

# Producing Quality Goods and Services

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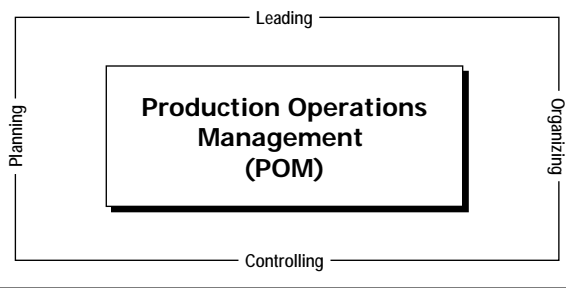
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## What Is Production?



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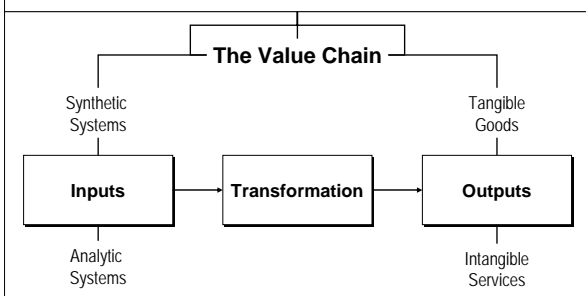
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## The Conversion Process



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## Input-Transformation-Output Relationships for Typical Systems

System	Inputs	Transformation Components	Transformation Function	Typical Desired Output
Hospital	Patients, medical supplies	M.D.s, nurses, equipment	Health care	Healthy individuals
Restaurant	Hungry customers, food	Chef, waitress, environment	Well-prepared & well-served food	Satisfied customers
Automobile Factory	Sheet steel, engine parts	Tools, equipment, workers	Fabrication & assembly of cars	High-quality cars
College or University	High School graduates, books	Teachers, classrooms	Impart knowledge & skills	Educated individuals
Department Store	Shoppers, stock of goods	Displays, sales clerks	Attract customers, promote products, fill orders	Sales to satisfied customers

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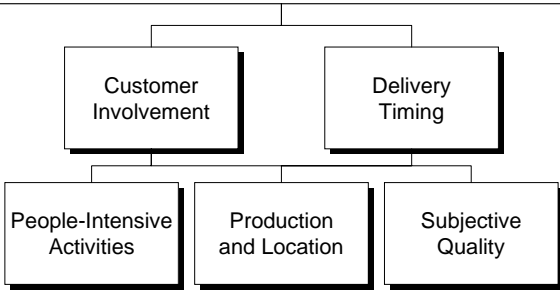
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## Challenges of the Service Industry



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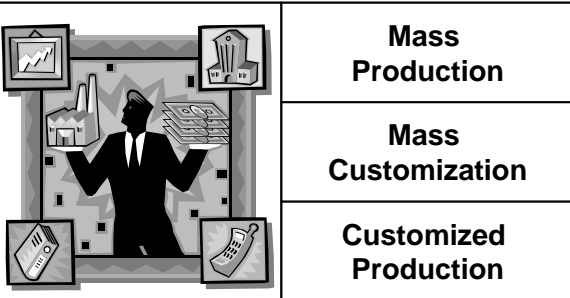
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## Manufacturing Goods



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# Outsourcing the Manufacturing Function

## Advantages

Capital and Resources

Economies of Scale

## Disadvantages

Quality and Cost

Privacy Issues

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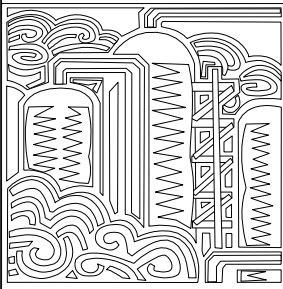
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# Production Process Design



Identify Supply Chain

Forecast Demand

Plan for Capacity

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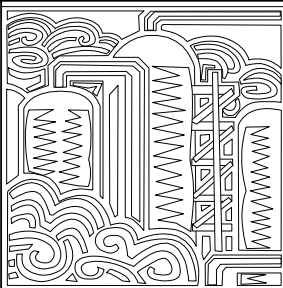
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# Production Process Design



Choose Facility Site

Design Facility Layout

Schedule Work

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## Establish the Supply Chain

- ✓Suppliers
- ✓Manufacturers
- ✓Distributors
- ✓Retailers



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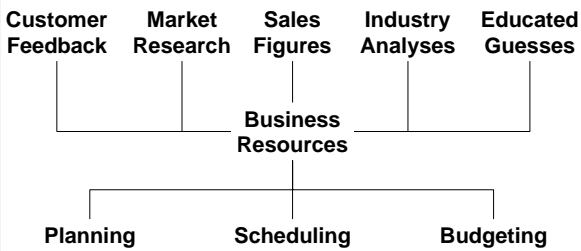
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## Forecast Demand



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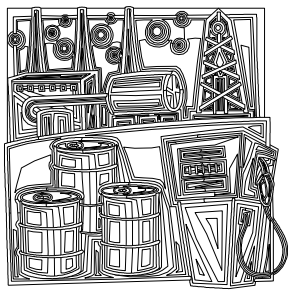
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## Capacity Planning

Level of  
Resources

Customer  
Demand



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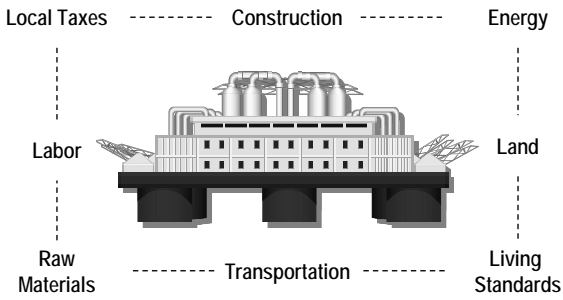
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# Facility Location



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# Facility Layout



**Process**

**Product**

**Cellular**

**Fixed-Position**

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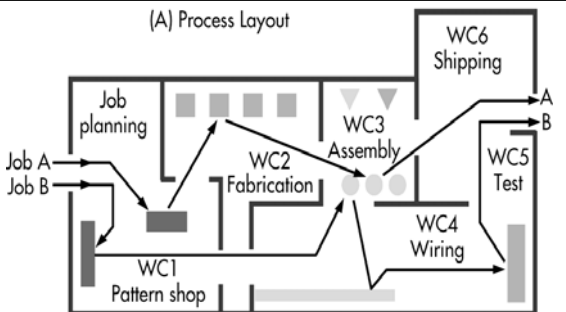
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# Process Layout

(A) Process Layout



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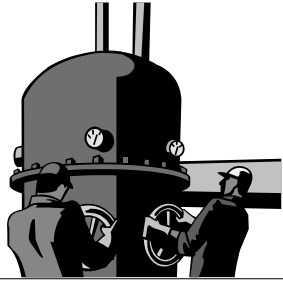
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# Production Schedule



Scheduling

Dispatching

Contingencies

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# The Gantt Chart

ID	Task Name	Start Date	End Date	Duration	2006	
					August	September
1	Make legs	8/1/06	8/28/06		[Gantt bar spanning from 8/1 to 8/28/06]	
2	Cut tops	8/22/06	8/28/06		[Gantt bar spanning from 8/22 to 8/28/06]	
3	Drill	8/29/06	9/4/06		[Gantt bar spanning from 8/29 to 9/4/06]	
4	Sand	9/5/06	9/11/06		[Gantt bar spanning from 9/5 to 9/11/06]	
5	Assemble	9/12/06	9/25/06		[Gantt bar spanning from 9/12 to 9/25/06]	
6	Paint	9/19/06	9/25/06		[Gantt bar spanning from 9/19 to 9/25/06]	

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# Program Evaluation and Review Technique (PERT)

1. Identify activities
2. Determine sequence
3. Establish time frame
4. Diagram activity network
5. Calculate longest completion path
6. Refine timing

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# PERT Time Estimates



Optimistic

Pessimistic

Most Likely

Expected

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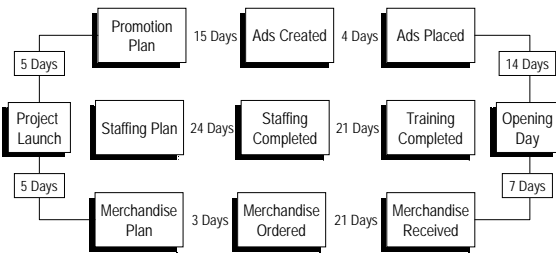
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# Simplified PERT Diagram for Store Opening



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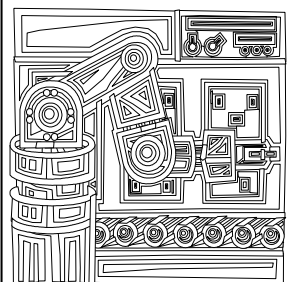
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# Industrial Robotics



Precision

Stamina

Diligence

Speed

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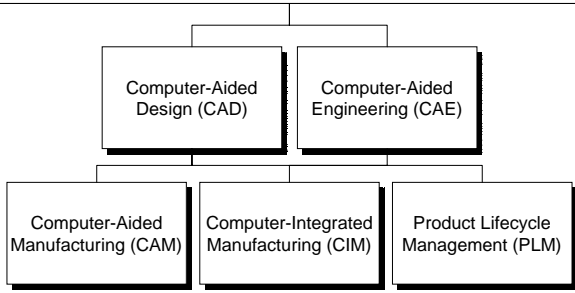
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## Computerized Production



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## Manufacturing Systems

Traditional	Flexible
Mass Production	Specialty Operations
Resistant to Change	Conducive to Change
High Set-Up Costs	Minimal Set-Up Costs

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## Supply Chain Data Interchange



Electronic Data Interchange (EDI)

Extensible Markup Language (XML)

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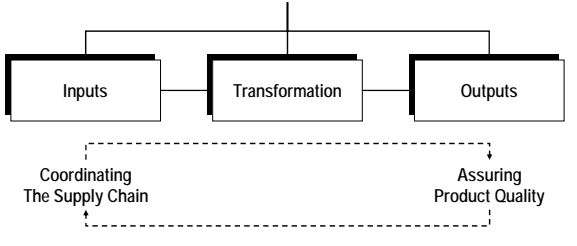
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# The Production Process

## Operations Managers



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# Supply Chain Coordination



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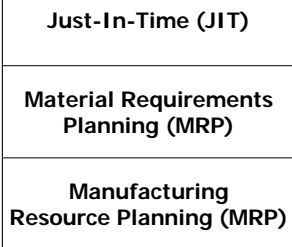
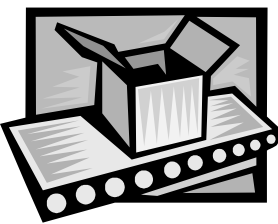
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# Inventory Control



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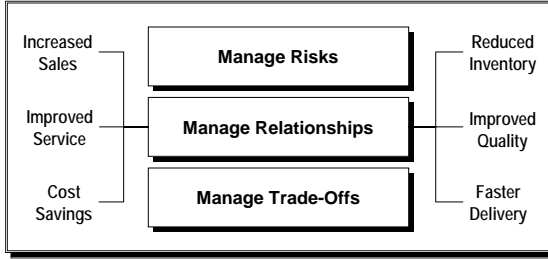
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# Supply Chain Management



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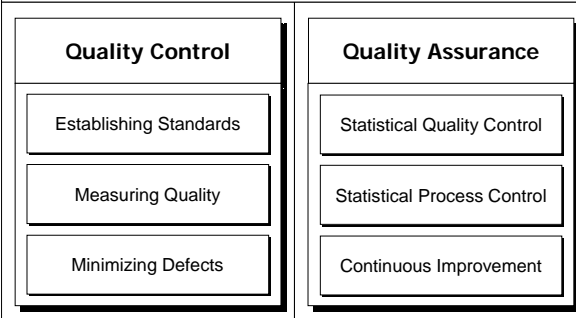
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# Assuring Product Quality



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# Total Quality Management

- Management commitment to TQM
- Clear customer focus
- Employee involvement
- Continuous improvement
- Partnering with suppliers
- Meaningful performance standards

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# The Six Sigma Approach



Define the Problem

Measure Performance

Analyze Root Causes

Improve the Process

Control the Process

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# Global Quality Standards

ISO 9000

ISO 14000



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