



# Introduction to Operations Management

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A comprehensive introduction to the principles, practices, and evolution of operations management in modern business environments.



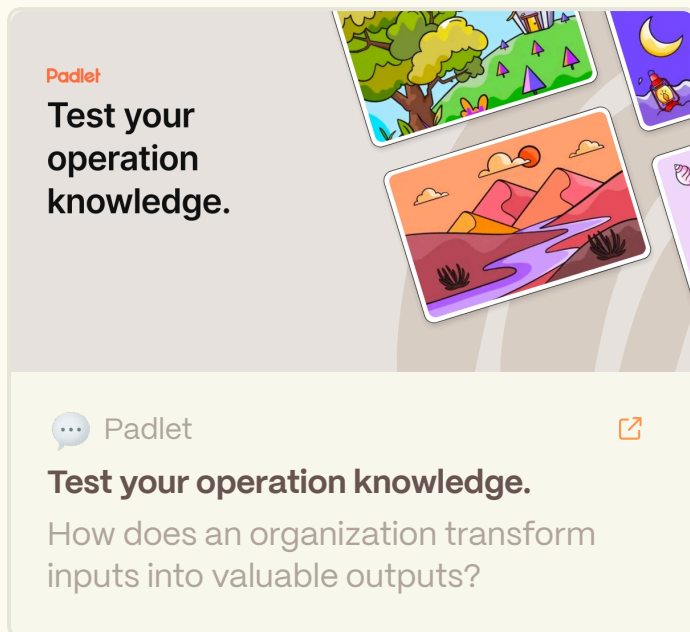
# Pre-Test: Your Operations Knowledge

Before we dive into the fundamentals of operations management, let's assess your current understanding of how organizations transform inputs into valuable outputs.

O1

## Visit Padlet

Navigate to



O2

## Organize a Group

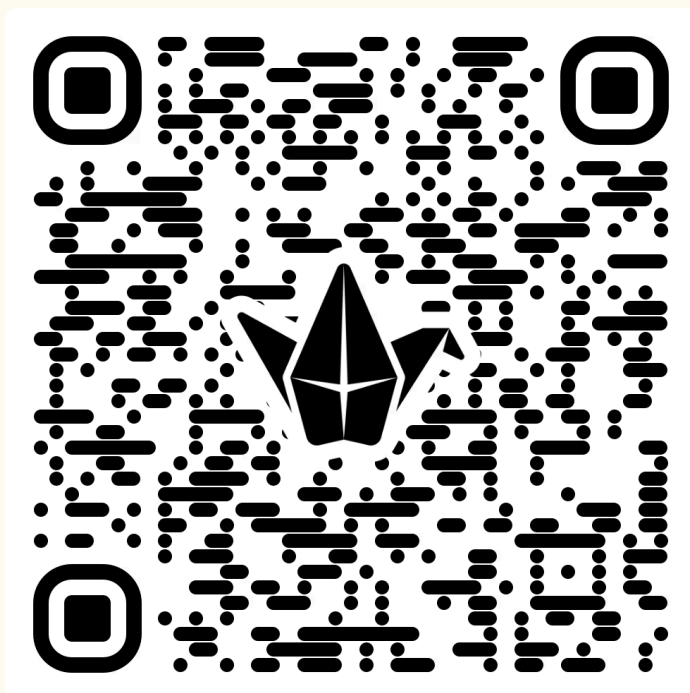
- Arrange a group of 4 people
- Select only 1 type of industry from those 4 types shown in the Padlet
- 20 minutes for the discussion

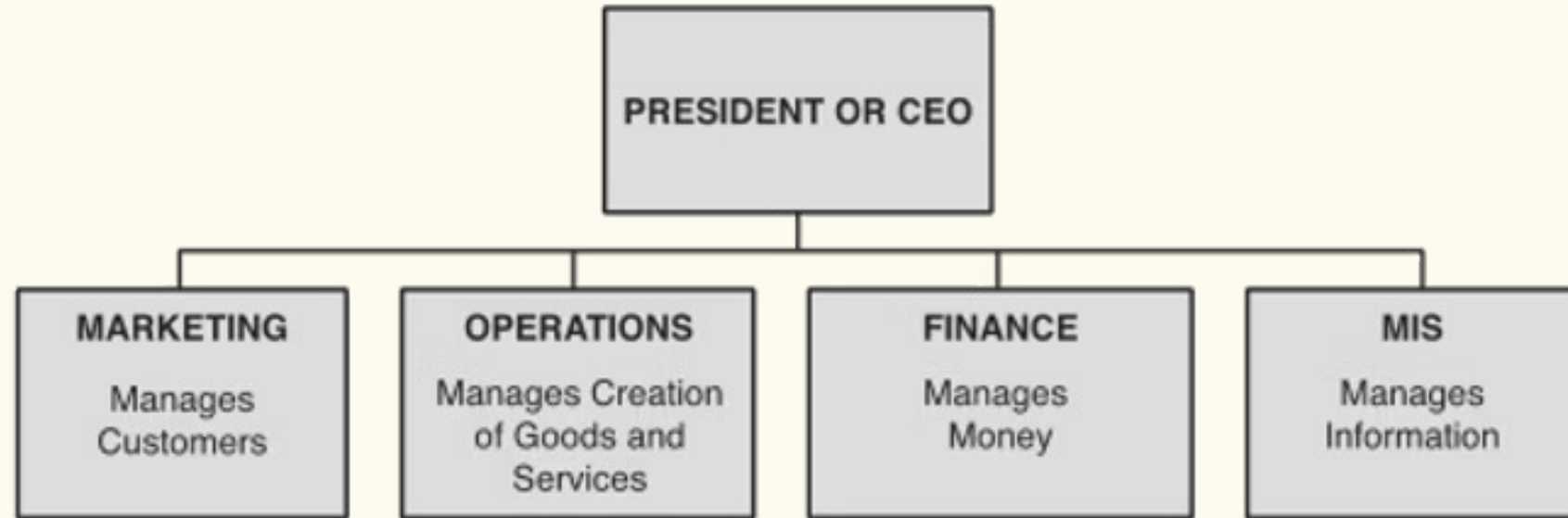
O3

## Share Your Ideas

Contribute your thoughts on how that company transforms **inputs** into **Outputs** by explaining its process.

or scan the QR code





# Understanding Business Structure

Every organization has a hierarchical structure that defines roles, responsibilities, and reporting relationships. Understanding this structure is essential for effective operations management, as it shows how different functional areas coordinate to achieve business objectives.

Operations management sits at the intersection of multiple business functions, coordinating resources across departments to deliver value to customers efficiently and effectively.



# Defining Operations Management

**Operations Management (OM) is the business function responsible for managing the process of creation of goods and services.**

At its core, operations management encompasses all activities involved in transforming inputs—such as materials, labor, and technology—into finished products or services that meet customer needs. This transformation process is central to every organization, whether manufacturing physical goods or delivering intangible services.

Operations managers orchestrate people, processes, and technology to ensure efficient production, consistent quality, and timely delivery while controlling costs and continuously improving performance.



# Eight Foundations of Operations Management

Successful operations management rests on eight fundamental pillars that guide decision-making and drive organizational performance. These interconnected foundations work together to create competitive advantage and sustainable business success.

## Planning

Forecast demand, plan capacity, and adjust processes dynamically to optimize operations based on changing market conditions

## Process Design

Production of goods or services requires establishing strong, repeatable, and scalable processes that ensure consistency

## Efficiency

Managers must identify and eliminate bottlenecks, address inadequate resources, and minimize downtimes to maximize productivity

## Cost Control

Manage production costs through strategic sourcing, waste reduction, and resource optimization without compromising quality

## Quality Management

Robust quality control is essential to maintain customer satisfaction, build brand reputation, and reduce costly defects

## Continuous Improvement

To remain competitive, companies need processes to consistently seek better ways of operating through innovation and learning

## Technology Integration

Strategic use of technology keeps companies ahead of competitors by enabling automation, data-driven decisions, and scalability

## Profitability

When executed properly, all foundations work together to create operational excellence and drive a strong financial bottom line



# The Transformation Role of Operations

Operations management performs a critical transformation role by converting various inputs into valuable outputs. This transformation process is what creates value for customers and differentiates successful organizations from their competitors.

The transformation combines both tangible and intangible resources to create customer value through operations.

## Tangible Inputs

- Physical plant and facilities
- Buildings and infrastructure
- Machinery and equipment
- Raw materials and components

## Intangible Inputs

- Organizational learning and knowledge
- Tacit knowledge and expertise
- Employee experience and skills
- Process innovations

Through strategic operations management, these diverse inputs are systematically transformed to create products and services that deliver superior value to end customers.

# Evolution of Operations Management

Operations management has evolved through the contributions of pioneering innovators who revolutionized how we think about production, efficiency, and quality. Their groundbreaking concepts form the foundation of modern operations practices.



Eli Whitney (1794)

Pioneered standardization and production quality through interchangeable parts in musket manufacturing



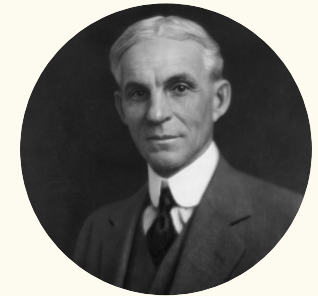
Frederick Winslow Taylor (1883)

Introduced scientific management and time-motion studies to maximize efficiency and productivity



Frank & Lillian Gilbreth (1912)

Developed predetermined motion time systems (PMTS) to analyze and optimize work movements



Henry Ford (1913)

Revolutionized manufacturing with the moving assembly line, dramatically reducing production time

# Eli Whitney: Father of Standardization



*Eli Whitney (1765-1825)*

In 1794, Eli Whitney invented the cotton gin using the revolutionary concept of **interchangeable parts**. He leveraged this innovation to secure a U.S. government contract to produce 10,000 muskets for the anticipated war with France.

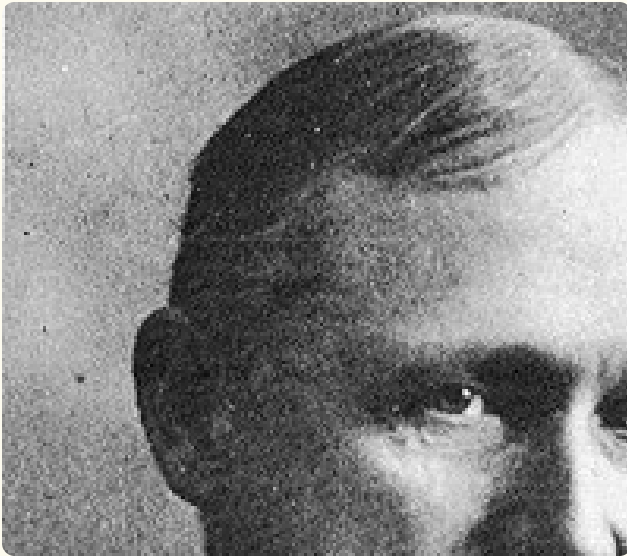
At that time, muskets were entirely handmade, with each component custom-fitted to a specific weapon. If a part broke, it couldn't be replaced without extensive custom machining. Whitney's breakthrough was developing new machine tools that allowed any part to fit any musket of the same model.

This innovation introduced the fundamental concepts of **standardization** and **quality control** to manufacturing, laying the groundwork for modern mass production techniques.

Source: <https://www.thoughtco.com/the-cotton-gin-and-eli-whitney-1992683>



# Scientific Management Pioneers



## Frederick Winslow Taylor (1883)

In 1883, Frederick Winslow Taylor revolutionized industrial efficiency by introducing the **stopwatch method** to time complex job tasks. His systematic approach to studying work became the foundation for analyzing efficiency and productivity in manufacturing environments.

Taylor's scientific management principles emphasized breaking down tasks into smaller components, studying each movement, and optimizing workflows to eliminate wasted time and effort.


 **Source:** <https://www.toolshero.com/toolsheroes/frederick-taylor/>



## Frank and Lillian Gilbreth (1912)

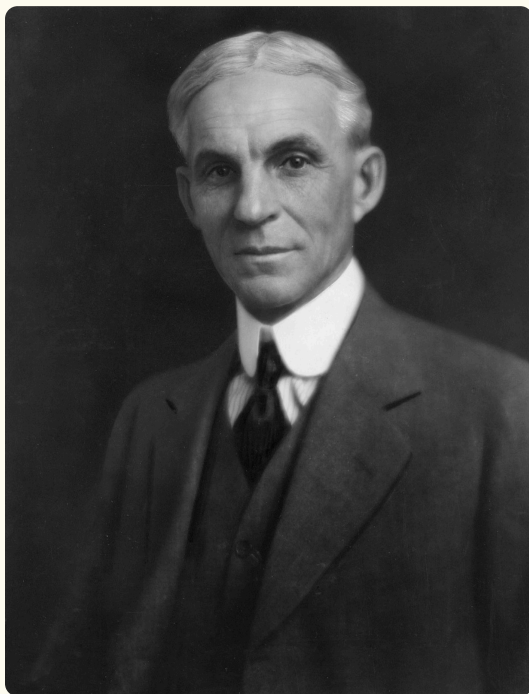
Around 1912, Frank and Lillian Gilbreth built upon Taylor's work by developing the foundation for **predetermined motion time systems (PMTS)**. These systems could predict the time required to complete specific tasks based on fundamental human motions.

The Gilbreths identified and categorized basic work movements, creating a systematic approach that enabled managers to design more efficient work processes before implementation.

 **Source:** <http://promrucsa-dba04.blogspot.com/2012/10/frank-gilbreth.html>



# Henry Ford: The Assembly Line Revolution



*Henry Ford (1863-1947)*

In 1913, Henry Ford's introduction of the **moving assembly line** transformed manufacturing forever. This groundbreaking innovation reduced the time required to produce a single automobile from 12 hours to less than three hours—a productivity improvement of over 75%.

Ford's assembly line concept divided the production process into simple, repetitive tasks performed by workers stationed along a moving conveyor. Each worker specialized in one specific operation, dramatically increasing efficiency and enabling mass production at unprecedented scale.

This revolutionary approach made automobiles affordable for average Americans and established principles that would dominate manufacturing for decades to come.



# Toyota: Lean Manufacturing Pioneer

In post-World War II Japan, **Toyota** faced severe resource constraints and developed an innovative production philosophy that would revolutionize global manufacturing. They created **just-in-time production (JIT)**, later formalized as the Toyota Production System (TPS).

The company designed this system with a singular focus: **eliminate waste and increase productivity and quality simultaneously**. Unlike traditional mass production, which emphasized building large inventories, Toyota's approach minimized inventory by producing only what was needed, when it was needed, and in the exact quantity required.

## Core Principles

- Continuous improvement (Kaizen)
- Respect for people
- Elimination of waste (Muda)

## Key Benefits

- Reduced inventory costs
- Improved quality control
- Faster response to customer needs

## Global Impact

- Adopted worldwide as "lean manufacturing"
- Transformed multiple industries
- Became foundation for modern operations



# The Critical Role of Operations Management

Operations management plays a pivotal role in organizational success, directly influencing performance across multiple dimensions. It is the function responsible for many critical decisions and activities that determine product design, delivery capabilities, and overall competitiveness.

## Resource Optimization

OM strongly influences how efficiently material resources are consumed in manufacturing goods or delivering services. Poor operations decisions can lead to excessive waste, inflated costs, and diminished profitability.

## Customer Alignment

Operations must ensure that what is produced actually matches what customers want. Misalignment between production capabilities and market needs leads to unsold inventory and dissatisfied customers.

## Inventory Management

Ensuring adequate inventory levels to meet production requirements and customer demand is a core responsibility. Too much inventory ties up capital; too little causes delays and lost sales.

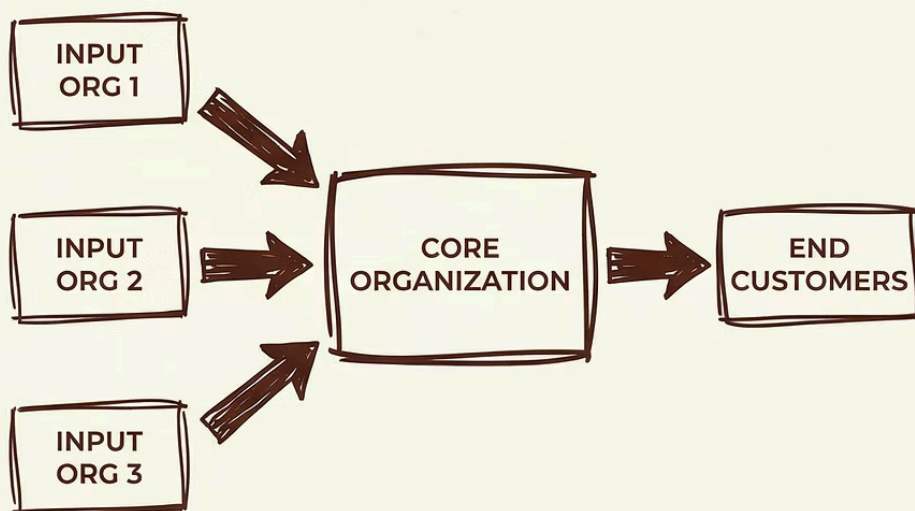
## Financial Impact

Many operational decisions carry significant cost implications. This is why operations management is often the first function executives turn to when seeking to improve performance and strengthen the financial bottom line.

# The Modern Extended Enterprise

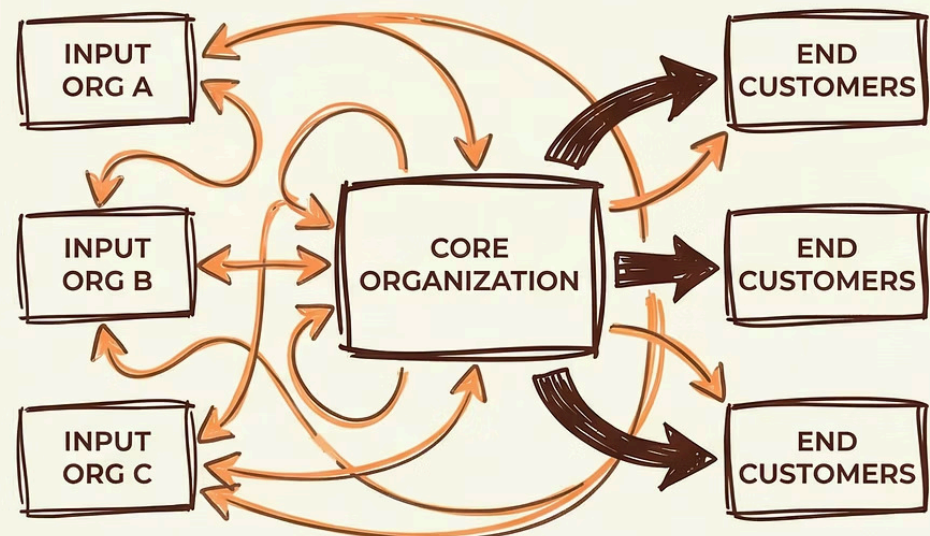
The modern era of operations management has fundamentally shifted from isolated organizational thinking to collaborative network models. Organizations now see themselves as integral parts of a wider, interconnected **extended enterprise**.

## TRADITIONAL MODEL (Non-Collaborative)



Isolated core with separate inputs; one-way flow.

## MODERN COLLABORATIVE MODEL (Interconnected)



Interconnected network; integrated flow and feedback.

In today's business environment, a network of collaborative partners links together to form an extended enterprise within an industry. These partnerships enable organizations to leverage specialized capabilities, share risks, and respond more quickly to market changes.

### Traditional Model

- Vertical integration
- Arm's-length supplier relationships
- Limited information sharing
- Competitive rather than collaborative

### Extended Enterprise Model

- Strategic partnerships
- Deep supplier collaboration
- Transparent information flows
- Shared goals and mutual success

# The Four Vs of Operations

Operations differ significantly across industries and organizations. Understanding these differences is crucial for designing appropriate operational systems. The **Four Vs framework** provides a systematic way to analyze and compare different types of operations.



## Volume

How many products or services does the operation produce? High-volume operations typically achieve economies of scale and lower unit costs.



## Variety

How many different types of products or services does the operation offer? Greater variety requires more flexibility but increases complexity.




## Variation

How much does the level of demand fluctuate over time? High variation in demand requires flexible capacity and responsive operations.



## Visibility

How much of the operation's internal workings are exposed to customers? High visibility operations require different management approaches.

 **Key Insight:** Operations at different positions on these four dimensions require fundamentally different management approaches and operational designs.

# Comparing Operations Using the Four Vs

The Four Vs framework reveals how different operations face unique challenges and opportunities. Operations whose profiles occupy the right-hand extreme of the dimensions—**high volume, low variety, low variation, and low visibility**—tend to operate at significantly lower cost than those at the opposite end of the spectrum.



## Bus Service vs. Taxi Service

**Volume:** Bus service has high volume (many passengers per trip), while taxi service has low volume (few passengers per trip)



## Jeans Shop vs. Department Store

**Variety:** Department stores offer high variety (thousands of products), while specialized jeans shops offer low variety (focused product range)



## Ice Cream vs. Bread Bakery

**Variation:** Ice cream sales show high variation (seasonal peaks in summer), while bread bakery demand has low variation (consistent daily demand)



## Music Teacher vs. Distance Learning

**Visibility:** Private music lessons have high customer contact (face-to-face interaction), while distance learning has low visibility (remote, automated delivery)



# Core Responsibilities of Operations Managers

Operations managers shoulder diverse responsibilities that span strategic planning, tactical execution, and continuous improvement. Their decisions directly impact organizational efficiency, quality, and competitive positioning.

## Value Management

Ensure every operational activity adds value for customers while minimizing waste and non-value-adding work

## Capacity Planning

Determine the right volume of production capacity to meet demand without excessive overcapacity or costly shortages

## Location Decisions

Select optimal locations for facilities, considering factors like labor costs, proximity to customers, and logistics efficiency

## Process Design

Define the nature, specifications, and methods for assembling or delivering products and services to customers

## Technology Management

Research, evaluate, and acquire appropriate equipment and technology to support operational objectives

## Human Resources

Develop and leverage human know-how, capabilities, and expertise to drive operational excellence

# Manufacturing vs. Service Operations

Although manufacturing and service operations share common operational principles, they differ fundamentally in ways that impact their management. Understanding these distinctions is essential for designing appropriate operational systems.




## Manufacturing Operations

- **Tangible output:** Physical products can be stored as inventory for later sale
- **Limited customer contact:** Customers typically have no direct contact with production processes
- **Longer response time:** Production can be planned in advance based on forecasts
- **Capital intensive:** Requires significant investment in equipment and facilities



## Service Operations

- **Intangible output:** Services cannot be produced ahead and stored; they're consumed as produced
- **High customer contact:** Customers have direct interaction with service providers during delivery
- **Short response time:** Services must be delivered immediately when customers demand them
- **Labor intensive:** Relies heavily on skilled personnel to deliver quality service experiences

 **Important Note:** While these distinctions are useful for analysis, most modern organizations blend manufacturing and service elements to create complete customer value propositions.

# Common Elements Across All Operations

Despite their differences, all operations—whether manufacturing or service—share fundamental similarities in their need for **transforming resources**. These resources fall into two categories: facilities and staff.

Examining three very different operations reveals how both facilities and staff function as essential transforming resources, regardless of industry or operational context.

Operation Type	Ferry Company	Paper Manufacturer	Radio Station
<b>Facilities</b>	<ul style="list-style-type: none"><li>• Ships and on-board navigation systems</li><li>• Dry docks for maintenance</li><li>• Port facilities</li></ul>	<ul style="list-style-type: none"><li>• Materials-handling equipment</li><li>• Paper-making machines</li><li>• Packing machinery</li><li>• Warehouses</li></ul>	<ul style="list-style-type: none"><li>• Broadcasting equipment</li><li>• Studios and studio equipment</li><li>• Transmitters and antennas</li></ul>
<b>Staff</b>	<ul style="list-style-type: none"><li>• Sailors and navigators</li><li>• Marine engineers</li><li>• Maintenance staff</li><li>• Catering staff</li><li>• Cleaners</li></ul>	<ul style="list-style-type: none"><li>• Machine operators</li><li>• Chemists and chemical engineers</li><li>• Process plant engineers</li><li>• Quality control specialists</li></ul>	<ul style="list-style-type: none"><li>• Disc jockeys</li><li>• Announcers and hosts</li><li>• Sound technicians</li><li>• Broadcast engineers</li></ul>

These examples illustrate that while the specific types of facilities and staff vary dramatically, the fundamental need for both categories of transforming resources is universal across all operations.



# The Manufacturing-Service Integration

A critical question emerges: Can we completely separate manufacturing from service? The answer is a resounding no. Today's business environment increasingly intertwines manufacturing and service operations.

The main insight is that **manufacturing and service operations often combine to provide a complete offer to customers** and other key stakeholders.

This integration is evident everywhere. Retail outlets—clearly service settings—are entirely dependent upon manufactured goods to sell. Conversely, manufactured goods increasingly depend on excellent service in retail outlets to reach and satisfy customers.

## The Automobile Example

The automobile industry is often viewed as purely manufacturing. However, for customers, after-sales service is critically important in the purchase decision. Warranty support, maintenance quality, and dealer relationships significantly influence brand loyalty and repeat purchases.

## The Restaurant Example

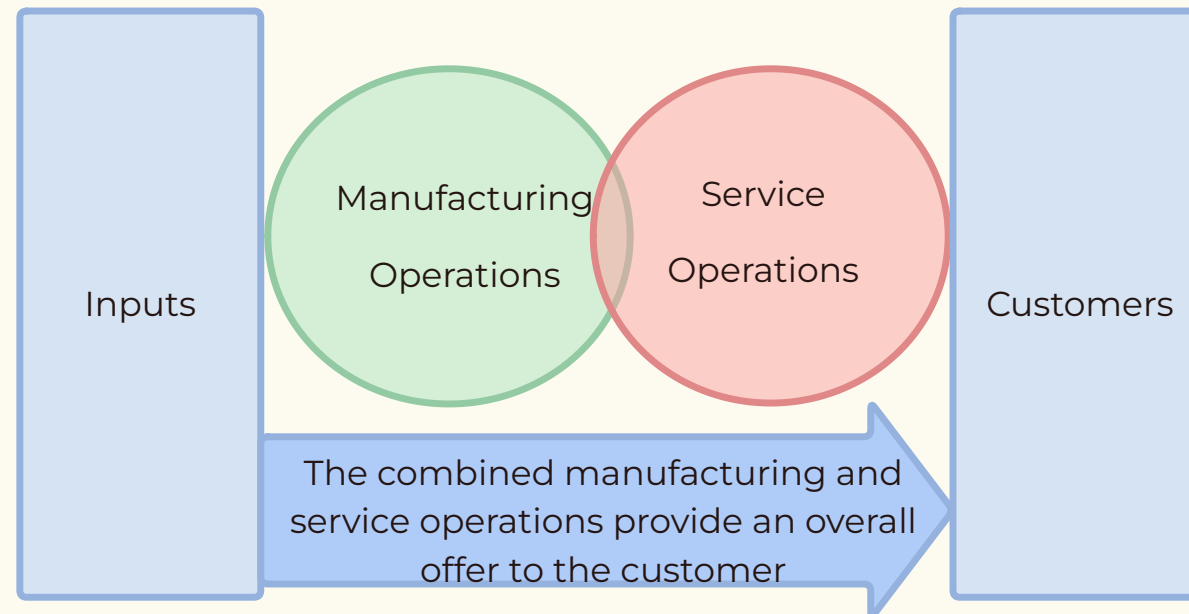
Restaurants obviously provide a service experience, but the quality of manufactured ingredients, equipment, and supplies is fundamental to their success. The food itself is a manufactured product that must meet strict quality standards.

## The Software Example

Software products are manufactured through development processes, but their success depends heavily on customer support services, training, updates, and user communities. Neither component alone creates sufficient value.

# The Combined Value Proposition

Understanding how manufacturing and service operations integrate to create customer value is essential for modern operations managers. The most successful organizations recognize that they must excel at both.



The combined manufacturing and service operations work together to provide an overall offer that exceeds what either could deliver independently. This integration creates **competitive differentiation** and superior customer value.

## Manufacturing Contribution

- Product quality and reliability
- Innovative features and design
- Cost-effective production
- Consistent specifications
- Supply availability

## Service Contribution

- Customer experience and interaction
- Customization and personalization
- After-sales support
- Training and education
- Problem resolution

# Quiz 1: Introduction to OM

Scan QR code or click the link



 waygroundai



**Wayground: Practice link**

Click the link to join now.

Or go to: [joinmyquiz.com](https://joinmyquiz.com)

and enter the join code: 30229494