PRODUCTION & OPERATIONS MANAGEMENT

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CHAPTER 1

OVERVIEW OF PRODUCTION & OPERATIONS MANAGEMENT

- Definition of production and operations
- Role in organizations
- Importance in competitiveness

DEFINITION OF PRODUCTION AND OPERATIONS

- ProductionProduction is the process of converting raw materials, labor, and resources into finished goods that satisfy customer needs.OperationsOperations refer to all activities involved in managing, controlling, and improving the processes that transform inputs into goods or services.

IN SIMPLE TERMS

- Production
- → What is made
- Operations
- → How it is made and delivered

KEY INPUTS AND OUTPUTS

- Inputs: Materials, labor, machines, capital, information
- Outputs: Goods or services with added value

TYPES OF PRODUCTION

- Primary production
- Secondary production
- Tertiary production

SCOPE OF OPERATIONS MANAGEMENT

- Production planning and control
- Quality management
- Inventory and capacity management
- Process and performance improvement

INDUSTRY CLASSIFICATION

- Manufacturing
- Service
- Craft and construction

INDUSTRIAL EVOLUTION

- Industry 1.0 to 5.0
- Technology-driven change

KEY CONCEPTS

- Lean production
- JIT
- TOC

ROLE OF PRODUCTION MANAGER

- Planning
- Control
- Resource management

CHAPTER 2

CAPACITY PLANNING

- Definition
- **Capacity Planning – Definition**
- **Capacity Planning** is the process of **determining the production capacity needed by an organization to meet changing demand** for goods or services over a specific period of time.
- Strategic importance

OBJECTIVES

- Ensure sufficient capacity to meet customer demand
- Balance demand and available resources
- Minimize operating costs and idle capacity
- Avoid overcapacity and undercapacity problems
- Support smooth production and service operations
- Assist long-term strategic and investment decisions

Strategic importance

- Determines the organization's **ability to meet future demand**
- Influences **long-term investment decisions** (plants, machinery, technology)
- Affects **cost structure and profitability**
- Supports **competitive advantage** through flexibility and reliability
- Reduces risks of **overcapacity and undercapacity**
- Aligns operational capacity with **business strategy**

TYPES OF CAPACITY PLANNING

- Long-term
- Medium-term
- Short-term

CAPACITY PLANNING PROCESS

- Demand forecasting
- Resource analysis

KEY THEORIES

- Theory of Constraints
- Resource allocation

CAPACITY CALCULATION

- Machine capacity
- Labor capacity

OVER & UNDER CAPACITY

- Overproduction
- Underproduction

PROCESS STRATEGY

- Definition
- Purpose

PROCESS TYPES

- Process focus
- Repetitive focus

PRODUCT FOCUS

- High volume production
- Low variety

PROCESS SELECTION

- Cost
- Flexibility
- Volume

PROCESS ANALYSIS

- Flow diagram
- Process chart

PROCESS IMPROVEMENT

- Efficiency
- Waste reduction

PRODUCT DESIGN

- Definition
- Importance

SERVICE DESIGN

- Customer focus
- Service quality

DESIGN PROCESS

- Idea generation
- Screening

DESIGN TOOLS

- CAD
- **CAD (Computer-Aided Design)**
- **Definition**
  CAD is the use of **computer software to create, modify, analyze, and optimize product or service designs**.
- Prototyping
- **Definition**
  Prototyping is the process of **creating a preliminary model or sample of a product or service** to test and evaluate its design before full-scale production.

SUSTAINABILITY

- Eco-design
- Green products

DESIGN CHALLENGES

- Cost
- Market fit

LAYOUT STRATEGY

- Definition
- Objectives

CHAPTER 3

LAYOUT TYPES

- Process layout
- Product layout

FIXED POSITION LAYOUT

- Large projects
- Construction

OFFICE LAYOUT

- Information flow
- Employee productivity

RETAIL LAYOUT

- Customer behavior
- Sales maximization

LAYOUT IMPROVEMENT

- Efficiency
- Cost reduction

LOCATION STRATEGY

- Definition
- Importance

FACTORS AFFECTING LOCATION

- Cost
- Accessibility

MANUFACTURING LOCATION

- Labor
- Transportation

SERVICE LOCATION

- Customer proximity

GLOBAL LOCATION

- Risk
- Supply chain

LOCATION DECISION

- Long-term impact

CHAPTER 4

INVENTORY MANAGEMENT

- Definition
- Objectives

TYPES OF INVENTORY

- Raw materials
- Finished goods

INVENTORY COSTS

- Holding
- Ordering

INVENTORY MODELS

- EOQ
- ABC analysis

JUST-IN-TIME

- Low inventory
- Efficiency

INVENTORY CONTROL

- Balance supply and demand

CHAPTER 5

QUALITY MANAGEMENT

- Definition
- Importance

QUALITY CONCEPTS

- Customer satisfaction

QUALITY TOOLS

- TQM
- Six Sigma

QUALITY CONTROL

- Inspection
- Standards

CONTINUOUS IMPROVEMENT

- Kaizen

QUALITY BENEFITS

- Cost reduction
- Competitiveness

CHAPTER 6

PRODUCTIVITY

- Definition
- Importance

PRODUCTIVITY MEASUREMENT

- Output/Input

TYPES OF PRODUCTIVITY

- Labor
- Machine

PERFORMANCE MEASUREMENT

- KPIs
- KPIs (Key Performance Indicators)DefinitionKPIs are measurable indicators used to evaluate how effectively an organization, department, or process achieves its objectives.

PURPOSE OF KPIS

- Monitor performance and progress
- Support decision-making
- Align operations with strategic goals
- Identify problems and improvement areas

COMMON KPIS IN PRODUCTION & OPERATIONS

- **Productivity Rate** = Output ÷ Input
- **Cycle Time** = Time to complete one process
- **Capacity Utilization (%)**
- **Defect Rate / Error Rate**
- **On-Time Delivery Rate**
- **Inventory Turnover**

IMPROVEMENT METHODS

- Technology
- Training

STRATEGIC IMPACT

- Competitiveness
- Growth