. With the increased share of containerized cargo, specially designed container ships for carrying different categories of containers operate.
2. The cargo handling equipment on a liner will be varied and sophisticated for quick loading and unloading of cargo to ensure a quick turnaround. A quick turnaroung means that the ship spends the least possible time in the port and most of its time in transit.
3. Liner ships frequently operate between fixed ports and normally loads in several ports. It serves a number of discharging ports along a pre- determined route.
4. In order to ensure speedier carriage, liner ship is fitted with sophisticated and expensive propelling machinery.
5. Liner shipping service provides pre- announced scheduled services on given terms and conditions of carriage. These conditions in the receipt mostly relate to the responsibilities and liabilities of the ship owners, carriage , and delivery of cargo.
6. Liner shipping generally offers carriage on fixed and stable freight rates.

17.10 TRAMPSHIPPING SERVICE- MEANING

A tramp service or tramper on the other hand, is a ship that has no fixed routing or itinerary or schedule and is available at short notice or fixture to load any cargo from any port to any port.

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 is in an entirely different direction. From Oakland, it could carry some cargo to Bremerhaven.

17.11 FEATURES OF TRAMPSHIPPING SERVICE:

1. It is primarily designed to carry the more simple and homogenous cargo in huge quantity. It is , therefore, designed to completely utilize its carrying capacity for carriage of one type of cargo.
2. Since one kind of homogenous cargo is to be handled, a tramp will have the comparatively simple equipment . Bulk cargos are normally loaded and discharged by mechanical equipment, elevators, pumps,etc.
3. Because of the comparatively low unit value of commodities carried , a tramp will be operated at the lowest possible cost. This objective can be achieved by operating ships having relatively less speed by fitting less expensive propelling machinery.
4. A tramp generally carries cargos of one or two ship users. Hence, loading and discharging are confined to a few ports.
5. Tramp carriers do not have a fixed route and predetermined schedule of departure as it is to be engaged by one / two users as and when their need arises.
6. Tramp carrier offers services at terms and conditions , including freight / hire charges, which are not fixed and given but are negotiable.

17.12 SUMMARY

Of all the water bodies, the oceans are the largest and the most important. They are all connected to each other. But for our convenience, they have been divided into the pacific ocean ,atlantic ocean, Indian ocean, and antartic ocean. ocean transport is responsible for carriage of 90 % of the world trade, making it the largest means of transport in

international trade. The bulk transport of raw material for import and export of affordable food and manufactured goods would not have been possible without shipping. It is the low cost availability and efficiency of maritime transport that has made it possible to shift industrial production to low cost countries. Costs of ocean transport are very competitive due to continuous improvement in technology and efficiency. Ocean transport is the oldest mode of international business, a large number of shipping practices are derived by the customs of trade. an international sales agreement and arrangement of transport goes hand in hand.

17.13 GLOSSARY

Gross Registered tonnage (GRT), Hamburg, bulk cargo services

17.14 SELFASSESSMENT QUESTIONS

1. What is ocean transport.

2. Give Importance of ocean transport.

3. what is the role of ocean transport in international trade.

4. Give features of linear shipping service.

5. What in marketing team.

17.15 LESSON END QUESTIONS

1. What is linear shipping service.

2. Give types of ocean cargo in maritime transportation.

3. Give merits of ocean transport.

4. What are the various limitations of ocean transport .

5. Give importance of ocean transport.

17.16 SUGGESTED READINGS

1. Kotler P. & Keller K.L. Marketing Management , Pearson
2. Kotler P.Armstrong G Agnihotri , Principles of Marketing, South Asian Prespective, Pearson
3. Dutta A. K . Material Management Procedures Text and cases
4. Gopalakrishnan ,P and Sundarson M. Material Management
5. Shah N M , An Integrated Concept of Material Management Indian Institute of Material Management.

CONFERENCE SYTEM & BILL OF LADING**STRUCTURE**

- 18.1 Conference system – Meaning
- 18.2 Bill of lading
- 18.3 Importance of bill of lading
- 18.4 Purpose of bill of lading
- 18.5 Types of bill of lading
- 18.6 Sets of bill of lading
- 18.7 Bill of lading as contract of carriage
- 18.8 Content of freight bill of lading
- 18.9 Summary
- 18.10 Glossary
- 18.11 Self assessment questions
- 18.12 Lesson end questions
- 18.13 Suggested Readings

18.1 CONFERENCE SYSTEM

A group of shipping lines which have associated to offer regular service on specific routes at publicly announced prices. Conferences generally offer specific rebates for regular or high-volume shipments. Shipment by conference lines is sometimes referred to as liner

shipping and the freight rates are referred to as liner terms. Shipping lines which are not members of a conference for a particular route are known as outsiders, independent lines, or non-conference lines. Also called steamship conference.

18.2 BILL OF LADING

A bill of lading is a legal document issued by a carrier to a shipper that details the type, quantity, and destination of the goods being carried. A bill of lading also serves as a shipment receipt when the carrier delivers the goods at a predetermined destination. This document must accompany the shipped products, no matter the form of transportation, and must be signed by an authorised representative from the carrier, shipper and receiver. for example, a logistic company intends to transport via heavy truck , gasoline from a plant in texas to a gas station in Arizona. A plant representative and the driver sign the bill of lading after loading the gas on the truck. Once the carrier delivers the fuel to the gas station in Arizona, the truck driver requests that the station clerk also sign the document.

It is generally binding document that provides the carrier and shipper with all of the necessary details to accurately process a shipment. It has three main functions. First, it is a document of title to the goods described in the bill of lading. Secondly, it is a receipt for the shipped products. Finally, the bill of lading represents the agreed terms and conditions for the transportation of the goods. It is a record of traded goods which have been received on board. It is a document that establish an agreement between a shipper and a transporation company for the transportation of goods. Transportation company issues these records to the shipper.

It clearly indicates a particular carrier through which the goods have been placed to their final destination and the conditions for transporting the shipment to its final destination. Land, ocean and air are the means used for bills of lading.

According to Business diectionary, a bill of lading is “a document issued by a carrier, or its agent, to the shipper as a contrait of carriage of goods. It is also a receipt for cargo accepted for transportation and must be presented for taking delivery at the destination”

18.3 IMPORTANCE OF BILLS OF LADING

The carrier need not require all originals to be submitted before delivery. It is therefore essential that the exporter retains control over the full set of the originals until payment is effected or a bill of exchange is accepted or some other assurance for payment has been made to him.

A bill of lading, therefore, is a very important issue when making shipments to move the cargo or freight from one point to the other. On one hand, it is a contract between a carrier and shipper for the transportation of goods and on the other hand, it serves as a receipt issued by a carrier to the shipper. Hence, the bill of lading is considered a legal document which provides all the vital details to the shipper and the carrier to conveniently process the freight shipment through different maritime countries and invoice it correctly. The original copy of the bill of lading is provided to the carrier, and a copy of the same should also be ascribed to the packaged freight.

1. Negotiable bill of lading: in this type of lading, a clear instruction is provided to make the delivery of the goods to anyone having the possession of the original copy of the bill, which itself signifies the title and control of the freight. In this type of bill, the buyer/ receiver or his/ her agent has to acquire and present an original copy of the bill of lading at the discharge port . In the absence of original bill copy, the freight will not be released.
2. Non negotiable bill: This type of bill of lading fixes a specific consignee/ name of the receiver to whom the freights will be shipped and delivered. It , however, does not itself serve the ownership of the goods . under this type of bill, the assigned receiver/ buyers can claim the cargo by confirming their identity.

18.4 PURPOSE OF BILL OF LADING

The bill of lading document is meant, to act as a transport document enacting as the evidence of the contract of carriage of the goods. A negotiable bill of lading has the following legal qualities.

- It acts as a piece of evidence for the carriage contract containing the terms and condition under which the goods transportation will be carried out.

- It represents as a receipt which endorses that the carrier has received the cargo as per the contract and the goods are received in good condition.
- It is a document of title, permitting the sale of goods in transit and the raising of financial credit.
- Most of the local and international system does not consider a bill of lading as a document of title . it provides the right for the delivery to be made to the possessor.

18.5 TYPE OF BILL OF LADING

The bill of lading can be classified on the basis of “how it is executed “ and “method of operation”.

On the basis of execution

1. **Straight bill of lading:** It reveals that the goods are consigned to a specified persona and it is not negotiable free from existing equities. It means any edorsee acquires no better rights than those held by the endorser. This type of bill is also known as a non- negotiable bill of lading, and from the banker’s point of view, this type of bill of lading is not safe. This type of bill is prominently used for military cargo.
2. **Open bill of lading:** This is a negotiable bill of lading where the name of consignee can be changed with consignee’s signature and thus transferred. This can be transferred multiple times. Switch bill of lading is a type of open bill of lading.
3. **Bearer bill of lading:** It is a bill states that delivery shall be made to whosoever holds the bill. Such bill may be created explicitly or it is an order bill that fails to nominate the consignee whether in its original form or through an endorsement in blank. A bearer bill can be negotiated by physical delivery. They are used for bulk cargo that is turned over in small amounts.
4. **Order bill of lading:** It is the bill uses express words to make the bill negotiable. This means that delivery is to be made to the further order of the consignee using words such as “ delivery to A ltd. or to delivered to the bonafide holder of the bill of lading, and it has to be verified by an agent who issues delivery order and the verified bill of lading. The order bill of lading(a) is the most modern type bill which

is the widely used all over the world. (b) ensures the safety of delivery of cargo to a bonafide holder of B/L (c) since the ship visits several foreign ports where the language, practice, procedures may be different the master might be inconvenienced during the delivery of the cargo. People might fraudulently collect the cargo. (d) to overcome this difficulty and avoid future cargo claims and litigations, the consignee or the holder is required to surrender the bill of lading to the ship's agent at the discharge port who will verify the genuineness of the bill of lading. When satisfied the agent will issue a delivery order and the verified bill of lading. Now any person can collect the cargo from the ship by surrendering the bill of lading and the delivery note to the ship.

As the bill of lading is made to "to order" of the consignee, it is a negotiable instrument of title. This means that the ownership of the bill of lading can be transferred from one person to another by authorising signature and delivery of the bill of lading.

All the goods which have not been paid in advance and are shipped under "To order" of the bill of lading can be categorised into two types.

- To order, blank endorsed: not consigned to any named party but "To order" of the consignor, with the intended – consignee's name given under "notify party". The consignor must stamp and sign (endorse) this B/L so that its title can be transferred.
- To order, bank: Consigned to a bank with the intended consignee's name given under "notify party". The bank endorses the B/L to the intended consignee against payment of (or a pledge to pay) the amount of the accompanying bill of exchange. "To Order" B/Ls are used commonly in the letter of credit transactions and may be bought, sold or traded, or used as security for borrowing money from banks or other lenders.

On the basis of method of operation

1. **Received for shipment bill of lading:** This bill is sent from agent/ charterer to shipper. The endorsement of this bill ensures that the carrier has received goods but does not confirm it is onboard of the assigned vessel.

2. **Shipped B/L:** This bill of lading is issued when cargo is loaded on board. It binds the shipowner and the shipper directly
3. **A clean bill of lading** is one which states that the cargo has been loaded on board the ship in apparent good order and condition. Such a bill of lading will not bear a clause or notation which expressively declares a defective condition of goods and/or the packaging. The opposite term is a soiled bill of lading. It reflects that the goods were received by the carrier in anything but good condition.
4. **Through B/L** – This bill of lading is a legal document that allows for direct delivery of cargo from point A to point B. The bill allows transportation of goods both within domestic borders and through international shipment as it serves as a receipt of the cargo, a contract of carriage, and sometimes title for the products as well
5. **Combined transport B/L** – This bill gives information about cargo being transported in large containers by sea and land, i.e. through multi-model transport
6. **Dirty bill of lading:** If the shipowner raises an objection about “the condition of the cargo is in good order”, he/she can include a clause thereby causing the bill of lading to be “claused or dirty” along with the remarks as per the finding of the cargo condition. E.g. torn packing, broken cargo, shortage in the quantity of the goods etc.

18.6 SETS OF BILL OF LADING:

This is an old practice where the bills are signed in the sets of three originals to facilitate the goods are timely delivered even when the original is lost. They are stated as first original, second original, third original on top of the bill. A duplicate copy with a stamp – “Non-negotiable” may also be distributed.

The master will sign the original bill of lading, and when the master of agent signs the three bill of lading, all other copies are considered void. This clause is clearly written on the bill of lading which is supplied in sets.

This is a reason why bank, negotiating a letter of credit that covers the cargo, will always ask for the full set of B/Ls. This is to prevent other B/L holders from legally claiming the cargo before the bank does.

18.7 BILL OF LADING AS CONTRACT OF CARRIAGE:

The contract between the carrier and the shipper is already created before issuing the bill of lading when the cargo is loaded on the ship. This is done to safeguard the shipper in case the cargo is damaged before loading it on board the vessel and to help the shipper in the claim process. For the carrier and the consignee, the bill of lading will act as the actual contract of carriage.

The popularly used conventions and rules which covers the contract of carriage for carrying goods by sea :

- Hamburg Rules
- Rotterdam Rules
- Hague Rules
- US COGSA
- Hague – Visby Rules

The convention which governs the contract of the carriage is usually stated in the first page of the bill of lading. Upon booking space for shipment by the consignee the carrier sends a booking confirmation which states. Clauses sent by the carrier, it will indicate the terms and conditions that will govern the booking and contract of carriage.

18.8 CONTENTS OF FREIGHT BILL OF LADING:

The bill of lading comprises of the following details:

- The complete name and official address of the receiver and the shipper.
- The Purchase orders or special reference/ invoice numbers which helps the shipper and the consignee to release the goods for pickup or accepted at delivery
- The date of the pickup which acts as a reference to track the freight
- The details of the item including the number of unit being shipped, weight and dimension of the product, along with the nature of the cargo being carried, i.e. dangerous goods etc.

- If the goods are hazardous, Department of Transportation hazardous material designation is tagged, and it is cited on the bill to follow special rules and requirements when shipping
- The details of the packaging used such as crates, pallets, cartons, pills, drums etc.
- Any special notes or instruction for the carrier

Bill of Lading Tracking:

Different companies use different forms of bill of lading which makes it difficult to track them unless a specific tracking service is provided by the carrier. There are few companies which tie up with the shipping carriers to track the bill of lading for easy trade.

However, these precautions must be taken before signing bill of lading.

Electronic Bill of Lading:

With the modernisation of the shipping industry as a whole, the bill of lading is also modernised to the electronic bill of lading to solve the issues occurring while using a paper bill of lading under the latest iteration of International Group of P&I Clubs. The problem faced when using a paper bill of lading are:

The paper bill uses printed bills of lading which are both costly. The bill has to be couriered which is an additional cost

- The slow movement of the paper-based bill of lading.
- Carriers are obligated to release the goods only on the production of an original bill of lading, which if not received in time will slow the process.
- The paper bill can be forged, and delivery of goods against a forged bill of lading will lead to a huge loss

18.9 Advantages of Electronic Bill of Lading:

- As there are no papers involved, it saves paper cost as well the cost involved in sending the paper to a different destination by courier
- The electronic bill of lading can be transmitted instantaneously around the world in the presence of internet connection, enabling a quick trade and ease of multiple

transfers of ownership during the carriage of the cargo.

- If there are any modifications required in the bill, it can be made quickly and cost effectively as compared to the paper system of bill of lading.
- If the electronic bill of lading system is drawn correctly, such as introducing audit trails, PIN, electronic signature etc., it will be difficult to commit any type of fraud.

18.10 ISSUES WITH THE ELECTRONIC BILL OF LADING

It is possible to negotiate and transfer the possession of the paper bill as it is the evidence of title of the goods. However, this is not automatically the case with e-bill.

(Source – A paper bill of lading is a document of title, enabling it to be negotiated and transferred as possession of the bill is evidence of title to the goods. This is not automatically the case at law with an e-bill)

If the electronic bill system is not secured, it can be hacked, and the details can be manipulated as per the convenience of the hacker, leading to fraud and loss of cargo

Implementation of electronic bill system across the industry needs consent from all the stakeholder, which will take time.

18.11 PRECAUTIONS TAKEN BEFORE SIGNING BILL OF LADING

A Bill of Lading is a receipt for the goods carried on ship, or when technically put, is an evidence of contract between the shipper and the carrier. It is a documented title for the goods, signifying that the holder of the Bill of Lading is the legal owner of the goods it states. These days even on ships loading oil in bulk, the ship's masters are required to sign the Bill of Lading (B/L). Generally, there are separate departments looking after the cargo documentation and the authorization for cargo contracts.

However, the Master of the ship is still required to endorse the cargo carried on board for all legal proceedings. As a general rule, the Master has the authority by law to sign the Bill of Lading on behalf of the Ship Owner. Sometimes the legal jargon mentioned on the Bill of lading can be unclear and confusing. It is therefore, essential that the Master of the ship who is the owner's representative should thoroughly go through and if required be advised systematically before signing the bill of lading.

Port and Date of Loading

The date of loading should coincide with the date as stated in the Mates' receipt. This provides an indication of the origin of goods and is at times crucial to determine the customs duty structure or permissibility of the goods into a country.

Port of Discharge

Unless the charter party for a port to be nominated after the vessel sails to avoid deviation charges, the ship must precede with all dispatch to the port of discharge as said. The master must ensure that this falls within the charter party limits.

Condition of the Goods

Confirm that the goods have indeed actually or physically been shipped on board the ship. Check accordingly that an accurate description of the goods is present on the Bill of lading, whether any short-loading or dead-freights are correctly mentioned. Ensure that all of the conditions must be in lieu with the Mates' receipt and the Bill may have a clause to reflect the actual condition of the goods.

Quantity and Description of Cargo Loaded

Prior to endorsing the Bill of lading, the master should ensure that the quantity and description of the goods is true to its correct value of that loaded on board. This can be done by counter-checking the Mates' receipt along with the other cargo documents.

Freight

Ensure that the Bill of Lading is not marked "Freight Paid" or "Freight Prepaid", as in certain cases, if not true. The master must confirm and verify the factual position of the freight with the ship owner or shipper.

It is also recommended to get a written confirmation from either of the two.

Conflicting terms

No clause of bill of lading should ever conflict with that of the charter party terms. If the bill has to be clausured as per the charter terms then such references must be clear and unambiguous. Finally, check to see whether the number of original bill of lading are in the set provided as stated.

18.12 CHARTERING(SHIPPING)

Chartering is an activity within the shipping industry whereby a shipowner hires out the use of his/her vessel to a charterer. The contract between the parties is called a **charterparty** (from the French "*charte partie*", or "parted document"). The three main types of charter are: **demise charter**, **voyage charter**, and **time charter**

18.13 TYPES OF CHARTER

There are three main types of charter:

- A **demise charter**, or **bareboat charter**, is an arrangement for the hiring of a vessel whereby no administration or technical maintenance is included as part of the agreement. The charterer obtains possession and full control of the vessel along with the legal and financial responsibility for it. The charterer pays for all operating expenses, including fuel, crew, port expenses and P&I and hull insurance. In commercial demise chartering, a subtype of bareboat chartering, the charter period may last for many years and may end with the charterer acquiring title (ownership) of the ship. In this case, a demise charter is a form of hire-purchase from the owners, who may well have been the shipbuilders. Demise chartering is common for tankers and bulk-carriers.
- A **voyage charter** is the hiring of a vessel and crew for a voyage between a load port and a discharge port. The charterer pays the vessel owner on a per-ton or lump-sum basis. The owner pays the port costs (excluding stevedoring), fuel costs and crew costs. The payment for the use of the vessel is known as freight. A voyage charter specifies a period, known as laytime, for loading and unloading the cargo. If laytime is exceeded, the charterer must pay demurrage. If laytime is saved, the charter party may require the shipowner to pay despatch to the charterer.^[1]
- A **time charter** is the hiring of a vessel for a specific period of time; the owner still manages the vessel but the charterer selects the ports and directs the vessel where to go. The charterer pays for all fuel the vessel consumes, port charges, commissions, and a daily *hire* to the owner of the vessel.

Variations on these types include:

- A **passenger cruiseship charter** - The hiring of a passenger cruise ship in regular service for a limited period of time exclusively for a private function, using all accommodations; often for business meetings or conferences, music festivals, charity fundraisers or global events such as the 2016 Rio Olympics.
- A **trip time charter** is a comparatively short time charter agreed for a specified route only (as opposed to the standard time charter where charterer is free to employ the vessel within agreed trading areas).^[2]
- A **bareboat yacht charter** (In the leisure industry, the term “demise charter” is not used). Bareboat yacht chartering is the short-term hire for only a few weeks or even less. The owner supplies the yacht in seaworthy order, fully fuelled and possibly revictualled. The yacht may be part of a holiday flotilla; and sometimes the yacht is manned by an employee of the owner. At the end of the hire period, the charterers are expected to pay for the fuel used.
- A **contract of affreightment** is **not** strictly a charter contract, but is somewhat similar to a voyage charter. Under a contract of affreightment the shipowner undertakes to carry a number of cargoes within a specified period of time on a specified route. Agreed frequency of cargoes may require more than one ship. Unlike a true charter, the cargo-owner does not have a laytime period, nor is he responsible for demurrage.

18.14 PRINCIPAL METHOD OF CHARATERING

There are four principal methods of chartering a tramp ship—voyage charter, time charter, bareboat charter, and “lump-sum” contract. The voyage charter is the most common. Under this method a ship is chartered for a one-way voyage between specific ports with a specified cargo at a negotiated rate of freight. On time charter, the charterer hires the ship for a stated period of time, for a specified round-trip voyage, or, occasionally, for a stated one-way voyage, the rate of hire being expressed in terms of so much per ton deadweight per month. Whereas on a voyage charter the owner bears all the expenses of the voyage (subject to agreement about costs of loading and discharging), on time charter the charterer bears the cost of bunkers and stores consumed.

On bareboat charter, which is less frequently used in ordinary commercial practice, the owner of the ship delivers it up to the charterer for the agreed period without crew, stores, insurance, or any other provision. Contracts can also be arranged on a lump-sum basis, when an owner agrees to ship a given quantity of a stated cargo from one port to another for a stated sum of money.

The charter party is the document that is subject to scrutiny and interpretation by a court of law in the event of dispute, but, in practice, most disputes are submitted to arbitration. Among the most important clauses in any charter party are those that lay down the number of days allowed for loading or unloading and those that determine who is to bear the expenses involved.

Our additional pages contain somewhat larger lists of resources where you can find useful informations

1. Dry Cargo Charterparties

There are numerous various forms, but to give a taste of dry cargo time charters, two types that are commonly used are: - New York Produce Exchange (NYPE 93) Baltic and International Marine Council (BALTIME 1939 (amended 2001))....

2. Tanker Time Charters

Specific information such as, parties to the contract, where and when the vessel will be delivered, rates of hire, general permitted cargoes, general trading range etc.

3. Commercial VoyageManagement

Time Charters and Pools have very strict off-hire clauses designed to compensate the Charterer for unavailability or under-performance of the vessel. It is important that off-hire is minimised wherever possible and that all opportunities for maintenance during waiting or idle time are utilised.

4. Documentation & notices

When a vessel is on Time Charter, bunkers and the majority of port services and costs, etc., are to the account of Time Charterers. However, should Time Charterers default on payment, then these charges may fall on Owners and there will then be a serious risk of the vessel being arrested for debts incurred by the Time Charterer.

5. Function of bill of lading

The Bill of Lading is one of the most important documents that the Master will sign and therefore strict controls on how it is issued are required. Although the B/L is usually drafted by the Shipper and presented to the Master for signature, it is an Owners document. One of its three functions is to act as a receipt for the cargo, so therefore the Master must make sure that the quantity and description of the goods is accurate as he will be expected to deliver the same to the Receiver.....

6. Port of refuge

A port or place of refuge is a port or place to which a vessel proceeds in consequence of an accident, sacrifice or other extraordinary circumstance. The loading port or discharge port/place can be the port/place of refuge. In case of deviation to a port/place of refuge, the Master must send (in addition to the previously mentioned information) the following to :.....

7. Seaworthiness for cargo ship, international navigational condition & procedure for Insurance claim

Insurance premiums amount to a very large proportion of the ship's running costs. Whilst the owner insures his ship against certain risks and may present a claim which will recuperate at least part of his losses, the effect of submitting many claims will have the effect of increasing the insurance premiums for the next year. It is therefore in everyone's interest to ensure that risks are not taken, that the ship operates safely and that accidents and incidents are avoided....

8. Masters obligation to follow charterers routing advise - The Hill Harmony case

The Hill Harmony case involved a vessel on time charter trading trans-Pacific. The Charterers had engaged a weather routing service and the Master was advised to take the shortest northern great circle route, however he deemed it safer to take a more southerly rumb line route. The Charterers were eventually able to prove that the great circle route had been suitable for safe navigation and that the extra steaming time was for the Owners account.

What is Ships Charterparty agreement ? - The Contract between one party who has control of a ship and another party who wishes to make use of the ship is known as a Charterparty.

Types of Charterparty:

Time Charter

In a Time Charter the Owner hires the ship to the Charterer for a set period of time, usually with restrictions on trading limits and cargoes – so that the Owner's interest is protected.

Time Charters can be for short (e.g. single voyages) or for long periods of time. Normally the Owner is paid a hire rate per day whilst the vessel is on charter. i.e. The Owner agrees to provide the vessel to the Charterer for his commercial use for an agreed period of time.

Time and vessel performance are key under time charter's and of prime importance are meeting the C/P warranties with regard to speed and performance and to also avoid off-hire time as far as possible.

Details of the responsibilities of the Owner and Charterer under a T/C are as below:

Owner

- Crew
- Stores & Provisions
- Maintenance
- Communications re ship
- Husbandry Fees

Charterer

- Fuel
- Port & Canal Dues

- Pilotage
- Towage/Linesmen
- Agency Fees (except husbandry)
- Communications re Voyage & Cargo
- Berth Dues (sometimes: see C/P)
- Wharfage (sometimes: see C/P)
- Stevedoring (sometimes: see C/P)
- War Risk Insurance
- Freight Tax

Voyage Charter

In a voyage charter the ship is hired to carry a particular cargo (or a variety of cargoes) between specified places, usually either at a freight rate per MT of cargo carried or for lump sum freight to the Owner. i.e. The Owner agrees to provide the cargo carrying capacity of his vessel to the Charterer for a specific voyage(s).

The commercial operator will operate the vessel on a voyage charter and relay specific instructions from the Charterer to the Master. These instructions must be followed exactly, unless there is any safety or operational restrictions, in which case the commercial operator and/or DPA should be consulted immediately. Responsibilities of the Owner and Charterer under a V/C as below.

Owner

1. Ship
2. Crew
3. Stores & Provision
4. Maintenance
5. Communications

6. Insurances
7. Fuel
8. Port & Canal Dues
9. Agency Fees
10. Towage/Linesmen
11. Pilotage
12. Berth Dues
13. Wharfage
14. Stevedoring
15. Freight Tax (sometimes see C/P)
16. War risk insurance

Charterer

1. Berth Dues (sometimes : see C/P)
2. Wharfage (see C/P terms)
3. Stevedores (see C/P terms)
4. Cargo Dues/Freight Tax (see C/P)
5. War risk insurance

Commercial awareness is knowing how to make the correct decisions to ensure that your vessel's commercial performance is optimal. In turn, this will boost the vessel's profitability significantly.

Contracts of Affreightment (COA)

Another type of contract is the COA. Under this contract the Owner agrees to provide his vessel or vessels to the Charterers for a series of voyages to carry a pre-specified amount of cargo, or to perform a pre-specified number of voyages. In this case

the C/P terms will remain the same for each voyage with perhaps only the freight rates being adjusted for the prevailing market conditions.

Hierarchy of C/P's

The Master must be aware that there can be chains of charterers. Example:-

- Owner to Head Charterer: (Time Charterer).
- Head Charterer to Sub Charterer: (Time Charter).
- Sub Charterer to Sub-Sub Charterer: (Time Charter or Voyage Charter).

If a voyage charter is involved then it will always be the last in the chain. The Master is to be guided by the head charterparty terms only and is advised that any subsequent sub charterparties received from charterers are to be used only for guidance. Any conflicting clauses are to be brought immediately to the attention of his commercial operator. This is also important because the Master will be required to sign for items such as Pilotage, tugs, canal dues, lashing material, etc., which although services supplied to the ship are, because of the Charterparties, a liability of one or other of the Charterers.

18.9 SUMMARY

A bill of lading, therefore, is a very important issue when making shipments to move the cargo or freight from one point to the other. On one hand, it is a contract between a carrier and shipper for the transportation of goods and on the other hand, it serves as a receipt issued by a carrier to the shipper. Hence, the bill of lading is considered a legal document which provides all the vital details to the shipper and the carrier to conveniently process the freight shipment through different maritime countries and invoice it correctly. The original copy of the bill of lading is provided to the carrier, and a copy of the same should also be ascribed to the packaged freight. In last, a bill of lading is legally binding document that details the type, quantity, and destination of the goods carried as well as details of the shipper (consignor), carrier (transporter) and consignee (buyer/receiver) among other things.

18.10 GLOSSARY

Hamburg Rules, e-bill, freight prepaid

18.11 SELFASSESSMENT QUESTIONS

1. What is Conference System

2. What do you mean by bill of lading.

3. What are the types of bill of lading.

4. What is port of discharge.

5. What is chartering.

18.12 LESSON END QUESTIONS

1. Who is charterer.

2. What is ships charter party agreement.

3. What is clean bill of lading.

4. What is dirty bill of lading.

18.13 SUGGESTED READINGS

1. Kotler P. & Keller K.L. Marketing Management , Pearson
2. Kotler P.Armstrong G.Agnihotri , Principles of Marketing, South Asian Prespective, Pearson
3. Dutta A. K . Material Management Procedures Text and cases
4. Gopalakrishnan ,P and Sundarson M. Material Management
5. Shah N M , An Integrated Concept of Material Management Indian Institute of Material Management.

MULTI-MODEL TRANSPORT SYSTEM**STRUCTURE**

- 19.1 Introduction.
- 19.2 Objective
- 19.3 Concept of Mmts
- 19.4 Techniques Used Inmmts Need Standard Approach
- 19.5 Advantages of MMTS
- 19.6 Summary
- 19.7 Glossary
- 19.8 Self Assessment Question
- 19.9 End Exercise Question
- 19.10 Suggest Reading

19.1 INTRODUCTION

Multi Modal TransportSystem

Multi Modal Transportation System (MMTS) explores the coordinated use of two or more modes of transport for speedy, safe, pleasant and comfortable movement of passengers in urban areas. It provides convenient and economical connection of various modes to make complete journey from origin to destination. Generally, MMTS has been characterized by increased capacity, efficient access and better location of both integration and nodes. Public transport is an important constituent.

The Government of NCT of Delhi has developed an Integrated Multi-modal Transit Project using modes such as the Bus Rapid Transit (HCBS).

Light Rail and the Monorail in addition to the metro rail and the present DTC bus services duly integrated through multi-modal interchange points. This project has been approved by the Cabinet of GNCTD for about phased implementation by 2020. The total length of the public transit network including 250km of Metro will be 750km.



Fig 19.1

To implement this project, the Government of NCT Delhi has incorporated a ‘Special Purpose Vehicle’ under the name and style of Delhi Integrated Multi-modal Transit System (DIMMTS) Limited on 19th April, 2006. DIMMTS Ltd. is responsible for all aspects of implementation, operation and maintenance of the proposed multi-modal network i.e. planning, design, financing, implementation, operation and maintenance of services and associated infrastructure.

In present scenario, there has been rise in the number of middle-class having desire to own personalized mode. Further, the automobile companies are also coming up with new models of cars of reasonable cost.

Thus, personalized vehicles will increase and further cause deterioration in traffic and environmental conditions. Hence it is necessary to shift mode of travel from car to walk/cycle for short distance journey and to public transport for long journey.

Multimodal transportation system demands synchronization among various modes

of transport for better, advanced and efficient service. Further, it also requires need based traffic circulation plans to integrate various modes and improvement of major road stretches and intersections to facilitate smooth movements.

Integration of walk and bicycle may also be taken with public transport modes to assess enhanced share of non-motorized transport and reduce use of personalized vehicles. It is also equally important to integrate underutilized railway infrastructure with other modes of mass transport.

The Ministry of Urban Development, Govt. of India (2006), New Delhi enacted National Urban Transport Policy, 2006 with broad objective to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within cities.

One of the methods to achieve such objectives is to “enabling the establishment of quality focused multi-modal public transport systems that are well integrated, providing seamless travel across modes”. The planning and building of Multi-modal.

Containers for sea transport appeared during the 1960s and should be attributed to the innovativeness and the sea/land strategy of Mr. M McLean, the founder of Sea-Land Inc. (UNCTAD, 1993). He was originally an executive of a trucking company who took over a shipping company. As he was familiar with road/rail combination operations for land transport, he decided to apply the concept with sea transport to enable sea/land through transport with the help of standardized dimensions for containers.

It followed that containers had to be fitted with special devices for the ease of switch between different modes of transport and that ships had to be equipped with rail structures known as cell-guides for vertical sliding and stowing into the ship's hold.

Containers ultimately enabled multimodal transport to be applied to most types of general cargo by means of an international standardized transport unit. Only particularly large (out- of-gauge) and particularly heavy cargoes cannot be containerized. Containerization is basically the largest form of unitization.

Containers are loaded with products at the shipper's premises and sealed, and then they are carried over to the consignee's premises intact, without the content being taken out or re- packed en route. This is the essence of container transport as well as

multimodal transport, but containerization is not synonymous with multimodal transport. Containerization contributes to a higher efficiency in the development of multimodal transport operations.

The focus, now, is more on the organization of the transport industry and the synchronization of the integrated logistical system (Hayuth, 1987). In order to achieve multimodal transport, intensive co-operation and co-ordination among transport modes are essential. Keys elements in multimodal transport Containerization Multimodal Transport:

- Unitization System concept
- Standardization
- Management and Co-ordination Cellular ships
- Control over cargo RoRo vessels
- Mergers Gantry cranes
- Multimodal Transport Operators

Definitions

The terms ‘Combined Transport’, ‘Intermodal Transport’ and ‘Multimodal Transport’ are all used in the context of cargo movement, from origin to destination.

These four terms have very similar meanings, i.e. the transportation of goods by more than one mode of transport and a through freight rate. However, the United Nations made a distinction between each term and introduced definitions of transportation terminology in their Multimodal Transport Handbook (1995).

Modes of Transport:

The method of transport used for the movement of goods, e.g. by rail, road, sea or air. • Means of Transport: The vehicle used for transport, e.g. ship, truck, or aircraft.

Types of Means of Transport

The type of vehicle used in the transport process, e.g. wide-body, tank truck, passenger vessel, etc.

- **Unimodal Transport**

The transport by one mode of transport only, where each carrier issues his own transport document (B/L, airway bill, consignment note, etc.).

- **Combined Transport**

The transportation of goods in one and the same loading unit or vehicle by a combination of road, rail, and inland waterway modes.

- **Intermodal Transport**

The transportation of goods by several modes of transport where one carrier organizes the whole transport from one point or port of origin via one or more interface points to a final port or point.

- **Multimodal and intermodal transport.**

Both intermodal and multimodal transportation suggest using two or more shipping modes. However, there is a list of differences between intermodal and multimodal. When you ship intermodal, each part of your transportation chain is handled by a different carrier. Therefore, you have several separate shipping bills, and reports from each link in the chain. When using multimodal, all of your shipments are signed under a single bill of lading. Both transportation methods have benefits and drawbacks, and here we will dive deep into multimodal.

- **Multimodal transport.**

Multimodal transportation is a combination of several shipping modes like a truck, rail, ocean or air to deliver freight to its destination. Multimodal shipping suggests all of your freight movements are handled under a unified bill of lading, even if different carriers are moving it.

Multimodal transport can benefit many businesses that ship large amounts of cargo on a normal basis. Using multimodal transport for your shipments can save you money while providing your goods with faster transit. The main reason why companies prefer multimodal is that the mode requires less time and effort since all of the shipments are under a single bill and are usually handled by an external party. This solution is suitable

when you use the same route regularly. That way, multimodal can really drive significant time and cost savings to your business.

Other than saving money and time, there are many reasons your company should choose multimodal transport when planning your next shipment.

Depending on how responsibility for the entire transport is shared, different types of Documents are

The HMSO (1966) publication Through Transport to Europe has defined through transport as: “The methods of distribution and transport which give through flow of traffic, from the point of origin to the final point of destination, with minimum transshipment delay.”²

Traditionally a “through bill of lading” is issued to cover the move from the port of loading via the port of transshipment to the port of discharge. Depending on the back clauses, the first carrier might be responsible for the entire transport, or maybe only for that part which took place on board his vessel. For the sake of clarity, it is best to restrict the use of the expression

“THROUGH BILL OF LADING” or “through transport” to one mode of transport but covering several means of transport.

Bill of Lading

The International Chamber of Commerce Rules for Combined Transport has defined Combined Transport as “the carriage of goods by at least two different modes of transport, from a place at which the goods are taken in charge situated in one country to a place designated for delivery situated in a different country.” used. There are also different definitions for intermodal transport.

The ECMT (European Conference of Ministers of Transport) and the European Committee for **standardization** (CEN) use the following definition for intermodal transport: “the movement of goods in one and the same loading unit or vehicle which uses successively several modes of transport without handling of the goods themselves in changing mode”. The EC definition goes beyond the ECMT/CEN definition, and corresponds with the ECMT/CEN definition of multimodal transport: “the movement of goods whereby at least two different modes are used in a **door-to-door** transport chain”. For Mahoney (1986),

“**Intramodality**” means the movement of freight via two or more dissimilar means of modes of transportation while for **Hayuth** (1987), “**Intramodality**” means the movement of cargo from shipper to consignee by at least two different modes of transport under a single rate, through-billing, and through liability. The term “**intramodality**” has been widely adopted by European Union policy-makers.

Multimodal Transport: Where the carrier organizing the transport takes responsibility for the entire door-to-door transport and issues a multimodal transport document. Multimodal transport is therefore a concept which places the responsibility for transport activities under one operator, who then manages and coordinates the total task from the shipper’s door to the consignee’s door ensuring the continuous movement of the goods along the best route, by the most efficient and, cost-effective means, to meet the shippers requirements of delivery. This means simplified documentation, and increasingly by electronic means such as electronic data interchange(EDI).

19.2 OBJECTIVE

Objectives: After studying this lesson you are able to understand about the concept of multi-model transport system and its advantages.

19.3 CONCEPT OFMMTS.

The implementation of MMTS project requires the following components.

- **Transport Supply**

It includes availability of various modes at city and regional level, location & design aspects of nodes, pedestrian flow modeling at transfer station, etc. Similarly, network structure, line density, stop density, frequency of services, etc. affect transport supply. The entire network models of both road and rail transport, and the sub networks for these two modalities must be linked by the feeder services in order to get a cost-efficient solution.

- **Travel Demand**

It estimates demands of customers for multi-modal transport services. It also assesses preferences and choice behavior of travelers with respect to multi-modal composition of trip chains and need for interchangeable.

- **Transport Services**

It requires high quality time table of buses, trains and other modes. It also includes train movement network, feeder services, maximum & minimum capacity of various modes, models for predicting departure & delays, etc. The concept of multi-modal transport junction refers to a centre for passenger flow conversion on a multi-modal transport network node. It is affected by location, number of transport routes linked, scale of its radiation and services, etc.

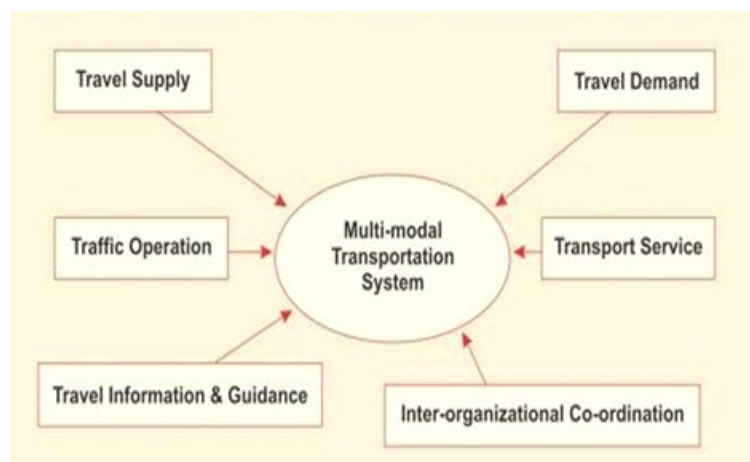


Fig 19.3 Components of Multi Modal TransportationSystem

- **Traffic Operation**

It is a tool consisting of operation schedule controlled by conditional bus priority at intersection/interchange to improve punctuality and regularity. It is also a synchronization control on daily operational performance of public transport services and other modes.

- **Travel Information and Guidance**

The concept of integrated multi-modal traveler information to mixed modes and mixed socio-demographic groups of travelers is important. The research illustrates that the majority of travelers do not consider their modal choice for the majority of journeys. Rather, this choice is automatic and habitual, based upon subconscious perceptions of the viability and desirability travel by modes other than the dominant mode. Result suggests that presentation of a number of modal options for a journey in response to a single enquiry can change the perceptions.

- **Inter-organization Co-ordination**

The co-ordination among transport operators, authorities, information suppliers, facility owners, etc. is important element of MMTs

Multiple modes of transport for safe, convenient and efficient movement of passengers. Generally, MMTS has been characterized by increased capacity, efficient access and better location of both interchange and integration nodes. Additionally, presence of MMTS in metro region enhances accessibility, economic growth, public health, environmental protection, security & safety, social cohesion, etc. In this connection, it is desirable to establish a single authority for planning, development, implementation and enforcement of the policies.

19.4 TECHNIQUES USED IN MMTS NEED STANDARD APPROACH

Design and engineering standards (e.g., capacity/demand ratio, level of service ratio) are set for each mode and thereby establish present conditions and forecast future demands. The difference between the standards and existing or future conditions is the need. Since need generally exceeds financial resources and hence priority projects by mode must be identified. Such approach is simple, direct, credible, and can be implemented.

Most notably, it is not a planning approach since “plans” have to be assumed at the outset (from the present facility) so the approach does not evaluate plans but simply accepts or rejects them based on direct user benefits.

- **Single Mode Simulation Evaluation Approach**

This approach is derived from the urban transport planning process. It consists of following elements i.e.

Statement of goals or criteria.

Preparation of plans to improve performance in relation to goals or criteria.

Simulation of present and future performance of the planned system evaluation of the results.

Unlike the physically dimensioned standards in the needs standards approach, this approach relates performance by both non-users and users. It can add up costs (e.g.

time) on the same basis for several modes, permitting inter-modal comparisons. Its relative complexity and difficulty in implementation is major disadvantages.

- **Multimodal Simulation Evaluation Approach**

It incorporates demands for transportation by people and goods on a broad base. Demands are allocated among modes and simulations are undertaken for all modes. However, this approach permits more effective planning and coordination across modes.

19.5 ADVANTAGES OF MMTS

1. Provides faster transit of goods

The faster transportation of goods is made possible under Multimodal transport reduces the disadvantages of distance from markets and the tying-up of capital.

2. Reduces the burden of documentation and formalities

The burden of issuing multiple documentation and other formalities connected with each segment of the transport chain is reduced to a minimum.

3. Saves cost

The savings in money from costs resulting from these advantages are usually reflected in the through freight rates charged by the Multimodal transport operator and also in cargo insurance cost. Establishes only one agency to deal with the consignor needs to deal with only the Multimodal transport operator in all matters relating to goods, or delay in delivery of goods at destination.

4. Reduces cost of exports

The inherent advantages of Multimodal transport system will help to reduce the cost of exports and improve their competitive position with pricing in the international market segment.

5. The multimodal transport: coordinated and planned

As a single operation, it minimizes the loss of time and risk of loss, pilferage and damage to the cargo at trans-shipment coordinated and planned as a single operation, it

minimizes the loss of time and risk of loss, pilferage and damage to the cargo at trans-shipment points.

The markets are psychically reduced by faster transit of goods; Reference to Globalization challenge, the distance between origin or source materials and customers is getting to be insignificant thanks to the development of multimodal transport.

The burden of issuing multiple documentation for each segment of transport is reduced to minimum.

The consignor / consignee has to deal with only the MTO (multimodal transport operator) in all matters related to the goods transportation.

Multimodal transport is commonly known as referring to a transport operation that is carried out using different modes of transport such as railway, waterway, and airway. A single operator organizes it.

Multimodal transport is a legal concept strictly defined in the United Nations Convention on the International Transport of Goods and other international instruments, where the specified liability regime of the operator differs from those applicable in modal operations.

Key benefits of multimodal transport are:

6. Minimizes time loss at trans-shipment points:

Multimodal transport operator maintains its communication links and coordinates that interchange onward carriage smoothly at transshipment points.

7. Provides faster transit of goods:

The faster transportation of goods is made possible under Multimodal transport reduces the disadvantages of distance from markets and the tying-up of capital.

8. Reduces the burden of documentation and formalities:

The burden of issuing multiple documentation and other formalities connected with each segment of the transport chain is reduced to a minimum.

9. Establishes only one agency to deal with:

The consignor needs to deal with only the Multimodal transport operator in all matters relating to goods, or delay in delivery of goods at destination.

10 Reduces cost of exports:

The inherent advantages of Multimodal transport system will help to reduce the cost of exports and improve their competitive position with pricing in the international market segment.

11 Easier Communication

When companies ship through multimodal transportation, they handle all shipping updates, delays and interactions through one provider and contract. This gives shippers ease of mind and simplifies the process of communicating between different contacts and carriers. Essentially, when you have one person responsible for the entire transportation chain, it's much easier to just focus on business and don't spend time bouncing from one call to another.

12 Faster Transit Options

Due to new restrictions on truck drivers on driving hours and other regulations, some . shipments are not as fast as they could be. The combination of different transportation modes under one contract lets you have a piece of mind and balance transit time. That way, you avoid driver being on a way too long and therefore bypass shipping delays. Giving companies more options for their shipment gives you control and flexibility over the loading and unloading process.

13 Cost Savings

Multimodal transport often saves shippers money through lower freight rates and lower cargo insurance costs. When you sign multiple contracts, you have to buy insurance for each transportation mode. That may add up a significant amount to your final bill. Also, if you're using a third-party logistics provider, you get the discounted rates and reliable carriers. Multimodal is a great option for shippers when a certain route or mode is too expensive for their shipment. Ultimately, multimodal transport helps guarantee consumers

on-time deliveries and true cost savings. Whether you are shipping by air, rail or barge, multimodal shipping can be a solution for you.

DIFFERENT MODES OF TRANSPORT

There are many different types of transport and various shipping modes available to shippers today to help move goods all over the world. But sometimes, a single mode is not enough. Perhaps, your goods are going a long way from another part of the world by ship or aircraft. To reach the final destination, freight needs to travel some more – via the truck or train. In a nutshell, shippers often need to combine transportation modes in order to get their goods to the right place. Logistics companies define two ways of such combination: intermodal transport and multimodal transport.

The 3 main benefits of multimodal

Forms of multimodal transport operations Currently, different types of multimodal transport operations involving different combinations are taking place, such as:

Land-Sea-Land

An example of this form of the transport is as follows: An empty container is picked up from the line's container yard in Singapore and trucked to shipper's factory in Johore (Malaysia) for stuffing, thereafter the FCL is trucked to Singapore and transported by ocean vessel to New York. Truck from vessel to rail-head New York Rail from New York to rail-head Chicago Truck from Chicago rail-head to consignee's warehouse.

Truck Ocean Vessel Rail Truck

Recapitulation

Truck

There can be several additional links, for instance, if the container was carried by rail from, say, Kuala Lumpur to Singapore. Where LCL cargo is concerned, the individual shipments would be delivered to the freight forwarders CFS or the shipping line's CFS and consolidated into an FCL which, in Chicago, is trucked to the CFS, where from it is picked-up by the consignee's truck.

Road/Air/Road

A combination of air carriage with truck transport is a frequent method of multimodal service. Undoubtedly, pickup and delivery services by road transport are usually incidental to air transport.

19.6 SUMMARY

Thus, Multimodal transportation system seeks better synchronization among various modes of transport for better, advanced and efficient service. Further, it requires need based traffic circulation plans to integrate various modes and improvement of major road stretches and intersections to facilitate smooth movements. Hence, management of such mega projects requires expertise of both traffic engineering and transport planning.

As it is commonly known as transport operation that is carried out using different modes of transport such as railway, waterway, and airway. A single operator organizes it.

Multimodal transport is a legal concept strictly defined in the United Nations Convention on the International Transport of Goods and other international instruments, where the specified liability regime of the operator differs from those applicable in modal operations.

19.7 GLOSSARY:

Personalized modes –designed or produce to meet some requirements.

Implementation-the process of putting a descision or plan into process.

Synchronization –the activity of two or more things at the same time.

Documentation- the material that provide official information.

Integration modes- it is used to provide an isolated run time environment for a set of deployed message forms and resourece.

Accessibility - the quality of being easy to obtain or use.

Simulation – an process or act of stimulating first required modal is developed.

Inventory control ,pilferage documents ,social cohesion.

19.8 SELFASSESSMENT QUESTION

Q1 Write in detail about MMTS.

Q2 Discuss the components of MMTS.

Q3 What are the various advantages of MMTS.

19.9 END EXERCISE QUESTION

Q1 Discuss the term multimodal transport system in detail.

Q2 “As multi modal transport system had developed in India” are you agree with the statement explain with reason.

Q3 Write in brief about intermodal transport system in India.

19.10 SUGGEST READING

- Multi media systems by ralf setinmetz.
- Abuja kk marketing management ed.4th, 1998 kalyani publishers, new delhi 110002.
- Rail projects in India by m. Rama Chandra.

CONTAINERIZATION

STRUCTURE

- 20.1 Introduction
- 20.2 Objectives
- 20.3 Meaning of Containerization
- 20.4 Needs & Advantages of containerization
- 20.5 Concept of Inland Container Depots[ICDS]
- 20.6 Meaning of Container Freightstation[CFSS]
- 20.7 Summary
- 20.8 Glossary
- 20.9 Self Assessment question
- 20.10 End Exercise Question
- 20.11 Books recommended

20.1 INTRODUCTION

Containerization is a system of intermodal freight transport using intermodal containers (also called shipping containers and ISO containers).

The shipping containers have standardized dimensions. They can be loaded and unloaded, stacked, transported efficiently over long distances, and transferred from one mode of transport to another container ships, rail transport flatcars, and semi-trailer trucks

without being opened.

The handling system is completely mechanized so that all handling is done with cranes and special forklift trucks. All containers are numbered and tracked using computerized systems.

Containerization originated several centuries ago but was not well developed or widely applied until after World War II, when it dramatically reduced the costs of transport, supported the post-war boom in international trade, and was a major element in globalization.

Containerization did away with the manual sorting of most shipments and the need for warehousing. It displaced many thousands of dock workers who formerly handled break bulk cargo. Containerization also reduced congestion in ports, significantly shortened shipping time and reduced losses from damage and theft.

Containers can be made of weathering steel to minimize maintenance needs.

✓ Origin



Loading assorted break bulk cargo onto ships manually



Transferring freight containers on the London, Midland and Scottish Railway (LMS; 1928)

Fig 20.1

Before containerization, goods were usually handled manually as break bulk cargo.

Typically, goods would be loaded onto a vehicle from the factory and taken to a port warehouse where they would be offloaded and stored awaiting the next vessel.

When the vessel arrived, they would be moved to the side of the ship along with other cargo to be lowered or carried into the hold and packed by dock workers. The ship might call at several other ports before off-loading a given consignment of cargo. Each port visit would delay the delivery of other cargo.

Delivered cargo might then have been offloaded into another warehouse before being picked up and delivered to its destination. Multiple handling and delays made transport costly, time consuming and unreliable.

Containerization has its origins in early coal mining regions in England beginning in the late 18th century. In 1766 James Bindley designed the box boat 'Starvation' with 10 wooden containers, to transport coal from Worsley Delph (quarry) to Manchester by Bridgewater

Canal. In 1795, Benjamin Outram opened the Little Eaton Gangway, upon which coal was carried in wagons built at his Butterley Ironwork. The horse-drawn wheeled wagons on the gangway took the form of containers, which, loaded with coal, could be transshipped from canal barges on the Derby Canal, which Outram had also promoted.

By the 1830s, railroads on several continents were carrying containers that could be transferred to other modes of transport. The Liverpool and Manchester Railway in the United Kingdom was one of these. "Simple rectangular timber boxes, four to a wagon, they were used to convey coal from the Lancashire collieries to Liverpool, where they were transferred to horse-drawn carts by crane. Originally used for moving coal on and off barges, "loose boxes" were used to containerize coal from the late 1780s, at places like the Bridgewater Canal. By the 1840s, iron boxes were in use as well as wooden ones. The early 1900s saw the adoption of closed container boxes designed for movement between road and rail.

Twentieth century

On 17 May 1917, Benjamin Franklin Fitch inaugurated exploitation of an experimental installation for transfer of the containers called demountable bodies based on his own design in Cincinnati, Ohio in US. Later in 1919, his system was extended to over 200 containers serving 21 railway stations with 14 freight trucks. Prior to the Second World War, many European countries independently developed container systems.

In 1919, Stanisław Rodowicz, an engineer, developed the first draft of the container system in Poland. In 1920, he built a prototype of the biaxial wagon. The Polish-Bolshevik War stopped development of the container system in Poland.

The US Post Office contracted with the New York Central Railroad to move mail via containers in May 1921. In 1930, the Chicago & Northwestern Railroad began shipping containers between Chicago and Milwaukee. However, their efforts ended in the spring of 1931 when the Interstate Commerce Commission wouldn't allow the use of a flat rate for the containers.

In 1926, a regular connection of the luxury passenger train from London to Paris, Golden Arrow/Fleche d'Or, by Southern Railway and French Northern Railway, began. For transport of passengers' baggage four containers were used. These containers were loaded in London or Paris and carried to ports, Dover or Calais, on flat cars in the UK and "CIWL Pullman Golden Arrow Fourgon of CIWL" in France.

At the Second World Motor Transport Congress in Rome, September 1928, Italian senator Silvio Crespi proposed the use of containers for road and railway transport systems, using collaboration rather than competition. This would be done under the auspices of an international organ similar to the Sleeping Car Company, which provided international carriage of passengers in sleeping wagons. In 1928 Pennsylvania Railroad (PRR) started regular container service in the northeast United States.

After the Wall Street Crash of 1929 in New York and the subsequent Great Depression, many countries were without any means of transport for cargo. The railroads were sought as a possibility to transport cargo, and there was an opportunity to bring containers into broader use. Under auspices of the International Chamber of Commerce in Paris in Venice on September 30, 1931, on one of the platforms of the Maritime Station

(Mole di Ponente), practical tests were done to assess the best construction for European containers as part of an international competition.

In the same year, 1931, in USA Benjamin Franklin Fitch designed the two largest and heaviest containers in existence anywhere at the time. One measured 17'6" by 8'0" by 8'0" with a capacity of 30,000 pounds in 890 cubic feet, and a second measured 20'0" by 8'0" by 8'0", with a capacity of 50,000 pounds in 1,000 cubic feet.

In November 1932 in Enola, PA the first container terminal in the world was opened by The Pennsylvania Railroad Company. The Fitch hooking system was used for reloading of the containers.

The development of containerization was created in Europe and the US as a way to revitalize rail companies after the Wall Street Crash of 1929, which had caused economic collapse and reduction in use of all modes of transport

In 1933 in Europe under the auspices of the International Chamber of Commerce the International Container Bureau (French: *Bureau International des Conteneurs*, B.I.C.) was established. In June 1933, the B.I.C. decided on obligatory parameters for containers used in international traffic. Containers handled by means of lifting gear, such as cranes, overhead conveyors, etc. for traveling elevators (group I containers), constructed after July 1, 1933.

20.2 OBJECTIVES

Objective: After going through this lesson you should be able to understand containerization and its advantages. The concept of inland container depots (ICDS) and container freight stations (CFSs)

20.3 MEANING OF CONTAINERIZATION

A container essentially can be called as goods or store goods. equipment utilized to carry Based upon this concept of a container, we can say that containerization is technique or a method of distributing goods in unitized form thereby making it convenient to evolve or establish an intermodal transport system which can be a combination of railways, roadways, waterways or airways. Containers are usually standard sized and are referred to 20 ft. containers, 40 ft. containers etc.

The international organization has defined freight container as an article of transport equipment of a permanent character and accordingly strong enough for repeated use

Specially designed to facilitate the carriage of goods by one or more modes of transport without intermediate reloading

Fitted with devices permitting its ready handling

So designed as to be easy to fill and empty.

By dock workers, the ship might call at several other ports before off-loading a given consignment of cargo. Each port visit would delay the delivery of other cargo.

Delivered cargo might then have been offloaded into another warehouse before being picked up and delivered to its destination. Multiple handling and delays made transport costly, time consuming and unreliable

The main km coastline capacity handled in 2008 is 9.1 advantages of along 7517 mteu and expected to reach 21.0 mteu by 2014 drivers of container traffic international trade penetration of hub and feeder service growth containerization structure. Indian containerization in India some numbers about sea transport in India sea transport carries 95% of India's exports by volumes and 70% by value India has 12 major ports and 187 non-major ports exports reached \$102 billion a. total tonnage handled in all major a. growing traffic builds a strong

Containerization

The box (container) is what makes the world go round.

The driver of intermodal transportation has undoubtedly been the **container**, which permits easy handling between modal systems. While intermodalism could take place without the container, it would be very inefficient and costly. At start, a distinction is necessary between containerization and the container.

Container. A large standard size metal box into which cargo is packed for shipment aboard specially configured transport modes. It is designed to be moved with common handling equipment enabling high-speed intermodal transfers in economically large units between ships, railcars, truck chassis, and barges using a minimum of labor. The container,

therefore, serves as the load unit rather than the cargo contained therein. The reference size is the 20 foot box of 20 feet long, 8'63 feet high and 8 feet wide, or 1 **Twenty-foot Equivalent Unit (TEU)**. Since the great majority of containers are now forty foot long, the term **Forty-foot Equivalent Unit (FEU)** is also used, but less commonly. “Hi cube” containers are also common and they are one foot higher (9'63) than the standard.

Containerization. Refers to the increasing and generalized use of the container as a load unit for freight transportation. It involves processes where the intermodal container is increasingly used because it either substitutes cargo from other conveyances, is adopted as a mode supporting freight distribution or is able to diffuse spatially as a growing number of transport systems are able to handle containers.



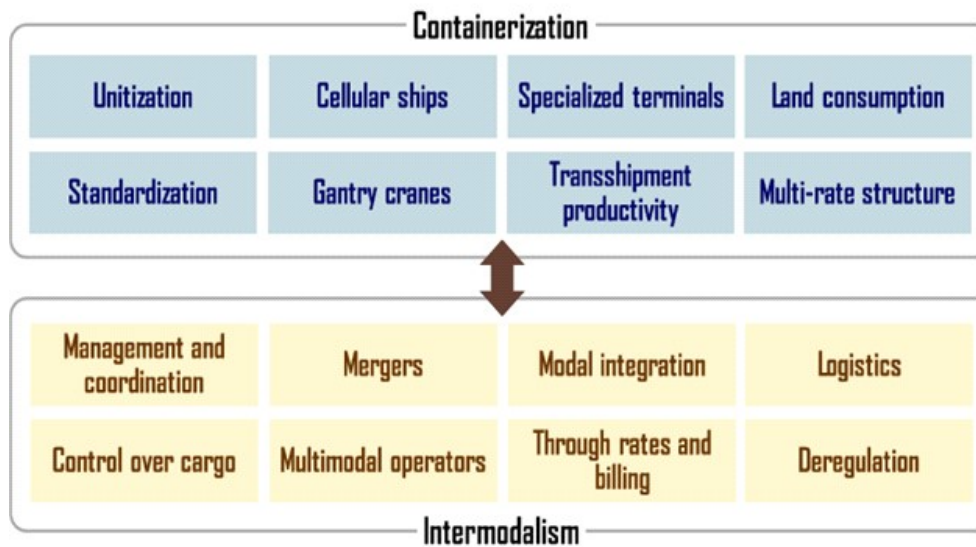
Fig 20.2 Panamax Containership at the Port of Le Havre



Fig 20.3 40-Foot Containers Doublestacked on a Rail Car



Fig 20.4 Hybrid Container Chassis



Driving Forces of Containerization and Intermodalism

The development of intermodal transportation and containerization are mutually inclusive, self strengthening and rely of a set of driving forces linked with technology, infrastructures and management. One of the initial issue concerned the different sizes and dimensions of containers used by shipping lines, which were a source of much confusion in compiling container shipping statistics. A lift could involve different volumes since different box sizes were involved. As a result, the term TEU (Twenty foot Equivalent Unit) was first used by Richard F. Gibney in 1969, who worked for the Shipbuilding & Shipping Record,

as a comparative measure. Since then, the TEU remains the standard measure for containerized traffic.

The usage of containers shows the complementarity between freight transportation modes by offering a higher fluidity to movements and a standardization of loads. The container has substantially contributed to the adoption and diffusion of intermodal transportation which has led to **profound mutations in the transport sector**. Through reduction of handling time, labor costs, and packing costs, container transportation allows considerable improvement in the efficiency of transportation. Thus, the relevance of containers is not what they are – simple boxes – but what they enable; intermodalism. Globalization could not have taken its current form without containerization.

Containers are either made of steel (the most common for maritime containers) or aluminum (particularly for domestic) and their structure confers flexibility and hardness. Another factor behind the diffusion of the container is that an agreement about its base dimensions and latching system was reached through the International Standards Organization (ISO) within 10 years of its introduction. From this standard, a wide variety of container sizes and specifications have been put in use. The most prevalent container size is however the 40 foot box, which in its 2,400 cubic feet which carry on average 22 tons of cargo. However, transporting cargo in a 20 foot container is usually 20% cheaper than transporting cargo in a 40 foot container. Irrespective of the size a 20 foot container requires the same amount of intermodal movements even if it takes about half the space during transport and at terminals.

TYPES OF CONTAINERS

There are five main types of containers:

- **Standard container.** Container designed to carry a wide variety general cargo. They are often labeled as dry containers because they carry dry goods either in break bulk (most common) or bulk (less common) form. Cargo is loaded and unloaded through a double door which marks the “back side” of the container.
- **Tank container.** Container designed to carry liquids (chemicals or foodstuff). It is composed of a tank surrounded by a structure making it the same size than a standard 20 foot containers, including its four latching points.

- **Open top container.** A container with an open roof and designed to carry cargo that is too large to be loaded through standard container doors, such as machinery. The container is loaded from the top with a tarpaulin used to cover its contents.
- **Flat container.** Container having an open roof and sides designed to carry heavy and oversized cargo. The cargo transported is left exposed to outdoor conditions.
- **Refrigerated container.** Also known as a reefer. Container designed to carry temperature controlled cargo, often around or below freezing point. It is insulated and equipped with refrigeration plant maintaining the temperature constant.

CONTAINERIZATION GROWTH FACTORS

World Container Throughput, 1980-2017 (millions of TEU)

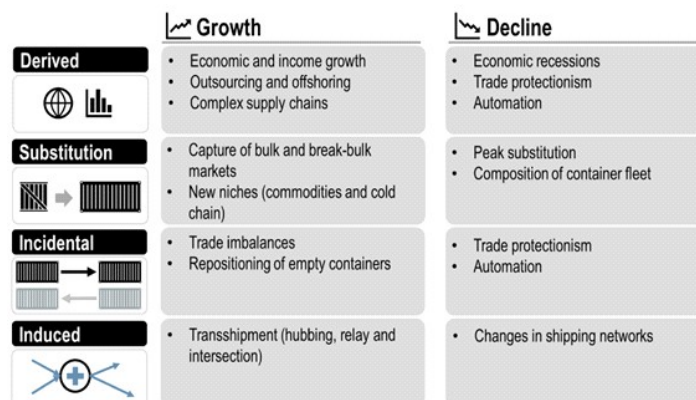


Fig 20.5

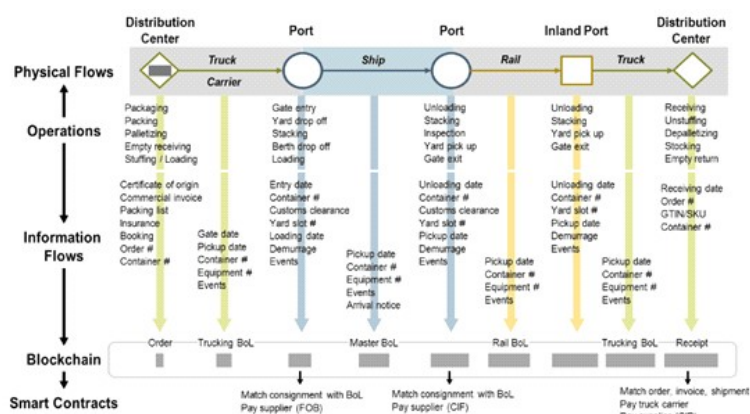


Fig 20.6 Blockchains and Intermodal Transportation

20.4 NEEDS & ADVANTAGES OF CONTAINERIZATION

1. Standardization

Standard transport product that can be handled anywhere in the world (ISO standard) through specialized modes (ships, trucks, barges and wagons) and equipment. Each container has a unique identification number and a size type code.

2. Flexibility

Can be used to carry a wide variety of goods such as commodities (coal, wheat), manufactured goods, cars, refrigerated (perishable) goods. There are adapted containers for dry cargo, liquids (oil and chemical products) and refrigerated cargo. Discarded containers can be recycled and reused for other purposes.

3. Costs

Lower transport costs due to the advantages of standardization. Moving the same amount of break-bulk freight in a container is about 20 times less expensive than conventional means. The containers enable economies of scale at modes and terminals that were not possible through standard break-bulk handling.

4. Velocity

Transshipment operations are minimal and rapid and port turnaround times have been reduced from 3 weeks to about 24 hours. Containerships are faster than regular freighter ships, but this advantage is undermined by slow steaming.

5. Warehousing

The container is its own warehouse, protecting the cargo it contains. This implies simpler and less expensive packaging for containerized cargoes, particularly consumption goods. The stacking capacity on ships, trains (double stacking) and on the ground (container yards) is a net advantage of containers.

6. Security and safety

The contents of the container is unknown to carriers since it can only be opened at the origin (seller/shipper), at customs and at the destination (buyer). This implies reduced spoilage and losses (theft).

It eliminates the need intermediate handling.

The absence of intermediate handling as well as the goods being transported quickly indicates that there are few chances for a cargo to get damaged or pilfered.

Since there is less risk of damage and pilferage due to containerization, transporting companies can charge profitable cargo carrying premiums. Such premiums cannot be changed in the conventional mode of cargo shipment.

Since the need for intermediate handling at terminal points such as ports, is avoided, savings on labour can be realized.

Since goods are transport in standardized containers, saving on packaging materials, labour required for packing, etc can be realized.

Among the numerous advantages related to the success of containers in international and hinterland transport, it is possible to note the following.

7. Standard transport product

A container can be manipulated anywhere in the world as its dimensions are an ISO standard. Indeed, transfer infrastructures allow all elements (vehicles) of a transport chain to handle it with relative ease. Standardization is a prevalent benefit of containerization as it conveys a ubiquity to access the distribution system and reduces the risks of capital investment in modes and terminals.

The rapid diffusion of containerization was facilitated by the fact that its initiator, Malcolm McLean, purposely did not patent his invention. Consequently, all segments of the industry, competitors alike, had access to the standard. It necessitated the construction of specialized ships, lifting equipment and terminal facilities, but in several instances existing transport modes could be converted to container transportation, at least while a more effective transition to containerization takes place. In time, the container became the standard transport unit of global trade.

8. Flexibility of usage

A container can transport a wide variety of goods ranging from raw materials (coal, wheat), manufactured goods, and cars to frozen products. There are specialized containers

for transporting liquids (oil and chemical products) and perishable food items in refrigerated containers (called “reefers” which now account for 50% of all refrigerated cargo being transported). About 2.3 million TEUs of reefers were being used by 2013. Discarded containers are often used as storage, housing, office and retail structures.

The container, as an indivisible unit, carries a unique identification number and a code enabling transport management not in terms of loads, but in terms of unit. This identification number is also used to insure that it is carried by an authorized agent of the cargo owner and is verified at terminal gates, increasingly in an automated fashion. Computerized management enables to reduce waiting times considerably and to know the location of containers (or batches of containers) at any time. It enables to assign containers according to the priority, the destination and the available transport capacities. Transport companies book slots in maritime or railway convoys that they use to distribute containers under their responsibility. As such, the container has become a production, transport and distribution unit.

9. Economies of scale

Relatively to bulk, container transportation reduces transport costs considerably, about 20 times less. While before containerization maritime transport costs could account between 5 and 10% of the retail price, this share has been reduced to about 1.5%, depending on the goods being transported. The main factors behind costs reductions reside in the speed and flexibility incurred by containerization. Similar to other transportation modes, container shipping is benefiting from economies of scale with the usage of larger containerships.

The 6,000 TEUs landmark was surpassed in 1996 with the Regina Maersk and in 2006 the Emma Maersk surpassed the 12,000 TEU landmark. By 2013, ships of more than 18,000 TEU became available. A 5,000 TEU containership has operating costs per container 50% lower than a 2,500 TEU vessel. Moving from 4,000 TEU to 12,000 TEU reduces operating costs per container by a factor of 20%, which is very significant considering the additional volume involved. System-wide the outcome has been costs reductions of about 35% by the use of containerization.

10. Operational velocity

Transshipment operations are minimal and rapid, which increase the utilization level of the modal assets and port productivity. A modern container ship has a monthly capacity of 3 to 6 times more than a conventional cargo ship. This is notably attributable to gains in transshipment time as a crane can handle roughly 30 movements (loading or unloading) per hour. Port turnaround times have thus been reduced from an average of 3 weeks in the 1960s to less than 24 hours, since it is uncommon for a ship to be fully loaded or unloaded along regular container shipping routes.

It takes on average between 10 and 20 hours to unload 1,000 TEUs compared to between 70 and 100 hours for a similar quantity of bulk freight. With larger containerships, more cranes can be allocated to transshipment; 3 to 4 cranes can service a 5,000 TEU containership, while ships of 10,000 TEU can be serviced by 5 to 6 cranes. This implies that larger ship sizes do not have much differences in loading or unloading time, but this requires more yard equipment. A regular freighter can spend between half and two-third of its useful life in ports. With less time in ports, containerships can spend more time at sea. Since a ship generates revenue while at sea, containerships are more profitable. Further, containerships are on average 35% faster than regular freighter ships (19 knots versus 14 knots). Put all together, it is estimated that containerization has reduced travel time for freight by a factor of 80%.

11. Warehousing and security

The container limits damage risks for the goods it carries because it is resistant to shocks and weather conditions. The packaging of goods it contains is therefore simpler, less expensive and can occupy less volume. This reduces insurance costs since cargo is less prone to be damaged during transport. Besides, containers fit together permitting stacking on ships, trains (doublestacking) and on the ground. It is possible to superimpose three loaded and six empty containers on the **ground. The container is consequently its own warehouse.**

The contents of the container are anonymous to outsiders as it can only be opened at the origin, at customs and at the destination. Thefts, especially those of valuable commodities, are therefore considerably reduced, which results in lower insurance

premiums. Theft was a serious issue at ports before containerization as longshoremen had direct access to the cargo they were handling.

In spite of numerous advantages in the usage of containers, some challenges are also evident.

12. Site constraints

Containerization implies a large consumption of terminal space. To fully load or unload a containership of 5,000 TEU a minimum of 12 hectares of stacking space is required. Conventional port areas are often not adequate for the location of container transshipment infrastructures, particularly because of draft issues as well as required space for terminal operations. Many container vessels require a draft of at least 14 meters (45 feet) and the later generation of larger ships require at least 15 meters (50 feet). A similar challenge applies to container rail terminals; many being relocated at the periphery of metropolitan areas. Consequently, major container handling facilities have new location criteria where suitable sites are only found at the periphery.

13. Infrastructure costs and staking

Container handling infrastructures, such as gantry cranes, yard equipment, road and rail access, represent important investments for port authorities and load centers. For instance, the costs of a modern container crane (portainer) are in the range of 4 to 10 million USD depending on the size. Several developing countries as well as smaller ports face the challenge of finding capital for these infrastructure investments.

The arrangement of containers, both at terminals and on modes (containerships and double-stack trains) is a complex problem. At the time of loading, it becomes imperative to make sure that containers that must be taken out first are not below the pile. Further, containerships must be loaded in a way to avoid any restacking along its numerous port calls where containers are loaded and unloaded

20.5 MEANING OF INLAND CONTAINERDEPOTS

Inland Container Depots, otherwise known as ICDs, are dry ports equipped for handling and temporary storage of containerized cargo as well as empties. This means that hinterland customers can receive port services more conveniently closer to their premises.

The present trend in the international trade is containerization of cargo. The full benefits of containerization can be derived only when the containers are, permitted to be moved to points in close proximity to important industrial station so that the importers can get clearance of the imported goods at the nearest point to their factory/premise. The facility is helpful to the exporters as they can export the goods from the nearest point of their factory/premise in order to provide this facility some statutory conditions are to be fulfilled and necessary infrastructure provided.

To start with, the Government of India issued a notification under Section 7 of the Customs Act 1962 appointing a suitable place as inland container Depot for the unloading of the import goods and the loading of export goods or any class of such goods. After issue of such notification, the Commissioner of Customs having jurisdiction over that place issues a notification under Section 8 of the Customs Act, 1962 approving proper places in the ICD for the loading and unloading of the goods and also specify the limits of Customs area and post Customs Officers and staff to attend.

20.6 MEANING OF CONTAINER FREIGHTSTATION.

A container freight station is a facility where freight shipments are consolidated or de-consolidated, and staged between transport legs. A CFS is typically located in proximity to an ocean, port, or airport where cargo containers are transported to and from June 13, 2016

CFS Container Freight Station

The term CFS at loading port means the location designated by carriers for the receiving of cargo to be loaded into containers by the carrier. At discharge or destination ports, the term CFS means the bonded location designated by carriers for devanning of containerized carCFS stands for 'Container Freight Station'; a station or warehouse where a number goodsor products are stored to be shipped together in one or morecontainers.

At a CFS, the goods normally belong to a number of different customers, and the shipment is often done via LCL shipments.

LCL (Less container load)

Shipments occur when the exporters don't have enough cargo to fill one container full (an FCL). We've put together a guide on less container load shipment and full container load shipments [here](#).

A Bill of Lading might contain the port name followed by /CFS, which refers to the shipping port name, followed by the destination port name, which clearly lays out the responsibilities between the exporter, shipping company and customer..

CFS Pier to Pier

Another term often appearing on Bills of Lading or Letters of Credit are CFS/CFS pier to pier, referring to cargo which is packed by the carrier into a container along with other goods and accepted and unpacked by a consignee at the destination terminal or port.

CFS Receiving Services

CFS receiving services are a set of services which are provided between receiving cargo from exporters and packing them into containers.

CFS Receiving Services include: Moving empty containers from a Container Yard to a Container Freight Station

Drayage of loaded containers from the Container Freight Station to the Container Yard Tallying

- Issuing dock receipt or shipping order
- The physical movement of cargo in or out of a Container Freight Station Stuffing, sealing and marking of containers for labelling and identification
- Storage of containers
- Ordinary sorting and stacking of containers pre or post shipment Preparing containers internal load plan.

20.7 SUMMARY

Thus, containerization is the process of moving goods from one place to another as it is a method of distributing goods in unitized form there making it convenient to establish an intermodal transport system which can be a combination of railways, roads, waterways or airways. Containers are usually standard sized .documents require for container depots and container freight. A significant share of international containers is either owned by shipping lines that tend to use them has a tool to help fill up their ships or by leasing companies using containerized assets for revenue generation. In the United States, a large amount of domestic containers of 53 foot are also used. Double stacking of containers on railways (COFC: Containers On Flat Cars) has doubled the capacity of trains to haul freight with minimal cost increases, thereby improving the competitive position of the railways with regards to trucking for long-haul shipments.

While it is true that the maritime container has become the workhorse of international trade, other types of containers are found in certain modes, most notably in the **airline industry**. High labor costs and the slowness of loading planes, that require a very rapid turnaround, made the industry very receptive to the concept of a loading unit of standard dimensions designed to fit the specific shape of the belly hold. The maritime container was too heavy and did not fit the rounded configuration of a plane's fuselage, and thus a box specific to the needs of the airlines was required. The major breakthrough came with the introduction of wide-bodied aircraft in the late 1970s. Lightweight aluminum boxes, called unit load devices, could be filled with passenger's baggage or parcels and freight, and loaded into the holds of the planes using tracking that requires little human assistance.

Containerization represents a revolution in the freight transport industry, facilitating both economies of scale and improvements in handling speed and throughput, with containerized traffic has surged since the 1990s. This underlines the adoption of the container as a privileged mean to ship products on international and national markets, particularly for non bulk commodities where the container accounts for more than 90% of all movements. Containerization leans on growth factors mainly related to globalization, substitution from break bulk and more recently the setting of intermediate transshipment hubs. Although containerization initially superimposed itself over existing transportation systems, as it became a dominant mean of freight transportation it created its own unique

system of exclusive modes and terminals. Thus, the container became a standard unit around which a new transportation system was built, including specialized modes and terminals.

Globalization and containerization as closely interrelated. According to UNCTAD, between 1970 and 1990 trade facilitation measures accounted for 45% of the growth in global trade while membership to global trade organization such as GATT/WTO accounted for another 285%. The container accounted for an **additional 790%**, exceeding all the other trade growth factors put together. The diffusion and adaptation of transport modes to containerization is an ongoing process which will eventually reach a level of saturation. Containers have thus become the most important component for rail and maritime intermodal transportation. The challenge remains about the choice of modes in an intermodal transport chain as well as minimizing the costs and delays related to moving containers between modes. As the use of intermodal transportation increased and became more complex (e.g. international trade), transactional costs and inefficiencies became increasingly apparent. New innovations involve the usage of the blockchain technology, as distributed electronic ledger, to support the complex array of transactions and information flows related to intermodal transportation.

20.8 GLOSSARY

Inter modal freight- it refers to mental model a representation of reality within the mind of an individual internal modal principle .

Standardized dimensions –it is the process of implementing and developing .

Forklift trucks –a small industrial vehicle with a power-operated pronged platform that can be raised and lowered for inertation under a load to be lifted and moved to stack by use of a vehicle.

Dramatically - Suddenly or obviously in a very sudden way.

Congestion in ports – to blocked and caving difficulties congested roads and towns have too much traffic.

Subsequent- coming after something in times happening after something else.

Reduction-the action or fact of making something smaller or less in amount .

Destination-the place to which someone or something is going or being send .

Multiple handling –a unit loud is either single unit of a item or multiple unit so arranged or respond or reshicted that they can be mowed.

Cargo- in shipping break bulk cargo or general cargo are goods that much be loaded individually and not in a intermodal containeus nor in bulk as with oil or gain.

Break-bulk freight ; Stuffing ; Bill of loading ; Maiden voyage

20.9 SELFASSESSMENTQUESTION

Q1 Describe containerization

Q2 Write a detail note on CDS and CFS.

Q3 What are the advantages of Containerization

20.10 END EXCERSIES QUESTION

Q1 Discuss in details about containerization.

Q2 List all the types of containers explain with example.

20.11 REFERENCE

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- Shipping container by craig martin published on 28 January 2016

WAREHOUSING

STRUCTURE

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21.1 INTRODUCTION

In its simplest form, “warehousing” is the storage of goods until they are needed. satisfy customers needs and requirements while utilizing space, equipment, and labor effectively. The goods must be accessible and protected. Meeting this goal requires constant planning and ongoing change.

Warehousing is an unavoidable cost and that it provide a necessary service to

customers The needs of all of your customers must be considered in all warehouse-planning activities. Otherwise, rather than meeting their needs,

Storage involves proper management for reversing goods from the time of their production or purchase till actual use. When this storage on large scale and in a specified manner it is called warehousing

21.2 OBJECTIVES

Objectives; After going through this lesson the you should be able to understand about Concept of Warehousing depositor and warehouseman. The elements and functions of warehousing.

Objectives of warehouse

- Decreased Shrinkage.
- Increased Turnover.
- Better Production Processes.
- Safety Optimal Basic Storage. For many small-business owners, the main objective for building a warehouse or renting warehouse space is simply to store inventory.
- Efficient Accessibility.
- Decreased Shrinkage.
- Increased Turnover.
- Better Production Processes.
- Safety Optimal Basic Storage. For many small-business owners, the main objective for building a warehouse or renting warehouse space is simply to store inventory.

Efficient Accessibility

1. Maximum use of space.
2. Ready access to all items.

3. Efficient movement of goods.
4. Effective utilization of labour & equipment's
5. Maximum protection of items
6. Good-house-keeping
7. Goods are stored at one place from the time of production until they are demanded by the consumers.
8. In order to meet fluctuations in demand, warehouses act as a cushion.
9. In order to meet the demand promptly, it is necessary to have some goods ready in warehouse.
10. Certain items like umbrella, woolen items, desert coolers etc. are required in a par-ticular season. Such items are manufactured and stored in warehouses to meet the seasonal demands.
11. Warehouses are needed to preserve the goods and also to minimize the risk of damage due to natural factors.

21.3 CONCEPT AND MEANING OF WAREHOUSING

A warehouse is a building for storing goods. Warehouses are used by manufacturers, importers, exporters, wholesalers, transport businesses, custom Warehousing is an integral part of every logistics system, that:

- Stores products (raw materials, parts, goods in process, finished goods at and between point of origin and point of consumption
- Provides information to management on the status, condition and the disposition of product being stored Warehousing is used for carrying inventories in every s They are usually large plain buildings in industrial parks on the outskirts of cities, towns or villages. They usually have loading docks to load and unload goods from trucks. Sometimes warehouses are designed for the loading and unloading of goods directly from railways, airports, or seaports. They often have cranes and forklifts for moving goods, which are usually placed on ISO standard pallets loaded into pallet racks. Stored goods can include any raw materials, packing materials, spare

parts, components, or finished goods associated with agriculture, manufacturing, and production. In India, a warehouse may be referred to as a godwon.

A simple definition of a warehouse is:

A warehouse is a planned space for the storage and handling of goods and material.’

(FritzInstitute)

In general, warehouses are focal points for product and information flow between sources of supply and beneficiaries. However, in humanitarian supply chains, warehouses vary greatly in terms of their role and their characteristics

PRODUCER OF WAREHOUSING

The procedures document defines step by step how the activities in the warehouse should be carried out and clearly defines the processes to be adopted. These can be adopted as ‘best practice’.

The procedures provide visibility of the operations for managers and donors.

However, in creating such procedures, care must be taken to avoid constraining the use of local initiative which might be required to deal with local conditions. Procedures should be considered as streamlining the business processes and providing checks and balances. They provide guidance to warehouse managers and must have some level of flexibility to cater to unique situations. This can be achieved by limiting the level of detail that the procedures document defines, allowing more flexibility and/or by arranging ‘dispensations’ to allow departure from the procedures in order to optimize local performance, especially in emergencies.

The procedures will normally provide the step by step guidance on how to manage each aspect of warehousing and may cover: receiving and issuing of supplies, quality control or verification; storage of goods, how to control stock movement (stock control documentation flow; how to detect and deal with stock losses; how rejected material will be managed; and how to deal with unwanted material, obsolete and scrap, disposal one should look beyond the basic need of a warehouse to store things.

Whilst, this is correct there are also other considerations the volume of goods; speed of through-put required as a transit point; breaking bulk location; an area for sorting

and consolidating different goods; to enhance the speed of the response; to protect and account for inventory; and as a buffer in the event of a break-down or delay in the supply pipeline.

1. Determining Storage Requirement

Selecting a suitable location for a new warehouse facility. There are a range of factors to consider when deciding on the location of a new warehouse facility and these may vary depending on whether you are selecting a location for a temporary building or selecting from one of a number of existing buildings.

These may include proximity to ports of entry and beneficiaries, existing buildings, security, the context, site condition access services land size available for the purpose of warehouse previous use of the facility floor weight.

2. Warehouse Selection

Factors to consider nature and characteristics of goods to be stored; nature of equipment available; duration of storage needed i.e. short term or long term; the need for other activities. repackaging, labeling, kitting, etc; access and parking for vehicles; number of loading docks required; and secure compound.

3. Warehouse Preparation Planning Space layout

The areas that should be planned are both the general storage areas and the areas for goods receipt, consignment picking and goods dispatch. It is also desirable that space should be set aside for the following activities: equipment maintenance and parking; charging of equipment batteries such as pallet trucks; refueling of trucks; an area for garbage disposal e.g. empty packaging; a quarantine area for keeping rejected goods, goods to be sent back or destroyed; an employee rest area; washroom; and an administration office.

4. Planning

It is worth keeping these requirements in mind during the planning of the main operating areas. Planning consideration needs to be given to the following: allocate space for each type of product and locating number; allow sufficient space for easy access to the stacks for inspecting, loading and unloading. Stacks should be one meter from the walls and another meter between stacks; sizing the goods receipt and despatch area; allow

space for storage of cleaning materials and supplies; allocate areas for damaged items by consignment number; allow sufficient space to repackage damaged items and place it in separate stacks; sufficient free space is needed to operate a warehouse effectively. When planning the size of a warehouse consider: planning on having about 70-80% utilisation of available space, whilst considering: throughput rate number of stock keeping units (SKU) handling characteristics of items, etc.

5. Warehouse storage space Special storageneeds

Some relief items require special attention in terms of the type and security of the storage area. For example: Medical supplies and drug shipments can contain a large number of small, highly-valued and, often, restricted items, many with a limited shelf-life. Thus, a secure area is required, as well as judicious attention to expiry dates. Hazardous products such as fuels, compressed gases, insecticides, alcohol, ether and other flammable, toxic or corrosive substances must be stored separately, preferably in a cool, secure shed. The compound but outside the main warehouse. Antibiotics and vaccines may require temperature-controlled cold storage arrangements, with sufficient capacity and a reliable, as well as a back-up, power source. With combustible items, such as alcohol and ether, specific attention is required when storing and handling. Inventory management techniques need to be implemented to prevent wasteful surpluses and to ensure proper stock rotation to avoid costly losses due to expired goods. Procedures for controlling, preserving and releasing medical supplies and drugs should be established in consultation with the medical experts. The warehouse operation is composed of four key work activities: goods receipt storage picking goods dispatch

To estimate the resource requirement for the whole warehouse, one should start by estimating the requirements for each of the key work activities in turn and the level of demand. Then, the resource requirements for all activities should be combined together, taking into account the way that the activities are phased during the working day, in order to make an estimate of the total resources required.

The following steps should be consider for managing Warehouse Operations.

- Planning the workload allocating resources
- Space utilization & handling, receiving goods, storing goods.

- Assembling consignments dispatching consignments
- Disposal of goods pest control
- Security inventory management handling and stacking techniques
- Occupational health and safety

Managing Inventory Levels

It has been established that the role of inventory management is to ensure that stock is available to meet the needs of the beneficiaries as and when required.

Inventory represents a large cost to the humanitarian supply chain. This is made up of the cost of the inventory itself, plus the cost of transporting the goods, cost of managing the goods (labor, fumigation, repackaging, etc) and keeping the goods in warehouses. The inventory manager's job is to make inventory available at the lowest possible cost.

In order to achieve this, the inventory manager must ensure a balance between supply and demand by establishing minimum holding stocks to cover lead-times. To achieve this, the inventory manager must constantly liaise with the programs to keep abreast of changing needs and priorities. The warehouse must always have sufficient stocks to cover the lead-time for replacement stocks to avoid stock-outs.

Inventory Control

There are two methods of inventory control that are applicable to emergency situations:

- a) Reorder level policy.
- b) Reorder cycle policy.

Both are applicable to humanitarian situations and have associated pros and cons. Note that economic order quantity (EOQ) in practice only works in a fairly stable environment where demand variability and replenishment lead-time are reasonably stable and predictable. This is not the case in an emergency. Economic order quantity is applicable in more stable environments such as refugee camps and perhaps later in a relief/recovery phase.

Inventory management in an emergency is more 'project based', matching supply with demand in a rapidly changing environment. This requires building a supply chain that has a high level of flexibility and adaptability, with rapid identification of need and rapid fulfilment of that need through the supply chain.

In managing this sort of system, inventory should be considered in relatively small quantities (inventory packages of associated relief items) that are attached (pegged) to an identified need then moved (and tracked) through from source to the identified need (the user).

Optimization comes from having logistics systems that can configure, procure and consolidate these packages quickly and a distribution chain that is flexible and can adapt to changing requirements quickly and at least cost.

Information systems that facilitate transparency of the supply chain inventory levels, location, and demand provide the necessary visibility to facilitate good planning and effective decisions that maximize services and reduce costs.

Stock control and movements

The warehouse/inventory manager is responsible for monitoring the movement of goods as they are transported from the supplier and for the control of stock movement in the warehouse facility.

The vital stock control measurements include:

Establish levels of operating stocks based on consumption/rate of usage. The stock levels shall be reviewed from time to time depending on current needs.

Ensure that weekly and monthly stock balances reports of each stock item and the total value is prepared.

Maintain monthly stock usage report of each item kept in the store and the overall in the usage trend in last six months

Review and report on six monthly basis slow moving items indicating the last movement date the unit value and total value and liaise with user department;

Establish quantity, lead -time and availability of each item supplied on the market;

Keep a record of all non-stock items received from suppliers, returned to suppliers and issued out. controlling stock movements: establishing minimum stock levels and monitoring the same; goods receipt quality inspections; physical stock control in the warehouse.

Controlling Specialized Items : and releasing stock from storage and goods dispatch. To facilitate and account for movement of stocks the following documents could be used: delivery notes or waybill samples 1 goods received notes, see several samples stock card; bin card; and consignment notes.

Resource Requirements

In addition to the work methods, equipment and space requirements it is essential that the warehouse is adequately resourced. This is done by planning or estimating the requirements for people and equipment in order to operate the warehouse facility.

There is a trade-off to be made between the people and handling equipment requirements for any given workload.

In global warehouse operations, which are run like commercial operations, the focus is on minimizing the cost of running the operation. In this situation, it is often better to invest in handling equipment and reduce the dependence on people resources.

However, in field operations, many humanitarian organizations prefer to hire local labor which provides employment instead of relying on handling equipment.

The requirement for the total amount of resources required will be determined by the amount of goods flowing into and out of the warehouse, as shown in the diagram below.

Basic Warehouse Equipment

Various types of equipment are required to ensure the smooth execution of work in a warehouse. All equipment should be properly stored when not in use and a regular maintenance schedule posted. Warehouse staff should be trained in standard daily maintenance practices and the correct use of equipment. Where necessary, they should be equipped with personal safety equipment such as work gloves, work boots, goggles, etc.

Required equipment may include: sufficient quantities of standard forms, calculators and stationery to keep proper storage records; small tools for opening cases, such as hammers, pliers, crowbars, steel cutters; tools and materials for store repair and simple maintenance; supplies for reconditioning damaged packaging, such as bags, needles, twine, oil containers, stitching machine, strapping machine, adhesive tape and small containers or cartons;

A sampling spear for inspecting foodstuffs scales for weighing goods.

Standard wooden pallets in sufficient numbers – ideally international. Standardization organization's "Euro" type (120 × 80cm).

Two-wheel hand trolleys for moving supplies within the warehouse. A pallet-jack to move pallets.

A forklift where pallets are to be loaded and offloaded from trucks.

Brooms, dust pans, brushes, shovels, sieves, refuse bins for cleaning and disposing of collected waste.

First aid kits, flashlights, fire extinguishers and other fire-fighting equipment both inside and outside the warehouse.

Weighing scales and ladders.

Care of Warehouse equipment

Warehouse equipment is maintained to prevent accidents and breakdowns from occurring.

Maintenance activities consist of inspections, regular servicing and monitoring performance for failure trends, as this will enable symptoms to be recognised before failure occurs.

Equipment maintenance has a strong health and safety bias. Often health and safety legislation will impose on management an obligation.

Legal Considerations

Leasing Temporary Warehouses/Contracting.

The common practice in emergencies is to lease or rent, not purchase warehouses. In this situation, there is often a shortage of suitable buildings or locations for warehouse space and this can often cause the costs to increase significantly. Therefore, it is often necessary to utilise temporary warehouse space for as short a time as possible.

21.4 CONCEPT OF WAREHOUSE DEPOSITOR AND WAREHOUSEMAN

Need for storage arises both for raw material as well as finished products. Storage involves proper management for reversing goods from the time of their production or purchase till actual use. When this storage on large scale and in a specified manner. Concept of warehouse depositor and warehouseman “including any protected place conforming to all the requirements including warehouse means any premises (manpower specified by the Authority by regulations wherein the warehouseman takes custody of the goods deposited by the depositor and includes a place of storage of goods under controlled conditions of temperature and humidity.

“Warehousing business” means the Business of maintaining warehouses in storage of goods and issuing negotiable warehouse receipts. “warehouse receipt” means an acknowledgement in writing or in electronic form issued by a warehouseman or his duly authorized representative (including depository by whatever name called) of the receipt for storage of goods not owned by the warehouseman. A “warehouseman” is the one who has been granted a certificate of registration in respect of any warehouse or warehouses by the Authority or an accreditation agency for carrying on the business of warehousing.

Definitions of the act, Warehousing (Development and Regulation) Act, 2007. “depositor” means a person who delivers goods to the warehouseman.

“Warehouseman” means any person who is granted a certificate of registration in respect of any warehouse or warehouses by the Authority or an accreditation agency for carrying on the business of warehouse.

The term “depositor” means the shipper, consignee, owner of the goods or its agents, including, but not limited to, motor carriers, motor freight brokers and draymen and/or any entity that places or maintains a chassis/trailer pool at the warehouseman’s facility identified in this warehouse receipt.

LIMITATIONS OF DEPOSITOR & WARE HOUSE MEN

LIABILITY ACCEPTANCE – Sec. 1

(a) This contract and rate quotation including accessorial charges endorsed on or attached hereto must be accepted by signature of depositor. In the absence of written acceptance, the act of tendering goods described herein for storage or other services by warehouseman shall constitute such acceptance by depositor.

(b) In the event that goods tendered for storage or other services do not conform to the description contained herein, or conforming goods are tendered without prior written acceptance by depositor as provided in paragraph (a) of this section, warehouseman may refuse to accept such goods. If warehouseman accepts such goods, depositor agrees to rates and charges as may be assigned and invoiced by warehouseman and to all terms of this contract.

(c) This contract may be canceled by either party upon 30 days written notice and is canceled if no storage or other services are performed under this contract for a period of 180 days.

STORAGE PERIOD AND CHARGES – Sec. 2

(a) Unless otherwise stated herein, all charges for storage are per each unit of measure per calendar year or any fraction thereof.

(b) Storage charges become applicable upon the date that warehouseman accepts care, custody and control of the goods, regardless of unloading date or date of issue of warehouse receipt.

(c) Except as provided in paragraph

(d) of this section, a full month's storage charge will apply on all goods received between the first and the 15th, inclusive, of a calendar month; one-half month's storage charge will apply on all goods received between the 16th and last day, inclusive, of a calendar month, and a full month's storage charge will apply to all goods in storage on the first day of the next and succeeding calendar months. All storage charges are due and payable on the first day of storage for the initial month and thereafter on the first day of the calendar month.

(d) When mutually agreed by the warehouseman and the depositor, a storage month shall extend from a date in one calendar month to, but not including, the same date of the next and all succeeding months. All storage charges are due and payable on the first day of the storage month.

TRANSFER, TERMINATION OF STORAGE, REMOVAL OF GOODS - Sec. 3

(a) Instructions to transfer goods on the books of the warehouseman are not effective until delivered to and accepted by warehouseman, and all charges up to the time transfer is made are chargeable to the depositor of record. If a transfer involves re-handling the goods, such will be subject to a charge. When goods in storage are transferred from one party to another through issuance of a new warehouse receipt, a new storage date is established on the date of transfer.

(b) The warehouseman reserves the right to move, at his expense, 14 days after notice is sent by certified or registered mail to the depositor of record or to the last known holder of the negotiable warehouse receipt, any goods in storage from the warehouse in which they may be stored to any other of his warehouses; but if such depositor or holder takes delivery of his goods in lieu of transfer, no storage charge shall be made for the current storage month. Warehouseman will store the goods at, and may without notice move the goods within and between, any one or more of the warehouse buildings which comprise the warehouse complex identified on of this warehouse receipt.

(c) The warehouseman may, upon written notice to the depositor of record and any other person known by the warehouseman to claim an interest in the goods, require the removal of any goods by the end of the next succeeding storage month. Such notice shall be given to the last known place of business or abode of the person to be notified. If goods are not removed before the end of the next succeeding storage month, the warehouseman may sell them in accordance with applicable law.

(d) If warehouseman in good faith believes that the goods are about to deteriorate or decline in value to less than the amount of warehouseman's lien before the end of the next succeeding storage month, the warehouseman may specify in the notification any reasonable shorter time for removal of the goods and in case the goods are not removed, may sell

t.hem at public sale held one week after a single advertisement or posting as provided by law.

(e) If as a result of a quality or condition of the goods of which the warehouseman had no notice at the time of deposit the goods are a hazard to other property or to the warehouse or to persons, the warehouseman may sell the goods at public or private sale without advertisement on reasonable notification to all persons known to claim an interest in the goods. If the warehouseman after a reasonable effort is unable to sell the goods he may dispose of them in any lawful manner and shall incur no liability by reason of such disposition. Pending such disposition, sale or return of the goods, the warehouseman may remove the goods from the warehouse and shall incur no liability by reason of such removal.

LIABILITY AND LIMITATION OF DAMAGES - Sec. 4

(a) The warehouseman shall not be liable for any loss or injury to goods stored however caused unless such loss or injury resulted from the failure by the warehouseman to exercise such care in regard to them as a reasonably careful man would exercise under LIKE CIRCUMSTANCES and warehouseman is not liable for damages which could not have been avoided by the exercise of such care.

(b) Goods are not insured by the warehouseman against loss or injury however caused.

(c) The depositor declares that damages are limited to the estimated value as stated previously or 100 times the storage rate identified for box storage and 300 times the monthly storage rate identified for pallet storage not to exceed one year's storage. such liability may at the time of acceptance of this contract as provided in section 1, can be increased upon depositor's written request on part or all of the goods hereunder in which event an additional monthly charge will be made based upon such increased valuation.

(d) Where loss or injury occurs to stored goods, for which the warehouseman is not liable, the depositor shall be responsible for the cost of removing and disposing of such goods and the cost of any environmental cleanup and site remediation resulting from the loss or injury to the goods.

NOTICE OF CLAIM AND FILING OF SUIT - Sec.5

(a) Claims by the depositor and all other persons must be presented in writing to the warehouseman within a reasonable time, and in no event longer than either 60 days after delivery of the goods by the warehouseman or 60 days after depositor of record or the last known holder of a negotiable warehouse receipt is notified by the warehouseman that loss or injury to part or all of the goods has occurred, whichever time is shorter.

(b) No action may be maintained by the depositor or others against the warehouseman for loss or injury to the goods stored unless timely written claim has been given as provided in paragraph of this section and unless such action is commenced either within nine months after date of delivery by warehouseman or within nine months after depositor of record or the last known holder of a negotiable warehouse receipt is notified that loss or injury to part or all of the goods has occurred, whichever time is shorter.

(c) When goods have not been delivered, notice may be given of known loss or injury to the goods by mailing of a registered or certified letter to the depositor of record or to the last known holder of a negotiable warehouse receipt. Time limitations for presentation of claim in writing and maintaining of action after notice begin on the date of mailing of such notice by warehouseman.

LIABILITY FOR CONSEQUENTIAL DAMAGES - Sec. 6

Warehouseman shall not be liable for any loss of profit or special, indirect, or consequential damage³⁰s of any kind.

MYSTERIOUS DISAPPEARANCE - Sec. 7

Warehouseman shall not be liable for loss of goods due to inventory shortage or unexplained or mysterious disappearance of goods unless depositor establishes such loss occurred because of warehouseman's failure to exercise the care required of warehouseman under Section 11 above. Any presumption of conversion imposed by law shall not apply to such loss and a claim by depositor of conversion must be established by affirmative evidence that the warehouseman converted the goods to the warehouseman's own use.

RIGHT TO STORE GOODS - Sec. 8

Depositor represents and warrants that depositor is lawfully possessed of the goods and has the right and authority to store them with warehouseman.

Depositor agrees to indemnify and hold harmless the warehouseman from all loss, cost and expense (including reasonable attorneys' fees) which warehouseman pays or incurs as a result of any dispute or litigation, whether instituted by warehouseman or others, respecting depositor's right, title or interest in the goods. Such amounts shall be charges in relation to the goods and subject to warehouseman's lien.

ACCURATE INFORMATION - Sec. 9

Depositor will provide warehouseman with information concerning the stored goods which is accurate, complete and sufficient to allow warehouseman to comply with all laws and regulations concerning the storage, handling and transporting of the stored goods.

Depositor will indemnify and hold warehouseman harmless from all loss, cost, penalty and expense (including reasonable attorney's fees) which warehouseman pays or incurs as a result of depositor failing to fully discharge this obligation.

SEVERABILITY and WAIVER - Sec. 10

(a) If any provision of this receipt; or any application thereof, should be construed or held to be void, invalid or unenforceable, by order, decree or judgment of a court of competent jurisdiction, the remaining provisions of this receipt shall not be affected thereby but shall remain in full force and effect.

(b) Warehouseman's failure to require strict compliance with any provision of the Warehouse Receipt shall not constitute a waiver or estoppel to later demand strict compliance with that or any other provision(s) of this Warehouse Receipt.

(c) The provisions of this Warehouse Receipt shall be binding upon the depositor's heirs, executors, successors and assigns; contain the sole agreement governing goods stored with the warehouseman; and, cannot be modified except by a writing signed by warehouseman.

The depositor shall not designate the warehouseman to be the consignee for any goods under any bill of lading, waybill, air waybill, or any other transportation contract. If, in violation of this agreement, goods are shipped to the warehouseman as named consignee, the depositor agrees to notify carrier in writing prior to such shipment, with copy of such notice to the warehouseman, that warehouseman named as consignee is a warehouseman and has no beneficial title or interest in such goods and the depositor further agrees to indemnify and hold harmless the warehouseman from any and all claims for unpaid transportation charges, including undercharges, demurrage, detention or charges of any nature, in connection with goods so shipped.

The depositor further agrees that if it fails to notify carrier as required by the preceding sentence, the warehouseman shall have the right to refuse such goods and shall not be liable or responsible for any loss, injury or damage of any nature to, or related to, such goods.

A **warehouseman** can be someone who works in a warehouse, usually delivering goods for sale or storage, or, in older usage, someone who owns a warehouse and sells goods directly from it or from a shop fronting onto the warehouse similar to a modern.

- Noun one who keeps a warehouse; the owner or keeper of a dock warehouse
- Noun a workman who manages or works in a warehouse.

Noun, plural warehousemen.

a person who stores goods for others for pay.

a person who is employed in or who manages a warehouse

RESPONSIBILITIES OF A DEPOSITOR

If you are the person who placed the goods under the customs warehousing procedure – a depositor in a public warehouse or a private warehousekeeper – you are bound by the declaration placing the goods under the procedure. You must ensure that:

- The goods are sent directly to the warehouse shown on the declaration and
- That the customs warehousing procedure is discharged by declaration of the goods to another customs approved treatment or use.

If you are using a public warehouse, you are responsible for providing the warehousekeeper with all the necessary details of the declaration that entered the goods to the customs warehousing procedure to enable the warehouse stock records to be updated (such as the quantity and a description of the goods).

RESPONSIBILITY OF WAREHOUSEMAN A warehouseman, or warehouse worker, may be tasked with any of a variety of duties that keep a warehouse running efficiently.

Responsibilities often include the following:

- Assisting shipping and receiving by unloading trucks and checking in products or materials.
- Preparing orders by processing requests, pulling orders, packing boxes and transporting packages to the shipping area.
- Sorting and placing warehouse items, as directed by organizational standards.
- Maintaining inventory controls.
- Preparing packages for mailing.
- Ensuring clean and safe working environment.

Education Requirements

There are no formal education requirements for a position as a warehouseman. Employers generally prefer a high school diploma or equivalent. Previous warehouse experience is sometimes required, although because warehouse operations can vary from one employer to another, on-the-job training is usually provided. It's important that the warehouseman have good communication, organizational and time management skills. As with any job, employers seek workers who are dependable and reliable. Certain physical requirements are necessary for performance of a warehouse job. Workers regularly lift and move objects. In some cases, workers are expected to lift heavier weight. Warehouse workers spend a lot of time on the move; they are frequently required to stand, walk, bend and kneel. Depending on the job, they may be expected to climb and balance. For the safety of the workers and others, a warehouseman needs good vision and hearing. Although certification is not required to operate heavy equipment such as pallet jacks and forklifts,

earning a credential can be an asset when looking for a job, since it demonstrates knowledge of the equipment and commitment to safety.

Work Environment

Warehouse workers may work indoors or outdoors. Warehouses are not necessarily climate-controlled, so you may be working in the heat or cold, even if you're inside all the time. A warehouse worker may work full-time, part-time or perform shift work that involves evenings, nights, weekends or holidays.

Warehouse Resume Sample

Many warehouse positions are entry-level, so prior experience is not required. When writing a resume, be sure to list skills that an employer asks for in a job announcement.

- Proficient with computer software, including data entry programs, Word and Excel.

If you have experience, you may be qualified for higher wages or a supervisory position. On a resume, briefly explain duties performed at your previous position:

- Received shipments and stored products in warehouse.
- Coordinated transfers of products between several facilities.
- Oversaw all products leaving the warehouse to ensure accuracy of shipments.
- Performed weekly inventory to find damaged or unacceptable products to improve quality control.

Salary and Job Outlook

The U.S. Bureau of Labor Statistics tracks data and makes projections for all civilian occupations. Warehouse workers are classified in several ways. Their occupational titles and average salaries are based on one day laborer charges or fix by per hours on monthly salary.

21.5 ELEMENTS OF WAREHOUSING

According to Sherman, in order to avoid the strategic faux pas described earlier, and to account for a firm's strategic personality, a pre-planning stage must be added to the strategic management process in order to create a baseline of the firm, a strategic profile

or inventory. The strategic profile of the firm centers the firm's strategy formulation processes by placing realistic delimiters on the strategies that are developed from analysis. Matching the firm's profile with the available strategic options creates a better strategic fit. The strategic profile consists of the strategic personality, the firm's structure, leadership, and organizational culture. The remainder of this article will be a step-by-step guide that will help firms construct a profile including forms and then provide recommendations for how to use the profile for guiding strategy development and implementation. That is the initiative to make the warehouse activities well-oiled with identify root causes. In the other hand, this profiling activity is to improvements all the process in warehouse and lastly for provide decision making.

There have two main categories in warehouse profiling activities such as customer order profiles and item activities profiles. First is a customer order profile. According Cooper and Mulaik, customer order profiles represent the outbound activity. That means it is an outbound activity that would deal with behavior of customer orders and fill up their orders. In the other word, this activity indicates the ordering patterns and ordering products of customer orders. There are four types of customer order profiles including order mix distribution, order increment distribution, order lines distribution, lines and cube per order distribution.

The item activity profile is used primarily to slot the warehouse, to decide for each item. First is what storage mode the item should be assigned to, second is how much space the item should be allocated in the storage mode, and lastly, where in the storage mode the item should be located (Frazelle, 2002). That means customer order profiles is represent the outbound activities, while in the item activity profiles is represent in house behavior of the items in the warehouse. This profile activity is preparation storage mode that could be used to locate the goods, the space needed to every item and the suitable place in the warehouse that should be located the entire item based on the types of item whether there are the small parts, medium parts, bulk, expensive parts or auto parts. The item activity profiles involving popularity distribution, cube- movement or volume distribution, popularity-volume distribution, order completion distribution, demand correlation distribution and demand variability distribution (Frazelle, 2002).

In the context of warehouse efficiency, the detailed analysis can give an idea and providing opportunity of how to prepare the future needs in warehouse operation such as receiving, putaway, storage, picking, packing, sortation, and shipping activities. These activities also can be a great help in understanding warehouse operations otherwise improved the productivity and conducting cost.

1. RECEIVING

After analyses of customer and items activities in the warehouse profiling are done, next is receiving in warehouse operation. Receiving activities in the warehouse can be considered as physically accepting material into warehouse, unloading the material it from the inbound transportation mode. Activities also include verifying the quantity and the condition of the material, and documenting this information as required, and arrange or ensconce the material to storage or to organizational function requiring them. We must be careful when receiving material or merchandise because if we didn't do properly it will become difficult to handle in other step in warehouse function.

The best receiving is no receiving. For activities receiving there are few steps to make the process of receiving become better and better. If we appoint this few step it will helping us in minimizing work content, mistake, time, and accident in logistics. So, we have to pay attention and more seriously when practices it. The 1st type is **direct shipping**. Direct shipping mean the material come into the warehouse then direct shipping to the customer. Direct shipping no need to pick location, picked, packed and loaded. Consequently, the labor, time, equipment, mistake and accident often occur in the warehouse are eliminated.

The 2nd type in receiving activities is **Cross-docking**. Cross-docking will be used when some material cannot doing by shipped direct. The few process in cross-docking is the merchandise is plan to send to the warehouse from vendors, Inbound is sorted into their order, outbound order are send to their outbound dock, no need to checking and no need to storage the product. In the other hand ,the other function of warehouse like receiving staging, putaway, storage, pick location replenishment and order assemble are no need .

The 3rd type in receiving activities is **receiving scheduling**. Receiving scheduling need ability to set inbound materials to match coordinate outbound requirement on a daily or even hourly basis. Capacity are need to schedule carrier and shift time consuming receipts to off-peak hours and make sure equilibrium receiving resource.

The 4th type in receiving activities is **prereceiving** the most time and space intensive activity in receiving function is receiving dock, because that time need hold material for location assignment, product identification.

The Final type in receiving activities is **receipt preparation**. When a product has been receiving we have to plans for the time to shipment. This is because when the product has order by customer that just has little time for additional preparation of the product period to shipment. Any Material that should be accomplished ahead of time should be accomplished. Those Preparatory activities include Prepackaging in issue increments, Applying necessary labels and tags and Cubing and Weighing for storage and transport planning.

The content in receiving has been show that receiving is important function in warehouse activities. That is because activities receiving in warehouse are receiving all the material and order from outside or other company. We need to pay all attention when the activities receiving is holding make sure the quantity and quality of material or goods is suit and accurate with ordered. In receiving activities, it's including upgrade the system look out the way to improve the system operation. Receiving activities also need to check and clear the receipts that have been receipt and make sure the receipt are not any error. Activities receiving not only important for the warehouse only, but if we practice it well, it will improving the productivity and efficiency of warehouse.

2. INVENTORY AUDIT

Inventory audit is one of activities in warehouse activities. Audit in warehouse have been use to evaluate changes in warehouse and completed in March 1996. Major change in since previously Activities inventory audit normally will handle by an auditor's. Major change in since previously was the implementation of the inventory module of the new oracle finance system. There got few objective in inventory audit, That is material has receiving need to check properly and records it immediately. Make sure all the inventory

complete and prefect. Warehouses were in acceptable condition and properly procured or returned to stock. No goods were removed from stock without proper authorization. When needed, goods are moved from the warehouse to production; perpetual inventory and cost accounting records are updated. Goods in stock were maintained at a cost effective level necessary to support City operations. Excess inventory levels were timely noted and adjusted in accordance with City policy. Goods stored at the warehouse were secured and protected from damage or Misappropriation. The environmental conditions and work practices at the Warehouse Complied with applicable safety standards.

The good and material and from receiving to the warehouse, goods are moved from receiving to a warehouse; perpetual inventory is updated, When needed, goods are moved from the warehouse to production; perpetual inventory and cost accounting records are updated, When finished, goods are moved from production to the warehouse; perpetual inventory and cost accounting records are updated for the second time, finally When sold, goods are shipped and perpetual inventory records are updated again

The auditor need to concern that the inventory plan has statistical validity, properly applied and achieves applied, and achieves reasonable results. Auditor also need always review customer procedure for investigating and evaluating the warehouse. Besides that the auditor still need observe the physical inventory count, and the quality and condition of the inventory. Auditor need selected a sample of inventory items from the customer count records and if a consignee holds a portion of the customer's inventory, auditor also need confirm that amount with consignee. Finally auditor need consider the effect of sales and purchases that cut off on inventories and test the cost accumulation process that affect valuation of ending inventories.

The Content in Inventory audit have been show that Inventory audit is a finance system quiet important in the warehouse function. When the stock or goods in receiving process, the stock will store in the storage based on their type and variety .In this case, inventory audit are need to check the record or count the stock properly. Inventory audit need to count how many cost and expenses of this stock and good, what stock is gain profit and available to sell in future, and what stock is loss or deficit. The auditor needs to pay attention when record and count the stock to avoid company from getting deficit. We have to make sure no any goods and stock are removed from the warehouse with any

proper authorization. When the good and stock are removed from the warehousing to production perpetual inventory and cost accounting records are need to record immediately. Inventory audit are important for a company, we need it to help us record our activity, if we practice it well, it can help the company to gain profit and make the process of company become more efficiency.

3. PUTAWAY

Putaway is order picking in reverse. Many of the principles that streamline the picking process work well for putaway. In order, the world-class principles for putaway are Direct putaway

- a) Directed putaway
- b) Batched and sequenced putaway
- c) Interleaving

The statement about explain the definition of putaway and the system that they use in putaway operation. Put away is the process of taking the product from the receiving area to put it into the most appropriate location. These processes follow the sequent from the first which is the receiving step and come the put away system. There are different kinds of put away system such as direct put away, directed put away, batch and sequence put away and interleaving. According to (Frazelle, 2002), goods that been transfer to warehouse from receiving point is best to directly ship to the shipping area without including a lot of operation in warehouse. But that not near possible to all goods that been transfer to the warehouse.

DIRECT PUT AWAY. Goods from receiving area are transfer direct to storage area without much of inspection and staging activities included. These types of goods can be for special goods zone. When using this method, they can prevent delay and multi handlings that always in the put away activities, but not all parts can be done with this kind of system. These special goods like expensive parts have to carefully taking care of and some time immediately transfer it in the special or normal storage. Therefore they have to reduce the unnecessary activities to prevent from damaging the goods.

Directed put away. Directed put away system work like giving near supplier to the production area. Parts are send to the designated area that easy and near the production area means that part are no longer in the store. The reason to put this way is that the parts are big and use a lot of energy to transfer from store to production area. Another things is the part are always been use in producing product and that require times to take the parts from the store if they didn't use this kind of method. With this, production people have to take the responsibility to make sure the parts in goods shape when it's outside the storage area.

BATCHED AND SEQUENCED PUT AWAY system. These techniques use the storage area fully. Each part from receiving point are categories before entering the store. Then the warehouse personnel sort each part according the label or category that include in the store. They can divide the storage by zone to make it easier to sort and find the part like zone 1 for small and medium part, zone 2 for expensive part and so on. That way they can aim to sort inbound material for effective put away.

INTERLEAVING SYSTEM, it requires the combination of putaways and retrievals process in a dual command. That mean personnel in putaway area have to move continuously from the picking area to the shipping area. Interleaving is similar to backhauling in transportation. (Frazelle, 2002).

In the context of warehouse efficiency, put away can reduce the time need for the storage personnel to do their job. It is because in the process of put away, goods are been divide according to the three kind of system (Frazelle, 2002) before store it in the storage. Not all goods need to be store in the same place like the expensive goods in the hand phone such as camera, LCD and many more. These goods need to be taken carefully and with the help of put away personnel the goods can be store directly from the receiving area. Some goods didn't have to go into the storage like the big part or the part that always been use in the production floor. That way production personnel also can safe time from the placing of parts near them.

4. STORAGE

After the put away activities finished, the receiving materials will be stored in the storage area. Warehouse storage is the main core and plays an important role in keeping

all the materials which are included raw materials, work in progress and final products that belong to the organization. There are several types of storage inside the warehouse.

First of all, we can commonly see the pallet racks in the warehouse. This kind of storage method was specially designed to fulfill the maximization of product that placed on the pallet. Every standard size of pallet was set to store inside the storage rack using forklift or stacker.

Next, the open floor storage which is useful for bulky products that usually occupied the space. For example, the large size material used to be placed beside the operation part because it makes the operator more convenience to take the materials. Besides that, storage of these bulky products would be easily counted by quantity and volume.

Furthermore, containers are used to store temporary goods which are ready to be shipped by the transportation. Normally we can see the containers are sealed in the truck, ships, railcars and planes. Automatic Storage and Retrieval System (ASRS) is defined by the AS/RS product section of the Material Handling Institute as a storage system that uses fixed-path storage and retrieval(S/R) machines running on one or more rails between fixed arrays of storage racks (Edward, 2002).

In the context of warehouse efficiency, space utilization is the main key of storage policies. Warehouse is not helping company to earn any money. To minimize the cost created by warehouse, space is utilized by storing as much as the warehouse afford. The criteria need to be considered is the size of the materials to be store. Normally, the materials are store regarding to their size. There are several sizes of the materials such as small, medium parts and bulky products.

Besides that, warehouse personnel can implement zoning strategies inside the storage zone. This is a way to recognize different types of materials that been stored inside which zone. Arrangement of the materials will be tidier and more systematic. By using Warehouse Management System (WMS), product code commonly used by the company to identified the details of the materials.

5. ORDER PICKING

Order picking is a process retrieving items from warehouse storage locations to satisfy customer orders (Petersen, 2002). Orders typically consist of a list of stock keeping

units or “line items” that specifies the delivery date, customer address, and method of payment as well as the type and amount of material required (Bozer and White, 1990).

The most common objective of order-picking systems is to maximize the service level subject to resource constraints such as labor, machines, and capital investment (Goetschalckx and Ashayeri, 1989). A significance relationship between order picking and service level is how quick an order can be replenished and the total time needed for sending out to the customer.

According to Bartholdi and Hackman, 2005, ‘travel time is waste. It costs labor hours but does not add value’. It is, therefore, a first candidate for improvement. The travel time can be reduced by increase the number of orders.

There are five methods of order picking that been used in the industry. Methods that employing humans to conduct are picker-to-parts, put system and parts-to-picker. While, automated picking and picking robots are totally done by robots. (Koster et al.2007).

Nowadays, there are two methods of order picking practice in the warehouse.

Firstly, single order picking that required one order should be completed by each order picker.

Second, orders that are batched together for order picker to retrieve are known as batch picking.

In the context of warehouse efficiency, order picking is recognized as task to fulfill customers’ order and satisfy customers’ need. Every workers includes the top management have to know the exactly place of the materials. The travel time increased due to the pickers do not know the exactly place that the parts stored. We should reduce the travel time to improve the picking accuracy and cut the costs.

6. PACKAGING

Packaging is important to the warehouse’s manager. This is because the size, shape, and type of packaging will affect warehouse operation. The size of the packaging may affect the ability of a company to use pallets, or shelving or different types of materials handling equipment. So some companies have to be given to the packaging in order to use

the warehouse efficiency. They design packages that are too high and too wide for efficient use of a warehouse.

Besides that, goods stored in a warehouse have to be identified properly so that they can locate correctly and easily. Packaging is improvement of efficiency in handling and distributing packages. A major concern in dealing with packaging is the ease of handling in conjunction with materials handling and transportation. The important considerations fall to three areas, physical dimensions of the package, strength of the packaging, and packaging shape.

Generally, there are two types of packaging, consumer packaging or interior packaging, and industrial or exterior packaging. The marketing manager is usually concerned about the former since the consumer packaging provides information important in selling the product. The logistics manager is usually concerned with industrial packaging. This is the area that provides protection to the goods that will be moved and stored in the warehouse and permits the effective use of the space available of transportation vehicles.

The most common are used in corrugated fibreboard, steel, plastic, and wood. Corrugated fibreboard is most commonly used for consumer durables, such as washing machines, matchboxes, paints, and electronics goods. Steel is recommended for chemicals and lubricants. Plastic is quite common in logistical packaging, different types of plastic for different types of goods, such as plastic straps are used for unitized material in small packs. Wood is commonly used for construction of pallets or crates.

The packaging cost depends on the type of product. The maximum expenditure is on worthy packaging.

7. SORTATION

Sortation in this context refers to the proper arrangement of many different SKUs (stock-keeping units) for storage and/or for picking into individual customer orders (Tompkins et al. 2003). From the definitions given, we can conclude that a sortation activity is the process of goods arrangement for separate the items based on their specifications of many different SKUs or stock keeping units. According to Koster et al (2007), when batching and or zoning is applied, usually some additional effort is needed to split the batch and to consolidate the items per customer order or per destinations to

which orders will be shipped. These processes are often called accumulation or sorting (A/S). It would be easier for storage and shipping to doing their working stage completely into individual customer orders.

According to Rushton et al (200), sortation might occur immediately after picking so that items can be assembled into the appropriate orders ready for packing or dispatch. Where there is a separate packing operation, sortation may also occur after packing so that the packed goods can be assembled into vehicle loads. Sortation after packing goods could be assembled into vehicle loads in the same time it can increase the warehouse productivity and reduce the waiting time in the warehouse operations.

In the other words, according to Gu et al (2007), sortation can be performed either during the picking process or after the picking process. When it performed during the picking process there quite straightforward and is typically modeled by inflating the item extraction time. Besides that, after the picking process in sortation activity functional is perform by a separate downstream sorting system. Sorting system used in warehouse usually includes an accumulation conveyor, a recirculation conveyor, and exit lanes, and they operate simultaneously on all the orders in a single pick-wave.

High speed sortation systems normally use a continuous loop conveyor moving between off-take chutes or conveyors set around both sides of the main conveyor. There are three of high speed sortation systems that available to ensure the warehouse efficiency could increase. It includes sliding shoe sorters, tilt-tray sorters and cross-belt sorters. Firstly, the sliding shoe sorters. It functions when the goods would reach the appropriate destination point and the shoes slide across to divert the goods down the spur. These systems are suitable for cartons and tote bins of regular shape and reasonable rigidity typically operating rates are about 4,000 to 6,000 sorts per hour. Secondly are tilt-tray sorters. The configuration normally laid out in horizontal carousel by tilting conveyors could use for high speed sortation operation such as parcel distribution and cross docking installations. Lastly, cross-belt sorters, this sorters process starts up with appropriate of mini conveyor when the item reaches and the movement suitable for a wide range of items (Rushton et al,).

In the context of warehouse efficiency, selection of sortation systems or selecting the compact requirement can increase the operation of a warehouse and in the same time

can reduce space requirements during warehouse activities. For example when large sortation system may be replaced by several small systems placed at various regions of the warehouse. Further, narrow aisle trucks help reduce aisle space (Hassan, 2002). Besides that effectiveness and speed of application system could increase when information technology and coding system such as bar code are used.

8. UNITIZING AND SHIPPING

According to Rogers (2010), unitizing is the process of aggregating several items into a single unit load. That means all the goods would be assembled become a single load so that the unitizing process makes the loading trucks process easier and efficiency based on customer needs. In the same time it also could reduce the waiting time and storage cost. Meanwhile, shipping is the last sequence in the warehouse operations.

According to Faber et al (2002), shipping generates information to control the organizations of loads. Shipping documents like bill of loading, custom clearance are prepared. These activities would be involved of loading goods into carrier and leave the warehouse through the shipping docks. While the loading process, there would committing the final check before shipping invoice and for possible damage are made (Gunasekaran et al, 1999). This final check is important because it can show whether the need of the entire document related to the goods is fulfill the specification requirement or not. There are few of common unitizing and shipping activities and it includes container optimizations.

According to Frazelle (2002), there are few of common shipping activities including container optimization, container loading and void fill, weigh checking, automated loading and dock management. First is container optimization, select cost and space-effective handling units that means shipping selection from all kinds of containers such as cartons, totes, pallet, trailers and others could be determine whether the efficiency in warehouse can achieve or not. Containers should have features to protect, secure, and identify the merchandise they contain such as position container lock and seal and bar code container tracking to provide a better view of warehouse operation. Containers should be arranged in stack and net easily to prevent space wastage for eliminating extra bulk as well for store more product in the same place besides to provide an easy for any tracking and tracing.

Besides that, container load plans should be developed to prevent load failure with conduct a visual inspection (Rogers, 2010). It could be start from see whether the

load is wrapped at the top, middle and bottom and ensure there is not wrapping material trailing off loading. These methods could prevent to expend time and money for unloading a truck with the damage goods and should not be selling.

Environmentally friendly should be stressed while dunnage in order to overcome the unexpected damage when transfer process and in transit such as air pack, Styrofoam pads and polystyrene peanuts. The dunnage features needs to be recyclable and reusable to reduce the impact of landfills. Some examples of the recyclable and reusable containers are plastic pallets, plastic totes collapsible roll cages, and multiuse corrugated containers. Air packs and Styrofoam are the example recyclable and reusable dunnage.

Furthermore outbound containers should be weighed and cubed for load planning purpose. Weigh checking is important to detect whether the goods are done in the right process before there arrive in this stage. Any picking and packing error should be measured before product loading and would be sending to the customers.

In the context of warehouse efficiency, shipping activities help in term of reduce the error with checking goods while loading into the carrier. This process to ensure the goods are fulfils the requirements specification. In the other hand, shipping also can reduce cost with using the recyclable and reusable containers besides reduce the impact of landfills become environmentally friendly.

9. HEALTH AND SEFETY

Health and safety important in the warehouse because process there involve with machine, big and heavy things. There are a lot of danger faces by the personnel during the transaction of the goods. One of major cause of injuries in the warehouse is by worker slipping and tripping. There are also accident occur during manual handling like been hit by moving or falling object.

Manager need to consider the health and safety part for their workers when designing and layout the warehouse. Design and layout affect the process in transaction of goods directly. For example, goods need to carefully handle and because of some design and layout that not perfect for handling the specific goods, sometime it will cause accident in the warehouse. There also need to have safe system or traffic management. Manager

need to consider about some issue such as the storage area, aisle, traffic route, staircases and many more to build a safety layout of warehouse.

Fire safety also one major things in the warehouse development that need to consider first before moving the goods from the containers. According to (The Health and Safety Executive, 2007), there are 5 step of fire safety legislation to ensure the safety in the warehouse :

Step 1 identifies fire hazards (sources of ignition, fuel and oxygen);

Step 2 identifies people at risk;

Step 3 evaluate, remove, reduce and protect from risk (evaluate, remove or reduce fire hazards and evaluate, remove or reduce the risks to people);

Step 4 record, plan, inform, instruct and train (record significant findings and action taken, prepare an emergency plan, inform and instruct relevant people, and provide fire safety training for your staff); and

Step 5 reviews and revise your assessment as necessary.

During the movement of goods in the warehouse, personnel need to see clearly the road to the storage or from storage to the designated place. For that reason manager need to make a good lighting arrangement. This is needed because accident might occur during the transaction of goods if the personnel didn't see which way they suppose to go. Not only the way, have stairs also needed to be well lit because using the stairs included in the working process. Manager also needs to consider the brightness that suitable in each section because some work didn't need much light and some does and it will cause visual discomfort to the personnel if they put wrong arrangement for that lighting. This is one of factor that will cause accident or stress to the personnel and lead to other mistake

Manager need to consider the workforce that need in the warehouse for the safety and healthy warehouse. There are many kinds of workforce such as young and old, male and female, experience and inexperience. These workforces need different way to handle them and they can't be freely do the work without instruction or guide. For example, female can't always carry heavy loads or working in long hour especially pregnant and breastfeeding workers.

In the context of warehouse efficiency, health and safety cover all operation in the warehouse. Each operation need the safety and healthy guideline to prevent accident occur during the process. There are several guidelines can imply in the process such the steps of fire safety legislation. Applying these step can reduce the loss or damage if there are fire occur during or before the operation begin. Other than that, health and safety also tell about how to plan for layout in warehouse such the lighting, criteria for human power need in the warehouse and many more. These guidelines are made to prevent anything bad happen and to make the operation move smoothly.

10. LAYOUT

There are 14 elements that should be taken care by warehouse personnel. First is specifying the type and purpose of the warehouse follow by forecast and analysis of the expected demand, established.

Whether the purpose is strictly storage or storage plus order fulfillment, warehouses use specific elements that help manufacturers, distributors, and retailers monitor inventory and store it safely basic elements includes are :-

- Determine the objective of the facility
- Define volumes and functional requirements
- Match storage modes, it systems and mechanized technologies with volumes flow. Close to zero materials handling movements.
- Evaluate your options. Design consulting.

Silver Lining Storage solutions offers wide range of storage solutions as per the industry requirement. Products offered include floor settings heavy racking system.

Shelving and rack systems that offer maximum storage capacity and easy product access.

A climate control system for the product being stored. This is particularly important for frozen products or those required refrigeration, including certain pharmaceutical or laboratory products, and others that degrade if exposed to too much heat.

21.6 FUNCTIONS OF WAREHOUSING

The wide range means the activities, which are associated with the physical distribution of goods from end of production line to the final consumers. These activities include purchasing of goods, inventory management, storage, materials handling, protective packing and transportation. Warehousing is concerned with the storing function of good and commodities. Warehousing also refers to all the activities which are connected with the safe keeping of goods until they are needed for consumption. In the words of R.E Murphy, “Warehousing is concerned with storing function in the channel of distribution of goods”.

- **Storage of surplus goods**

The basic functions of warehousing are to provide the facility of storage for the goods which are laying surplus with the businessman. The businessmen produce the goods in anticipation of their demand. They store and preserve the goods which are surplus. They make the goods available in the market when their supply is relatively scarce.

- **Price stabilization**

Warehousing also help in the stabilization of the prices of goods in the market. When the supply of goods in the market is in excess, the fall in the prices of goods can be avoided by storing some stocks in the warehouses. Similarly, in case of increasing demand, the rise in the prices of goods can be checked by releasing the goods from the warehouses. The warehouses thus help in the stabilization of prices and safeguard the businessman against the dangers of price fluctuations.

- **Risk bearing**

Risk bearing is also considered as one of the utmost important functions of warehousing. When the goods are handed over to the warehouse keeper by the businessman, the risk of loss or damage for the stored goods passes to the warehouse keeper.

- **Loan Facility**

The businessman can obtain short term finance from the lenders on the security of goods stored in the warehouses. The producers and manufacturers of goods can continue and increase production with the help of raised working capital from the lenders.

- **Advantages to the importers and exporters**

The importers can store the imported goods in the bonded warehouses at the port. When the import duty is paid by them, the goods are then released. The importers have the facility to remove the goods in parts after making payments of the duty and warehouse charges. The exporters can also keep the goods to be exported directly in the bonded warehouse. In the absence of warehouse, the exporters would have to take the goods to their own warehouse and again to the port for the exports. Thus, the double expenses of transport and storage are saved

Warehouse operations contribute to the overall total cost of managing a supply chain, and as such, the trade-offs between warehousing costs and services to that of other critical functions of the firm must be evaluated. It is when warehousing contributes to reduced costs and improved service, flexibility, and responsiveness that warehouses become more valued to the organization and supply chain as a whole.

Value is provided through storing product to fulfill customer demand and protect against uncertainties in demand and lead-time. Providing customers with product assortment. Postponing or delaying inventory commitment to form or location until demand is better known. Achieving low total cost and improved lead-time through consolidating multiple orders. Reducing lead-time through cross-docking. Sequencing materials and components from multiple third-party logistics (3PLs) providers for time-based delivery to factory production lines.

Performing light manufacturing, assembly, and kitting

1. Receiving to materials to be stored in the warehouses.
2. Identification and Sorting and maintaining the record of material
3. Dispatching the goods to the desired storage location.
4. Placing i.e., keeping the goods at their desired location, where they will be kept during custody.
5. Storage which means holding, protecting, and preserving the goods until they are required to be shipment

6. Order picking means withdrawal of goods from storage.
7. Order accumulation. In this function, goods after being picked-up are accumulated to make up a specific order.
8. Packing. After accumulating the order, it is packed to provide protection during ship-ment.
9. Loading and shipping. After the goods are packed, they are kept in marshalling area awaiting loading and shipping.
10. Record keeping. This is the most important function and maintains the required record of all the above activities.

- **ADDITIONAL VALUE ADDED SERVICES**

Warehousing has been around for years, and it has helped businesses with different storage needs. Today, a warehouse is not simply a storage facility. Some companies offer additional services to optimize your entire supply chain system. This helps to create time utility as goods are only released when they are needed.

So, if you want to monitor and track your raw materials, finished goods, and other storage needs, then you need to rent a warehouse space.

- **GET A CENTRAL STORAGE LOCATION**

A centralized location for all your storage needs help to reduce the production gap. This means you can receive, store, distribute, and ship products with much ease to save time and cost.

For example, a warehouse near a loading dock is ideal for receiving and storing goods from suppliers. For another company, a warehouse in the middle of the city can help them distribute and mail items to their customers easily.

Ideally, when choosing a warehouse, you want to look at a location that will make the most sense for your operations. This can be a location that can be easily accessed by your suppliers or one that's in your target market.

- **IMPROVED ORDERPROCESSING**

When customers place their orders, all they're concerned with is the delivery of their products. They want timely delivery and quality services. Any potential fulfillment issue is not their concern; it's yours.

Warehousing offers you "security stocking." Ideally, this means that your products are available for shipping whenever customers place their orders. You don't need to fulfill orders from your production facility.

You can have enough stock for the next few months, and this reduces delays in delivery. The last thing you want is to lose your long-term client or a sale because you couldn't fulfill an order.

- **OFFERS ADDITIONAL STORAGE**

You can have a storage space your production facility, but your stock volume can outgrow it during your busy months. In this case, getting a warehouse space will make the most sense. You want your goods to be safe from damage and theft.

Basically, a warehouse is great for storing surplus goods, which customers and clients don't need immediately.

Most companies usually produce goods in anticipation of demand. This means they'll need adequate storage for their surplus goods until their customers and clients start putting in orders. A warehouse makes an ideal option to meet your needs.

- **IMPROVED PRODUCTION QUALITY**

It's easy to assume that warehousing inventory control systems only monitor quantities.

With better storage management, it's possible to monitor your production quality, too. You can use it to track your raw materials and finished goods. These numbers can help to determine the number of materials that go through your production process.

As such, when you detect defects or quality problems in the production process, it's easier to isolate defective materials or finished goods.

An effective warehouse tracking system also allows you to work with your vendors and suppliers to identify and minimize defective raw materials. This helps you save time as you won't need to carry out control at your facility.

Inventory quality control systems help to monitor the shelf life and expiration dates of your materials. Workers can easily identify and remove stocks before they expire.

- **IMPROVED PURCHASING DECISIONS**

How do you determine the right time to replenish your stock and raw materials?

A warehouse with an effective inventory management system can help in all purchasing decisions. It can offer you accurate data, which you can use to determine when to purchase raw materials and stock.

You can easily identify fast-moving and slow-moving products depending on your order history. It's also easier to identify seasonal products. The data helps you to avoid purchasing an excessive or inadequate amount of certain materials.

Some inventory systems have signals that alert you to products that need replenishing. This allows you to keep your stock always in check.

- **LEVERAGE SEASONAL GROWTH**

Holiday and shopping seasons, such as Christmas and Black Friday, are famous for their high sales numbers.

As a small business, you don't need to have Amazon-like facilities to hit your sales targets. A warehouse space will just suffice.

In this case, you have scale your operations when the shopping seasons come. You can monitor consumer trends and stock up on inventories for peak seasons. This won't lead to a significant increase in costs.

Basically, a warehouse gives you the ability to boost your operations as needed without any cost burden. You can take advantage of new opportunities and sales cycles in the market.

- **RISK MANAGEMENT**

As a business owner, the last thing you want is to experience violent fluctuations in prices. This usually happens when the supply of a particular product exceeds the market demand. If you decide to sell, you can easily suffer losses.

Instead, you can use a warehouse to store your products. When the demand becomes more than the immediate supply and productions, you can then release them to the market.

A warehouse also provides safe custody of perishable goods. You can utilize cold storage and refrigeration to avoid product spoilage. Of course, you can expect this storage service to cost more than regular storage.

Also, businesses can minimize the loss from fire, theft, and damage by using a warehouse to store their goods. Plus, your goods are insured, so you can expect full compensation in case of any damage or loss.

21.7 SUMMARY

It is a key component of the warehouse the supply chain in emergencies. It buffers uncertainties and breakdowns that may occur in the supply chain. When properly managed and appropriately stocked a warehouse provides a consistent supply of material when it is needed.

Warehousing role in the supply chain has become more critical and at an escalating rate during the past two decades. Responsibilities of warehouse operators have evolved from maintaining long-term storage of materials and products to supporting economies of purchasing, production, and transportation to including light manufacturing and facilitating time-based supply chain strategies.

Most important, warehouses impact the receiving customer in many critical ways. Frontline warehouse personnel may be the final customer service defense in ensuring product accuracy, quantity, timing of shipment and delivery, accuracy of documentation, and overall product condition—all of which impact total cost and customer perception of the brand.

21.8 GLOSSARY

Equipment :- The Process of supplying someone something with necessary equipment. The set necessary tools for particular purchase

Constant planning :- It is a strategy assets allocation strategy or investment formula which keeps the aggressive and conservativeprotons.

Gashes system :- A business L.S.H made up of 3 amenachieves order processing inventory managements and freight transportation . Order processingdiscontent with the information flow in logistics system includes a number of operation.

Disposition of product:- It mean the documented control status and for usage for a product

Beneficiaries;- Person who derives advantage from something especially a trust will or life insurance policy

Humanitarian supply chain: - The humanitarian supply chain supply of necessary goods like water food, lets blankets, Medicines, stc in care of natural and man-made disasters

Dispensation;- Exemption from rule or use all requirement or social system prevailing as a particular himes.

Consolidations; - Make something physically stronger or more solid

Buffer, Kitting, Quarantine Area.

21.9 SELFASSESSMENTQUESTION

Q1 Explain the term warehousing in detail.

Q2 Write short note warehouse depositor and warehouseman.

Q3 Discuss the elements of warehousing

Q4 What are the functions of warehousing.

21.10 END EXCERSIES QUESTION

Q1. Discuss in detailed about warehousing

Q2. List all the functions and elements of warehouse.

21.11 BOOKS SUGGESTED

- Logistic management by satish caliwadi [director of management studiesmumbai.
- Retailing management by swapna pradhan. Warehousing management by kate vitasek.
- Denise Dayton is a a freelance writer who specializes in business, education and technology.

ROLE OF WAREHOUSING IN ECONOMIC DEVELOPMENT**STRUCTURE**

- 22.1 Introduction
- 22.2 Objectives
- 22.3 Role of Warehousing In Economic Development.
- 22.4 Types of warehousing
- 22.5 Advantages of Public warehouse.
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22.1 INTRODUCTION

Nowadays, the warehousing is playing a very important role in the supply chain management. The warehousing not only provides the function to holding or storage the goods but it also provides the value-added services to improve the performance of the supply chain. The value- added service services are including. The warehousing is holding the goods for the downstream stages of supply chain. The tracking system help the company manage the inventory in the warehouse with more efficiency and aims to reduce the cost and time in the warehouse operation process.

22.2 OBJECTIVES

Objectives: After studying this chapter you should be able to understand the impact of warehousing in development of India types of warehousing and advantages of public warehouse. Role of Warehousing in Economic development

22.3 ROLE OF WAREHOUSE IN ECONOMIC DEVELOPMENT

Traditional Roles of Warehousing supply chains demand greater service value from warehouse operations, the basic economies of manufacturing, purchasing, and transportation must continue to be supported. Cost trade-offs, along with service expectations, must be evaluated to determine the role of the warehouse in supporting the traditional economies of scale.

Supporting Functional Economies of Scale Wide scope business strategies catering to broad-based clientele require large scale purchasing, production, and distribution. Achieving competitive scale demands operating efficiencies and economies supported by large scale

Warehousing of supplies and product. Economies of scale in purchasing, production, and transportation have long required warehouse support, and today, need continues for such warehouse support.

1. Role in Supporting Economies of Manufacturing

Long manufacturing runs of single products create efficiencies in production processes, allocation of personnel, and capacity utilization of machinery and equipment. A manufacturer and marketer of a major brand of candy found that it would be financially feasible to operate a single production line for three flavors of a specific candy. To change from one product to another, the changeover process required that the machinery be completely disassembled, sterilized, and reassembled prior to running the next item on the master production schedule. Three days were required to complete the changeover, and the sterilization was critical because one of the three products included a nut ingredient. Sterilization reduced the threat of cross-contamination of products that could have devastating consequences if consumed by people with severe allergies toward nut products. Plant supporting warehouses must add value in the supply chain by supporting long manufacturing runs to gain economies of production and reduce changeover needs. Single-

item finished products produced in mass quantities must be stored and maintained for future demand.

2. Role in Supporting Economies of Purchasing Materials

Planners utilize the master production schedule and materials requirements plans to determine ordering needs for each material or component required to meet production plans. Planners and procurement personnel work together to evaluate material needs, lead times for receiving materials, and price-break concessions afforded to buyers for ordering in bulk quantities. All the components influence the need to receive and store materials and components for future production. Specifically, bulk purchase pricing may provide cost-savings per item that when purchased in great enough quantity it more than offsets the cost of storing and maintaining the materials. Warehouse operators add value for manufactures, assembly operations, and consolidation points by receiving, storing, maintaining, picking, and shipping materials and components to support large volume purchase discounts.

3. Role in Supporting Economies of Transportation

Similar to both manufacturing and purchasing economies, the better a carrier utilizes the full capacity and capability of its transportation equipment, the more efficient and cost-effective products are transported. Transportation cost per unit is reduced as a greater number of units are transported. Fixed costs are spread over the greater product amount being transported, and the variable costs do not necessarily increase one-for-one as another case of product is loaded onto a trailer and transported. Truckload (TL) business models are based on this premise, and truckload (LTL) and package carriers create bulk shipments by consolidating or bundling independent orders destined for a common ZIP code zone. Costs associated with managing and holding greater levels of inventory in warehouse stock must be compared with the cost of transporting in large quantities to gain economies of transportation associated with reduced unit pricing. In many supply chains the transportation savings per case or item more than offsets the cost to warehouse additional product. Carriers can more efficiently utilize transportation equipment and offer discounts to shippers for helping carriers fill trailers. Warehouses add value by supporting large volume transportation needs.

Traditionally, warehouses have 'been looked upon as an asset heavy model which

gave importance to creation of space alone without any emphasis on efficient handling, scientific processes and its management.

Of late, we are seeing importance being given to systems and processes which are making agri-logistics independent of infrastructure and agnostic to geographic location.

4. Buffer

The warehousing is holding the goods for the downstream stages of supply chain. It is to balance the difference goods schedules and aim to deal the efficiency in the distribution process and achieve the economics of scale.

5. Consolidation center

The warehouse is used for accumulates and consolidates the goods from the different manufacturer or company for combined the goods into a same shipment to the customers. The consolidation can reduce the expenditure of transportation operations because it will prepare the goods for the outbound activities insoon.

6. Value-added Services

Due to the strong competitive market nowadays, the function of warehouse is requiring to extend to a wide range. Inventory tracking system Many different goods from different manufacturer is storage in the warehouse and a good tracking system can provide the reduce the number of shipping and the capacity of loading is sharing by few companies.

7. Cross-dock

Cross docking is the moving the goods from a manufacturer and the goods is directly delivers to the customer with low material handling and without storage in warehouse in a long time period. For example, the goods have sent to the loading dock from the manufacturers information about the type of goods, goods order, shipment schedule, and the sold of goods. The tracking system help the company manage the inventory in the warehouse with more efficiency and aims to reduce the cost and time in the warehouse operation process. It also prevents the loss of goods because every step in movement of goods is recording in system and the related document wassigned.

8. Reverse logistic

Reverse logistic is a customer service that helps the retailers in process of goods return to the warehouse and increases the satisfaction of retailer and customer. The reverse logistic activities include handling of returned goods, goods recycling, goods reuse and hazardous materials disposition. The retailer returns the goods to the warehouse when the defective product was return by the customer to retailer. The warehouse will responsible to checking the situation of the product such as packaging damage, due day of goods, hazardous materials and so on. After the goods was return, the process to scanning and test will make and the suitable solution from dispose management will do for the defective product either is repacking, repairing, or recycling. Finally, the final goods will distribute to the retailers.

9. Just in time delivery

The company can gain the competitive advantage when it available delivery the right quantities and quality goods to the customer. Just in time delivery is a management that arrange and manage the goods shipment for different customer which ensure the goods is sent to them before they need to sell the goods. It can be prevent too much goods are storage in warehouse in long

10. Opportunities

Agriculture sector in India, accounts for about 16 per cent of the GDP in spite of employing more than 50 per cent of the country's workforce. Despite agriculture losing its share in GDP, it is still the largest economic sector.

Agriculture has begun to regain its sheen, with the government and private entities taking interest in empowering the sector. However, the agriculture supply chain in India suffers from inefficiencies leading to heavy losses of commodities due to lack of proper storage and transportation facilities. It is estimated that about 20 per cent of the food grains (including grains, fruits and vegetables, spices, etc) are lost annually because of poor storage facilities. There is a huge gap in the quantity of agricultural produce and the available scientific management.

The huge gap between the demand and supply of logistics services, which have been left unattended due to the unorganized nature of the market, has opened up many

opportunities for players.

Total warehousing space requirement in India is expected to grow at a compounded annual growth rate of nine per cent from 919 million sq ft in 2014 to 1,439 million sq ft by 2019, according to Knight and Frank Report. Manufacturing will continue to remain one of the biggest demand drivers of the warehousing sector with an annual requirement of 61 million sq ft of incremental space between 2014 and 2019.

11. Scientific processes

The losses in commodities are mainly attributed to infrastructure. However, lack of knowledge of managing and maintaining premises with inefficient scientific processes are the key reasons for the losses. The emphasis is falsely placed on creation of infrastructure rather than adopting innovative methods of scientific storage for managing warehouses.

However, increasing competition and introduction of global best practices by certain companies are forcing Indian businesses to rethink on the importance of warehousing processes and the resultant benefits of managing an efficient supply chain.

Supply chain management is all about flow, be it of goods from the producer to the consumer or from the consumer to the producer.

Warehouses play a critical role in this process and were conventionally set up as inventory buffer points along with the supply chain so that any irregularities within this chain could be ironed out.

However, the need to reduce the service response time and contain inventory cost has necessitated the progression of warehouses from storage points to distribution centres. Additionally, the advent of technology has made it possible to operate warehouses more efficiently and achieve greater integration with the rest of the supply chain modules.

Regulatory barriers have constrained the investments in development of storage and processing facilities; hampered the development of successful institutions; and led to deterioration.

Evolving technology Information Technology (IT) and its use in organisations and across the supply chain has become a determinant of competitive advantage for many corporations.

Warehouses have been going through various challenges such as – supply chains are becoming more integrated and shorter, globalised operation, customers are more demanding and rapidly changing technology. In a market dominated by unorganized players, the use of technology has been neglected by the logistics and warehousing industry.

Most logistics and warehousing companies use outdated technology and systems which are incapable of meeting current and projected requirements. Technology is set to be the key enabler of growth for this sector. India has just awakened to the tremendous potential of technology-driven innovation in this burgeoning sector.

22.4 TYEPS OF WAREHOUSING

The warehouse is the most common type of storage, though other forms do exist (e.g., storage tanks, computer server farms).

Some warehouses are massive structures that simultaneously support the unloading of numerous in-bound trucks and railroad cars containing suppliers' products while at the same time loading multiple trucks for shipment to customers.

Below we discuss types of warehouses:

1. Private Warehouse

This type of warehouse is owned and operated by channel suppliers and resellers, and used in their own distribution activity. For instance, a major retail chain may have several regional warehouses or “fulfillment centers” supplying their stores, or a wholesaler will operate a warehouse at which it receives and distributes products.

2. Public Warehouse

The public warehouse is essentially space that can be leased to solve short-term distribution needs. Retailers that operate their own private warehouses may occasionally seek additional storage space if their facilities have reached capacity or if they are making a special, large purchase of products. For example, retailers may order extra merchandise to prepare for in-store sales or order a large volume of a product that is offered at a low promotional price by a supplier.

3. Climate-controlled warehouses

handle storage of many types of products including those that need special handling, such as freezers for storing frozen products, humidity-controlled environments for delicate products, including produce or flowers, and dirt-free facilities for handling highly sensitive computer products.

4. Distribution Center

There are some warehouses where product storage is considered a very temporary activity. These warehouses serve as points in the distribution system at which products are received from many suppliers and quickly shipped out to many customers. In some cases, such as with distribution centers handling perishable food (e.g., produce), most of the product enters in the early morning and is distributed by the end of the day

5. Automated Warehouse

With advances in computer and robotics technology many warehouses now have automated capabilities. The level of automation ranges from a small conveyor belt transporting products in a small area all the way up to a fully automated facility where only a few people are needed to handle storage activity for thousands of pounds/kilograms of product. In fact, many warehouses use machines to handle nearly all physical distribution activities, such as moving product-filled pallets (i.e., platforms that hold large amounts of product) around buildings that may be several stories tall and the length of two or more football fields. And the newest trend in warehouse automation is the use of warehouse robot technology, where small robots assist with product movement.

6. Bonded Warehouses:

Bonded warehouses are licensed by the government to accept imported goods for storage until the payment of custom duty. They are located near the ports. These warehouses are either operated by the government or work under the control of custom authorities.

The warehouse is required to give an undertaking or 'Bond' that it will not allow the goods to be removed without the consent of the custom authorities. The goods are held in bond and cannot be withdrawn without paying the custom duty. The goods stored

in bonded warehouses cannot be interfered by the owner without the permission of customs authorities. Hence the name bonded warehouse.

Bonded warehouses are very helpful to importers and exporters. If an importer is unable or unwilling to pay customs duty immediately after the arrival of goods he can store the goods in a bonded warehouse. He can withdraw the goods in installments by paying the customs duty proportionately.

The main services rendered by the bonded warehouses are as under:-

a) Duty can be paid in part

The importer can remove the goods stored in bonded warehouses in parts after making payment of excise and custom duty only on that quantity of the goods which is removed. The importer is thus saved of making heavy payment of duty all at once.

b) Bottling, racking and vetting

Bottling racking and vetting of liquid can be carried out by warehousing authority on receiving such instructions from the importer of liquid.

c) Blending and labeling

The warehouse owners also perform the duty of blending different varieties of tea and coffee through its experienced staff. When the quality and flavor of the product is improved, it fetches higher price in the market. The warehouse owners, on receiving orders from the importers, also attach labels and pack the goods in suitable packages or containers.

7. Government Warehouses - These warehouses are owned, managed and controlled by central or state governments or public corporations or local authorities. Both government and private enterprises may use these warehouses to store their goods. Central Warehousing Corporation of India, State Warehousing Corporation and Food Corporation of India are examples of agencies maintaining government warehouses..

8. Co-operative Warehouses - These warehouses are owned, managed and controlled by co-operative societies. They provide warehousing facilities at the most economical rates to the members of their society.

22.5 ADVANTAGES OF PUBLICWAREHOUSE

A public warehousing is a business that provide or long term storage short to companies on a month-to- month, warehouses are massive structures that simultaneously support the unloading of numerous in-bound trucks and railroad cars containing suppliers' products while at the same time loading multiple trucks for shipment to custom or instance, a major retail chain may have several regional warehouse.

The advantages of a public warehouse are:

- Storage facilities can be availed at desired locations as and when required, and at a known cost.
- The goods can be despatched to the warehouses with the warehousemen as the consignee for the clearance of the goods at the railhead and transportation to the warehouse.
- The goods can be delivered or dispatched to the nominees/allotters of the depositor.
- The warehouseman does entire inventory management, and the depositor is completely free from these costs and botherations.
- The goods are handled properly and preserved scientifically by the trained technical personnel without any damage or deterioration during handling andstorage.
- The goods can also be insured against all risks like fire, flood, thefts, etc. at nominal cost and the depositor is indemnified against such losses.
- The goods can be kept in the public warehouses till the market price is found remunerative enough for the disposal of goods and, thus, distress sale can be avoided.
- Advance can be obtained against the pledge of the warehouse receipt from banks.
- Uncertainties in the availability of raw materials or finished products due to supply dislocation areavoided.
- Public warehouse helps in the physical distribution of goods like food grains, fertilizers, public distribution items, consumer goods, etc. and therefore helps in marketing of products.

- The public warehouse can also be used for grading, standardization, and packing of goods if the arrangement is on dedicated and a long term usage basis.

1. Reduces Your Need for Infrastructure

If you own a warehouse facility, you probably bought it out of pure necessity. The storage demands of your business outstripped the available space in your store or office. Every piece of additional infrastructure comes with numerous demands that range from extra staff to site security. Public warehouses eliminate the majority of those additional demands. Switching to or adopting a public warehouse resembles switching to or adopting cloud-based services, which Forbes says nearly 40 percent of small businesses have done, and for similar reasons. Your business enjoys all the benefits of access to infrastructure but none of the headaches.

2. Adapts To Your Needs

A warehouse you own costs you money and remains fixed in size regardless of its usage. Public warehouses can adapt to your changing needs. For example, a business that specializes in Christmas-themed items almost certainly experiences additional space demands during the last few months of the year but a smaller and fairly stable demand the rest of the year. With a public warehouse, the business gets to expand their total storage space for the high demand months and scale back the space it uses the rest of the year.

3. Less Costly

If you buy a warehouse, you choose one based on anticipated peak space usage. That means you end up buying more space than your business needs during non-peak periods, which drives the initial purchase costs up. The business also must pay for any utility, upkeep and property improvement costs, as well as property taxes. If you use a public warehouse, the warehouse owners take responsibility for those costs. Your costs remain confined to the agreed-on rate for the total space you use, which often proves less expensive over the long run. Because public warehouses operate all over the country, you stand to lower your shipping costs by selecting a centrally located facility or one near your main concentration of customers.

4. Leveraging Specialty

Businesses manage lots of moving parts, from marketing and payroll to human resources and placing orders with vendors. Frequently, businesses outsource much of this work to specialists. Efficient management of a warehouse facility requires a solid understanding of logistics. Employing a public warehouse lets you avoid the necessity of either developing that logistics knowledge or hiring a logistics specialist. A public warehouse already specializes in logistics and logistics systems to maximize the value of the warehouse's business. You can use that specialization for your benefit.

It's important to weigh up the advantages and disadvantages of public warehousing. Here are some of the key points to consider:

- Public warehouses are often more affordable compared to private and can help companies to attain better customer service level.
- The location of warehouse is often strategically situated to be easily reached.
- Public warehouses offer flexibility in usage space
- Overall warehouse fix cost is lower since companies are only paying for the space and services rendered.
- There is no liability cost when companies discontinue with their warehouse space usage
- Companies' peak requirements can be met with ease
- Companies can benefit from the tax
- Companies do not need to concern about labor dispute

Operating a business, no matter what the size, requires a keen understanding of finances, the ability to adapt and an innovative mindset. Overspending and lack of planning puts companies at risk in several ways. One way that companies can overcome these obstacles is by using public warehouse space rather than private warehouses. Here are four reasons to consider a public warehouse for your company's storage needs:

Zero Investment

When a company or business chooses to operate a private warehouse, it requires an outlay of capital to purchase, upgrade and maintain the property. Additionally, safety equipment, storage racks, forklifts and a myriad of other things must be purchased to operate smoothly. Contrarily, a public warehouse has all of the infrastructure, equipment and employees in place. There is no capital investment required, which means money will not be diverted away from other essential aspects of your business.

No Property Tax

Property taxes are a huge expense for companies that own large warehouses. Failure to pay taxes on time results in fines and penalties, further increasing the cost. In tough financial times, that kind of liability can cause serious problems that may be difficult, or impossible, to recover from. On the other hand, there are no property tax liabilities with a public warehouse space for the tenants. Those costs are the sole responsibility of the warehouse provider.

Greater Flexibility

Owning a private warehouse restricts your company's ability to relocate should the need arise. It can take a great deal of time and effort to sell a privately held warehouse facility, find a new location and build to suit your needs. However, public warehousing offers a great deal of flexibility since typical lease agreements only require a 30- or 60-day notice before moving. In addition, expanding into a new territory or geographic location can be facilitated with ease by utilizing other public warehouse space.

Value-added Services

If you're the owner and operator of a private warehouse, inventory control, sorting, packaging, shipping and receiving are all up to your company to manage. Employees must be hired, trained and supervised in order to assure quality and compliance. Most public warehouse facilities offer these types of services as part of the lease agreement. It's like having an entire staff of dedicated employees that you don't have to put on the payroll. In addition, third-party providers are able to offer lower rates for other logistics services such as transportation.

Before you invest in a private warehouse for your company's storage needs, take a moment to consider what you've read here. For most companies, operating a private warehouse is expensive and restrictive, which makes growth slow and difficult. Public warehouse space, on the other hand, is cost-effective and flexible, allowing your company to grow faster and easier.

22.6 SUMMARY

Thus, public warehouse improve the work life of business community as it is less costly price have been fixed which give ultimate benefit to the customer. As goods can be store for duration and it is a customer-oriented philosophy.

A **warehouse** is a building for storing goods. Warehouses are used by manufacturers, importers, exporters, wholesalers, transport businesses, customs, etc. They are usually large plain buildings in industrial parks on the outskirts of cities, towns or villages.

They usually have loading docks to load and unload goods from trucks. Sometimes warehouses are designed for the loading and unloading of goods directly from railways, airports, or seaports. They often have cranes and forklifts for moving goods, which are usually placed on ISO standard pallets loaded into pallet racks. Stored goods can include any raw materials, packing materials, spare parts, components, or finished goods associated with agriculture, manufacturing, and production. In India, a warehouse may be referred to as a godown.

Warehouses are generally considered industrial buildings and are usually located in industrial districts or zones (such as the outskirts of a city). Loop Net categorizes warehouses using the "industrial" property type. Craftsman Book Company's 2018 National Building Cost Manual lists "Warehouses" under the "Industrial Structures Section. In the UK, warehouses are classified under the Town and Country Planning Act 1990 as the industrial category B8 Storage and distribution.

Types of warehouses include storage warehouses, distribution centers (including fulfillment centers and truck terminals), retail warehouses, cold storage warehouses, and flex space.

A customized storage building, a warehouse enables a business to stockpile goods, eg, to build up a full load prior to transport, or hold unloaded goods before further distribution, or store goods like wine and cheese that require maturation. As a place for storage, the warehouse has to be secure, convenient, and as spacious as possible, according to the owner's resources, the site and contemporary building technology. Before mechanized technology developed, warehouse functions relied on human labor, using mechanical lifting aids like pulley systems.

22.7 GLOSSARY OF TERMS UTILITY

Downstream- situation or moving in the direction in which a stream or a river flow .

Inventory – the contents of a building .

Trade off – a balance achieved between two desirable but incompatible features.

Allocation – the action or process of allocation or sharing out something .

Disassembled – take (something) to pieces.

Sterilization – the process of making something physically more stable .

Cross - Contamination – the process by which bacteria are formed .

Consolidating – make physically stronger or more solid.

Dispose – get rid by throwing away or giving or selling to someone else.

Compounded – make up constitute.

Conventionally – in a way that is based on what is traditionally done or believed.

Irregularities – the state or quality of being irregular or thing that is irregular in form or nature.

22.8 SELF ASSESSMENT QUESTIONS

Q1 Discuss the role of warehousing in economic development.

Q2 Explain various types of warehousing.

Q3 Write the advantages of public warehouse.

22.9 END EXERCISE QUESTION

Q1 Write in detail about public warehouse

Q2 Diagrammatically represent various type of warehousing

22.10 BOOKS RECOMMENDED

- Ware housing's role in the supply chain by scamp, scot b. Keller, brain c. Keller
Warehousing management by Kate vitas
- Supply chain Management global by Sunil chopra on 05 April 2012

COST ASSOCIATED WITH WAREHOUSING**STRUCTURE**

- 23.1 Introduction
- 23.2 Objectives
- 23.3 Concept of Cost Associated with Warehousing
- 23.4 Meaning of warehousing Corporation in India
- 23.5 Objectives of Warehousing Corporation
- 23.6 Functions of Warehousing Corporation
- 23.7 Summary
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- 23.9 Self Assessment Question
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23.1 INTRODUCTION

As Cost of Goods Sold includes Cost of Raw Materials, Packaging and Product Displays, Labor, Blending, Filling, Product Shipping Costs, Warehousing Costs, Product Liability Insurance, and any Financing Costs affiliated with the COGS (Factoring or lines of Credit). Warehousing good. Costs have to be stored for some time after production, however small that time interval may be for example if one company run its business and they handle

500,000 units they do the calculation; this is the total number of units handled during the previous year. Divide the total warehouse cost of Rs 750,000 by the number of units handled, which for this example will be 500,000 units, which gives you a warehouse storage cost of Rs 1.50 per unit.

Warehousing is nothing more than the management of space and time. The space management portion, storage, has a cost per month, because there is a monthly cost for warehouse space. The time management component includes labor involved in handling materials as they move in and out of the warehouse. If you are buying or selling warehouse services, or simply providing warehousing services for your own organization, the models that are presented in this article will enable you to isolate and analyze the costs of warehousing. All companies with warehouses incur the same elements of cost, but they compile them differently. The goal of this article is to convey a costing system that can be used to compare costs of one warehouse with another, or one company to others. Some warehousing costs tend to be ignored or misallocated, because the analyst does not recognize where they belong. In any costing system, allocation of overhead costs is a matter of judgment, and no specific formula will be correct for every user. The cost models shown here have been designed to ensure that no item is overlooked.

23.2 OBJECTIVES

After studying this chapter you should be able to understand about The need for warehousing, various sub-system of warehousing and its features. Role of warehousing and cost associated with it.

23.3 CONCEPT OF COST ASSOCIATED WITH WARE HOUSING

1. Receipt, Handling and Dispatch

Handling (often RH&D for receipt, handling and dispatch) refers to any expenditure on moving the goods into or out of the warehouse. Most of the cost is human labor, including receiving, storing and loading the goods for delivery etc. Secondary to labor is the equipment cost, depreciation and energy/fuel. The price for RH&D is usually charged as a pallet price in and out.

2. Pick and Pack Prices

If a logistics company charges for order picking or pick-and-pack, this is usually a separate cost which is charged per pick or per carton picked depending on the warehouse. This also falls under handling as well however is normally a separate cost.

3. Storage Costs and Pallet Storage Prices

Storage is the cost incurred as the goods rest in the facility. This is usually a weekly cost similar to 'rent' for your goods. It is often charged either per pallet per week (pallet storage cost) or per square foot of footprint.

Operations administration is the cost of keeping the facility open. Overheads, really. Line supervision, clerical support, IT, insurance, office supplies, even taxes all fall under operational expenses.

General administrative expenses are often not associated with that particular warehouse or facility in particular, but represent the expenses of the larger organization. How these expenses are allocated to each facility and to each customer is up to the company, and can be a bit obscure.

We assume that each user will customize the models, and make individual judgments regarding allocation of administrative costs

4. Four Categories Of Warehouse Costs

- **Handling.**

All expenses associated with moving product in or out of the warehouse should be included in the handling cost center. The largest component is the labor used to handle the product that moves through the distribution center. It includes receiving, put-away, order selection, and loading. It also may include labor to re-warehouse, repack, or refurbish damaged product. Handling also includes all costs associated with the equipment used to handle product in the warehouse, such as the depreciation of equipment cost, and the cost of fuel, or electricity to power the equipment. Other handling expenses are the detention of truck or rail cars, operating supplies, and trash disposal. In effect, handling includes all those costs that are associated with "goods in motion."

- **Storage.**

Storage expenses are costs associated with “goods at rest.” These costs would be incurred whether or not any product ever moved. Because storage expenses are related to the cost of occupying a facility, and these costs are normally accumulated each month, storage is expressed as a monthly cost. If an entire building is dedicated to an operation, storage expenses are the total occupancy cost for that facility.

- **Operations administration.**

These expenses are incurred to support the operation of the distribution center. Closing the facility would eliminate these costs. Included are costs for line supervision, clerical effort, information technology, supplies, insurance, and taxes.

- **General administrative expenses.**

Expenses not incurred for a specific distribution center are included in this category. General management, nonoperating staff, and general office expenses are examples. Allocation of such expenses to each warehouse is a judgment call. Productivity Improvement Most warehousing costs, particularly storage and handling, can be influenced by improvements in productivity. Improved methods and equipment may enable the operator to increase the number of units moved without increasing labor, resulting in a higher number of units handled per hour. Changes in inventory, storage layout or equipment may enable the operator to expand the number of units stored in the same number of cubic feet of storage space.

5. **The Risk Factor Cost**

Per unit is escalated when a distribution center is not fully utilized. **Fixed cost** always will be influenced by the rate of utilization. **Variable costs**, such as labor, never What Only the Only the CEO can link the external world with the internal organization, and that must be done, because without that link the company cannot succeed. These four tasks of the CEO: Define the “meaningful outside.” How do we connect with the ultimate consumer? Decide what business you are in. At the same time, determine what businesses you should not be in. Balance present and future. Consider both short-term and long-term goals and results. Shape values and standards. Are they relevant for both

today and tomorrow.

The first step is testing, ensuring that every aspect of the system functions as expected. Training should start early, and include those on the warehouse floor as well as the office staff who work with the system. The timing of conversion, the process of moving data to the new system, may be critical. Validation is a second test to confirm that everything is on track. The most common mistakes in implementation result from poor planning, improper training, and/or inaccurate item analysis. Cost-Saving Strategies for Contracts By J. S. Millstein and Tim Rough ton, CSCMP's Supply-Chain Quarterly, Quarter .

They addressed **four areas that offer opportunities to improve outsourcing contracts** with new ways to cut costs.

The four areas are flexibility, enforcement of contractual rights, renegotiation and leverage. Regarding flexibility, they stress the importance of recognizing the price of superior service. Don't ask for or agree to service requirements that truly are not needed. In these difficult times, a dispute resolution provision is an important part of every outsourcing agreement. Changing economic conditions may signal the need to renegotiate terms that were acceptable prior to the current recession. Finding New Value In Truck Leasing, By Gene Scoggins, Inbound Logistics, The author, president of Nation a Lease, a major provider of leased motor trucks, focused on transportation equipment in this article; yet the same arguments apply to lift trucks, and other capital equipment used in warehouses. Some **advantages of equipment leasing** include the following

Conserve capital to grow the business. You might earn more with many other investments. P Manage credit. In today's banking climate, financing of equipment can be challenging. P Avoid depreciation losses. Leased equipment is not depreciated. P Control maintenance costs.

The World Academy, based in New Jersey, offers three-day compliance seminars for shippers and logistics service providers. More information. Motivating the Staff During A Down Economy , Material Handling Management, May 2009, When a California trucking company faced the need to reduce salary expenditures by 20%, management elected to adopt a four-day work week rather than resort to a layoff. At the same time, the company launched a training program conducted by a professional business coach.

The six-week program was entitled, “Battling Burnout and Regaining Control.” Many of the sessions were forum discussions that permitted workers to express their fears and anxieties. The CEO stated, “I was pleasantly surprised at how much they helped me cope with the stress of leading a company during this economic storm.” Logistics Bright Spots American Shipper, May 2009. An increasing number of logistics service providers are using solar energy to power their facilities. Warehouse roofs are ideal for solar panel installations because they offer large expanses of access to sunlight

All of the example are from facilities on the Pacific coast. are quite as flexible as they seem. Management may be reluctant to eliminate experienced workers, particularly when they will be needed for a coming busy season.

The same is true for forklift trucks and other materials handling equipment. Therefore, the primary risk in controlling costs is the rate of utilization. Errors represent another unknown risk. People make mistakes, which may result in product damage and errors, or shipping errors. Just as the insurance underwriter factors in the risk of loss, the warehouse operator must make a realistic estimate of risk costs. Risk may be expressed as a percentage of total warehousing costs. It should be based on past experience.

Methods to reduce risk should be explored. The simplest way to calculate the risk factor is to include it in the size of the markup.

Many time and material agreements have a low percentage of profit, but the unit pricing agreement must factor in a higher profit percentage that reflects the substantial risk of changing volume. As you contemplate the risk factor, consider the position of the buyer.

With a time and material agreement, the buyer agrees to pay for all space and labor that is used, which often includes the rent for a building that is dedicated for the buyer’s use. In contrast, the buyer of a unit price agreement pays only for services that actually are used.

According to Hurdle Rates When your company makes an investment in logistics facilities, financial managers want to know about the return on investment. Hurdle rate reflects the minimum percentage of investment return that is acceptable for your company. If you choose the “do-it-yourself” option, your return on investment will be based on the dollars saved, rather than the cost of contracting the service to another party. Yet, you

must recognize the substantial risk of doing it yourself, then compare it to the employment of an independent service provider.

Such kinds of warehousing requirements may not call for dedicated facilities. Normally the 3PL service provider who manages the freight will have warehouses that are used as shared or common facilities. In few cases public warehouses are also used by the buyers as the case may be.

General cargo warehouses or shared facilities and public warehouses are warehouses that house cargo of various clients. Depending upon the clients requirements, materials can be stored per day, week or month, etc. Inventory held of each customer may not be very high.

6. Storage Space

Storage and space options provided by the 3PL in such cases can vary with the client's nature of the business. In a country consolidation center, where multiple shipments are stored and consolidated, the buyer may contract a fixed space on square foot basis with specified number of locations.

In another case of a merging center, the buyer may not contract fixed space and pay on transaction basis.

7. Pricing

a) Fixed Price:

In cases where the buyer contracts a fixed space, the costing model will be based on a fixed fee per month including cost of space, resources, infrastructure, etc. Even in Fixed Fee model, there are many variations in pricing models.

b) Transaction based pricing model:

Wherever there is no fixed space allocation, the transactional pricing models are in vogue. Variable pricing models are many. Some of the usual methods of pricing are - Per pallet price, per unit or Kg -volumetric weight /volume price, per transaction price including price per inward, per shipment, etc.

Normally in transactional pricing model, the buyer's requirement will be minimum and does not call for any specific or dedicated investments. The 3PL provider normally uses his general or public facility and recovers his total cost of investment and operations on the volume or transactions.

23.4 MEANING OF WAREHOUSING CORPORATION IN INDIA

The Warehousing Corporation act, 1962: Subject to the provisions of this Act, the Central Warehousing Corporation may

SubscribetothesharecapitalofaStateWarehousingCorporation;

Act as agent of the Government for the purposes of the purchase, sale, storage and distribution of agricultural produce, seeds, manures, fertilizers, agricultural implements and notified commodities.

Central Warehousing Corporation was established during 1957 to provide logistics support to the agricultural sector. It is a public Warehouse operator offering logistics services to diverse group of clients. CWC operates 432 Warehouses across the Lok Sabha by the Ministry of Consumer Affairs, Food and Public Distribution seeking to make Mini-Rant company Central Warehousing Corporation (CWC) and country with a storage capacity of 9.96 million tones providing warehousing services. These services include food grain warehouses, industrial warehousing, custom bonded warehouses, container freight stations, inland clearance depots and air cargo complexes.

The Warehousing Corporation (Amendment) Bill, 2011 has been proposed in the independent body without government being a WC operations include scientific storage and handling services for more than 400 commodities include Agricultural produce, Industrial raw- materials, finished goods and variety of hygroscopic and perishable items.

Scientific Storage Facilities for commodities including hygroscopic and perishable items through network of 476 warehouses in India with its 5,658 trained personnel.

Import and Export Warehousing facilities at its 36 Container Freight Stations in ports and inland stations.

CWC enables the movement of imported and exportable goods to and from the port towns and has developed infrastructure of Container Freight Stations & Inland

Clearance Depots throughout the country. It operates 36 CFSs/ ICDs where composite services for containerized movement of import/export cargo are provided. The Warehousing Corporation is empowered to acquire and build Warehouses for storage of Agricultural produce, seeds, fertilizers and other notified commodities and also to act as an agent of the Central Warehousing Corporation or of the Government, for the purpose of purchases, sales storage, distribution etc., of Agricultural Commodities in time of need. Though it has been criticized for lack of manpower and technologically equipped warehousing facility.

The Warehousing Corporation is empowered to acquire and build Warehouses for storage of Agricultural produce, seeds, fertilizers and other notified commodities and also to act as an agent of the Central Warehousing Corporation or of the Government, for the purpose of purchases, sales storage, distribution etc.

WAREHOUSING CORPORATION, ACT 1962

The all India Rural Credit Survey Committee of Reserve Bank of India recommended the establishment of warehouses to strengthen the rural credit and marketing. As a result of the recommendations of the Committee, the Government of India enacted the Agricultural Produce (Development and Warehousing) Corporation Act, 1956. PROVISIONS OF THE ACT: a) The establishment of a National Co-operative Development and Warehousing Board, which was set up on 1st September 1956. b) The establishment of the Central Warehousing Corporation (set up in 1957) c) The establishment of State Warehousing Corporation in various States (since 1957) In 1962, the Government of India decided to bifurcate the Act of 1956 into two separate Acts, such as: - a) National Co-operative Development Corporation Act (1962) b) Warehousing Corporation Act (1962) Warehouses are scientific storage structures constructed for the protection of quality and quantity of the stored produce.

In other words, it can be called as the protector of the national wealth. Warehousing scheme in India is an integrated scheme of scientific storage, rural credit, price stabilization and market intelligence and is intended to strengthen the cooperative institutions.

Functions of Warehouses: - Scientific storage: In Warehouses the stored produce is protected from the vagaries of weather and rodents, insects, pests' etc. and prevents quality and quantity losses. Financing: Warehouses meet the financial needs of the persons who store the produce by providing value of the goods stored. Price stabilization:

Warehouses help in regulating the price levels by regulating the supply of goods in the markets. More goods from the buffer are released when supplies are less and less is released when supplies are more in the markets. Thus the demand levels are monitored.

Market Intelligence: Warehouses offer the price, supply and demand information to the market users so as to develop selling and buying strategies by them.

Central Warehousing Corporation (CWC): Established on 2nd March, 1957 with 91.99 lakh MTs capacity of storage capacity spread among 473 units. The CWC provides safe and reliable storage facilities for about 120 agricultural and industrial commodities. The area of operation of the Warehouses under CWC is Centre and inter-State importance.

Functions of the Central Warehousing Corporation are

- To acquire and build godowns and warehouses at suitable places in India.
- To run warehouses for the storage of agricultural produce, seeds, fertilizers and notified commodities for individuals, co-operatives and other Institutions.
- To act as an agent of the Government for purchase, sale, storage and distribution of the above commodities.
- To arrange facilities for the transport of above commodities.
- To subscribe to the share capital of State Warehousing Corporations. To carry out such other functions as may be prescribed under the Act.

State Warehousing Corporations:

Separate Warehousing corporations were also set up in different States of the Indian Union. The first warehouse was set up in Bihar in 1956 and now, 17 State Warehousing Corporations are operating. The area of operation of the State Warehousing Corporations is centers of district importance. The total share capital of the State Warehousing Corporations is contributed equally by the concerned State Governments and the Central Warehousing Corporation. The SWCs are under the dual control of the State Government and the Central Warehousing Corporation.

Warehousing activities of WC include food grain warehouses, industrial warehousing, custom bonded warehouses, container freight stations, inland clearance depots and air cargo complexes.

WAREHOUSING FOR EVERY ONE.

Established : 1957

Storage Capacity (Million Tones) : 9.96

National Presence : 15 Regional Offices

The Warehousing Corporation act, 1962: Subject to the provisions of this Act, the Central Warehousing Corporation may subscribe to the share capital of a State Warehousing Corporation Act as agent of the Government for the purposes of the purchase, sale, storage and distribution of agricultural produce, seeds, manures, fertilizers, agricultural implements and notified commodities.

23.5 OBJECTIVES OF WAREHOUSING CORPORATION

- Acquire Land and Build Warehouse Go downs at suitable places.
- Act as agent of the State Government & Run Warehouses for the storage of agricultural produces, seeds, manures, fertilizers, agricultural implements and notified commodities offered by individuals, co-operative societies and other institutions.
- Arrange transport facilities to and from Warehouses for transportation of stocks.
- Carry out such other functions as may be prescribed by the Government from time to time Creation of Negotiable Instrument (Warehouse Receipt) for the expansion of credit through Commercial Banks for the benefit of all producers, dealers and others who might be connected with ruraleconomy.
- Improving Nation's real income by reducing waste and losses in storage, by promoting and developing warehousing and scientific storage facilities.
- Assistance to the Government and Government Sponsored Organizations in Price support and Price control schemes.

- Assistance in orderly marketing by introducing standard grade specifications in the Warehouse Receipts. The Central Warehousing Corporation (CWC) was set up in the year 1957. It functions under the Warehousing Corporations Act, 1962 for warehousing of agricultural produce and other notified commodities. The objectives of the Corporation is to acquire / build Warehouses for storage of agricultural produce, seeds, manures, fertilizers and other notified commodities.
- To establish specialized warehouses and Container Freight Station/Inland Clearance Depots for storing industrial/exportable and imported goods.
- The objective of the Corporation also aims to train, educate and assist farmers in reduction of post-harvest losses at farm level through scientific storage techniques and disinfestations measures.

SERVICES RENDERED BY CWC

Under the Warehousing Corporations Rules, 1963, CWC undertakes disinfestations services outside its warehouses at the request of the parties/clients & citizens. Besides Warehousing Services, CWC also provides a package of services briefed as below: -

1. Provision of space to accept notified commodities from various clients.
2. Acts as an enabler for credit through pledge of negotiable warehouse receipts with banks.
3. Scientific storage through a chain of 466 numbers of warehouses all over the country at reasonable rates.
4. Cold/Air Conditioned Storage for perishables like fruits, vegetable, dairy products, drugs & pharmaceuticals,
5. Custom Bonded Warehouses at Ports Metro-polite towns, industrial complexes and inland stations for various import/export cargo.
6. Air-cargo Complexes to provide storage facilities at Air Ports for import/export of cargo and unaccompanied baggage.

7. Container Freight Stations (CFSs) and Inland Clearance Depots (ICDs) for handling of import containers, their de-stuffing and delivery of stocks; consolidation and stuffing of export cargo for onward transmission to Gateway Ports by road/through rail.
8. Handling and Transport facilities to depositors on their request on actual plus nominal supervision charges.
9. Orderly Marketing – facilities through handling, grading, storage and distribution of commodities on behalf of Import Marketing and Consumers Centres.
10. Help the depositors to keep his goods indemnified against loss of damage due to fire, floods and burglary.
11. CWC takes up construction programmed of warehouses for storage for other companies.
12. Under Farmers Extension Service Scheme, CWC educates the farmers on scientific preservation at farm level to reduce post-harvest losses.
13. CWC also provides Pest Control Services at the door steps of farmers, traders, cooperatives, government organizations, exporters and importers at very competitive rates with a network of technically trained man-power throughout the country. CWC has got recognition from the Directorate of Plant Protection & Quarantine, Ministry of Agriculture and has authorized man-power to undertake fumigation of export and import cargo. Also provides ship fumigation and air craft fumigation services and disinfestations services to many more government and private organizations, hospitals, residential colonies, railway coaches etc.
14. Expert advice and training on storage problems.
15. Consultancy services – preparation of projects, techno-economic feasibility report in respect of all warehousing facilities.
16. Financing: Warehouses meet the financial needs of the persons who store the produce by providing value of the goods stored.
17. Price stabilization: Warehouses help in regulating the price levels by regulating the supply of goods in the markets. More goods from the buffer are released when supplies

are less and less is released when supplies are more in the markets. Thus the demand levels are monitored.

18. **Market Intelligence:** Warehouses offer the price, supply and demand information to the market users so as to develop selling and buying strategies by them. **Central Warehousing Corporation (CWC):** Established on 2nd March, 1957 with 91.99 lakh MTs capacity of storage capacity spread among 473 units. The CWC provides safe and reliable storage facilities for about 120 agricultural and industrial commodities. The area of operation of the Warehouses under CWC is Centre and inter-State importance.

23.6 FUNCTION OF WAREHOUSING CORPORATION

- Warehousing activities of CWS include food grain warehouses, industrial storage, custom bonded warehouses, container freight stations, inland clearance depots and air cargo complexes.
- Apart from storage and handling, CWC also offers services in the area of clearing and forwarding, handling and transportation, procurement and distribution, disinfestations services, fumigation services and other ancillary activities.
- CWC also offers consultancy services and training for construction of warehousing infrastructure to different agencies.
- CWC is the office for storage and covering. CWC also offers services in the field of authorizing, and forwarding, handling and transportation, procurement and distribution, disinfestation services, fumigation services and other ancillary activities are:
- **To establish warehouses:** The very first function of Central Warehousing Corporation is to acquire and build godowns and warehouses at such suitable and useful places in India as it deems it.
- **Run warehouses:** After establishing warehouses at suitable places the next function is to run warehouses for the storage of agricultural produce, seeds, manures, fertilizers, agricultural implements and notified commodities offered by individuals, cooperative societies and other institutions.

- Provide assistance to agriculturist: Central Warehousing Corporation also needs to arrange facilities for the transport of agriculture products, seeds, manures, fertilizers, agricultural implements and notified commodities to and from warehouses.
- Assisting state warehousing corporation: Being a supreme government body in this field Central Warehousing Corporation is also supposed to assist and direct State Warehousing Corporations. It also has to subscribe to the share capital of State Warehousing Corporation.
- Act as an agent of government: Sometimes central warehousing corporation has also to serve as an agent of the Government for the purpose of purchase, sale, storage and distribution of agricultural produce, seeds, manures, fertilizers agricultural implements and notified commodities.
- Disinfestations services: The corporation may, at the request of parties concerned, undertake disinfestations service outside its warehouses in respect of agricultural produce or notified commodities.
- Act as an agent of its discretion: CWC may, act at its directions, act as agent for the purpose of purchase, sale, storage and distribution of agricultural produce, seeds, manures, fertilizers, agricultural implements and notified commodities on behalf of the company as defined in the Companies Act, 1956, or a body corporate established by an Act of Parliament or a State Legislature or a co-operative society.
- Follow the instruction of the Government: Being a government organization the corporation has to follow instructions from the central government. So, it also able to carry out such other functions as may be prescribed by the Government from time to time.
- Warehousing purchase, sale, storage and distribution of agricultural produce, seeds, manures, fertilizers, agricultural implements and notified commodities on behalf of the company as defined in the Companies Act, 1956, or a body corporate established by an Act of Parliament or a State Legislature or a co-operative society.
- Follow the instruction of the Government: Being a government organization the corporation has to follow instructions from the central government. So, it also to

carry out such other functions as may be prescribed by the Government from time to time.

CWC IS THE OFFICE FOR STORAGE AND COVERING. CWC ALSO OFFERS SERVICES IN THE FIELD OF AUTHORIZING, AND FORWARDING, HANDLING AND TRANSPORTATION, PROCUREMENT

- 1) To acquire and build godowns and warehouses at suitable places in India;
- 2) To run warehouses for the storage of agricultural produce, seeds, fertilizers and notified commodities for individuals, co-operatives and other Institutions;
- 3) To act as an agent of the Government for purchase, sale, storage and distribution of the above commodities;
- 4) To arrange facilities for the transport of above commodities;
- 5) To subscribe to the share capital of State Warehousing Corporations; and
- 6) To carry out such other functions as may be prescribed under the Act. State Warehousing Corporations: Separate Warehousing corporations were also set up in different States of the Indian Union. The first warehouse was set up in Bihar in 1956 and now,
- 7) State Warehousing Corporations are operating. The area of operation of the State Warehousing Corporations is centres of district importance. The total share capital of the State Warehousing Corporations is contributed equally by the concerned State Governments and the Central Warehousing Corporation. The SWCs are under the dual control of the State Government and the Central Warehousing Corporation.

Working of Warehouses:

The Warehouses (CWCs and SWCs) work under the respective Warehousing Acts passed by the Central or State Governments. They are licensed under the provisions of the Act.

Eligibility:

Any person may store notified commodities in warehouse on agreeing to pay the specified charges. The person is required to bring his produce to the warehouse for storage. The commodity is inspected and the quality of the product is determined.

Warehousing Receipt (Warrant):

This is receipt/warrant issued by the warehouse manager/owner to the person storing his produce with them. This receipt mentions the name and location of the warehouse, the date of issue, a description of the commodities, including the grade, weight and approximate value of the produce based on the present price.

The warehouse warrants are a negotiable instrument and can be transferred by a simple endorsement and delivery. The depositor may take a delivery of part of the goods through this warrant. Sometimes, the warrant may be non-negotiable. Use of chemicals:

The produce accepted at the warehouse is preserved scientifically and protected against rodents, insects and pests and other infestations. Periodical dusting and fumigation are done at the cost of the warehouse in order to preserve the goods. Financing: The warehouse receipt serves as a collateral security for the purpose of getting credit. Commercial banks advance upto 75 percent of the value of the produce stored in the warehouse

Delivery of produce:

The warehouse receipt has to be surrendered to the warehouse owner before the withdrawal of the goods. The holder may take delivery of a part of the total produce stored after paying the storage charges. License for running Warehouse: A license is required to run a warehouse from the CWC / SWC

23.7 SUMMARY

Thus, warehousing is a collective process in which warehouse may be defined as a place used for the storage or accumulation of goods. The function of storage can be carried out successfully with the help of warehouses used for storing goods. Warehouse is a building for storing goods.

Warehouses are used by manufacturers, importers, exporters, wholesalers, transport businesses, customs, etc. They are usually large plain buildings in industrial parks on the outskirts of cities, towns or villages.

They usually have loading docks to load and unload goods from trucks. Sometimes warehouses are designed for the loading and unloading of goods directly

from railways, airports, or sea ports. They often have cranes and forklifts for moving goods, which are usually placed on ISO standard pallets loaded into pallet racks. Stored goods can include any raw materials, packing materials, spare parts, components, or finished goods associated with agriculture, manufacturing, and product and distribution, disinfection services, fumigation services and other ancillary activities are: the following are the function of WC

23.8 GLOSSARY

Insurance – an arrangement by which a company or the state undertake to provide a guarantee of compensation for specified loss.

Dispatch – send off to a destination or for a purpose.

Logistics company – in a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers.

Hygroscopic item – a hygroscopic substance is able to absorb water from its surrounding.

Recommendation – a suggestion or proposal as to the best course of action.

Stabilization – to process of making something physically more secure or stable.

Procurement – to action of obtaining or procuring something.

Disinfection services – physical or chemical process to destroy or remove small undesirable animal form.

23.9 SELFASSESSMENT QUESTIONS

Q1 Define warehousing and point out its various functions

Q2 Explain various type of warehousing.

Q3 Write a detailed note on warehousing corporation In India.

Q4 Discuss the role of warehousing in economic development of India

23.10 END EXERCISE QUESTION

Q1 Discuss the role of warehousing corporation in India.

Q2 Write all the function of warehousing corporation.

23.11 BOOKS RECOMMENDED

- Central warehousing corporation superintendent written by vvk sub raj publishers
- Central warehousing corporation written by prashant chaturvedi.