

Chapter

1 Using Operations To Create Value

Course Introduction

1. Today's objectives:
 - a. What are the course requirements?
 - b. What is OM? OM deals with processes that produce services and goods that people use every day.

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Ask the students to share their ideas on a business they would like to start. Discuss the major OM, Accounting, Finance, Human Resources, Management Information Systems, and Marketing decisions.

- c. Why study OM?
2. Course objectives:
 - a. Primary goal of this textbook is to gain an understanding of how to make operations a competitive weapon
 - b. Strategy and analysis
3. Syllabus
 - a. Go over course outline
 - b. Performance measures
 - c. Office hours and other administration
 - d. Questions
 - e. Nature of assignments

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Introduce with Disney. The operational planning at Disney provides one example of designing processes for competitive operations.

1. Operations management deals with the systematic design, direction, and control of processes.
 - a. “A **process** is an activity or group of activities that takes one or more inputs, transforms them, and provides one or more outputs for its customers.”
 - b. An “**Operation** is a group of resources performing all or part of one or more processes.”
 - c. “**Supply chain management** is the synchronization of a firm's processes with those of its suppliers and customers to match flow of materials, services, and information with customer demand.”

1. Role of Operations in an Organization

1. Operations serve as an excellent career path to upper management positions in many organizations because operations managers are responsible for key decisions that affect the success of the organization.
2. Operations is one of several functions within an organization
 - a. Cross-functional coordination is essential to effective management
 - b. Operations plays an important role in meeting global competition
3. Historical Evolution and Perspectives
 - a. James Watt invented the steam engine in 1785.
 - b. With the invention of the cotton gin in 1794, Eli Whitney introduced the concept of interchangeable parts.
 - c. The foundations of modern manufacturing and technological breakthroughs were also inspired by the creation of a mechanical computer by Charles Babbage in the early part of the nineteenth century.
 - d. Scientific management of operations and supply chain management was further improved upon by Frederick Taylor in 1911
 - e. First is the invention of the assembly line for the Model T car by Henry Ford in 1909
 - f. Alfred Sloan in the 1930s introduced the idea of strategic planning for achieving product proliferation and variety
 - g. Toyota Production System in 1978, Taiichi Ohno laid the groundwork for removing wasteful activities from an organization.
 - h. The 1980s were characterized by wide availability of computer aided design (CAD), computer aided manufacturing (CAM), and automation.

2. Process View

Departments within an organization typically have their own set of objectives and a set of resources with capabilities to meet those objectives. The concept of a process is much broader: a process can have its own set of objectives where the work flow may cross different department boundaries, and require resources from several departments.

1. Any process has inputs and outputs
 - a. Inputs can include a combination of human resources (workers and managers), capital (equipment and facilities), purchased materials and services, land, and energy.
 - b. Processes provide outputs to customers. Outputs could be services (that can take the form of information) or a tangible product.
 - c. Customer-supplier relationships
 - Every process and every person within an organization has customers
 - ⇒ External customers
 - ⇒ Internal customers
 - Every process and every person in an organization also relies on suppliers

- ⇒ External suppliers
- ⇒ Internal suppliers
- d. Inputs and outputs vary, depending on the service or product (examples)
 - Jewelry store
 - ⇒ Inputs: merchandise, the store building, registers, the jeweler, and customers
 - ⇒ Outputs: to the external customers are services and sold merchandise
 - Factory manufacturing blue jeans
 - ⇒ Inputs: denim, machines, the plant, workers, managers, and services by outside consultants
 - ⇒ Outputs: clothing and supporting services
- 2. Nested processes
 - a. Process within a process
 - b. Interconnectivity within a business
 - c. Nature of each process's inputs and outputs
 - d. Greater detail in Chapter 4 "Process Analysis"
- 3. Service and Manufacturing Processes
 - a. Ratio of services to manufacturing jobs
 - b. Differences
 - Nature of output
 - Degree of customer contact
 - c. Similarities
 - Customers expect good service and good products

3. A Supply Chain View

The strategic view is that processes must add value for customers throughout the supply chain; reinforcing the link between processes and performance. This includes a firm's internal processes with those of external customers and suppliers.

1. Core processes
 - a. Supplier relationship process
 - b. New service/product development process
 - c. Order fulfillment process
 - d. Customer relationship process
2. Support processes
 - a. provide vital resources and inputs to the core processes
 - b. capabilities
 - c. other inputs that allow core processes to function

3. Supply Chain Processes
 - a. Adding value with process innovation in supply chains
 - Outsourcing
 - Warehousing
 - Sourcing
 - Customer Service
 - Logistics
 - Cross-docking

4. Operations Strategy

1. Operations strategy
 - a. Specifies the means by which operations implements corporate strategy and helps to build a customer-driven firm.
 - b. It links long-term and short-term operations decisions to corporate strategy and develops the capabilities the firm needs to be competitive.
2. Corporate strategy
 - a. Environmental scanning
 - b. Developing core competencies
 - Workforce
 - Facilities
 - Market and financial know-how
 - Systems and technology
 - c. Developing core processes
 - d. Developing global strategies
 - Strategic alliance
 - Locating abroad.
3. Market analysis
 - a. Market segmentation
 - b. Needs assessment
 - Service or Product Needs. Attributes of the service or product, such as price, quality, and degree of customization.
 - Delivery System Needs. Attributes of the processes and the supporting systems, and resources needed to deliver the service or product, such as availability, convenience, courtesy, safety, accuracy, reliability, delivery speed, and delivery dependability.
 - Volume Needs. Attributes of the demand for the service or product, such as high or low volume, degree of variability in volume, and degree of predictability in volume.

- Other Needs. Other attributes, such as reputation and number of years in business, after-sale technical support, ability to invest in international financial markets, and competent legal services.

5. Competitive Priorities and Capabilities

1. **Competitive priorities** are the critical operational dimensions a process or supply chain must possess to satisfy internal or external customer, both now and in the future.
2. **Competitive capabilities** are the cost, quality, time, and flexibility dimensions that a process or supply chain actually processes and is able to deliver. An abbreviated list with examples is provided here.

Dimension	Definition	Example
Low-cost operations	Delivering a service or product at the lowest cost possible.	Costco achieves low costs by designing all processes for efficiency.
Top quality	Delivering an outstanding service or product.	Rolux is known globally for top-quality precision timepieces
Consistent quality	Producing services or products that meet design specifications on a consistent basis.	McDonald's standardizes work methods, staff training processes, and procurement to achieve consistency.
Delivery speed	Quickly filling customer orders	Dell engineered processes to deliver reliable and inexpensive computers with short lead times.
On-time delivery	Meeting delivery-time promises	United Parcel Service (UPS) uses expertise in logistics and warehousing processes to deliver on-time.
Development speed	Quickly introducing new services or products.	Zara is known by its ability to bring fashions from the runway to market quickly
Customization	Satisfying unique needs of customers	Ritz Carlton customizes services to individual customers.
Variety	A wide assortment of services or products.	Amazon.com uses information technology along with order fulfillment processes to deliver a vast variety of items to customers.
Volume flexibility	Accelerating or decelerating the rate of production	The United States Post Office (USPS) can have severe demand peak fluctuations.

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Application of Organizational Capabilities - Zara. Leveraging development speed for gaining competitive advantage provides one example of companies using their competitive capabilities.

3. Order winners and qualifiers
 - a. Order winner is a criterion that customers use to differentiate the services or products of one firm from those of another, such as cost, quality, time, and flexibility
 - b. Order qualifier is the minimal requirement for doing business in a particular market segment.

4. Using competitive priorities: an airline example (two market segments: first-class passengers and coach passengers)
 - a. Customer relationships
 - Top quality: High levels of customer contact and lounge service for the first-class passengers
 - Consistent quality: The information and service must be error free
 - Delivery speed: Customers want immediate information regarding flight schedules and other ticketing information
 - Variety: The process must be capable of handling the service needs of all market segments and promotional programs
 - b. New service development
 - Developing speed: It is important to get to the market fast to preempt the competition
 - Customization: The process must be able to create unique services
 - Top quality: New services must be carefully designed because the future of the airline industry depends on them
 - c. Order fulfillment
 - Low-cost operations: Airlines compete on price and must keep operating costs in check
 - Top quality: High quality meal and beverage service delivered by experienced cabin attendants ensures that the service provided to first-class passengers is kept top notch.
 - Consistent quality: Once the quality level is set, it is important to achieve it every time
 - On-time delivery: The airline strives to arrive at destinations on schedule, otherwise passengers might miss connections to other flights
 - Variety: Maintenance operations are required for a variety of aircraft models
 - d. Supplier relationship
 - Low-cost operations: Costs of acquiring inputs must be kept to a minimum to allow for competitive pricing
 - Consistent quality: Quality of the inputs must adhere to the required specifications. In addition, information provided to suppliers must be accurate
 - On-time delivery: Inputs must be delivered to tight schedules
 - Variety: Many different inputs must be acquired, including maintenance items, meals and beverages.
 - Volume flexibility: The process must be able to handle variations in supply quantities efficiently
5. Identifying Gaps Between Competitive Priorities and Capabilities

- a. Operations strategy translates service or product plans and competitive priorities for each market segment into decisions affecting the supply chains that support those market segments.
- b. Once managers determine the competitive priorities for a process, it is necessary to assess the competitive capabilities of the process.

6. Addressing the Trends and Challenges in Operations Management

1. Productivity improvement

- a. The value of outputs produced is divided by the value of input resources.

$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$

- b. In the United States, while there are signs of improvement, service sector productivity gains have been much lower than those in the manufacturing sector.
- c. Use **Example 1.1: Productivity Calculations** to give students the chance to make their own productivity calculations.
- d. Productivity measures – two approaches
 - Single factor
 - ⇒ In example 1.1, the single (input) factor is employee hours
 - Multifactor
 - ⇒ In example 1.1, the multiple (input) factors are labor cost, materials cost, and overhead costs.
- e. Managers must examine productivity from the level of the value chain, i.e., the collective performance of individual processes.
- f. Additional examples are provided as Solved Problems
- g. **Application 1.1**

	This Yr.	Last Yr.	Year Before Last
Factory unit sales (\$)	2,762,103	2,475,738	2,175,447
Employment (hrs)	112,000	113,000	115,000
Sales of manufactured products (\$)	\$49,363	\$40,831	—
Total manufacturing cost of sales (\$)	\$39,000	\$33,000	—

- Calculate the year-to-year labor productivity.

	This Yr.	Last Yr.	Year Before Last
$\frac{\text{factory unit sales}}{\text{employment}}$	$\frac{2,762,103}{112,000} = \$24.66 / hr$	$\frac{2,475,738}{113,000} = \$21.91 / hr$	$\frac{2,175,447}{115,000} = \$18.91 / hr$

- Calculate the multifactor productivity.

	This Yr.	Last Yr.
$\frac{\text{sales of mfg products}}{\text{total mfg cost}}$	$\frac{\$49,363}{\$39,000} = 1.27$	$\frac{\$40,831}{\$33,000} = 1.24$

2. Global competition

- Firms can increase their market penetration by locating their production facilities in foreign countries because it gives them a local presence that reduces customer aversion to buying imports
- Five developments have stimulated the need for sound global strategies
 - Improved transportation and communication technology
 - Loosened regulations on financial institutions
 - Increased demand for imported services and goods
 - Reduced import quotas and other international trade barriers
 - ⇒ European Union (EU)
 - ⇒ North American Free Trade Agreement (NAFTA)
 - Comparative cost advantages
- Comparative cost advantage
 - What role does China play in globalization today?
 - What role does India play?
- Disadvantages of globalization
 - Relinquish proprietary technology
 - Political risks
 - Employee skills may be lower in foreign countries

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Managerial Practice 1.1: “Japanese Earthquake and its Supply Chain Impact.” Japanese earthquake disaster exposes supply chain weakness: reliance on small concentrated network of suppliers. Economic losses have been felt worldwide.

3. Ethical, and workforce diversity and environmental issues

- Decisions about the design and operations of production systems consider the environment, ethics, and workplace diversity issues

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Discuss examples such as: toxic waste, poisoned drinking water, poor air quality, and climate change.

4. The Internet of Things

- a. The impact of IoT on Operations as objects embedded with software, sensors and actuators collect and exchange data
- b. Some applications
 - Product design and development
 - Health care
 - Preventative maintenance
 - Inventory management
 - Logistics
 - City management
- c. Concerns and Barriers
 - Technology
 - Privacy
 - Security
 - Organizational roles

7. Developing Skills for Your Career

1. Developing skills to understand how organizations meet challenges by better design of its operating processes and supply chains.
 - a. The management of processes and supply chains goes beyond designing them; it requires the ability to ensure they achieve their goals.
 - b. All effective operations decisions follow from a sound operations strategy.
 - c. The text has three major parts:
 - Part 1: “Managing Processes”
 - ⇒ Focus on analyzing processes and how they can be improved to meet the goals of the operations strategy.
 - Part 2: “Managing Customer Demand”
 - ⇒ Focus of this part of the book is on effectively forecasting and managing customer demand.
 - Part 3: “Managing Supply Chains”
 - ⇒ Focus of Part 3 is on supply chains involving processes both internal and external to the firm and the tools that enhance their execution.
2. Adding Value with Process Innovation
 - a. Each part of an organization, not just the operations function, must design and operate processes that are part of a supply chain and deal with quality, technology, and staffing issues.
 - b. Each function of an organization has its own identity and yet is connected with operations through shared processes.