Logistics and Supply Chain Management

Supply Chain Drivers and Obstacles

Outline

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

Logistical Drivers

- Facilities
  - places where inventory is stored, assembled, or fabricated
  - production sites and storage sites
- Inventory
  - raw materials, work in process (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

Cross-functional Drivers

- 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
  - the “where” of the supply chain
  - manufacturing or storage (warehouses)
- Role in the competitive strategy
  - economies of scale (efficiency priority)
  - larger number of smaller facilities (responsiveness priority)
- Example 3.1: Toyota and Honda

Components of Facilities Decisions

- Location
  - centralization (efficiency) vs. decentralization (responsiveness)
- Capacity
  - flexibility vs. efficiency
- Manufacturing methodology
  - (product focused versus process focused)
- Warehousing methodology
  - (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 occur
    - \( I = RT \) (Little’s Law)
    - \( I \) = inventory; \( R \) = throughput; \( T \) = flow time
    - Example: Flow time = 10 hours; throughput = 60 units an hour, Little's law tells us that the inventory is 60 x 10 = 600 units.

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

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

Transportation

- Role in the supply chain
- Role in the competitive strategy
- Components of transportation decisions
Transportation: Role in 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: Laura Ashley

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: Dell

Components of Information Decisions

- Push versus pull
  - demand information transmitted quickly throughout the SC
- Coordination and information sharing
- Forecasting and aggregate planning
- Enabling technologies
  - Electronic data interchange (EDI)
  - Internet
  - Enterprise resource planning (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

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

Pricing: 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

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