SUPPLY CHAIN MGT

UNIT - I

Introduction to Supply chain mgt:

Before SC the focus was only on Production but after Industrialisation firms Concentrated on Selling & Marketing.

but after introduction of Tech it focused only on Relationship.

→ SCM integrates the different objectives of the functional areas.

A Success of any business firm depends on scm operations i.e from procurement of raw materials to the ultimate customer.

Concept:

→ A Supply chain involves various participants who Perform a sequence of activities in moving physical goods/services from a point of origin to a point of Consumption i.e Source Suppliers, manufacturers, distributors, retailers & Customers.

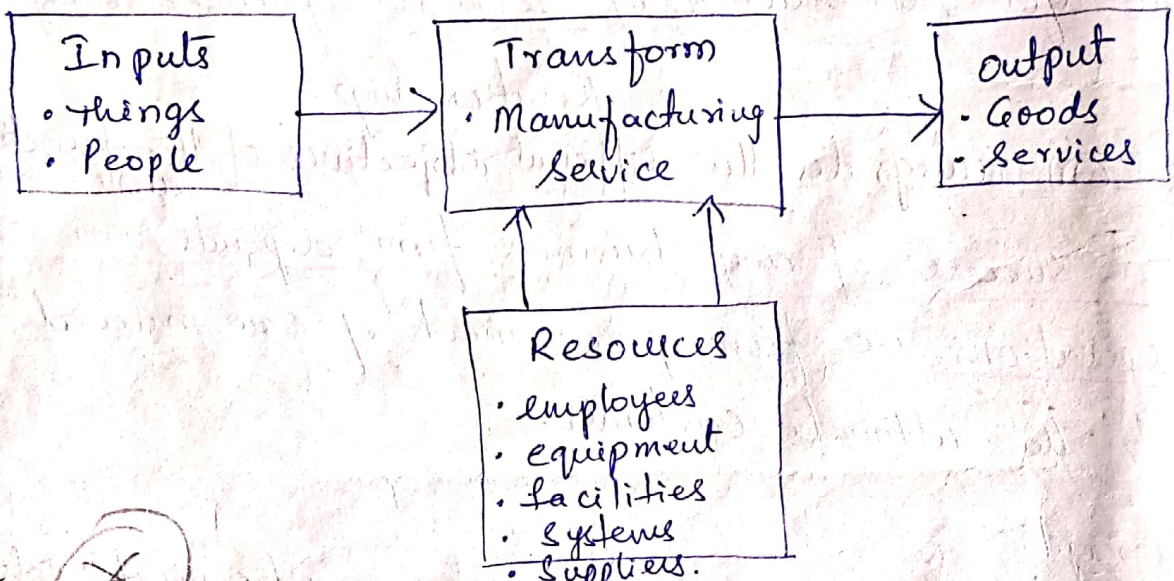
→ SCM is the design, planning, execution, Control & monitoring of Supply chain activities with the objective of creating net value, building a Competitive infrastructure, leveraging worldwide logistics, Synchronising Supply with demand, & measuring Performance globally.

diagram Pg: 3.

→ A Company manages a Series of business processes in order to transform inputs into outputs that have value to a Customer.

∴ the input - transformation - output (ITO)

The Basic ITO model



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Definitions

(1) APICS Dictionary defines a Supply chain as "the global network used to deliver products & Services from raw materials to end Customers through an engineered flow of information, physical distribution & Cash.

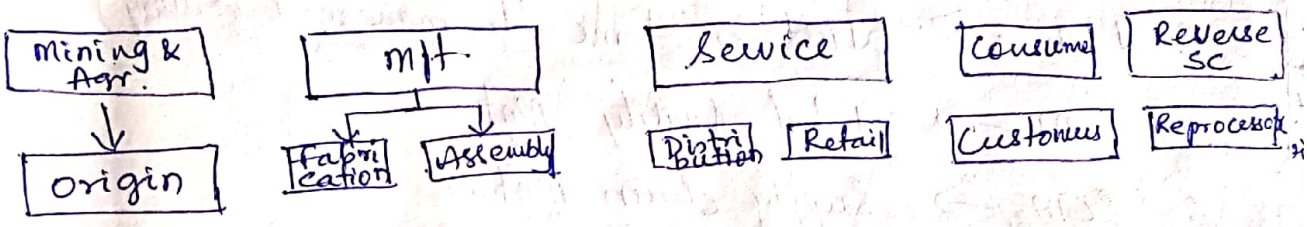
(2) According to Marty Weil — SCM is the ability to get closer to the Customer.

SCM = Seller → Buyer

Seller ↓ IBL (inbound logistics)

Buyer ↓ OBL (outbound logistics)

→ Using technology in logistics is called SCM. (2)
→ Scm is integration of all activities.
→ Scm describes the functions used to manage the activities of delivering products, producing information, & generating increased revenue for stakholders involved at different stages of a supply chain.



Ceroo

* A supply chain consists of all stages involved, directly or indirectly in fulfilling a customer's request.

Objectives & functions of SCM:

1. Control on inventory flow.
2. Quick response System (QRS)
3. Cost Control.
4. Reduction in labour Content
5. Increase in cash flow
6. Eliminating superflouous admn activities
7. Reduction in Stockholding

8. JIT Mgt.
9. Efficient Customer Response
10. Customer Sewice enhancement.

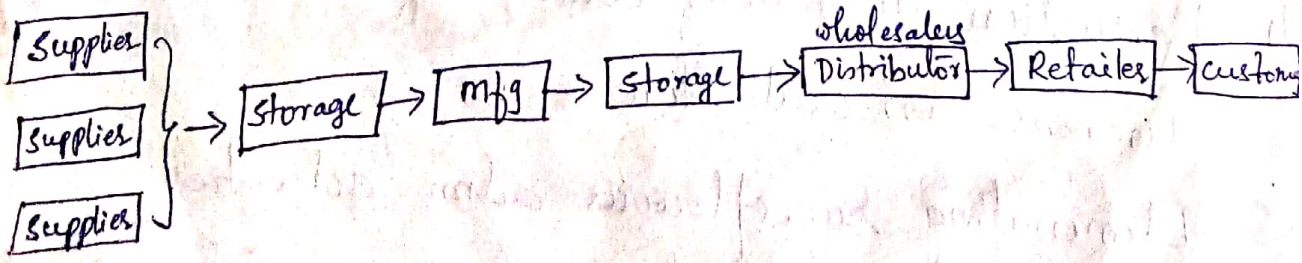
To retain in the market, a firm has to implement the following tools.

1. ERP → Enterprise resource planning
2. CRM → Customer Relationship mgt.
3. JIT → Just in time (to manage Inventory)
4. TQM → Total Quality Mgt.
5. SCM → Supply chain mgt.

Conceptual framework of SCM:

Contd in pg. 3.

A typical manufacturing Supply chain (to be drawn after Concept of SCM Pg no. 1)



Nature & Scope of SCM — Pg 11

Pg.11 # Nature & Scope of SCM.

Three important activities involved in SCM, form the framework for studying the nature & scope of SCM are:

(1.) Purchasing.— Purchasing is responsible for obtaining materials, parts & supplies needed to produce a product.

→ Purchasing is the link between the organisation & its Suppliers. It exchanges information with Suppliers and functional areas are

(a) Operating units

(b) Accounting — handling payments to Suppliers, data Processing, inventory records, checks invoices

(c) Design & engineering — material specifications

(d) receiving.

Pg14 (e) Suppliers (or) Vendors.

(2) Logistics:

→ Logistics involves the movement of materials & information in a supply chain.

→ Logistics is defined as the process of anticipating customer needs & wants, acquiring the capital, material, people, technologies, & information necessary to meet those needs & wants.

→ Logistics involves the integration of information, transportation, inventory, warehousing, material handling & Packaging.

→ Logistics integrates material Mgt with Sales & distribution Mgt.

→ Logistics adds Value by creating time utility & place utility.

→ Logistics Mgt is part of SCM that plans, implements, & Controls the efficient & effective forward & reverse flow & storage of goods, and related information between the point of origin to point of consumption in order to meet customers requirements.

→ Logistics Mgt is Concerned with creation of Value for Customers, Suppliers & Stakholders of the firm

→ Logistics Contribute to an org's success by providing customers with the right products, at the right time.

③ Warehousing & Expediting:

Warehousing is the Mgt of materials, while they are in storage. It includes storing, dispensing, ordering & accounting for all materials & finished goods from the beginning to the end of the production process.

Contemporary Developments in warehousing

1. Barcoding
2. Electronic data Interchange (EDI)
3. Distribution requirement planning.
   → JIT deliveries.

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Customer Service

Customer Service is an output of the logistics system and is a key to gain Competitive advantage.

Customer Service.

→ Customer Service can be defined as "a process which takes place between the buyer, seller & third party

→ Customer Service is the fuel that drives the logistics supply chain.

Having the right product, at the right time, in the right quantity, without damage or loss to the right customer is an underlying principle of logistics systems that recognises the importance of customer service.

→ Even though the objective of any firm to make a profit, but not without establishing service policies & programs, that will satisfy customers needs & ~~the~~ deliver them in a cost-efficient manner. This approach is referred to as customer service.

Elements of customer service

logistics costs are based mainly on customer service. The logistics manager must balance among customer service levels, total logistics costs, & total benefits to the firm

Customer service has 4 dimensions/elements they are:

1. Time — lead time (or) Order Cycle time i.e ← order processing, order preparation, order shipment.
2. Dependability — refers to delivering a customer's order with a regular, consistent lead time, in safe condition & quality of items the customer ordered.
3. Communication → Information flow by EDI.
4. Convenience. → transportation.

Basic Service Capability:

Basic logistical service is measured in terms of

1. availability
2. operational performance
3. service reliability.

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1. What is conceptual framework?

(A) A. Conceptual framework is used in research to outline possible courses of action (or) to present a preferred approach to an idea or thought.

(b) Concepts that are placed within a logical & sequential design.

→ may be ideas, designs, plans based on given facts, situations & examples.

Conceptual framework of SCM.

The conceptual framework of SCM is for designing & managing supply chain process in an org. are.

1. Supply chain network structure
2. " " business Process
3. SCM components.

I. SC Network work:

firms have to maintain more than one supply chain to deal with different parties.

firms must focus on maintaining effective relationships with these parties depending on level of their importance.

the 3 major aspects are

1. → Supply chain members
   - (a) Primary members
   - (b) Supporting members

(a) Primary members — engaged in managerial activities

(b) Supporting " — functional assistance to primary members (ex. Supplies)

(c) Researchers.

(d) Scarce resources

2. → Structural Dimensions of Network.

→ ~~Vertical structure~~ — total no. of levels present in S.C, it can be short, medium or long SC.

→ Horizontal

→ Vertical structure — total number of consumers & suppliers

→ Different process links

Supplier → Manufacturing site → warehouse → transportation → Distributors → Retailers → Customers

II Supply chain business process

1. customer Relationship mgt.
2. Customer Sewice mgt
3. Demand mgt.
4. Product development &
5. Manufacturing flow mgt.

III SCM Components:

1. planning & Control
2. work Structures
3. Mgt methods
4. (Power) Authority & leadership
5. Org Structure
6. channels of information
7. culture & attitude.

Pg:34 - R. Diagram.

SUPPLY CHAIN STRATEGY

(4)

SCM mainly focuses on: (Operations to meet obj & constraints)

→ Methods of operations to achieve Competitive edge over Competitors.

→ Operational components are continuously analyzed

→ SCM Strategy helps in meeting the demands of the mkt & customer satisfaction.

→ It provides guidelines to the firm to operate with its Suppliers, customers, distributors, Shareholders etc.

Developing a Supply chain Strategy:

1. ~~Acknowledge the business strategy.~~
2. Methods adopted by the firms to gain Competitive advantage.

2. Evaluation of Supply chain

→ External parties assist the firms in determining Strengths & opportunities.

→ After identifying set up benchmarks.

→ identify risks

→ If SC strategy & operations of assets varies, then develop a new Strategy.

3. Implementation plan;

It must be developed by using activities, tasks, responsibilities etc.

II Execution of Supply chain Strategy:

1. Performance mgt.
2. Cost-benefit analysis (re-examine the SC strategy in terms of Competitors, structures, business practices, tech, etc)

Components of SC Strategy:

1. Sourcing Strategy.
   a. Mft mgt.
   b. make-or-buy.
   c. capacity Mgt.
2. Distribution Strategy:
   a. channel selection
   b. Distribution planning (to provide fast & timely Services)
3. Inventory Strategy: (how much stock to be maintained)
   a. Demand forecasting.
   b. Inventory planning (to maintain minimum & maximum stock)
4. Customer Service Strategy:- (Customers are assets to the firm)
   a. Service
   b. Service Cost.

Technology Integration.

Pg 449.

Global Supply chain Mgt → Pg 456.

diagram Pg 458

Expansion of local supply chains into global SC opened access to new markets & new sources of supply. or offshore outsourcing.

→ Global SC consists of multiple supply chains working together throughout a no. of diff. countries

→ With advances in transportation & Communication technology, goods & services can be potentially sourced from anywhere around the world.

→ Global supply chains are formed when all SC participants are spread across country boundaries.

→ The challenges of managing supply chains on a world wide has 3 categories, they are

1. Governmental — different political sys, regulatory requirements, cultural capabilities.
2. Geoeconomic — time zone diff, managing infrastructure interacting with various participants, limited availability of expertise.
3. Culture: — diff ethics & attitudes.

→ Internet enables SC participants to engage in transactions without knowing each other.

→ Today's global supply networks are in digital formats.

→ Expansion to global SC has dramatic improvements in electronic communication.

→ Information Systems combine hardware, software & telecommunication networks to automate the data collection, creation & distribution process.

→

diagram in Pg:30.

Value chain & Value Chain delivery.

Value chain is a part of Supply Chain Design.

(or)

Role of Value chain in the design of the Supply chain.

→ Raw materials are the most important Component of many production processes.

→ finding the right materials, procured from the right source, at the right price, with the right quality, at the right time is the key to the success of a production process.

→ There is a very close relationship between Supply chain design & the Value chain. As the Value chain expands, it creates challenges that the Supply chain has to handle. Having lower production costs does not help if the cost for delivering it to the customer is high.

→ Cost, quality, delivery & technological performance do not guarantee success for a supply chain. even though they are critically important, the process linkages between the Supply chain are equally imp.

*→ Supply chain design is a strategic decision. It decides what the chain's configuration will be, how resources will be allocated, & what processes each stage will perform.

→ To understand the relationship between Competitive & S.C Strategy, it should start with value chain.

→ The Conventional Value chain is comprised of both the primary & Support activities.

2 of the primary activities of Value chain are inward & outward logistics.

*→ The revised Version of Value chain, Consists of a Series of activities that create & build Value.

→ It is a pull System value chain i.e the Customer who determines the product requirements & product value.

diagram: 4.2 pg: 81.

The Bullwhip Effect

As the complexity of supply chain increases, very often different stages of a supply chain may have objectives that conflict, if each stage has a different owner.

→ If there is lack of coordination, it then results in total supply chain profits that are less than what could be achieved through coordination.

*→ The reason for the bullwhip effect is that each company in the chain has incomplete information about the needs of others, therefore it responds with a disproportional increase in inventory levels.

*→ when complete information is not shared between stages due to conflicting objectives, information gets distorted as it moves within the supply chain.

∴ this distortion is exaggerated by the fact that supply chains today produce a large amt of product variety, creating what is called the bullwhip effect.

The bullwhip effect distorts demand information within the supply chain, with different stages having very different estimates of what demand looks like. The result is a loss of supply chain coordination.

UNIT - II

LOGISTICS MANAGEMENT

Logistics can be defined as the science pertaining to the movement of materials & the services along with its information. (*) [Logistics is the part of a supply chain involved with the forward & reverse flow of goods, services, cash, & information]

→ The evolution of the word logistics can be traced from the french word "logistique", which is derived from "loger" meaning quarters (quartering troops)

In fact the whole concept of logistics first evolved from defense (military) operations & later applied in the business operations.

Def:

① Logistics is the process of moving & positioning inventory to meet customer requirements at the lowest possible total landed cost.

→ Logistics is the major element of SCM.

② International Council of Logistics' Mgt (CLM) 1991, defined logistics as "the process of planning, implementing, & controlling the efficient, effective flow & storage of goods, services, & related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements".

Elements of logistics Mgt:

logistics Mgt Consists of eight elements called Wings of logistics, they are:

1. Customer Order processing.
2. location analysis
3. Inventory Control
4. Material Handling.
5. Packaging
6. Transportation
7. Warehousing.
8. Customer Service.

Developing the logistics Org for effective SCM.

→ first business should adopt a customer perspective, for Customer Satisfaction to be pre-eminent in the planning of the business.

The role of Customer Satisfaction should be reflected in the structure.

→ Whereas in traditional, Vertical, functional structure is typical of most business Org has limitations, & in that a number of problems exist.

Pg 276 RWC

iii Inventory Mgt in Supply chain.

Inventory Mgt is an important component of SCM.

→ Inventory is defined as " those Stocks/items used to Support production (raw materials & work-in-process items), Supporting activities (maintenance, repairs, & operating supplies) & Customer Service (finished goods & Spare parts).

→ Inventory is an important decision parameter for a successful scm. Having too much inventory increases the supply chain costs. Having too less inventory decreases Sales volume of the Co. thus leading to this satisfied customer.

Importance:

1. Improve customer Service
2. Permits purchase & transportation Economies

Pg-180-B

Inventory is the physical stock of items that a business / production org keeps in hand for efficient running of affairs or its production.

→ It is very essential that material of the correct quantity & quality is made available as & when required.

Inventories are classified as:

1. Raw materials & Supplies inventories.
2. Production Inventories
3. M.R.O Inventories (Maintenance, Repair & Operation Supplies)
4. Work-in-process Inventories (Semi-finished goods)
5. finished product Inventories
6. Material in Transit inventories

→ There are several reasons for holding inventory, such as demand anticipations, headging against price fluctuations, product-lot-sizing & safety against uncertainty in the sc

The basic objective of Inventory Control was to provide efficient & smooth sevice to the customers by minimising the idleing of men & machines, which may arise due to shortage of raw materials.

The Scope of Inventory mgt :-

1. Defining policies to guide the Inventory Control programmes
2. Determining the most appropriate Store Org structure
3. Determining EOQ.
4. Determination of stockout.
5. " " Safety stock
6. Determining lead time.
7. Inventory status
8. Minimising handling & storing cost
9. Effective running of stores.

Inventory Models:

These are used to reduce costs associated with inventory like overstocking & understocking costs, Repa

→ EOQ (Economic order quantity)
→ FOIS (fixed order Interval System)
→ FOQS (fixed order Qty System)
→ ORS (operational Replenishment System)

$$EOQ = \sqrt{\frac{2(\text{Annual usage in units})(\text{Order Cost})}{\text{Annual carrying cost per unit}}}$$

Inventory Counting Systems:

1. Two-bin System:

This System operates on reorder level (R.O.L) system & it Physically segregates the stock of entire items into 2 bins. Reorder when the first bin is empty, use the contents of Second bin until order received.

(2). Universal Bar Code.

Inventory turnover — is company maintains Inventories equal to 3 months consumption, and inventory turnover is 4 times a year.

Order cycle — the time period between 2 Successive orders is called order cycle.

Purchase Mgt:

JIT, VMI.

JIT :— JIT is a Japanese mgt philosophy, which has been applied in many Japanese manufacturing Org's.

→ It was developed by Taiichi Ohno, who is also refered as the father of JIT.

*→ JIT is more of a manufacturing & waste elimination philosophy.

→ It Originally refered to the production of goods to meet customer demand exactly, in time, quality & quantity.

UNIT - III.

TRANSPORTATION IN SC.

Transportation is one of the most visible elements of logistics operations.

(XX) →

Def:

Transportation in a simple language can be defined "as a means through which goods are transferred from one place to another.

Transportation is the operational area of logistics that geographically positions inventory.

→ Transportation is the major part of the supply chain, & it occurs between almost all the steps of value chain.

→ Internal transportation should be avoided as far as possible by getting the manufacturing process physically closer, but major challenges lies in handling the external transportation.

Transportation requirements can be accomplished in three basic ways

1. By a pvt fleet of equipment
2. Contracts with transport specialists
3. Engage the services of carriers on individual shipment basis.

(XX) The major objective of a modern transportation system is to move product from an origin location to a prescribed destination, while minimising temporal, financial & environmental costs.

functionality :-

Transportation provides 2 basic functions, they are

1. Product Movement
2. Product Storage.

① Product Movement

→ It is a primary transportation function.

→ It moves the product up & down the value chain.

→ Product is in the form of materials, Components, assemblies, work-in-progress (or) finished goods, for which transportation is necessary to move it to the next stage of manufacturing.

→ during transportation of product, there could be some loss on account of damage., environmental hazards

② Product Storage:

→ This is a less common function of transportation. Because vehicles make rather expensive storage facilities.

Transportation formats

→ The trans requirement can be accomplished in 3 basic ways.

In each of these the legal status of the operating authority is different (hence there are different regulations for each of them).

The following are the 3 formats of a carries

1. Private fleet → A put carries providing its own transportation they are not for hire.
2. Coubract Carries → Coubract carries provide transportation sewices for select customers.
3. Common carriage → the basic public transportation is the Common carries. The most common carries is railways.

Modes of transportation:

Mode of transport is a general term for the different kinds of transport facilities, that are often used to transport people / cargo.

→ Each mode has its own significance depending upon the geographical location & product to be transported.

→ Each differs in cost & time taken to transport the goods from one place to another.

There are five basic modes of transportation, they are.

(1) Railways (3) Air (5) pipeline.
(2) Road ways (4) water

1. Railways: India has the 2nd largest network of railways in the world

factors influencing the selection of transporter:

1. Cost < direct cost — Payment for movement & admn exp.
   indirect cost — maintaining en-transit inventory.
2. Speed — time required to complete a specific movement.
3. Consistency — refers to the variations in time required to perform a specific movement.
4. Distance
5. Volume — the greater the load lesser will be the cost per unit of weight.
6. Density — incorporates weight & space.
7. Stowability — affect vehicle space Utilisation i.e odd sizes & shapes / excessive lengths / weight consume more space, i.e they do not stow well & waste a lot of space.
8. fragile — which requires minimum handling

Modes of transport:

① Fleet mgt Pg: 250-R. ② Multimodal transport ③. Containerisation ④ Vehicle scheduling & routing ⑤ Milk run & cross docking

Fleet Management.

Fleet Mgt is an important area, & the issues that to be considered are

→ Running the most suitable types of vehicles
→ Selecting the most appropriate fuel type
→ Ensuring vehicle safety
→ Controlling associated costs
→ Minimising environmental impact.

The focus on fleet mgt should come in from the top level mgt.

Process:

The steps in managing a fleet are as follows:

1. Developing a fleet action plan.
2. Assess current position — i.e no. of vehicles, mileage, fuel consumption, overall costs etc.
3. Identify outline objectives — obj for improvement of fleet & they should be measurable i.e cost savings, Reduction in fuel, time-scale etc.
4. Review the performance:
   Once obj are set, there should be constant review, whether the objectives are met (or) not.

Factors:

The three factors that need to be considered for fleet mgt are:

1. The transport.
2. The vehicle driver (Single drivers / two Drivers)
3. Vehicle selection (Large trucks)

Containerisation

A Container is a large rectangular box into which a firm places Commodities to be shipped. Throughout the movement, the carrier handles the Container, not the Commodities. Commodity handling reduces handling costs, damage costs, theft & pilferage.

⇒ Containerised freight requires less labour because the container is too large & too heavy for manual movement.

Concept of Containerisation:

Containerisation is an important element of the logistics revolution that changed freight handling on ships, railways & trucks.

ICLC has been successful in introducing & Popularising the Intermodal form of transportation whereby a single container can be transported via, rail, roadways, or shipped.

The most efficient logistics support in the most safe & secured environment, ensuring safety from

1. Theft
2. Pilferage of goods
3. Poor handling of commodities
4. effects of natural calamity
5. loading/unloading problems
6. Tampering.
7. unauthorised access.

WAREHOUSING

In simple terms:

A store (or) warehouse is typically viewed as a place to store inventory.

→ A warehouse is a godown or storage space where firms stores raw material, semi-finished goods (or) the finished goods for different periods in time.

→ A warehouse is a location with adequate facilities, where volume shipments are received from production centre, broken down, reassembled into combinations representing a particular order, & shipped to the customer's location.

A company must take decision regarding warehousing are:

1. Number of warehouses
2. Types of "
3. Location of "

Types of warehouses:

1. Bonded warehouses :— these are under the customs & Excise Act & Municipal Corporation regulations.
2. Field warehouses :- which are managed by public warehousing.
3. Refrigerated warehouses (Cold Storage) : are provided for perishables

Commodity warehouses.

4. Agricultural warehouse : used for storing agricultural produce

5. Distribution warehouse : located close to manufacturing Co's . It is an automated warehouse designed to receive goods from Suppliers, take orders, & deliver goods to customers

6. Buffer storage w/h : built at strategic locations with adequate transport & Communication.

7. Export & import w/h :- these are located near the ports., where international trade is undertaken.

Warehousing Operations:

1. Receiving goods
2. Identifying "
3. Sorting "
4. Dispatching "
5. Holding "
6. Retrieving "
7. Preparing records & advices.

Warehousing Options:

There are different options for the firm to choose W/H. They are:

1. An Owner Operated W/H: which is owned by the co.
2. A private W/H — on Contractual basis by 3PL. & Provide unique & specially tailored W/H.
3. A Public W/H — operated by Central Warehousing Corporation (CWC) (was setup in 1957) of India (or) by state warehousing Corp. (SWC)

Warehouse layout & Design:- one of most imp decisions when planning a W/H is layout.

W/H layout are of 2 types

1. General layout
2. layout of racking.

1. General layout: the physical arrangement of storage racks, loading/unloading areas, equipment, offices, rooms & all other facilities.

layout decisions are imp for 3 basic reasons:

1. They require substantial invts of both money & effort.
2. They involve long-term commitments
3. They have significant impact on the cost & efficiency of short-term operations.

Essential elements of a warehouse are:

1. Receiving, Checking & Sorting.
2. Storage.
3. Assembling
4. Handling
5. Information System.

2. Layout of Racking:

In most warehouses, materials are stored in some form of shelves or racking.

The basic requirements are:

1. what type of racking should be used
2. the best layout for the racking.
3. different items to be stored on the racks.

The basic type of storage is an area of floor space.

∴ As a fact, there is no best layout. Depending upon the need, the most appropriate layout must be selected.

Some of the good layouts (or) Principles or Designs.

1. Layouts which give a smooth flow of materials within & out of w/h.
2. ~~Layout which simplify movements~~
3. Layout where high level storage are possible
4. Layout that have spare roof space for overhead movement of materials.
5. Layout which have movements in straight lines on one floor.
6. Future expansion.

Warehouse Automation (logistics)

logistics automation is the application of computer software and automated machinery to improve the efficiency of logistics operations.

Components:

logistics automation systems comprise a variety of hardware & software components such as:

1. Fixed Machinery
   - a. Automated cranes
   - b. Conveyors are used to transport material from one fixed point to another fixed point. Some conveyors have belts to move parts/granular material. Others have a series of hooks to move parts through a paint system.
   - c. sortation systems: used to distribute high volumes of small cartons
2. Mobile Technology:
   - a. Radio Data Terminals: Connect wirelessly to logistics automation software & provide instructions to operators moving throughout the w/h.
3. Software:
   - a. Integration Software: Overall control of the automation machinery
     ex: allows cranes to be connected to conveyors
   - b. Operational Control Software: relates to decision-making like - where to store incoming containers & to retrieve when requested.
   - c. Business Control Software: It provides higher level functionality i.e identification of incoming stock, scheduling, assignment of stock to outgoing trailers

Benefits of Warehouse Automation:

1. Automated goods in processes – Incoming goods can be marked with barcodes. on arrival good are scanned & identified & taken by conveyors, sortation systems & automated cranes into an automatically assigned storage location.

2. Automated goods retrieval for orders.

3. " Despatch processing.

∴ A complete warehouse automation system can drastically reduce the workforce required.

Warehouse Mgt Systems (WMS)

WMS is a software solution.

(2) Initially a system used to control movement & storage of materials in W/H.

(3) WMS is expanding to transportation Mgt, Order Mgt, & Complete accounting systems.

(1) The primary purpose of a WMS is to control the movement & storage of material within an operation.

The detailed setup & processing within a WMS can vary from one software vendor to another.

Evolution of terms for raw material requirement
1. MRP (material requirement Planning) soon evolved to
2. MRP II (Manufacturing Resource planning) & scheduling & capacity planning
3. Later evolved to ERP.

WMS are big, Complex, data intensive & application oriented. They require a lot of initial setup, lot of system resources to run & a lot of ongoing data Mgt.

However the implementation of a WMS along with automated data Collection will likely give increases in accuracy, reduction in labour & greater ability to service the customers (by reducing cycle-times).

functionality / Considerations:

1. Integration with automated material handling equipment.
2. Advanced Shipment Notifications (i.e orders)
3. Cycle Counting. (operational work)
4. Labour tracking / capacity planning
5. Activity based billing (Ex 3PL can assign transaction fee, shipment transaction, fee for storage etc)
6. Browser based (adopting the browser based approach)

Thirdparty warehousing.

The Companies which are not able to build their own warhouses to store the inventory on their own are moving towards the 3P (third party) warehousing.

3P W/H is divided into 3 types:

1. Pvt W/H
2. Public W/H
3. Contract W/H

Value Added warehouse

Apart from the storage & movement of goods, the warehouses of the firms should also provide value added services for attracting the customers & for gaining the competitive advantage.

→ The value added services of warehouse helps in better packaging of the quality products & making timely supply.

→ The main purpose of establishing the value added services centre is to gain customer satisfaction by fulfilling their needs.

Value added services provided by the warehouses are

1. Reducing the inventory levels & cycle times
2. Increasing market confidentiality
3. Relabelling the products to maintain the confidentiality of the end customers of the importer.
4. Supplying the seasonal & perishable commodities by using different storage tools & techniques.
5. Removing protective packaging before delivering the products to the customers in order to recycle them.

ROLE AND IMPORTANCE OF HANDLING SYSTEMS.

Material handling is a process of movements of raw material, work in process & finished goods within a facility most efficiently at the lowest possible cost.

Def:

Materials handling involves all those activities that are responsible for the efficient of goods either within a plant or a warehouse or between a plant & a transportation agency.

Importance of Material Handling:

In scm material handling under 4 aspects, they are

1. Movement
2. Save Time. < Production customers Perspective.
3. Quantity
4. Space.
5. Reduction in accidents
6. Reduce damage of material
7. Reduce overall cost

Objectives:

1. To achieve efficiency in movement of Products in & out of warehouse.
2. To ensure movement of goods in right Qty
3. To ensure availability of products when & where required.
4. Effective utilisation of available space, equipment, manpower etc.

Classification of Material Handling:

1. Manual System — when weight of material is low & distance is near, the equipments - manual trolleys, racks, lockers etc.

2. ~~Mah~~ Mechanical System
   a. fork lift trucks
   b. Cranes
   c. Conveyors — belt, chain, wheel, line shaft
   d. Carousels (a conveyer which moves in round direction ex: airport uses carousels where Passengers collect their luggage)

3. Automated System:
   a. Sortation
   b. Robotics
   4. Automated storage & retrieval system.

Selection of Handling System (HS)

factor influencing HS / Principles

1. planning
2. Work principle (Avoid unnecessary movement of products)
3. Ergonomic principle (Human capabilities & limitations must be recognised)
4. Unit load " (load should be of uniform size for smooth flow of material)
5. Standardisation (equipment, methods, software)
6. Space utilisation (available space should be used efficiently)
7. Automation
8. Systems — all activities should be integrated to form & coordinate operational system.

9. Environment –

10. Preventive Maintenance – material handling equipments should be regularly maintained.

Selection of Handling System: H/S – Handling System

Before selecting any type of material handling equipment, firms need to perform trade-off analysis & benefits of H/S is compared with its associated costs.

1. characteristic features of Products – like size, weight, Packaging, perishability etc.

2. Govt Regulations – from 1970, the Govt has been certain precautions in the movement of dreadful materials, chemicals etc.

3. Physical features of warehouse facility.

4. Time

5. Easy to maintain

6. Unit load Shipment Concept.

7. Optimum utilisation of space & equipment.

8. Costs.