

Operation Management

**Slide Prepared By
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Chapter 1

Introduction to Operations Management



Overview

- 1 Introduction, Scope, Importance.
- 2 The operations manager and the management process.
- 3 Operations management and decision making.
- 4 Trends in operations management
- 5 Competitiveness, productivity

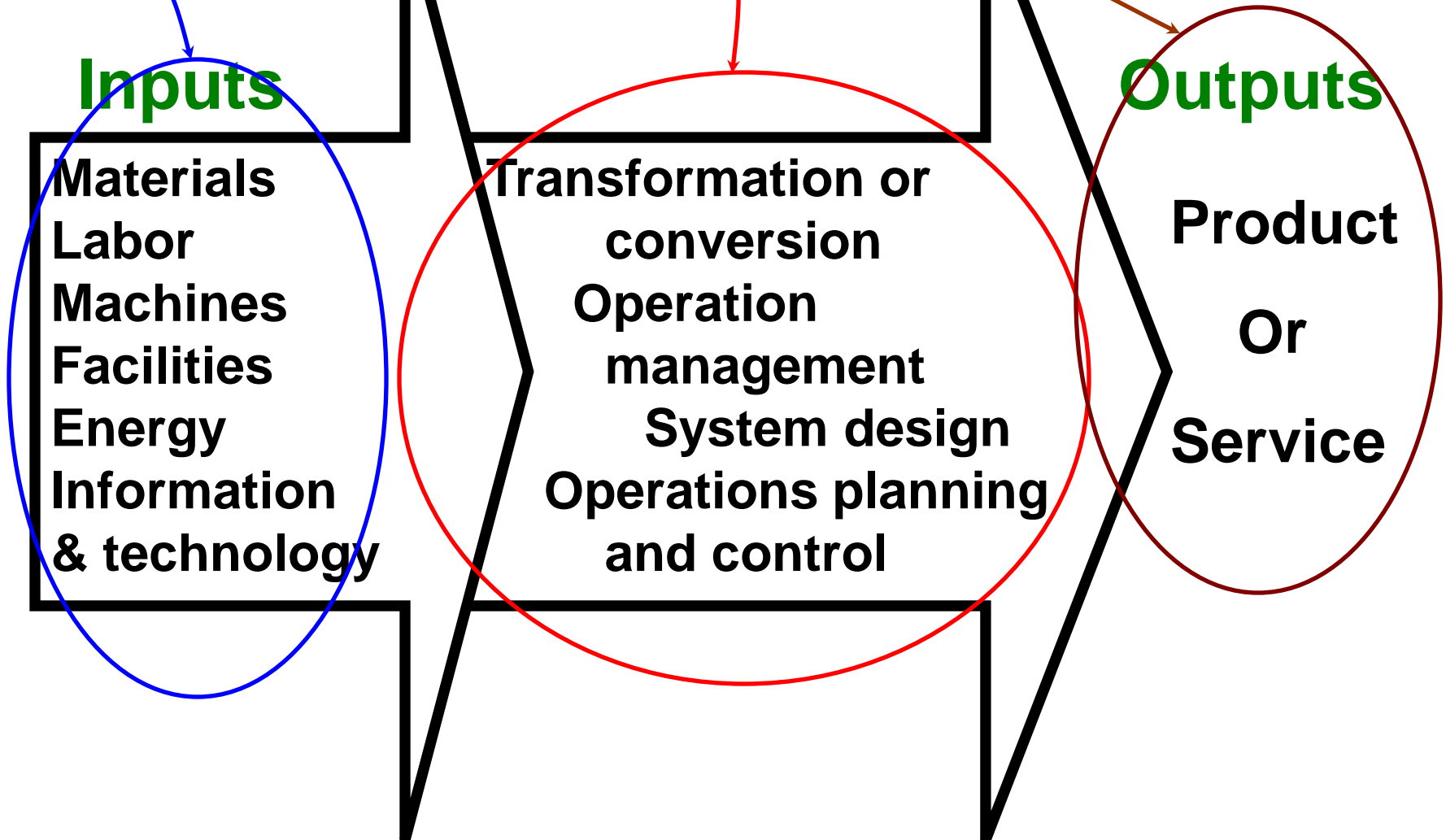
Operation Management

Definition

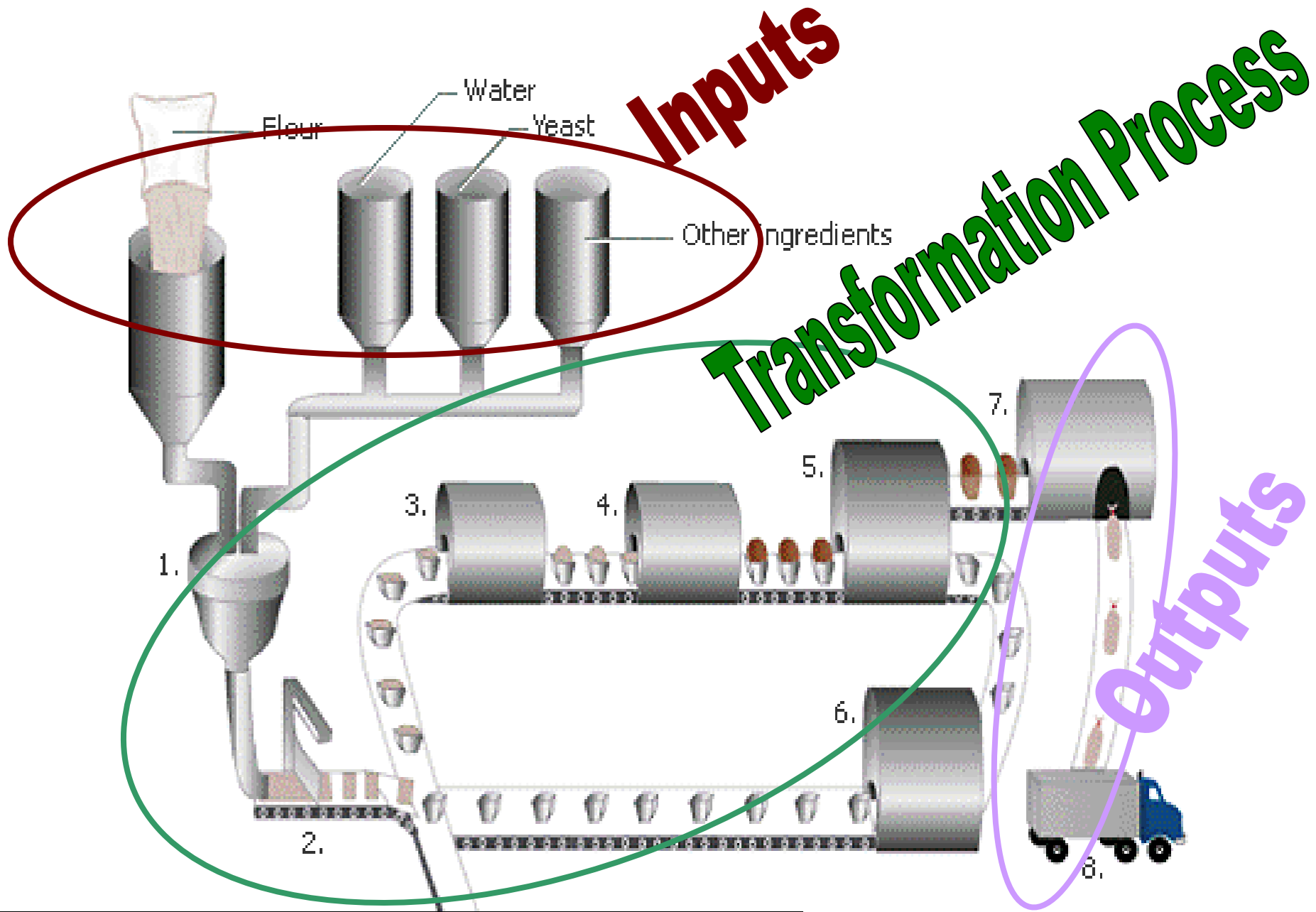
- **Operation Management** is the **Process** which **combines** and **transforms** various resources used in the Production and Operation subsystem of the organization into value added **product / services** in a control manner .

Operation Management

- It is the process of **transformation** of a range of **inputs** into the required **outputs** (products/services) having the requisite quality level.

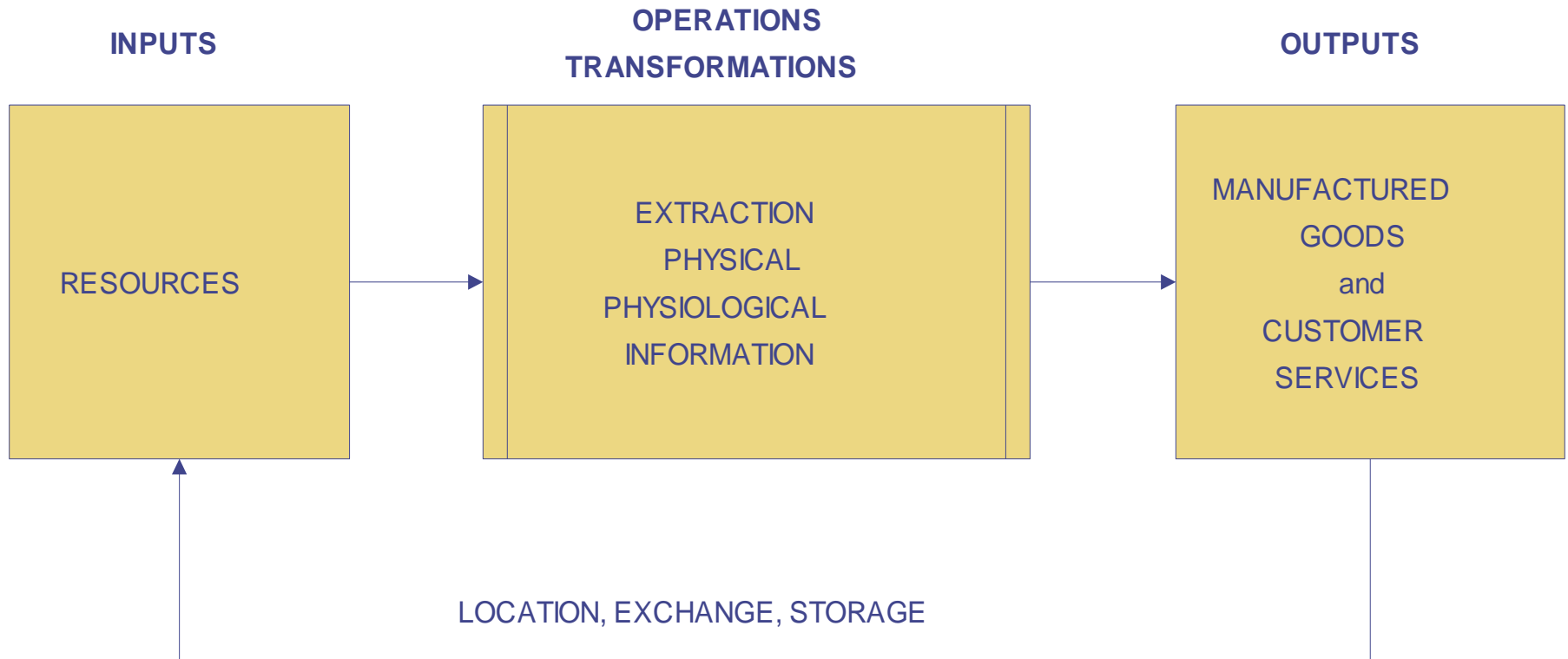


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Input-Transformation-Output Cycle (System Model)



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Components of Operation Function

Inputs:

material, money, manpower, machine or finished product from another system etc. Information, method of management and technology are also essential inputs.

Transformation Process:

converting inputs into desired output

Outputs:

desired result of the system.

It may goods or services

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Air Service

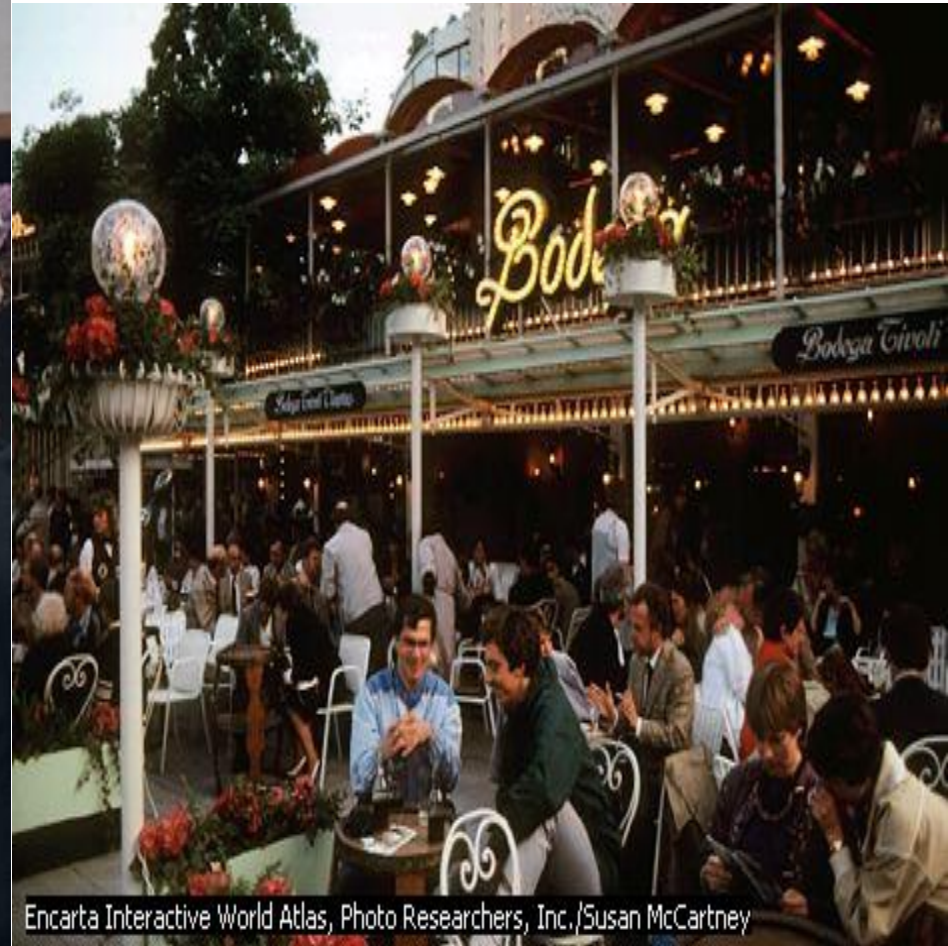
Ship Service

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Encarta Encyclopedia, The Image Works

Bank Service



Encarta Interactive World Atlas, Photo Researchers, Inc./Susan McCartney

Food Service



• **McDonald's Food Service**

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Corbis/Charles O'Rear

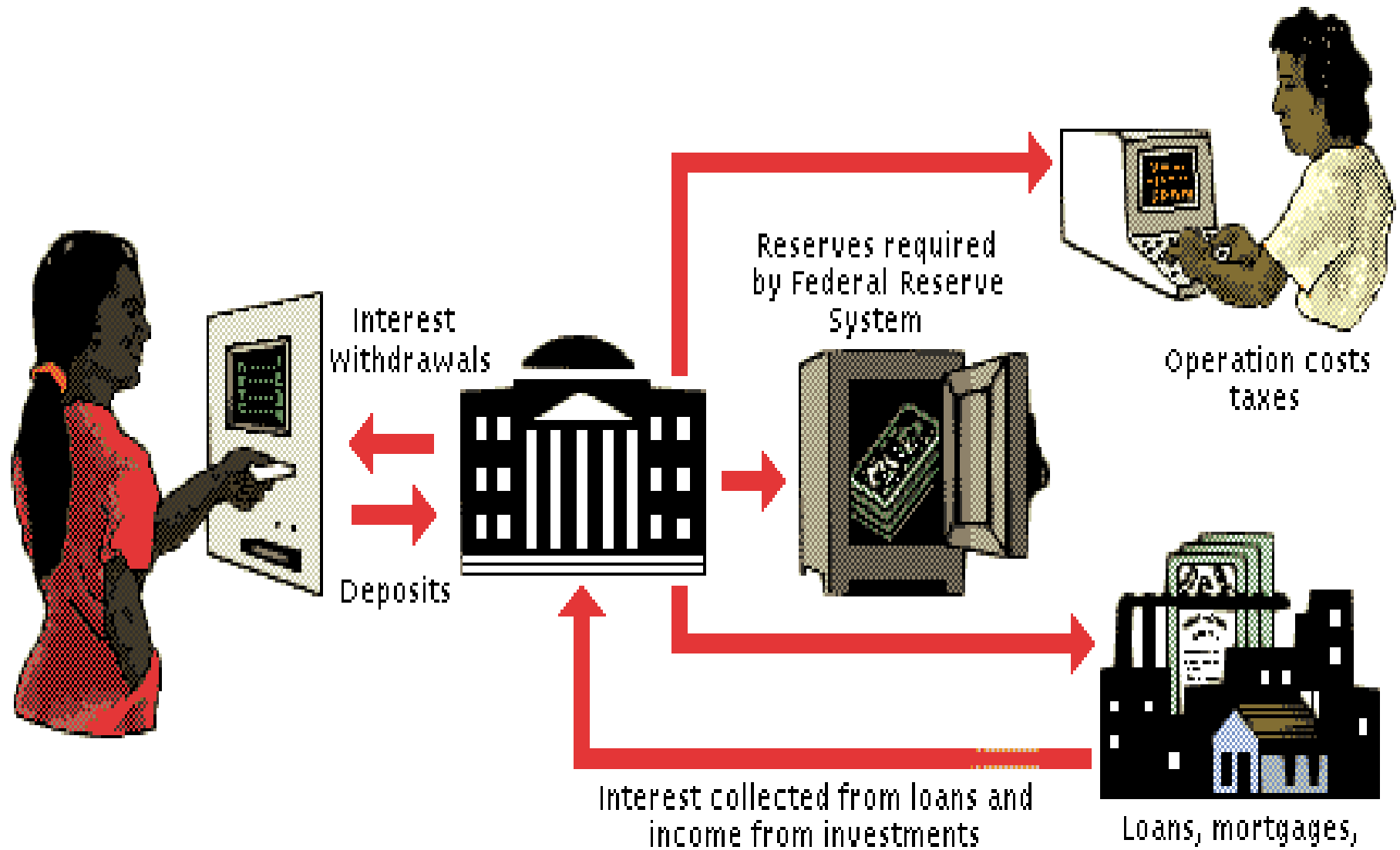
- **Production of steel**

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- Textile factory

Production and Operation Management



Operation Management

- **“Operation management may be defined as the design, operation and improvement operations of the production systems that create the firms primary products or services.”**



- **R.B. chase**

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- **Operation management deals with decision making relating to production process so that the resulting goods and services are produced in accordance with the quantitative specification and demand schedule with minimum cost.**



E.S. Buffa

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- **Production management is the process of effective planning and regulating the operations of the section of an enterprise which is responsible for the actual transformation of materials in to finished goods.**

- E.L. Brech

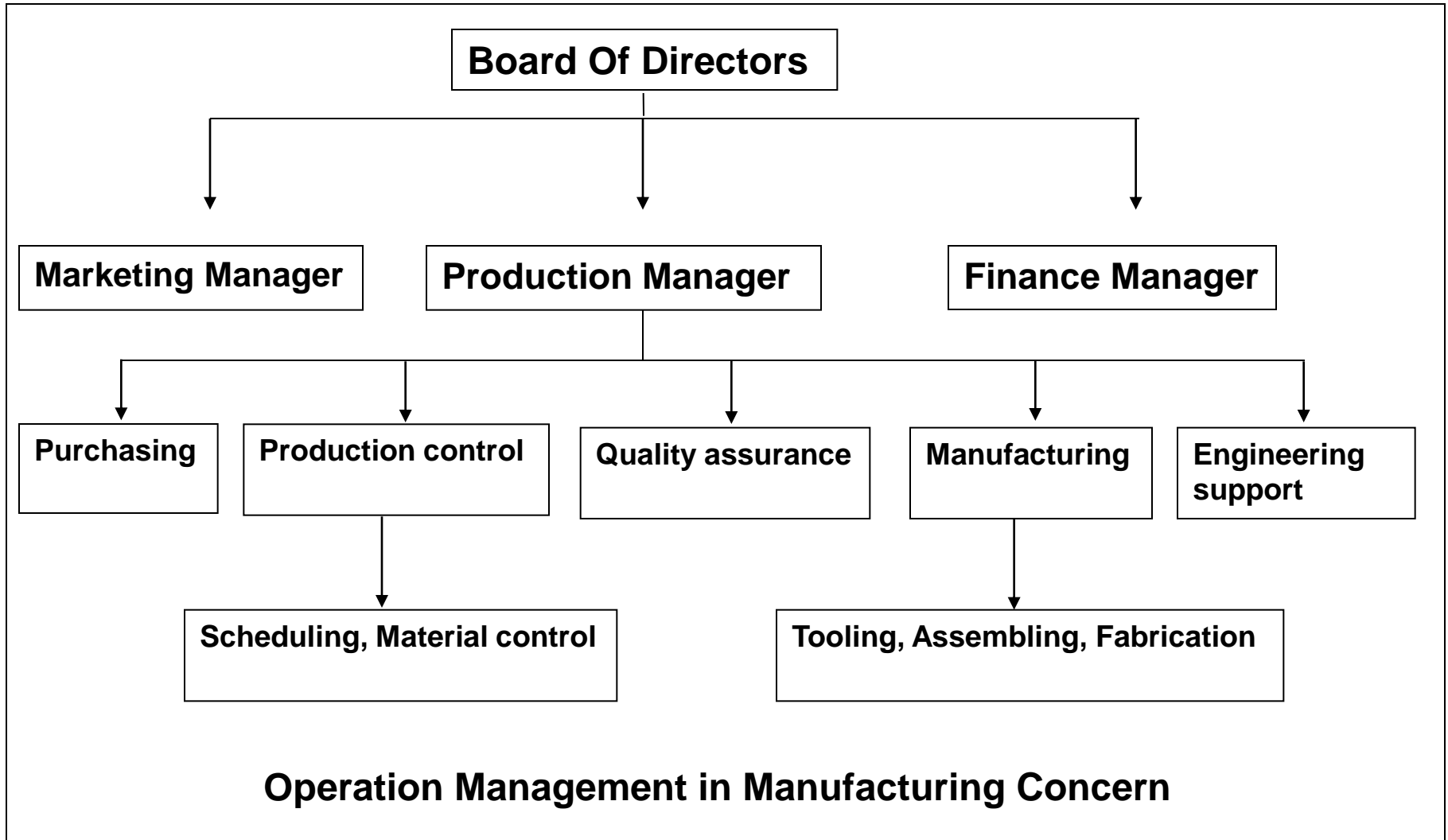
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- **The Operation manager's job is to manage the process of converting inputs into desired outputs**

E.E. Adam & R.J. Ebert

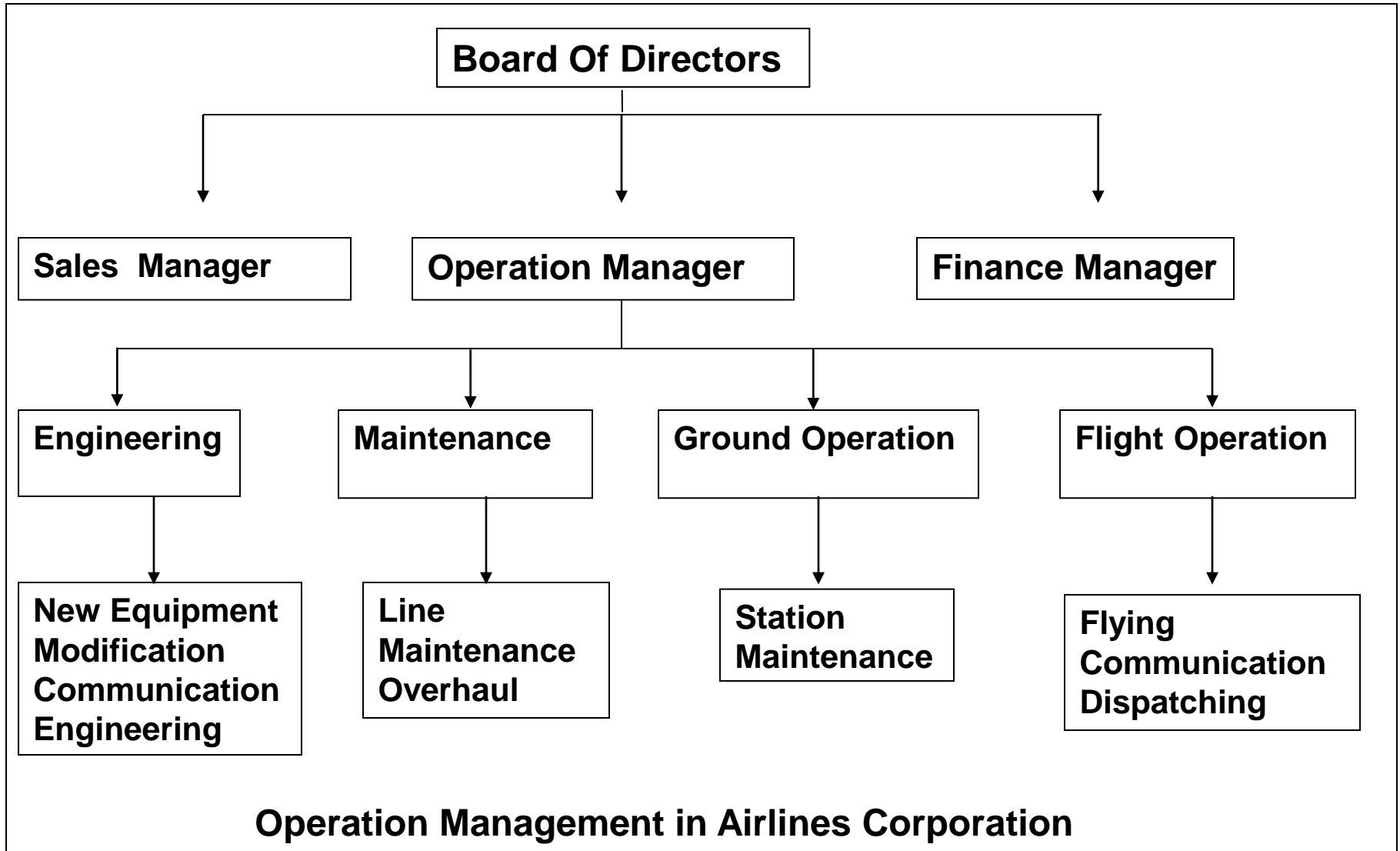
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Operation management in organization chart



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Operation management in organization chart



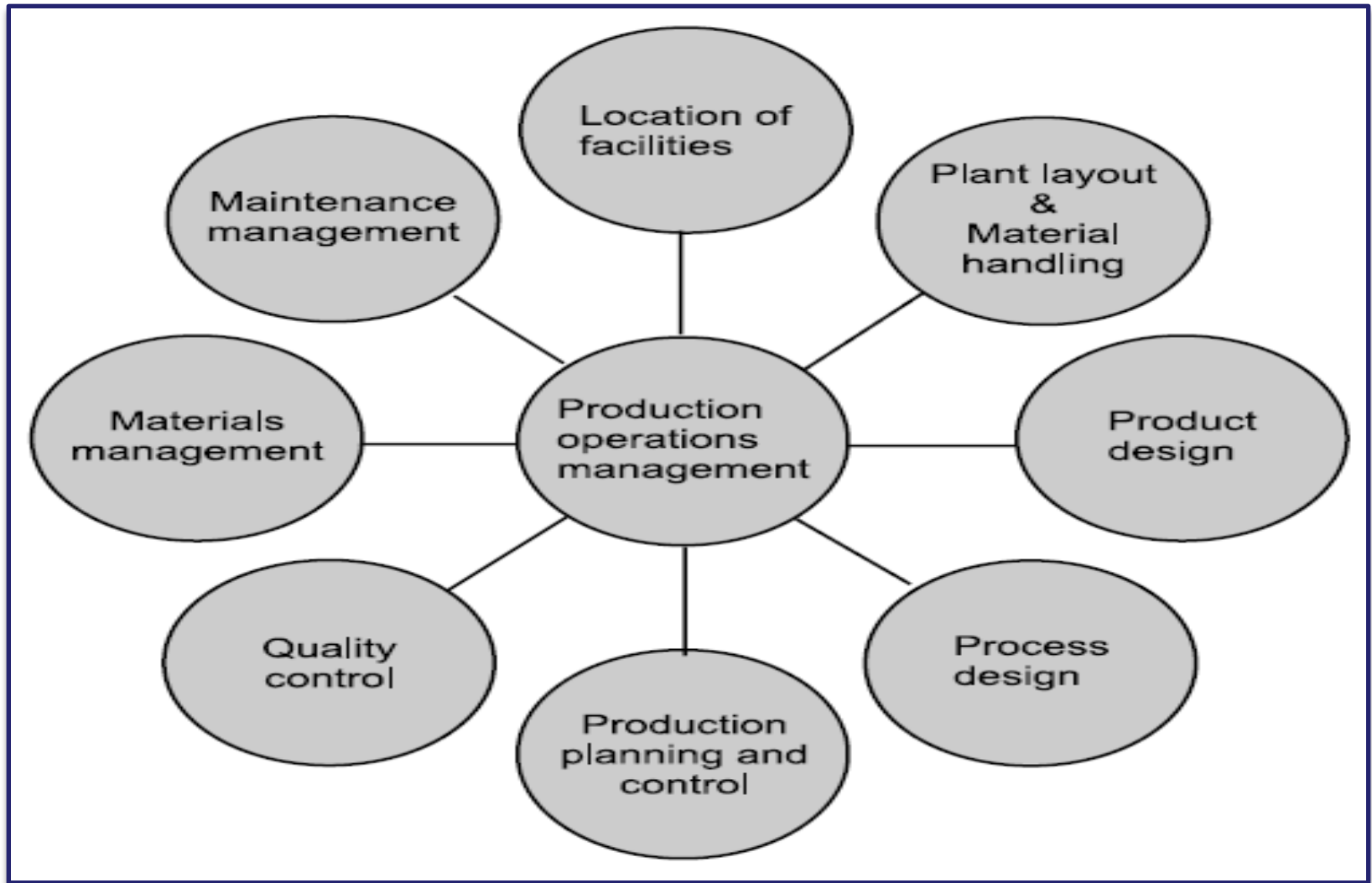
Scope of Operation Management

The scope of operations management ranges across the organization. Operations management people are involved in product and service design, process selection, selection and management of technology, design of work systems, location planning, facilities planning, and quality improvement of the organization's products or services.

Scope of Operation Management

- Following are the activities, which are listed under Production and Operations Management functions:
 1. Location of facilities.
 2. Plant layouts and Material Handling.
 3. Product Design.
 4. Process Design.
 5. Production and Planning Control.
 6. Quality Control.
 7. Materials Management.
 8. Maintenance Management.

Scope of Operation Management



Importance of Operation Management

Operations management is the business function that is responsible for managing and coordinating the resources needed to produce a company's products and services. Without operations management there would be no products or services to sell. Operations management is responsible for a wide range of decisions. They range from strategic decisions, such as designing the unique features of a product and process, to tactical decisions, such as planning worker schedules.

Importance of Operation Management

- It can reduce the costs of producing products and services and being efficient;
- It can increase revenue by increasing customer satisfaction through good quality and service;
- It can reduce the amount of investment (sometimes called *capital employed*) that is necessary to produce the required type and quantity of products and services by increasing the effective capacity of the operation and by being innovative in how it uses its physical resources;
- It can provide the basis for *future* innovation by building a solid base of operations skills and knowledge within the business.

Importance of Operation Management

- ***A business education is incomplete without an understanding of modern approaches to managing operations.***
- ***Operations management provides a systematic way of looking at organizational processes. OM uses analytical thinking to deal with real-world problems. It sharpens our understanding of the world around us whether we are talking about how to expand globally or how many lines to have at the bank teller's window.***
- ***Operations management presents interesting career opportunities. These can be in direct supervision of operations as a staff positions in OM specialties such as supply chain management, purchasing and quality assurance. In addition, consulting firms regularly recruits individuals having strong OM capabilities such as process reengineering and enterprise resource planning.***
- ***The concepts and tools of OM are widely used in managing other functions of a business. All the managers have to plan work, control quality and ensure productivity of individuals under their supervision. Other employees must know how operations work to effectively perform their jobs.***

Scope of Operation Management

What: What resources will be needed, and in what amounts?

When: When will each resource be needed? When should the work be scheduled? When should materials and other supplies be ordered? When is corrective action needed?

Where: Where will the work be done?

How: How will the product or service be designed? How will the work be done (organization, methods, equipment)? How will resources be allocated?

Who: Who will do the work?

Operation Management

Operation Management

- **Operation Management refers to Management process of transformation of resources into goods and serves.**

Following are the functions of OM

- **Planning**
- **Organizing**
- **Controlling**
- **Behavior**
- **Modeling**

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Planning:

Planning is a process which determines that when to do a work? What to do? Who does it? Where to do? a work. Planning define operational policy, programmes, operational strategies and procedure for attaining the operational objectives. Therefore it includes product planning and designing, facility planning and layout for conversion process.

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Organizing:

Organization refers the structural relationship between authority and responsibility. Operation Manager determine task and authorities of each individual as well as work centers to achieve operational goal and objectivities.

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Controlling:

Effective control is essential to achieve operational goals and objectives. Operation manager control all the activities comparing actual performance with the standards for corrective actions. Controlling may concern with cost, quality and schedule.

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Behavior:

An analytical study on the behaviors of workers is essential for successful organization. Behavior of workers and employees are affected by planning, scheduling and controlling activities. Therefore POM should select the best POC

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Modeling:

POM have to face different types of problems while managing conversion process. In order to overcome such problems they use mathematical and quantitative techniques in decision making such as network analysis, liner programming, queuing theory etc.

Competitiveness

- To succeed, they would have to compete globally.
- To compete globally, they would have to produce goods of world class quality, which meant producing better goods but at reasonable, competitive prices.
- How effectively an organization meets the wants and needs of customers relative to others that offer similar goods or services

Driving force of competitiveness

- Sense of urgency for survival
- Vision, leadership
- Competitive environment
- Customers' sophistication
- Quality/competitiveness of support services
- Policy and structural frameworks, etc.

Businesses Compete Using Operations

- Product and service design
- Cost
- Location
- Quality
- Quick response

Businesses Compete Using Operations

- Flexibility
- Inventory management
- Supply chain management
- Service and service quality
- Managers and workers

Why Some Organizations Fail

- Too much emphasis on short-term financial performance
- Failing to take advantage of strengths and opportunities
- Neglecting operations strategy
- Failing to recognize competitive threats

Why Some Organizations Fail

- Too much emphasis in product and service design and not enough on improvement
- Neglecting investments in capital and human resources
- Failing to establish good internal communications
- Failing to consider customer wants and needs

Trends of Operation Management

(i) Manufacturing Management:

It was the era of recognizing benefit of work specializing in manufacturing system.

The pioneer of this era was "Adam Smith" who gave the concept of traditional manufacturing management by his published book "Wealth of nations" in 1776. He recommended for assignment jobs to the workers as per their performance, ability and knowledge.

Charles Babbage also supported Adam Smith by accepting the concept of job design in 1832 by his published book 'The economics of manufactures'.

F.W. Taylor emerged with efficient work technique and scientific management system in 1900. He also recommended following principles.

Scientific selection and training of employee.

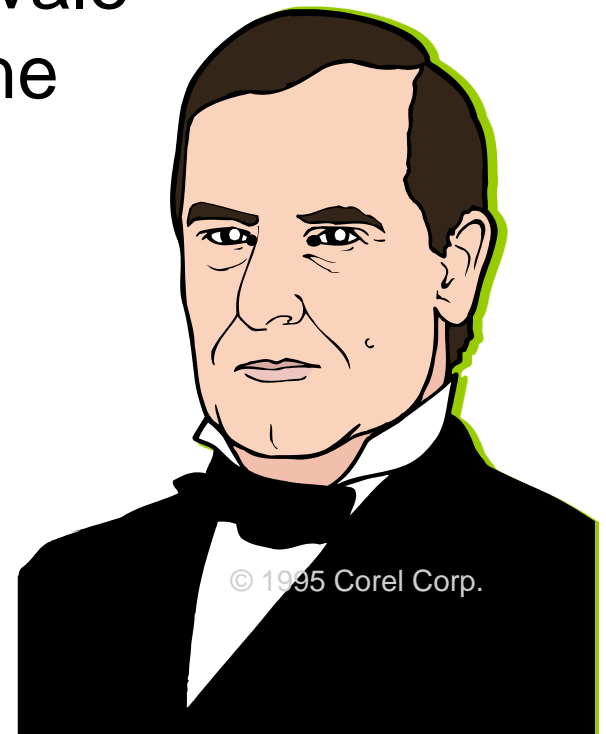
Specializing in work.

Harmony between management and Labor.

Time and motion study.

Frederick W. Taylor

- Born 1856; died 1915
- Known as 'father of scientific management'
- In 1881, as chief engineer for Midvale Steel, studied how tasks were done
 - Began first time & motion studies
- Created efficiency principles



Trends of Operation Management

(ii) Production Management:

It was the era between 1930 and 1950.

Under this era, managers developed many techniques and tools for decreasing wastage and increasing productivity.

Elton Mayo, Mary Parker Follet, Abraham Mallow and Douglas McGregor have contributed more to promote their theory regarding production management.

Focused on good working environment or quality of working life (QWL).

Managers started to study psychological, social and behavioral aspect of the workers.

Various models and techniques were introduced

Trends of Operation Management

(iii) Operations Management:

Started since 1970 and service product is also considered with physical product.

Whole organizations are classified into manufacturing organization and service organization.

Consumer oriented management system.

Concept of globalization is emerged.

Service should be attached with physical product on pre sales, during sales and after sales (post sales).

E-commerce through internet and World Wide Web.

Operation Management

- Production Vs Productivity

- **Production:** Production is understood as the volume or units of the product manufactured in a given time period.
- **Productivity** is defined as the relationship between the production of a good and the input used to create the output.

$$\text{Productivity} = \frac{\text{Production of the goods}}{\text{Inputs used to produce the goods}}$$

Productivity has direct relationship with production and inversely related with inputs resources.

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Difference between Production and Productivity

Description	Production	Productivity
Definition	It deals with conversion of inputs resources in to output of the production System	It is the ratio of the outputs of the system to inputs employed in the system.
Unit	It is expressed in Nos., Kgs, Meters, Tonnes, Kiloliters etc.	It is the ratio doesnot have any unit.
Utility	It satisfies the human needs and wants.	It is an management technique used to improve the efficiency and effectiveness of the production system.

Example 1: A manufacturing company has following data on input and output. Compare the different productivity over given periods.

Inputs and outputs	2068 (Rs)	2069 (Rs)
Raw materials	10000	15000
Capital equipments depreciations	1000	1250
Labor	8000	10000
Sales value	25000	29000

For 2068,

$$\text{Labor productivity} = \frac{\text{Total output}}{\text{Labour input}} = 3.125$$

$$\text{Capital Productivity} = \frac{\text{Total output}}{\text{Capital input}} = \frac{25000}{1000} = 25$$

$$\text{Raw material Productivity} = \frac{\text{Total output}}{\text{Total raw material used}} = \frac{25000}{10000} = 2.5$$

$$\text{Total Productivity} = \frac{\text{Total output}}{\text{Total input}} = \frac{25000}{19000} = 1.32$$

Example 1: A manufacturing company has following data on input and output. Compare the different productivity over given periods.

Inputs and outputs	2068 (Rs)	2069 (Rs)
Raw materials	10000	15000
Capital equipments depreciations	1000	1250
Labor	8000	10000
Sales value	25000	29000

For 2069,

$$\text{Labor productivity} = \frac{\text{Total output}}{\text{Labour input}} = \frac{29000}{10000} = 2.9$$

$$\text{Capital Productivity} = \frac{\text{Total output}}{\text{Capital input}} = \frac{29000}{1250} = 23.2$$

$$\text{Raw material Productivity} = \frac{\text{Total output}}{\text{Total raw material used}} = \frac{29000}{15000} = 1.93$$

$$\text{Total Productivity} = \frac{\text{Total output}}{\text{Total input}} = \frac{29000}{26250} = 1.04$$

Here, Partial productivities as well as total productivity are lower in 2069 with respect to 2068.

Scientific Management

- Principles 1881 Frederick W. Taylor
- Time / motion study 1911 Frank & Lillian Gilbreth
- Activity scheduling chart 1912 Henry Gant
- Economic order quantity 1917 Harris, Westinghouse
(“Wilson’s formula)
- Assembly line, mass production 1913 Henry Ford

- Hawthorne studies 1930 Elton Mayo
- Motivation theories 1940s Abraham Maslow
1950s Frederick Hertzberg

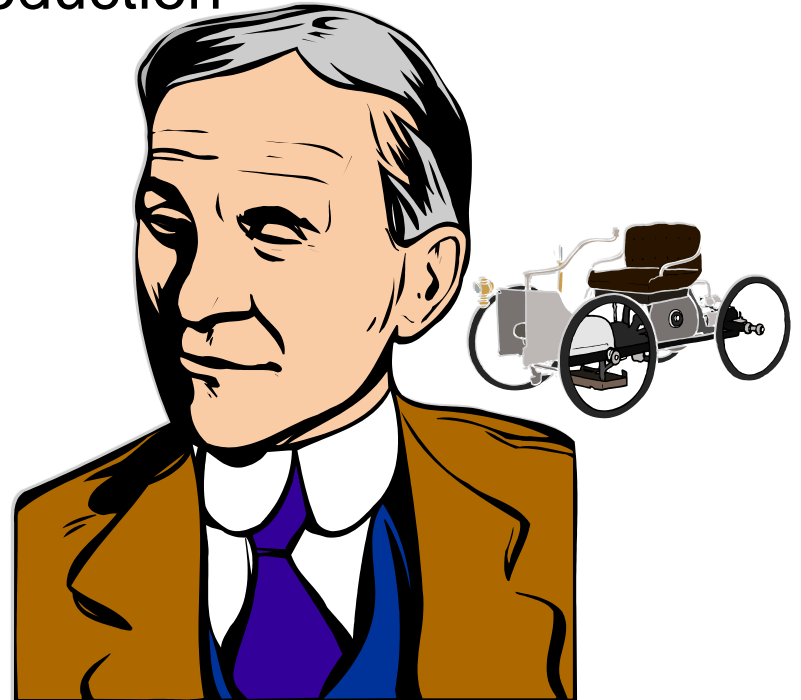
Scientific Management

- Develop a science for each element of a man's work
- Scientifically select, train, and develop each worker
- Heartily cooperate with workers to ensure all work is performed according to scientific management
- Ensure an almost equal division of work and responsibility between management and workers, according to their abilities
- Management should take more responsibility for
 - Matching employees to right job
 - Providing the proper training
 - Providing proper work methods and tools
 - Establishing legitimate incentives for work to be accomplished

Henry Ford

- Born 1863; died 1947
- In 1903, created Ford Motor Company
- In 1913, first used moving assembly line to make Model T
 - Unfinished product moved by conveyor past work station
- Paid workers very well for 1911 (\$5/day!)
- Reduced the lead time of car production from 728 h to 1.5 h!

'Make them all alike!'



Management Science

- Computer 1852 Charles Babbage
- Linear programming 1947 George Dantzig
- Digital computer 1951 Remington Rand
- Simulation, PERT/CPM, 1957 DuPont research groups
- Waiting line theory
- MRP 1960 Joseph Orlicky, IBM

The first production planning and control experts were expeditors (1950s)