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Logistics Planning & Analysis
Chapter 2
Logistics Network
Objectives

• Understand what logistics network is.
• Examine the factors involved in designing a logistics network.
• Examine the factors in determining the location of facilities.
• Understand the factors in determining the optimal number of DCs.
Introduction

- Logistics network is concerned with the determination of the location and number of warehouses and production plants, location and number of customer demand points to warehouses.
- A logistics network design initiative typically covers three elements - the inbound and internal supply chain, outbound logistics, and reverse logistics.
Logistics Network

- A logistics network is a system which is made up of a set of facilities linked by transportation services.
- Facilities are sites where materials are processed, e.g. manufactured, stored, sorted, sold or consumed.
- These include manufacturing and assembly centres, warehouses, distribution centres, trans-shipment points, transportation terminals, retail outlets and others.
- It seeks to minimize logistics cost while offering the right level of flexibility to meet service level requirements.
Designing Logistics Network

• 2 major steps:
  ▪ Key Issues
    o Strategic
    o Cost
    o Location
  ▪ Information Requirements
Designing Logistics Network

Figure 2-1: Logistics Network
Distribution Costs

- Collection and storage of raw materials.
- Collection and storage of components from subcontractors.
- Finished goods storage at the factory.
- Dispatch center costs at the factory.
- Transport to the DC.
- DC handling and inventory costs.
- Inter-DC transfer costs.
- DC dispatch costs (often part of sales cost).
Distribution Costs

- DC to customer transport costs (often part of sales cost).
- Administration and documentation costs at each of the above cost centers.
Total Distribution Costs

- Total distribution costs are the aggregate of the following costs:
  - In-plant movement and storage.
  - Plant-to-DC transport.
  - DC operating costs.
  - DC inventory costs.
  - DC-to customer costs.
Location

- In particular, location decisions are often made when new products or services are launched, or outdated products are withdrawn from the market.
- The selection of the site of the facility will be the final stage of a sequence of decisions which begins with the selection of an appropriate region, then involves the selection of an appropriate area in that region, etc.
Location

• Steps in choosing the exact location of facility:
  ▪ Region
  ▪ Area
  ▪ Community
  ▪ Site
Location Decisions May Be Strategic or Tactical

- Locations of facilities are places where there are:
  - Demand for goods.
  - Potential pool of employees.
  - Infrastructure such as transport network eg roads, trains and ports.
  - Utilities eg water, electricity.
  - Accessibility to resources eg raw materials.
Location decisions May Affect Demand

Opening a new RDC may lead to the acquisition of customers who previously could not be served at a satisfactory level of service because they lived too far away.

Figure 2-2: Multi-DC Network
Number of DCs

Figure 2-3: Optimal Number of DCs
Conclusion

- Logistics network which is a system which interconnects all the facilities via transportation.
- The network is also linked by the physical movement of inventory and information flow.