



## The Role of Distribution in the Supply Chain

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- ◆ **Distribution**: the steps taken to move and store a product from the supplier stage to the customer stage in a supply chain
- ◆ Distribution directly affects cost and the customer experience and therefore drives profitability
- ◆ Choice of distribution network can achieve supply chain objectives from low cost to high responsiveness
- ◆ Examples: Wal-Mart, Dell, Proctor & Gamble, Grainger

## Factors Influencing Distribution Network Design

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- ◆ Distribution network performance evaluated along two dimensions at the highest level:
  - Customer needs that are met
  - Cost of meeting customer needs
- ◆ Distribution network design options must therefore be compared according to their impact on customer service and the cost to provide this level of service

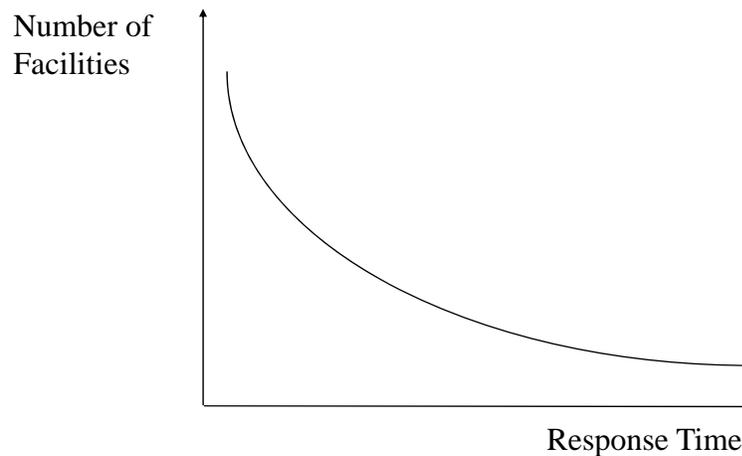
## Factors Influencing Distribution Network Design

- ◆ Elements of customer service influenced by network structure:
  - Response time
  - Product variety
  - Product availability
  - Customer experience
  - Order visibility
  - Returnability
- ◆ Supply chain costs affected by network structure:
  - Inventories
  - Transportation
  - Facilities and handling
  - Information

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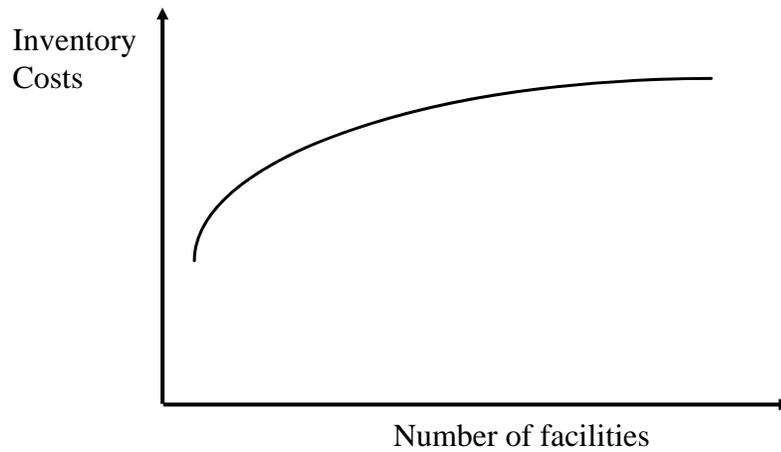
## Service and Number of Facilities (Fig. 4.1)



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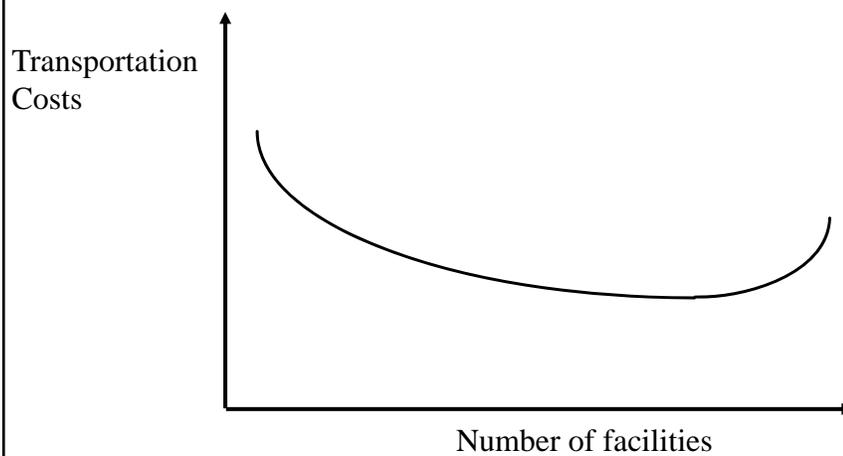
## Inventory Costs and Number of Facilities (Fig. 4.2)



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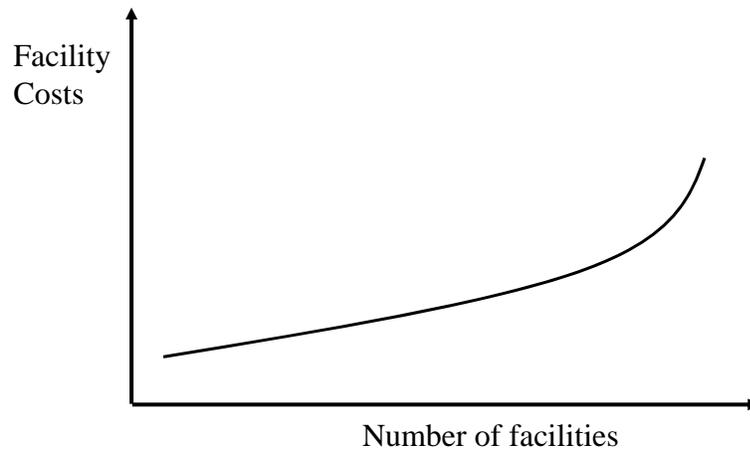
## Transportation Costs and Number of Facilities (Fig. 4.3)



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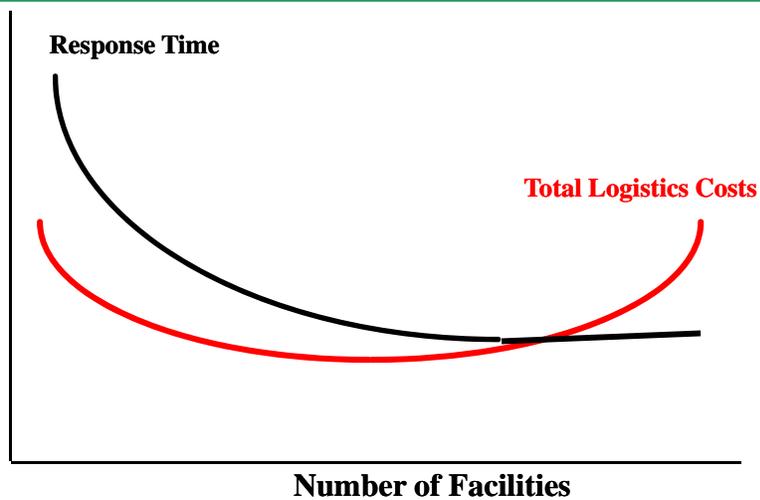
## Facility Costs and Number of Facilities (Fig. 4.4)



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## Variation in Logistics Costs and Response Time with Number of Facilities (Fig. 4.5)



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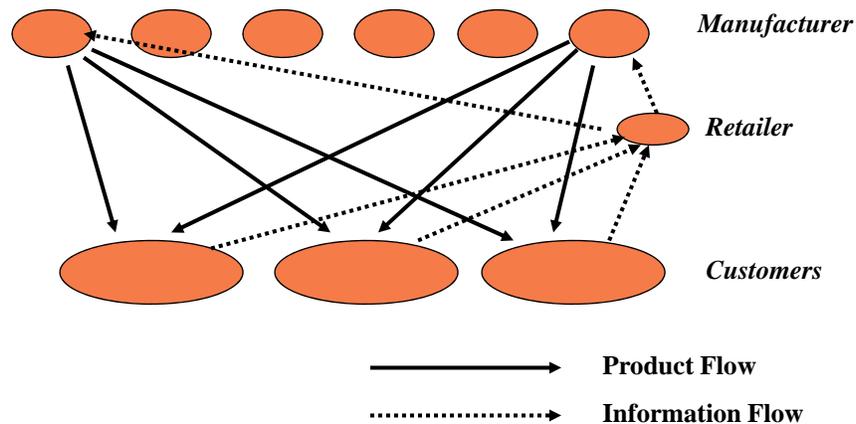
## Design Options for a Distribution Network

- ◆ Manufacturer Storage with Direct Shipping
- ◆ Manufacturer Storage with Direct Shipping and In-Transit Merge
- ◆ Distributor Storage with Carrier Delivery
- ◆ Distributor Storage with Last Mile Delivery
- ◆ Manufacturer or Distributor Storage with Customer Pickup
- ◆ Retail Storage with Customer Pickup
- ◆ Selecting a Distribution Network Design

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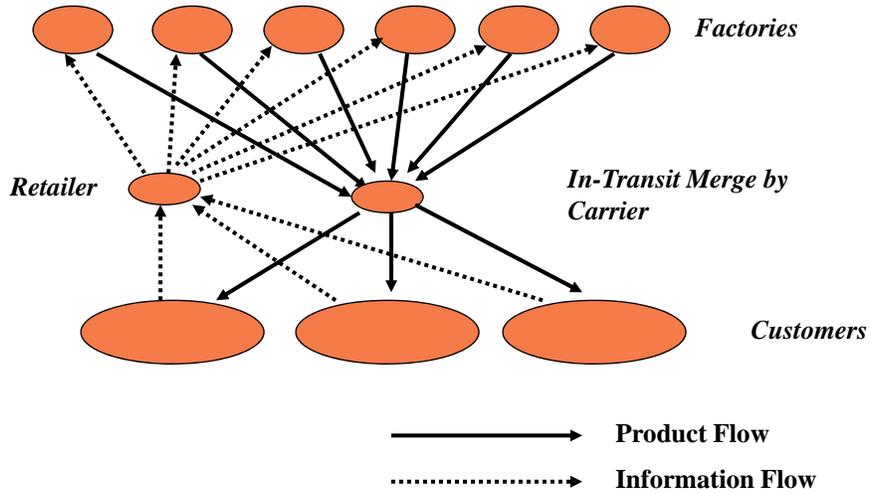
## Manufacturer Storage with Direct Shipping (Fig. 4.6)



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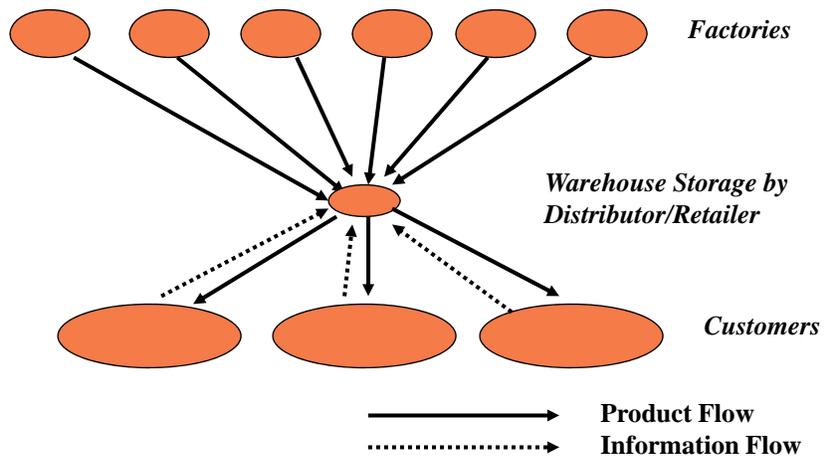
## In-Transit Merge Network (Fig. 4.7)



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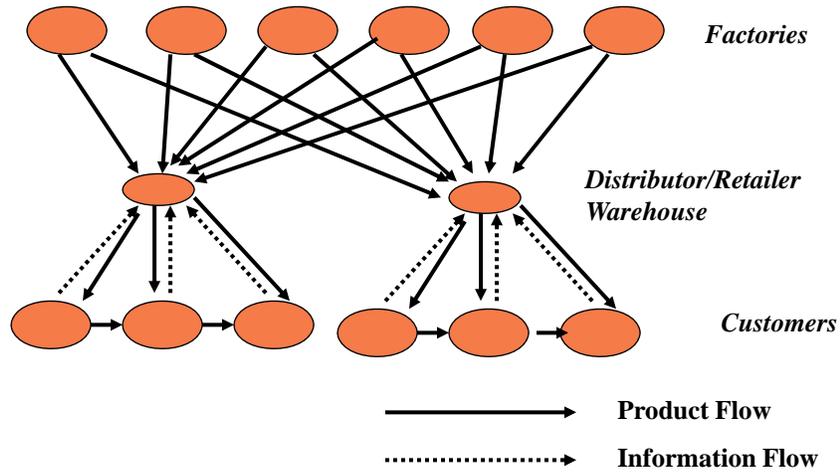
## Distributor Storage with Carrier Delivery (Fig. 4.8)



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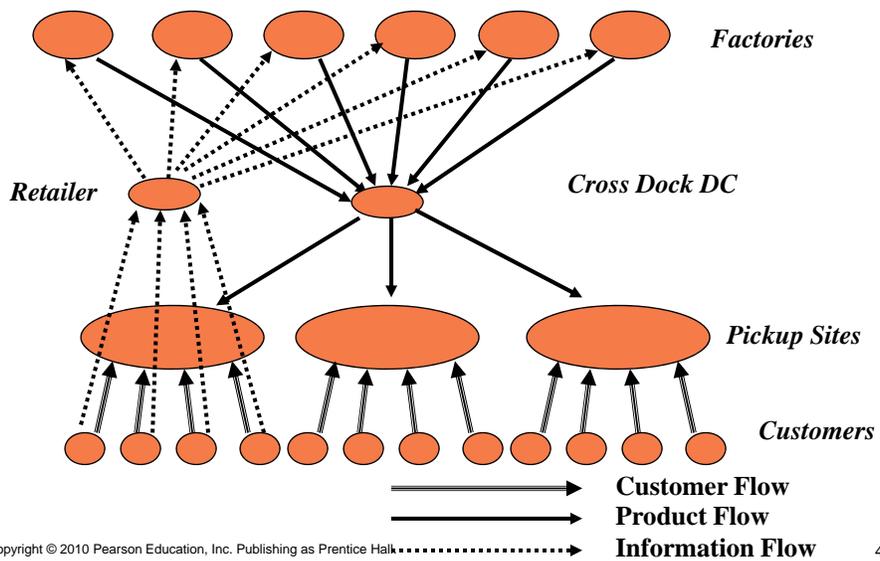
## Distributor Storage with Last Mile Delivery (Fig. 4.9)



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## Manufacturer or Distributor Storage with Customer Pickup (Fig. 4.10)



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## Comparative Performance of Delivery Network Designs (Table 4.7)

	Retail Storage with Customer Pickup	Manufacturer Storage with Direct Shipping	Manufacturer Storage with In-Transit Merge	Distributor Storage with Package Carrier Delivery	Distributor storage with last mile delivery	Manufacturer storage with pickup
Response Time	1	4	4	3	2	4
Product Variety	4	1	1	2	3	1
Product Availability	4	1	1	2	3	1
Customer Experience	5	4	3	2	1	5
Order Visibility	1	5	4	3	2	6
Returnability	1	5	5	4	3	2
Inventory	4	1	1	2	3	1
Transportation	1	4	3	2	5	1
Facility & Handling	6	1	2	3	4	5
Information	1	4	4	3	2	5

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## Performance of Delivery Networks for Different Product/Customer Characteristics (Table 4-8)

	Retail Storage with Customer Pickup	Manufacturer Storage with Direct Shipping	Manufacturer Storage with In-Transit Merge	Distributor Storage with Package Carrier Delivery	Distributor storage with last mile delivery	Manufacturer storage with pickup
High demand product	+2	-2	-1	0	+1	-1
Medium demand product	+1	-1	0	+1	0	0
Low demand product	-1	+1	0	+1	-1	+1
Very low demand product	-2	+2	+1	0	-2	+1
Many product sources	+1	-1	-1	+2	+1	0
High product value	-1	+2	+1	+1	0	-2
Quick desired response	+2	-2	-2	-1	+1	-2
High product variety	-1	+2	0	+1	0	+2
Low customer effort	-2	+1	+2	+2	+2	-1

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## E-Business and the Distribution Network

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- ◆ Impact of E-Business on Customer Service
- ◆ Impact of E-Business on Cost
- ◆ Using E-Business: Dell, Amazon, Peapod, Grainger

## Impact of E-Business on Customer Service

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- ◆ Response time
- ◆ Product variety
- ◆ Product Availability
- ◆ Customer experience
- ◆ Time to market
- ◆ Order Visibility
- ◆ Returnability
- ◆ Direct Sales to Customers
- ◆ Flexible Pricing, Product Portfolio, and Promotions
- ◆ Efficient Funds Transfer

## Impact of E-Business on Cost

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- ◆ Inventory
- ◆ Facilities
- ◆ Transportation
- ◆ Information

## Distribution Networks in Practice

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- ◆ The ownership structure of the distribution network can have as big an impact as the type of distribution network
- ◆ The choice of a distribution network has very long-term consequences
- ◆ Consider whether an exclusive distribution strategy is advantageous
- ◆ Product, price, commoditization, and criticality have an impact on the type of distribution system preferred by customers

## Summary of Learning Objectives

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- ◆ What are the key factors to be considered when designing the distribution network?
- ◆ What are the strengths and weaknesses of various distribution options?
- ◆ How has E-Business affected the design of distribution networks in different industries?
- ◆ What roles do distributors play in the supply chain?