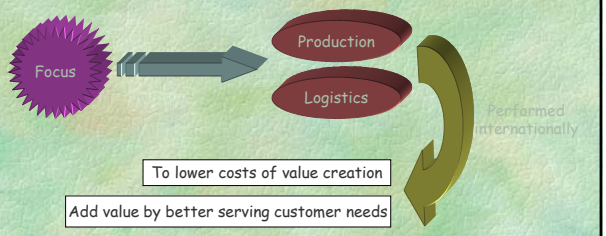
Strategy, Manufacturing, and Logistics



Manufacturing and Materials Management - Strategic Objectives -

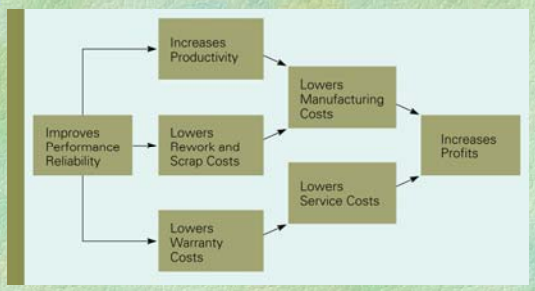
- Lower costs.
- Increase product quality.
  - Total Quality Management.
    - Increases productivity.
    - Lowers rework and scrap costs.
    - Lowers warranty costs.
- Accommodate demands for local responsiveness.
- Respond quickly to shifts in customer demand.

Total Quality Management (TQM)

- The leaders: *W. Edwards Deming, Joseph Juran, and A.V. Feigenbaum*

> "We have learned to live in a world of mistakes and defective products as if they were necessary to life. It is time to adopt a new philosophy in America."
> W. Edwards Deming

The relationship between quality and cost



Global Manufacturing Activities

- Location and scale
- Choice of process
- Control of the system
- Degree of vertical integration relative to out-sourcing
- Coordination of R&D

Make or buy decisions

- Should a firm make or buy the component parts that go into their final product?
- Advantages of making own components:
  - Lower costs if most efficient producer
  - Facilitating specialized investments
  - Proprietary product technology protection
  - Improved scheduling

Risks in Global Sourcing

- loss of critical skills or developing the wrong skills
- loss of cross-functional skills
- loss of control over supplier
- need to compete for supplies
- maintain high inventory levels
- length of supply line
- costs (freight, insurance, duties, brokerage fees)

Benefits of Global Sourcing

- choice among suppliers
- avoid their business risks
- no additional investments
- no need to learn about a new business
- greater flexibility
- lower price from foreign sources
- suppliers worldwide reputation & quality
- supplier is a global firm

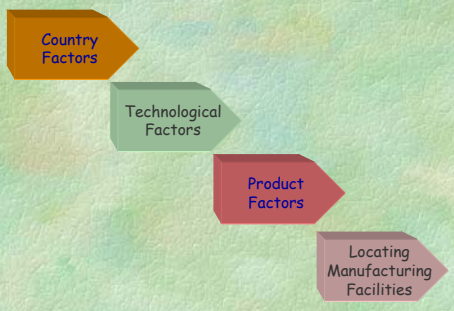
Advantages of Make

- control over costs
- control over quality
- control over delivery
- not competing for supply
- develop new expertise

Disadvantages of Make

- increased investment
- need for expertise
- need for management
- may be inefficient
- overspecialization

Where to manufacture?



Country-related Factors

- Resource availability, infrastructure, costs
- Labor- costs, unions, productivity
- Country-of-origin effects
- National Culture
- Political risk
- Government FDI policies

Country Factors

- Political economy.
- Culture.
- Relative factor costs.
- Global concentrations of activity.
  - Skilled labor pools.
  - Supporting industries.
- Formal and informal trade barriers.
- Transportation costs.
- Rules regarding FDI.
- Exchange rate movements.

Product-related Factors

- Value-to-weight ratio affects transportation costs
- Production technology - efficiency
- Is customer feedback important?
- Does product serve universal needs?

Centralized location

- Factor costs have substantial impact
- Low trade barriers
- Externalities favor certain location
- Stable exchange rates
- High fixed costs, high minimum efficient scale

relative to global demand or flexible manufacturing technology

- Product's value-to-weight ratio is high
- Product serves universal needs

Decentralized location

- Factor costs do not have substantial impact
- High trade barriers
- Location externalities not important
- Exchange rates volatile
- Low fixed costs, low minimum efficient scale
- Flexible manufacturing technology unavailable
- Product's value-to-weight ratio is low
- Significant differences in consumer tastes and preferences exist between nations.

Location strategy and manufacturing

Table 16.1
Location Strategy and Manufacturing

Country Factors	Concentrated Manufacturing Favored	Decentralized Manufacturing Favored
Differences in political economy	Substantial	Few
Differences in culture	Substantial	Few
Differences in factor costs	Substantial	Few
Trade barriers	Substantial	Few
Location externalities	Important in industry	Not important in industry
Exchange rates	Stable	Volatile
Technological Factors		
Fixed costs	High	Low
Minimum efficient scale	High	Low
Flexible manufacturing technology	Available	Not available
Product Factors		
Value-to-weight ratio	High	Low
Serves universal needs	Yes	No

Strategic Role of Foreign Factories

- Initially, established where labor costs low.
- Later, important centers for design and final assembly.
- Upward migration caused by:
  - Pressure to improve cost structure.
  - Pressure to customize product to meet customer demand.
  - Increasing abundance of advanced factors of production.

Dispersed Centers of Excellence are consistent with a Transnational Strategy

Technological Factors

- Fixed costs.
- Minimum efficient scale.
- Flexible manufacturing (Lean Production).
  - Reduce setup times.
  - Increase machine utilization.
  - Improve quality control.
- Flexible machine cells.

Mass Customization: Low cost + Product customization

Manufacturing location

- Fixed costs are substantial
- Minimum efficient scale is high
- Flexible manufacturing technologies available

→ Single or few locations.

- Fixed costs are low
- Minimum efficient scale is low
- Flexible manufacturing technologies unavailable

→ Major market locations if it better meets local demands.

Trade barriers and transportation costs remain major impediments

A Typical Unit Cost Curve

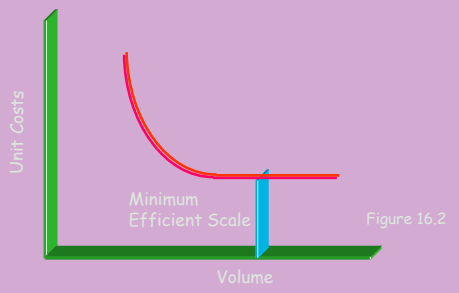


Figure 16.2

Organizational Factors

- Business strategy
- Organizational structure
- Inventory management policies
- Impact of distance and time

Global Manufacturing Configurations

- Home country production with exporting
- Autonomous regional plants
- Combination of regional and global focus
- Coordinated global focus
- Centers of excellence

International Logistics

- Materials management- all activities that move materials to a mfg. facility, through the mfg. process, and to the users finally
- Intl. logistics complicated by
  - distance (number of modes)
  - culture and customs
  - exchange rates
  - time
  - regulations (customs, tariffs etc.)

Coordinating a Global Manufacturing System

- Materials management (includes logistics):
  - Activities necessary to get materials from suppliers to manufacturer, to distribution system, to end user.
  - Achieve lowest possible cost that customer's needs.
- Power of 'Just-in-Time':
  - Economize on inventory holding costs.
  - Drawback: no buffer inventory.

Role of Information Technology and the Internet

- Track component parts to assembly plant.
  - Optimize production scheduling.
    - Ability to accelerate (or slow) production.
- Electronic data interchange coordinates flow through into/through manufacturing to customers.
  - Suppliers, shippers, and purchasing firms can communicate with each other without delay.
    - Flexibility and responsiveness.
  - Paperwork is decreased.