

# 7 Process Strategy and Sustainability

**PowerPoint presentation to accompany  
Heizer and Render  
Operations Management, 10e  
Principles of Operations Management, 8e**

PowerPoint slides by Jeff Heyl



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OM Strategy Decisions

# ***Process Strategies***

**The objective of a process strategy is to build a production process that meets customer requirements and product specifications within cost and other managerial constraints**

# *Process Strategies*

- ◆ **How to produce a product or provide a service that**
  - ◆ **Meets or exceeds customer requirements**
  - ◆ **Meets cost and managerial goals**
- ◆ **Has long term effects on**
  - ◆ **Efficiency and production flexibility**
  - ◆ **Costs and quality**

# *Process Strategies*

## **Four basic strategies**

- 1. Process focus**
- 2. Repetitive focus**
- 3. Product focus**
- 4. Mass customization**

**Within these basic strategies there are many ways they may be implemented**

# *Process Focus*

- ◆ **Facilities are organized around specific activities or processes to facilitate low-volume, high-variety production**
- ◆ **General purpose equipment and skilled personnel**
- ◆ **High degree of product flexibility**
- ◆ **Typically high costs and low equipment utilization**
- ◆ **Product flows may vary considerably making planning and scheduling a challenge**

# Process Focus



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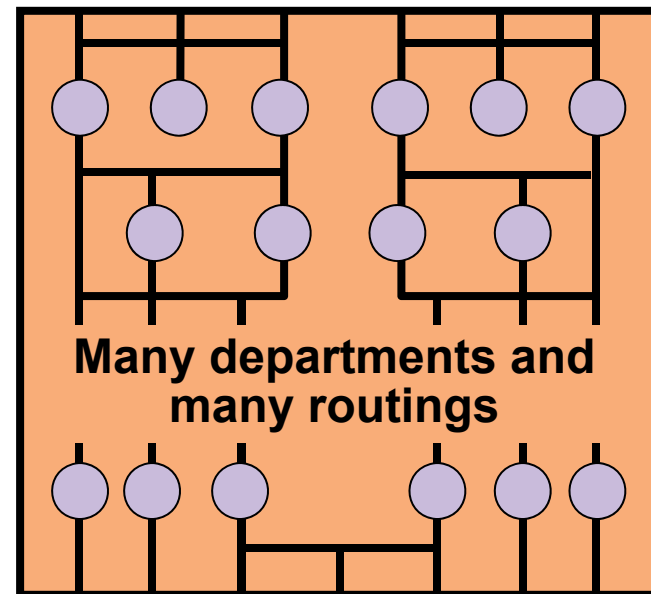
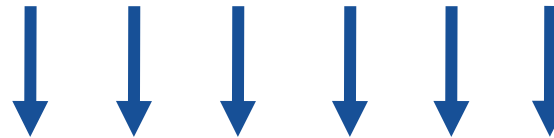
(low volume, high variety,  
intermittent processes)

**Arnold Palmer Hospital**

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Figure 7.2(a)

**Many inputs**  
(surgeries, sick patients,  
baby deliveries, emergencies)



**Many different outputs**  
(uniquely treated patients)

# *Repetitive Focus*

- ◆ **Definition: a production-oriented production process that uses modules**
- ◆ **Facilities often organized as assembly lines**
- ◆ **Characterized by modules with parts and assemblies made previously**
- ◆ **Modules may be combined for many output options**
- ◆ **Less flexibility than process-focused facilities but more efficient**

# Repetitive Focus



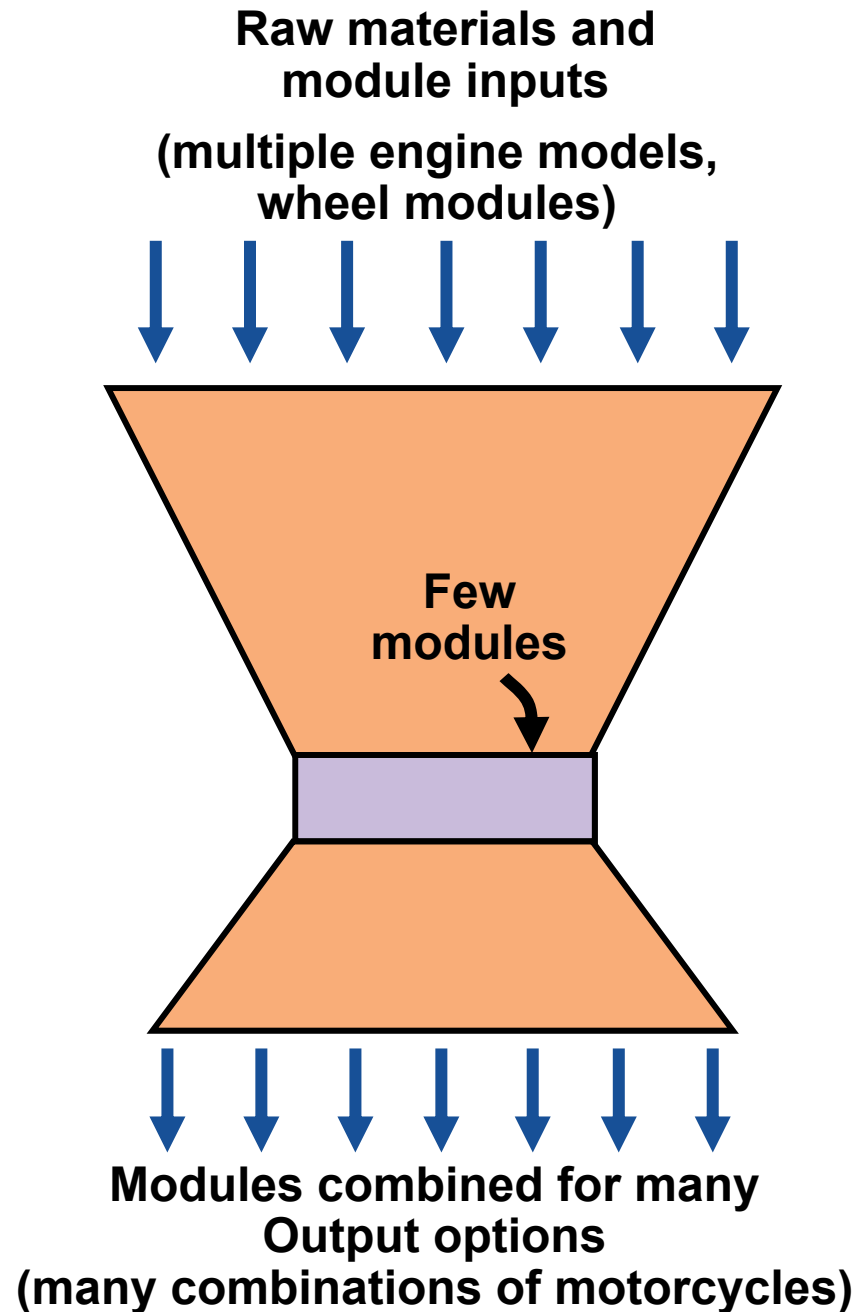
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(modular)

**Harley Davidson**

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Figure 7.2(b)





# *Product Focus*

- ◆ **Facilities are organized by product**
- ◆ **High volume but low variety of products**
- ◆ **Long, continuous production runs enable efficient processes**
- ◆ **Typically high fixed cost but low variable cost**
- ◆ **Generally less skilled labor**

# Product Focus



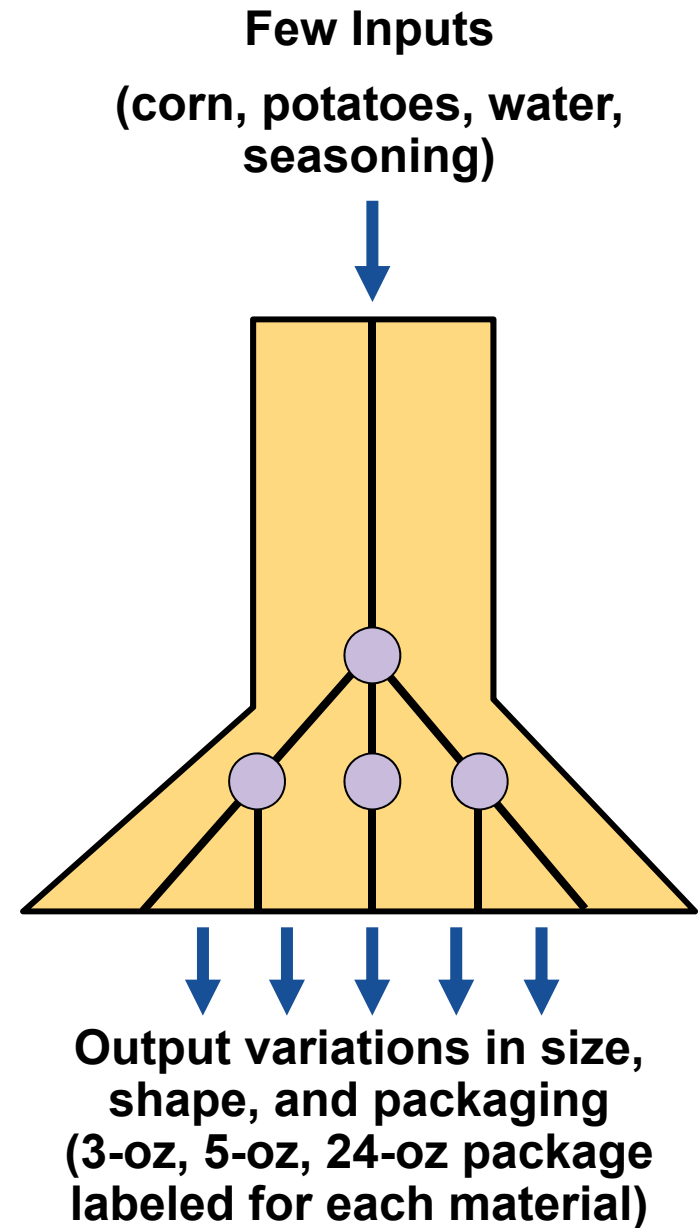
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(low-volume, high variety,  
continuous process)

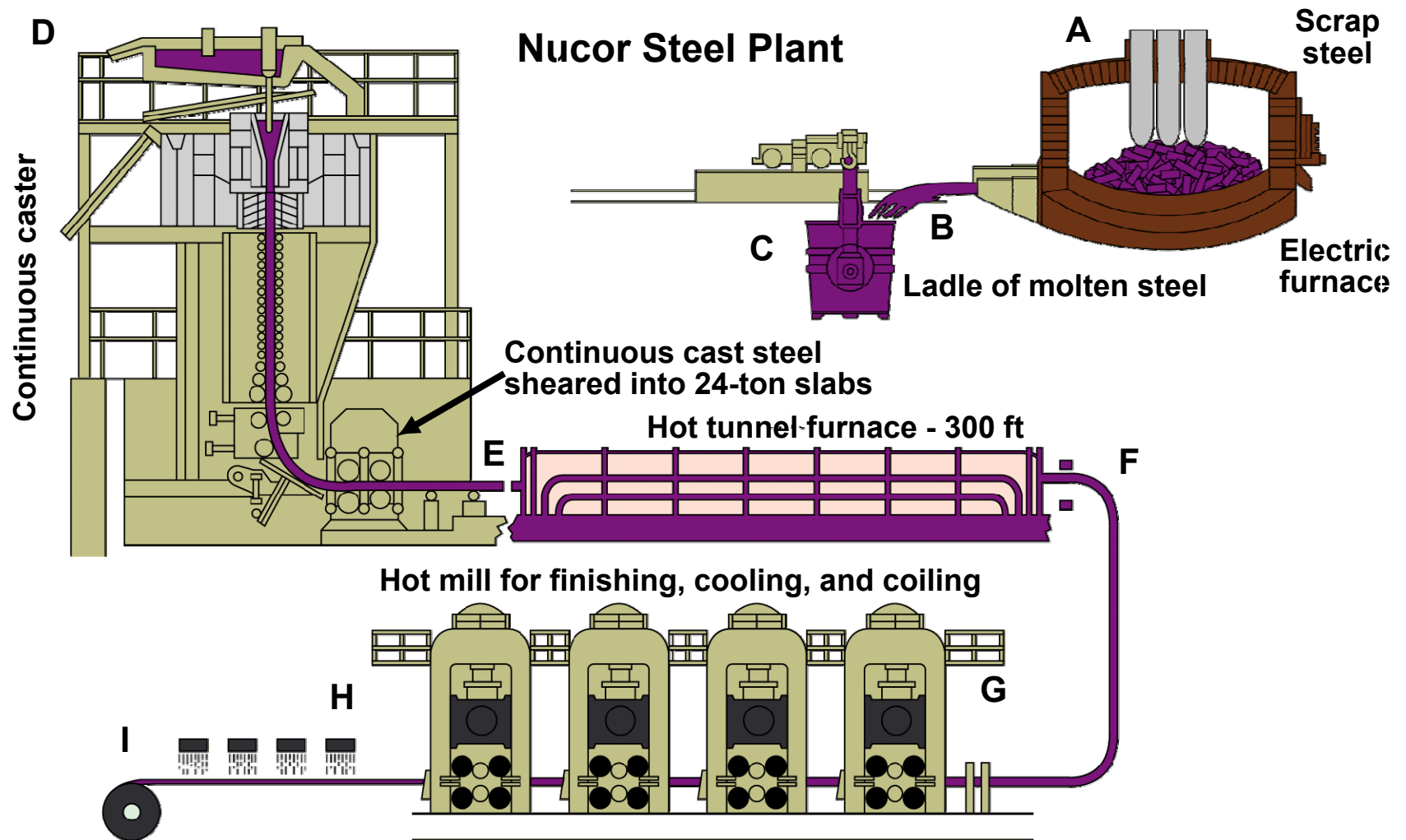
**Frito-Lay**

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Figure 7.2(c)



# Product Focus



# *Mass Customization*

- ◆ **The rapid, low-cost production of goods and service to satisfy increasingly unique customer desires**
- ◆ **Combines the flexibility of a process focus with the efficiency of a product focus**



# Mass Customization



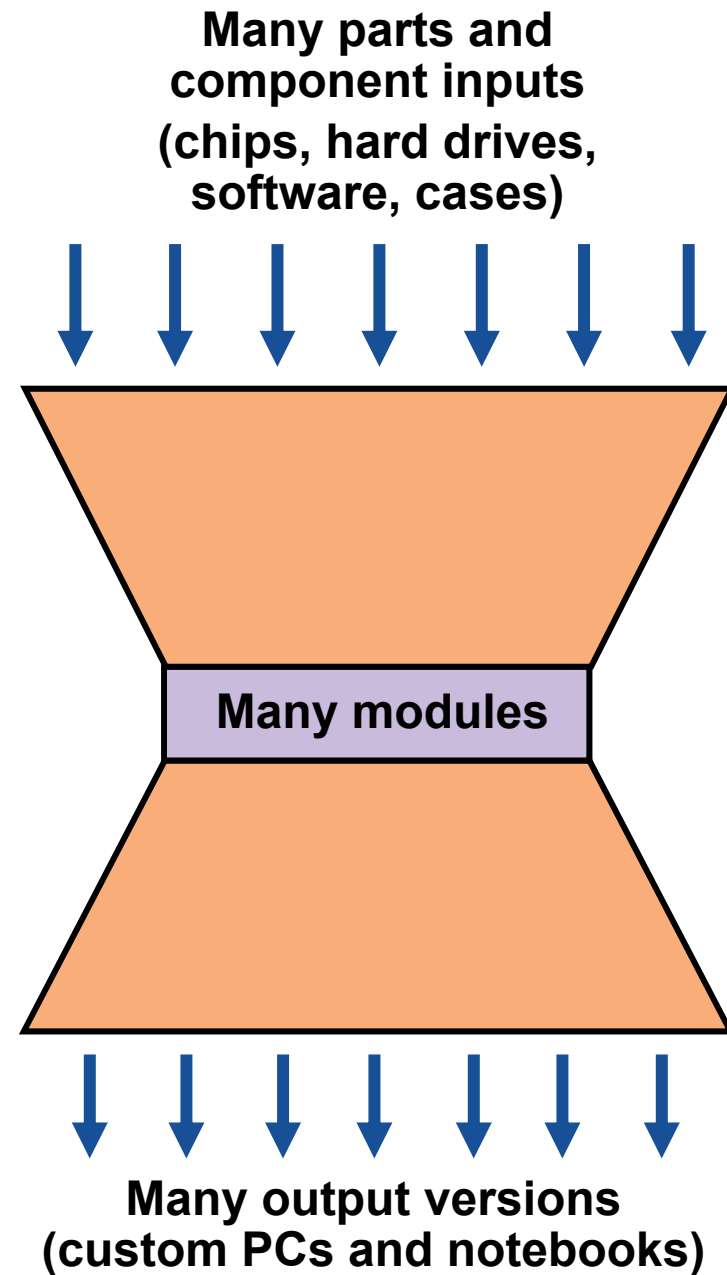
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(high-volume, high-variety)

**Dell Computer**

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Figure 7.2(d)



# *Mass Customization*

- ◆ **Imaginative and fast product design**
- ◆ **Rapid process design**
- ◆ **Tightly controlled inventory management**
- ◆ **Tight schedules**
- ◆ **Responsive supply chain partners**

# *Changing Processes*

- ◆ **Difficult and expensive**
- ◆ **May mean starting over**
- ◆ **Process strategy determines transformation strategy for an extended period**
- ◆ **Important to get it right**

# *Process Analysis and Design*

- ◆ **Is the process designed to achieve a competitive advantage?**
- ◆ **Does the process eliminate steps that do not add value?**
- ◆ **Does the process maximize customer value?**
- ◆ **Will the process win orders?**



# *Process Analysis and Design*

- ◆ **Flow Charts - Shows the movement of materials**
- ◆ **Time-Function Mapping - Shows flows and time frame**
- ◆ **Value-Stream Mapping - Shows flows and time and value added beyond the immediate organization**
- ◆ **Process Charts - Uses symbols to show key activities**
- ◆ **Service Blueprinting - focuses on customer/provider interaction**

# Value-Stream Mapping

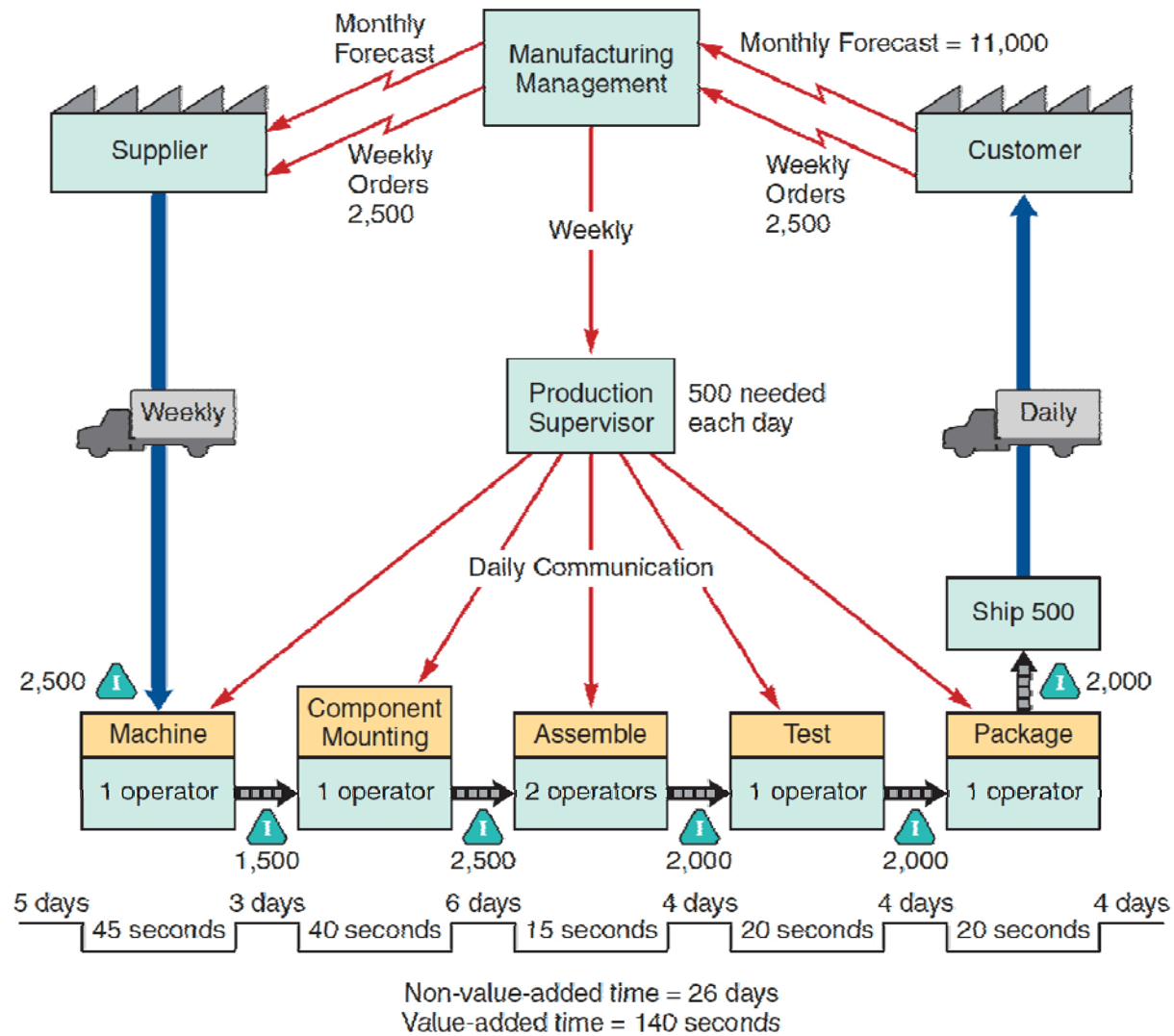


Figure 7.6

# Process Chart

Present Method <input checked="" type="checkbox"/>		PROCESS CHART		Proposed Method <input type="checkbox"/>	
SUBJECT CHARTED <u>Hamburger Assembly Process</u>		DATE <u>8/1/10</u>			
DEPARTMENT _____		CHART BY <u>KH</u>		SHEET NO. <u>1</u> OF <u>1</u>	
DIST. IN FEET	TIME IN MINS.	CHART SYMBOLS	PROCESS DESCRIPTION		
	—	○ → □ ▯ ▽	Meat Patty in Storage		
1.5	.05	○ → □ ▯ ▽	Transfer to Broiler		
	2.50	○ → □ ▯ ▽	Broiler		
	.05	○ → □ ▯ ▽	Visual Inspection		
1.0	.05	○ → □ ▯ ▽	Transfer to Rack		
	.15	○ → □ ▯ ▽	Temporary Storage		
.5	.10	○ → □ ▯ ▽	Obtain Buns, Lettuce, etc.		
	.20	○ → □ ▯ ▽	Assemble Order		
.5	.05	○ → □ ▯ ▽	Place in Finish Rack		
		○ → □ ▯ ▽			
3.5	3.15	2 4 1 - 2	TOTALS		
Value-added time = Operation time/Total time = (2.50+.20)/3.15 = 85.7%					
○ = operation; → = transportation; □ = inspection; ▯ = delay; ▽ = storage.					

Figure 7.7

# *Service Blueprinting*

- ◆ **Focuses on the customer and provider interaction**
- ◆ **Defines three levels of interaction**
- ◆ **Each level has different management issues**
- ◆ **Identifies potential failure points**

# Service Blueprint

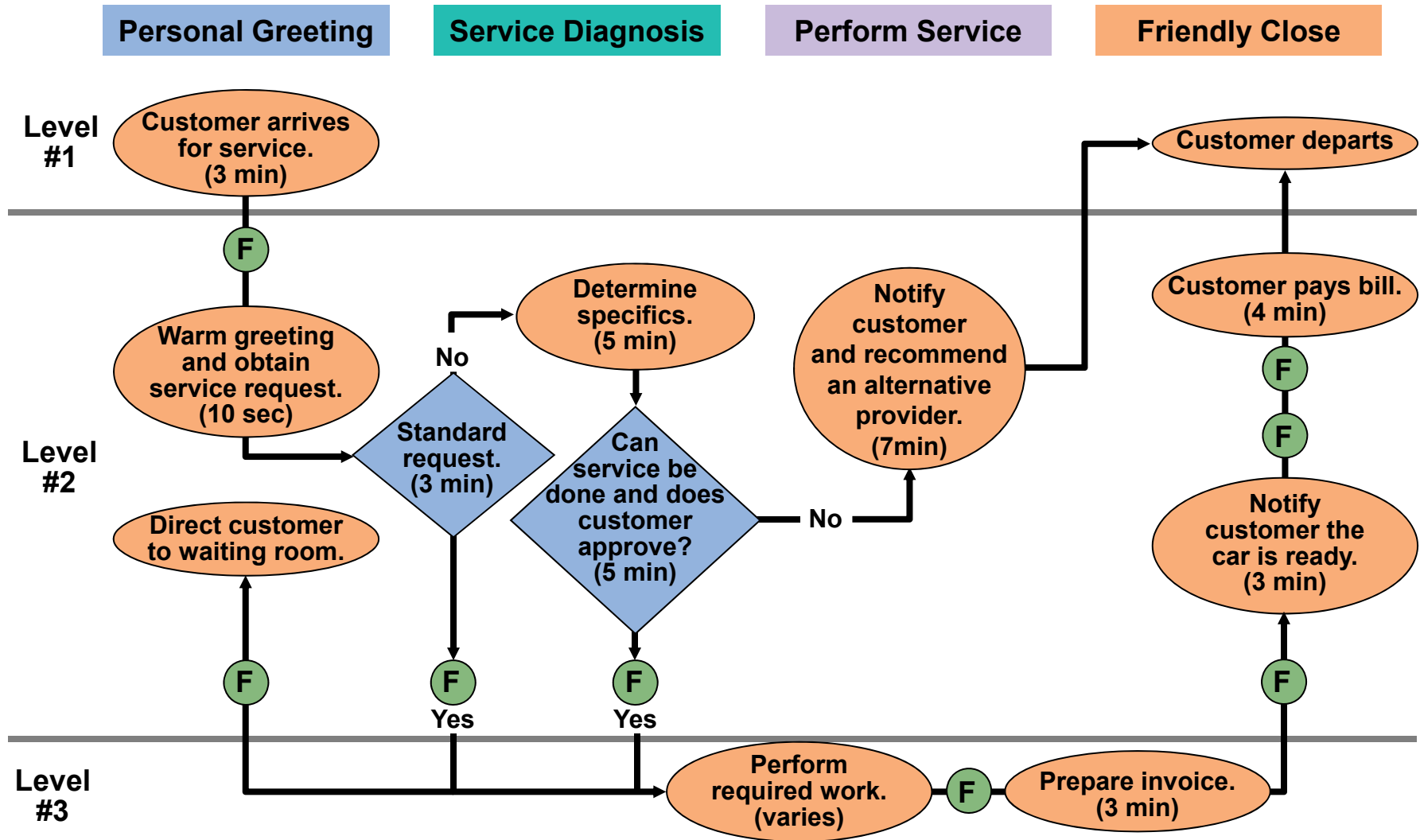
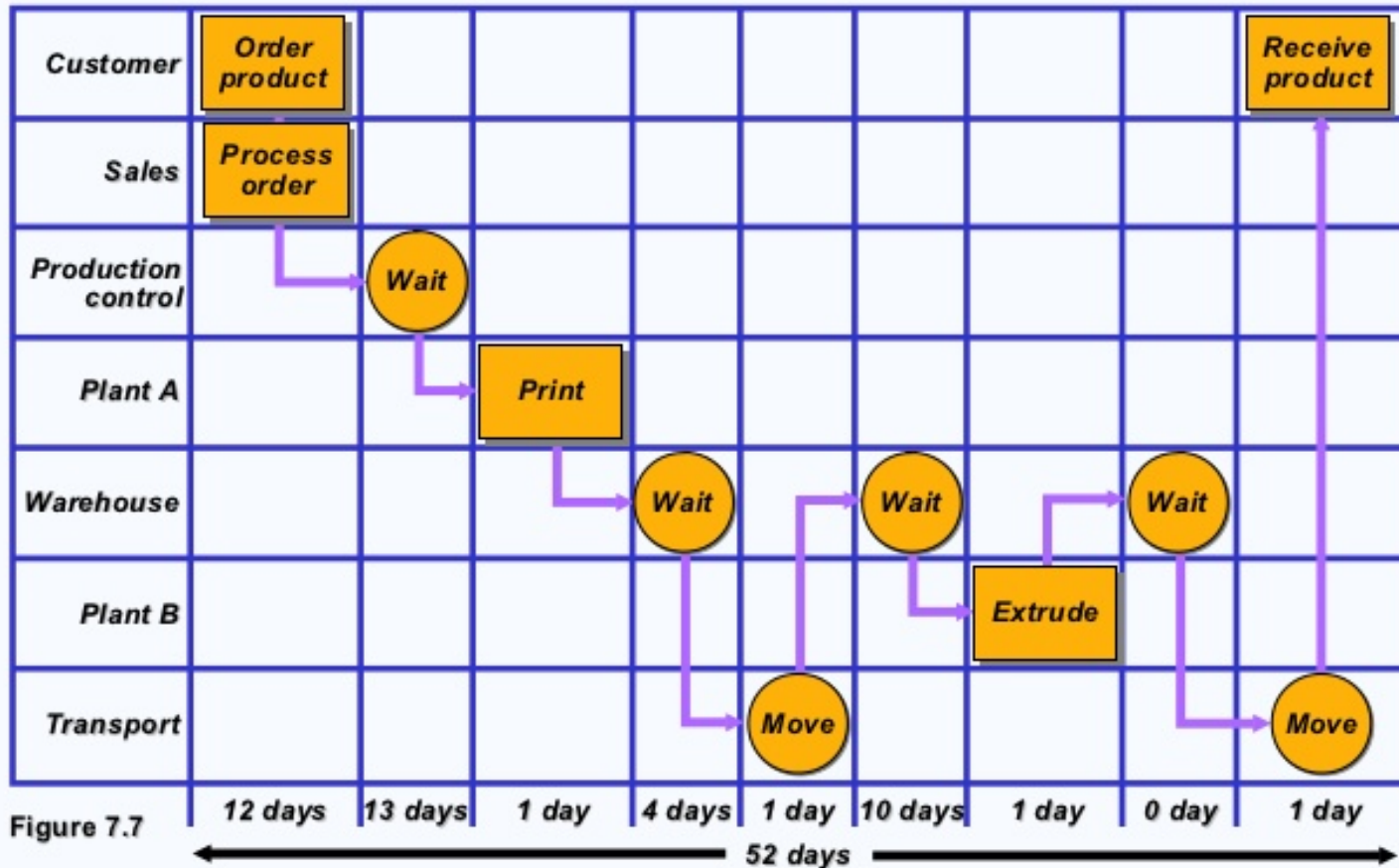


Figure 7.8

# Time-Function Mapping - Shows flows and time frame

## “Baseline” Time-Function Map



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# *Process Analysis Tools*

- ◆ **Flowcharts provide a view of the big picture**
- ◆ **Time-function mapping adds rigor and a time element**
- ◆ **Value-stream analysis extends to customers and suppliers**
- ◆ **Process charts show detail**
- ◆ **Service blueprint focuses on customer interaction**

# *Special Considerations for Service Process Design*

- ◆ **Some interaction with customer is necessary, but this often affects performance adversely**
- ◆ **The better these interactions are accommodated in the process design, the more efficient and effective the process**
- ◆ **Find the right combination of cost and customer interaction**



# ***Production Technology***

- ◆ **Machine technology**
- ◆ **Automatic identification systems (AISs)**
- ◆ **Process control**
- ◆ **Vision system**
- ◆ **Robot**
- ◆ **Automated storage and retrieval systems (ASRSs)**
- ◆ **Automated guided vehicles (AGVs)**
- ◆ **Flexible manufacturing systems (FMSs)**
- ◆ **Computer-integrated manufacturing (CIM)**



# ***Machine Technology***

- ◆ **Increased precision**
- ◆ **Increased productivity**
- ◆ **Increased flexibility**
- ◆ **Reduced power requirements**

# *Automatic Identification Systems (AISs)*

**A system for transforming data into electronic form**

- ◆ **Improved data acquisition**
- ◆ **Reduced data entry errors**
- ◆ **Increased speed**
- ◆ **Increased scope of process automation**



**Example – Bar codes and RFID**

# *Process Control*

## ◆ Real-time monitoring and control of processes

The use of IT to control a physical process

- ◆ Sensors collect data
- ◆ Devices read data on periodic basis
- ◆ Measurements translated into digital signals then sent to a computer
- ◆ Computer programs analyze the data
- ◆ Resulting output may take numerous forms



# *Vision Systems*

A system that use video cameras and computer technology in inspection roles

- ◆ **Particular aid to inspection**
- ◆ **Consistently accurate**
- ◆ **Never bored**
- ◆ **Modest cost**
- ◆ **Superior to individuals performing the same tasks**



# *Robots*

**A flexible machine with the ability to hold move or grab items**

- ◆ **Perform monotonous or dangerous tasks**
- ◆ **Perform tasks requiring significant strength or endurance**
- ◆ **Generally enhanced consistency and accuracy**



# ***Automated Storage and Retrieval Systems (ASRSs)***

**Computer-controlled warehouses that provide for the automatic placement of parts into and from designated places within a warehouse**

- ◆ **Automated placement and withdrawal of parts and products**
- ◆ **Reduced errors and labor**
- ◆ **Particularly useful in inventory and test areas of manufacturing firms**

# ***Automated Guided Vehicle (AGVs)***

- ◆ **Electronically guided and controlled carts**
- ◆ **Used for movement of products and/or individuals**



# *Flexible Manufacturing Systems (FMSs)*

- ◆ **Computer controls both the workstation and the material handling equipment**
- ◆ **Enhance flexibility and reduced waste**
- ◆ **Can economically produce low volume at high quality**
- ◆ **Reduced changeover time and increased utilization**
- ◆ **Stringent communication requirement between components**

# ***Computer-Integrated Manufacturing (CIM)***

- ◆ **Extension of flexible manufacturing systems**
  - ◆ **Backwards to engineering and inventory control**
  - ◆ **Forward into warehousing and shipping**
  - ◆ **Can also include financial and customer service areas**
- ◆ **Reducing the distinction between low-volume/high-variety, and high-volume/low-variety production**

# Computer-Integrated Manufacturing (CIM)

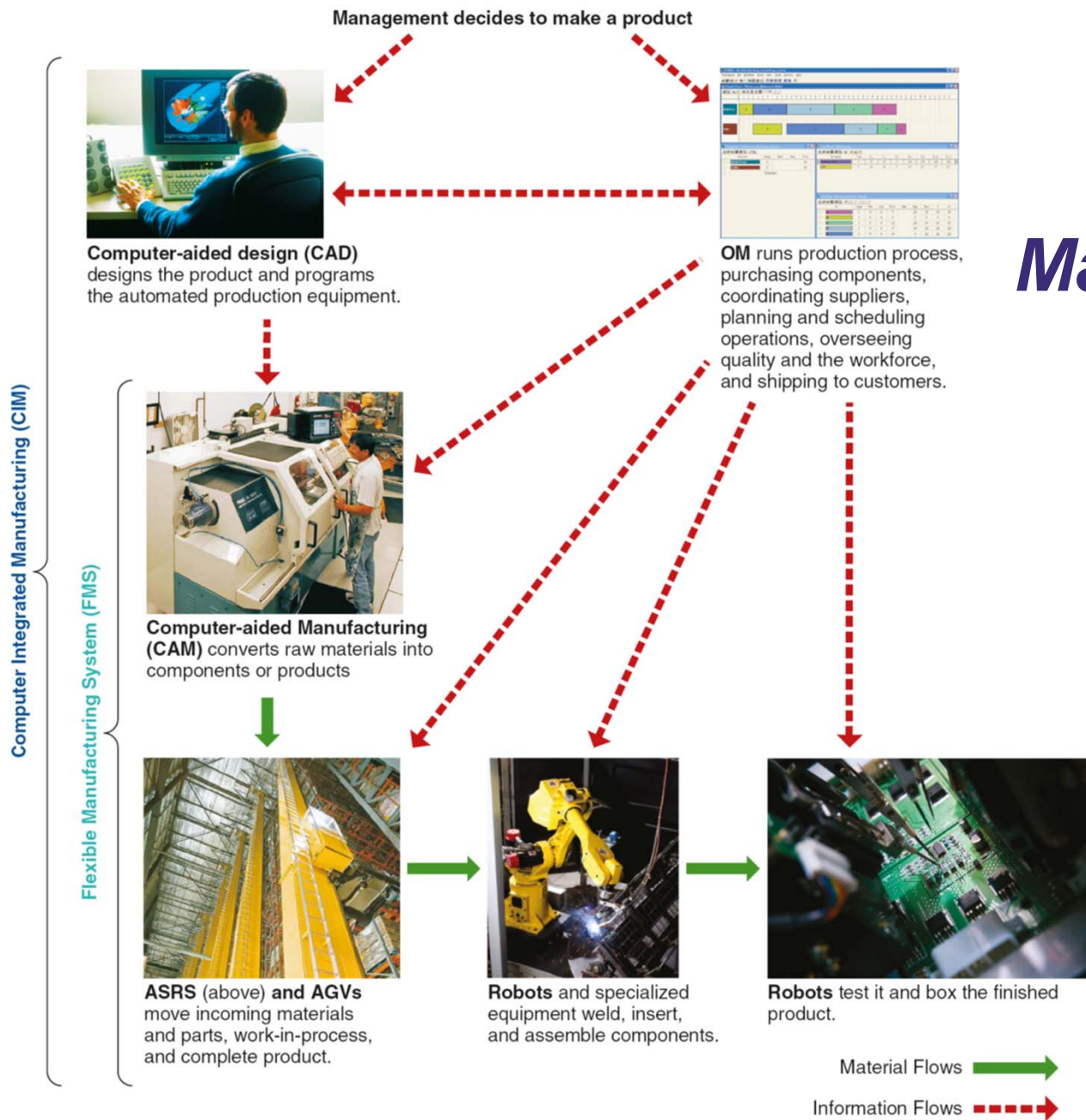


Figure 7.10