Study Materials for

LOGISTICS MANAGEMENT







TABLE OF CONTENT

MODULE ONE

1.0 LOGISTICS MANAGEMENT

1.1 The Concept of Logistics and Logistics Management

1.2 Elements or Wings of Logistics

1.2.1 Customer Order Processing

1.2.2 Location Analysis

1.2.3 Inventory Control

1.2.4 Material Handling

1.2.6 Transportation

1.2.7 Warehousing

1.2.8 Customer Service

MODULE TWO

2.0 DISTRIBUTION

2.1 Understanding the Concept of Distribution

2.2 Inventory Management

2.3 Reactive Inventory System

2.4 Planning Approach

2.5 Benefits of DRP System

2.6 The Major Logistics Benefits include:

2.8.1 Cross Docking

2.8.2 MILK RUNS

2.8.3 Direct Shipping

2.8.4 Hub and Spoke Model

2.8.5 POOL DISTRIBUTION

MODULE THREE

3.0 MANAGING TRANSPORTATION

3.1 Introduction

3.2 Modal Split In Transportation

3.2.2 Land Transport

3.2.3 Rail Transport (restricted right of way)

3.2.4 Sea and Inland Water Transport)

3.2. 5 Problems of Inland Water Transport (IWT) in Nigeria

3.2.6 Ocean/ Maritime

3.3 The Demand and Supply of Transport in Supply Chain

1.4 Factors That Determine Demand For Transport Services

3.5 The Supply of Transport

3.5.1 Factors That Influence the Supply of Transport

3.6 PACKAGING IN EXPORT/IMPORT TRADE (Foreign Logistics)

3.6.1 Factors that influence Packaging of Cargo in International Procurement

MODULE FOUR

4.0 International Chamber of Commerce Trade Terms (INCOTERMS)

4.1 Introduction

4.2 Understanding INCOTERMS

4.3 WHAT INCOTERMS DO:

4.4 What INCOTERMS Do Not Do?

4.5 SOME INTERESTING QUESTIONS

4.7 Incoterms Group E

4.8 What are The Most Important Changes in INCOTERMS 2020?

4.10 The Most Significant Changes

4.11 Incoterms for Sea and Inland Waterway Transport (the 4 rules)

4.14 The Things INCOTERMS Do not Cover

5.16 THE DOCUMENTATION PROCESS

4.17 CARRIER AND CONSOLIDATION

MODULE FIVE

5.0 SUPPLY CHAIN AND DEMAND PLANNING IN INVENTORY

5.1 Introduction

5.2 Scope of Enterprise Resource Planning

5.4 SUPPLY CHAIN METRICS

5.5 Demand Planning

5.6 Categories of Demand (Dependent and Independent Demand)

5.7 Components of Demand

5.8 Quantitative Forecasting Models/Forecasting Methods

5.9 Basic Approach to Demand Forecasting

5.11 Collaborative Planning Forecasting Replenishment (CPFR)

5.12 Functions of CPFR and Electronic Collaboration

References

MODULE ONE

LOGISTICS MANAGEMENT

1.1 The Concept of Logistics and Logistics Management

Logistics can be defined as the science pertaining to the movement of materials and the services along with its information. The more comprehensive definition says, “Logistics is the process of moving and positioning inventory to meet customer requirements at the lowest possible total landed cost.”

According to the Chartered Institute of Logistics and Transport (CILT). Logistics is the time related positioning of resources at the right time at the right place at the right quantity and at the right price.

To get these “rights” correct, logistics involves activities and processes like planning, Inventory, costing, transportation, warehousing, customer care and all other activities that will help create value at the hand of the final consumer. Logistics is and involves the flow of resources, information, ideas, money and all other input that create value. Resources are (5Ms) – Men, Machines, Money Materials and Management. These five elements interact with the boundaries of an organization to develop a process called LOGISTICs. It involves all the activities and organization performs within the fence to create customer satisfaction (Value).

Here, value is defined from the end users perspective. E.g. to the investor (shareholder, value is return on investment (ROI). Hence logistics managers are on their toes to control cost, working capital and fixed assets.

Logistics is concerned with funds flow. Material flow and information flow within the organization. It is a cross-functional discipline that addresses management processes of plan, make, deliver and return. These processes are repeated across the supply chain (Harrison 2008).

According to AI overview, Logistics management is the process of planning, implementing, and controlling the movement and storage of goods, services, and related information. Its primary goal is to efficiently get the right product, in the right condition, to the right place, and at the right time to meet customer needs.

Furthermore according to AI overview, logistics management is generally divided into four core areas:

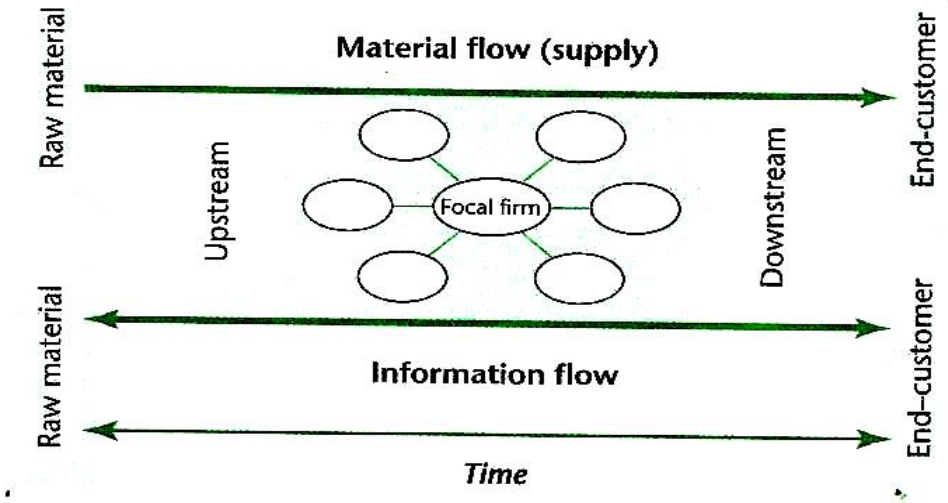
Inbound Logistics: Moving raw materials or supplies from suppliers to your manufacturing or assembly plants.

Outbound Logistics: Storing and delivering finished products from the end of the production line to the end consumer.

Reverse Logistics: Managing the return of products, including recycling, refurbishing, or disposing of goods.

Third-Party Logistics (3PL): Outsourcing logistics operations (like warehousing and shipping) to a specialized external provider.

1.3 Elements or Wings of Logistics



Adapted from Harrison and Van Hoek, 2008, pg 93

Logistics management consists of eight elements called wings of logistics. These are discussed in a nutshell below:

1.2.1 CUSTOMER ORDER PROCESSING

Flow of Actions

1. Filling up the order form
2. Deciding the specifications of the product
3. Deciding the quality check list of the product
4. Deciding the delivery schedule
5. Deciding the location of delivery

Important Factors

1. Cost of order processing
2. Whether the company is capable of producing a component
3. Detailed list of specifications

Techniques

1. Electronic data Interchange (EDI)
2. E- Enterprise Resource Planning (ERP) or Collaborative planning (CPFR)
3. Web portal

1.2.2 LOCATION ANALYSIS

Flow of Actions

1. Cost of transportation of raw materials and finished goods:
- Proximity to suppliers
- Proximity to customers
2. Availability and type of land
3. Availability of secondary resources
4. Availability of desired manpower at affordable cost
5. Communal harmony
6. Governmental regulation and taxation

Important Factors

1. Cost of operations as a percentage of sales
2. Shelf life of product

1.2.3 INVENTORY CONTROL

Flow of Actions

1. On hand inventory analysis
2. Communicating the quantity, quality and timing of material with the supply points
3. Getting the material of right quality, quantity and at right time

Important Factors

1. Inventory control at planning stage
2. Lead time
3. Cost vs importance of raw material

Techniques

1. DRP and replenishment order control

2. Fixed order interval system
3. Economic order quantity with ROP system
4. Selective inventory control (ABC, VED, FSN analysis etc.)
5. Order forecasting using statistical tools

1.2.4 MATERIAL HANDLING

Flow of Actions

1. Type of material (Business significance like raw material, finished goods etc.)
2. Material handling requirements of the material (Fragile, inflammable)
3. Cost ratio of material handling to material cost
4. Material default location, identification and traceability

Important Factors

1. Material breakage
2. Pilferage
3. Cost of material handling
4. Number of handlings

Techniques

1. Operational research
2. Material flow analysis
3. Computerized material retrieval system
4. ASRS (Advanced Storage & Retrieval System)

1.2.5 Packaging

Is the process of containment of the cargo for protection and1easier stowage.

Flow of Actions

1. Packaging requirement for the
2. Material (Refrigeration, Fragile etc.)
3. Primary packaging
4. Cost of packaging

5. Transportation requirement for packaging (Vibration proof, water or moisture tight)

Important Factors

1. Protection to product
2. Holding the product
3. Communicating the message to customers
4. Customer requirement for packaging
5. Reverse logistics for packaging
6. Recycling of packaging materials
7. Cost of packaging

Techniques

1. Standardized box packaging
2. Containerization of packaging
3. Direct part marking
4. ISO 14001
5. Recycling of packaging materials
6. Reusable packaging materials
7. Eco-friendly packaging materials
8. Bar coding
9. Bumpy bar coding
10. GPS tracking system
11. RFID

1.2.6 Transportation

Flow of Actions

1. Mode of transportation
2. Cost of product
3. Speed of transportation
4. Ambience requirement of material (Refrigeration, Vacuum)
5. Cost of transportation
6. Urgency of the product to customers

Important Factors

1. Urgency of the product

2. Cost of product
3. Cost of transportation

Techniques

1. Containerized transportation
2. Cool Chain Transport (Refrigerated Vans/Containers)
3. Multi-modal Logistics
4. Milk Run Distribution systems
5. Cross Docking
6. Direct Shipment

1.2.7 Warehousing

Flow of Actions

1. Location of the warehouse
2. Inventory level at the warehouse
3. Storage requirement of the product
4. Packaging and repackaging requirement of the product
5. Shelf life of the product

Important Factors

1. Availability of space
2. Availability proper material handling systems
3. Strategic location
4. Packing and Re-packing facilities
5. Information and allied services

Techniques

1. Third Party Logistics
2. Third Party Warehousing

1.2.8 Customer Service

Flow of Actions

1. Contractual services offered to client
2. Type of customer service required for the product
3. Location of the service centre
4. Service level at the service centre
5. Cost of service vs replacement

Important Factors

1. Contractual requirement of customer service
2. Service quality
3. Reserve logistics

Techniques

1. AMC (Annual Maintenance Contracts) and free replacements
2. Limited (free) trail period
3. Guarantee and Warrantee
4. User clubs
5. Help lines, toll free number, call centers
6. CRM

MODULE TWO

DISTRIBUTION

2.1 Understanding the Concept of Distribution

Distribution in layman's language refers to getting the right product to the right place at the time. Distribution can be defined as the channel structure used to transfer products from an organization to its customers. Distribution organizations manage the activities associated with the movement of materials, usually finished goods or parts, from the supplier to the customer. All activities related to physical distribution need to be managed. This movement may be through one or more levels of field warehouses. The distribution strategy used, e.g. financial planning services, may be offered from printed material, and sold at retail, sold by consultants face-to-face, or delivered electronically by computer, by phone and by correspondence-multitude of different distribution systems.

Distribution decisions have significant implications on:

a Product margins and profits
b Marketing budgets
c Final retail pricing
d Sales management practices

Distribution channels can include one or more of these options:

a Retail: Stores selling to final buyer (one store or a chain of stores)

b Wholesale: An intermediary distribution channel that usually sells to retail stores

c Direct Mail: Generally catalog merchants that sell directly to buyers at retail prices plus shipping via mail

e Telemarketing: Merchants selling directly to buyers at retail via phones

f Cyber Marketing: Merchants selling directly buyers at retail prices, or business-to-business products and services at wholesale prices via computer networks

g Sales Force: Salaried employees of a company or independent commissioned representatives who usually sell products for more than one company

Distribution planning applications are designed to calculate what products need to be received at which location, and at what time. Distribution planning helps organizations create their Distribution Requirement Plan (DRPs) and establish distribution lead times. Before a system can calculate the shipment plan it must understand what inventory is available to meet the demand at any point in time and what demand might be unmet at any point in time. It is difficult to complicate when allocating for limited supply, customer priorities, shipment costs and other organizational priorities.

Many organizations are interested in building complete supply chain planning systems that can address these major application types. Thus, most planning solutions usually include multiple products, from

which users can select particular components or integrate third-party components to create the finished application.

2.2 Inventory Management

Inventory management is the deliberate planning, coordination, control and budgeting of distribution resources to meet customer's requirements at all time and to create value for the organization. It is key to any successful distribution business. Inventory management provides everything you need to know about the receipt and movement of goods, the sale, removal or other disposition of goods and the precise valuation and status of goods remaining in inventory at any time.

Effective inventory management allows a distributor to meet or exceed his customer's expectations of product availability with the amount of each item that will maximize the distributor's net profits.

2.3 Reactive Inventory System

This system responds to the channel members inventory needs by drawing the products through the inventory channel. In the reactive system, the retailer independently decides when and how much to order to the wholesalers. The wholesalers in turn order independently to their suppliers. These independent actions create a lot of uncertainly which increase the need to have certain safety stock for adequate performance.

2.4 Planning Approach

It is an approach that schedules the product movement through the channel according to the forecasted demand and the availability of the product. It coordinates the inventory requirements across various locations by sharing information. There are two types of inventory planning methods:

a Fair Share Allocation

b Distribution Requirement Planning (DRP)

Fair Share Allocation: It is an inventory planning method that provides a “fair requirements at the stocking locations and ensure that the supply sources are able to meet the demand. It has been viewed as the key requirement for a just in time production (JIT) and logistics system. DPR is defined as:

Distribution Requirement Planning (DRP) is a planning approach that considers multiple distribution stages and the characteristics associated with each stage. DRP, in fact, is the logical extension of MRP(Manufacturing Requirement Planning). PRP helps to schedule the production resources and attempts to resolve the capacity problems like shortage of material, in the material management system. Manufacturing requirements determine the master production schedule (MPS) and manufacturing requirement plan (MRP). MPS defines the weekly or daily production and machine

schedules. Given the MPS, MRP co-ordinates the purchase and arrival of materials and components to support the manufacturing plan. The characteristics of DARP and MRP are highlighted in Figure 2.1

FIGURE 2.1 Characteristics of DRP and MRP

DRP	MRP
• DRP is determined by customer demand on which the organization has no control.	• MRP is determined by a production schedule which is in turn managed by the enterprise
• DRP operates in an independent demand situation	• MRP operates in a dependent demand situation
• DRP co-ordinates once • the finished goods are received in the plant warehouse	• MRP controls inventory till manufacturing or assembling is completed.

DRP Process: DRP is a process that co-ordinates inventory levels, plans the inventory movement, and reschedules inventory between levels (if necessary). The most fundamental DRP planning tools is the schedule.

It co-ordinate the requirements across the planning horizon.

2.5 Benefits of DRP System

The integrated inventory planning system such as DRP provides various benefits to the management. This system has especially helped marketing and logistics.

The major marketing benefits include:

a DRP, through the integration of various distribution centres, has helped to provide timely delivery to the customers.

b The on time delivery system in turn has helped to reduce the number of customer complaints.

c The system has helped to forecast the future requirements, which helps to anticipate the shortages so that lower product stocks do not affect the company's name.

d It has improved the inventory co-ordination with other functions such as MRP and it has offered a co-ordinated inventory management system to the customers.

2.6 The Major Logistics Benefits include:

a There has been a considerable reduction in the distribution costs incurred earlier, due to coordinated shipments.

b It has contributed a lot so as to maintain low inventory levels as DRP can predict what product is needed and precisely at what time.

c DRP further has also reduced the warehouse space required to store the goods as a result of lower inventory levels.

d DRP further has improved the amount of co-ordination between the manufacturing division and the logistics division as they have to work in close co-ordination with each other in this integrated system.

e The budgeting capability has increased as DRP can effectively simulate inventory and transportation requirements.

2.7 Constraints

The most important thing required in such an integrated system is accurate and coordinated forecasts for each and every distribution centre. The forecast is required to direct the flow of goods through the distribution channels. Moreover, this forecast is required for each distribution centre and SKU (Stock Keeping Unit).

Here, there might be 3 kinds of errors:

1. The forecast itself might be wrong.
2. It requires stable, consistent and reliable performance cycles.
3. System nervousness is a major constraint to the effectiveness of DRP. It is mainly due to production breakdowns or delay in delivery etc.

Uncertainties such as supply transportation performance cycles and the reliability of vendor delivery can cause extremely nervous management; many companies have reported substantial performance improvements with its use.

2.8 Distribution Strategies

Distribution strategies are the methods a focal organization adopts to make its products or market offerings get to their final consumers regardless of their locations. Distribution Strategies can be of the following types:

a Cross docking
b Milk runs
c Direct shipping
d Hub and spoke model
e Pool distribution

2.8.1 Cross Docking

Traditional warehouses move materials into storage, keep them till they are needed and then move them out to meet the customer demand. Cross docking co-ordinates the supply and delivery so that the goods arrive at the receiving area and are transferred straight away to the loading area, where they are put into delivery vehicles. In other words, Cross docking is the movement of materials from the receiving docks directly to the shipping docks. It is said, “Cross docking is a flow through concept and we don’t want product to stop anywhere, because space, brick and mortar is getting very expensive these days”.

Goods do not need to be placed in storage, creating a significant cost saving in inventory and material handling. Cross docking helps reduce direct cost associated with excess inventory by eliminating unnecessary handling and storage of product. Fewer inventories means less space and equipment required for handling and storing the products. This also means reduced product damages and product obsolescence. Thus, the step of filling a warehouse with inventory before shipping it out is virtually eliminated. Cross docking shift the focus from “supply chain” to “demand chain”. For example, stock coming into docking centre has already been pre-allocated against a replenishment order generated by a retailer in the supply chain. Cross docking helps retailers streamline the supply chain from point of origin

to point of sale. Cross docking also encourages electronic communications between retailers and their suppliers.

Two Basic Forms of Cross Docking

1. Basic Cross Dock: In this form the packages are moved directly from the arriving vehicle to the departing ones. This form of cross docking does not need a warehouse and a simple transfer point is enough.

2. Flow Through Cross Dock: In case of the flow through concept, when the materials arrive and they are in large packages, these are opened and broken into smaller quantities, sorted, consolidated to deliver them to different customers and transferred to vehicles.

   Cross docking can develop to a phase where nothing actually moves through a warehouse. The stock kept within vehicles is referred to as stock in wheels. Nowadays wholesalers use the method of drop-shipping, where they do not keep the stock themselves, but coordinate the movement of goods from the upstream suppliers to the downstream buyers.

How Cross Docking Works

On receiving goods workers put them in lanes corresponding to the receiving doors. A second team of workers sort the goods into shipping lanes from which a final ream loads them into outbound trailers. This is illustrated in Figure 2.2

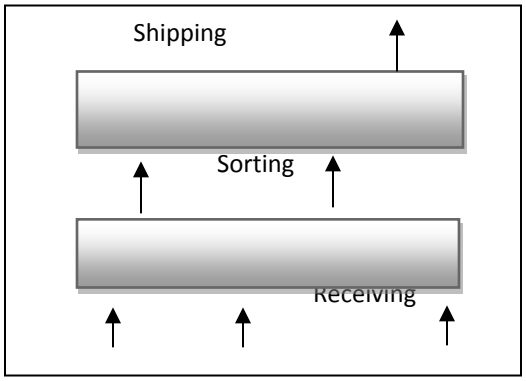


FIGURE 2.2 Working of Cross Docking:

BENEFITS OF CROSS DOCKING

1. Cross docking helps to improve the speed of flow of the products from the supplier to the stores.

2. It helps to reduce the costs as the labour is removed from the job of storage (warehouse).

3 It helps eliminate the two most expensive distribution operations i.e. warehousing and storage.

4. Cross docking helps to reduce the amount of finished goods inventory that is required to be maintained as safety stock.

4. Cross docking reduces costs and hence helps to save money.

Constraints

1. Cross docking requires a strong IT base and real time information sharing facilities, e.g. (Bar codes on cartons).

2. Cross docking is appropriate for products with large, predictable demands and also requires that the distribution centers should be set up such that the benefits of economies of scale in transportation can be achieved on both the inbound and the outbound side.

3. It requires a great degree of coordination and synchronization between the incoming and outgoing shipments which, in turn, relies on better information and planning.

4. Further the product availability, accuracy and quality are also critical.

5. The company can't force other members of the supply chain to incur additional costs or efforts so as to take the benefits of cross docking.

2.8.2 MILK RUNS

A milk run is a route in which a truck either delivers product from a single supplier to multiple retailers or goes from multiple suppliers to single retailer as shown in Figure 5.3 (a) and (b). in other words, in a milk run, a supplier delivers directly to multiple retail stores on a truck or a truck picks up deliveries for many suppliers of the same retail store. The main job of the supply chain manager is to decide on the routing of each milk run

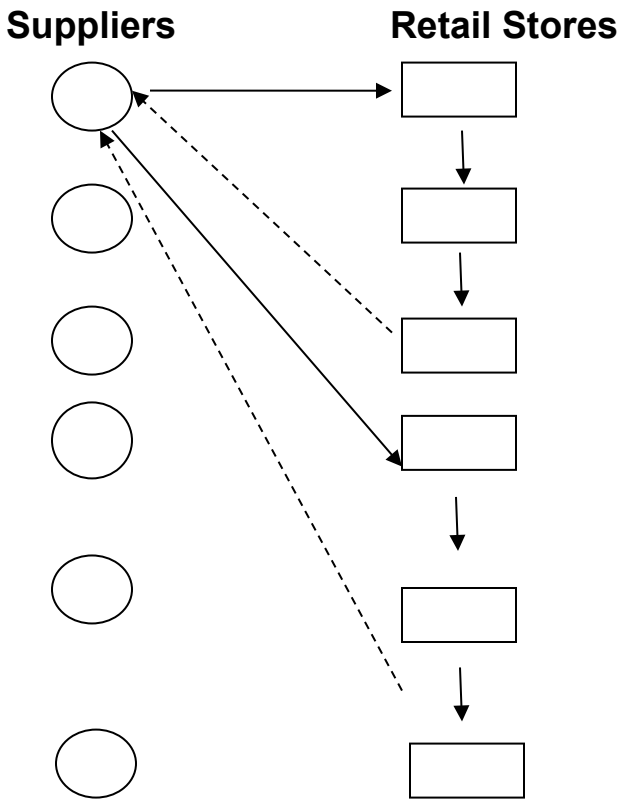


Figure 2.3 (a) Milk runs from single supplier to multiple retailers

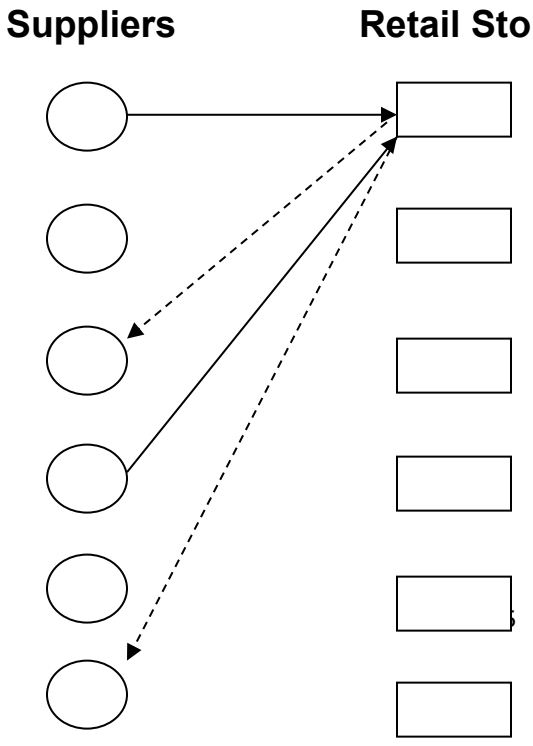


Figure 2.3 (b) Milk runs from multiple suppliers to single retailer.

Benefits of Milk Run

2. **Reduces costs**: Milk runs help to reduce the transportation costs by consolidating shipments to multiple stores on a single truck. The use of milk runs allows deliveries to multiple stores to be consolidate on a single truck, resulting in a better utilization of the truck and somewhat lower costs.
3. **Proximity of suppliers**: The use of milk runs is helpful if very frequent, small deliveries are related on a regular basis and either a set of suppliers or a set of retailers is in geographical proximity.
4. **Reduces inventory**: Milk runs also help to reduce the amount of inventory need to be kept as safety stock in the warehouses.

   One of the major challenges faced by the milk run system of distribution is the degree of coordination and synchronization required among the members of supply chain.

2.8.3 Direct Shipping

Direct shipping refers to the method of distribution in which the goods come directly from the suppliers to the retailer stores as shown in figure 5.4. in case of direct shipment network, the routing of each shipment is specified and the supply chain manager only needs to decide on the quantity to ship and the mode of transportation to use. This system eliminates the need for the intermediate facilities that are

otherwise required, e.g. warehouses and distribution centres. The products that are generally distributed through the method of direct shipping are certain perishable items, high volume goods, high bulk items and specialty products.

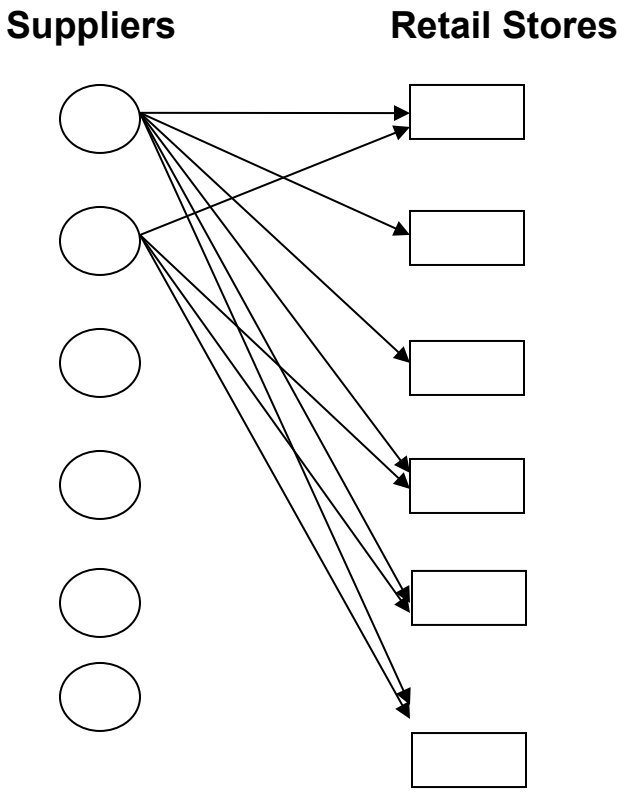


FIGURE: 2.4 Direct Shipment Network

Benefits of Direct Shipment

1. **Elimination of Intermediaries**: The major advantage of direct shipment network is the elimination of warehouses and the simplicity of its operation and coordination.
2. **Saves Time**: It saves a lot of time as the required for distribution of goods from the supplier to the retail store would be short because each shipment goes direct.

3. **Less Damage**: As the goods move directly from the supplier to the retailer there is less handling of the products as a result there is product damage.
4. **Improved Accuracy**: Since the distribution is direct the invoices match receiving records, correct products enter the store etc.

Challenges

1. **Large Retail Stores**: The direct shipment network is justifies if the retail stores are large enough. With the small size of retail stores the direct shipment network tends to have high costs.
2. **Higher Costs**: Due to the system of direct distribution the costs of transporting the goods may be higher than other systems of distribution.
3. **Hassle for Store Personnel**: The shipment directly from the supplier retailer poses a lot of hassles for the store personnel e.g. more deliveries, paperwork, loading and unloading etc.

4. **No Safety Stock**: If there is certain problem in the shipment of goods from the supplier, e.g. wrong goods are transported; goods are damages while shipment etc. maintenance of no supply stock creates a problem.

2.8.4 Hub and Spoke Model

In case of the hub and spoke model of distribution is the Nicholas Piramal Group. Nicholas Piramal is using the hub and spoke model to reduce the finished goods inventory. Currently, the stock holding at the carrying and forwarding agent level is 30 days. Once all the hubs are set up, the response time will reduce to 10 to 2 days. Using the system, the inventory at the carrying and forwarding agent level would go down to 7 days and at the hubs level would also be 7 days bringing down the overall inventory level to 14 days. The company has already set up 2 hubs and would be putting up 1 more. Some high volume products would be going directly to the carryingand forwarding agent. The problem to get full truckload can be solved by supplying to the hubs.

2.8.5 POOL DISTRIBUTION

Pool distribution is the distribution of product to numerous destination points customers, stores or stop points) within a particular geographic region.

Characteristics include high frequency regular shipments in LTL quantities, typically in the 150 to 2000 pound per shipment range. Pool distribution (Figure 2.5) represents an excellent cost effective alternative to the higher cost of individual LTL shipments. Instead of LTL direct, product is shipped to regional terminals in truckload quantities. There it is off loaded, then segregated and sorted by delivery point the reloaded on local delivery trucks for delivery to the individual destinations. Pool reduces transit times, maintains shipment integrity and allows a significant discount over LTL rate.

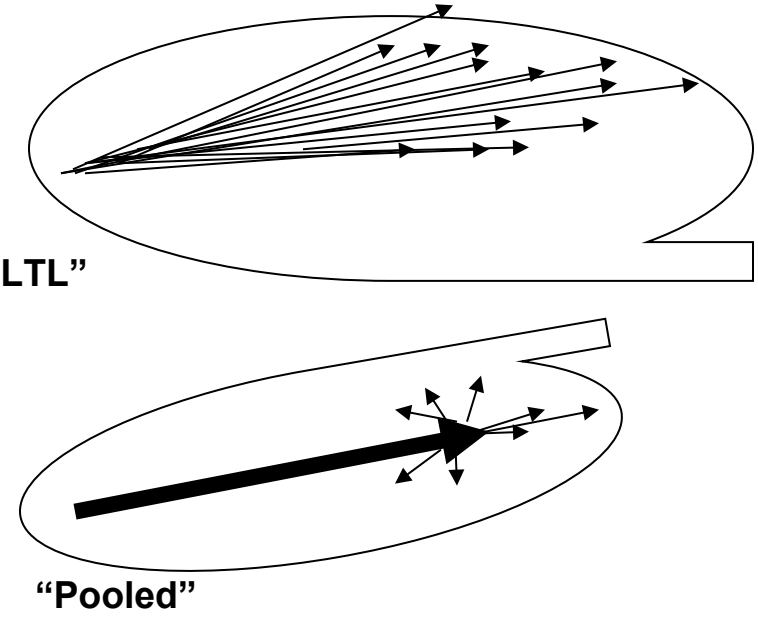


FIGURE 2.5 Normal LTL and Pool Distribution

Benefits

1. When you have multiple shipments bound for a specific region, pool distribution is a simple, cost effective alternative to LTL.
2. Speed merchandise to retail outlets.

3. Truckload transit time is shorter than LTL and once at our distribution centres, your multiple shipments are delivered the next day.
4. Reduce claims (less handling than normal LTL service).
5. Meet customer delivery requirements.
6. Reduce delivery costs to your customer.
7. Handle peaks in business effectively.

Above all, the mode of distribution depends on the overall need of the customer i.e. the nature of the customer order. In case of any damage to the goods in transit by any packer, it is the duty of the company to reimburse the entire order and that too within the time prescribed, otherwise the goodwill/reputation of the company would be at stake. The company also gets the full amount of insurance in case of any damage to the goods. So this damage does not cause any loss to the company.

Questions

a. What is cross-docking? Explain the benefits of cross docking to the procurement and supply chain managers. What are the constraints?

b. Explain the concept of the Milk Run as a distribution strategy. What are the advantages of this concept in supply chain?

c. Why do procurement officers control inventory. List three ways inventory can be controlled in a modern warehouse.

MODULE THREE

MANAGING TRANSPORTATION



Multiple modes of Transportation a support to Procurement

3.1 Introduction

Transportation in Logistics –Aviation, Rail, Road Ocean an Pipeline

Transport is a movement service that aims at creating space and location value/Utility. i.e., transport is concerned with the movement of freight, information and passengers round the world from areas of need to consumption. It is one of the tools civilized societies adopt to create order out of chaos. It reaches every phase and facet of our existence. Transportation management is concerned with purchase and control, planning, budgeting, supervising and co-coordinating of movement services used by a firm (procurement) to achieve her logistics objectives e.g. procurement. Transportation accounts for between one-third and two-thirds of total logistics costs. Transportation increases the time and place utility of products by delivering them at the right time and to the right place where they are needed. Hence, efficient and effective management of transport systems impacts on

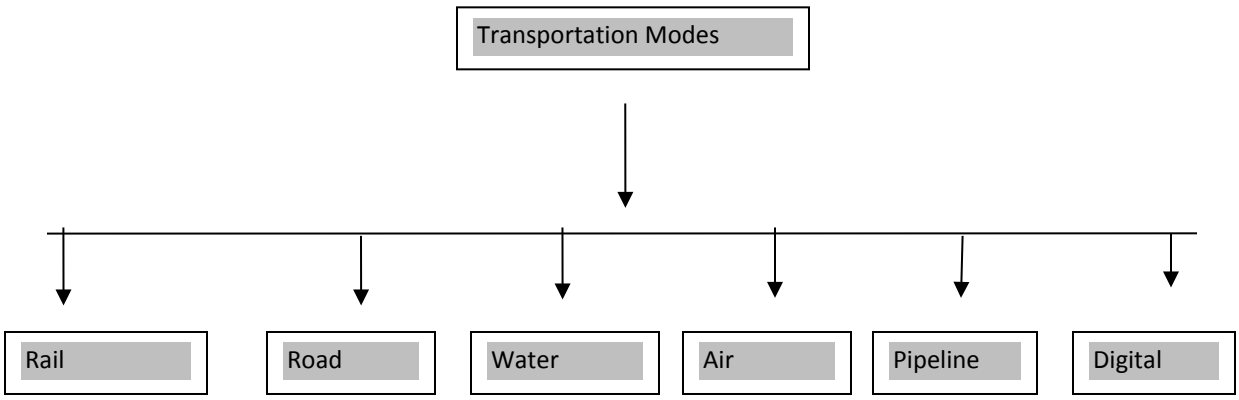
the three types of inter-firm flow (product, information and cash) this is critical in achieving supply chain integration and objectives.

In procurement, transportation has a derived demand. Managers demand transportation services as a means to serve other problem e.g. movement of resources. Hence we say that transport is a movement service that creates time and place value.

3.2 Modal Split In Transportation

Transport is organized in modes with each mode expressing a unique characteristic. In which ever mode we operate, there are six basic modes of transport that move or enhance flows in supply chain via:

Fig 7a Basic modes of Transportation



3.2.1 Air Transport



Fig1. Air Carrier a support to International Procurement

This includes the fixed wing (Air plane), the rotary wing (helicopters) and all forms of balloons, rockets that move above the ground or in space. Air transport is noted for its high technological input, speed and higher international regulations by ICAO. It has the highest technological input. This has reflected as a high fare per kilometer and good for international travel for its speed. It has speed, reduced packing, safety and security, wide market

Weaknesses

Has a restricted right of way. As such, it can not engage in door to door delivery of services (incomplete service delivery).

Faces international safety standards and multiple local regulations and restrictions.

It is capital intensive as such cannot serve the purpose of low income group.

It is not versatile in reaching every point of origin and destination. Its operation is affected by weather conditions.

Have restrictions in size and weight. It's best for transportation of goods of high value e.g. diamonds, electronic equipments and perishable goods for its speed. However there are high restrictions on

carriage of dangerous goods like explosives, flammables, compressed gasses and all other hazardous materials. (ICAO and IMO). Air transport is covered by the Warsaw and the Montreal conventions.

3.2.2 Land Transport

Road is the term applied to describe the route (paved and unpaved) that units of carriage pass on to deliver goods. (Cars, Trucks, Trailers, bikes – units of carriage) Road transport is classified under two major heading:-

Motorized Mode Of Transportation (Motor Carrier)
These are those nonhuman units of carriage that derive their energy or motive powers from steam, alcohol, coal, petroleum, gas, electricity or batteries, solar and nuclear energy. These units of carriage are the motor vehicles which are mechanically propelled devises intended to be used on the roads, routes etc. This sub-mode has gained exceptional acceptance among travelers for the speed, comfort and reliability in short and medium distance travels. In Nigeria for example, the mode carries about ninety percent (90%) of passengers and freight- (Lucy, 2004). The motorized mode or the motor carrier is the most accepted mode in Nigeria as it is able to lend itself to expansion to reach every settlement within the region. Also, it has the most extensive route network reaching every origin and destination (door to door)

Advantages

a It provides door-to-door or origin to destination services

b It is cheap, fast and economical for short distance travels

c It is very flexible and ubiquitous.

d It is a multipurpose medium of transport (cars)

Disadvantages

a It has high fuel consumption rate

b Not very economical for long distance travel

c Too many users hence causes congestion and over crowding

d It is a pollutant i.e. source of noise, air, and water pollution.

e Has low tonnage and carrying capacity as compared to other modes

The Motor Carrier



Fig. 1 Units of Carriage in land transportation

The motor carrier is the principal unit of carriage of road transport for procurement. It has greater advantage to other modes of transport for its easy take off and drop off of limited units of goods. It has the principal character of accessing every origin and destination. It can under take door to door delivery. The motor carrier has emerged to be the favored mode in recent times for it medium speed and able to cover short and medium distances with reduced travel time. Today, technical

changes sweeping through the transport world has ushered in an era of trucks with increased axle load, speed, safety, comfort and reliability.

3.2.3 Rail Transport (restricted right of way)

Rail transportation is a land based mode of transport. It has a restricted right of way as it runs on steel rail tracks which guide the wheels and enable the unit carry heavy loads while resisting flexibility on the tracks. It has the advantage of moving large volumes of freight over very long distances. The rail system has under gone tremendous change with the introduction of computers and information technology. There are three main grades of rail (train) systems namely:-

a Steam train (water powered/ steam locomotion)
b Diesel trains (powered by diesel fuel)
c Electric trains (powered by electricity)
d Pipe Line (slow for liquids and powders)

3.2.4 Sea and Inland Water Transport)

Inland Water Transport (IWT)

Nigeria has over 42 navigable rivers, 36 inland waterways and two major lakes. These rivers form a waterway network connecting major towns and economic and population centers and they use the river ports as nodal points for exchange.

This mode of transport uses the inland water ways as the high ways. It is principally used by riverine people and coastal communities that move their sea food to up land areas for exchange. In Nigeria, the rivers Niger and Benue are the principal arteries of transport and

communication. In the past, colonial master used the rivers extensively as tools for effective administrative and economic coordination of the state. Some commercial companies like – The Royal Niger Company, Julius Berger, United African Company (UAC) used these rivers to move large towns of cargo, steel for construction and iron ore that supported development of Ajeokuta steel company.

3.2. 5 Problems of Inland Water Transport (IWT) in Nigeria

a Infrastructural/Super structural Issues
b Structural/Systematic Constraints
c Jurisdictional Constraints
d Manpower/Capacity Constraints
e Lower Private Sector Participation
f Competition from other Modes – Road, Rail, Air
g Poor Funding/Organizational Bottlenecks
h Morphology:

3.2.6 Ocean/ Maritime

This is the highly regulated sea/ocean transport where ships of various tonnages (GRT, NWT and dwt) travel international waters as the principal unit of carriage in international trade and commerce. The seaports are the nodal points (Transport terminals) for ocean transport.

Characteristics of Ocean Transport

a It has the capacity to carry the largest tonnage of freight and passengers in supply chain compared to any other mode of transport.
b It is international in nature and subject to international rules and regs

c It is the cheapest mode of transport

d It has very low speed.

3.3 The Demand and Supply of Transport in Supply Chain

The Concept of Derived Demand in Transport

According to transport planners, the demand for Transport Services is ignited by the desire to meet other needs – work, Shopping, School, Hospital and other social or political issues this is in relation to land use. Transport is not demanded for its own sake but as a means to satisfy other needs.

Transport is demanded to satisfy other economic, social and personal needs, e.g. the demand for shopping, work, tourism, recreation. Take for example, people living kilometers away from their place of work demand transport to get them to their work location quickly and safely too. Again, a trader in the central business district (CBD) needs to take his new fashion to a nearby village that has good market, he demands transport to enable him move the fabrics to the market. Here, we say that transport opens access between two complimentary areas. Manufacturers need to move their produce from the factory to the market. None of the above demanded transport for the sake of it. The demand for transport is just a means to an end. Hence, Bonavia in (1936), Akpoghomeh, (2003) opined that transport aims at creating place utility. The concept of derived demand is important to a transport operator or planner as it could be used to predict or relate the number of trips that take place as compared to land use activities.

Also, the number of trips into a shopping centre can be related to the size of the shop and the number of employees. Hence, the derived

demand can be used to predict the travel pattern as a function of land use activities. Transport is a service rarely demanded for its own (except sightseeing and leisure)

4.4 Factors That Determine Demand For Transport Services

a Income per Head of travelers (Per capita income)

b Cost of Transport (Mode)

c Cost of Closer substitutes (other modes)

d Employment

e Population structure

f Geographical locale of residential areas

g Urbanization and travel pattern

h Demand for commerce and movement will cause transport to develop. Transport has a catalytic effect on the society as it stimulates commerce and movement.

3.5 The Supply of Transport

Transport is a service. The supply will be determined by the objective of the operating firm. If the service provider is profit driven, its supply is affected by the price or cost of the service. Where the cost or price is high, transport service providers will put in (supply) more of their units of carriage (cars, Lorries, trailers buses etc). They want to maximize profit.

Price is the principal determinant of supply in a profit driven market. The higher the price the higher the profit and the more suppliers put in more of their services. The converse is true for decrease in price.

Political Influence/legislations Government may legislate price of services e.g. air transport, Port dues, Docking fees and action of Competitors or Price of alternatives

3.5.1 Factors That Influence the Supply of Transport

a Cost of Transport in a mode.

b State of Technology in the mode

c Price of other closer substitutes

3.6 PACKAGING IN EXPORT/IMPORT TRADE (Foreign Logistics)

International procurement involves movement of goods across the globe. It requires that goods for transportation need to be properly secured and packaged to avoid risks associated with long distance travel and handling and to meet international regulations of various countries (importing/Procuring countries).

As such, there are basic and accepted ways cargo must be packaged to meet such international requirements. These include:

b. Use of ISO certified Metal Container /boxes, bags, pallets, nets racks etc. for various types of goods e.g. for general dry bulk cargo, we use the general purpose ISO certified metal containers and open-top containers for pipes and piping accessories. “Gen. Purpose”





Fig. 3 and 4 ISO certified Open top and General Purpose Containers

c. For wet and frozen stock that requires constant freezing and cooling, a type of ISO container called the reefer is recommended for international shipment. Reefer are connected to main ships source of power from port of origin to destination. Temperature sensitive cargo are stuffed here so are drugs and vaccines. The container gives opportunities for easy handling at the ports of loading and discharge. It enhances greater throughput for a work gang.



Fig. 4 A Reefer for wet and frozen Purchases (cargo)

d. It is also recommended that wet liquids and hydrocarbons, acids, corrosives be transported in special containers or ISO certified

container tanks. Each must be accompanied with a vivid description of the cargo and a material Safety data sheet (MSDS) that will explain the nature, character and reactivity of the substance to protect the handler and the environment. These substances must be rated according to their rate of reactivity from (1 - 9). A mark from (1 – 3) implies that such cargo or chemical is capable of spontaneous e.g. explosion, reaction, acidic, flammability etc. While numbers (4 -6) averagely (7 – 9) capable.

e. Life animals. These need to be handled with care. Hence a special type of containers are made for their transportation. Such are ISO certified

3.6.1 Factors that influence Packaging of Cargo in International Procurement

a Mode of Transport

b Government policy

c Nature and cost of packaging material

d Value of cargo to be packaged

f Nature and type of cargo (Dangerous goods, Life animal, Time sensitive etc.)

Exchange Rate

This is the value or worth or price of a currency in relation to another currency. It is the cost/value of a currency in international market. It is the number of units of a currency that can exchange for a given number of units of another currency – Branch 2013. Hence, the rate for the Naira is the number of units of another currency to the Naira. Take for example, if there are N450 to a 1Pound sterling, it implies that the

exchange rate for the Pound (UK) is N450. Here, the cost/price of one British Pound is N450 Naira. It is concerned with the method of settling foreign debts, means of payment and the services of bankers and brokers in international markets. Each politically independent nation of the world has its currency that serves as a medium of exchange (legal tender). It is also used for purchase of goods and services in international market after it has undergone conversion (Change to desire currency). Exchange rate are not static but changing in international market as the forces of demand and supply drive it (fluctuation).

Two closing rates are quoted for each currency – the higher is the buying market rate for that currency while the lower is the market selling rate for same currency. Bankers and brokers base their market price on this market cover which guides their price or rates to customers.

Questions

Why is road transportation in higher demand than other modes of transportation in your country?

List and explain any four challenges of air transportation as a major carrier in international procurement.

MODULE FOUR

INTERNATIONAL CHAMBER OF COMMERCE TRADE TERMS (INCOTERMS)

4.1 Introduction

INCOTERMS is the abbreviation for international commercial trade terms in international trade. The terms are rules that facilitate fair and consistent global trade. INCOTERMS outlines the shipping responsibilities of buyers (importers) and sellers (exporters) in international commerce. INCOTERMS are therefore rules for buyers and sellers to follow when formulating contracts for the shipment of goods. This is associated in international trade between buyer and sellers who may be domiciled in different countries

4.2 Understanding INCOTERMS

International commerce (trade) has been bedeviled by chains of litigations that hinder smooth flow of trade and commerce. Most of these litigations have been hindered due to differences in political, cultural and legal climates of the various parties. They are not from same nationality. The International Chamber of Commerce (ICC) therefore introduced INCOTERMS (the rules) in 1923 to detail the roles and responsibilities of each party in the import and export business.

It opens up the time each party undertakes due diligence to ensure goods arrive at the named ports in good and safe conditions. Since then, there has been several revisions to the rules, the most recent edition being ‘INCOTERMS 2020’ they are recognized by numerous countries that engage in international trade.

Incoterms are the internationally identifiable acronyms used to establish the precise nature of the relationship between seller and buyer in any commercial transaction. These phrases are efficient ways

of communicating the specific responsibilities assigned to each party wherever a transaction involves the transportation of goods.

For example, INCOTERMS outline who is obliged to cover the cost of each part of the international journey, who is responsible for the shipment at each part of the international journey, and who must ensure the goods are insured. Incoterms also determine what documentation is required for the transaction.

Suffice to say that Incoterms (International Commercial Terms) are universally recognized rules that guide buyers and sellers to fulfil a contract for the shipment of goods. The International Chamber of Commerce (ICC) introduced the new rules in effect from 1 January 2020.

A careful study of INCOTERMS 2020 will repay the effort by enabling more favorable trade terms for effective trade finance. Incoterms 2020 marks the first update since 2010 to keep pace with the continually evolving global trading landscape. It consists of eleven separate Incoterms with some specific revisions that are worth addressing.

4.3 WHAT INCOTERMS DO:

a. **INCOTERMS** remove uncertainties of different interpretations of such terms in different countries and lessen misunderstandings that lead to dispute and litigation.

b. **INCOTERMS** help clarify the geographical location and destination where risk and responsibility pass from exporter to importer.

c. **INCOTERM** help outline conditions under which title is transferred from buyer to seller.

d. **INCOTERM** determines which party is responsible for export clearance, import clearance, shipping cost.

e. **INCOTERMS** indicate which party assumes the cost if merchandize is lost or damage.

4.4 What INCOTERMS Do Not Do?

a. **INCOTERMS** does not clarify how responsibility would pass

b. **INCOTERMS** are not law and so are to be incorporated into sales contract with specifics highlighted i.e., “That passes when delivery is made under Incoterms 2000”

c. They do not directly address who owns the goods at any point in the transaction

4.5 SOME INTERESTING QUESTIONS

1. If your goods are on board a ship and they arrive wet, who takes the loss?

2. If goods are shipped from your location in good condition but arrive at the destination damaged, whose loss is it?

3. You buy a toaster from Park /Shop and the price paid includes making delivery to your house. On the way, the bus is involved in a traffic accident, and the toaster is damaged beyond repair.

   Whose toaster was it? Yours or Park /Shop’s?

4.6 THE TYPES OF INCOTERMS

Currently, there are eleven (11) INCOTERMS. Each type is divided into four groups: **E, F, C and D**. These categories are determined by the delivery location and who is responsible for covering the cost of each part of the journey. The groups are then split into sub-categories which refer to various scenarios. When choosing an INCOTERM, buyers and sellers should thoroughly review each incoterm and decide which set of terms best suit them and their shipment

4.7 Incoterms Group E

EXW (Ex Works) Ex Works places most of the responsibility onto the buyer. The seller ensures the goods are at the seller's premises or another named location where the buyer loads and clears the goods for export.

Group F

In this group, the seller is responsible for delivering the goods to the buyer's pre-agreed method of transportation. After this, the buyer takes responsibility for all the costs and risks. There are a couple of sub-groups in the F category of incoterms, including:

1. **Free Carrier (FCA)**: This is similar to Ex Works. The seller delivers goods either to the carrier, a nominated person at the seller's premises, or another named location. The point at which any risks are passed onto the buyer must be clearly stated.

ii **Free Alongside Ship (FAS)**: FAS is when the seller delivers goods alongside a vessel nominated by the buyer. The responsibility lies with the buyer once the goods are alongside the vessel.

iii **Free on Board (FOB)**: FOB is when the seller delivers goods on-board a vessel nominated by the buyer. The responsibility lies with the buyer once the goods are on-board the vessel. Both FAS and FOB are incoterms used for waterway shipments.

Group C

In this group, the seller bears responsibility for all costs to the destination port. Once the goods are loaded onto the transport, the risks are transferred to the buyer. Group C incoterms include:

i **Cost and Freight (CFR)**: CFR is similar to FOB. The difference is that the seller must pay for the costs and freight to deliver goods to their destination.

ii **Cost, Insurance and Freight (CIF)**: CIF is similar to CFR. The difference is that the seller arranges insurance cover against the buyer's risk of loss or damage. Both of these terms relate to waterway shipments.

iii **Carriage Paid To (CPT)**: In this case, the seller is responsible for arranging the transportation of the goods to a named destination, but not for insuring them.

iv **Carriage and Insurance Paid To (CIP)**: This is similar to CPT, except the seller is also responsible for insuring the goods.

Group D

These terms relate to the destination of goods:

i **Delivered at Terminal (DAT)**: DAT is when the seller delivers the goods to a named place of destination, once the goods have been unloaded. The seller has full responsibility for the goods up until the named place of destination.

ii **Delivered at Place (DAP)**: DAP is when the seller delivers the goods ready for unloading at the named place of destination. The seller has full responsibility for the goods up to the named place of destination.

iii **Delivered Duty Paid (DDP)**: This is for when the seller is responsible for all costs and risks relating to the delivery of goods to the buyer's named place of destination. This includes clearing goods for export and import, paying any duty and carrying out customs formalities.

4.8 What are The Most Important Changes in INCOTERMS 2020?

INCOTERMS 2020 formally defines the delivery point in the transaction where 'the risk of loss or damage to the goods passes from the seller to the buyer'. In contrast, previously, the term had a more informal explanation. Knowing the point of risk transfer eases the transaction for different trade finance parties.

INCOTERMS 2020 rules make security more prevalent by listing import and export requirements. Also, they help in distinguishing whether the buyer or seller is responsible for meeting each of those requirements. The updated definitions split the incoterms into 2 groups, each relevant to a specific mode of transport.

4.9 WHICH INCOTERM SHOULD YOU CHOOSE?

Free Carrier (FCA) and Delivered at Place (DAP) incoterms are popular incoterms as they can be used for both domestic and international shipments and for any mode of transport. The seller is responsible for export customs and the buyer is responsible for import customs. In contrast, using Ex Works (EXW) places full responsibility onto the buyer, which poses the risk of the buyer not being able to carry out all of these responsibilities.

One can carry out a cost/benefit analysis to help one decide which incoterm to use. This might enable one to identify any tax or other financial benefits available for the transaction. It is also worth checking there are no legal issues that could cause problems with a shipment reaching its destination. For example, there might be country-specific restrictions on one's goods if they are prohibited. It's incredibly important to ensure one have all the necessary documentations, including licenses or permits.

Shipments can face problems without the correct incoterm so it is really important to think carefully about which one is appropriate. Failure to understand incoterm definitions leads to problems throughout the

supply chain. For example, logistics costs could increase, the terms may not match the requirements of the buyer or seller or the buyer or seller may not be able to comply with the incoterm.

4.10 The Most Significant Changes

a The most significant change relates to the term FCA (Free Carrier). It now allows the buyer to instruct the carrier to issue a Bill of Lading with an onboard notation to the seller. By doing so, it satisfies the terms and conditions of a Letter of Credit.

Previously, many exporters preferred to use FOB (Free on Board) to arrange payment under a Letter of Credit. Nonetheless, FCA was more suitable for the shipment of containerized goods. It was due to the extra delivery cost differential between FCA and FOB.

b Another major change is the replacement of DAT (Delivered at Terminal) with DPU (Delivered at Place Unloaded). Previously, the word 'Terminal' was confusing, and DPU broadly covers all delivery options.

The term CIP (Carriage and Insurance Paid) changes the insurance coverage requirements. The seller, under Institute Cargo Clause A, must purchase a higher level of insurance. The insurance could amount to 110 per cent of the invoice value, which is more appropriate for manufactured goods.

The CIF (Cost Insurance & Freight) is for commodity shipments. The Institute Cargo Clause C specifies the insurance requirements (unchanged).

c Additionally, FCA (Free Carrier), DAP (Delivered at Place), DPU (Delivered at Place Unloaded) and DDP (Delivered Duty Paid) now take account of buyers and sellers arranging their own transport rather than using a third party.

d Expense allocation between buyer and seller are now listed more precisely to help avoid confusion. In the 2010 Incoterms, costs sometimes became a big issue. Carriers could change their pricing structure by adding back charges. As a consequence, sellers faced additional terminal handling expenses. Unravel the different INCOTERMS costs involved when selecting trade terms for your shipment.

4.11 INCOTERMS for Any Mode of Transport

Some INCOTERMS are better suited to specific modes of transport than others. These are broken into two subcategories:

1 Rules for any mode of transport (x7). That is to say that there are seven incoterms that are suitable for any mode of transport.

2 Rules for sea and inland waterway transport (x4). That is to also say that there are four incoterms that are suitable or can be used for sea and inland waterway transport only.

Based on the above incoterms classifications for any mode of transport and inland waterway transport, they are discussed hereunder:

a Incoterms Applicable for any Transport Mode (The 7 Rules)

EXW – Ex Works

Under the EXW term, the seller is responsible for making the goods available at its premises. The parties can also agree on another named place such as factory, office or warehouse. At this point, the buyer

gains ownership of the goods. Then, he handles all costs and risk after the products are collected.

EXW is most favorable to the seller. He has no obligation to load the goods or to cover freight costs once the goods have left the premises. This term can cause complications for the buyer if products are for export.

FCA – Free Carrier

With FCA, the seller is responsible for delivering the goods to the buyer's nominated premises. He needs to load the stocks onto th buyer's transportation. Then, the seller organizes the shipping, including export clearance and meeting security requirements.

The risk is transferred once the goods are loaded onto the buyer's transportation. Thus, any damage to the products when on board the vessel is the responsibility of the buyer.

The buyer pays the cost of freight, bill of lading fees and insurance. Also, he pays for unloading and transportation costs to the final destination. FCA is the term that has been most significantly changed under the Incoterms 2020 rules. Previously, the use of a transport intermediary meant the seller was unable to obtain a bill of lading with onboard notation. The reason was that he did not present the goods directly to the international shipper. Without the BL, the transacting bank would not authorize payment to the seller.

Under the new Incoterms 2020, FCA resolves this problem. The buyer should instruct the carrier to issue a bill of lading with the onboard notation to the seller. The parties specify this notation on the sale contract.

CPT – Carriage Paid To

CPT goes beyond FCA by specifying that the seller bears the costs of transportation to the buyer's place of destination. The seller clears the goods for export and delivers them to the carrier or place of destination as instructed by the buyer.

At the defined place of shipment is where the risk is transferred to the buyer. The seller is responsible for the transportation costs associated with delivering goods. However, he is not responsible for procuring insurance.

If the buyer requires the seller to obtain insurance, the parties should consider the INCOTERM CIP instead.

CIP – Carriage and Insurance Paid To

CIP is broadly similar to CPT. However, the seller is required to insure the goods in transit and to pay the transportation itself.

The seller clears the goods for export and delivers them to the carrier or place of destination as instructed by the buyer. The seller is responsible for the transportation costs of the items to the designated place of destination. The risk is transferred to the buyer at the defined place of shipment.

In one of the most significant changes under Incoterms 2020, CIP requires the seller to purchase a higher level of insurance. This level of coverage is appropriate for containerized goods: 110% of the contract value under Institute Cargo Clauses (A) of the Institute of London Underwriters. Previously the minimum insurance was applicable under Institute Cargo Clauses (C).

DPU – Delivered at Place Unloaded

It was previously known as Delivered at Terminal (DAT). It has been renamed because the buyer (or seller) may want to specify the delivery location rather than the terminal. This term is often used for consolidated containers with multiple consignees. It is the only term that tasks the seller with unloading the goods. The seller covers all the costs of transportation (export fees and carriage). Also, at the destination port, the seller pays the unloading from the carrier and the port charges. He assumes all risks until arrival at the destination port or terminal.

The buyer is responsible for all costs and risks after unloading. It includes import duties, taxes and customs clearance. Also, the buyer pays local transportation to the final named place of destination. If the seller is not able to organize unloading, he should consider shipping under DAP terms instead.

DAP – Delivered At Place

The seller delivers the goods to a named place of destination but is not responsible for unloading. His responsibilities include packing, export clearance, carriage expenses and any terminal costs up to the agreed destination port.

DAP means the buyer is responsible for all costs, duties and taxes associated with unloading the goods. He is also responsible for clearing customs to import the products into the named country of destination. The risk is transferred to the buyer at the final designated place of destination.

DDP – Delivered Duty Paid

DDP means the seller bears all risks and costs associated with clearing and delivering the goods to the designated place.

The seller is liable for clearing the goods through customs in the buyer's country. It includes payment of both duties and taxes. Furthermore, he needs to obtain the necessary authorizations and registrations from the authorities. However, the seller is not responsible for unloading.

This term places the maximum obligations on the seller and minimum obligations on the buyer. The buyer bears no risk or responsibility until the goods are at the final agreed place.

Hence, the term is favorable for online businesses seeking e-Commerce financing for cross-border trading.

Unless the seller has a profound understanding of the rules and regulations in the buyer's country, DDP terms can be a considerable risk both in terms of delays and in unforeseen extra costs. Hence, DDP should be used with caution.

4.12 Incoterms for Sea and Inland Waterway Transport (the 4 rules)

The following four rules apply to goods shipped by sea or inland waterways.

Usually, the risk and responsibility are transferred when the goods are on board (apart from FAS). As the condition of the items must be verified at this point, these terms are only suitable for non-containerized goods, such as commodities.

Note: In previous editions of INCOTERMS (2010), the risk passed between the seller and the buyer at the point where the goods crossed the ship's rail.

1 FAS – Free Alongside Ship

The seller delivers the goods alongside the buyer's vessel at the named port of shipment. It means that the buyer bears all costs and risks of loss or damage from that moment. The FAS term requires the seller to clear the goods for export (under previous Incoterms, the buyer arranged export clearance).

2 FOB – Free On Board

Under FOB terms, the seller bears costs and risks until the goods are loaded on board of the designated vessel. The seller's responsibility includes arranging export clearance. At the same time, the buyer pays the cost of marine freight, bill of lading fees and insurance. He is also responsible for unloading and local transportation costs from the port of arrival to the final destination. Any damage to the goods when on board the vessel is the responsibility of the buyer.

For this reason, FOB is ideal for invoice financing solutions. This is because the risk of goods is transferred to the buyer once the goods are shipped. Since Incoterm FCA was introduced in 1980, FOB should be used only for non-containerized sea freight and inland waterway transport.

However, FOB continues to be the most commonly – and incorrectly – term used for all modes of transportation. Despite the contractual risk

that can result (which include the difficulty of checking goods if they are enclosed in a container).

3 CFR – Cost and Freight

CFR incurs more significant risk and responsibility for the seller who pays for the carriage of the goods up to the named port of destination. The risk is transferred to the buyer at the country of export. Specifically, when the goods have been loaded on board the ship.

The shipper pays for export clearance and freight costs to the selected port. Furthermore, he is responsible for any damage to the goods on board the ship until the port of final destination.

The buyer pays for local delivery from the port to the final destination and is responsible for purchasing insurance. If the buyer requires the seller to obtain insurance, the parties should consider the Incoterm CIF instead.

CFR should only be used for non-containerized sea freight and inland waterway transport. For all other modes of transportation – and for containerized goods – it should be replaced with CPT, as specified in a critical change in Incoterms 2020.

4 CIF – Cost, Insurance & Freight

The seller clears the goods for export and delivers them when they are on board at the port of shipment. The seller bears the cost of freight and insurance to the designated port of destination. Also, he is responsible for any damage to the goods on board the ship. The seller needs to purchase the minimum level of insurance under Clause C of the Institute Cargo Clauses. (This requirement is unchanged from Incoterms 2010.)

At the port of arrival, the seller must turn over three key documents – invoice, insurance policy and bill of lading. Those documents represent

the cost, insurance and freight of CIF. This Incoterm is similar to CFR. However, the seller needs to obtain insurance while the goods are in transit.

4.13 THE 7 RULES FOR ANY MODE OF TRANSPORT *[FOR MORE CLARITY]*

Group E

1 **EXW**: **Ex Works (insert place of delivery)** – the Supplier arranges the trade of products, but it's the Buyer's responsibility to arrange shipment to the preferred location (which could be the Buyer's premises or a third party address).

Group F

2 **FCA**: **Free Carrier (insert named place of delivery)** – the Supplier arranges shipment of goods and assumes responsibility for risks and costs. Once the goods are in with the carrier, the Buyer is then responsible for the risks and costs of the shipment.

Group C

3 **CPT: Carriage Paid to (insert place of destination).** The Supplier must pay additional freight costs for the goods (even after the Buyer has assumed responsibility for risk) when the carrier receives the item.

4 **CIP:Carriage and Insurance Paid To (insert place of destination)**. The Supplier incurs additional freight and insurance costs for the goods even after the carrier receives the item. The Buyer assumes responsibility for loss or damage to goods during transportation.

Group D

5 **DAP: Delivered at Place (insert named place of destination).** The Supplier is responsible for all risks and costs of goods being shipped until they reach their destination (regardless of the

location). This includes freight and insurance costs but **not** customs duties, import permits or the costs of unloading goods, which are the Buyer's responsibilities.

6 **DPU: Delivered at Place Unloaded (insert place of destination).** The Supplier is responsible for the shipped goods - including all risks and costs - until they reach their destination (wherever it may be). This includes all freight and insurance costs **and the costs of unloading goods** but **not** customs duties or import permits.

7 **DDP - Delivered Duty Paid (insert place of destination).** The Supplier assumes all responsibility for risks and costs of shipped goods - including customs and import duties and insurance costs - until they reach their destination.

4.14 The Things INCOTERMS Do not Cover

INCOTERMS can be used ***within*** contracts to define and agree upon shipping terms and responsibilities, but they do not represent a sales contract between a Buyer and a Supplier. There are additional details that must be agreed upon alongside them.

Some of the common trade details **not** covered by Incoterms include:

a Pricing details, such as those of the goods

b Exact payment details, such as the method or currency of payment

c Details on the quality or condition of goods

d Legal implications of contract breaches

Note: INCOTERMS 2020

The latest edition of INCOTERMS is known as **Incoterms 2020** and was published in the same year.

This edition is not too different from the previous iteration - **Incoterms 2010** - and features the same 11 rules. However, there were some important updates added to the 2020 iteration.

Most significantly, **Incoterms 2020** features an **in-depth introduction** and **expanded explanatory notes** for each term and trading role, which previous editions did not have. The 2020 edition also outlines **best practices** for using the terms in global trade deals and their incorporation into sales contracts.

These updates were included to minimize errors and improve efficiency and accuracy in international trade.

4.15 What Are the Most Used Incoterms?

The most commonly used Incoterms are EXW and DDP. This is because these two agreements see a single party – the Buyer or the Supplier – take full responsibility for shipment risks and costs, reducing the sales contract complexities.

EXW sees the Buyer assume full responsibility for the risks and costs of the shipment, while DDP requires the Supplier to organize and assume responsibility for the shipment.

Incoterms may appear complicated but they are easy to understand once you realize why they are there. The terms exist to reduce errors and delays in international trade, therefore ensuring an easy experience for both Buyer and Supplier.

5.16 THE DOCUMENTATION PROCESS

a. Documentation involves knowing the required paperwork (documents) and the function they perform and being able to prepare such documents, avoiding discrepancies and maintaining a standard format.

b. In most cases, competent freight forwarders and customs broker are retained to handle the many details of export and import shipment.

c. This helps to minimize the paperwork for organizations and maximize the chances that the shipment will arrive intact and on time.

4.17 CARRIER AND CONSOLIDATION

CARRIER:

- This is essentially the function of moving cargo. This can be a stream ship line, an airline, or an inland carrier such as trucking company or railroad. Almost all shipments involve more than one mode of carriage such as – truck from warehouse to airport, - truck from warehouse to railroad to airport
- The movement of cargo via different modes of transport in a single seamless journey is called Intermodal Transport while Multimodal Transport refers to the same movement of different cargos

Consolidation:

- This is an intermediary service by carriers and it is done when a carrier operates no aircraft but contract with major airlines for a guaranteed amount of cargo from airport X to airport Y.
- In such cases, the carrier is obligated to pay the minimum of the guaranteed amount if they have the cargo or not.

NVOCC: Non Vessel Operating- Common- Carrier. This is the name of carriers which purchase space from steamship lines, retail the space out, but operate no vessel of their own. Sometimes called “NVO”.

Self Test Question

What are the relevance of INCOTERMS IN INTERNATIONAL shipping?

MODULE FIVE

SUPPLY CHAIN AND DEMAND PLANNING IN INVENTORY

5.1 Introduction

For effective study of this topic, it is important to recommend that every company involved in the business of supply chain, logostocs must have an Enterprise Resource Planning (ERP). An Enterprise Resource Planning is a computer system that merges essential departmental functions, like Manufacturing, Logistics, Operations, Supply Chain, Sales and Accounting in a firm. This system enables smooth management and monitoring of supply chain management activities in an organization.

However, to have a comprehensive management of supply and demand planning in a firm, it is essential to incorporate the concept of “Transaction Processing”. Transaction processing is the management of posting and tracking of the routine activities of a business for decision making purpose. The end result of transaction processing brings about “Decision Support” concept. The Decision Support is the act of the system to provide relevant means to effectively and efficiently manage the business.

5.2 Scope of Enterprise Resource Planning

The scopes of ERP in any supply chain firm are in 3 categories, which are:

1. Manufacturing and Logistics: Under Manufacturing and Logistics, the following are essential functions:

a. Procurement and Logistics
b. Operations
c. Manufacturing Planning and Control
d. Sales and Operations Planning
e. Material and Capacity Planning
f. Materials and Vendor Management

2. Enterprise Resource Planning: The following functions are under ERP:

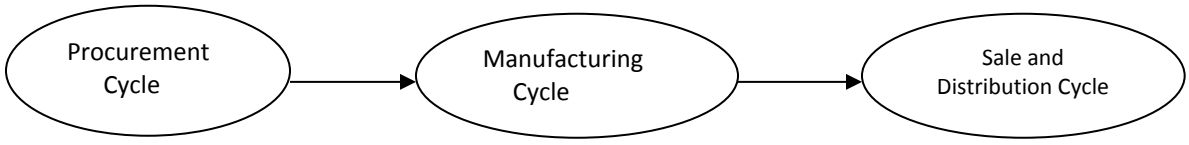
a. Enter Planning Models
b. Enterprise performance
c. Data Warehousing
d. Report Generation
e. Transaction Processing

3. Administration: Administration includes:

a. Management/Administration
b. Human Resource Management
c. Finance
d. Sales and marketing

5.3 Manufacturing Operation Cycle

The manufacturing Operation Cycle, MOC, is the management tool use by supply chain managers in order to effectively and efficiently plan the production cycle for the purpose of forecasting.



1. **Procurement Cycle**:

a) Purchase Cost of Material
b) Accounts Payable

2. **Manufacturing Cycle:**

a) Raw Materials Inventory
b) Work-in-Process
c) Finished Goods Inventory

3. **Sales and Distribution Cycle**:

a) Distribution Inventory
b) Accounts Receivable

5.4 SUPPLY CHAIN METRICS

The supply chain council with practical steps has developed many metrics to be used in the measurement of the performance of the supply chain in a firm.

MEASURE	DESCRIPTION	BEST IN CLASS	AVERAGE OR MEDIAN
Delivery performance	What percentage of order is shipped according to schedule?	93%	69%
Fill rate by line item	Orders often contain multiple line items. This is the percentage of the actual line items filled	97%	88%
Percentage order fulfillment	This measures how many complete orders were filled and shipped on time	92.4%	65.7%
Order fulfillment lead time	The time from when an order is placed to when it is received by the customer	135 days	225 days
Warranty cost of % of revenue	This is the actual warranty expense divided by revenue	1.2%	2.4%
Inventory days of supply	Hoe long an item spends in inventory before being used	55 days	84 days
Cash-to-cash cycle time	Considering account payable, accounts receivable and inventory, this is the amount of time it takes to turn cash from a customer	35.6 days	99.4 days
Asset turns	This is a measure of how many times the same assets can be used to generate revenue and profit	4.7 turn	1.7 turns

Source: Council of Supply Chain Management professionals

It is important for Supply Chain Management Professionals to apply the supply chain metrics in their firms in order to ascertain the efficiency of supply chain management in their organization.

5.5 Demand Planning

Demand Planning is the management function in the supply chain that deals with forecasting. Forecasting is vital because it determines the quality of inventory to be stored I order to meet customer's orders

5.6 Categories of Demand (Dependent and Independent Demand)

a. Independent demand: This kind of demand is concentrated in finished goods.

b. Dependent demand: This kind of demand is concentrated in semi-finished goods, subassemblies or components.

Independent demand goods are forecast able while dependent demand goods are forecast able subject to finished goods.

5.7 Components of Demand

Components of demand can be divided into six components.

1. Average Demand for the period
2. A Trend
3. Season Element
4. Cyclical Element
5. Random Varieties
6. Autocorrelation

It is pertinent that supply chain firms should establish their demand within the specific years either two or four years incorporating any of the six components of demand.

Cyclical factors may be complex to determine because of certain influences such as economic status, political elements, security instability, war, religious indifference.

Random varieties are caused by event of chance. When all the known causes of demand components are established and what is yet to be established is the unknown portion of demand. If he unknown cannot be determined, it is assured to be a random chance.

Autocorrelation is when there is persistence occurrence. The value expected a certain point in the future correlated with its own past values.

Trend line is the starting point in developing a forecast. It is designed in such a manner it can be adjusted in the future as other components of demand surfaces.

You must understand that these demand components may not be too strong.

5.8 Quantitative Forecasting Models/Forecasting Methods

Forecasting can be grouped into four categories:

1. Qualitative
2. Time Series Analysis
3. Causal Relationships
4. Simulation

Qualitative forecasting is the use of qualitative techniques in forecasting.

Time series analysis is a forecasting in which post demand is used to predict future demand.

Causal relationships is the used of linear regression technique which assure that demand forecasting is related to some certain factors in the environment.

Simulation models give the person forecasting the chance to apply various range of assumption about the condition of the forecast.

Key Facts: qualitative Forecasting Methods are primary subjective, they rely on human judgment and opinion to make a forecast.

Time Series Methods use historical data to make a forecast.

Causal method involves assuring that the demand forecast is highly correlated with certain factors in the environment like the state of economy or interest rates.

Simulation forecasting methods imitate the consumer choices that give rise to demand to arrive at a forecast. Using simulation, a firm can combine time series and causal methods to ensure such question like what will be the impact of price promotion on sales.

5.9 Basic Approach to Demand Forecasting

a) Properly understand the main and objective of forecasting

b) Merge demand planning and forecasting

c) Identify cogent factors that influence the demand forecast

5.10 Characteristics of Forecasts

a. Forecasts are sometime wrong

b. Long-term forecasts are usually less accurate than short-term forecasts.

c. Aggregate forecasts are usually less accurate than disaggregate forecasts. For example, it is more accurate to forecast the GDP of a country than forecasting the earning of a specific company.

5.11 Collaborative Planning Forecasting Replenishment (CPFR)

Collaborative Planning, Forecasting and Replenishment is the sharing of forecast, production, purchasing and related business information among business partners in the supply chain to enhance automatic product replenishment. It is an electronic/internet aided system where trading partners are connected to a central server where information is share across the chain and channel members. It aims at improving

collaboration between and among buyers and suppliers to improve customer service and inventory management..

5.12 Functions of CPFR and Electronic Collaboration

Collaborative planning focuses on the processes of forecasting supply and demand and bringing projections from suppliers and customers into synchronization. This must be an internet supported device. This makes products available to customers at all times, while improving service delivery. (speed and accuracy are the immediate gains of this electronic collaboration.

1. Creation of a front-end partnership agreement
2. Joint business planning
3. Development of demand forecast
4. Sharing forecasts
5. Inventory replenishment

5.13 Inventory Control Techniques

Inventory Control Techniques is vital in forecasting of inventory. Inventory control techniques ensure availability of any material while at the same time, checking through a system, the tendency to hoard larger inventory than is necessary.

Inventory Management is the effective and efficient maintaining, storing and assurance of adequate supply of inventories in order to meet an expected pattern of distribution of demand for a given financial investment.

5.14 Factors To Be Considered In Inventory Decisions

1. Where should warehouse be placed?
2. What should be stored there?
3. How much an item should be stored?
4. How much extra of an item should be stored (safety stock)?

5. How long should it be placed there before expected request (safety time)?

6. How can we find and keep track of what is stored and where?

7. How can we move/use items from different stores?

Questions

a What is collaborative planning?

b Why do supply chain organizations adopt this form of joint venture?

c What are the key challenges to collaboration in today's business?

d Why do supply chain firms spend money on demand forecasting? List and explain any three forms of forecasting contemporary firms use today.

References

Alan and Kelly Branch (2013); Managing Import and Export 5th EditionTata - Mac Grow publisher New Delhi India.

Alan Harrison and Ramko Van Hoek (2008) Logistics Management and Strategy Competing through the Supply Chain 3rd edition – Prentice Hall

Arjan J. Van Weele (2017) Purchasing and Supply Chain Management, sixth edition –Cengage publishers London United Kingdom.

Altekar R.V. (2013); Supply Chain Management: Concepts and Cases; PHI Learning Private Limited, Delhi – 110092; pp. 174-179; 181-189

Altekar, Rahu (2004); Enterprise – Wide Resource Planning: Theory and Practice, Prentice Hall of India.

Arora K.C. (2010); Total Quality Management, S.K Kataria and Sons, Ansari Road, Darya Ganj, New Delhi-110002