

Logistics basics

[Business](#), [Marketing](#)



Logistics Chapter 1 Logistics Management - Vinod V. Sople Contents • Introduction • Military origin of Logistics • Definitions – Logistics – Logistics Management • The Broad Scope of Logistics (Only for your understanding. Not required for exam) • Logistics – A System Concept – Logistics Mix • Logistics Functions • * Scope / Activities of Logistics * Refer Vipul's BMS Series Elements of Logistics & Supply Chain Management by Vijay Kumar Bhatia 2 ... Contents Inbound Logistics [Upstream Logistics] • Outbound Logistics [Downstream Logistics] • Manufacturing Logistics [Process / Operations / Production Logistics] • Distribution of Logistics Costs • Logistics in the value chain / Customer Value Chain • ** Value - Added Role of Logistics • ** Logistics for Competitive Advantage – The 3C's Concept • Four Sub-divisions of Logistics – Business Logistics – Event Logistics – Service Logistics – Military Logistics ** To be done from slides only 3 ... Contents Logistics Interfaces – Logistics Interface with Operations / Manufacturing – Logistics Interface with Marketing – Logistics Interface with Other Areas • Evolution of Logistics Functions • Integrated Logistics / Integrative Role of Logistics • Barriers to Integration • Operational Objectives of Logistics Management • What Causes Bad Logistics? • Customer Order Cycle • Lead-Time 4 ... Contents • Logistical Performance Cycle • Logistics Planning & Strategy • Logistical Competency • Mission of Logistics Management • Reverse Logistics • Logistics for Business Excellence • Importance of Logistics • Logistics Future • References Introduction • Logistics – Originated from the Greek work logistikos & the Latin word logisticus – Means the science of computing or calculating – Usage can be traced back to the 17th century when it was probably used for the first time by the French army

- Is considered to have originated in the military's need to supply themselves with arms, ammunition and rations as they moved from their base to a forward position

6 .. Introduction – Gained importance during World War II in army operations, covering movement of supplies, troops and equipment • In recent times Logistics has acquired wider meaning & is used in business for the movement of raw material from suppliers to the manufacturers and finally the finished goods to consumers • Also referred to as physical distribution

7 Military Origin of Logistics The word "logistics" is derived from the Greek adjective *logistikos* meaning "skilled in calculating" • The first administrative use of the word was in Roman and Greek times when there was a military administrative official with the title "Logista" • Usage can be traced back to the 17th century when it was probably used for the first time by the French army in relation to an organized military administrative science • The French still use the words *logistique* and *loger* • Logistics is the lifeblood of any army

8 .. Military Origin of Logistics • The manner in which any army is supported with food & ammunition decides how efficiently an army fights • The military activity known as logistics probably is as old as war itself • In the early history of man when the first wars were fought, each man had to find his own food, stones, and knotted clubs • Each warrior was responsible for foraging for his own food and firewood

9 ... Military Origin of Logistics Later, when fighters joined as groups and fighting groups became larger, certain men specialized in supporting fighters by providing them food and weapons • The men who provided support to the fighters constituted the first logistics organization • There have been several wars that are believed to have been won or lost purely on the basis of good or bad logistics

management, including the American War of Independence 10 .. Military Origin of Logistics • Many famous military leaders such as Alexander & Duke of Wellington are thought to have been logistical masterminds • Napoleon Bonaparte famously stated, " an army marches on its stomach" • After World War II in the 1950s Logistics as a business concept emerged 11 Definitions Philip Kotler defines Logistics as “ Planning, implementing and controlling the physical flow of materials and finished goods from point of origin to point of use to meet the customer's need at a profit” • The American Council of Logistics Management defines Logistics as “ The process of planning, implementing & controlling the efficient, cost effective flow & storage of raw materials, in-process inventory, finished goods and related information from point of origin to point of consumption for the purpose of conforming to customers' requirements” 12 .. Definitions • Logistics is the function responsible for flow of materials from supplier to organization, through operations within the organization and then out to customers • Martin Christopher says that “ Logistics is essentially a planning process & an information based activity” • Philips Schary describes logistics as “ The corporate traffic cop”, directing the flow of material from source, through production and distribution, to the final customer 13 .. Definitions – Logistics is not limited to manufacturing organizations alone – Logistics is relevant to all types of organizations, government, NGOs, service related organizations such as schools, restaurants, hospitals, bank, retail outlets etc 14 ...

Definitions Logistics Management – Application of management principles to logistics operations for efficient and cost effective movement of goods and personnel – Is an integrative process which optimizes the flow of materials &

supplies through an organization & its operations to the customer – Is that part of Supply Chain Management that plans, implements, and controls the efficient, effective, forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements 15

The Broad Scope of Logistics Only for your understanding. Not required for exam 16 Logistics – A System Concept • In an organization business process – Starts with flow of materials from suppliers – Progresses to manufacturing – Through distribution channels reaches customers • Each department may excel at their respective functions viz procurement, production & distribution but may not excel as an organization • Reasons – Lack of coordination – Departments pursue different goals – No single agency that coordinates these activities 17 .. Logistics – A System Concept 18 ... Logistics – A System Concept • Concept of logistics is based on the system approach • Flow of material from supplier to manufacturing plant to end customer is viewed as a single chain, ensuring efficiency & effectiveness to achieve customer satisfaction at lowest possible cost • Logistics recognizes that all activities of material movement across business processes – Are interdependent & need close coordination – Are to be managed as a system 19 ...

Logistics – A System Concept LOGISTICS MIX • Logistics Mix was formulated by Martin Christopher • Covers the following functional areas – Inventory Control – Packaging – Warehousing – Transportation – Information flow 20 ... Logistics – A System Concept • The objective of logistics is to facilitate the flow of materials across the supply chain of an enterprise so that the right product is available at the right place at the right time, cost effectively • This

is possible only when all logistics functions are working as a unified system to achieve common goals

1 Logistics Functions

- Logistics is the process of movement of materials & goods across the supply chain of the company
- This process consists of various functions
- Each of the functions have to be properly managed to bring about effectiveness & efficiency in the supply chain
- Major Logistics functions are – Material Handling & – Order Processing Storage – Inventory Management – Logistical Packaging – Warehousing – Information – Transportation

22 ... Logistics Functions 23 ...

Logistics Functions

Order Processing

- Starts when a purchase order is placed by a buyer on the supplier
- Consists of the following activities – Order checking for any deviations in agreed or negotiated terms – Prices, payment & delivery terms – Checking the availability of materials in stocks – Material & Production scheduling to avoid shortages – Acknowledging the order, indicating deviations, if any

24 ... Logistics Functions

Order Processing

- In large organizations – Usually thousands of orders are received a day – Its essential to devise an order processing system capable of handling such voluminous work with minimal human intervention

5 ... Logistics Functions

- Inventory Management – Is maintaining the requisite level of stocks to meet customer requirements simultaneously ensuring minimal carrying cost – In the overall supply chain, inventory costs indirectly chews profits because of inventory carrying costs – Average inventory carrying costs varies from 10% 25% of the total inventory per year – Two approaches to Inventory management
- Cost approach
- Customer satisfaction

26 ... Logistics Functions

Inventory Management

- Businesses try to strike a balance between these two

approaches - With improvements in infrastructure & communication, business firms are adopting JIT techniques 27 ... Logistics Functions • Warehousing - Storage place where finished goods are stored until they are brought to point of sales - Location of warehouse impacts the ability of a firm to deliver desired level of customer service - Effectiveness of an organization's marketing strategy depends on making the right decision about warehousing 28 ... Logistics Functions Warehousing - In Logistics, warehousing is a key decision area involving following decisions • Location of warehousing facilities • Number of warehouses • Size & layout of warehouse • Ownership of warehouse 29 ... Logistics Functions • Transportation - Goods have to be moved from supplier to buyer through different transportation modes - Depending on infrastructure of country / region, particular mode of transportation is selected - Usually for low value products transportation cost is 20% of product cost - Is very critical for perishable goods such as milk, ice-creams 0 ... Logistics Functions • Transportation - Common modes are road carriers, railways, airways, ships, pipelines & ropeways - Key decisions involved in Transportation is should the firm have its own fleet or go in for outsourcing? - Choice of Transportations depends on reach, investment required, operating costs, expertise & reliability - Firms decide on the mode with optimum cost under given product-market conditions 31 31 ... Logistics Functions Material Handling & Storage - Speed of inventory movement across the supply chain depends on the material handling methods - Improper methods of material handling could lead to product damage and delayed deliveries, resulting in incidental overheads - Mechanisation & automation in material handling enhances productivity of logistics system 32

... Logistics Functions • Material Handling & Storage – Considerations for material handling are volumes to be handled, speed required for material movement and level of service to be offered to the customer – Choice of storage system should maximise space utilization (floor and cubic) in the warehouse – Material handling system should support the storage system for speedy movement (storage & retrieval) of goods in and out of the warehouse

33 ... Logistics Functions • Logistical Packaging – AKA Industrial Packaging – Differs from product packaging which is based on marketing objectives – Influences the efficiency of the logistical system – Plays an important role in damage protection, ease of material handling and storage space economy

34 .. Logistics Functions • Information – Logistics is an information based activity of inventory movement across the supply chain – Information systems play a vital role in delivering superior customer service – Involves usage of IT tools for information identification codes, access, storage, analysis and decision support

35 Scope / Activities of Logistics 36 ... Scope / Activities of Logistics In any organization logistics involves 3 phases – Inbound Logistics / Upstream Logistics – Operations / Process Logistics – Outbound Logistics / Downstream Logistics • In these 3 phases the total scope or activities involved with logistics are ? Procurement / Purchasing ? Outward Transport ? ? Inward Transport Physical Distribution ? Management Receiving ? ? Recycling, returns & Warehousing waste disposal ? Stock Control ? Location ? Order Picking ? Communication ? Materials Handling

37 Inbound Logistics 38 ... Inbound Logistics AKA Upstream Logistics • Involves pre-production logistical activities that take care of procuring materials from vendors • Manages the procurement cycle involving the following tasks –

Sourcing - Order Placement - Transportation - Receiving • Associated activities are material handling, warehousing, inventory control, delivery scheduling, receiving, storing etc • Factors such as delivery time, size of shipment, mode of transport, inventory levels have to be planned 39

Outbound Logistics 40 ... Outbound Logistics AKA Downstream Logistics • Involves post-production logistical activities that take care of distribution of finished goods • Manages the delivery cycle involving the following tasks - Order Receiving - Order Processing - Order Filling - Transportation • Associated activities are order processing, order filling, material handling, warehousing, delivery vehicle operations, scheduling, transportation etc • Factors such as delivery time, size of shipment, mode of transport have to be planned 41

Manufacturing Logistics AKA Operations / Process / Production Logistics • The purpose of production logistics is to ensure that each machine and workstation is being fed with the right product in the right quantity and quality at the right time • Ensures that the production resources - 4Ms are used efficiently • Involves synchronizing the flow of material with the production processes • The concern is not the transportation itself, but to streamline and control the flow through value-adding processes and eliminate non-value-adding ones 2 ...

Manufacturing Logistics • Manages the production cycle involving the following tasks - Material planning - In-house transport - Storage - Packaging - Inventory management • Associated activities are in-house transport (transport of raw material to the production line, transport of semi-finished products to the next stage of production, transport finished product to the stores), storage, packaging of goods 43 43 ...

Manufacturing Logistics • Production logistics is becoming more important with decreasing batch sizes allowing customer's demand to be fulfilled efficiently • Production Logistics must also address the issues of tracking and tracing which are gaining importance due to product safety and product reliability issues especially in the automotive and medical industries 44

Distribution of Logistics Costs 45 ... Distribution of Logistics Costs There are three categories of logistics - Inbound logistics - Process Logistics - Outbound logistics • Logistics costs are involved in all the above categories • The largest costs are involved in outbound logistics • The component of transportation covers the largest portion • The total logistics cost as a percentage of sales differs with product categories • For FMCG products the logistics cost maybe 30-40% of the sales value • For high value heavy engineering items the logistics cost would be 5-8% of the sales value • With proper systems & controls, the logistics cost which are borne by the customer can be reduced 46

Logistics in the Value Chain 47 ... Logistics in the Value Chain • Concept of Value Chain was formulated by Michael Porter • The Value Chain is composed of value activities and margin which is achieved by these activities • Value activities are divided into two groups of activities - Primary Activities - Secondary Activities 48 ... Logistics in the Value Chain Primary Activities - Those activities which are directed at the physical transformation and handling of goods & services the organization delivers to its customers - Includes the following categories • Inbound Logistics • Operations • Outbound Logistics • Marketing & Sales • Services 49 ... Logistics in the Value Chain • Secondary Activities - Those activities which enable and

support primary activities – Includes the following categories • Procurement • Technology Development • Human Resources Management • Firm Infrastructure 50 ... Logistics in the Value Chain The value chain provides further insights on how logistics can contribute to cost and service advantage to the organization • The activities in the value chain are those activities that an organization must perform in order to provide benefits or value to the customers • Two of the five primary activities are related to logistics: – Supplying raw materials, component parts & related services into the production line (inbound logistics) – Managing the flow of finished goods from end of production line to the customer (outbound logistics) 51 .. Logistics in the Value Chain • All activities need to be performed in such a way that the total value generated by the company is more than the sum of its costs • The total value of the organization is determined by the whole of its sales value whereas margin reflects the rewards • Hence organizations must develop logistics capabilities to attain cost and service advantages 52 Value - Added Role of Logistics 53 ...

Value - Added Role of Logistics • Four principle types of economic utilities add value to a product or service viz – Form Utility – Time Utility – Place Utility – Possession Utility • Generally, professionals credit – Manufacturing activities with providing form utility – Logistics activities with providing time & place utility – Marketing activities with providing possession utility 54 ... Value - Added Role of Logistics

Form Utility • Refers to the value added to goods through a manufacturing, production, or assembly process • Results when raw materials are combined in some predetermined manner to make a finished product • e. g. – A

bottling firm adds together syrup, water, and carbonation to make a soft drink - This simple process of adding the raw materials together to produce the soft drink presents a change in production form that adds value to the product 55 55 ... Value - Added Role of Logistics

Form Utility • Certain logistics activities can also provide form utility • e. g. - Breaking bulk and product mixing, which typically takes place at distribution centers, change a product's form by changing its shipment size and packaging characteristics - Thus, unpacking a pallet of breakfast cereal into individual consumer-size boxes adds form utility to the product • However, the two principle ways in which logistics adds value are place and time utility

56 .. Value - Added Role of Logistics Place Utility • Logistics provides place utility by moving goods from production points to points where demand exists • Logistics extends the physical boundaries of the market area, thus adding economic value to the goods • This addition to the economic value of goods or services is known as place utility • Logistics creates place utility primarily through transportation 57 ... Value - Added Role of Logistics

Place Utility • e. g. - Transporting farm produce from farm areas to markets where consumers need this produce creates place utility - The same is also true when steel is moved to a plant where the steel is used to make another product • The market boundary extension added by place utility increases competition, which usually leads to lower prices and increased product availability 58 ... Value - Added Role of Logistics

Time Utility • Refers to making available goods and services not only where consumers need them, but also at the time when consumers demand them • Logistics creates time utility through proper inventory maintenance and the

strategic location of goods and services • e. g. logistics creates time utility by having heavily advertised products and sale merchandise available in retail stores at precisely the time promised in advertisements 59 ...

Value - Added Role of Logistics Possession Utility • Possession utility is primarily created through the basic marketing activities related to the promotion of products or services • Time or place utility make sense only if demand for the product or service exists • Also possession utility cannot be acted upon unless time and place utility are provided • Order fulfillment is the critical and often final step for meeting customer requirements 0 ...

Value - Added Role of Logistics • Logistics helps in creating time & place utilities of the product that satisfies customers' needs • In today's competitive markets, the competitiveness of a firm is judged by how efficiently & effectively it manages creation of time & place utilities to - Avail of sales opportunities - Create new opportunities for repeat sales to the same customers 61

Logistics for Competitive Advantage 62 ... Logistics for Competitive Advantage • Concept formulated by Martin Christopher • 3Cs in business are - Customer - Company - Competition • All 3Cs are important & healthy for a business & the economy • A buying decision is always triggered by a need / want experienced by a customer 63 ... Logistics for Competitive Advantage Customer: Whilst making a buying decision, Customer is attracted by value offered by a company • Company: Tries to give a better offering to the customer than competition by efficient & effective utilization of its assets • Competition: Ensures its assets are almost similar to industry other players in the same industry • Hence product differentiation in terms of product

quality & cost is nearly impossible • Opportunity exists for Company to differentiate its products & services through superior logistics • When this happens, Customer sees better value in Company's products than Competition • This provides the Company with a means of beating Competition viz competitive advantage

64 Four Sub-divisions of Logistics • In the 21st century, logistics should be viewed as a part of management & has four subdivisions – – – – Business Logistics Military logistics Event logistics Service logistics • All of the four sub-divisions have some common characteristics & requirements such as forecasting, scheduling and transportation • All four sub-divisions can be viewed in supply-chain context viz upstream & downstream, several organizations play a role in the overall success of operations

65 ... Four Sub-divisions of Logistics • Business Logistics That part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, service, and related information from point of use or consumption in order to meet customer requirements ? Military logistics The design and integration of all aspects of support for the operational capability of the military forces (deployed or in garrison) and their equipment to ensure readiness, reliability, and efficiency

66 ... Four Sub-divisions of Logistics ? Event logistics

The network of activities, facilities, and personnel required to organize, schedule, and deploy the resources for an event to take place and to efficiently withdraw after the event • Service logistics The acquisition, scheduling, and management of the facilities / assets, personnel, and materials to support and sustain a service operation or business

67 Logistics Interfaces • Logistics, by its nature, focuses on operations that cut across

traditional functions of a firm • Logistics interfaces in many important ways with other functional areas • Of importance are - Logistics Interface with Operations / Manufacturing Logistics Interfaces with Marketing Logistics Interfaces with Other Areas 68 - - ... Logistics Interfaces

Logistics Interface with Operations / Manufacturing • Length of production runs Balance economies of long production runs against increased costs of high inventories • Seasonal demand Logistics & manufacturing must be prepared to accept seasonal inventory that begins to accumulate 2-3 months before the season / event • Supply-side interfaces Stocking adequate supplies to ensure uninterrupted production is now a logistics function 69 ...

Logistics Interfaces Logistics Interface with Operations / Manufacturing • Industrial packaging Main purpose is unitization and protection of the product from damage & pilferage • Foreign & third party alternatives Several organizations are making arrangements with 3rd party or contract manufacturers to produce / assemble some of the firm's products, a practice is common in the food industry 70 ... Logistics Interfaces Logistics Interface with Marketing This area is studied with respect to Marketing Mix viz 4Ps • Product -

Product shape, weight, size & packaging affect the ability of the logistics system to move & transport products Hence the logistics manager must be consulted when marketing is deciding product dimensions Marketing always pays great deal of attention to product packaging Logistics manager must be consulted when marketing is deciding packaging because the product with its packaging has to fit inside logistical packaging 71 71 - - - ... Logistics Interfaces Logistics Interface with Marketing • Place - The place decision

refers to the distribution channel decisions, which involves both distribution & transactions. The kind of distribution channel selected by marketing has an effect on logistics operations. e. g. Firms dealing only with wholesalers will have fewer logistics problems in distribution than while dealing directly with retailers. The reason is wholesalers order in bulk whereas retailers require smaller quantities more frequently. 72 - - ... Logistics Interfaces

Logistics Interface with Marketing • Promotion -

When marketing plans promotions to stimulate sales, logistics manager must be informed so that sufficient quantities of inventory are available at the place where customers' demand them. Adjusting quantity prices to suit shipment sizes for transportation is important. Volumes sold under different pricing schedules will affect inventory requirements & replenishments. 73 • Price - - ... Logistics Interfaces

Logistics Interface with Other Areas • Manufacturing and marketing are probably the two most important internal functional interfaces with logistics • Other important interfaces now include finance and accounting - Logistics can have a major impact on return on assets and return on investment - Logistics costs reported by cost systems measure supply chain trade-offs and performance. 74

Evolution of Logistics Function Before the 1950s, managers focused on the production function and methods to achieve efficiency in production • Logistics was under a dormant condition in this period • Post World War II, in the 1950s businesses realized the importance of logistics • During the 1950s to and 1960s, applying new ideas of administration on business was a tendency • Businesses started focusing on the procedure of physical distribution of products. 75 ... Evolution of Logistics Function • From the 1970s onwards,

more and more applications and researches of logistics were pioneered & appeared in USA • Due to petroleum price rise in 1973, the effects of logistics activities on enterprises grew Slow growth of market, pressure of high stagflation, release of transportation control, and competitions of the third world on products and materials all increased the significance of logistics system on planning and business at that time • Computers and information technology came of age and were increasingly being used in business applications 76 ... Evolution of Logistics Function • In the 1980s & 1990s economies of many countries including India were liberalized • This saw the growth of globalization and stiff competition • Hence businesses started focusing on global sourcing, manufacturing & distribution • Simultaneously 3PLs emerged 77 ...

Evolution of Logistics Function • Today businesses realize – That sourcing, manufacturing and distribution must have a global perspective – Competition today is not in products but supply chains – Superior logistics can provide a competitive edge – Integration of supply chain and flow of information is vital for superior logistical performance 78 Integrated Logistics 79 ... Integrated Logistics • Information from & about customers flows through the firm in the form of sales activity, forecasts & orders • Information is then translated into manufacturing and purchasing plans • Raw materials are then procured • Value addition takes place & ultimately results in transfer of ownership of finished products to the customers • The process of integration is not restricted to manufacturing companies alone, the retailing and wholesaling firms link physical distribution and purchasing since manufacturing is not required 80 ... Integrated Logistics As shown in the figure, entire process can

be viewed with respect to two interrelated activities - Inventory Flow - Information Flow

Inventory Flow • Flows through 3 activities - Physical Distribution, Manufacturing & Procurement • These 3 activities combine to provide integrated management of material flow along the supply chain

81 ... **Integrated Logistics Inventory Flow Physical Distribution** • Links a marketing channel with its customers facilitating the movement of a finished product to the final destination of a marketing channel • Needs a proper marketing effort so as to enable desired products being delivered when and where needed • Fulfills objective of implementation of time and place utilities

Manufacturing • Concerned with managing work-in-process inventory as it flows between the stages of manufacturing

Procurement • Concerned with purchasing & arranging in-bound movement of materials, parts thereby ensuring availability of materials/ assortments where and when needed

82 ... **Integrated Logistics Information Flow** • Provides integration in the three operating areas - physical distribution, manufacturing & procurement • Two main components of information flow are - Planning & coordinating flows - Operational flows

83 ... **Integrated Logistics Information Flow Planning & coordinating flows** • Coordinating is the backbone of information flow among supply chain partners • Deals with the following - -

Nature & Location of customers
 Required products & services matching to needs of customers
 Limitations or bottlenecks within manufacturing facilities
 Deciding outsourcing requirements
 Requirements of logistical facilities based upon forecasting
 MRP to support manufacturing / procurement requirements

84 - - - - ... **Integrated Logistics Information Flow Operational flows** • Purpose of information flow is to provide detailed data required for

integration of the three operating areas physical distribution, manufacturing & procurement • Deals with the following – – – – Order management and processing Procurement Inventory management Transportation and shipping

85 Barriers to Integration

Factors that cause barriers to supply chain integration are • Organization Structure • Inventory Ownership • Knowledge Transfer Capability • Measurement Systems • Information Technology 86 ... Barriers to Integration

Organization Structure • Traditional organization structures are not capable of implementing any cross-functional processes • Traditional organization structures divide authority & responsibilities according to functional work such as inventory control, warehousing or transportation etc. • Each of these functional areas focus on achieving excellence in their functional areas • This hinders the goal of integration achieved by cooperation among functional areas • Successful integration of logistics requires a structure that facilitates cross-functional coordination 87 ... Barriers to Integration

Inventory Ownership • Traditional approach to inventory is to maintain adequate inventory for meeting demand and protection against uncertainty • Availability of inventory is beneficial because it supports long production runs resulting in economies of scale • Such benefits have related costs • Critical to understand the cost-benefit relationship and risk involved in incorrectly located / obsolete inventory 88 ... Barriers to Integration

Knowledge Transfer Capability • Every organization is a knowledge-base where-in knowledge has been created through experiences • Concentration of this knowledge strengthens the organization • When an employee leaves or retires this knowledge is lost • Many organizations fail to develop

procedures & systems for transferring cross-functional knowledge • Unless this knowledge is transferred, a strong barrier is created for integration 89 ...

Barriers to Integration

Measurement Systems • Traditional measurement systems which are an outcome of traditional organization structures also make coordination difficult • Hence newer measurement systems must be developed Information Technology • I. T. is the key resource for achieving integration • Levels of technology deployed must share information else existing applications act as a barrier to integration 90 Operational Objectives of Logistics • Operational

objectives of logistics are the primary determinants of logistical performance

• Include – Rapid Response – Minimum Variance – Minimum Inventory – Movement Consolidation – Quality – Life cycle Support 91 ... Operational

Objectives of Logistics Rapid Response • Is the firm's ability to respond to customer on a shipment-to-shipment basis in a timely manner •

Developments and advancements in I. T. have increased the capability to postpone logistical operations till the latest possible time & then accomplish rapid delivery of required inventory • Results in elimination of excessive inventories traditionally stocked in anticipation of customer requirements 92 ... Operational Objectives of Logistics Minimum Variance • Variance may

result due to the following – – – Delay in expected time of customer order receipt An unexpected disruption in production Goods arriving in damaged

condition at a customer's location Delivery to an incorrect location – • Traditionally the variances were minimized by means of safety stock or high

cost transport which ensured speedy delivery • In modern times I. T. has helped minimize variances 93 ... Operational Objectives of Logistics Minimum

Objectives of Logistics Minimum

Inventory • Traditionally inventory involved asset commitment and relative turnover • Asset commitment => the financial value of the inventory deployed in the total logistical system • Turnover AKA turn velocity => the rate of inventory usage over time • A high turnover along with inventory availability rate mean that inventory assets are being effectively utilized • On account of JIT and lean manufacturing the concept of zero inventory is popular • Hence constant efforts are made to minimize inventory in the supply chain 94 ... Operational Objectives of Logistics

Movement consolidation • Is concerned with transportation costs • Transportation costs are directly related to - Type of product - Size of shipment - Distance • Since transportation costs are high, movement consolidation must be done to reduce costs => larger the overall shipment & longer the distance it is transported, lower the transportation cost per unit 95 ... Operational Objectives of Logistics Quality ? Constant efforts should be made to improve quality of logistical services When quality of logistical service fails, the logistical performance needs to be reversed & the repeated again This is further complicated by the fact that logistical operations are performed over a large geographical area, at all times of day & night Reworking a customers' order as a result of incorrect shipment is far more costly than performing it right the first time 96 ? ? ? ...

Operational Objectives of Logistics Life Cycle Support / Customer Service ? Situations where-in flow of goods & services is reversed viz reverse logistics Usually happens during product recall Reasons for product recall - - - ? ? Product expiry Product defects Laws prohibiting disposals Recycling of containers & packaging materials 97 ? Life cycle support means cradle-to-

cradle support What Causes Bad Logistics? Causes of bad logistics • Infrastructure – Bad road conditions – Inefficient railway services – Poor communication facilities – Congestion at ports – Poor material handling capabilities • Taxation – e. g. Octroi 98 ... What Causes Bad Logistics?

Causes of bad logistics • Information – Inadequate information as most firms do not pay due attention to information integration • Management – Improper understanding of logistics – Poor managerial decisions 99 Customer Order Cycle • The customer order cycle includes all processes directly involved in receiving and filling the customer's order • Typically, the customer initiates this cycle when the customer feels the need for certain product and places an order with the supplier • The cycle starts with the receipt of the order and ends when the customer receives the order • The cycle primarily involves filling customer demand 100 ... Customer Order Cycle Following activities are involved in the customer order cycle • Order preparation • Order transmittal • Order entry • Order filling • Order status reporting 101 ... Customer Order Cycle

Steps in the customer order cycle • The customer initiates this cycle when the customer feels the need for certain product and places an order with the supplier • On receipt of the order, the supplier performs the following checks – Quantity is available in stock – If not available, start its production – Customer's credit is satisfactory • Order receipt acknowledgment is given to customer 102 ... Customer Order Cycle Steps in the customer order cycle • Picking & packing instructions are given to warehouse – When product has been removed from inventory and transportation has been planned, invoice is prepared • Products are transported and delivered to the customer •

Customer verifies the receipt of products with respect to quality & quantity • As far as possible the above activities should be computerized to reduce errors

103 Lead-Time With reference to SCM, lead-time – Is the time taken from the moment the customer places an order to the moment the order is received by the customer – Time taken to convert an order to cash • If finished goods stock is not available, then lead time would be the time it takes to manufacture and transport the goods • Lead-time would also depend on the nature of the product – Items which are generally made-to-stock products, the lead-time may be a few hours or just a day or two – Larger order of custom made parts may have a leadtime of weeks if not months

104 ... Lead-Time • Lead-time is a sum of the following three components – Review time Includes the time required for order reception, checking if ordered product is available in stock – Manufacture time If the ordered product is not available in stock, the product must be manufactured – Transit time Time taken for the shipment to reach the customer • Manufacturers always looks for ways to improve lead-time • A low lead-time can be a source of competitive advantage

105 Logistical Performance Cycle

Procurement Cycle Manufacturing Support Cycle Physical Distribution Cycle

106 ... Logistical Performance Cycle • Integrated logistics can be analyzed by means of performance cycle • The performance cycle provides the interface & link required to build an integrated logistical system • The logistics performance cycle is the basic unit of supply chain design and operational control • The performance cycle represents elements of work necessary to complete the logistics related to customer accommodation, manufacturing or procurement • In the performance cycle, suppliers, the firm and its

customers are linked together by communication & transportation 07 ...

Logistical Performance Cycle • The facility locations that performance cycle link together are called nodes • Work related to logistics occurs at nodes • A performance cycle also requires inventory which consists of base stock and safety stock • The input to a performance cycle is an order that specifies requirements for a product or material • Output of the performance cycle is level of performance expected from the logistical operation 108 ... Logistical Performance Cycle • The performance cycle comprises of three cycles – Physical Distribution Cycle – Manufacturing Support Cycle – Procurement Cycle 109 ... Logistical Performance Cycle

Physical Distribution Performance Cycle • Physical distribution operations involves processing and delivering customer orders • Activities performed in the physical distribution performance cycle are as shown in the figure below

• Physical distribution is integral to marketing & sales performance because it provides timely and economical product availability • Physical distribution integrates manufacturing & marketing 110 ... Logistical Performance Cycle

Physical Distribution Performance Cycle • Conflict between marketing & manufacturing Marketing – Focuses on delighting customers – Would like to maintain a broad product line with high inventory levels, regardless of its impact on profits Manufacturing – Constantly looks for sources of cost control and standardization – Desires long stable production runs – Prefers a narrow line of mass-produced products • Traditionally inventories are maintained to resolve this conflict 111 ... Logistical Performance Cycle

Physical Distribution Performance Cycle • Since physical distribution cycle deals with customer requirements, the related operations are more erratic

than manufacturing or procurement cycles • Ways to reduce physical distribution operational variance - Improve accuracy of forecast - Improve order management & coordination with customers - Have flexible & responsive cycle 112 ... Logistical Performance Cycle Manufacturing Support Performance Cycle • Provides production logistics • Positioned between physical distribution & procurement operations • Basically, supports what, where and when of the production and not how • Movement & storage of product, material & semi-finished parts & components between the organizations' facilities represent the responsibility of manufacturing support logistics • Logistical operations are restricted to - Dock-to-dock movement within the firm - Any intermediate storage point - Finished goods are allocated and dispatched to warehouses or directly to customers 113 ...

Logistical Performance Cycle Manufacturing Support Performance Cycle • For finished goods movement, physical distribution is initiated • Manufacturing support logistics does not deal with as much of uncertainty as compared to procurement performance cycle & physical distribution performance cycle • Features of manufacturing support performance cycle - Initiates the procurement of components & materials at the time & place needed - Operations are restricted to movement within the firm's facilities - After completion of manufacturing cycle, the finished goods inventory is allocated & transported directly to customers or to warehouses 114 ... Logistical Performance Cycle

Procurement Performance Cycle • Activities involved in the procurement process are as shown in the figure • Operations performed as also known as inbound logistics • Objective is to perform inbound logistics at lowest cost •

Deals with a far wide variety of materials as compared to manufacturing performance cycle & physical distribution performance cycle 115 ...

Logistical Performance Cycle Procurement Performance Cycle • Procurement often requires large shipments which requires use of large vessels such as barges, ships, truck loads etc on account of which procurement cycles are longer • Critical issues in procurement are uncertainty due to price change and / or supply discontinuity 116 ... Logistical Performance Cycle

Reducing performance cycle uncertainties Performance cycle uncertainties can be reduced by • Use of EDI • Monitoring daily change in workload • Human resource availability • Availability of specialized material handling equipments • Ensuring consistency in operations 117 Logistics Planning & Strategy • Logistics planning attempts to answer the question of what, when & how • Logistics planning is done at three levels strategic, tactical & operation • The major difference is the time horizon of planning, which requires a different perspective • Strategic Planning Long range, time horizon more than 1 year • Tactical Planning Medium range, time horizon less than 1 year • Operational Planning Short range decision making, decisions frequently made on an daily / hourly basis 118 ... Logistics Planning & Strategy 119 Logistical Competency ?

Logistical competency is an assessment of a firm to provide competitively superior customer service at lowest possible cost A firm can achieve logistical competency by coordinating and improving the level of performance of the following activities – Network design – Information – Transportation – Inventory, Warehousing, Material Handling & Packaging 120 ? ... Logistical Competency Network design ? Involves deciding the no. & type

of facilities required, their geographic locations & the work to be performed at each facility Logistics facilities typically include manufacturing plants, warehouses, cross-dock operations, and retail stores Network design is responsibility of logistics managers since a firm's facilities are used to provide products & services to customers Network design determines the type of the inventory and the quantity to be stocked at each facility, and the assigning of customer orders for shipment 121 ? ? ? ... Logistical Competency Network design ?

The first step towards achieving competitive advantage lies in superior network design, as the real competition is not between two companies but between efficiency & effectiveness in managing their supply chain network Information ? Present day technology is capable of handling the most complicated information requirements ? Forecasting & order management are two areas that depend on information Quality & timeliness of information are key factors in logistical operations 122 ? ... Logistical Competency Transportation ? Transportation geographically positions inventory where it is required ? Transportation can be achieved in three ways – Private: A private fleet of vehicles operated by Private the firm – Contract: A firm may enter into a contract with a Contract transport firm – Common Carriage: The services of different Carriage companies may be engaged on an individual shipment basis 123 ... Logistical Competency Transportation ? Factors affecting transportation performance Cost of transportation – The cost of moving material between geographical locations Speed of transportation – The time required for moving material between geographical locations – Transport firms capable of moving fast usually charge higher – Faster the

transportation, lower the required levels of safety stock Consistency - Is the dependability of transportation - Lower the consistency, larger the required safety stock to protect against unpredictable service 124 ... Logistical Competency Inventory ?

Objective is to achieve desired customer service with minimum inventory & lowest possible cost Excessive inventories may be helpful in compensating for deficiencies in network design but ultimately result into higher total logistics cost The best practice of inventory management is to achieve maximum turnover while satisfying customer service levels Merchandise needs to be warehoused at selected times Activities carried out in a warehouse are sorting, break-bulk, assortments, mixing, consolidation, postponement, order selection & sometimes product modification and assembly ? ? Warehousing, Material Handling & Packaging ? ? 125 ... Logistical Competency Warehousing, Material Handling & Packaging ? Within the warehouse, products must be received, moved, sorted, and assembled to meet customer order requirements and for these activities material handling is required Material handling is needed for efficient loading and unloading of goods Products packed in cans, bottles or boxes are handled more efficiently when combined into larger units such as Master Cartons Master units can further be consolidated into large units such as pallets, containers etc ? ? ? 126 Mission of Logistics Management Logistics of a firm is an integrated effort aimed at helping create customer value at lowest possible cost • Logistics exists to satisfy customer requirements by facilitating the firm's manufacturing & marketing operations • Logistics Management is concerned with delivering to the customer the desired service level at the lowest

possible cost • To achieve this, the firm must plan & co-ordinate all its various activities • This is the mission of logistics management • Hence logistics can be viewed as a link between the marketplace (customers) and the various business operations

127 Reverse Logistics Definition ? Reverse logistics is the process of recalling products from sales channel partners or consumers Reverse logistics is the process of moving goods from their final destination to their sources for the purpose of proper disposal or refilling or remanufacturing and refurbishing or product recall or capturing value ?

128 ... Reverse Logistics In reverse logistics, the product goes at least one step back in the supply chain – A product recall is a request to return to the maker, a batch or an entire production run of a product, usually over safety concerns or design defects or labeling errors – Whatever the reasons for reverse logistics, costs of moving products over the reverse logistics channel is very high – Studies have shown that an average of 4% to 6% of all retail purchases are returned, costing the industry about \$40 billion per year

129 ... Reverse Logistics A Model of the Environmental Forces Affecting Reverse Logistics Activities

130 ... Reverse Logistics Reasons / Need for reverse logistics • Strict environmental laws that force firms to take back their products for proper disposal • Strict laws making recycling mandatory • Damage in transit • Product recalls – In 2010 Apple recalled Iphone4 over signal problems – In perhaps the largest product recall in India, Nokia recalled 46 million BL-5C cellphone batteries • Product expiry • Error in order processing by supplier • Exchange of new product for an old product • Return of unsold goods such as bread, medicines, clothing etc

131 ... Reverse Logistics Drivers of Reverse Logistics • Quality • Cost • Law Quality

- Quality of material has to be ascertained before it can be moved through the reverse logistics channel
- Appropriate facilities would be required for this purpose
- If quality of material is poor it may not be worthwhile incurring further costs in moving goods over the reverse logistics channel

Reverse Logistics

Drivers of Reverse Logistics Cost • Usually drives the transportation decision for reverse logistics • Little attention is paid to the service level provided by the transportation mode chosen or specific carrier used • Rail is often chosen over motor carriage for surface transportation – Rail can handle high volumes of low-value, heavy material more cheaply than motor carriage • Extreme pressure to minimize costs also affects choice of facility location

133 ... Reverse Logistics Drivers of Reverse Logistics • Law – Government regulatory authorities can require compliance with environmental standards – Governments and customers demand “environmentally conscious” products & services – This causes firms to implement reverse logistics processes

134 ... Reverse Logistics The success of reverse logistics depends upon the efficiency of following factors • Product Location • Product Collection System • Recycling / Disposal Centers • Documentation System

135 ... Reverse Logistics

Product Location • For product recall it is necessary to identify the product location in the physical distribution system of the firm • For this purpose firms implement tracking & tracing capabilities • It is difficult to track & trace products in case of consumer goods but easier in case of industrial goods

Product Collection System • After the product location is identified, product collection is to be done through company's field force or 3PL • 3PL's

themselves realize 12-15% profits on the business of reverse logistics 136 ...

Reverse Logistics Recycling / Disposal Centers • This may be company's plant, warehouse or any other location • Called back products must be inspected before recycling or disposal etc Documentation System • Proper documents should be maintained at each level, this would help in tracing the product location 137 Logistics for Business Excellence 138 ... Logistics for Business Excellence In every organization, no matter how big or small, there is material movement from supplier to the manufacturer and then to customers • Logistics is an information based process of managing this movement of material • Involves 3 distinct components - Inbound Logistics - Operations Logistics - Outbound Logistics 139 ... Logistics for Business Excellence • These operations involve several activities such as purchasing, inward transport, receiving, warehousing, order picking, materials handling, outward transport, information flow etc • The integration of these operations and activities will make the business run as a chain rather than isolated process elements • For business excellence, proper integration between the logistics components • The efficiency & effectiveness of the business as a whole depends on how individual activities get coordinated and work as a system 140 ... Logistics for Business Excellence Integrated logistics requires a close coordination between inventory flow & information flow • For a manufacturer inventory flow - Starts when raw material is shipped from supplier to its manufacturing center - Ends with delivery of finished product to customer • For a retailer inventory flow - Starts after the material is dispatched from the manufacturer or wholesaler - Ends with delivery of product to customer 141 ... Logistics for Business Excellence • The volume &

type of logistic activity varies with the width of the supply chain, product category & volume of business • Whatever the type of business & quantum of logistic activity, in the business process, there is continuous value addition at every stage • Logistics supports the value creation process and hence it requires continuous management attention • For focused attention, logistics activities can be broadly divided into three areas of operations, logistics needs of each area are quite different 142 ... Logistics for Business Excellence The three broad areas requiring management focus are – Procurement – Processing / Operations / Manufacturing – Distribution 143 ... Logistics for Business Excellence Procurement • AKA buying or purchasing activity • Comes under purview of inbound logistics • Material movement from supplier to buyer • Involves materials such as components, parts & consumables required for manufacturing • Concerned with availability of materials before start of manufacturing activity • Logistics activities herein include transportation & storage • To save on carrying costs, smaller lot sizes are planned • However, with increased cost of transportation, freight charges may go up, thereby offsetting any savings on carrying costs 144 .. Logistics for Business Excellence Distribution • Comes under purview of outbound logistics • Concerned with availability of materials at the place & time where they are required by customers • Vital for organization so as to enable it to encash on sales opportunity • Material maybe required at different places in the distribution channels • Requirement of each channel may vary in terms of quantity, product variety, time of delivery, frequency of delivery, transportation etc • Outbound logistics ensures movement of

material as per the requirements at the right place, at the right time at minimum cost 145 ... Logistics for Business Excellence

Processing • AKA operations or manufacturing • Comes under purview of operations logistics • Concerned with movement of in-process or work-in-progress inventory • Concerned with availability of materials at the place & time where they are required for manufacturing • Takes care of movement of material as per requirements of internal customer • Degree of uncertainty is usually low because manufacturing operations are under the control of the organization 146 ... Logistics for Business Excellence • The prime goal of integrated logistics is to coordinate logistics activities in the three key operation areas of procurement, processing and distribution • This is achieved by coordinating inventory movement across the supply chain • This results in system effectiveness and efficiency, thus providing a competitive edge and business excellence • In today's globalized world, organizations supply products beyond their national boundaries wherever there is a market opportunity 147 ... Logistics for Business Excellence In this scenario, businesses across the world strive to be competitive • Business organizations are struggling not only for growth but also survival • This has resulted in focus shifting to integrating the operation areas of procurement, processing and distribution to not just deliver value to the customer but also gain competitive advantage • Logistics plays a key role in the value delivery process 148 Importance of Logistics • The importance of logistics systems lies in the fact that it leads to ultimate fulfillment of the sales contract • The buyer is not interested in the promises of the seller that he can supply goods at competitive prices but that he actually does so on a timely basis •

Delivery according to the contract is essential to fulfilling the commercial and legal requirements • Better and/or timely delivery helps in getting repeat orders through creation of goodwill for the supplier 149 ... Importance of Logistics Effective logistics system contributes immensely to – Creation of time and place utilities in the products which helps in maximizing the value satisfaction to consumers • The achievements of the business and marketing objectives of a firm • By ensuring quick deliveries in minimum time and cost, it relieves the customers of holding excess inventories thus bringing down the cost of carrying inventory, material handling, transportation and other related activities of distribution • Thus an efficient system of physical distribution / logistics has a great potential for improving customer service and reducing costs 150 ... Importance of Logistics • Logistics has gained importance due to the following trends – Globalization – Rise in transportation cost – Increasing production efficiencies – Fundamental change in inventory philosophy– Technology developments – Increased use of computers & technology – Increased public concern of products – Growth of several new, large retail chains or mass merchandise with large demands & very sophisticated logistics services, bypass traditional channel & distribution – Economic de-regulation 151 ... Importance of Logistics As a result of these developments, people at all levels of the organization think and act in terms of integrated logistics • Efficient logistics systems throughout the world economy are a basis for trade and a high standard of living for all of us • Furthermore Logistics has gained importance in international marketing for the following reasons – Technological advancement in the fields of information processing & communication –

Technological development in transportation & material handling - Companies are centralizing production facilities to gain economies of scale - Most MNC organizations are restructuring their production facilities on a global basis 152 ... Importance of Logistics With the advancement of new technologies, managers can now update sales and inventory planning faster and more frequently, and factories can respond with more flexibility to volatile market conditions - Product life cycles are contracting - Companies that have gone all out to slash costs by turning to large scale batch production regularly find themselves saddled with obsolete stocks and are unable to keep pace with competitors' new-product introductions - Product lines are proliferating - More and more product line variety is needed to satisfy the growing range of customer tastes and requirements, and stock levels in both field and factory inevitably rise 153 ... Importance of Logistics Since today it is not uncommon to see companies develop a product in one country, manufacture it in another, and sell it to a third country, the complexities associated with global trade must be accounted for in designing and managing supply chain - The balance of power in distribution chain is shifting from the manufacturer to the trader • The above factors highlight the importance of Logistics 154 Logistics Future • Assignment 155

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