



Operations Management  
(Processes and Supply Chain)  
10<sup>th</sup> Edition.

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# Outline of Chapters

- Part 1 (Competing with Operations)
  - Using Operations to Compete
  - Decision Making Models
  - Managing Effective Projects
- Part 2 (Designing and Managing Processes)
  - Developing a Process Strategy
  - Analyzing Process
  - Managing Quality
  - Planning Capacity
  - Waiting Line Models
  - Managing Process Constraints
  - Designing Lean Systems
- Part 3 (Designing and Managing Supply Chains)
  - Managing Inventories
  - Special Inventory Models
  - Designing Effective Supply Chain
  - Locating Facilities
  - Integrating the Supply Chain
  - Managing Sustainable Supply Chain
  - Forecasting Demand
  - Planning and Scheduling Operations
  - Planning Sufficient Resources
  - Linear Programming Models

# Chapter 1

## Using Operations to Compete

1. Operations Management (OM) and Supply Chain Management (SCM) Across the Organization.
2. Historical Evolution of SCM and OM.
3. A Process View.
4. The Supply Chain View.
5. Competitive Priorities and Capabilities.
6. Operations Strategy as a Pattern of Decisions.
7. Addressing the Challenges in OM.

# 1. Operations Management (OM) and Supply Chain Management (SCM) Across the Organization.

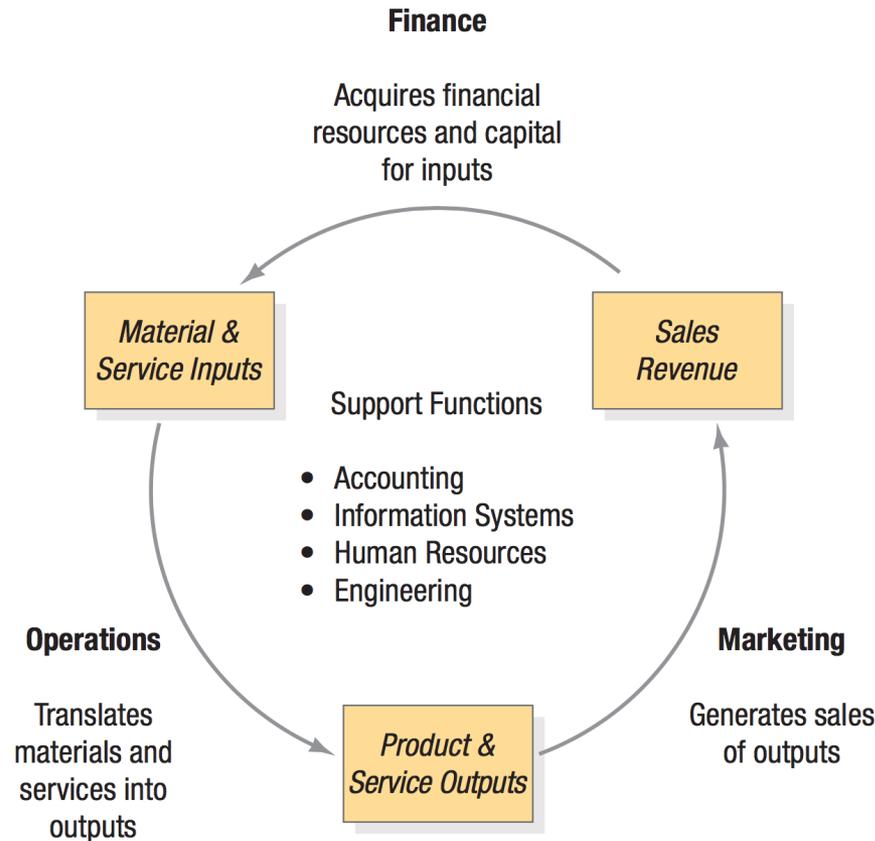
- **Operations Management** is the systematic design, direction, and control of processes that transform inputs into services and products for internal, as well as external, customers.
- A **Process** is any activity or group of activities that takes one or more inputs, transforms them, and provides one or more outputs for its customers.
- An **Operation** is a group of resources performing all or part of one or more processes.
- **Supply Chain** is an interrelated series of processes within and across firms that produces a service or product to the satisfaction of customers.
- **Supply Chain Management\*** is the synchronization of a firm's processes with those of its suppliers and customers to match the flow of materials, services, and information with customer demand.

\*The terms supply chain and value chain are sometimes used interchangeably.

# 1. Operations Management (OM) and Supply Chain Management (SCM) Across the Organization.

- OM and SCM spreads across all the department of any organization and to be a successful manager understanding and proper execution of such processes is desirable.
- Chief Operating Officer (COO) or Vice President of Manufacturing are the titles used in the industry for operations manager supervising the whole organizations' process.

# 1. Operations Management (OM) and Supply Chain Management (SCM) Across the Organization.



▲ **FIGURE 1.1**

Integration between Different Functional Areas of a Business

# 1. Operations Management (OM) and Supply Chain Management (SCM) Across the Organization.

- In figure 1.1 basic functions like Operations, Marketing, and Finance are shown.
- Finance generate resources and then decide where and how to invest them and convert them into assets and material inputs. Operations transforms these inputs into outputs and then marketing is responsible for producing sales revenue of the outputs.
- Functions such as accounting, information systems, human resources, and engineering make the firm complete by providing essential information, services, and other managerial support.
- All these functions provide a strategic directions of the organization and almost all of these are essential for any organization.

# 2 – Historical Evolution of SCM and OM

- Modern operations and SCM has been around for nearly 200 years.
- James Watt invented the steam engine in 1785 and subsequently railroad facilitated efficient and fast movement of goods.
- With the invention of the cotton gin in 1794, Eli Whitney introduced the concept of interchangeable parts.
- These developments and interchangeable machine parts ignited the industrial revolution in England, rest of the Europe, and USA.
- The internal combustion engine, steam-powered ships, metallurgy of iron making, large-scale production of chemicals, and invention of machine tools, among others innovations laid the foundations of modern manufacturing.
- Technological breakthroughs were also inspired by the creation of a mechanical computer by Charles Babbage in the early part of the nineteenth century.
- He also pioneered the concept of division of labor, which laid the foundation for scientific management of operations and supply chain management that was further improved upon by Frederick Taylor in 1911.

# 2 – Historical Evolution of SCM and OM

- Three other landmark events from the twentieth century define the history of operations and supply chain management.
- **First** is the invention of the assembly line for the Model T car by Henry Ford in 1909. The era of mass production was born, where complex products like automobiles could be manufactured in large numbers at affordable prices through repetitive manufacturing.
- **Second**, Alfred Sloan in the 1930s introduced the idea of strategic planning for achieving product proliferation and variety, with the newly founded General Motors Corporation offering “a car for every purse and purpose.”
- **Finally**, with the publication of the Toyota Production System in 1978, Taiichi Ohno laid the groundwork for removing wasteful activities from an organization, a concept that we explore further in this book while learning about lean systems.

# 2 – Historical Evolution of SCM and OM

- The recent history of operations and supply chains over the past three decades has been steeped in technological advances.
- The 1980s were characterized by wide availability of computer aided design (CAD), computer aided manufacturing (CAM), and automation.
- Information technology applications started playing an increasingly important role in 1990s, and started connecting the firm with its extended enterprise through Enterprise Resource Planning Systems and outsourced technology hosting for supply chain solutions.
- Service organizations like Federal Express, United Parcel Service (UPS), and Walmart also became sophisticated users of information technology in operations, logistics, and management of supply chains.
- The new millennium has seen an acceleration of this trend, along with an increased focus on sustainability and the natural environment.

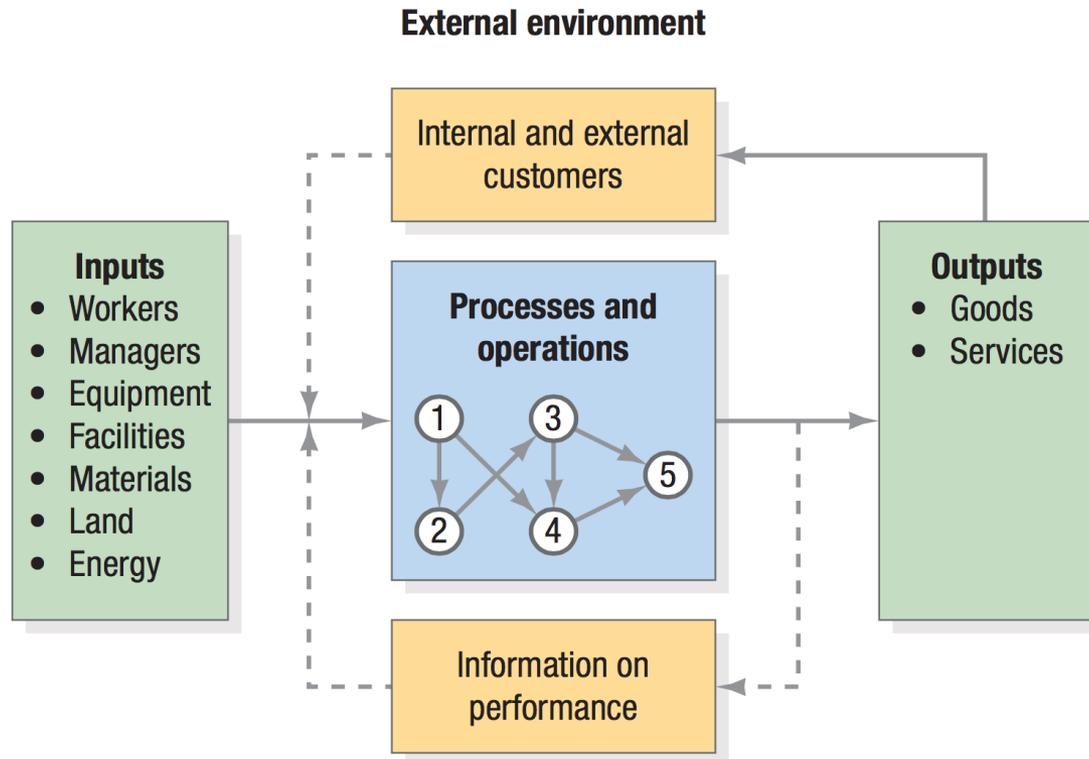
# 3 – A Process View

- Process can be considered at the heart of an organization.
- A process can have its own objectives, inputs, and outputs.
- Figure 1.2 (*next slide*) shows how processes work in an organization.
- Any process has inputs and outputs. Inputs can include a combination of human resources (workers and managers), capital (equipment and facilities), purchased materials and services, land, and energy.

# 3 – A Process View

## ▼ FIGURE 1.2

Processes and Operations



# 3 – A Process View

- Figure 1.2 can represent a whole firm, a department, a small group, or even a single individual.
- Inputs can be from **internal** (daily sales report, cooking material for cook in a restaurant) *or* **external** (like fuel for Deawoo) customers.
- Also, outputs can be for **internal** (preparing car parts for final assembly) *or* **external** customers (any final products or services).

# 3 – A Process View

- Almost all of these processes would be presents in some form or the other in all organizations.
- Each one has inputs and uses processes at various operations to provide outputs. The dashed lines represent two special types of input:
  - Participation by customers (students' participation during class discussion) and
  - Information on performance from both internal and external sources (customer services, inventory levels).
- Managers need all types of information to administer effectively.

# 3 – A Process View

- **Nested Processes** is a concept of a process within a process.
- A process can be divided into sub-processes as one person or one department may be unable to perform all parts of the process, or different parts of the process may require different skills.
- Some parts of the process may be designed for routine work while other parts may be geared for customized work.

# 3 – A Process View

- **Services and Manufacturing Processes** are the two major types of processes.
- Service processes pervade the business world and have a prominent place in our discussion of operations management.
- Manufacturing processes are also important; without them the products we enjoy as part of our daily lives would not exist. In addition, manufacturing gives rise to service opportunities.

# 3 – A Process View



- Physical, durable output
- Output can be inventoried
- Low customer contact
- Long response time
- Capital intensive
- Quality easily measured

- Intangible, perishable output
- Output cannot be inventoried
- High customer contact
- Short response time
- Labor intensive
- Quality not easily measured

## ▲ FIGURE 1.3

Continuum of Characteristics of Manufacturing and Service Processes

# 3 – A Process View

- The two main differences are (i) nature of the output and (ii) degree of contact with the customers.
- In general, manufacturing processes also have longer response times, are more capital intensive, and their quality can be measured more easily than those of service processes.
- Manufacturing processes convert materials into goods that have a physical form we call products.

# 3 – A Process View

1. *Physical properties*
  2. *Shape*
  3. *Size (e.g., length, breadth, and height of a rectangular block of wood)*
  4. *Surface finish*
  5. *Joining parts and materials*
- The outputs from manufacturing processes can be produced, stored, and transported in anticipation of future demand.
  - If a process does not change the **five** properties of materials on at least one of these five dimensions, it is considered a service (or non-manufacturing) process.
  - Service processes tend to produce intangible, perishable outputs.

# 3 – A Process View

- There can be **similarities** or presence of product and service under same roof as in restaurants or hospitals.
- There can be a debate about as how to classify an organization either manufacturing or service based organization.
- For this, we have to look at the processes and know the kind and impact and impact of that process on the organization.