Chapter 1

Foundations Of Information Systems In Business
Chapter Highlights

• Foundation Concepts: Information Systems in Business
  ➢ The fundamental roles of IS in business
  ➢ Trend in information systems
  ➢ The role of e-Business in business
  ➢ Types of information systems
  ➢ Managerial challenges of information technology
Chapter Highlights (continued)

- Foundation Concepts: The Components of Information Systems
  - Components of information systems
  - Information system resources
  - Information system activities
  - Recognizing information systems
Learning Objectives

• Understand the concept of a system and how it relates to information systems.

• Explain why knowledge of information systems is important for business professionals, and identify five areas of information systems knowledge they need.

• Give examples to illustrate how the business applications of IS can support a firm’s business processes, managerial decision making, and strategies for competitive advantage.
Learning Objectives (continued)

- Provide examples of several major types of information systems from your experiences with business organizations in the real world.
- Become familiar with the many of career opportunities in information systems.
Introduction

- Information systems and technologies are a vital component of successful businesses and organizations.
- Information technologies
  - including Internet-based information systems, are playing a vital and expanding role in business.
  - improve the efficiency and effectiveness of
    - business processes
    - managerial decision making
    - workgroup collaboration
  - increase their competitive positions in a rapidly changing marketplace.
An information system (IS) can be any organized combination of
- People
- Hardware
- Software
- communications networks
- data resources
- policies and procedures that stores, retrieves, transforms, and disseminates information in an organization.
People rely on modern IS to communicate with each other using a variety of physical devices (hardware), information processing instructions & procedures (software), communications channels (networks) & stored data (data resources).
• **Information system describes**
  - all of the components and resources necessary to deliver its information and functions to the organization.

• **Information technology refers**
  - to the various hardware, software, networking, and data management components necessary for the system to operate.
The Fundamental Roles of IS in Business

• Three vital roles that information systems can perform for a business enterprise.
  • Support of its business processes and operations.
  • Support of decision making by its employees and managers.
  • Support of its strategies for competitive advantage.
Several types of information systems can be classified as either:

- Operations Support Systems
- Management Support Systems
Operations Support Systems

- **Transaction processing systems**
  - Process data resulting from business transactions, update operational databases and produce business documents.
  - Examples: sales and inventory processing and accounting systems.
Operations Support Systems (continued)

- **Process control systems**
  - Monitor and control industrial processes.
  - Examples: petroleum refining, power generation, and steel production systems.
Operations Support Systems (continued)

• Enterprise collaboration systems.
  • Support team, workgroup, and enterprise communications and collaboration.
  • Examples: e-mail, chat, and videoconferencing groupware systems.
Management Support Systems

• Management information systems.
  • Provide information in the form of pre-specified reports and displays to support business decision making.
  • Examples: sales analysis, production performance, and cost trend reporting systems.
Decision support systems.
  • Provide decision-making processes of managers and other business professionals.
  • Examples: product pricing, profitability forecasting, and risk analysis systems.
Executive information systems.

- Provide critical information from MIS, DSS, and other sources modified to the information needs of executives.
- Examples: systems for easy access to analyses of business performance, actions of competitors, and economic developments to support strategic planning.
Figure 1.1 Operations & Management classifications of information systems

Operations Support Systems
- Specialized Processing Systems
  - Processing Business Transactions
- Transaction Processing Systems
- Process Control Systems
- Enterprise Collaboration Systems
  - Team and Workgroup Collaboration
  - Manage Organizational Knowledge
- Expert Systems
  - Expert Advice to Decision Makers

Management Support Systems
- Management Information Systems
  - Prespecified Reporting For Managers
- Decision Support Systems
  - Interactive Decision Support
- Executive Information Systems
  - Information Tailored for Executives
- Specialized Processing Systems
  - Support of Managerial Decision Making

Support of Business Operations
- Support of Business Operations
Several other categories of information systems can support either operations or management applications. For example:

- Expert systems
- Knowledge management systems
- Strategic information systems
- Functional business systems
Other Categories of IS (continued)

- Expert systems.
  - Knowledge-based systems that provide expert advice and act as expert consultants to users.
  - Examples: credit application advisor, process monitor, and diagnostic maintenance systems.
• Knowledge management systems.
  • Knowledge-based systems that support the creation, organization, and dissemination of business knowledge within the enterprise.
  • Examples: intranet access to best business practices, sales proposal strategies, and customer problem resolution systems.
Other Categories of IS (continued)

- Strategic information systems.
  - Support operations or management processes that provide a firm with strategic products, services, and capabilities for competitive advantage.
  - Examples: online stock trading, shipment tracking, and e-commerce Web systems.
Other Categories of IS (continued)

• Functional business systems.
  • Support a variety of operational and managerial applications of the basic business functions of a company.
  • Examples: information systems that support applications in accounting, finance, marketing, operations management, and human resource management.
Managerial Challenges of IT

- Success in today’s dynamic business environment depends heavily on maximizing the use of:
  - Internet-based technologies
  - Web-enabled information systems to meet the competitive requirements of customers, suppliers, and other business partners in a global marketplace.
- Figure 1.2 illustrates examples of the challenges and opportunities that business managers face in managing information systems and technologies to meet business goals.
**Business / IT Challenges**

- Speed and flexibility requirements of product development, manufacturing, and delivery cycles.
- Reengineering and cross-functional integration of business processes using Internet technologies.
- Integration of e-business and e-commerce into the organization’s strategies, processes, structure, and culture.

**Business / IT Developments**

- Use of the Internet, intranets, extranets, and the Web as the primary IT infrastructure.
- Diffusion of Web technology to internetwork employees, customers, and suppliers.
- Global networked computing, collaboration, and decision support systems.

**Business / IT Goals**

- Give customers what they want, when and how they want it, at the lowest cost.
- Coordination of manufacturing and business processes with suppliers and customers.
- Marketing channel partnerships with suppliers and distributors.
Success and Failure with IT

• Success should be measured by the effectiveness of information technology in supporting:
  • an organization’s business strategies
  • enabling its business processes
  • enhancing its organizational structures and culture
  • increasing the customer and business value of the enterprise
Developing IS Solutions

• Developing successful IS solutions to business problems is a major challenge for business managers and professionals today.

• As a business professional, responsible for:
  • proposing or developing new or improved uses of information technologies for your company.

• As a business manager, responsible for:
  • frequently manage the development efforts of information systems specialists and other business end users.
Developing IS Solutions (continued)

• Figure 1.3 shows that several major activities must be accomplished and managed in a complete IS development cycle.
Challenges and Ethics of IT

- As a manager, business professional, or knowledge worker, generated by the use of information technology. For example,
  - what uses of IT might be considered improper, irresponsible, or harmful to other individuals or to society?
  - What is the proper business use of the Internet and an organization’s IT resources?
  - What does it take to be a responsible end user of information technology?
  - How can you protect yourself from computer crime and other risks of information technology?
Successful MIS and technologies presents major challenges to business managers and professionals. Thus, the IS function represents:

- A major functional area of business equally as important to business success as the functions of accounting, finance, operations management, marketing, and HRM.
- An important contributor to operational efficiency, employee productivity and morale, and customer service and satisfaction.
The IS Function (continued)

• A major source of information and support needed to promote effective decision making by managers and business professionals.
• A vital ingredient in developing competitive products and services that give an organization a strategic advantage in the global marketplace.
• A dynamic, rewarding, and challenging career opportunity for millions of men and women.
• A key component of the resources, infrastructure, and capabilities of today’s networked business enterprises.
For example, system concepts help us understand:

- **Technology.**
  - That computer networks are systems of information processing components that use a variety of hardware, software, data management, and telecommunications network technologies.

- **Applications.**
  - That electronic business and commerce applications involve interconnected business information systems.
Foundation Concepts: The Components of IS (continued)

• Development.
  • That developing ways to use information technology in business includes designing the basic components of information systems.

• Management.
  • That managing information technology emphasizes the quality, strategic business value, and security of an organization’s information systems.
What Is a System?

• A system is defined as a set of interrelated components, with a clearly defined boundary, working together to achieve a common set of objectives by accepting inputs and producing outputs in an organized transformation process.

• Systems have three basic functions:
  • Input
  • Processing
  • Output
Feedback and Control

• The system concept becomes even more useful by including two additional elements:
  • feedback
  • Control

• Feedback is data about the performance of a system. For example:
  • data about sales performance is feedback to a sales manager.
  • Data about the speed, attitude, and direction of an aircraft is feedback to the aircraft’s pilot or autopilot.
Feedback and Control (continued)

- Control involves monitoring and evaluating feedback to determine whether a system is moving toward the achievement of its goal.
- The control function then makes the necessary adjustments to a system’s input and processing components to ensure that it produces proper output.
- For example: An airline pilot, makes minute adjustments after evaluating the feedback from the instruments to ensure the plane is exactly where the pilot wants it to be.
Components of an Information System

- People resources
- Hardware resources
- Software resources
- Data resources
- Network resources
People resources

End users (also called users or clients) are people who use an information system or the information it produces. They can be:

- Customers
- Salespersons
- Engineers
- Clerks
- Accountants
- Managers
People resources (continued)

• IS specialists are people who develop and operate information systems. They include:
  • systems analysts
  • software developers
  • system operators
  • technical
  • clerical IS personnel
Hardware Resources

• The concept of hardware resources includes all physical devices and materials used in information processing.

• Specifically, it includes not only machines, such as:
  • computers and other equipment
  • data media
  • tangible objects on which data are recorded
  • (magnetic or optical disks)
Hardware Resources (continued)

- Computer systems, which consist of central processing units containing:
  - micro-processor
  - peripheral devices such as printers, scanners, monitors, and so on.
Hardware Resources (continued)

- Computer peripherals, which are devices such as:
  - Keyboard
  - electronic mouse
  - trackball
  - video screen
  - printer for output of information
  - magnetic or optical disk drives for storage of data resources.
The following are examples of software resources:

- **System software**, such as an operating system program.
- **Application software**, which are programs that direct processing for a particular use of computers by end users.
  - Examples are a sales analysis program, a payroll program, and a word processing program.
Software Resources (continued)

• Procedures
  • which are operating instructions for the people who will use an information system.
    • Examples are instructions for filling out a paper form or using a software package.
The concept of data resources has been expanded by managers and information systems professionals.

The data resources of IS are typically organized, stored, and accessed by a variety of data resource management technologies into:

- Databases that hold processed and organized data
- Knowledge bases that hold knowledge in a variety of forms such as facts, rules and case examples about successful business practices
Network Resources

- The concept of network resources emphasizes that communications technologies and networks are a fundamental resource component of all information systems.

- Network resources include:
  - Communications media
  - Network infrastructure
Information System Activities

- **Input.**
  - Optical scanning of bar-coded

- **Processing.**
  - Calculating employee pay, taxes

- **Output.**
  - Producing reports & displays sales performance

- **Storage.**
  - Maintaining records on customers, employees & products.

- **Control.**
  - Generating clear signals to indicate proper entry of sales data.
As a business professional, you should be able to recognize the fundamental components of IS you encounter in the real world. This means that you should be able to identify:

- The people, hardware, software, data, and network resources they use.
- The types of information products they produce.
- The way they perform input, processing, output, storage, and control activities.