

Management Information Systems

MANAGING THE DIGITAL FIRM, 12TH EDITION, GLOBAL EDITION

Chapter 1

INFORMATION SYSTEMS IN BUSINESS TODAY

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CHAPTER 1: INFORMATION IN BUSINESS SYSTEMS TODAY

Learning Objectives

- Understanding 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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Efficiency in Wood Harvesting with Information Systems

- Problem: How to keep in contact with the various parties of the wood production and procurement chain
- Solutions: Use information systems to enhance experience. Cutting plans, maps and working instructions delivered via a dedicated e-mail system.
- Ponsse provides technology to make them the most wired in all of the timber machine industry.
- Demonstrates IT's role in providing new products and services.
- Illustrates the benefits of utilizing networks and mobile applications to enhance customer service, information.

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The Role of Information Systems in Business Today

- How information systems are transforming business
 - Increase in wireless technology use, Web sites
 - Increased business use of Web 2.0 technologies
 - Cloud computing, mobile digital platform allow more distributed work, decision-making, and collaboration
- Globalization opportunities
 - Internet has drastically reduced costs of operating on global scale
 - Presents both challenges and opportunities

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The Role of Information Systems in Business Today

Information Technology Capital Investment

Year	Total Investment (billions)	IT Investment (billions)	IT % of Total
1980	250	80	30%
1985	300	100	33%
1990	350	120	34%
1995	400	150	38%
2000	850	400	47%
2005	900	450	50%
2009	1050	550	52%

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

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- **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 iPod, iTunes, iPhone, iPad, Google's Android OS, and Netflix

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- **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 use to monitor and customize environment
 - Intimacy with suppliers allows them to provide vital inputs, which lowers costs
 - Example: J.C.Penney's information system which links sales records to contract manufacturer

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- **Improved decision making**
 - **Without accurate information:**
 - Managers must use forecasts, best guesses, luck
 - Leads to:
 - Overproduction, underproduction of goods and services
 - 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, etc.**

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The Role of Information Systems in Business Today

- Operational excellence:
 - Improvement of efficiency to attain higher profitability
- New products, services, and business models:
 - Enabled by technology
- Customer and supplier intimacy:
 - Serving customers raises revenues and profits
 - Better communication with suppliers lowers costs
- Improved decision making
 - More accurate data leads to better decisions

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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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- Survival
 - Information technologies as necessity of business
 - May be:
 - Industry-level changes, e.g. Citibank's introduction of ATMs
 - Governmental regulations requiring record-keeping
 - Examples: Toxic Substances Control Act, Sarbanes-Oxley Act

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The Role of Information Systems in Business Today

The Interdependence Between Organizations and Information Technology

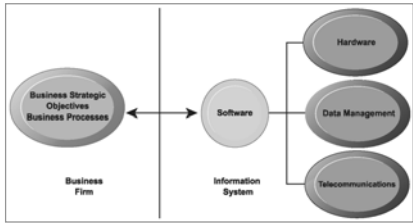


Figure 1.2 In contemporary systems there is a growing interdependence between a firm's information systems and its business capabilities. Changes in strategy, rules, and business processes increasingly require changes in hardware, software, databases, and telecommunications. Often, what the organization would like to do depends on what its systems will permit it to do.

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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

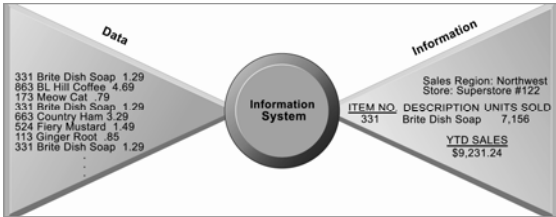


Figure 1.3 Raw data from a supermarket checkout counter can be processed and organized to produce meaningful information, such as the total unit sales of dish detergent or the total sales revenue from dish detergent for a specific store or sales territory.

ITEM NO.	DESCRIPTION	UNITS SOLD
331	Brite Dish Soap	7,156

YTD SALES \$9,231.24

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• Three activities of information systems produce information organizations need

1. **Input:** Captures raw data from organization or external environment

2. **Processing:** Converts raw data into meaningful form

3. **Output:** Transfers processed information to people or activities that use it

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Perspectives on Information Systems

• **Feedback:**

– Output 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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- **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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- **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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- **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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- **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, etc.

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- **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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- **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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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.

Figure 1.8

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Investing in information technology does not guarantee good returns

- 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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Complementary assets:

- Assets required to derive value from a primary investment
- Firms supporting technology investments with investment in complementary assets receive superior returns
- E.g.: invest in technology and the people to make it work properly

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Complementary assets include:

- Organizational assets, e.g.
 - Appropriate business model
 - Efficient business processes
- Managerial assets, e.g.
 - Incentives for management innovation
 - Teamwork and collaborative work environments
- Social assets, e.g.
 - The Internet and telecommunications infrastructure
 - Technology standards

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Contemporary Approaches to Information Systems

Contemporary Approaches to Information Systems

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

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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Contemporary Approaches to Information Systems

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 one another until a satisfactory fit is obtained.

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