# CHAPTER 17

Productivity and Quality in Operations

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## Operations Management

**The design, planning, and control of the factors that enable us to provide the product or service outputs of the organization.**

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## Operating Systems

**Low variety/High volume (Specific purpose)**

**High variety/Low volume (Flexible purpose)**


**Product orientation**

**Process orientation**

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## Manufacturing Systems

- **Repetitive Systems**
- **Continuous-Flow System**
- **Job-Shop System**
- **Project System**

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## Service Systems

- **Standard Service Systems**
- **Custom Service Systems**

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## Operations Management Decisions

- **Long-term**
- **Short-term**

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## Long-Term System Design Decisions

- **Choice of a product or service**
- **Product or service design**
- **System capacity**
- **Process selection**
- **Facility location**

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## Facility Layout

**The arrangement of the work areas and equipment so that inputs progress through the transformation process in as orderly a fashion as possible.**

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## Facility Layout Issues

- **Process layout**
- **Product layout**
- **Hybrid layout**
- **Fixed position layout**

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## Short-Term Decisions

- **Aggregate planning**
- **Master production schedule**
- **Inventory management**
- **Materials requirement planning**
- **Just-in-time inventory management**
- **Supply chain management**

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## Aggregate Planning

- **Customer demand**
- **Resources**
- **Costs**

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## Master Production Schedule

- **A detailed statement**
  - **Each item**
  - **Each time period**
- **A more detailed breakdown**

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## Inventory Management

- **Raw materials**
- **Work-in process**
- **Finished goods**
- **Supplies**

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## Materials Requirements Planning

**Methodology that uses the production schedule for the finished products to derive demand and production schedules for component items that make up the final product.**

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## Just-in-Time Inventory Management

- **Continual improvement in operations**
- **Reduce inventory**

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## Supply Chain Management (SCM)

- **Suppliers**
- **Warehouses**
- **Operations**
- **Retail outlets**

**. . . to synchronize functions**

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## Productivity

**A measure of the efficiency with which a firm transforms inputs into outputs, calculated as output divided by input.**

$$\text{Productivity} = \frac{\text{system outputs}}{\text{system inputs}}$$

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## Improving Productivity

- **Technology**
- **Diverse workforce**
- **Design**

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## Fundamentals of Quality

- **Quality Control (QC)**
- **Quality Assurance (QA)**
- **Total Quality Management (TQM)**

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## Assessing Quality

- **Product Factors**
- **Service Factors**

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## Cost of Quality

- **Prevention Costs**
- **Appraisal Costs**
- **Internal-Failure Costs**
- **External-Failure Costs**

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## TQM - Global Competitiveness

- **Customer-driven standards**
- **Management and labor commitment**
- **Organization and coordination of effects**
- **Employee participation**

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## Customer-Driven Standards

- External customer
- Internal customer

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## Management and Labor

- **Organizational culture**
  - **Embraced by top leaders**
  - **Communicated by leaders**

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## Organization and Coordination

- **Benchmarking**
- **Kaizen**

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## Employee Participation

- **Quality Circle**
- **Special-Purpose Team**

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## Quality Management Philosophers

- **W. Edwards Deming**
- **Joseph Juran**
- **Armand Feigenbaum**
- **Kaoru Ishikawa**
- **Philip Crosby**

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