



Chapter 1

Information Systems in Business Today

VIDEO CASES

Case 1: UPS Global Operations with the DIAD IV

Case 2: Google Data Center Efficiency Best Practices

Instructional Video 1: Green Energy Efficiency in a Data Center Using Tivoli Architecture

Instructional Video 2: Tour IBM's Raleigh Data Center



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Learning Objectives

- **Understand the effects of information systems on business and their relationship to globalization.**
- **Explain why information systems are so essential in business today.**
- **Define an information system and describe its management, organization, and technology components.**



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Learning Objectives (cont.)

- **Define complementary assets and explain how they ensure that information systems provide genuine value to an organization.**
- **Describe the different academic disciplines used to study information systems and explain how each contributes to our understanding of them.**
- **Explain what is meant by a sociotechnical systems perspective.**



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Shortening Lines at Disney World: Technology to the Rescue

- **Problem:** Long lines limit how many rides, shops, and restaurants a customer can visit during a stay.
- **Solutions:** Enhance customer satisfaction and spending by using information systems to spot gridlock and improve crowd flow.
- Operational Command Center uses video cameras, digital maps, computer programs, and mobile apps to monitor attendance, registers, and spot and prevent gridlock
- Demonstrates IT's role in increasing value and revenue in any business.
- Illustrates the potential for technology to improve customer experience.



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The Role of Information Systems in Business Today

- **How information systems are transforming business**
 - Emerging mobile digital platform
 - Growing business use of “big data”
 - Growth in cloud computing
- **Globalization opportunities**
 - Internet has drastically reduced costs of operating on global scale
 - Increases in foreign trade, outsourcing
 - Presents both challenges and opportunities



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Information Technology Capital Investment

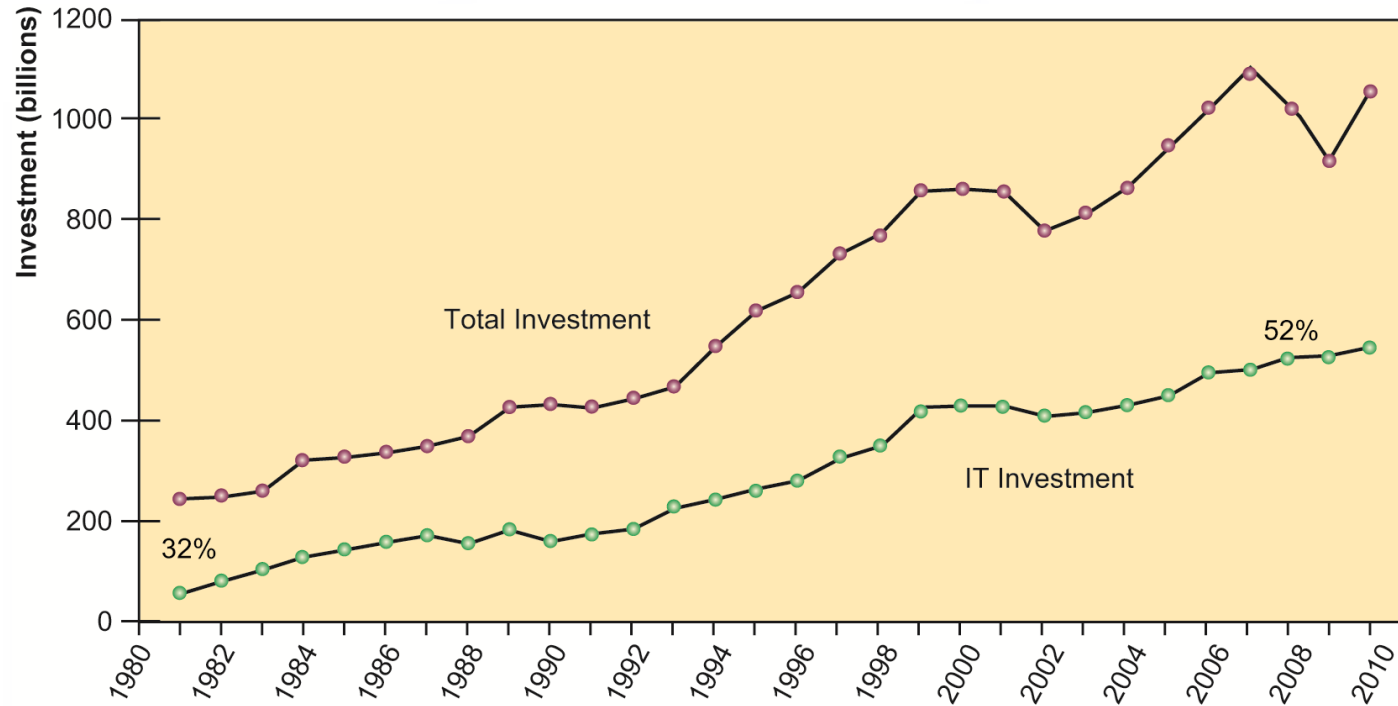


FIGURE 1-1 Information technology capital investment, defined as hardware, software, and communications equipment, grew from 32 percent to 52 percent of all invested capital between 1980 and 2009.



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Interactive Session: Management

RUNNING THE BUSINESS FROM THE PALM OF YOUR HAND

Read the Interactive Session and discuss the following questions

- **What kinds of applications are described in the case? What business functions do they support? How do they improve operational efficiency and decision making?**
- **Identify the problems that businesses in this case study solved by using mobile digital devices.**
- **What kinds of businesses are most likely to benefit from equipping their employees with mobile devices?**
- **Discuss the implications of this statement: “The iPhone is not a game changer, it’s an industry changer.”**



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The Role of Information Systems in Business Today

- **In the emerging, fully digital firm:**
 - Significant business relationships are digitally enabled and mediated.
 - Core business processes are accomplished through digital networks.
 - Key corporate assets are managed digitally.
- **Digital firms offer greater flexibility in organization and management.**
 - Time shifting, space shifting



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The Role of Information Systems in Business Today

- **Growing interdependence between ability to use information technology and ability to implement corporate strategies and achieve corporate goals**
- **Business firms invest heavily in information systems to achieve six strategic business objectives:**
 1. **Operational excellence**
 2. **New products, services, and business models**
 3. **Customer and supplier intimacy**
 4. **Improved decision making**
 5. **Competitive advantage**
 6. **Survival**



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The Interdependence Between Organizations and Information Technology

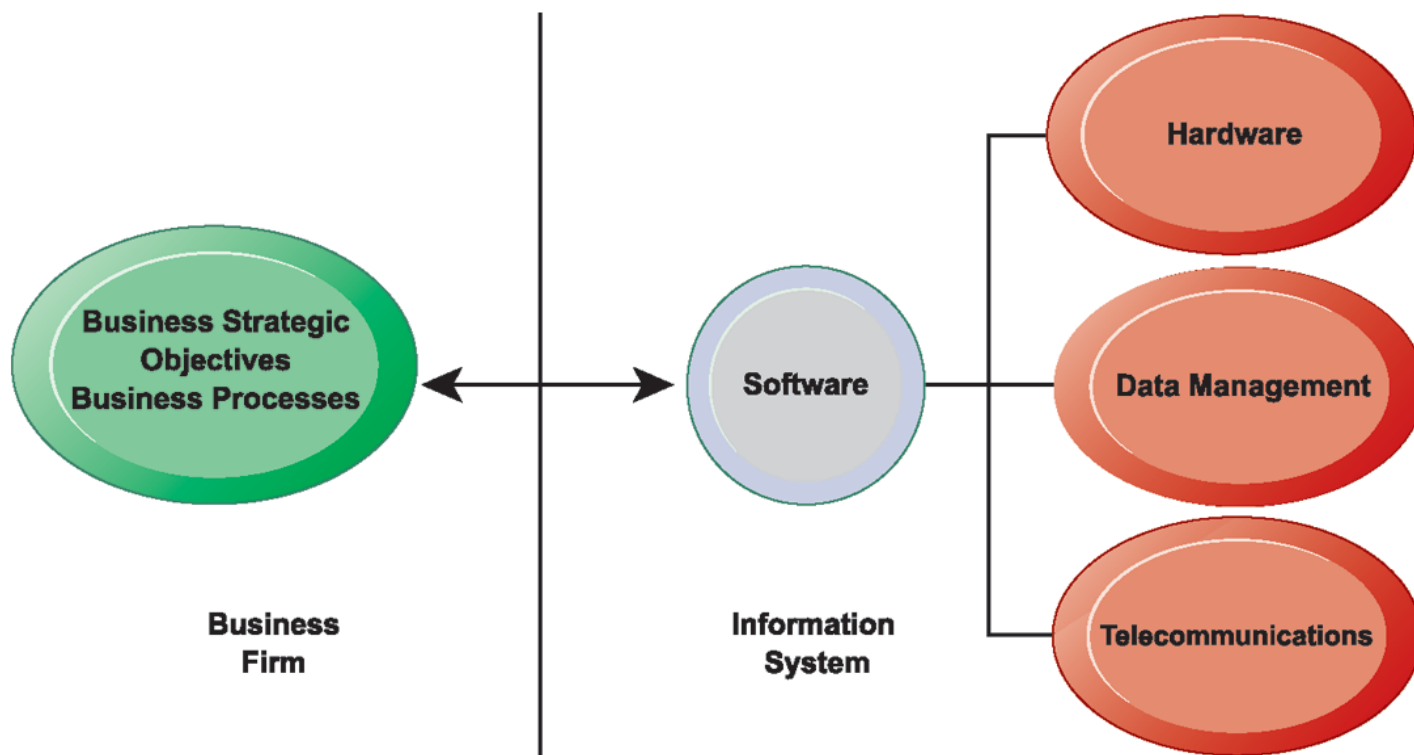


Figure 1.2

In contemporary systems there is a growing interdependence between a firm's information systems and its business capabilities. Changes in strategy, rules, and business processes increasingly require changes in hardware, software, databases, and telecommunications. Often, what the organization would like to do depends on what its systems will permit it to do.



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The Role of Information Systems in Business Today

- **Operational excellence:**
 - Improvement of efficiency to attain higher profitability
 - Information systems, technology an important tool in achieving greater efficiency and productivity
 - Walmart's Retail Link system links suppliers to stores for superior replenishment system



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The Role of Information Systems in Business Today

- **New products, services, and business models:**
 - **Business model:** describes how company produces, delivers, and sells product or service to create wealth
 - **Information systems and technology a major enabling tool for new products, services, business models**
 - Examples: Apple's iPad, Google's Android OS, and Netflix



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The Role of Information Systems in Business Today

- **Customer and supplier intimacy:**
 - **Serving customers well leads to customers returning, which raises revenues and profits.**
 - Example: High-end hotels that use computers to track customer preferences and used to monitor and customize environment
 - **Intimacy with suppliers allows them to provide vital inputs, which lowers costs.**
 - Example: JCPenney's information system which links sales records to contract manufacturer



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The Role of Information Systems in Business Today

- **Improved decision making**
 - **Without accurate information:**
 - Managers must use forecasts, best guesses, luck
 - Results in:
 - Overproduction, underproduction
 - Misallocation of resources
 - Poor response times
 - Poor outcomes raise costs, lose customers
 - **Example: Verizon's Web-based digital dashboard to provide managers with real-time data on customer complaints, network performance, line outages, and so on**



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The Role of Information Systems in Business Today

- **Competitive advantage**
 - Delivering better performance
 - Charging less for superior products
 - Responding to customers and suppliers in real time
 - Examples: Apple, Walmart, UPS



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The Role of Information Systems in Business Today

- **Survival**

- **Information technologies as necessity of business**
- **Industry-level changes**
 - Example: Citibank's introduction of ATMs
- **Governmental regulations requiring record-keeping**
 - Examples: Toxic Substances Control Act, Sarbanes-Oxley Act



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Perspectives on Information Systems

- **Information system:**
 - Set of interrelated components
 - Collect, process, store, and distribute information
 - Support decision making, coordination, and control
- **Information vs. data**
 - Data are streams of raw facts.
 - Information is data shaped into meaningful form.



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Data and Information

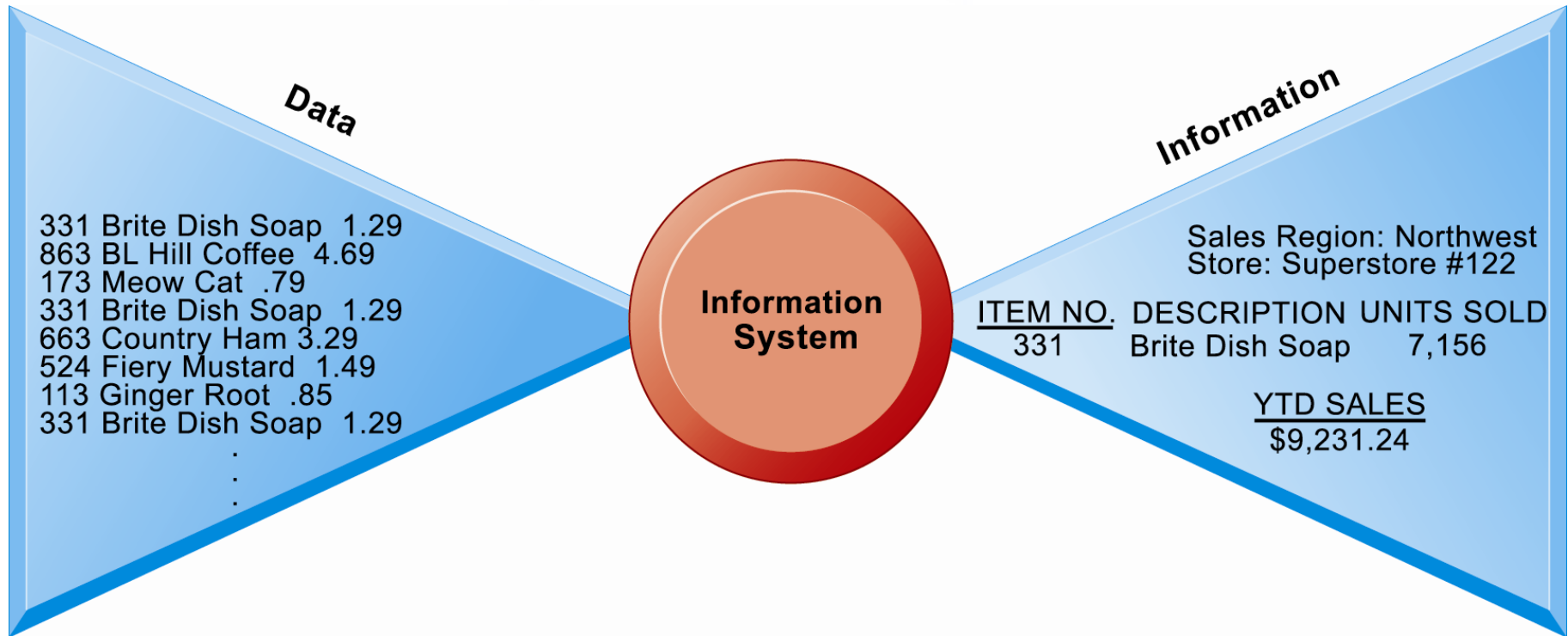


Figure 1.3

Raw data from a supermarket checkout counter can be processed and organized to produce meaningful information, such as the total unit sales of dish detergent or the total sales revenue from dish detergent for a specific store or sales territory.



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Perspectives on Information Systems

- **Three activities of information systems produce information organizations need**
 - **Input:** Captures raw data from organization or external environment
 - **Processing:** Converts raw data into meaningful form
 - **Output:** Transfers processed information to people or activities that use it



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Perspectives on Information Systems

- **Feedback:**
 - Output is returned to appropriate members of organization to help evaluate or correct input stage.
- **Computer/Computer program vs. information system**
 - Computers and software are technical foundation and tools, similar to the material and tools used to build a house.



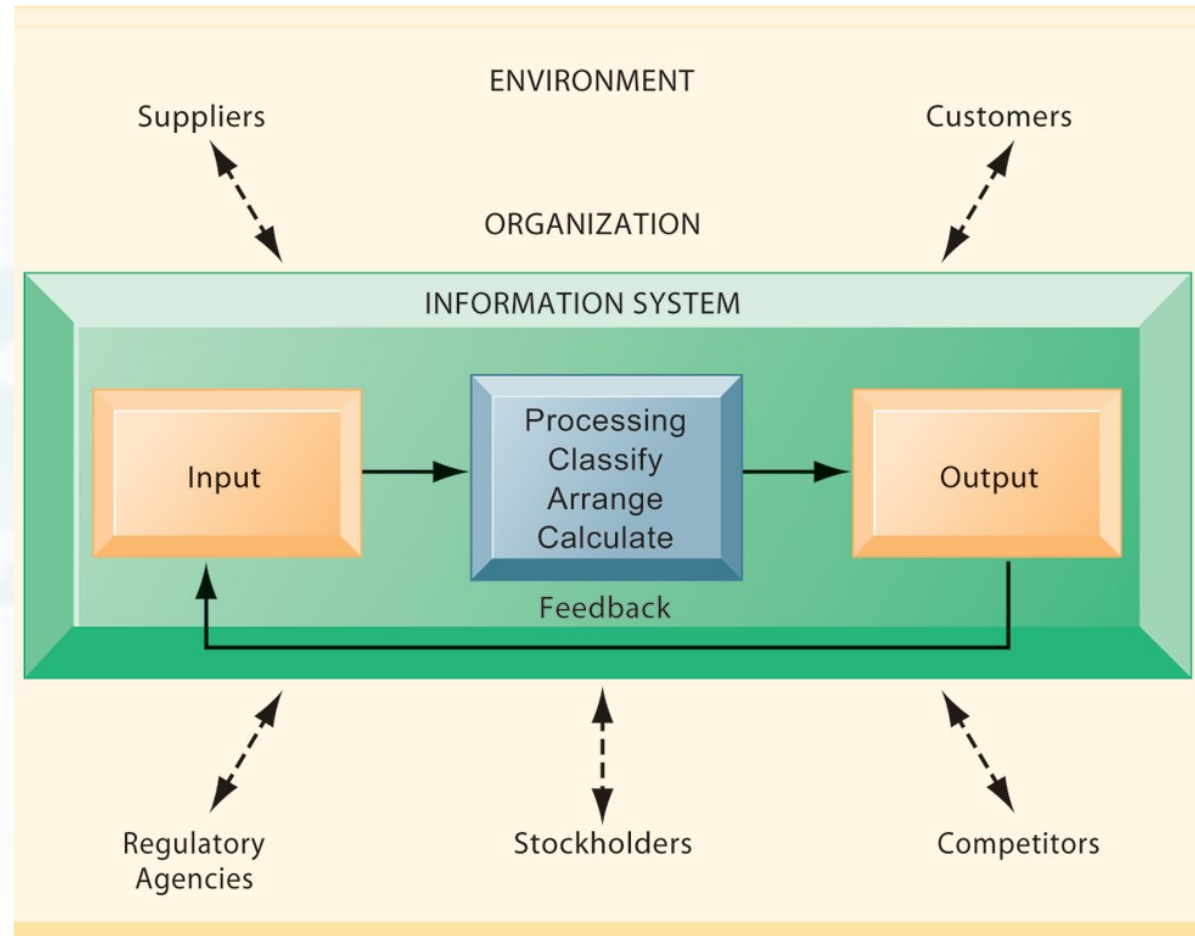
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Functions of an Information System

An information system contains information about an organization and its surrounding environment. Three basic activities—input, processing, and output—produce the information organizations need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. Environmental actors, such as customers, suppliers, competitors, stockholders, and regulatory agencies, interact with the organization and its information systems.

Figure 1.4





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Information Systems Are More Than Computers

Using information systems effectively requires an understanding of the organization, management, and information technology shaping the systems. An information system creates value for the firm as an organizational and management solution to challenges posed by the environment.

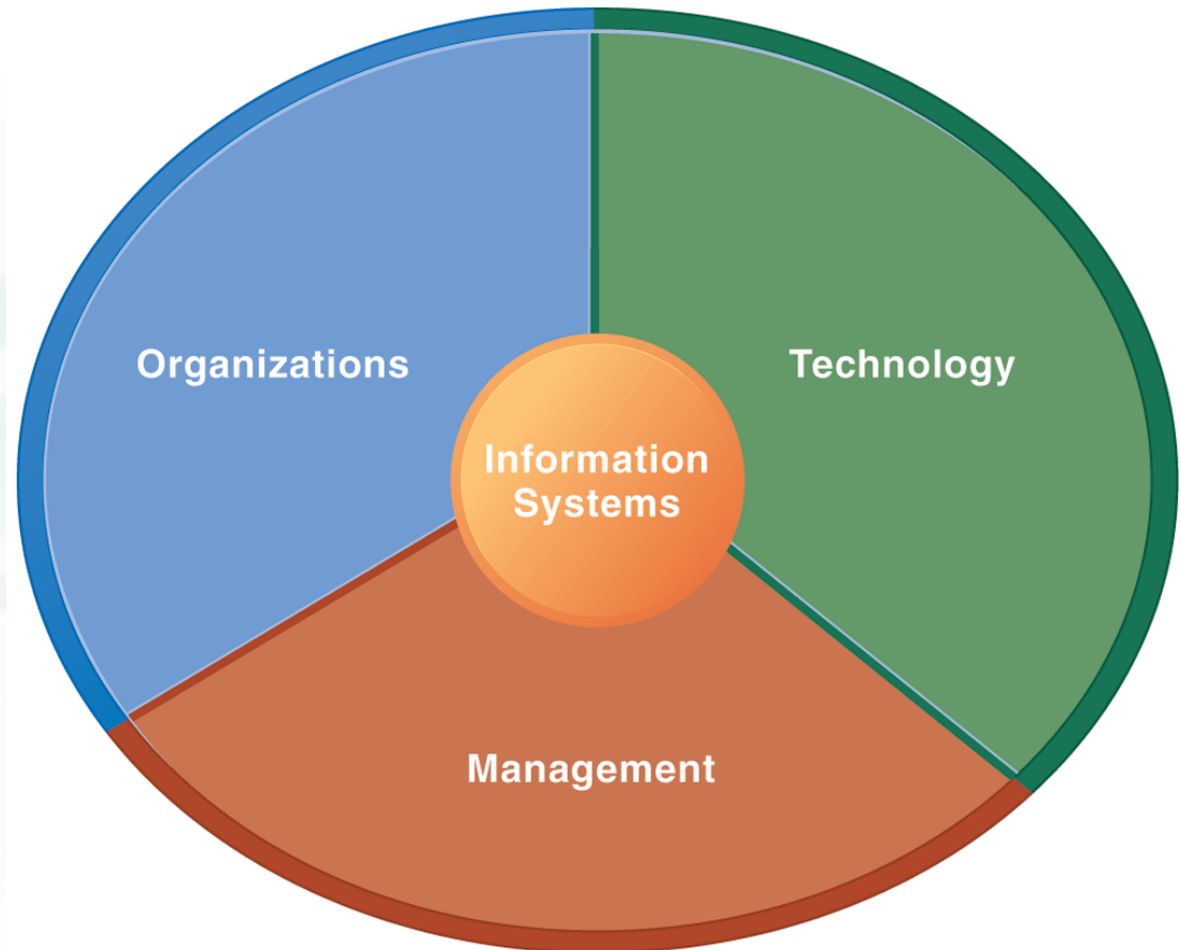


Figure 1.5



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Perspectives on Information Systems

- **Organizational dimension of information systems**
 - **Hierarchy of authority, responsibility**
 - Senior management
 - Middle management
 - Operational management
 - Knowledge workers
 - Data workers
 - Production or service workers



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Levels in a Firm

Business organizations are hierarchies consisting of three principal levels: senior management, middle management, and operational management. Information systems serve each of these levels. Scientists and knowledge workers often work with middle management.

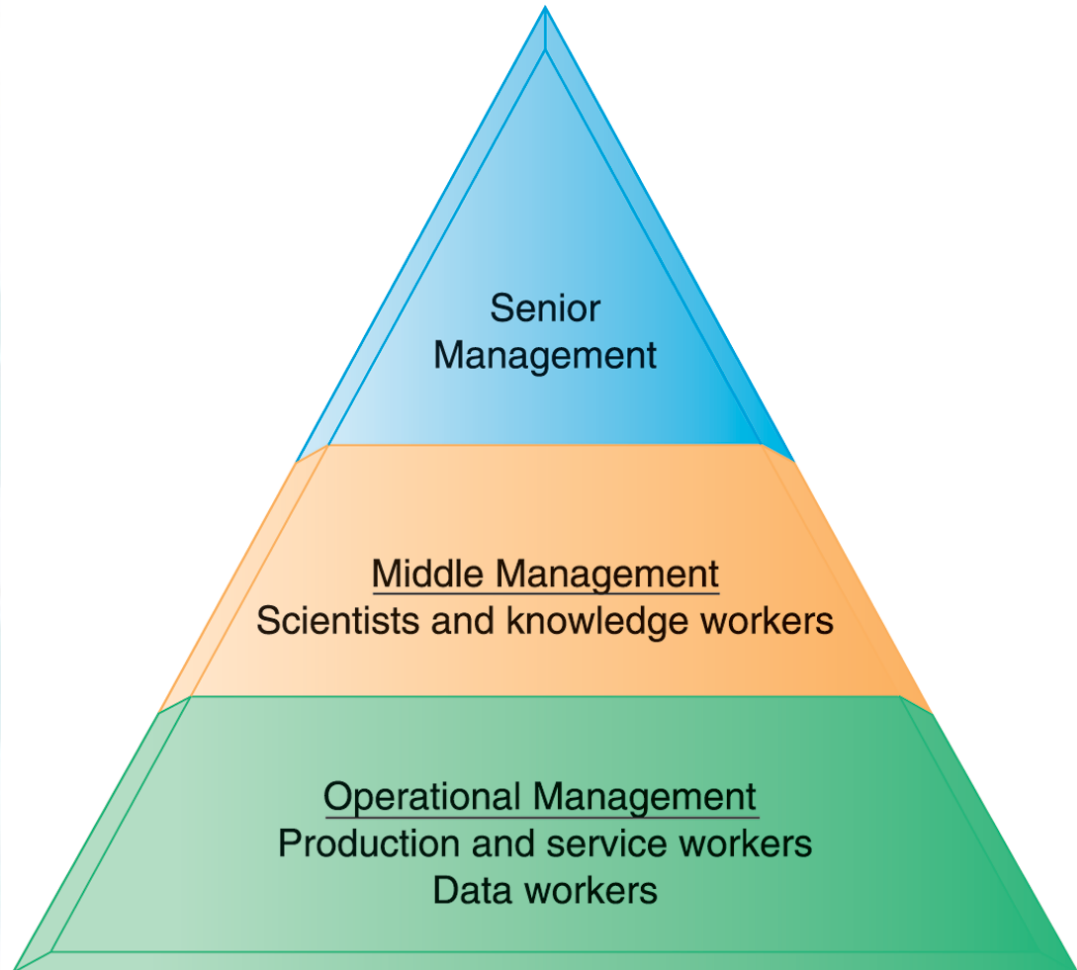


Figure 1.6



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Perspectives on Information Systems

- **Organizational dimension of information systems (cont.)**
 - **Separation of business functions**
 - Sales and marketing
 - Human resources
 - Finance and accounting
 - Manufacturing and production
 - **Unique business processes**
 - **Unique business culture**
 - **Organizational politics**



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Perspectives on Information Systems

- **Management dimension of information systems**
 - **Managers set organizational strategy for responding to business challenges**
 - **In addition, managers must act creatively:**
 - **Creation of new products and services**
 - **Occasionally re-creating the organization**



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Perspectives on Information Systems

- **Technology dimension of information systems**
 - **Computer hardware and software**
 - **Data management technology**
 - **Networking and telecommunications technology**
 - Networks, the Internet, intranets and extranets, World Wide Web
 - **IT infrastructure: provides platform that system is built on**



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Interactive Session: Organizations

UPS COMPETES GLOBALLY WITH I.T.

Read the Interactive Session and discuss the following questions

- **What are the inputs, processing, and outputs of UPS' s package tracking system?**
- **What technologies are used by UPS? How are these technologies related to UPS' s business strategy?**
- **What business objectives do UPS' s information systems address?**
- **What would happen if these systems were not available?**



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Perspectives on Information Systems

- **Dimensions of UPS tracking system**
 - **Organizational:**
 - Procedures for tracking packages and managing inventory and provide information
 - **Management:**
 - Monitor service levels and costs
 - **Technology:**
 - Handheld computers, bar-code scanners, networks, desktop computers, and so on



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Perspectives on Information Systems

- **Business perspective on information systems:**
 - Information system is instrument for creating value
 - Investments in information technology will result in superior returns:
 - Productivity increases
 - Revenue increases
 - Superior long-term strategic positioning



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Perspectives on Information Systems

- **Business information value chain**
 - Raw data acquired and transformed through stages that add value to that information
 - Value of information system determined in part by extent to which it leads to better decisions, greater efficiency, and higher profits
- **Business perspective:**
 - Calls attention to organizational and managerial nature of information systems



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The Business Information Value Chain

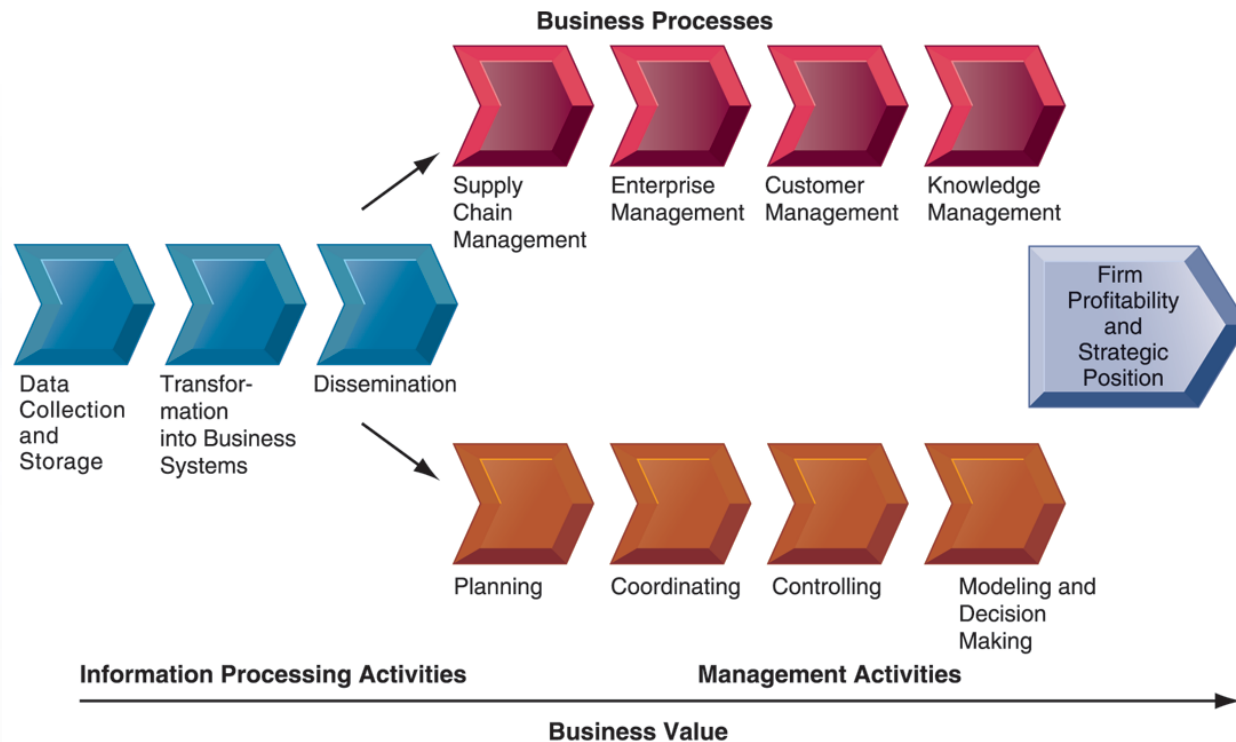


Figure 1-7

From a business perspective, information systems are part of a series of value-adding activities for acquiring, transforming, and distributing information that managers can use to improve decision making, enhance organizational performance, and, ultimately, increase firm profitability.



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Perspectives on Information Systems

- **Investing in information technology does not guarantee good returns.**
- **There is considerable variation in the returns firms receive from systems investments.**
- **Factors:**
 - **Adopting the right business model**
 - **Investing in complementary assets (organizational and management capital)**



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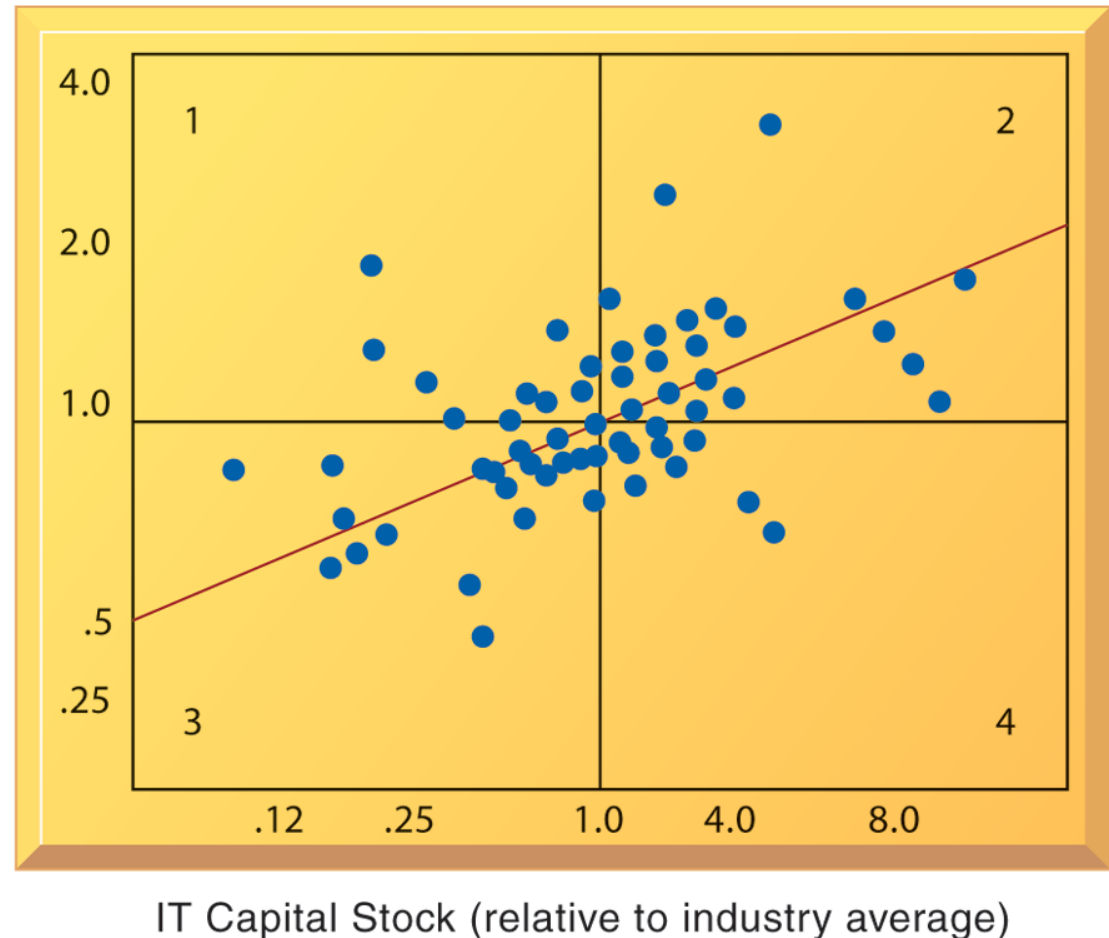
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Variation in Returns on Information Technology Investment

Although, on average, investments in information technology produce returns far above those returned by other investments, there is considerable variation across firms.

Productivity
(relative to
industry
average)

Figure 1.8





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Perspectives on Information Systems

- **Complementary assets:**
 - Assets required to derive value from a primary investment
 - Firms supporting technology investments with investment in complementary assets receive superior returns
 - Example: Invest in technology and the people to make it work properly



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Perspectives on Information Systems

- **Complementary assets include:**
 - **Organizational assets, for example:**
 - Appropriate business model
 - Efficient business processes
 - **Managerial assets, for example:**
 - Incentives for management innovation
 - Teamwork and collaborative work environments
 - **Social assets, for example:**
 - The Internet and telecommunications infrastructure
 - Technology standards



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Contemporary Approaches to Information Systems

The study of information systems deals with issues and insights contributed from technical and behavioral disciplines.

Technical Approaches

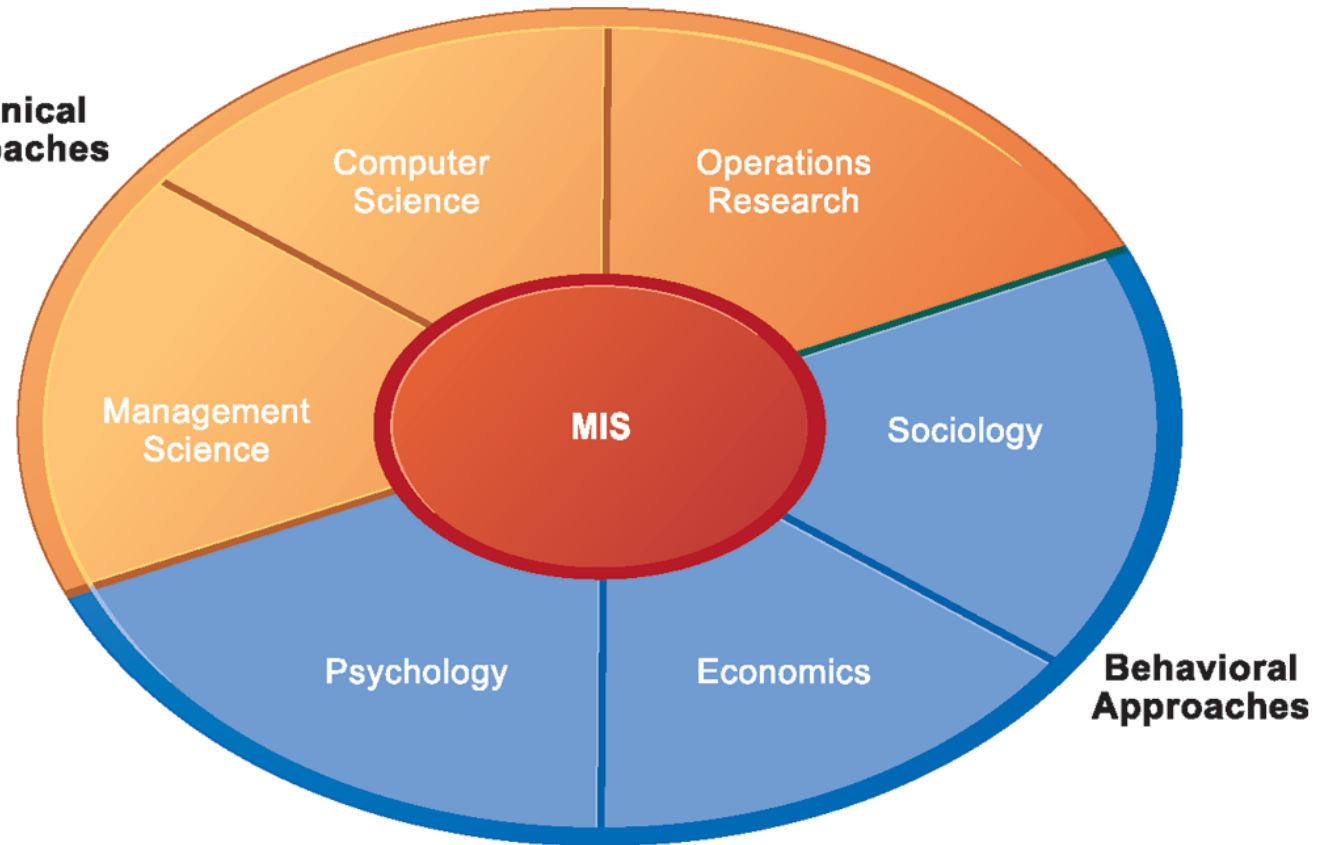


Figure 1.9



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Contemporary Approaches to Information Systems

- **Technical approach**
 - Emphasizes mathematically based models
 - Computer science, management science, operations research
- **Behavioral approach**
 - Behavioral issues (strategic business integration, implementation, etc.)
 - Psychology, economics, sociology



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Contemporary Approaches to Information Systems

- **Management Information Systems**
 - Combines computer science, management science, operations research and practical orientation with behavioral issues
- **Four main actors**
 - Suppliers of hardware and software
 - Business firms
 - Managers and employees
 - Firm' s environment (legal, social, cultural context)



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Contemporary Approaches to Information Systems

- **Approach of this book: Sociotechnical view**
 - **Optimal organizational performance achieved by jointly optimizing both social and technical systems used in production**
 - **Helps avoid purely technological approach**



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A Sociotechnical Perspective on Information Systems

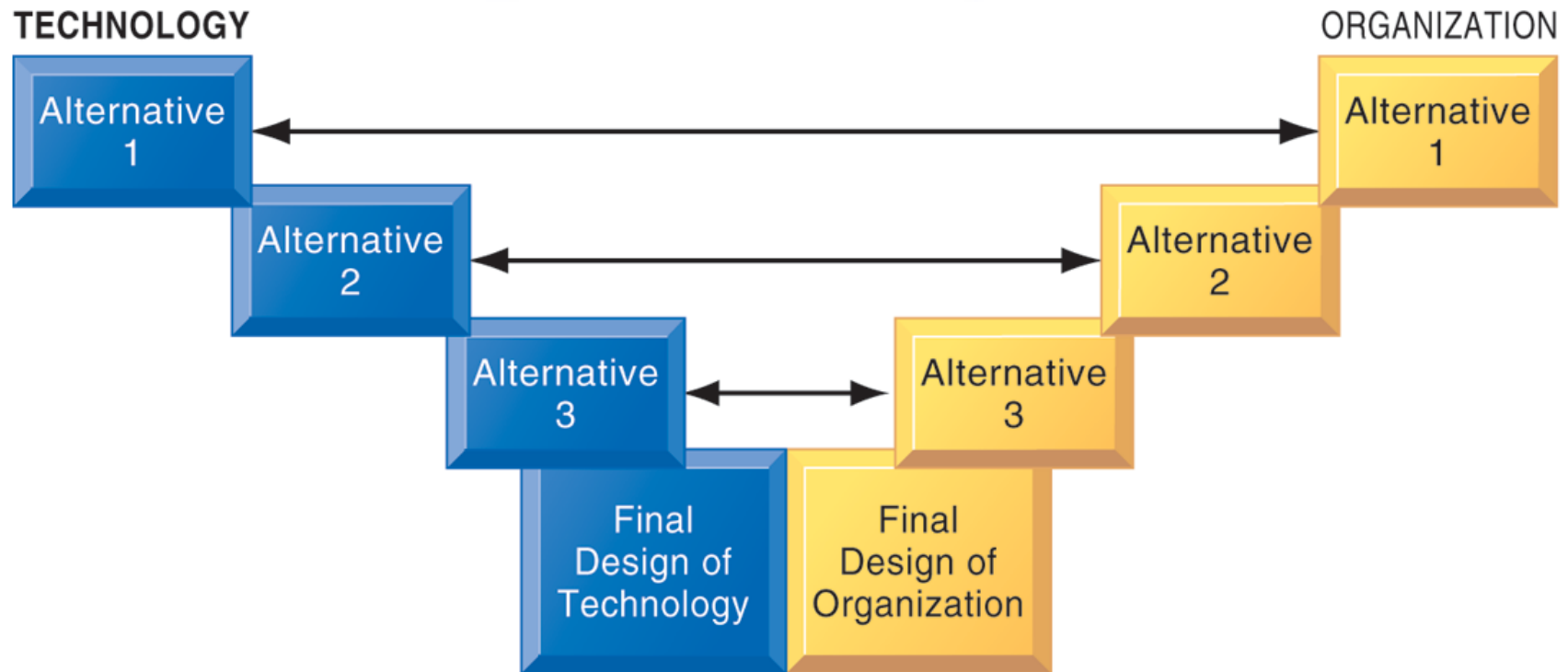


Figure 1-10

In a sociotechnical perspective, the performance of a system is optimized when both the technology and the organization mutually adjust to each other until a satisfactory fit is obtained.



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