

Introduction to Operations Management

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Key concepts, objectives, and tools for managing the production of goods and services.

1. What Is Operations Management (OM)?

Aspect	Description
Definition	The planning, organizing, directing, and controlling of resources and processes that transform inputs (materials, labor, information) into outputs (goods or services).
Scope	• Design of products & services • Process design & improvement • Capacity planning • Supply chain & logistics • Quality management • Inventory control • Scheduling & workforce management
Position in the Firm	Bridges strategy (what the firm wants to achieve) and execution (how it delivers). Works closely with marketing, finance, R&D, and HR.

2. Core Objectives of Operations Management

Objective	Why It Matters
Efficiency	Minimize resource use (time, material, labor) while maintaining output levels.
Effectiveness	Deliver the right product/service at the right time, meeting customer expectations.
Flexibility	Adapt quickly to changes in demand, technology, or supply conditions.
Quality	Ensure products/services meet defined standards and reduce defects.
Cost Control	Keep production costs competitive without sacrificing quality.
Sustainability	Reduce waste, energy use, and environmental impact.

3. Major Decision Areas

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Decision Area	Typical Questions
Product & Service Design	What should we offer? Which features add value?
Process Design	What steps convert inputs to outputs? Should we use batch, continuous, or project?based processes?
Capacity Planning	How much capacity is needed? Should we expand, outsource, or use overtime?
Location & Layout	Where should facilities be located? How should workstations be arranged?
Supply?Chain Management	Who supplies raw materials? How do we coordinate deliveries?
Inventory Management	What safety stock level is optimal? Which inventory model fits (EOQ, JIT, periodic review)?
Scheduling	Which jobs run when? How do we allocate labor and machines?
Quality Management	How do we measure quality? Which improvement methodology (Six Sigma, TQM) to use?

4. Common Analytical Tools & Techniques

Tool	Purpose	Typical Output
Process Flowchart	Visualize steps, identify bottlenecks	Process map
Value?Stream Mapping	Highlight value?adding vs. non?value?adding activities	Lean improvement opportunities
Forecasting Models (moving average, exponential smoothing, ARIMA)	Predict future demand	Demand forecast
Linear Programming	Optimize resource allocation under constraints	Optimal production mix
Economic Order Quantity (EOQ)	Determine ideal order size to minimize total cost	Order quantity

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Tool	Purpose	Typical Output
Just-In-Time (JIT)	Reduce inventory & waste	Pull-based production schedule
Six Sigma DMAIC (Define?Measure?Analyze?Improve?Control)	Reduce variation & defects	Process improvement plan
Simulation (Monte Carlo, discrete event)	Test system performance under uncertainty	Performance metrics (throughput, lead time)
Balanced Scorecard	Align operations with strategic goals	KPI dashboard

5. The Operations Management Cycle

1. **Strategic Planning** – Set long-term goals (e.g., cost leadership, differentiation).