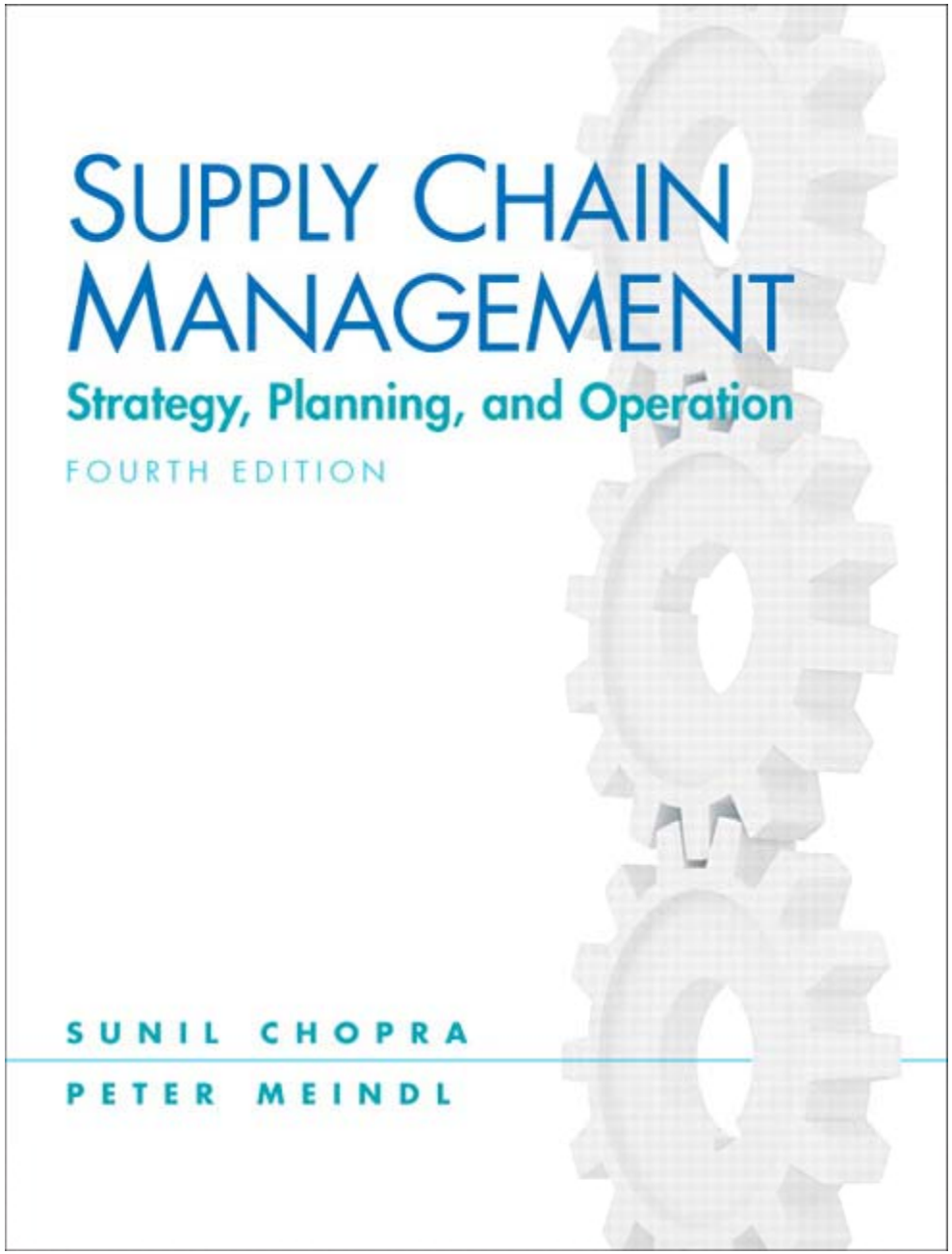


Chapter 3 Supply Chain Drivers and Metrics

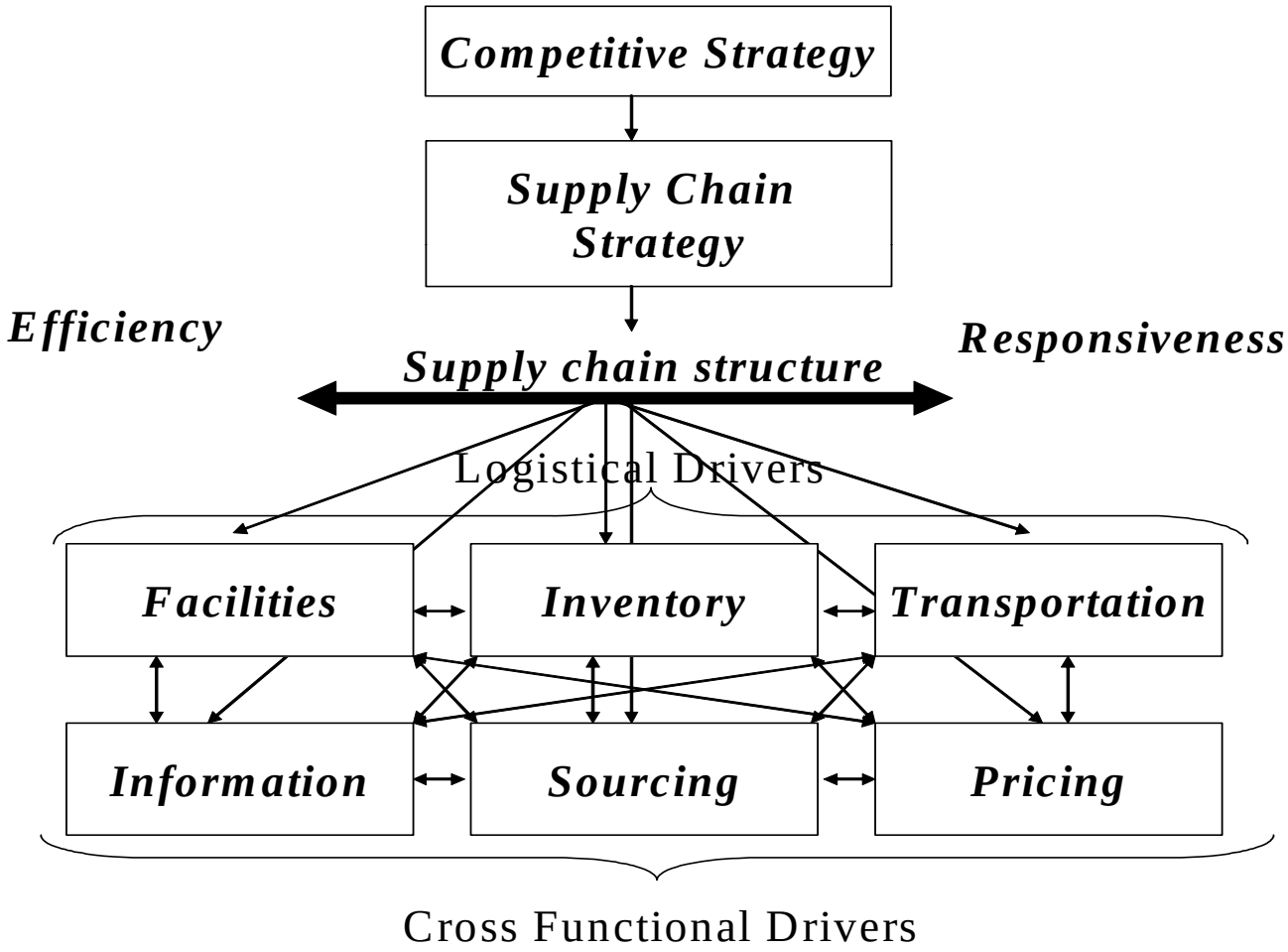
Outline

- Drivers of supply chain performance
- A framework for structuring drivers
- Facilities
- Inventory
- Transportation
- Information
- Sourcing
- Pricing
- Obstacles to achieving fit

Drivers of Supply Chain Performance

- Facilities
  - places where inventory is stored, assembled, or fabricated
  - production sites and storage sites
- Inventory
  - raw materials, WIP, finished goods within a supply chain
  - inventory policies
- Transportation
  - moving inventory from point to point in a supply chain
  - combinations of transportation modes and routes
- Information
  - data and analysis regarding inventory, transportation, facilities throughout the supply chain
  - potentially the biggest driver of supply chain performance
- Sourcing
  - functions a firm performs and functions that are outsourced
- Pricing
  - Price associated with goods and services provided by a firm to the supply chain

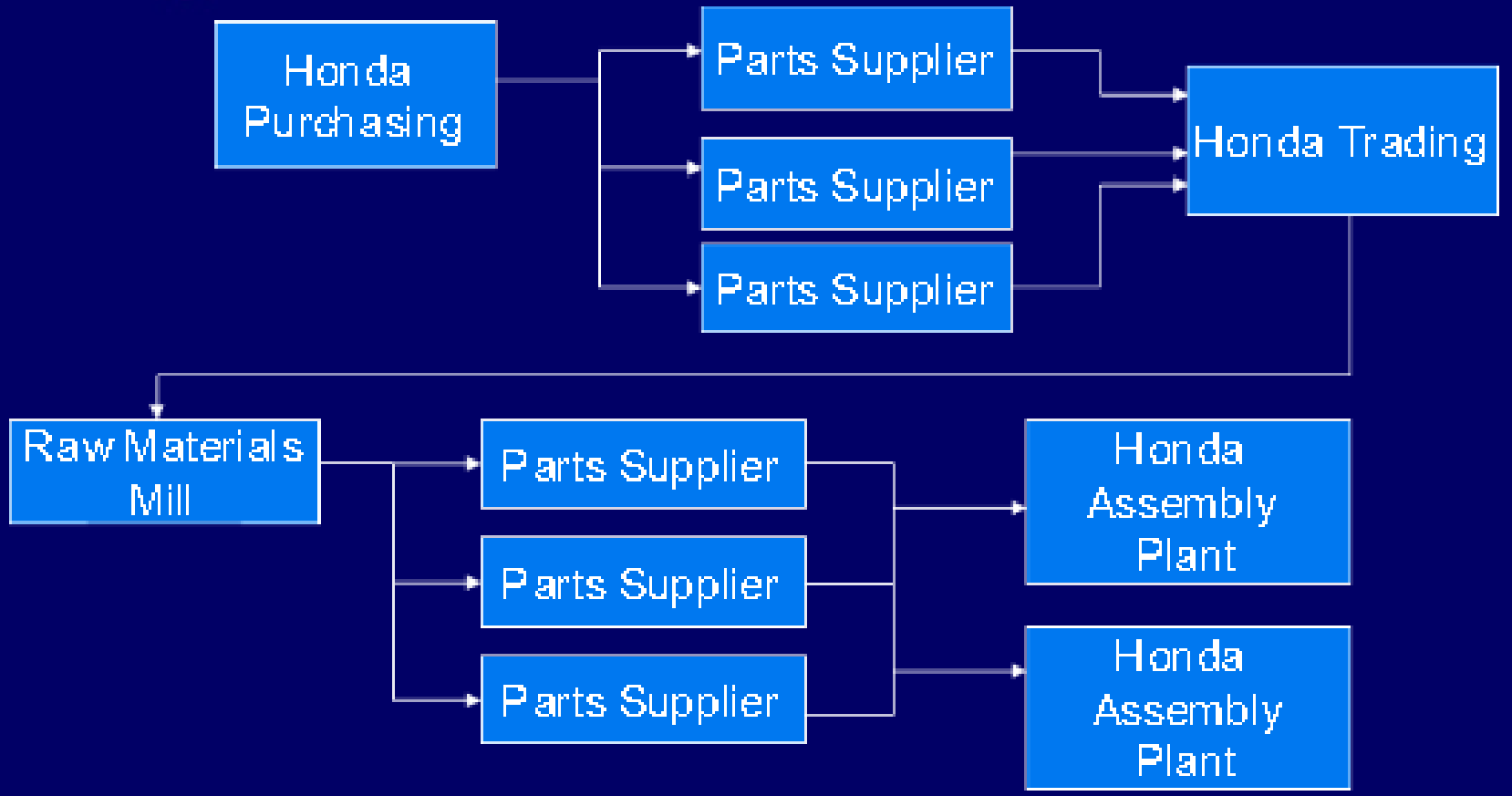
A Framework for Structuring Drivers



Facilities

- Role in the supply chain
  - Inventory = what
  - Transportation = how
  - Facilities = the “where” of the supply chain
  - manufacturing or storage (warehouses)
- Role in the competitive strategy
  - economies of scale (efficiency priority)
    - One location / centralized
  - larger number of smaller facilities (responsiveness priority)
    - Close to customer
- Example 3.1: Toyota and Honda
- Components of facilities decisions

Example Honda Supply Chain



Components of Facilities Decisions

- Location
  - centralization (efficiency) vs. decentralization (responsiveness)
  - other factors to consider (e.g., proximity to customers)
- Capacity (flexibility versus efficiency)
- Manufacturing methodology (product focused versus process focused)
- Warehousing methodology (SKU storage, job lot storage, cross-docking)
- Overall trade-off: Responsiveness versus efficiency

Inventory

- Role in the supply chain
- Role in the competitive strategy
- Components of inventory decisions

Inventory: Role in the Supply Chain

- Inventory exists because of a mismatch between supply and demand
- Source of cost and influence on responsiveness
- Impact on
  - material flow time: time elapsed between when material enters the supply chain to when it exits the supply chain
  - throughput
    - rate at which sales to end consumers occur
    - I = DT (Little's Law)
    - I = inventory; D = throughput; T = flow time
    - Example
    - Inventory and throughput are "synonymous" in a supply chain

Inventory: Role in Competitive Strategy

- If responsiveness is a strategic competitive priority, a firm can locate larger amounts of inventory closer to customers
- If cost is more important, inventory can be reduced to make the firm more efficient
- Trade-off
- Example 3.2 – Nordstrom

Components of Inventory Decisions

- Cycle inventory
  - Average amount of inventory used to satisfy demand between shipments
  - Depends on lot size
- Safety inventory
  - inventory held in case demand exceeds expectations
  - costs of carrying too much inventory versus cost of losing sales
- Seasonal inventory
  - inventory built up to counter predictable variability in demand
  - cost of carrying additional inventory versus cost of flexible production
- Overall trade-off: Responsiveness versus efficiency
  - more inventory: greater responsiveness but greater cost
  - less inventory: lower cost but lower responsiveness

Transportation

- Role in the supply chain
- Role in the competitive strategy
- Components of transportation decisions

Transportation: Role in the Supply Chain

- Moves the product between stages in the supply chain
- Impact on responsiveness and efficiency
- Faster transportation allows greater responsiveness but lower efficiency
- Also affects inventory and facilities

Transportation: Role in the Competitive Strategy

- If responsiveness is a strategic competitive priority, then faster transportation modes can provide greater responsiveness to customers who are willing to pay for it
- Can also use slower transportation modes for customers whose priority is price (cost)
- Can also consider both inventory and transportation to find the right balance
- Example 3.3: Blue Nile

Components of Transportation Decisions

- Mode of transportation:
  - air, truck, rail, ship, pipeline, electronic transportation
  - vary in cost, speed, size of shipment, flexibility
- Route and network selection
  - route: path along which a product is shipped
  - network: collection of locations and routes
- In-house or outsource
- Overall trade-off: Responsiveness versus efficiency

Information

- Role in the supply chain
- Role in the competitive strategy
- Components of information decisions

Information: Role in the Supply Chain

- The connection between the various stages in the supply chain – allows coordination between stages
- Crucial to daily operation of each stage in a supply chain – e.g., production scheduling, inventory levels

Information: Role in the Competitive Strategy

- Allows supply chain to become more efficient and more responsive at the same time (reduces the need for a trade-off)
- Information technology
- What information is most valuable?
- Example 3.4: Andersen Windows
- Example 3.5: Sunsweet Growers

Components of Information Decisions

- Push (MRP) versus pull (demand information transmitted quickly throughout the supply chain)
- Coordination and information sharing
- Forecasting and aggregate planning
- Enabling technologies
  - EDI
  - Internet
  - ERP systems
  - Supply Chain Management software
- Overall trade-off: Responsiveness versus efficiency

Sourcing

- Role in the supply chain
- Role in the competitive strategy
- Components of sourcing decisions

Sourcing: Role in the Supply Chain

- Set of business processes required to purchase goods and services in a supply chain
- Supplier selection, single vs. multiple suppliers, contract negotiation

Sourcing: Role in the Competitive Strategy

- Sourcing decisions are crucial because they affect the level of efficiency and responsiveness in a supply chain
- In-house vs. outsource decisions- improving efficiency and responsiveness
- Example 3.6: Cisco

Components of Sourcing Decisions

- In-house versus outsource decisions
- Supplier evaluation and selection
- Procurement process
- Overall trade-off: Increase the supply chain profits

Pricing

- Role in the supply chain
- Role in the competitive strategy
- Components of pricing decisions

Pricing: Role in the Supply Chain

- Pricing determines the amount to charge customers in a supply chain
- Pricing strategies can be used to match demand and supply

Sourcing: Role in the Competitive Strategy

- Firms can utilize optimal pricing strategies to improve efficiency and responsiveness
- Low price and low product availability; vary prices by response times
- Example 3.7: Amazon.com

Components of Pricing Decisions

- Pricing and economies of scale
- Everyday low pricing versus high-low pricing
- Fixed price versus menu pricing
- Overall trade-off: Increase the firm profits

Obstacles to Achieving Strategic Fit

- Increasing variety of products
- Decreasing product life cycles
- Increasingly demanding customers
- Fragmentation of supply chain ownership
- Globalization
- Difficulty executing new strategies

Summary

- What are the major drivers of supply chain performance?
- What is the role of each driver in creating strategic fit between supply chain strategy and competitive strategy (or between implied demand uncertainty and supply chain responsiveness)?
- What are the major obstacles to achieving strategic fit?
- In the remainder of the course, we will learn how to make decisions with respect to these drivers in order to achieve strategic fit and surmount these obstacles