Production / Operations Management

مدیریت تولید و عملیات

Lecture 1

Basic Business Functions

Finance
- Budgeting
- Economic analysis

Marketing
- Advertising
- Forecasting
- Pricing
- Order management
- Customer service

Production / Operations
- Forecasting
- Aggregate planning
- Production planning
- Production scheduling
- Capacity planning
- Inventory management
- Transportation
- Quality assurance
- Facility location

What Is Production / Operations Management?

The management of **systems** and **processes** that create goods and/or processes.

Example: An Airline Company

Systems: airplanes, airport facilities, and maintenance facilities.

Processes:

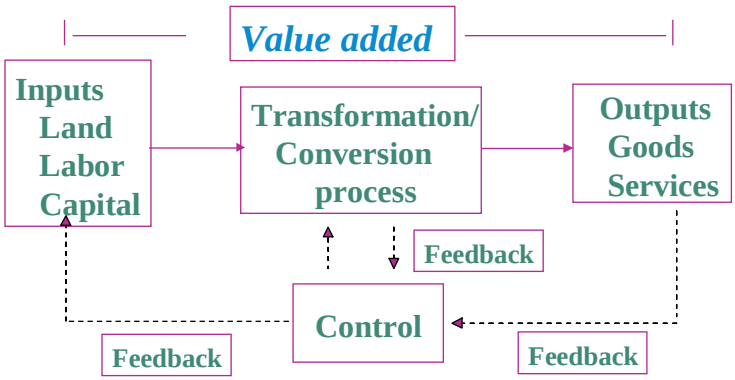
forecasting: weather, landing conditions, seat demand, air travel growth.
capacity planning: number of planes by locations and time.
scheduling: flights, maintenance, pilots, flight attendants, ground crews, counter staff, and baggage handlers.
inventory management: foods, beverages, 1st-aid equipment, in-flight magazines, pillows, blankets, and life preservers.
quality assurance: flying safety and efficiency and courtesy in check-in, reservation, and curb service.
facility location: maintenance facility locations and major/minor hubs.

Why Is Production / Operations Management Important?

- Core of all business organizations.
- Cover at least 35% of all jobs, including customer service, quality assurance, production planning and control, scheduling, job design, inventory management, logistics, and etc.
- Interrelated with other areas of business organizations.
- All about management and decision making.

Production / Operations Management Objective

Increase the added-value of a business, which is the difference between the cost of inputs and the value or price of outputs.



Example: Food Processing

Inputs	Processing	Outputs
Raw Vegetables	Cleaning	Canned vegetables
Metal Sheets	Making cans	
Water	Cutting	
Energy	Cooking	
Labor	Packing	
Building	Labeling	
Equipment		

Example: Hospital Service

Inputs	Processing	Outputs
Doctors, nurses	Examination	Healthy patients
Hospital	Surgery	
Medical Supplies	Monitoring	
Equipment	Medication	
Laboratories	Therapy	

Areas of Production / Operations Management

Typical Areas

- Procurement
- Forecasting
- Production Planning
- Material Requirement Planning
- Production Scheduling
- Inventory Planning
- Logistics, Location Planning and Analysis
- Quality

Special Areas

- Product and Service Design
- Process Selection
- Capacity Planning
- Work System Design
- Facility Layout
- Project Management
- Decision Making

Production / Operations Systems

- Degree of standardization: standardize vs. customized output.
- Type of operation: single, batch, and continuous operation.
- Production of goods vs. production of services.

Manufacturing vs. Service

Characteristic	Manufacturing	Service
Output	Tangible	Intangible
Customer contact	Low	High
Uniformity of input	High	Low
Labor content	Low	High
Uniformity of output	High	Low
Measurement of productivity	Easy	Difficult
Opportunity to correct quality problems	High	Low

Management and Decision Making

- Production / operations management is all about management and decision making in the following areas.

- **Planning**
  - Capacity
  - Location
  - Products / services
  - Make or buy
  - Layout
  - Projects
  - Scheduling
- **Controlling**
  - Inventory
  - Quality
- **Organizing**
  - Degree of centralization
  - Subcontracting
- **Staffing**
  - Hiring/laying off
  - Use of Overtime
- **Directing**
  - Incentive plans
  - Issuance of work orders
  - Job assignments

Decision Making

- Quantitative approaches. Linear programming, queuing technique, inventory planning, statistics, forecasting, and PERT/CPM.
- Trade-offs. Managers can add weights to reflect the relative importance of various factors on listed items.
- Systemic approaches. The output and objectives of a system take precedence over those of any one subsystem.
- Priorities. **Pareto phenomenon**: A few factors are very important; many factors are much less important.
- Ethics. Safety, quality, environment, and community.

Pareto Phenomenon

- A vital few things are important for reaching an objective or solving a problem.
- 80/20 Rule - 80% of problems are caused by 20% of the activities.

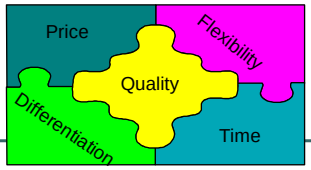
How do we identify the vital few?

High-Level Measures

- Productivity: An index that measures output relative to the input.

$$\text{Productivity} = \frac{\text{Outputs}}{\text{Inputs}}$$

- Competitiveness: How effectively an organization meets the needs of customers relative to others that offer similar goods or services.



Mission, Strategy, and Tactic

- Mission: The reason for existence for an organization.
  - Mission Statement: A clear statement of purpose.
- Strategy: A plan for achieving organizational goals.
- Tactics: The actions taken to accomplish strategies.

Mission, Strategy, and Tactics in Production / Operations Management

Strategy Formulation

- Take into account the realities of operations' strength and weakness.
  - Capitalizing on strength and dealing with weakness. (This is generally ignored in a business.)
- SWOT approach (strength, weakness, opportunity, and threat) critically examines factors that could have either positive or negative effects.

Strategy Formulation Trends

- Quality-based strategies focus on satisfying customers by integrating quality into all phases of the organization.
- Time-based strategies focus on reducing the time required to accomplish various activities.
  - The rationale is that, by reducing time, cost is generally less, productivity is higher, quality tends to be higher, product innovation appears on the market sooner, and customer service is improved.
  - A company that can bring out new products three times faster than its competitors enjoys a huge advantage.

Mission, Strategy, and Tactic Example

Rita is a high school student. She would like to have a career in business, have a good job, and earn enough income to live comfortably.

Mission:	Live a good life
Goal:	Successful career, good income
Strategy:	Obtain a college education
Tactics:	Select a college and a major
Operations:	Register, buy books, take courses, study, graduate, get job

SWOT Analysis

Strength Domain knowledge. Breadth of solution. Business strategy.	Opportunity Service to existing customers. Improve resource util. by integrating products. Strengths are our best weapons.
Weakness Lack of trans. knowledge. Frequent change of strategy. Lack of customer references. Overlapped products.	Threat Network effect of company X. Lack of product compatibility to legacy products. Multiple business acquisition consumes resource.

Recent Trends

- Globalization.
- Operations strategy.
- Total quality management (TQM), team approach, service, continuous improvement.
- Flexibility, agile manufacturing.
- Time reduction.
- Technology advance. Internet, e-Business, e-procurement, B2B.
- Re-engineering (starting over).
- Environmental issues.
- Corporate downsizing.
- Supply-chain management.
- Lean production.