Chapter 1

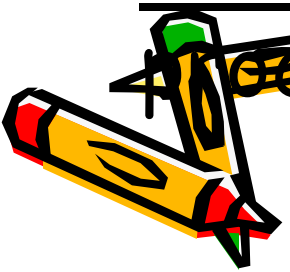
Production and Operations Management (POM): An Introduction

Overview

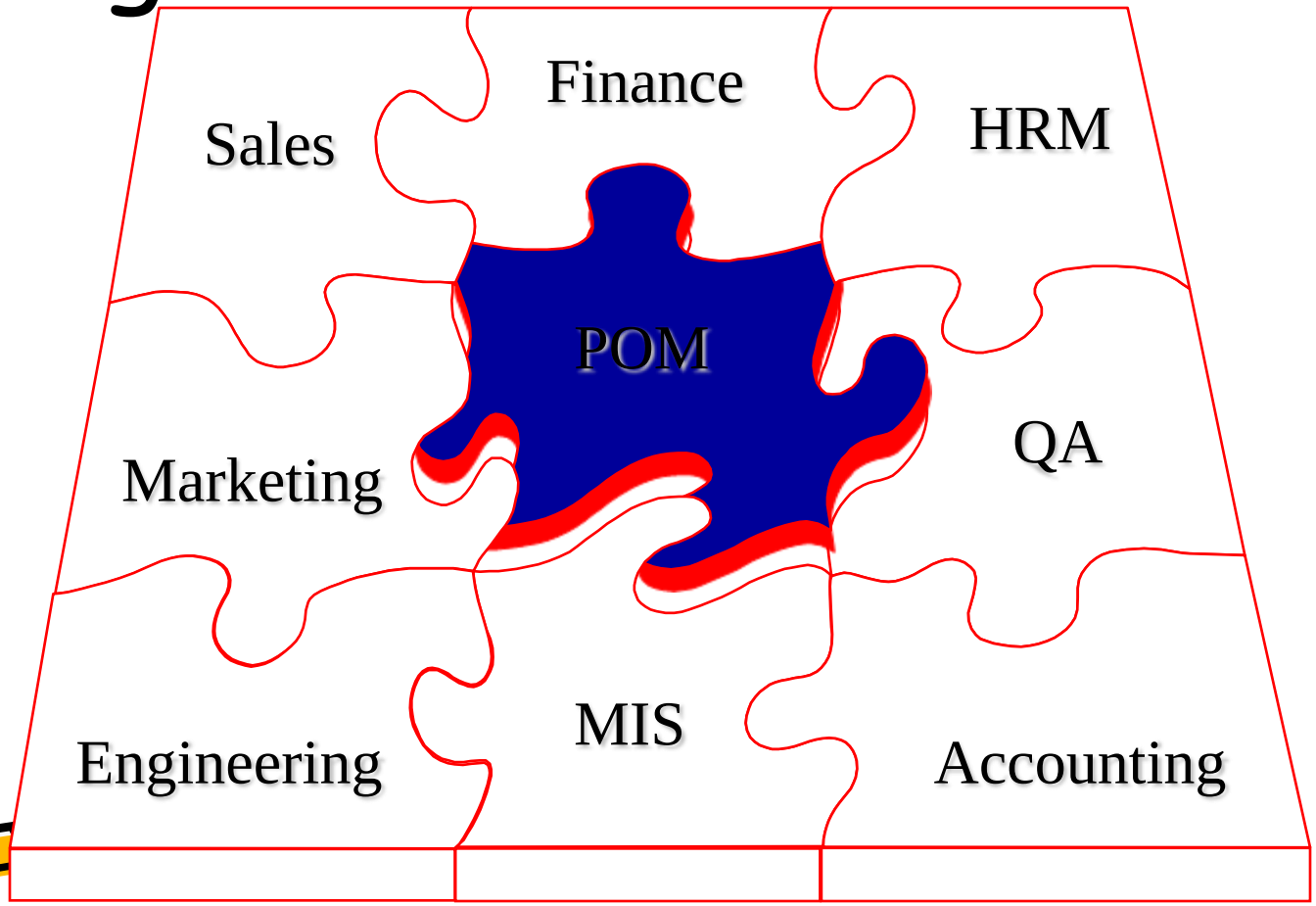
- Introduction
- Historical Milestones in POM
- Factors Affecting POM Today
- Different Ways of Studying POM
- Wrap-Up: What World-Class Producers Do

Introduction

- Production and operations management (POM) is the management of an organization's production system.
- A production system takes inputs and converts them into outputs.
- The conversion process is the predominant activity of a production system.
- The primary concern of an operations manager is the activities of the conversion process.



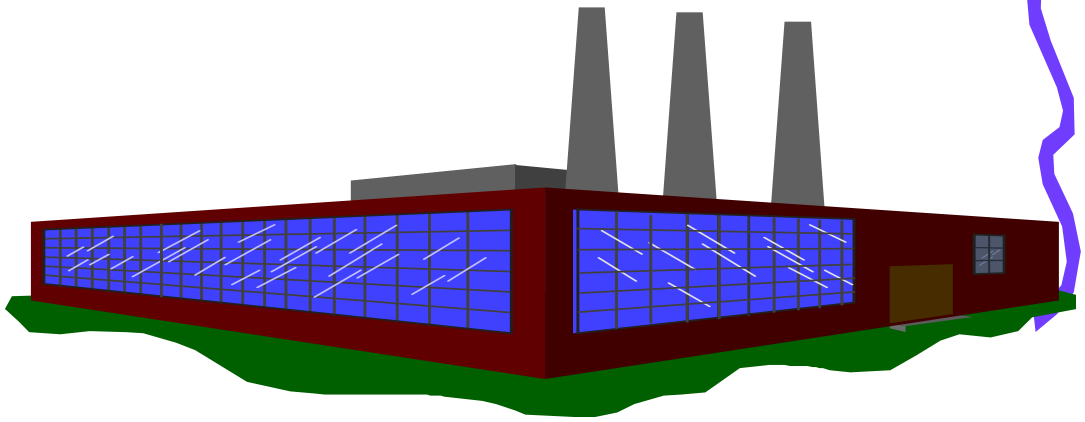
Organizational Model



Organization Chart-Major Elements

Manufacturing Organization

- Operations
- Finance/Accounting
- Marketing



Entry-Level Jobs in POM

- Purchasing planner/buyer
- Production (or operations) supervisor
- Quality specialist
- Production (or operations) scheduler/controller
- Production (or operations) analyst
- Inventory analyst

Historical Milestones in POM

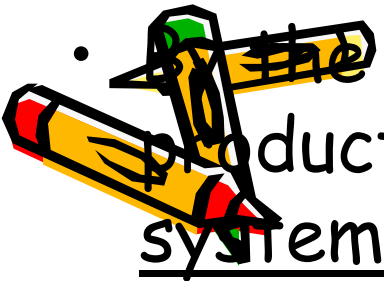
- The Industrial Revolution
- Post-Civil War Period
- Scientific Management
- Human Relations and Behaviorism
- Operations Research
- The Service Revolution

The Industrial Revolution

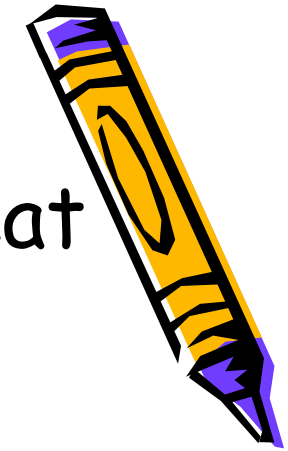
- The industrial revolution developed in England in the 1700s.
- The steam engine, invented by James Watt in 1764, largely replaced human and water power for factories.
- Adam Smith's *The Wealth of Nations* in 1776 touted the economic benefits of the specialization of labor.
- Thus the late-1700s factories had not only machine power but also ways of planning and controlling the tasks of workers.

The Industrial Revolution

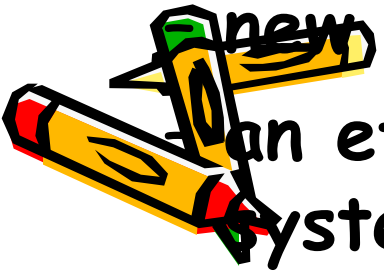
- The industrial revolution spread from England to other European countries and to the United Sates.
- In 1790 an American, Eli Whitney, developed the concept of interchangeable parts.
- The first great industry in the U.S. was the textile industry.
- In the 1800s the development of the gasoline engine and electricity further advanced the revolution.
- By the mid-1800s, the old cottage system of production had been replaced by the factory system



Post-Civil War Period

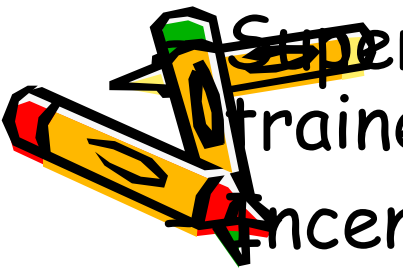


- During the post-Civil War period great expansion of production capacity occurred.
- By post-Civil War the following developments set the stage for the great production explosion of the 20th century:
  - **increased capital and production capacity**
  - **the expanded urban workforce**
  - **new Western U.S. markets**
  - **an effective national transportation system**



Scientific Management

- Frederick Taylor is known as the father of scientific management. His shop system employed these steps:
  - Each worker's skill, strength, and learning ability were determined.
  - Stopwatch studies were conducted to precisely set standard output per worker on each task.
  - Material specifications, work methods, and routing sequences were used to organize the shop.
  - Supervisors were carefully selected and trained.
  - Incentive pay systems were initiated.



Scientific Management

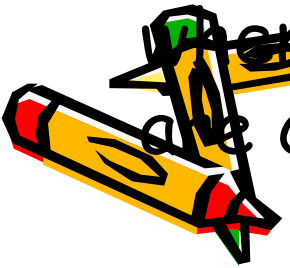
- In the 1920s, Ford Motor Company's operation embodied the key elements of scientific management:
  - standardized product designs
  - mass production
  - low manufacturing costs
  - mechanized assembly lines
  - specialization of labor
  - interchangeable parts

Human Relations and Behavioralism

- In the 1927-1932 period, researchers in the Hawthorne Studies realized that human factors were affecting production.
- Researchers and managers alike were recognizing that psychological and sociological factors affected production.
- From the work of behavioralists came a gradual change in the way managers thought about and treated workers.

Operations Research

- During World War II, enormous quantities of resources (personnel, supplies, equipment, …) had to be deployed.
- Military operations research (OR) teams were formed to deal with the complexity of the deployment.
- After the war, operations researchers found their way back to universities, industry, government, and consulting firms.
- OR helps operations managers make decisions when problems are complex and wrong decisions are costly.



The Service Revolution

- The creation of services organizations accelerated sharply after World War II.
- Today, more than two-thirds of the U.S. workforce is employed in services.
- About two-thirds of U.S. GDP is from services.
- There is a huge trade surplus in services.
- Investment per office worker now exceeds the investment per factory worker.
- Thus there is a growing need for service operations management.

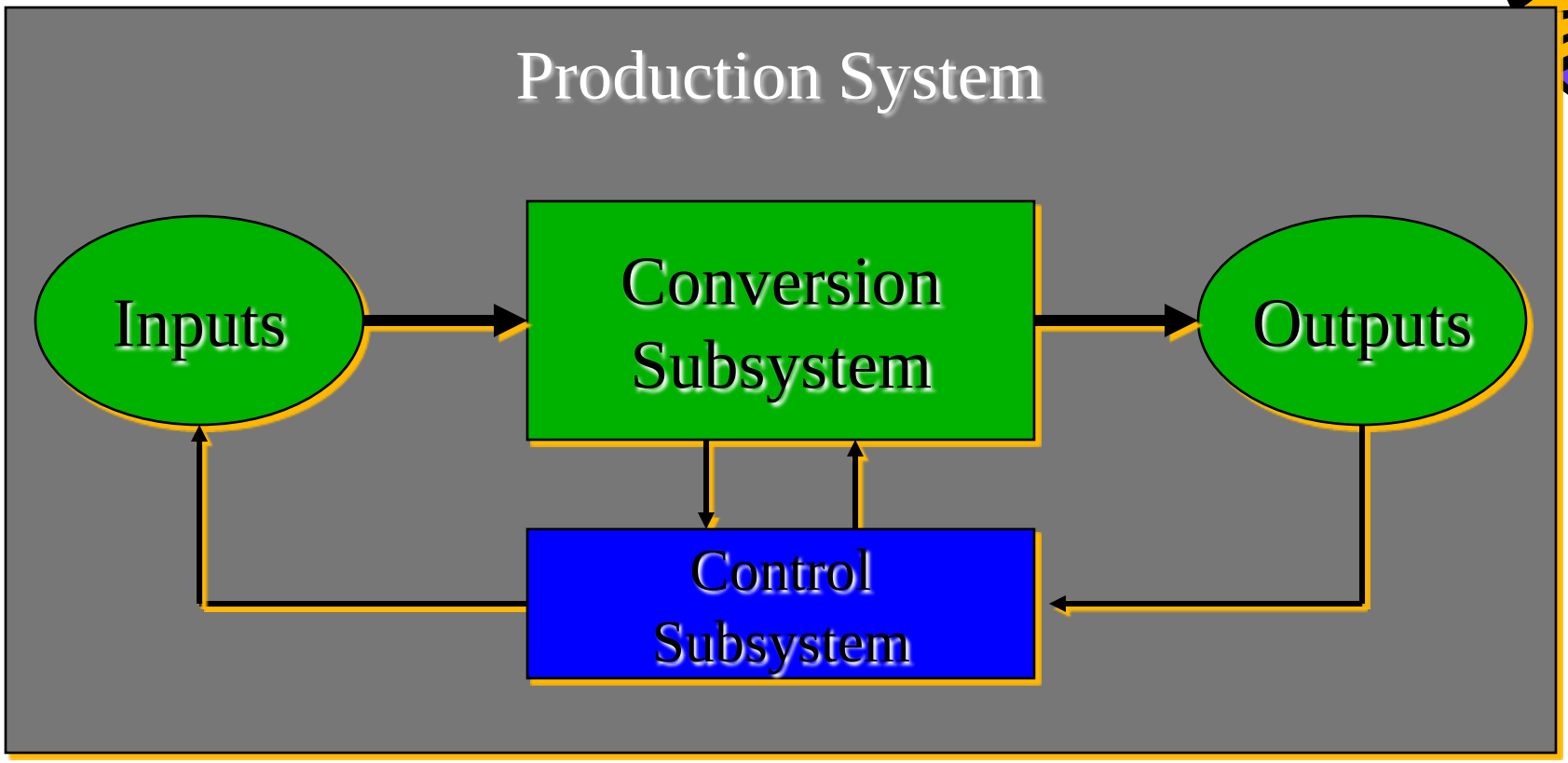
Today's Factors Affecting POM

- Global Competition
- U.S. Quality, Customer Service, and Cost Challenges
- Computers and Advanced Production Technology
- Growth of Indian Service Sector
- Scarcity of Production Resources
- Issues of Social Responsibility

Different Ways to Study POM

- Production as a System
- Production as an Organization Function
- Decision Making in POM

Production as a System

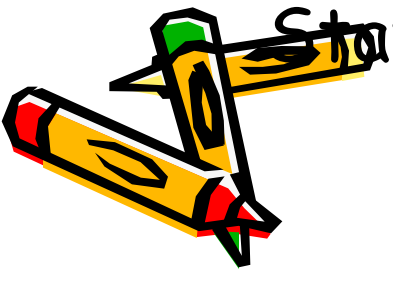


Inputs of a Production System

- External
  - Legal, Economic, Social, Technological
- Market
  - Competition, Customer Desires, Product Info.
- Primary Resources
  - Materials, Personnel, Capital, Utilities

Conversion Subsystem

- Physical (Manufacturing)
- Locational Services (Transportation)
- Exchange Services (Retailing)
- Storage Services (Warehousing)
- Other Private Services (Insurance)
- Government Services (Federal, State, Local)



Outputs of a Production System

- Direct
  - Products
  - Services
- Indirect
  - Waste
  - Pollution
  - Technological Advances

Production as an Organizational Function

- Companies cannot compete using marketing, finance, accounting, and engineering alone.
- We focus on POM as we think of global competitiveness, because that is where the vast majority of a firm's workers, capital assets, and expenses reside.
- To succeed, a firm must have a strong operations function teaming with the other organization functions.

Decision Making in POM

- Strategic Decisions
- Operating Decisions
- Control Decisions

Strategic Decisions

- These decisions are of strategic importance and have long-term significance for the organization.
- Examples include deciding:
  - the design for a new product's production process
  - where to locate a new factory
  - whether to launch a new-product development plan

Operating Decisions

- These decisions are necessary if the ongoing production of goods and services is to satisfy market demands and provide profits.
- Examples include deciding:
  - how much finished-goods inventory to carry
  - the amount of overtime to use next week
  - the details for purchasing raw material next month

Control Decisions

- These decisions concern the day-to-day activities of workers, quality of products and services, production and overhead costs, and machine maintenance.
- Examples include deciding:
  - labor cost standards for a new product
  - frequency of preventive maintenance
  - new quality control acceptance criteria

What Controls the Operations System?

- Information about the outputs, the conversions, and the inputs is fed back to management.
- This information is matched with management's expectations
- When there is a difference, management must take corrective action to maintain control of the system

Wrap-Up: World Class Practice

- POM important in **any** organization
- Global competition forces rapid evolution of POM
- Decision based framework focus of course
  - Strategic, Operating, and Control