

Operations Management and Quality for Producing Goods and Service

chapter # 7

Introduction

- **In this chapter we**
 - explore the numerous ways companies align their operations processes with their business plans
 - discuss how these decisions contribute to a firm's ability to create a high-quality product
 - discuss the many steps it takes to bring high-quality goods and services to market

learning objectives

- 1. Explain the meaning of the term production or operations and describe the three kinds of utility that operations processes provide for adding customer value.*
- 2. Identify the characteristics that distinguish service operations from goods production.*
- 3. Explain** how companies with different business strategies are best served by having different operations capabilities.

learning objectives

- 4. Identify the major factors that are considered in operations planning.*
- 5. Discuss the information contained in four kinds of operations schedules—the master operations schedule, detailed schedule, staff schedule, and project schedule.*
- 6. Discuss the two key activities required for operations control.*

learning objectives

- 7. Identify the activities and underlying objectives involved in total quality management.*
- 8. Explain how a supply chain strategy differs from traditional strategies for coordinating operations among firms.*

What Does Operations Mean Today?

- **Operations (Production)**
 - activities involved in making products — goods and services — for customers



- **Service Operations (Service Production)**

- activities producing intangible and tangible products, such as entertainment, transportation, and education

- **Goods Operations (Goods Production)**

- activities producing tangible products, such as radios, newspapers, buses, and textbooks

Growth in the Services and Goods Sectors

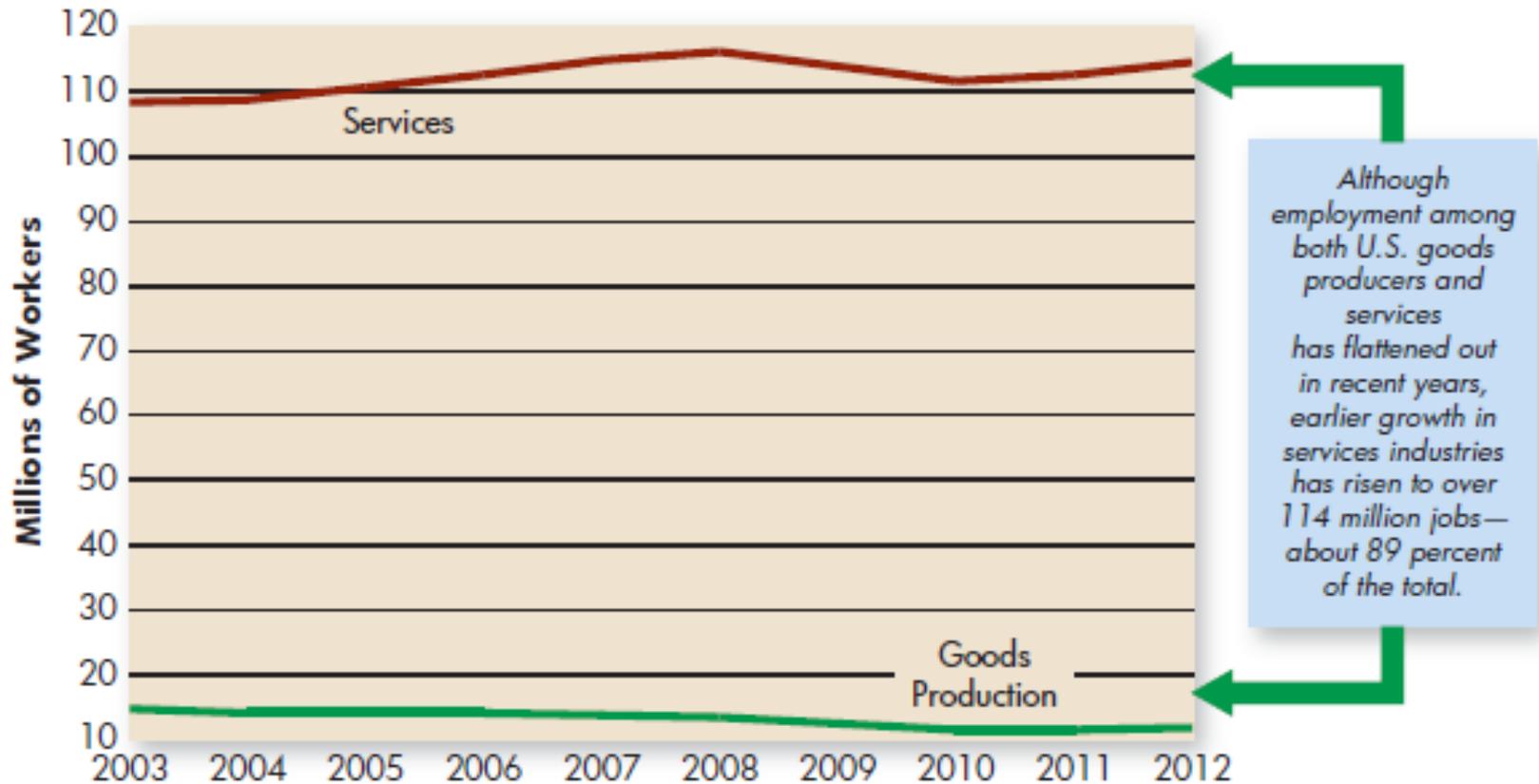


FIGURE 7.1 Employment in Goods and Services Sectors

GDP from Goods and Services

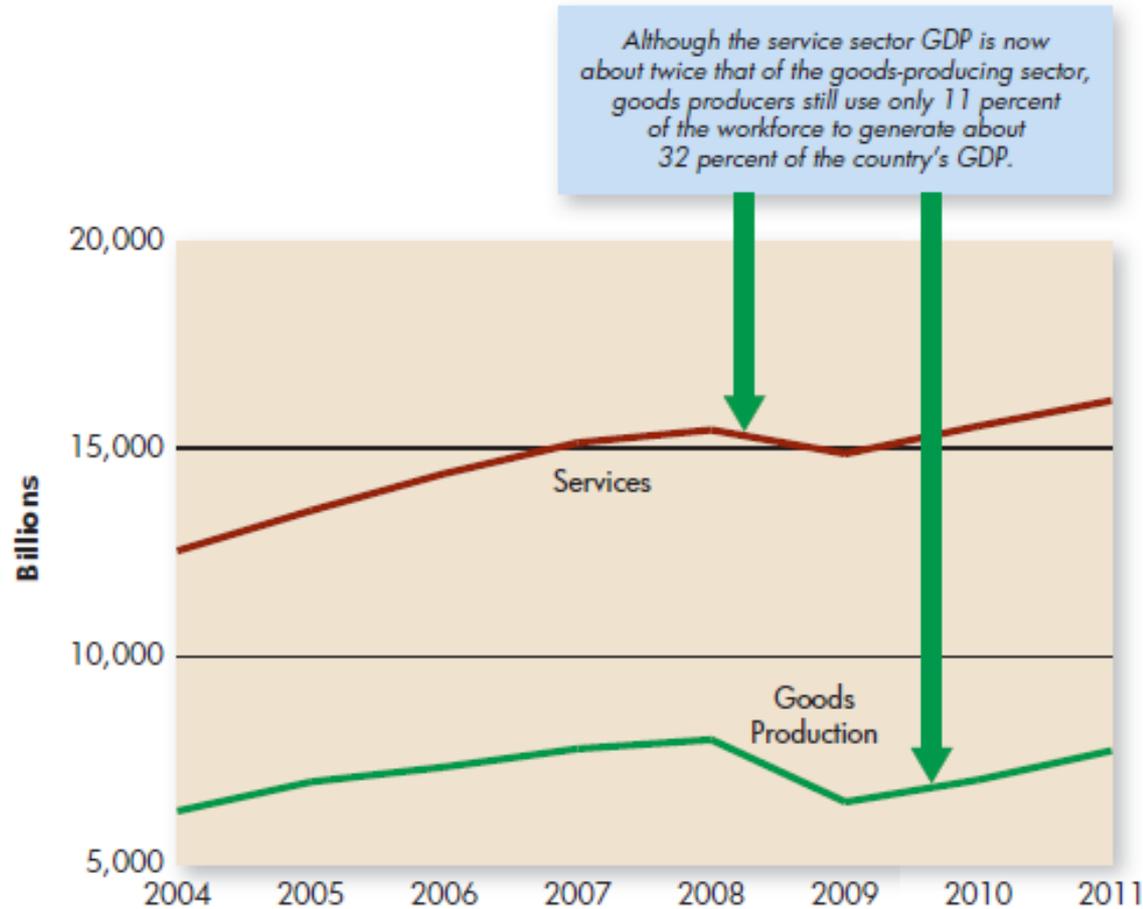


FIGURE 7.2 GDP from Goods and Services

Creating Value Through Operations

- **Utility**
 - product's ability to satisfy a human want or need
- **Operations (Production) Management**
 - systematic direction and control of the activities that transform resources into finished products that create value for and provide benefits to customers
- **Operations (Production) Managers**
 - managers responsible for ensuring that operations activities create value and provide benefits to customers

The Resource Transformation Process

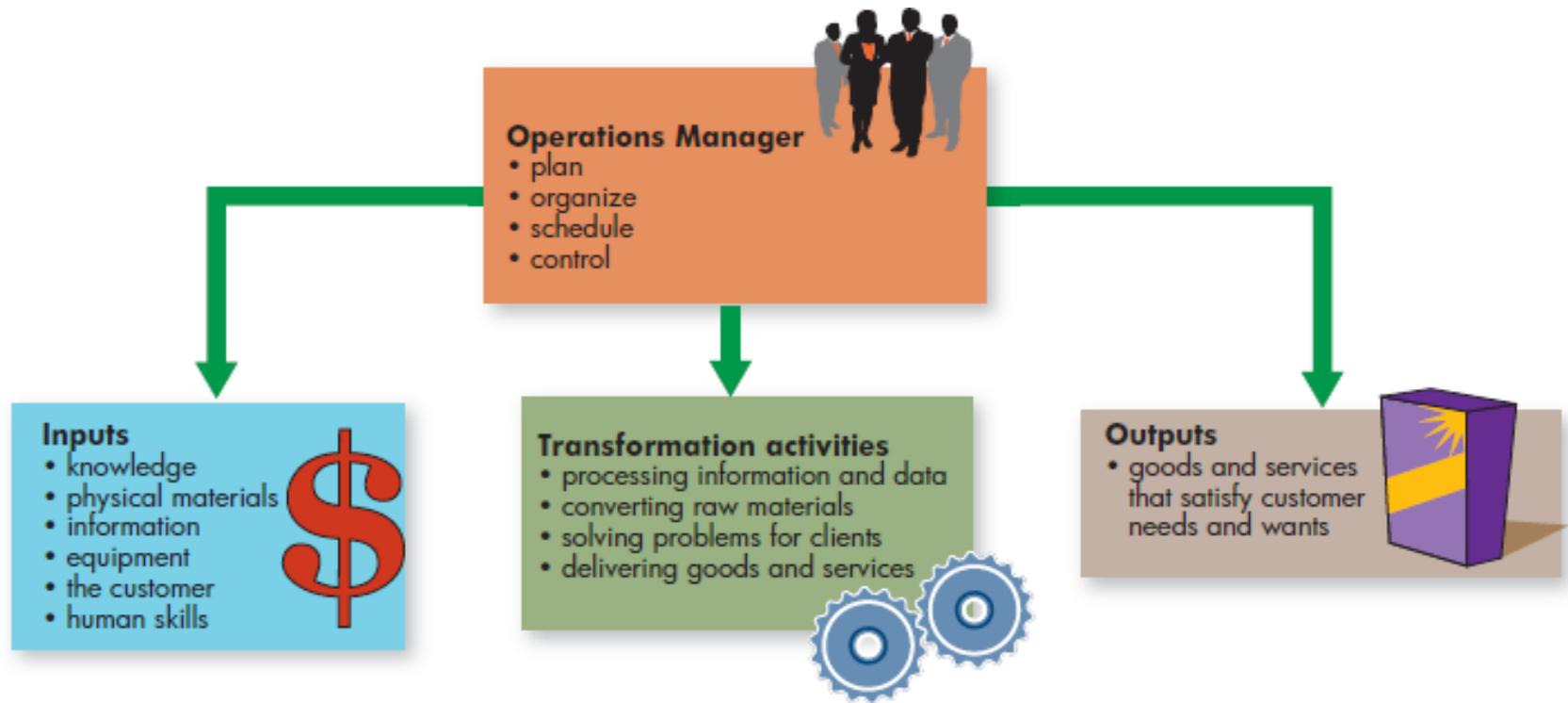


FIGURE 7.3 The Resource Transformation Process

Differences between Service and Goods Manufacturing Operations

Interacting with customers

The intangible and unstorable nature of some services

The customer's presence in the process

Service quality considerations

Operations Processes

- **Operations Process**
 - set of methods and technologies used to produce a good or a service
- **Make-to-Order Operations**
 - activities for one-of-a-kind or custom-made production
- **Make-to-Stock Operations**
 - activities for producing standardized products for mass consumption

Service Production Processes: Extent of Customer Contact

- **Low-Contact System**
 - level of customer contact in which the customer need not be part of the system to receive the service
- **High-Contact System**
 - level of customer contact in which the customer is part of the system during service delivery

Business Strategy Determines Operations Capabilities

- **Operations Capability (Production Capability)**
 - ↳ special ability that production does especially well to outperform the competition
- Excellent firms learn, over time, how to achieve more than just one competence

Business Strategies That Win Customers for Four Companies

table 7.1 Business Strategies that Win Customers for Four Companies

Company	Strategy for Attracting Customers	What the Company Does to Implement Its Strategy
Toyota	Quality	Cars perform reliably, have an appealing fit and finish, and consistently meet or exceed customer expectations at a competitive price
Save-A-Lot	Low price	Foods and everyday items offered at savings up to 40 percent less than conventional food chains
3M	Flexibility	Innovation, with more than 55,000 products in a constantly changing line of convenience items for home and office
FedEx	Dependability	Every delivery is fast and on time, as promised

Operations Capabilities and Characteristics for Four Companies

table 7.2 Operations Capabilities and Characteristics for Four Companies

Operations Capability	Key Operations Characteristics
Quality (Toyota)	<ul style="list-style-type: none"> • High-quality standards for materials suppliers • Just-in-time materials flow for lean manufacturing • Specialized, automated equipment for consistent product buildup • Operations personnel are experts on continuous improvement of product, work methods, and materials
Low Cost (Save-A-Lot)	<ul style="list-style-type: none"> • Avoids excessive overhead and costly inventory (no floral departments, sushi bars, or banks that drive up costs) • Limited assortment of products, staples, in one size only for low-cost restocking, lower inventories, and less paperwork • Many locations; small stores—less than half the size of conventional grocery stores—for low construction and maintenance costs • Reduces labor and shelving costs by receiving and selling merchandise out of custom shipping cartons
Flexibility (3M)	<ul style="list-style-type: none"> • Maintains some excess (expensive) production capacity available for fast startup on new products • Adaptable equipment and facilities for production changeovers from old to new products • Hires operations personnel who thrive on change • Many medium- to small-sized manufacturing facilities in diverse locations, which enhances creativity
Dependability (FedEx)	<ul style="list-style-type: none"> • Customer automation: uses electronic and online communications tools with customers to shorten shipping time • Wireless information system for package scanning by courier, updating of package movement, and package tracking by customer • Maintains a company air force, global weather forecasting center, and ground transportation for pickup and delivery, with backup vehicles for emergencies • The 25 automated regional distribution hubs process 3.5 million packages per day for next-day deliveries

Operations Planning

- **Capacity Planning**
 - determining the amount of a product that a company can produce under normal conditions
- **Location Planning**
 - determining where production will happen based on costs and flexibility
- **Layout Planning**
 - planning for the layout of machinery, equipment, and supplies

Operations Planning (cont.)

- **Capacity**
 - amount of a product that a company can produce under normal conditions
- **Capacity Planning**
 - determining the amount of a product that a company can produce under normal conditions

Operations Planning and Control

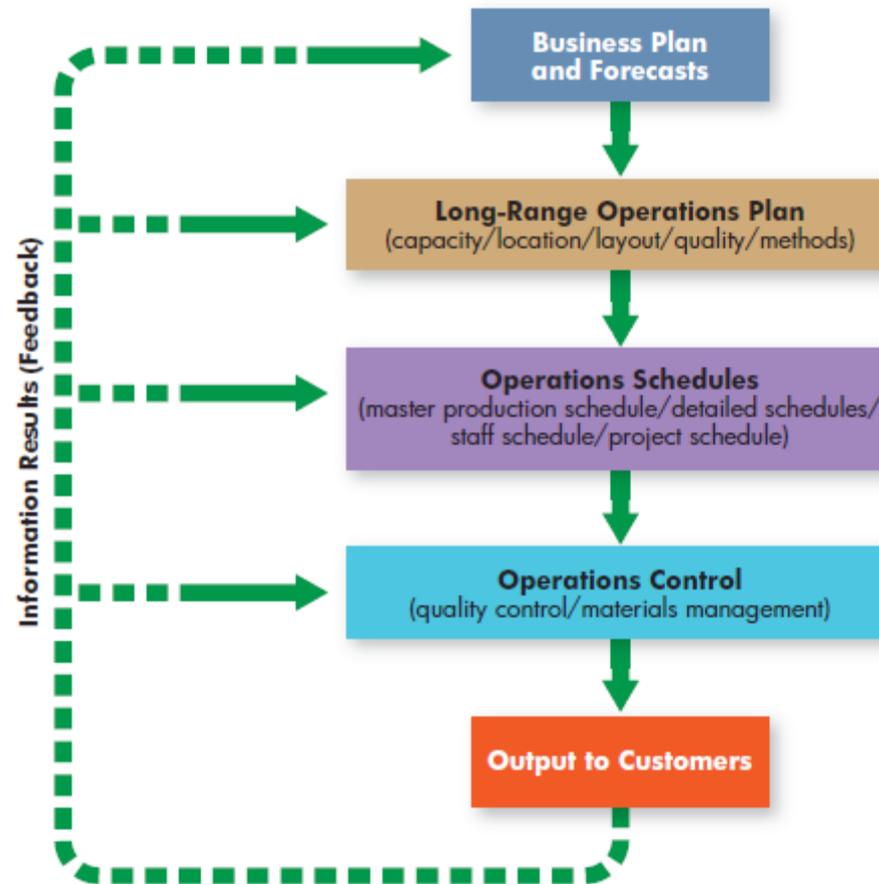


FIGURE 7.4 Operations Planning and Control

Layout Planning

- **Process Layout (Custom-Product Layout)**
 - physical arrangement of production activities that groups equipment and people according to function
- **Product Layout (Same-Steps Layout)**
 - physical arrangement of production steps designed to make one type of product in a fixed sequence of activities according to its production requirements

Layout Planning (cont.)

- **Assembly Line Layout**

- a same-steps layout in which a product moves step by step through a plant on conveyor belts or other equipment until it is completed

- **Fixed-Position Layout**

- labor, equipment, materials, and other resources are brought to the geographic location where all production work is done

Process Layout for a Service Provider

Example patient flow for one customer

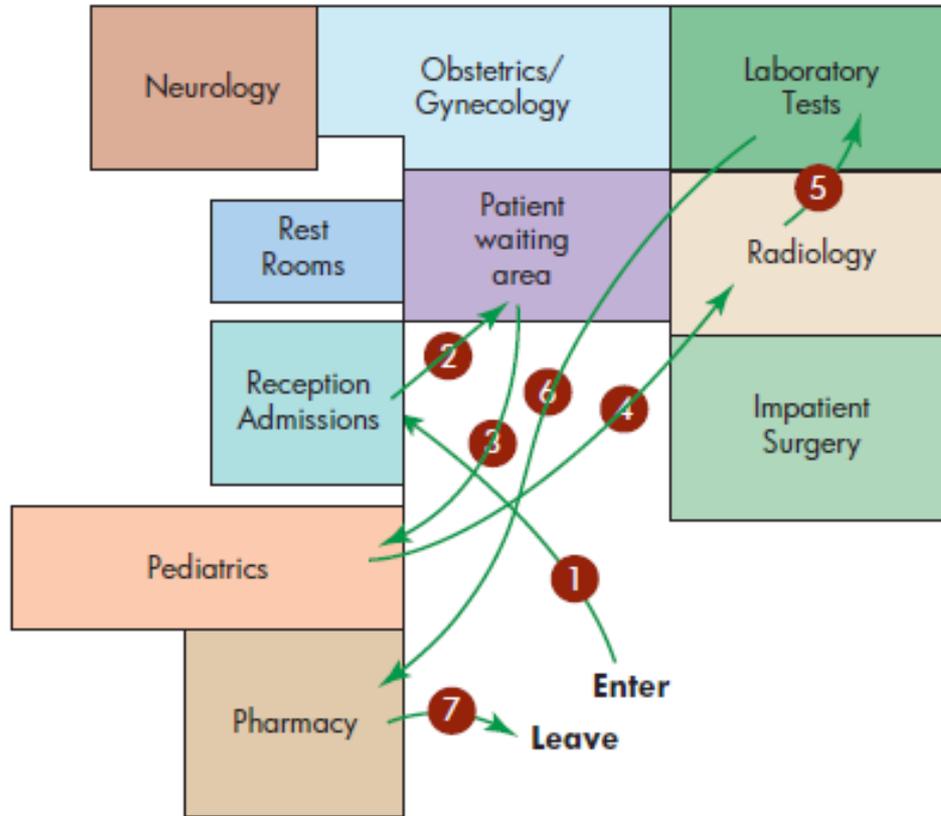


FIGURE 7.5 Process Layout for a Service Provider—a Medical Clinic

Product Layout for a Service

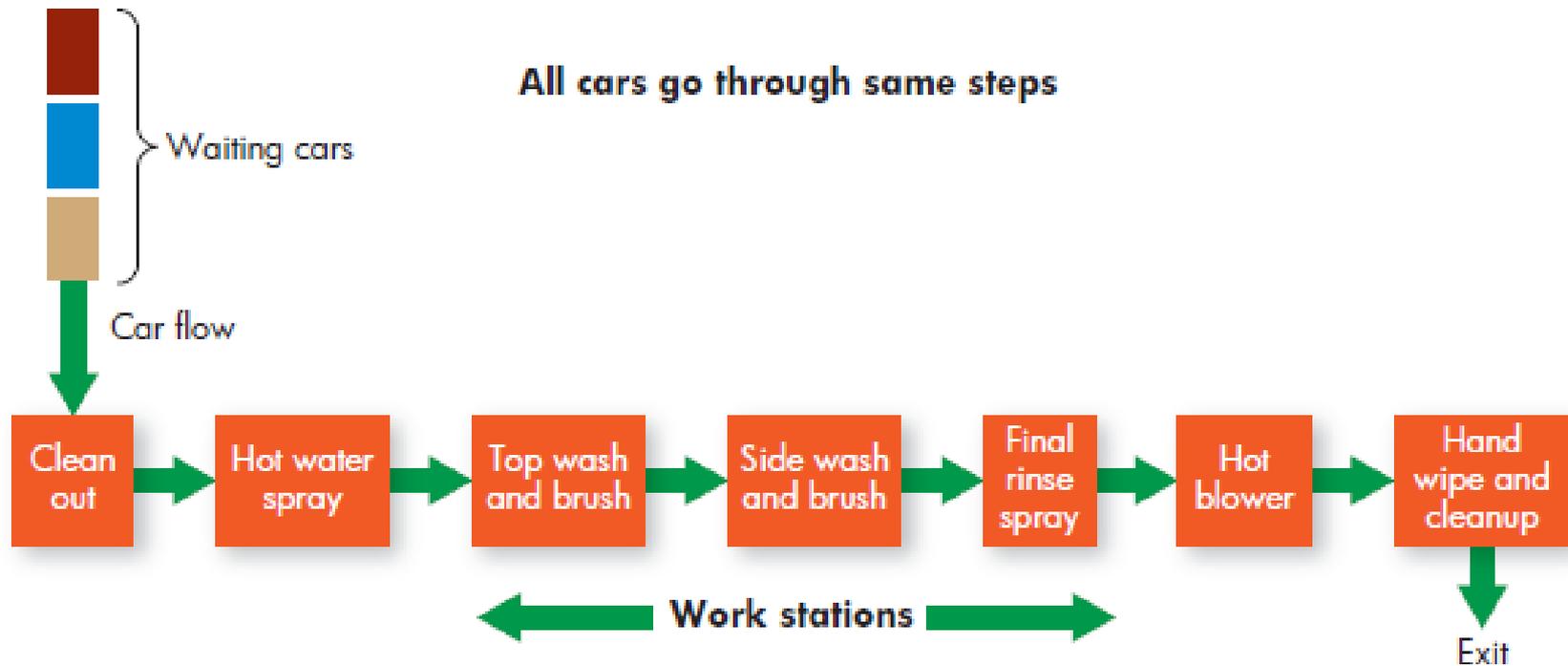
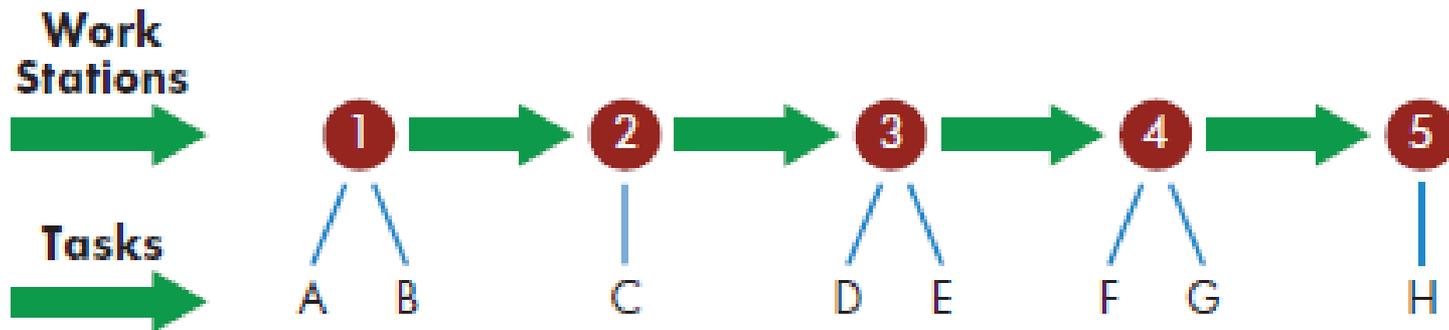


FIGURE 7.6 Product Layout for a Service—Automated Car Wash

Product Layout for Goods Production

Same assembly steps for all frames



A: Assemble window frame
B: Install frame latch
C: Install rubber molding
D: Insert frame screws

E: Cover frame screws
F: Install frame handle
G: Install glass pane
H: Pack window unit

FIGURE 7.7 Product Layout for Goods Production—Storm Window Assembly

Flowchart of Traditional Guest Checkout

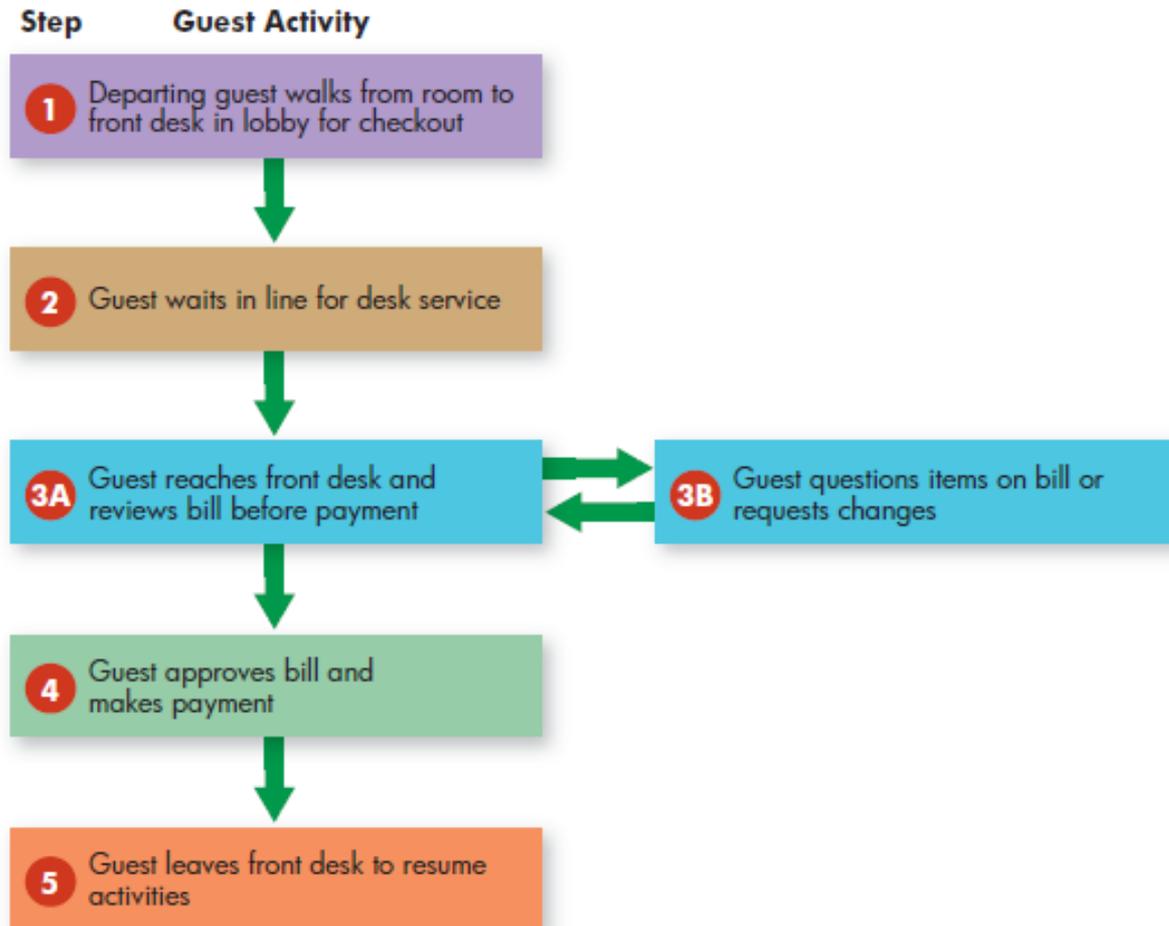


FIGURE 7.8 Flowchart of Traditional Guest Checkout

Quality Planning

- **Quality**

- combination of “characteristics of a product or service that bear on its ability to satisfy stated or implied needs”

- **Performance**

- dimension of quality that refers to how well a product does what it is supposed to do

- **Consistency**

- dimension of quality that refers to sameness of product quality from unit to unit

Operations Scheduling

- **Master schedule**
 - “the game plan” for upcoming production
- **Detailed schedules**
 - show day-to-day activities that will occur in production

Example of Partial Master Operations Schedule

Coil # (Product)	8/4/14	8/11/14	8/18/14	...	11/3/14	11/10/14
TC016	1,500	2,500			2,100	600
TC032	900		2,700		3,000	
TRO20	300		2,600			1,600

FIGURE 7.9 Example of Partial Master Operations Schedule

Food Retailer's Partial Operations Schedule



	Quarter/Year							
	1/2014	2/2014	3/2014	4/2014	1/2015	2/2015	3/2015	4/2015
Number of Stores	17	17	18	19	20	20	21	22
Staffing Level (no. of Employees)	1,360	1,360	1,530	1,615	1,700	1,700	1,653	1,827
Fresh Vegetables (tons)	204	204	192	228	240	240	230	260
Canned Goods (case loads)	73,950	77,350	80,100	80,100	83,000	84,500	88,600	90,200
Fresh Meats Etc.	-	-	-	-	-	-	-	-
-								
-								
-								

FIGURE 7.10 Food Retailer's Partial Operations Schedule

Operations Scheduling

- **Staff schedules**

- identify who and how many employees will be working, and when

- **Project schedules**

- provide coordination for completing large-scale projects

Project Scheduling

- **Gantt Chart**

- production schedule that breaks down large projects into steps to be performed and specifies the time required to perform each step

- **Pert Chart**

- production schedule specifying the sequence of activities, time requirements, and critical path for performing the steps in a project

Gantt Chart

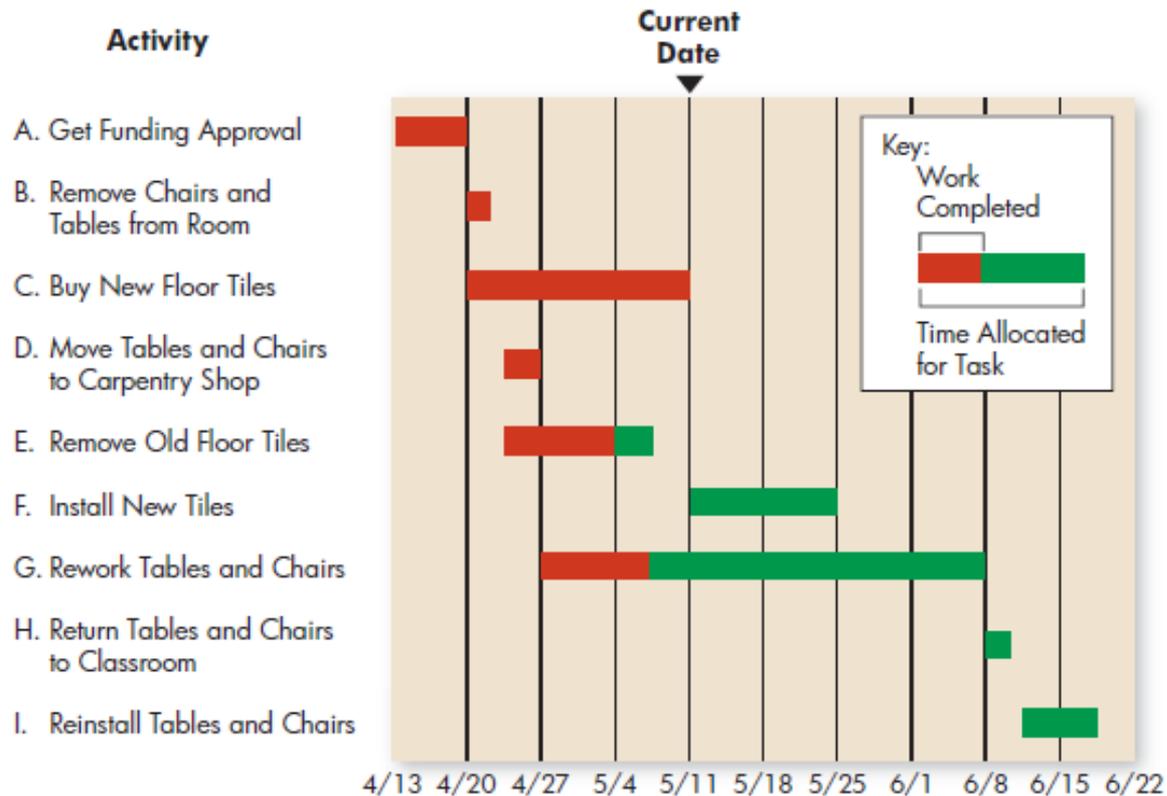


FIGURE 7.11 Gantt Chart

PERT Chart

Key

● Beginning/ending of an activity

➔ Critical path

- A. Get funding approval
- B. Remove chairs and tables
- C. Buy new floor tiles
- D. Move tables and chairs
- E. Remove old floor tiles
- F. Install new floor tiles
- G. Rework tables and chairs
- H. Return tables and chairs
- I. Reinstall tables and chairs

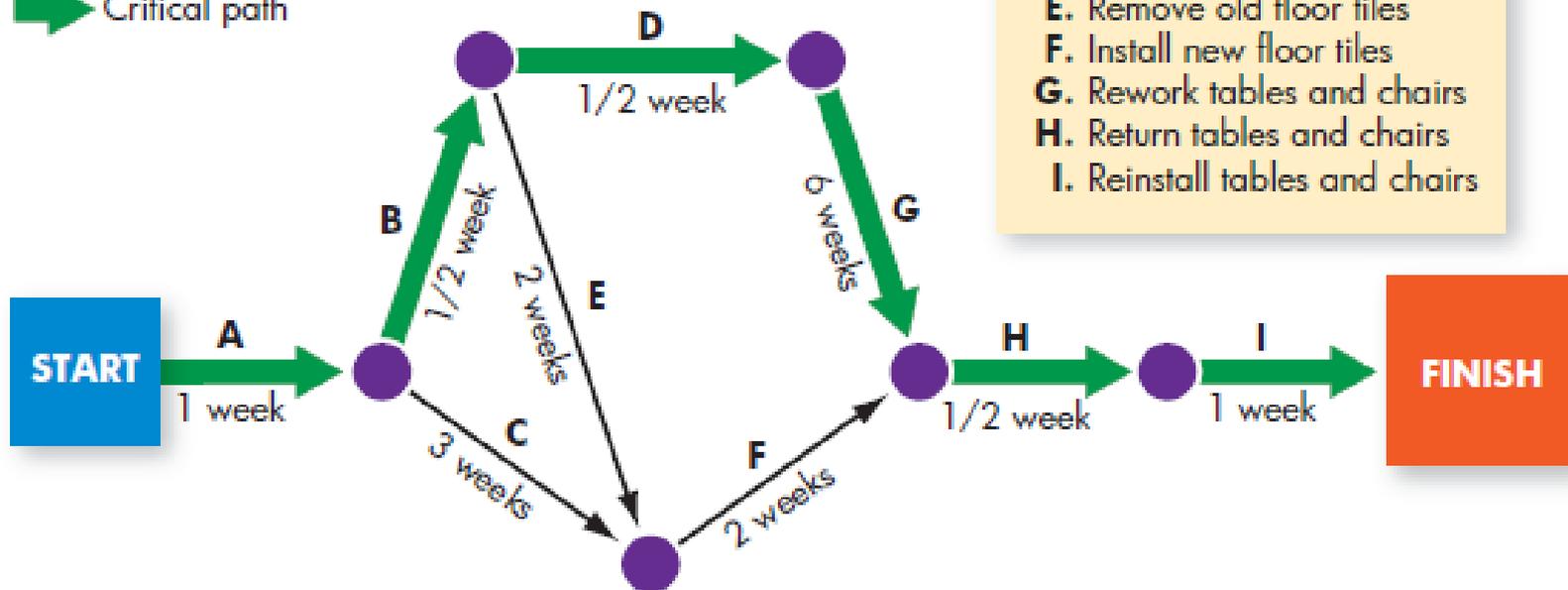


FIGURE 7.12 PERT Chart

Materials Management

- **Materials management**
 - the process by which managers plan, organize, and control the flow of materials from sources of supply through distribution of finished goods

Materials Management Activities for Physical Goods

- **Supplier Selection**

- *process of finding and choosing suppliers from whom to buy*

- **Purchasing**

- *acquisition of the materials and services that a firm needs to produce its products*

Materials Management Activities for Physical Goods (cont.)

- **Transportation**

- activities in transporting resources to the producer and finished goods to customers

- **Warehousing**

- storage of incoming materials for production and finished goods for distribution to customers

- **Inventory Control**

- process of receiving, storing, handling, and counting of all raw materials, partly finished goods, and finished goods

Materials Management

- **Lean Production System**

- production system designed for smooth production flows that avoid inefficiencies, eliminate unnecessary inventories, and continuously improve production processes

- **Just-in-Time (JIT) Production**

- type of lean production system that brings together all materials at the precise time they are required at each production stage

Operations Control

- **Operations Control**
 - process of monitoring production performance by comparing results with plans and taking corrective action when needed
- **Follow-Up**
 - operations control activity for ensuring that production decisions are being implemented

Quality Control

- **Quality Control**

- action of ensuring that operations produce products that meet specific quality standards

The Quality-Productivity Connection

- **Productivity**

- the amount of output produced compared with the amount of resources used to produce that output

Managing for Quality

- **Total Quality Management (TQM)**
 - all activities involved in getting high quality goods and services into the marketplace
- **Quality Ownership**
 - principle of total quality management that holds that quality belongs to each person who creates it while performing a job

Tools for Total Quality Management

- **Competitive Product Analysis**
 - process by which a company analyzes a competitor's products to identify desirable improvements
- **Value-Added Analysis**
 - process of evaluating all work activities, materials flows, and paperwork to determine the value that they add for customers

Tools for Total Quality Management (cont.)

- **Quality Improvement Team**

- TQM tool in which collaborative groups of employees from various work areas work together to improve quality by solving common shared production problems

- **ISO 9000**

- program certifying that a factory, laboratory, or office has met the quality management standards set by the International Organization for Standardization

Tools for Total Quality Management (cont.)

- **ISO 14000**
 - certification program attesting to the fact that a factory, laboratory, or office has improved its environmental performance
- **Business Process Reengineering**
 - rethinking and radical redesign of business processes to improve performance, quality, and productivity

Adding Value Through Supply Chains

- **Supply Chain (Value Chain)**
 - flow of information, materials, and services that starts with raw-materials suppliers and continues adding value through other stages in the network of firms until the product reaches the end customer
- **Supply Chain Management (SCM)**
 - principle of looking at the supply chain as a whole to improve the overall flow through the system

Supply Chain

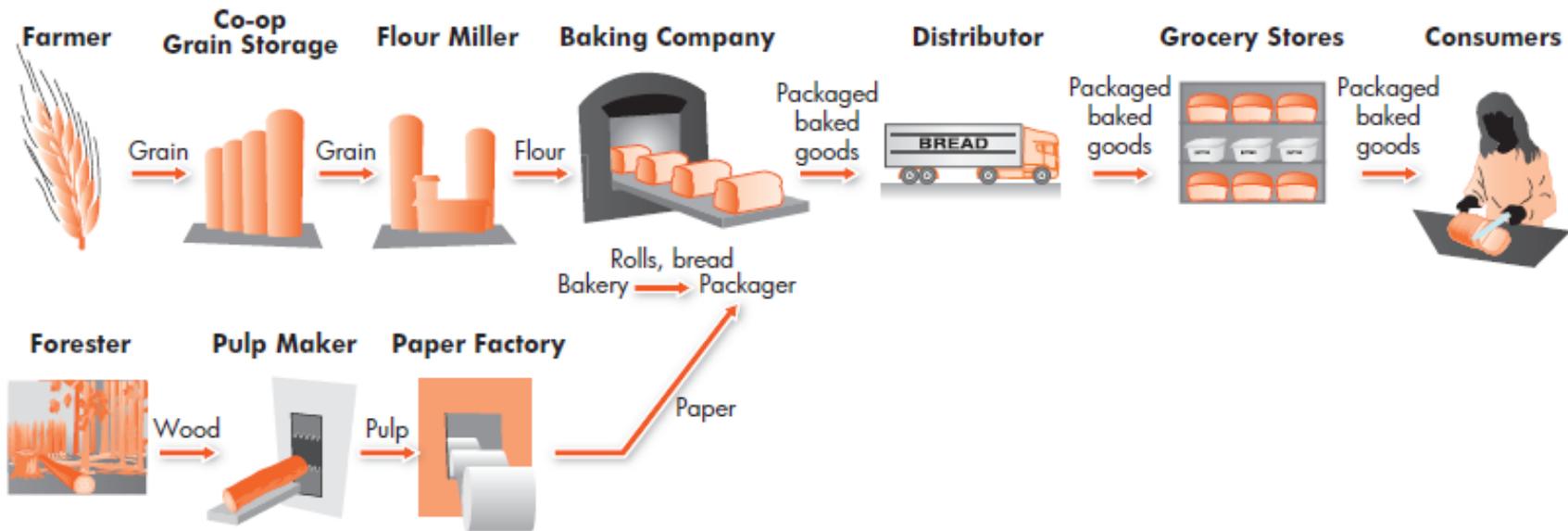


FIGURE 7.13 Supply Chain for Baked Goods

Outsourcing and Global Supply Chains

- **Outsourcing**

- replacing internal processes by paying suppliers and distributors to perform business processes or to provide needed materials or services

Applying What You've Learned

- 1. Explain** the meaning of the term production or operations and describe the three kinds of utility that operations processes provide for adding customer value.
- 2. Identify** the characteristics that distinguish service operations from goods production.
- 3. Explain** how companies with different business strategies are best served by having different operations capabilities.

Applying What You've Learned (cont.)

- 4. Identify** the major factors that are considered in operations planning.
- 5. Discuss** the information contained in four kinds of operations schedules—the master operations schedule, detailed schedule, staff schedule, and project schedule.
- 6. Discuss** the two key activities required for operations control.

Applying What You've Learned (cont.)

- 4. Explain** the differences among functional, divisional, matrix, and international organizational structures and describe the most popular new forms of organizational design.
- 5. Describe** the informal organization and discuss intrapreneuring.

Applying What You've Learned

- 7. Identify** the activities and underlying objectives involved in total quality management.
- 8. Explain** how a supply chain strategy differs from traditional strategies for coordinating operations among firms.



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