SUPPLY CHAIN (SC) DRIVERS AND OBSTACLES

Drivers of SC performance

- Facilities
- Inventory
- Transportation
- Information
- Sourcing
- Pricing

- The discussion here is mainly concerned with how these drivers are used in the design, planning and operation of supply chain

- Facilities
  - places where inventory is stored, assembled, or fabricated
  - production sites and storage sites
  - Decisions regarding location, capacity and flexibilities of facility have a significant impact on SC performance

- Inventory
  - raw materials, WIP, finished goods within a supply chain
  - Changes in inventory policies can dramatically alter the efficiency and responsiveness of a SC

- Transportation
  - moving inventory from point to point in a supply chain
  - combinations of transportation modes and routes can affect the performance of SC

- Information
  - data and analysis regarding inventory, transportation, facilities throughout the supply chain
  - potentially the biggest driver of supply chain performance
  - This driver allow the management with the better opportunity to make the SC more responsive and efficient

- Sourcing
  - Distinguish the 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

- The combined impact of these drivers determine responsiveness and efficiency of the entire SC
- SC strategy determines how the supply chain should perform with respect to efficiency and responsiveness
- SC then use the supply chain drivers to reach the performance level the SC strategy dictates

Competitive Strategy

Supply Chain Strategy

Efficiency

Responsiveness

Supply chain structure

Logistical Drivers

Facilities

Inventory

Transportation

Information

Sourcing

Pricing

Cross Functional 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)
- Components of facilities decisions

Components of Facilities Decisions

- Location
  - centralization (efficiency) vs. decentralization (responsiveness)
  - other factors to consider (e.g., availability of quality workers, infrastructure, 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
  – \( I = RT \) (Little’s Law)
    
    \( I = \) inventory; \( R = \) throughput; \( T = \) flow time
  – Inventory and flow time 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

**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

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: Del

**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

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• In-house vs. outsource decisions- improving efficiency and responsiveness
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

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

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

- A company’s ability to find a balance between responsiveness and efficiency that best meet the needs of the targeted customer is the key to achieving strategic fit
- Companies face many obstacles in deciding where this balance is to be located on the responsiveness spectrum

Obstacles

- Increasing variety of products
  - Increased variety (mass customization) tend to raise uncertainty, and uncertainty frequently results in increased cost and decreased responsiveness
- Decreasing product life cycles
  - This makes the job of achieving strategic fit more difficult as supply chain must constantly adapt to manufacture and deliver new product in addition to coping with these product’s demand uncertainty
- Increasingly demanding customers
Today’s customers are demanding faster fulfillment, better quality and better performing products for the same price they paid years ago means that the supply chain must provide more just to maintain its business

- Fragmentation of supply chain ownership
  - Now-a-days most firms have become less vertically integrated
  - More members in supply chain for providing goods
  - Many owners with its own policies and interests, the chain (network) more complicated to coordinate

- Globalization
  - Supply chains are more global
  - Global supply chains creates many benefits such as ability to source from a global base of suppliers who may offer better or cheaper goods than were available in a company’s home nation
  - Suppliers are apart making coordination much more difficult
  - Removal of trade barrier results in increased competition from global companies
  - Companies that once protected has to find time for responding to needs of customer that arise due to competition
  - Now more strain on supply chain better trade-off

- Difficulty executing new strategies
  - Creating successful strategy is not easy
  - Skillful execution of strategy is as important as creating successful strategies
  - For instance others could figure out Toyota’s brilliant strategies; the difficulty was in executing that strategy