Supply Chain Management Strategy

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Designing & Managing the Supply Chain

Concepts, Strategies & Case Studies

Global Sourcing
Daitto
Reducing Cost Creating Values
Driving Performances

What Is a Supply Chain?

Flow of products and services from:

- Raw materials manufacturers
- Intermediate products manufacturers
- End product manufacturers
- Wholesalers and distributors and
- Retailers

- Connected by transportation and storage activities
- Integrated through information, planning, and integration activities
- Cost and service levels

1.1 What Is Supply Chain Management?

- Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements.

Two Other Formal Definitions

The design and management of seamless, value-added process across organizational boundaries to meet the real needs of the end customer

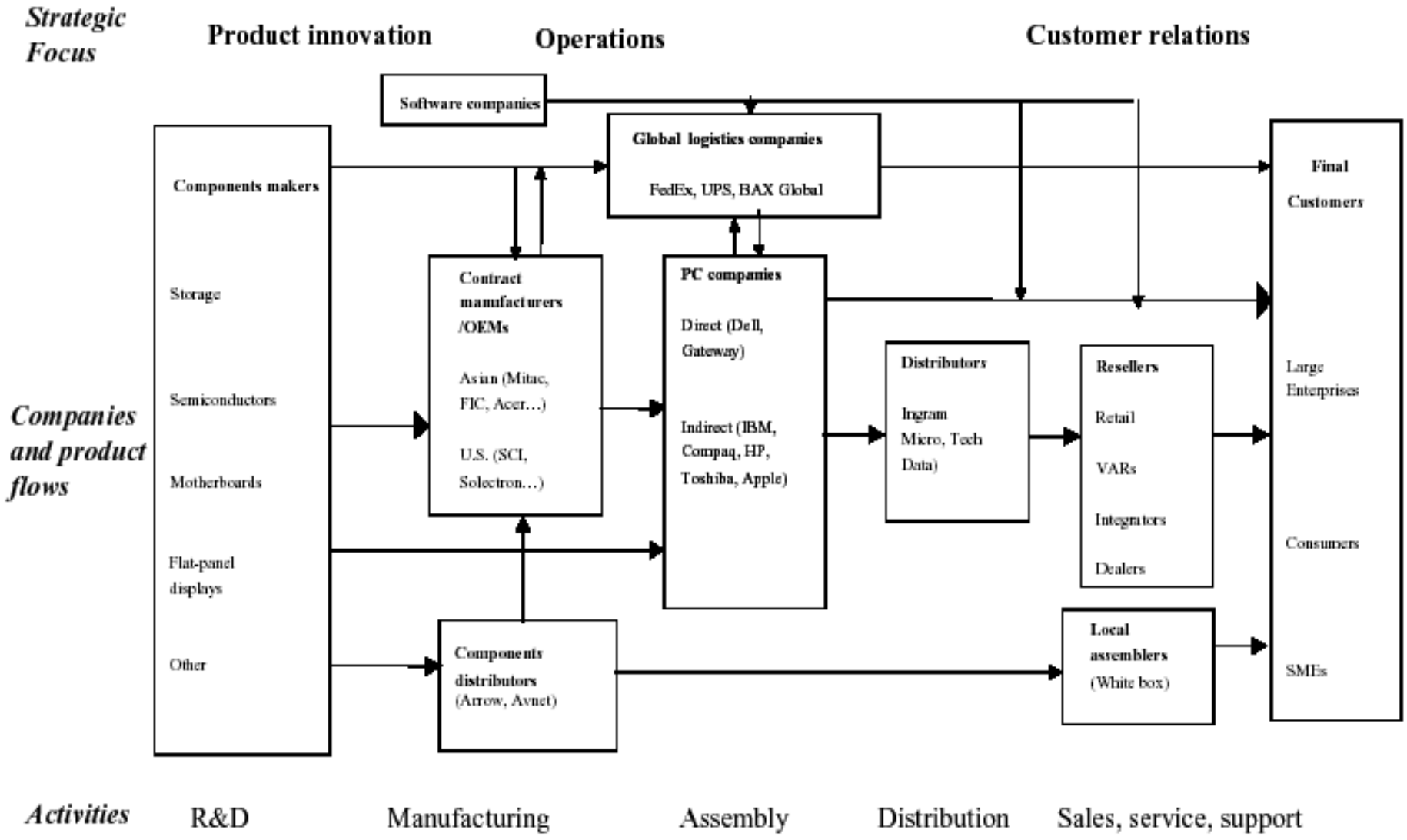
Institute for Supply Management

Managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer

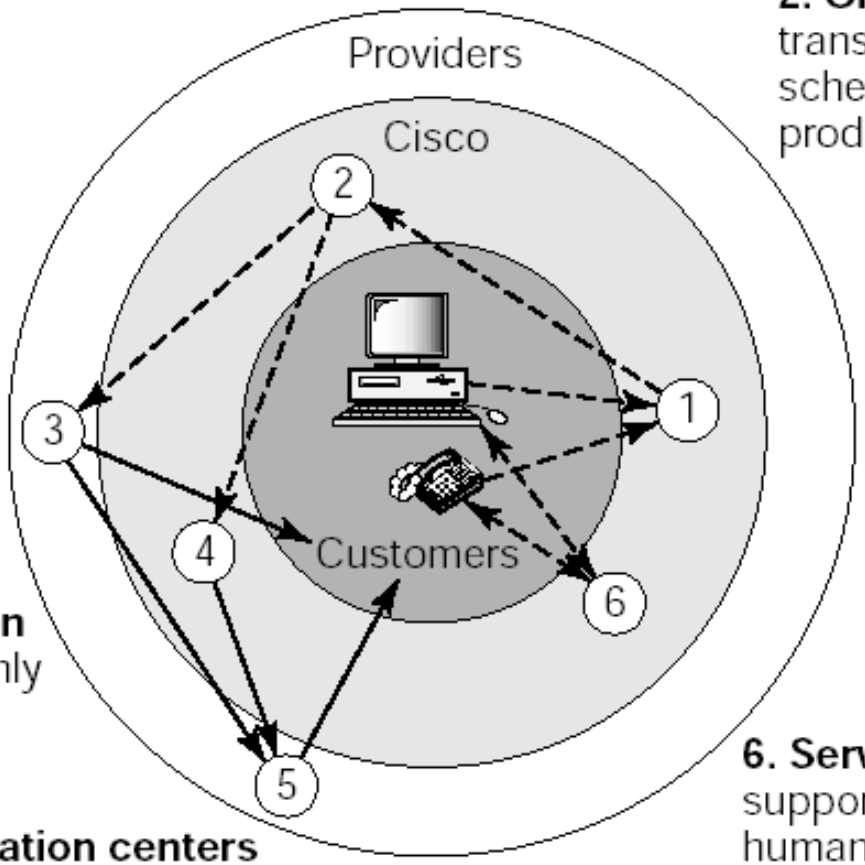
The Supply Chain Council

PC Industry Supply Chain

Tracing back the screen you stare at for the bulk of your time.



Cisco's Value Network



2. Orders are automatically transmitted to suppliers or scheduled in the Cisco production system

3. Contract manufacturers build and ship 60% of units direct to customers

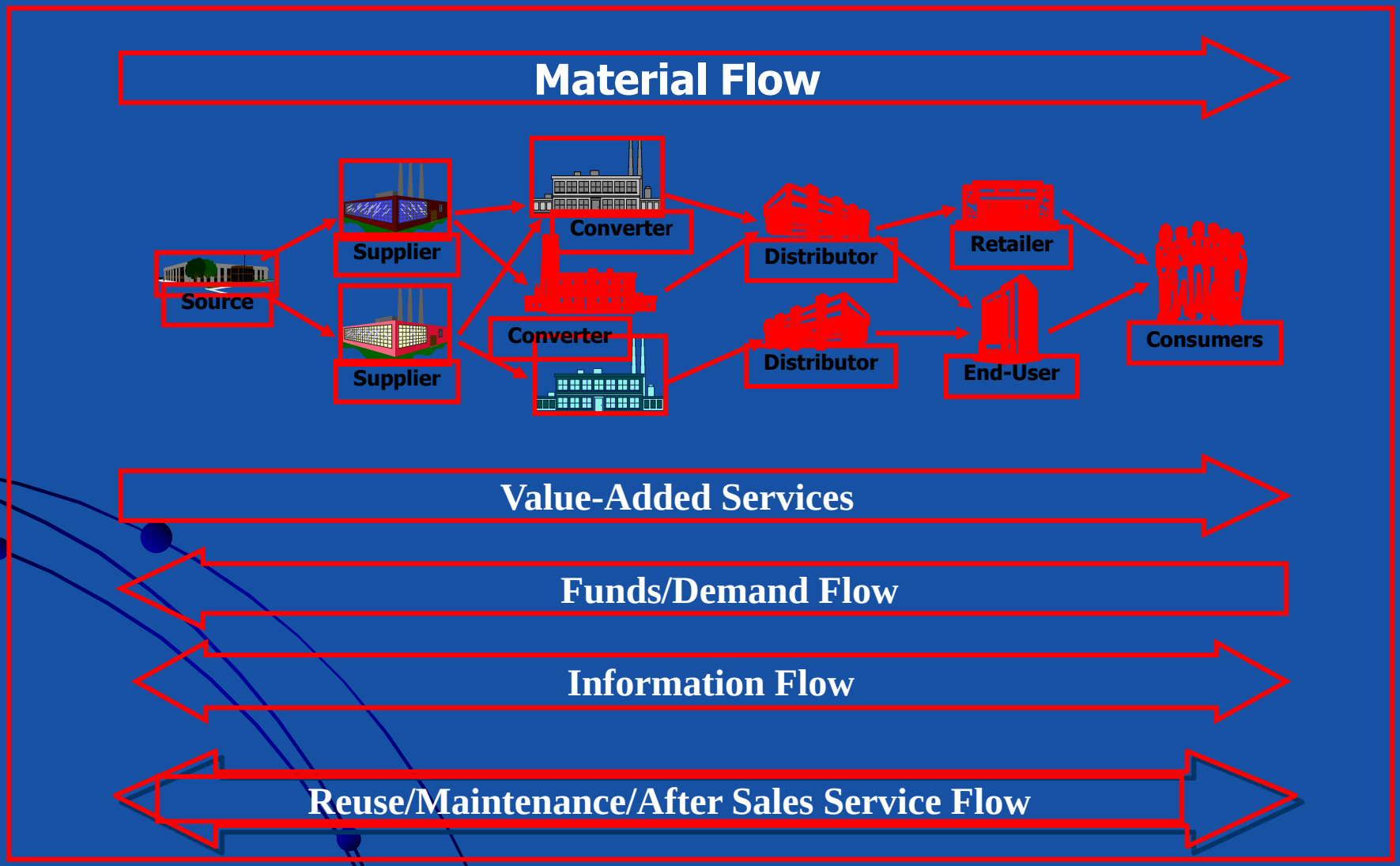
1. Customers 80% of orders are configured and submitted via Cisco's Web site

4. Cisco production configures only highly complex orders

6. Service 70% of technical support calls do not require human intervention

5. Consolidation centers Cisco operates just three centers worldwide

SCM Definition



The SCM Network

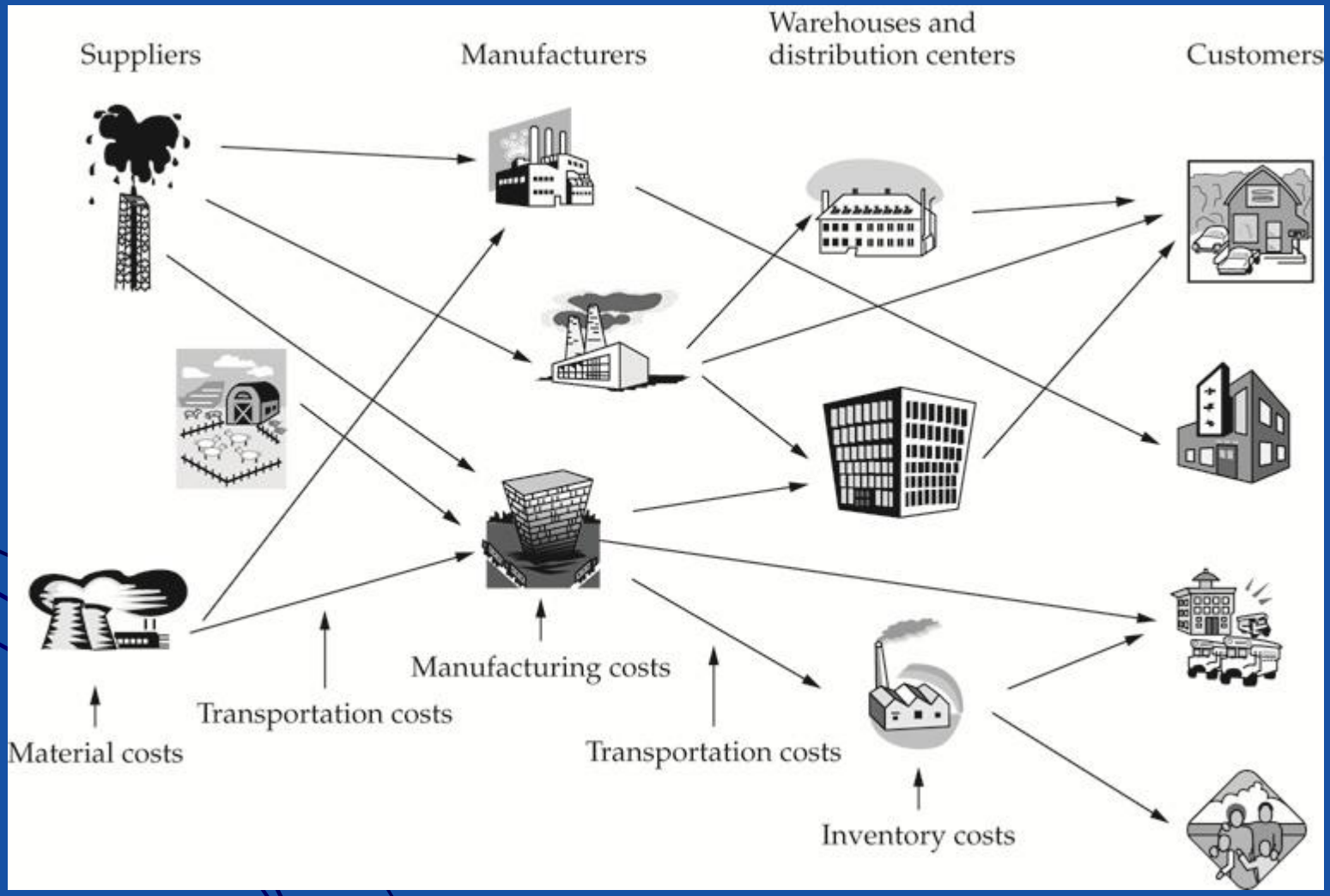


FIGURE 1.1: **The logistics network**

Key Observations

- Every facility that impacts costs need to be considered
  - Suppliers' suppliers
  - Customers' customers
- Efficiency and cost-effectiveness throughout the system is required
  - System level approach
- Multiple levels of activities
  - Strategic – Tactical – Operational

Other Related Observations

- Supply chain strategy linked to the Development Chain
- Challenging to minimize system costs and maximize system service levels
- Inherent presence of uncertainty and risk

1.2 The Development Chain

- Set of activities and processes associated with new product introduction. Includes:
  - product design phase
  - associated capabilities and knowledge
  - sourcing decisions
  - production plans

1.2 The Development Chain

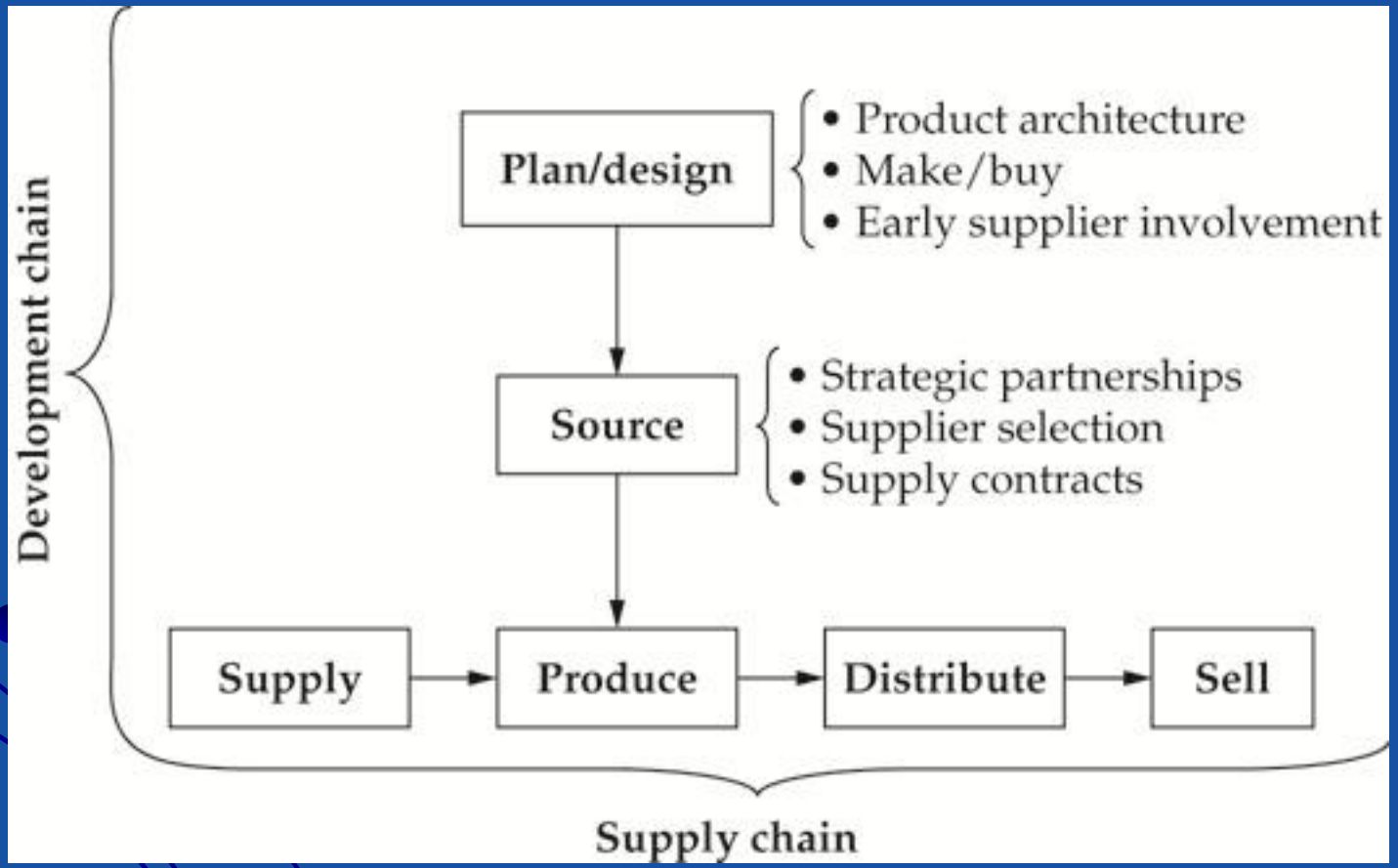


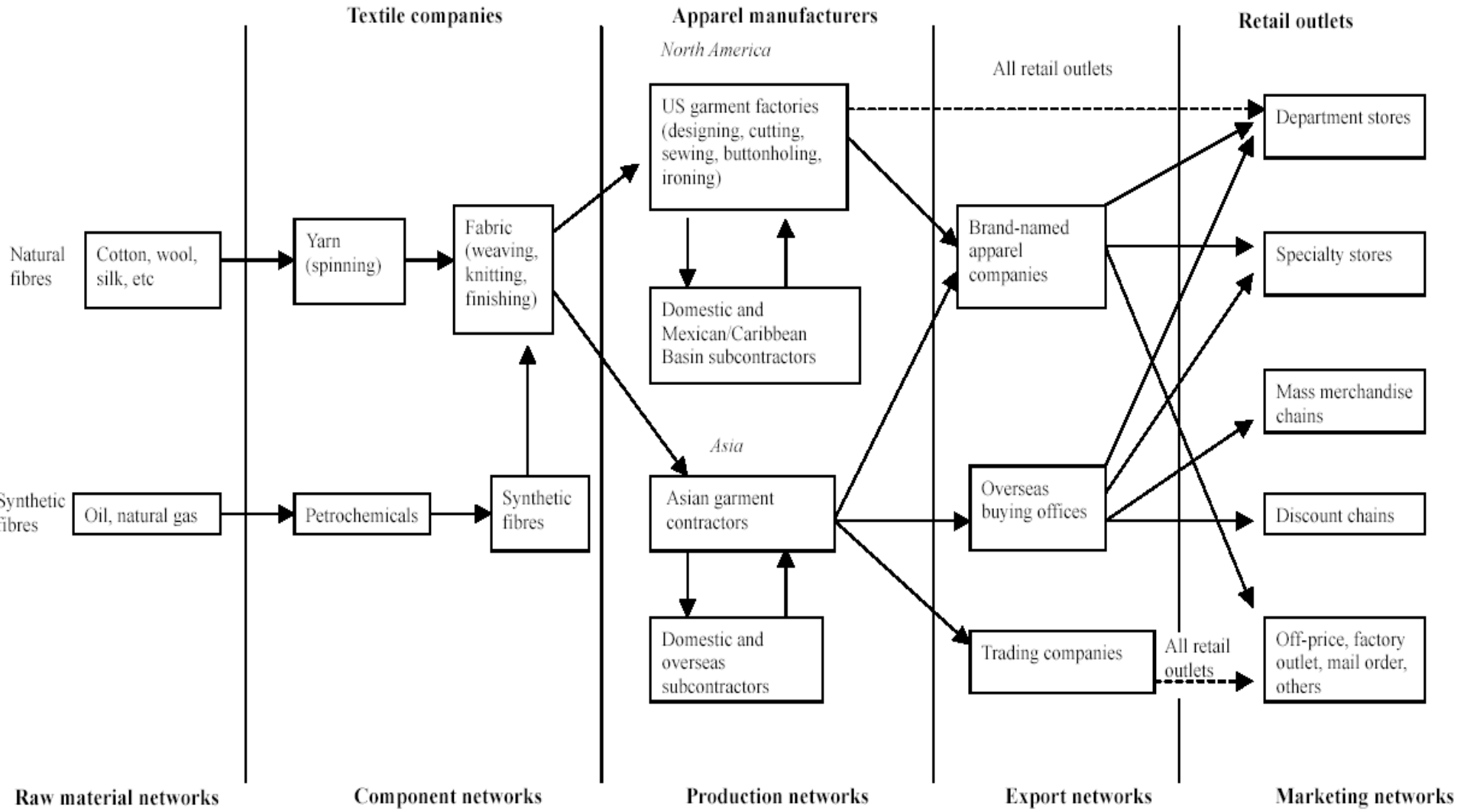
FIGURE 1-2: **The enterprise development and supply chain**

1.3 Global Optimization

- Geographically dispersed complex network
- Conflicting objectives of different facilities
- Dynamic system
  - Variations over time
  - Matching demand-supply difficult
  - Different levels of inventory and backorders
- Recent developments have increased risks
  - Lean production/Off-shoring/Outsourcing

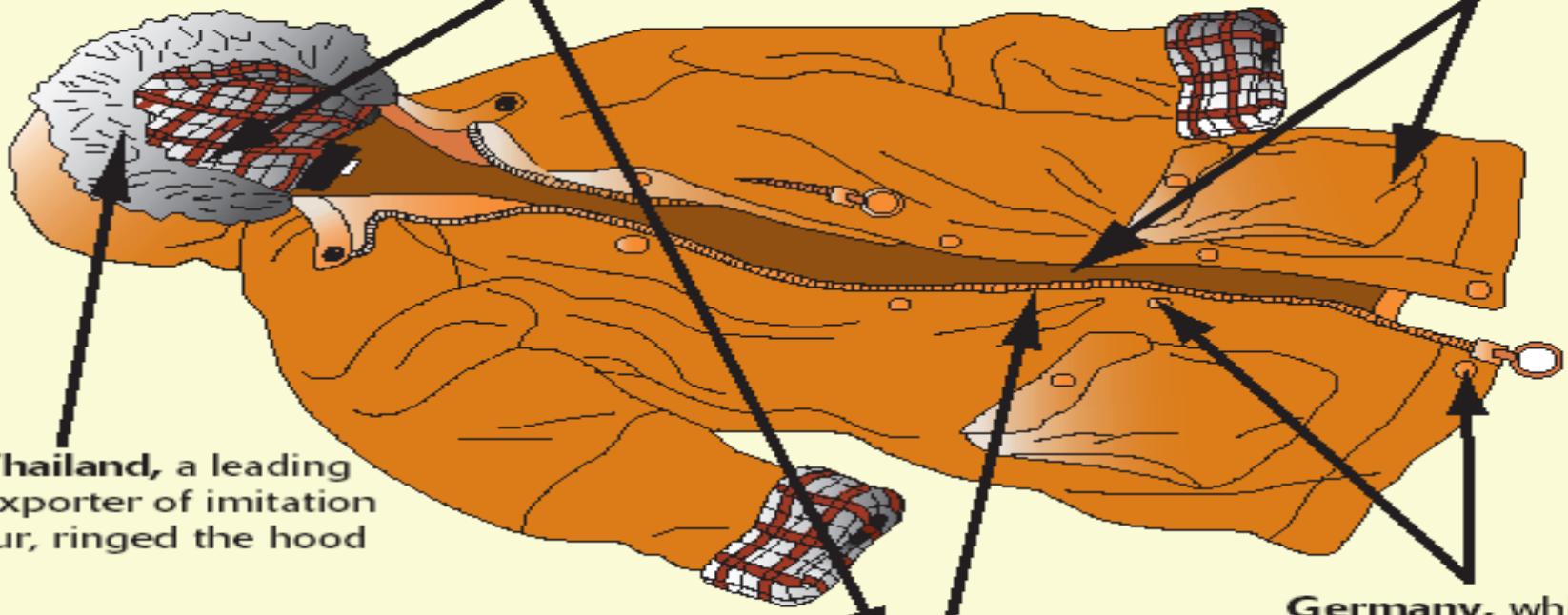
Global Apparel Value Chain

Tracing back the dress you are wearing



How Many Countries Does It Take to Make a Coat?

To make this jacket for the U.S. market, Hong Kong garment producer Li & Fung ordered materials from factories in five countries and had them delivered to Thailand, where the jacket was stitched together. Using a network of Web sites, Li & Fung stays in touch with its worldwide suppliers and can compress the time it takes to get items into stores.



China, the world's largest producer of cotton, made the liner

Taiwan, which specializes in making material for outdoor clothing, produced the shell and fleece.

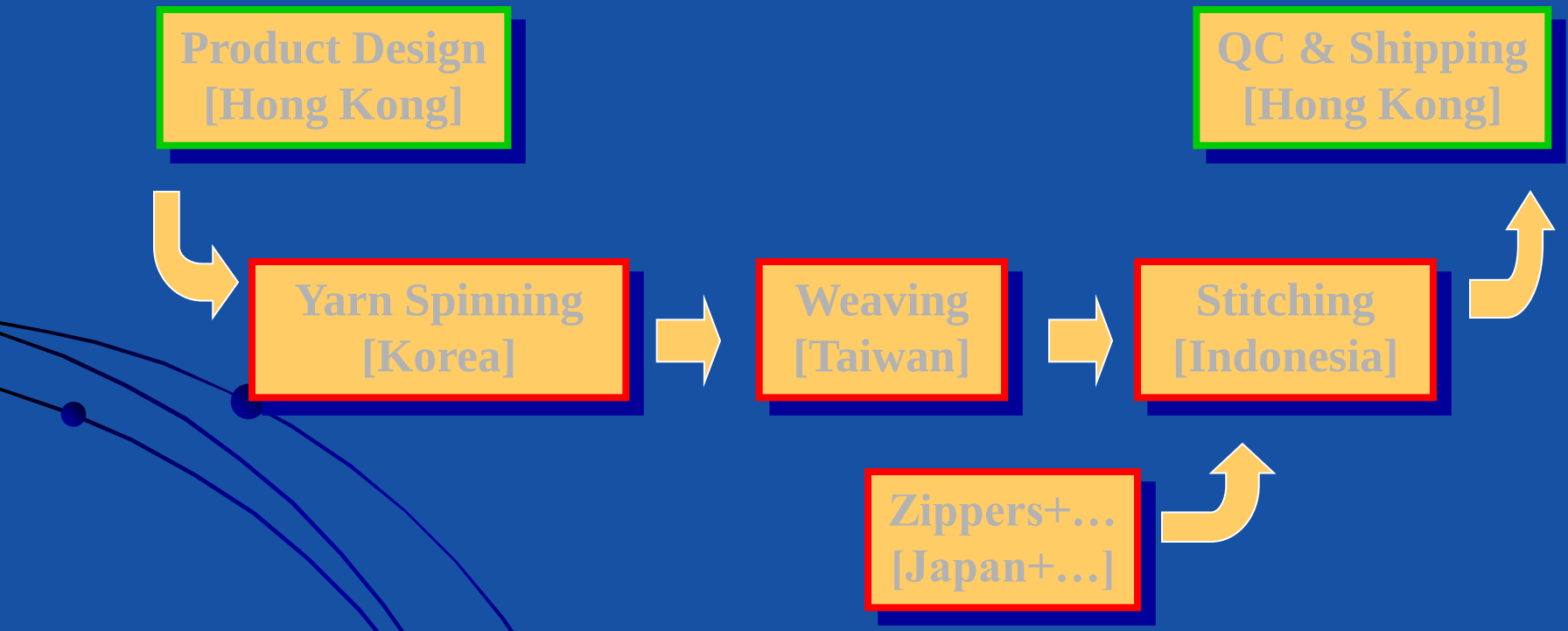
Thailand, a leading exporter of imitation fur, ringed the hood

Japan, the globe's biggest producer of stainless steel for zippers, put its teeth in this zipper

Germany, which gave the world the snap fastener in the 1880s, sent the snaps

Globally Dispersed Manufacturing

An Illustration: How Li & Fung Limited Might Make a Dress



1.4 Uncertainty and Risk Factors

Matching Supply and Demand a Major Challenge

REASONS	EXAMPLES
Raw material shortages Internal and supplier parts shortages Productivity inefficiencies	Boeing Aircraft's inventory write-down of $2.6 billion
Sales and earnings shortfall Larger than anticipated inventories	Sales at U.S. Surgical Corporation declined 25 percent, resulting in a loss of $22 million
Stiff competition General slowdown in the PC market	Intel reported a 38 percent decline in quarterly profit
Higher than expected orders for new products over existing products	EMC Corp. missed its revenue guidance of $2.66 billion for the second quarter of 2006 by around $100 million

1.4 Uncertainty and Risk Factors

Fluctuations of Inventory and Backorders throughout the Supply Chain

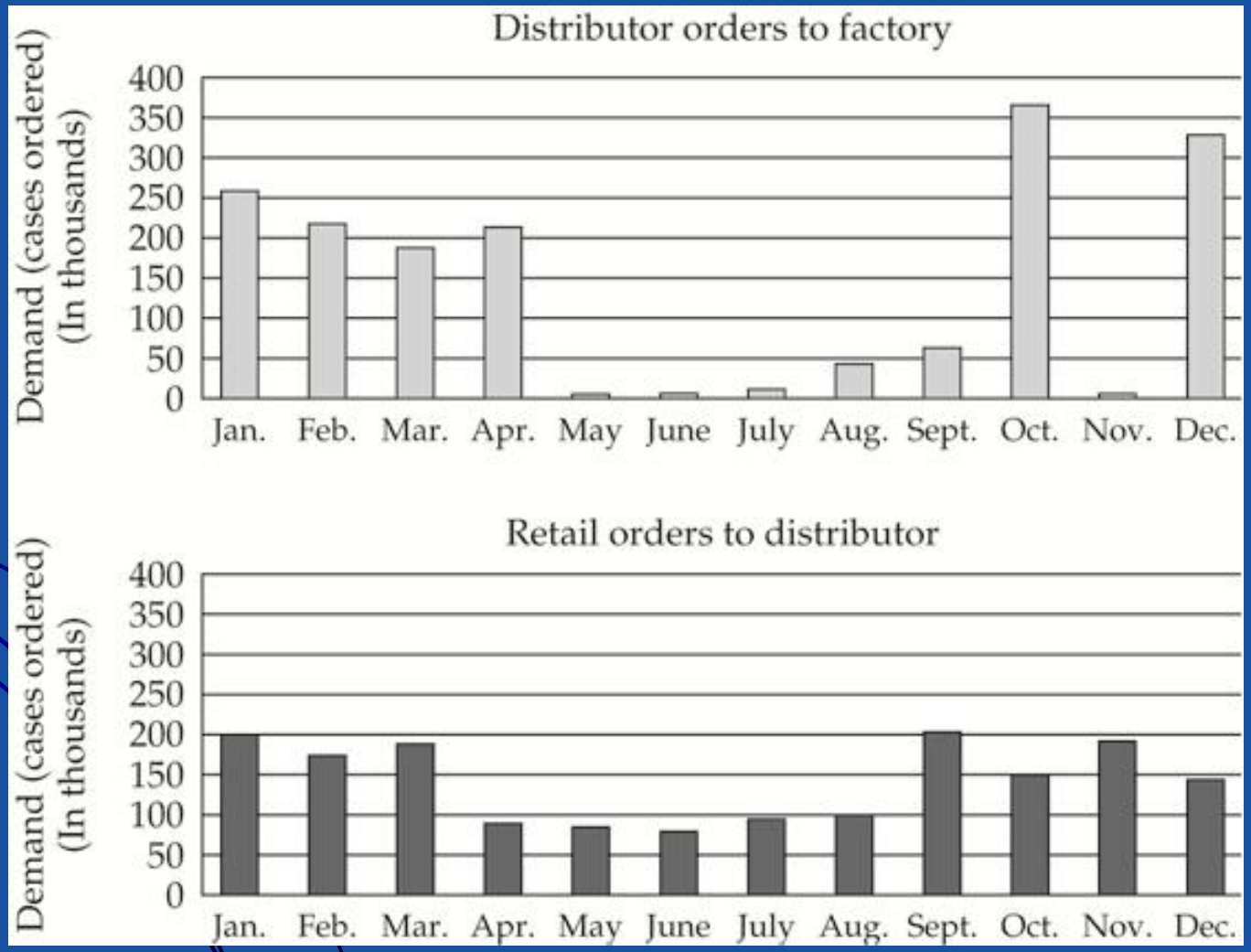


FIGURE 1-3: **Order variations in the supply chain**

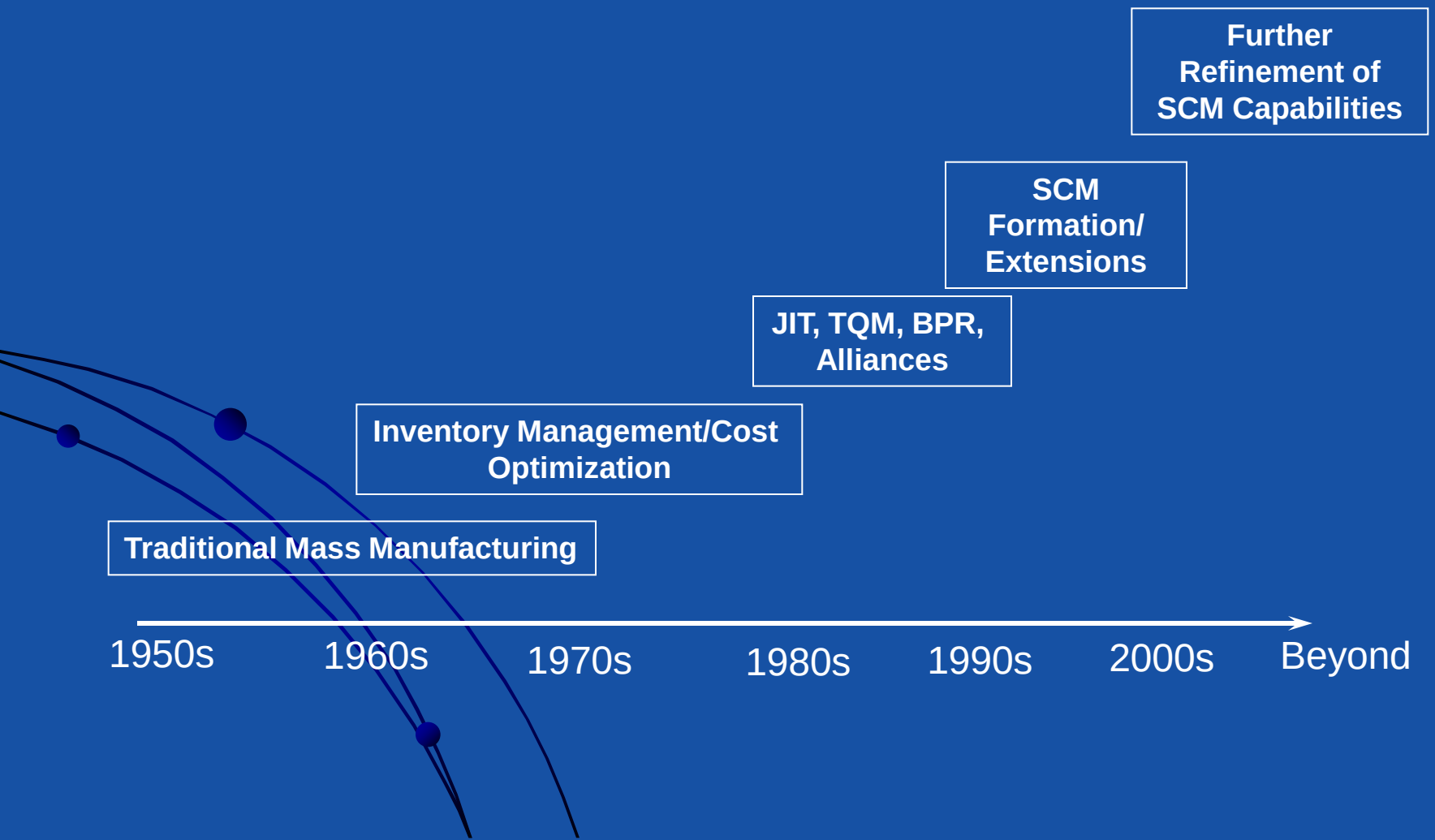
1.4 Uncertainty and Risk Factors

- Forecasting is not a solution
- Demand is not the only source of uncertainty
- Recent trends make things more uncertain
  - Lean manufacturing
  - Outsourcing
  - Off-shoring

1.4 Uncertainty and Risk Factors

- August 2005 – Hurricane Katrina
  - P&G coffee supplies from sites around New Orleans
  - Six month impact
- 2002 West Coast port strike
  - Losses of $1B/day
  - Store stock-outs, factory shutdowns
- 1999 Taiwan earthquake
  - Supply interruptions of HP, Dell
- 2001 India (Gujarat state) earthquake
  - Supply interruptions for apparel manufacturers

1.5 Evolution of Supply Chain Management



Progression of Logistics Costs

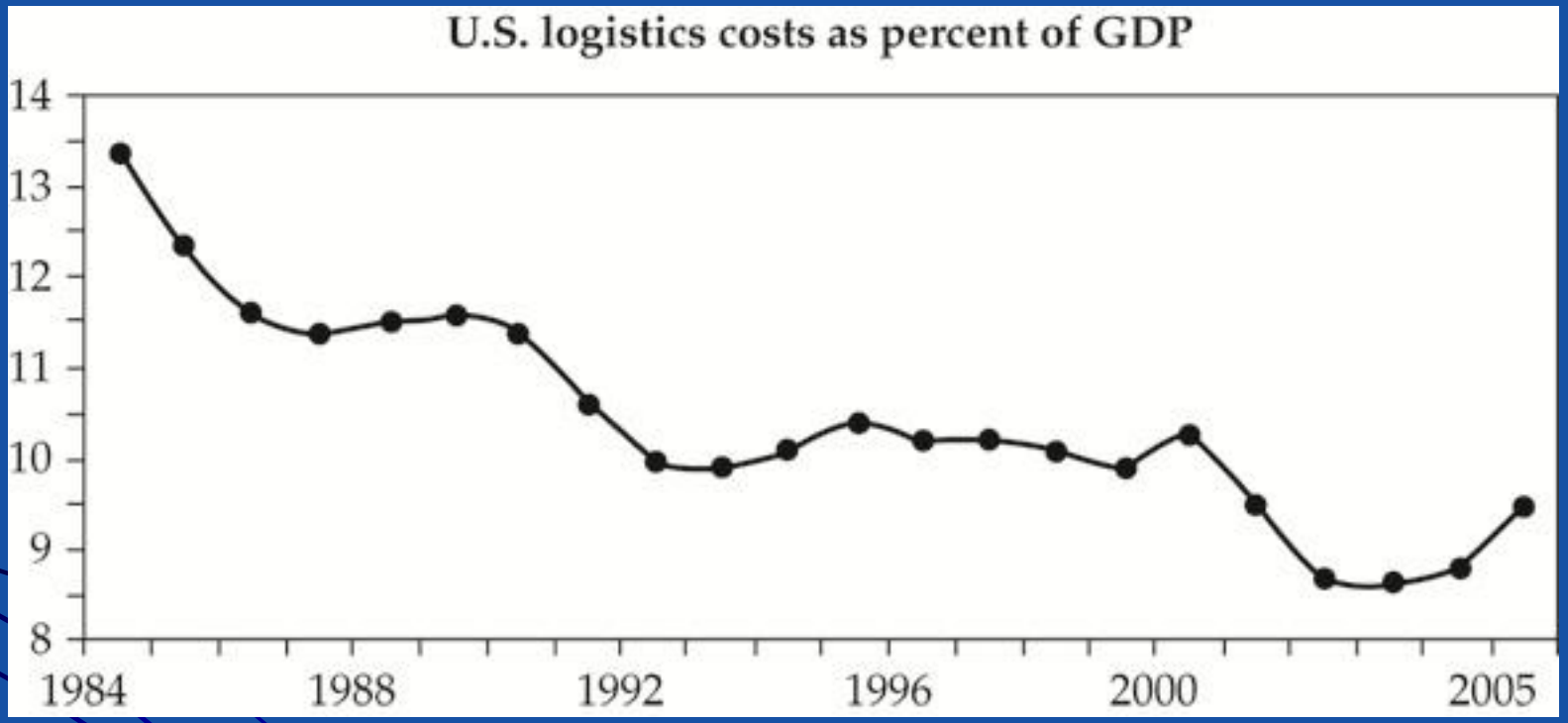


FIGURE 1-4: **Logistics costs' share of the U.S. economy**

Composition of Logistics Costs

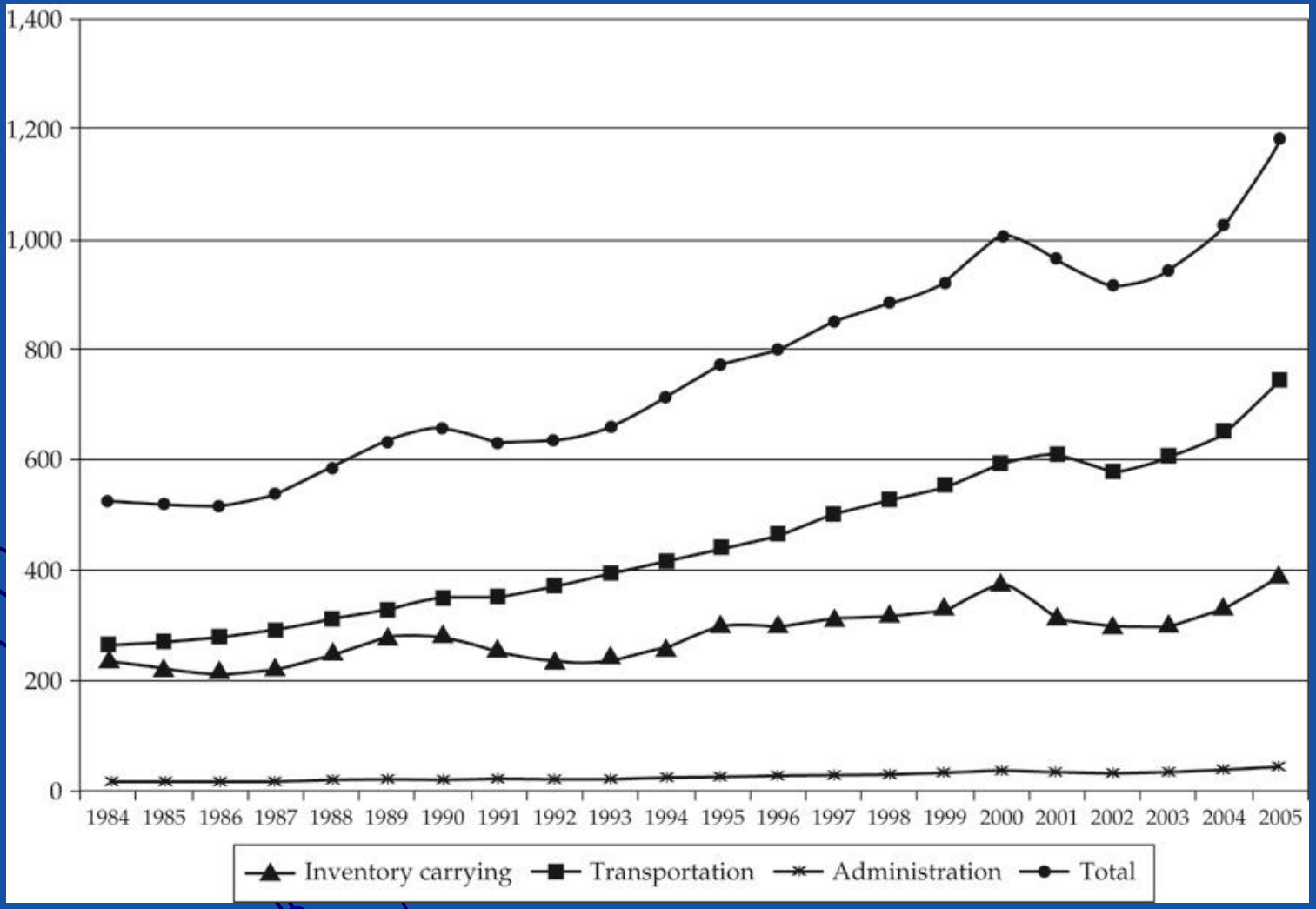


FIGURE 1-5: **Total U.S. logistics costs between 1984 and 2005**

1.6 Complexity: The Magnitude

- U.S. companies spend more than $1 trillion in supply-related activities (10-15% of Gross Domestic Product)
  - Transportation 58%
  - Inventory 38%
  - Management 4%
- The grocery industry could save $30 billion (10% of operating cost) by using effective logistics strategies
- A typical box of cereal spends 104 days getting from factory to supermarket.
- A typical new car spends 15 days traveling from the factory to the dealership.

Complexity: The Magnitude

- Compaq computer's loss of $500 million to $1 billion in sales in one year
  - Laptops and desktops were not available when and where customers were ready to buy them
- Boeing's forced announcement of write-downs of $2.6b
  - Raw material shortages, internal and supplier parts shortages....
- Cisco's multi-billion ($2.2b) dollar write-off of inventories in 2001-2002
  - Customers balked on orders due to market meltdown

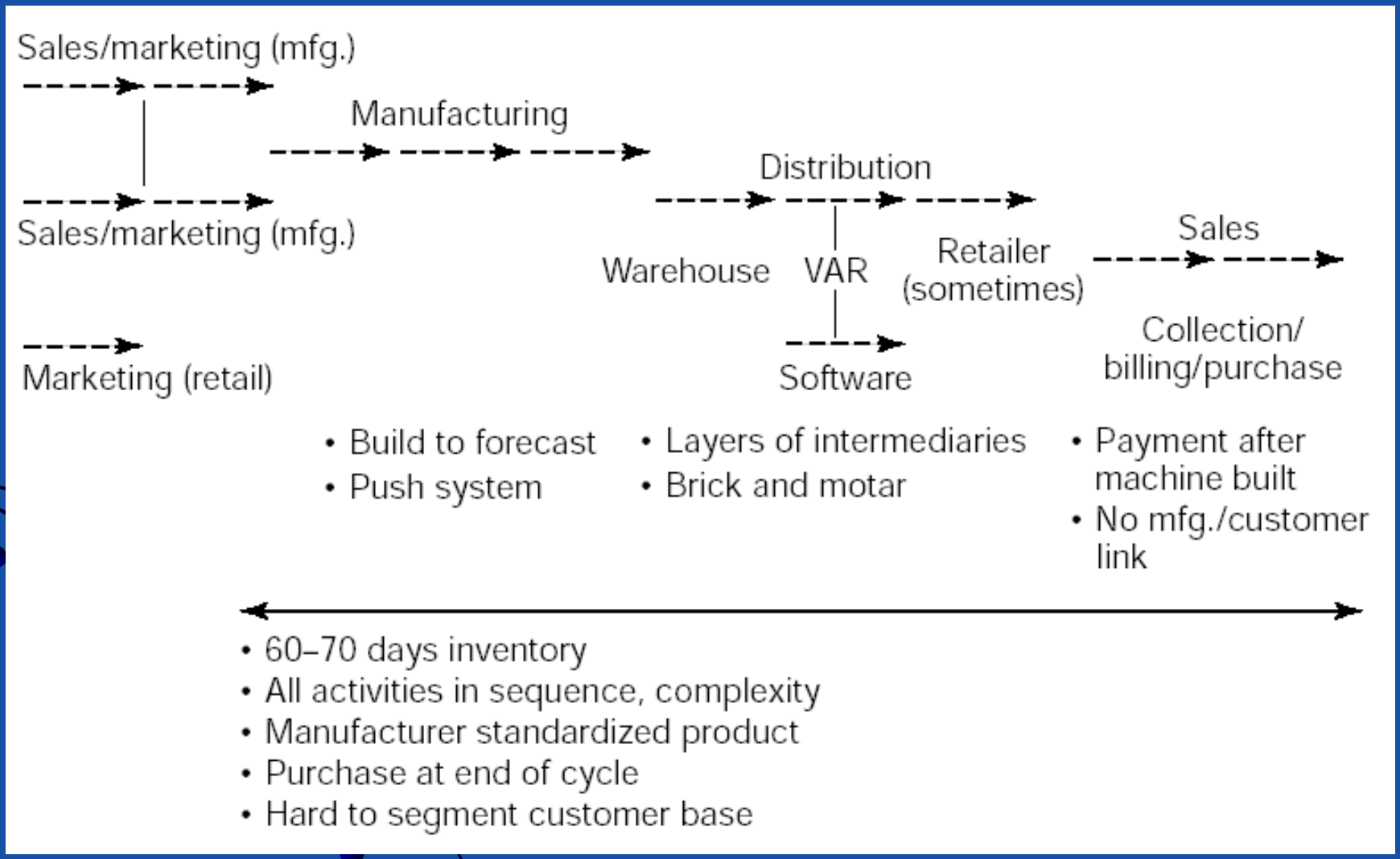
Transactional Complexity

National Semiconductors:

- **Production:**
  - Produces chips in six different locations: four in the US, one in Britain and one in Israel
  - Chips are shipped to seven assembly locations in Southeast Asia.
- **Distribution**
  - The final product is shipped to hundreds of facilities all over the world
  - 20,000 different routes
  - 12 different airlines are involved
  - 95% of the products are delivered within 45 days
  - 5% are delivered within 90 days.

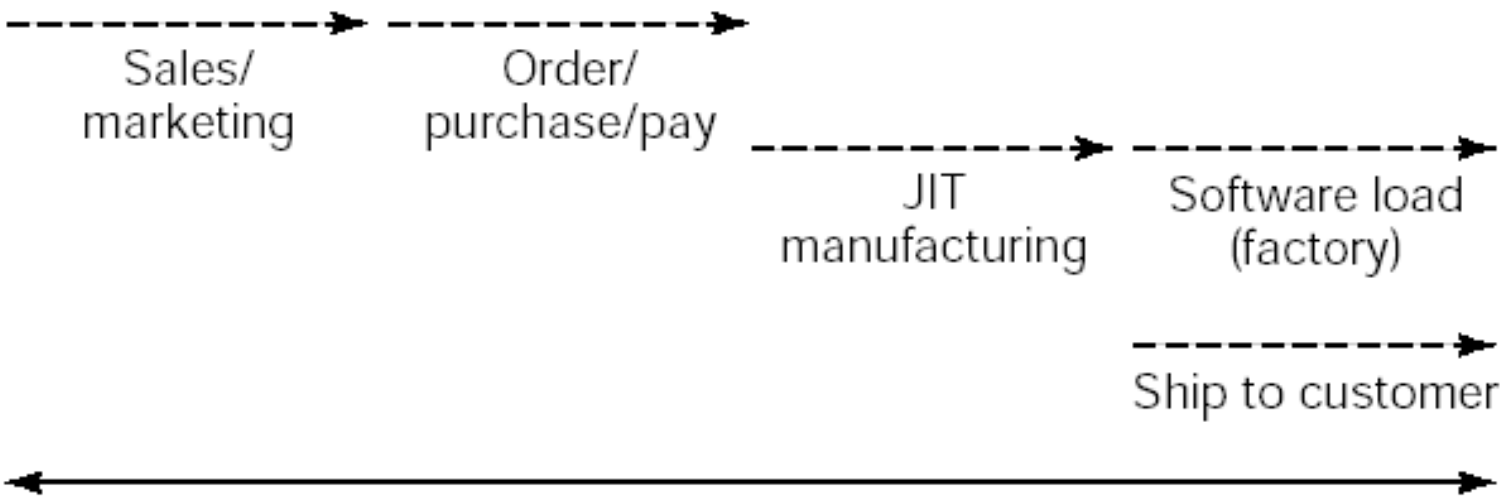
PC Value Chain

Performance of Traditional PC Manufacturer



PC Value Chain: Focus on Cost Reduction

Performance of Dell Computers

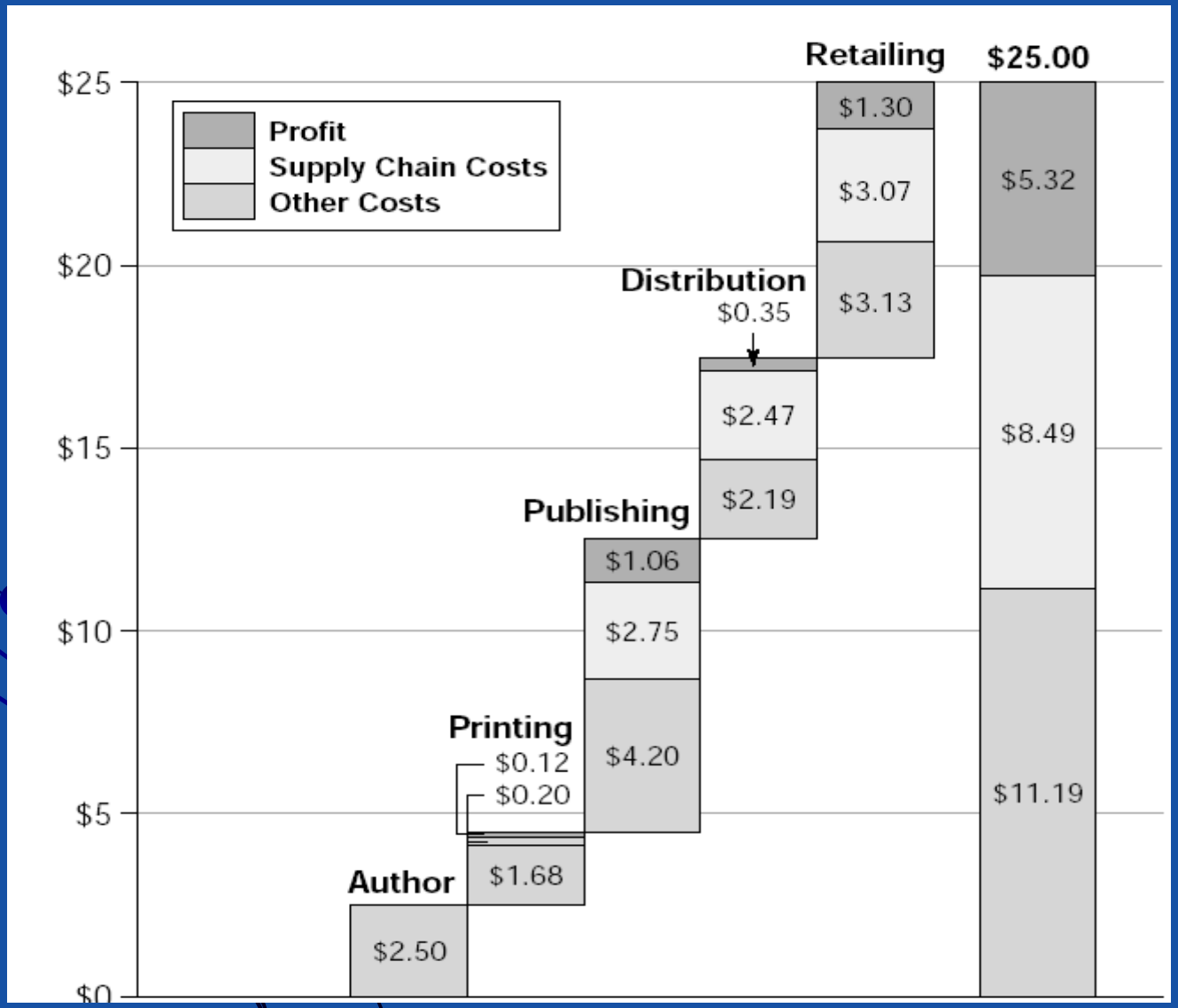


- 5 days inventory, 5 day cash conversion cycle
- Activities in sequence and parallel
- Customer standardized product
- Purchase at start of cycle (BTO)
- Easy to segment customer base

(b)

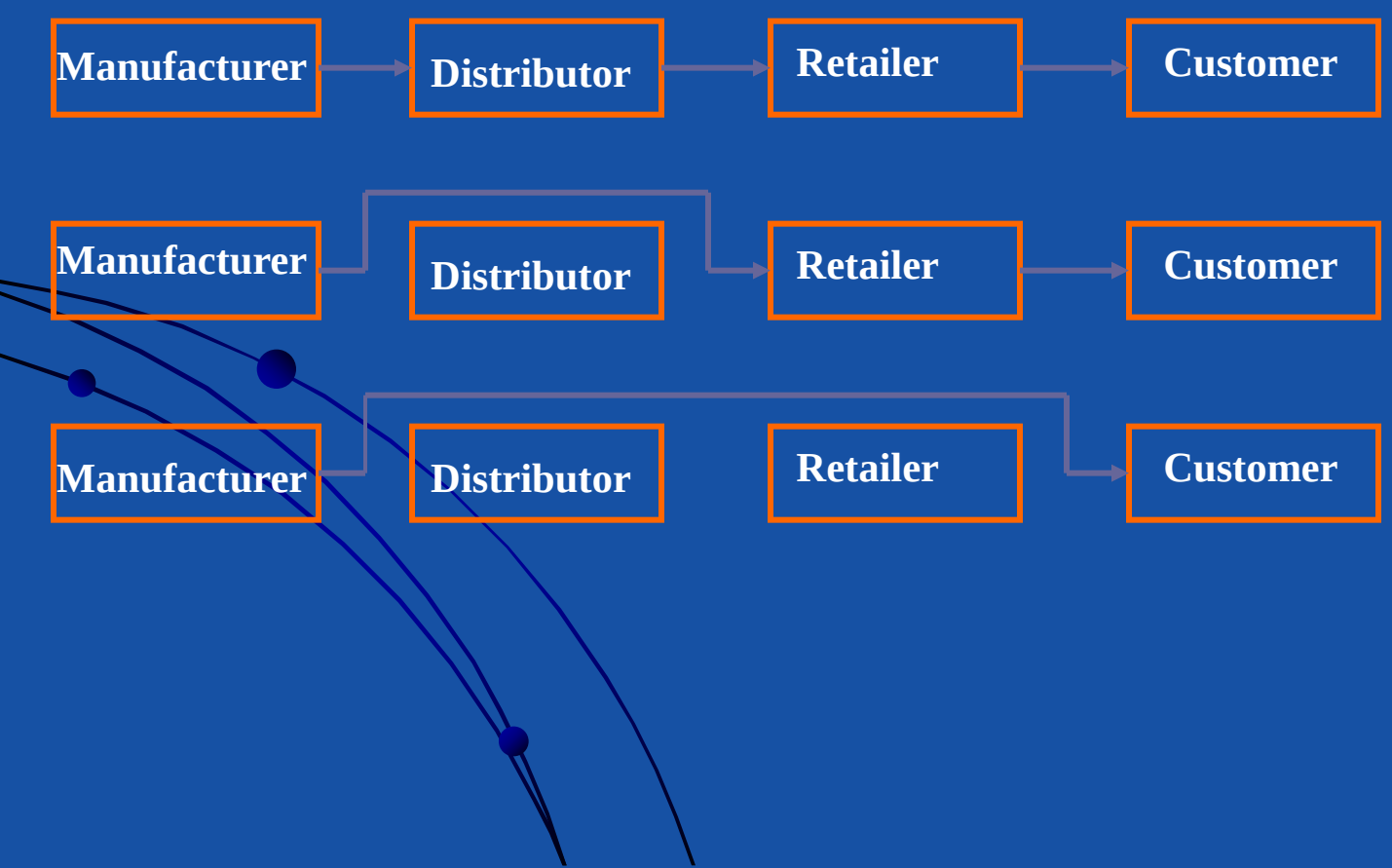
Magnitude of Supply Chain Costs

Cost Elements of a Typical Trade Book



Magnitude of Supply Chain Costs

Example: The Apparel Industry



	Cost per Shirt	*Percent Saving*
Manufacturer → Distributor → Retailer → Customer	$52.72	0%
Manufacturer → Distributor → Retailer → Customer	$41.34	28%
Manufacturer → Distributor → Retailer → Customer	$20.45	62%

Supply Chain: The Potential

- P&G's estimated savings to retail customers of $65 million through logistics gains
- Dell Computer's outperforming of the competition in terms of shareholder value growth over more than two decades by over 3,000% using:
  - Direct business model
  - Build-to-order strategy
- Wal-Mart transformation into the world's largest retailer by changing its logistics system:
  - highest sales per square foot, inventory turnover and operating profit of any discount retailer

1.7 Key Issues in Supply Chain Management

	Chain	Global Optimization	Managing Risk and Uncertainty
Distribution Network Configuration	Supply	Y	
Inventory Control	Supply		Y
Production Sourcing	Supply	Y	
Supply Contracts	Both	Y	Y
Distribution Strategies	Supply	Y	Y
Strategic Partnering	Development	Y	
Outsourcing and Offshoring	Development	Y	
Product Design	Development		Y
Information Technology	Supply	Y	Y
Customer Value	Both	Y	Y
Smart Pricing	Supply	Y	

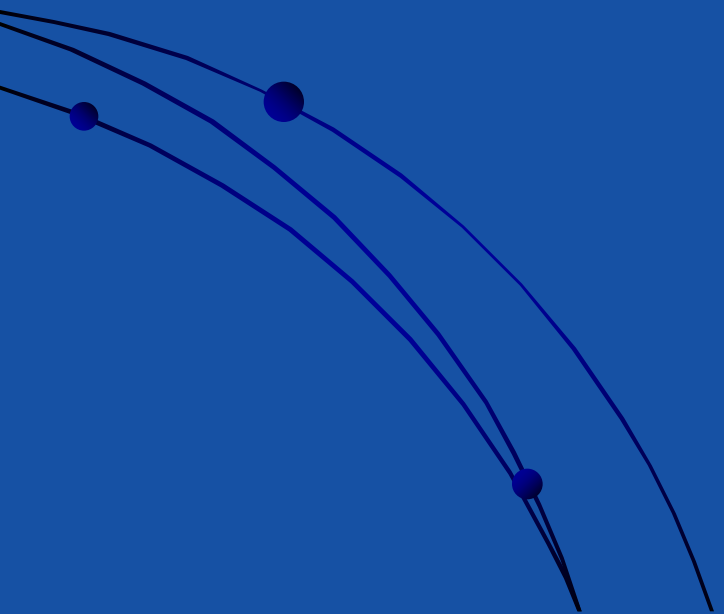
TABLE 1-1: **Key supply chain management issues**

1.8 Book Objectives and Overview

- Inventory management
- Logistics network planning
- Supply contracts for strategic as well as commodity components.
- The value of information and the effective use of information in the supply chain.
- Supply chain integration.
- Centralized and decentralized distribution strategies.
- Strategic alliances.
- Outsourcing, off-shoring, and procurement strategies.
- International supply chain management.
- Supply chain management and product design.
- Customer value.
- Revenue management and pricing strategies.
- Information technology and business processes.
- Technical standards and their impact on the supply chain.

Software Packages

- **Computerized Beer Game**
- **Risk Pool Game**
- **Procurement Game**



CASE: Meditech Surgical

- Intent – diagnosis of supply chain
- Business overview
- Supply chain
- Production planning
- What's wrong?
- How to fix it?

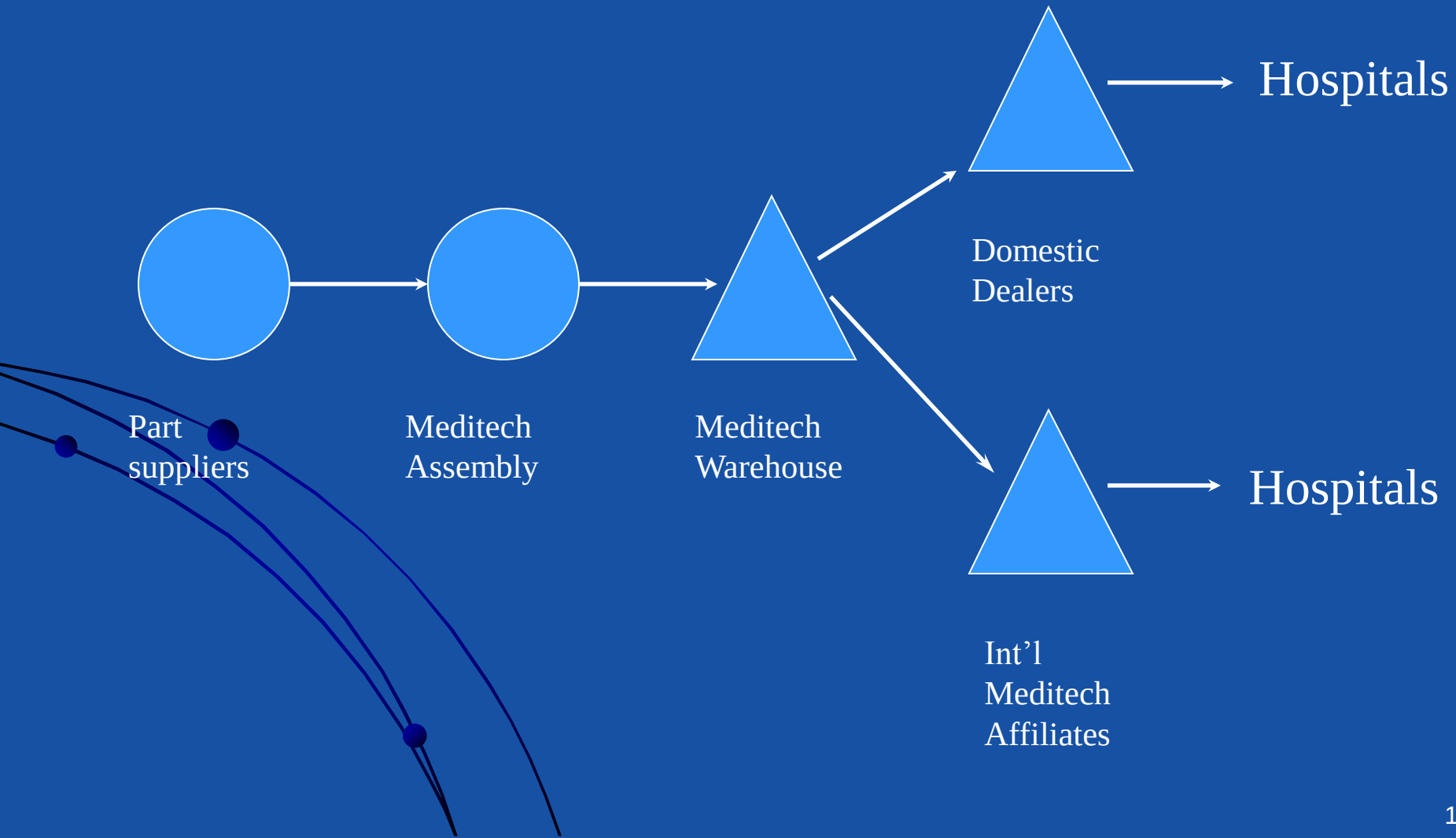
Endoscopic Surgical Instruments

- Permits minimally invasive surgery
- Market created in early 80’s, rapidly growing
- Old products continually updated and replaced with new product introductions

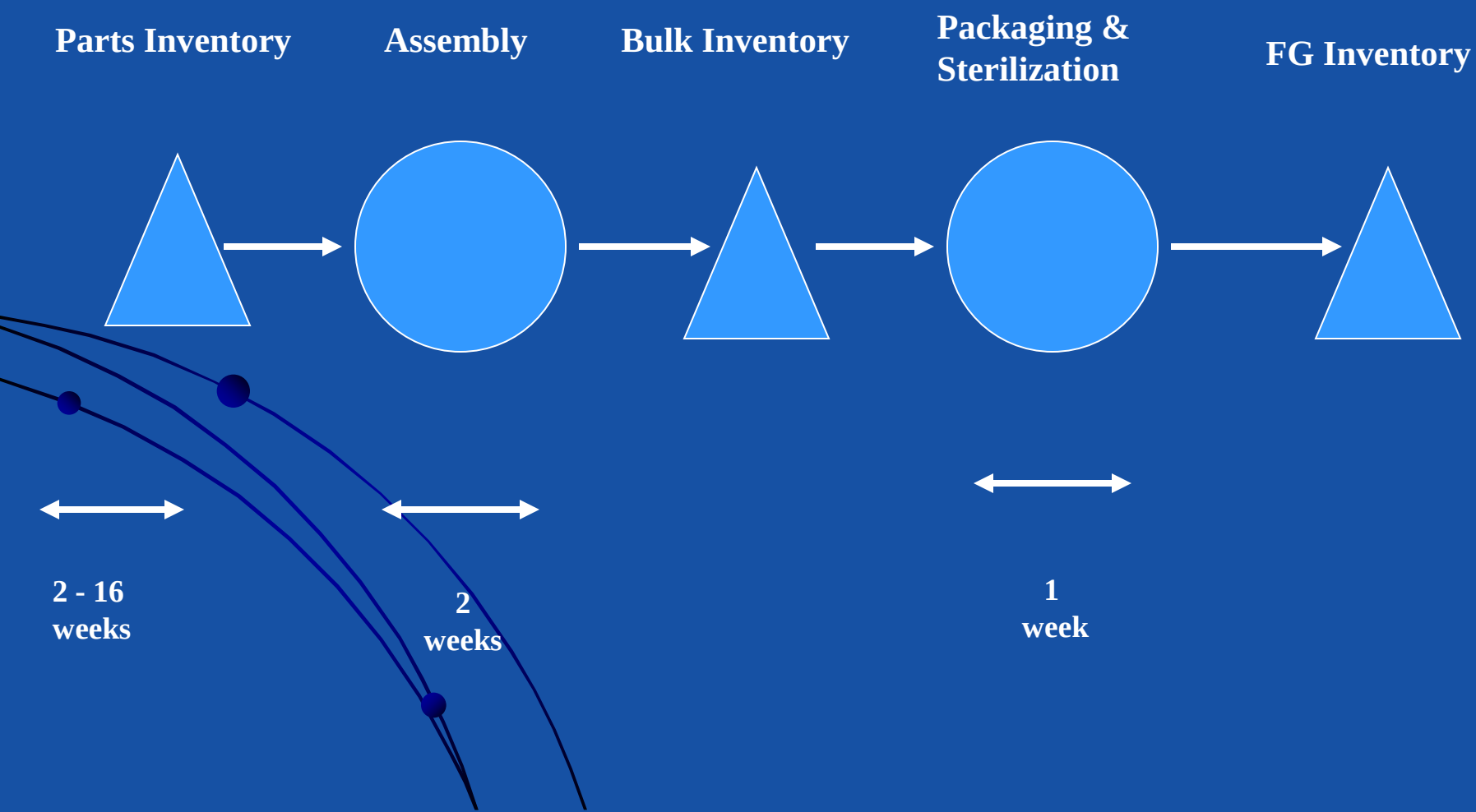
Business Overview

- National and Meditech split the market
- Compete based on product innovations, customer service, cost
- National sells to physicians; Meditech sells to material managers
- Customer preferences change slowly

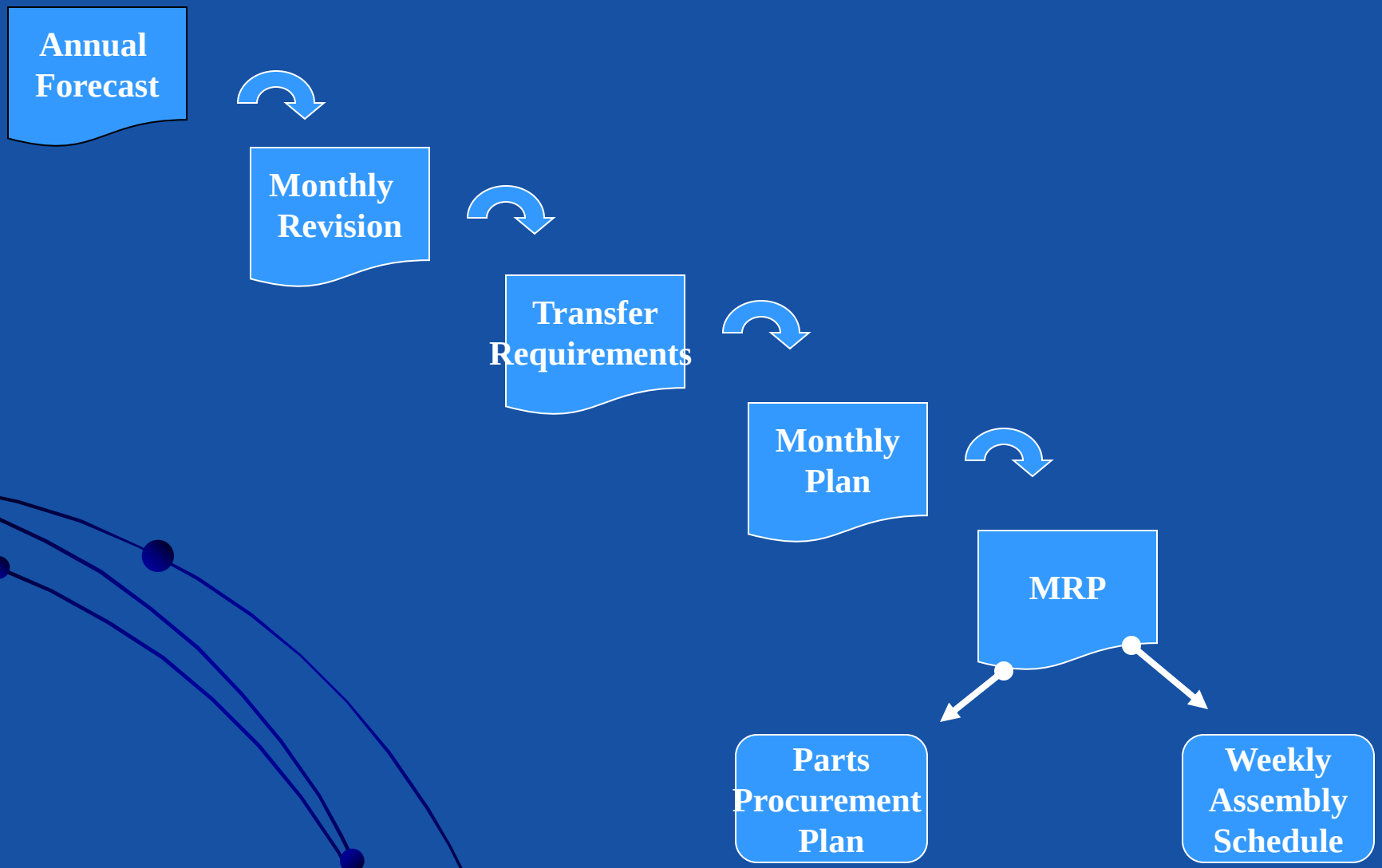
External Supply Chain



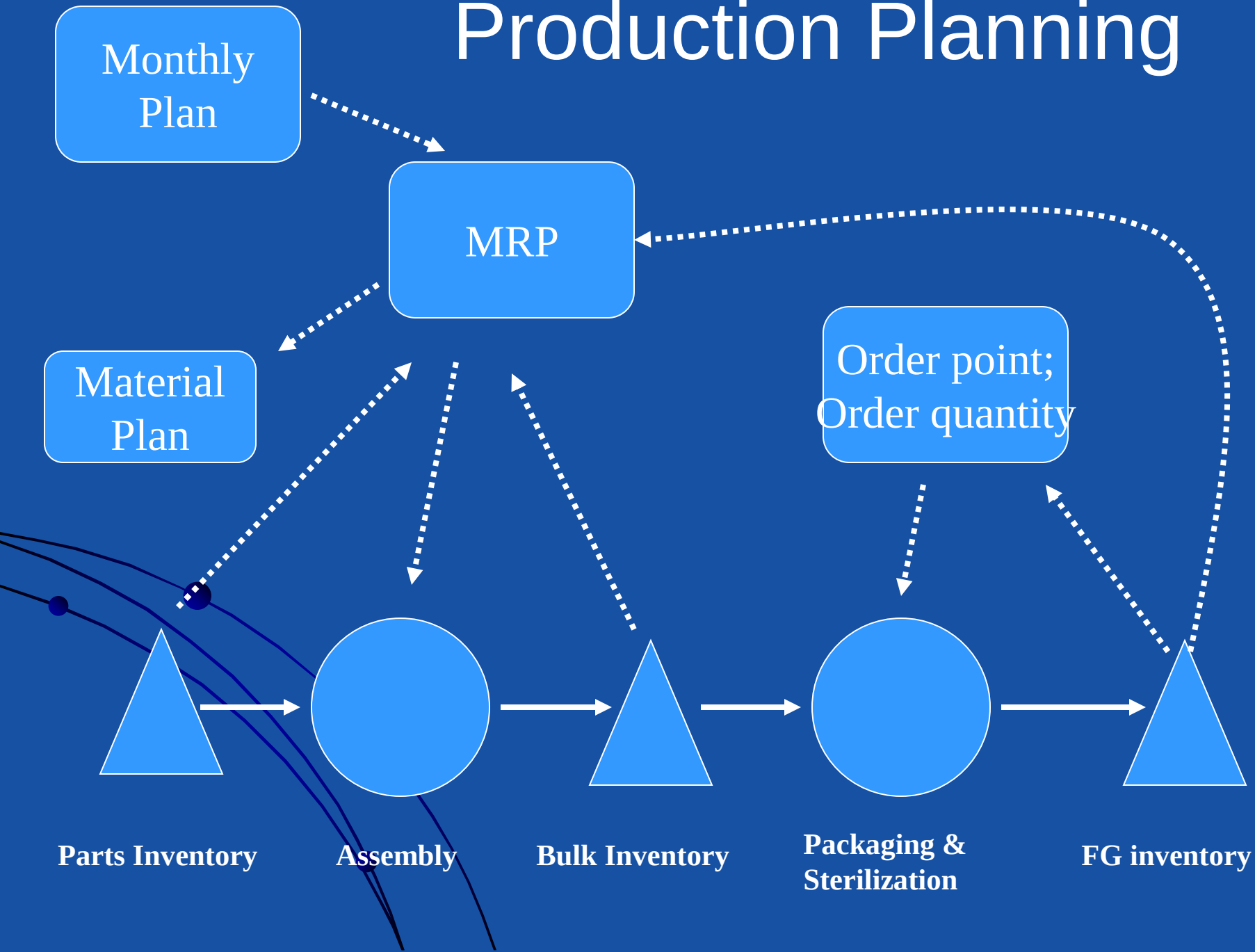
Internal Supply Chain



Production Planning



Production Planning



What's Wrong?

- Poor service for new product introductions
- Poor forecasting?
- Panic ordering?
- And high FG inventory

What Is Going On?

- Demand is quite predictable
- Usage in hospitals is quite stable
- Market share moves slowly over time
- With each new product, dealer must build inventory to fill pipeline

Why Did Meditech Think Demand Was Unpredictable?

- Poor information systems
- No one looked at demand
- No one had responsibility for forecast errors
- Tendency to shift the blame
- Built-in delays and monthly buckets in planning system
- Amplifier in planning system

What to Do?

- Recognize that demand is stable and predictable
- Establish accountability for forecast
- Eliminate planning delays and/or reduce time bucket
- Alternatively, put assembly within pull system and eliminate bulk inventory