

# Overview of Operations Management

## Overview of Operations Management

(A concise, easy-to-read guide for students and professionals)

### 1. What Is Operations Management (OM)?

| Aspect     | Description                                                                                                                                                                                                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Definition | The planning, organizing, directing, and controlling of resources and processes that produce goods or services.                                                                                                                                                                                  |
| Core Goal  | Deliver the right product/service, at the right time, in the right quantity, with the right quality, and at the lowest feasible cost. <ul style="list-style-type: none"><li>• Design of products &amp; services</li><li>• Process design &amp; improvement</li><li>• Capacity planning</li></ul> |
| Scope      | <ul style="list-style-type: none"><li>• Supply chain coordination</li><li>• Inventory management</li><li>• Quality control</li><li>• Scheduling &amp; workforce management</li><li>• Technology &amp; automation</li></ul>                                                                       |

### 2. Key Elements of Operations Management

| Element                 | Main Activities                                                   | Typical Tools/Techniques                                           |
|-------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| Product/Service Design  | Define features, specifications, and performance standards.       | QFD (Quality Function Deployment), Prototyping, CAD/CAM            |
| Process Design          | Map how work is performed; choose technology & layout.            | Process Flow Diagrams, Value Stream Mapping, Bottleneck Analysis   |
| Capacity Planning       | Determine the amount of resources needed to meet demand.          | Capacity Utilization Rate, Rough Cut Capacity Planning, Simulation |
| Supply Chain Management | Coordinate suppliers, manufacturers, distributors, and customers. | ERP, SCOR model, Vendor Managed Inventory (VMI)                    |

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| Element                           | Main Activities                                                         | Typical Tools/Techniques                                                       |
|-----------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Inventory Management              | Balance holding costs vs. stock? out risk.                              | EOQ, ABC analysis, Just?In?Time (JIT), Safety Stock calculations               |
| Quality Management                | Ensure products/services meet specifications and customer expectations. | Six Sigma, ISO 9001, Statistical Process Control (SPC), PDCA cycle             |
| Scheduling & Workforce Management | Allocate labor and equipment to tasks over time.                        | Gantt charts, CPM/PERT, Master Production Schedule (MPS), Heuristic algorithms |
| Continuous Improvement            | Ongoing efforts to enhance efficiency and effectiveness.                | Kaizen, Lean, Theory of Constraints (TOC), Total Productive Maintenance (TPM)  |

## 3. Strategic vs. Tactical vs. Operational Decisions

| Decision Level | Time Horizon  | Focus                                                                | Example                                                                       |
|----------------|---------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Strategic      | 3?10? years   | Long?term positioning, facility location, technology adoption        | Choosing a new plant site, investing in robotics                              |
| Tactical       | 1?3?years     | Medium?term resource allocation, capacity sizing, supplier contracts | Setting annual production volumes, negotiating long?term contracts            |
| Operational    | Daily? weekly | Day?to?day execution, scheduling, quality checks                     | Assigning workers to shifts, issuing work orders, monitoring line performance |

## 4. Common Operations Management Models

| Model                         | Purpose                                             | Core Formula / Concept                                                             |
|-------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------|
| Economic Order Quantity (EOQ) | Minimize total inventory cost (ordering + holding). | ( $EOQ = \sqrt{\frac{2DS}{H}}$ ) (D = demand, S = ordering cost, H = holding cost) |

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| Model                    | Purpose                                                             | Core Formula / Concept                                            |
|--------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------|
| <b>Bullwhip Effect</b>   | Explain demand amplification upstream in a supply chain.            | Variability ? as you move from retailer ? manufacturer ? supplier |
| <b>Four?Vs Framework</b> | Classify processes based on Volume, Variety, Variation, Visibility. | Guides process design and technology choice                       |
| <b>Little's Law</b>      | Relate throughput, inventory, and cycle time.                       | ( $L =$                                                           |