Chapter 1

Information Systems in Global Business Today
• How information systems are transforming business
  - Increased technology investments
  - Increased responsiveness to customer demands: A “Fed-Ex” economy
  - Shifts in media and advertising
  - New federal security and accounting laws
• Globalization opportunities
  - Internet has drastically reduced costs of operating on global scale
Information technology investment, defined as hardware, software, and communications equipment, grew from 34% to 50% between 1980 and 2004.


Figure 1-1
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
• What are the advantages of using videoconferencing technologies? What are the disadvantages?

• What is telepresence and what sorts of companies are best suited to use it as a communications tool?

• What kinds of companies could benefit from using videoconferencing? Are there any companies that might not derive any benefits from this technology?
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:

- Operational excellence
- New products, services, and business models
- Customer and supplier intimacy
- Improved decision making
- Competitive advantage
- Survival
• Operational excellence:
  – Improvement of efficiency to attain higher profitability
  – Information systems, technology an important tool in achieving greater efficiency and productivity
  – E.g. Wal-Mart’s RetailLink system links suppliers to stores for superior replenishment system
• 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
    • E.g. Apple’s iPod, iTunes and Netflix’s Internet-based DVD rentals
Customer and supplier intimacy:

- Serving customers well leads to customers returning, which raises revenues and profits
  - E.g. 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
  - E.g. J.C. Penney’s information system which links sales records to contract manufacturer
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
- E.g. Verizon’s Web-based digital dashboard to provide managers with real-time data on customer complaints, network performance, line outages, etc.
• Competitive advantage
  – Delivering better performance
  – Charging less for superior products
  – Responding to customers and suppliers in real time
  – Often achieved when firm achieves one of first four advantages
  – E.g. Dell: Consistent profitability over 25 years; Dell remains one of the most efficient producer of PCs in world.
  – But Dell has lost some of its advantages to fast followers-- HP
• **Survival**
  – Information technologies as necessity of business
  – May be:
    • Industry-level changes, e.g. Citibank’s introduction of ATMs
    • Governmental regulations requiring record-keeping
      – E.g. Toxic Substances Control Act, Sarbannes-Oxley Act
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.
• **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
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.
• **Information system**: Three activities 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
• **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
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
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.
Organizational dimension of information systems

- Hierarchy of authority, responsibility
  - Senior management
  - Middle management
  - Operational management
  - Knowledge workers
  - Data workers
  - Production or service workers
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.
• Organizational dimension of information systems (cont.)
  – Separation of business functions
    • Sales and marketing
    • Human resources
    • Finance and accounting
    • Production and manufacturing
  – Unique business processes
  – Unique business culture
  – Organizational politics
• Management dimension of information system
  – 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
• 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
Read the Interactive Session: Technology, and then 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 problems do UPS’s information systems solve? What would happen if these systems were not available?
• 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.
• **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
• **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
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.

Figure 1-7
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
• 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)
• 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
Complementary assets include:

- Organizational investments, e.g.
  - Appropriate business model
  - Efficient business processes

- Managerial investments, e.g.
  - Incentives for management innovation
  - Teamwork and collaborative work environments

- Social investments, e.g.
  - The Internet and telecommunications infrastructure
  - Technology standards
The study of information systems deals with issues and insights contributed from technical and behavioral disciplines.

Figure 1-9
• **Technical approach**
  • Emphasizes mathematically based models
  • Computer science, management science, operations research

• **Behavioral approach**
  • Behavioral issues (strategic business integration, implementation, etc.)
  • Psychology, economics, sociology
• **Management Information Science**
  • 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)
• **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
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.

Figure 1-10