Chapter 1

An Introduction to Information Systems

References
Ralph M. Stair and George W. Reynolds. 2010.
Principles of Information Systems A Managerial Approach. 9th edition. Course Technology.

Objectives

- The value of information is directly linked to how it helps decision makers achieve the organization's goals
  - Discuss why it is important to study and understand information systems
  - Distinguish data from information and describe the characteristics used to evaluate the quality of data

Objectives (continued)

- Computers and information systems are constantly making it possible for organizations to improve the way they conduct business
  - List the components of an information system and a computer-based information system

Objectives (continued)

- Knowing the potential impact of information systems
  - Identify the basic types of business information systems and what kinds of benefits they deliver

Objectives (continued)

- System users, business managers, and information systems professionals must work together to build a successful information system
  - Identify the major steps of the systems development process and state the goal of each

Objectives (continued)

- Information systems must be applied thoughtfully and carefully so that society, business, and industry can reap their enormous benefits
  - Describe some of the threats to security and privacy that information systems and the Internet can pose

Why Learn About Information Systems?

- Information systems used in most professions
  - Sales reps
  - Managers
  - Corporate lawyers
- Indispensable for achieving career goals

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Introduction

- **Information system (IS)**
  - A set of interrelated components that collect, manipulate, and disseminate data and information, and provide feedback to meet an objective
  - Examples: ATMs, airline reservation systems, course reservation systems

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Information Concepts

- Information is one of an organization's most valuable resources
- *Information* is different from *data*

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Data, Information, and Knowledge

- **Data:** raw facts
- **Information:** collection of facts organized in such a way that they have value beyond the facts themselves
- **Knowledge:** awareness and understanding of a set of information and ways that information can be made useful to support a specific task or reach a decision

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The Value of Information

- Value of information is directly linked to how it helps decision makers achieve their organization's goals
- For example, value of information might be measured in:
  - Time required to make a decision
  - Increased profits to company

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System Concepts

- **System**
  - A set of elements or components that interact to accomplish goals
- Components of a system
  - Input
  - Processing
  - Output
  - Feedback

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System Concepts (continued)

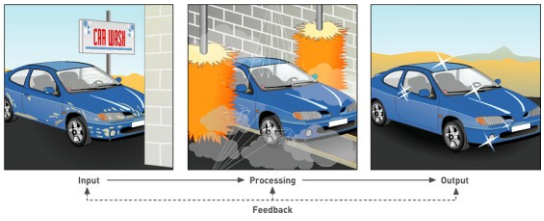

Figure 1.3: Components of a System

System Performance and Standards

- **Efficiency:** measure of what is produced divided by what is consumed
- **Effectiveness:** extent to which system attains its goals
- **System performance standard:** a specific objective of the system

Input, Processing, Output, Feedback

- **Input:** activity of gathering and capturing raw data
- **Processing:** converting or transforming data into useful outputs
- **Output:** production of useful information, usually in the form of documents and reports
- **Feedback:** output that is used to make changes to input or processing activities

Manual and Computerized Information Systems

- An information system can be:
  - Manual
  - Computerized

Computer-Based Information Systems

- **Computer-based information system (CBIS)**
  - A single set of hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information

Computer-Based Information Systems (continued)

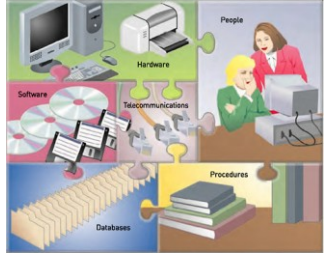

Figure 1.6: The Components of a Computer-Based Information System

Business Information Systems

- Most common types of information systems used in business organizations
  - Electronic and mobile commerce systems
  - Transaction processing systems
  - Management information systems
  - Decision support systems

Electronic and Mobile Commerce

- **E-commerce:** any business transaction executed electronically between parties such as:
  - Companies (business-to-business, B2B)
  - Companies and consumers (business-to-consumer, B2C)
  - Consumers and other consumers (consumer-to-consumer, C2C)
  - Business and the public sector
  - Consumers and the public sector

Enterprise Systems: Transaction Processing Systems and Enterprise Resource Planning

- **Transaction:** any business-related exchange, such as payments to employees, sales to customers, and payments to suppliers
- **Transaction processing system (TPS):** an organized collection of people, procedures, software, databases, and devices used to record completed business transactions

Transaction Processing Systems

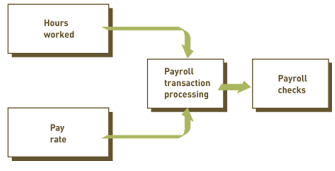

Figure 1.11: A Payroll Transaction Processing System

Enterprise Resource Planning

- A set of integrated programs that manages the vital business operations for an entire multisite, global organization
- Can replace many applications with one unified set of programs, making the system easier to use and more effective

Information and Decision Support Systems

- An effective TPS provides a number of benefits to a company
- A TPS can speed business activities and reduce clerical costs
- Data stored in TPSs is used to help managers make better decisions

Management Information Systems

- **Management information system (MIS):** an organized collection of people, procedures, software, databases, and devices that provides routine information to managers and decision makers
- Primary focus of an MIS is operational efficiency

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Management Information Systems (continued)

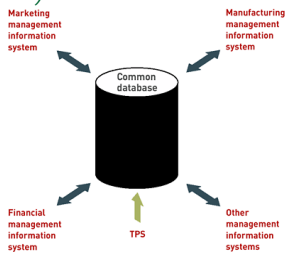

Figure 1.12: Management Information System

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Decision Support Systems

- **Decision support system (DSS):** an organized collection of people, procedures, software, databases, and devices used to support problem-specific decision making
- Focus of a DSS is on decision-making effectiveness

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Decision Support Systems (continued)

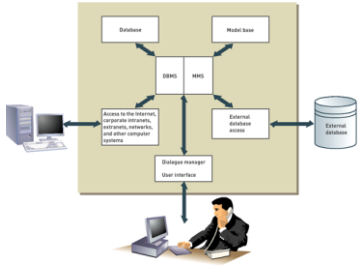

Figure 1.13: Essential DSS Elements

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Specialized Business Information Systems: Knowledge Management, Artificial Intelligence, Expert Systems, and Virtual Reality

- **Knowledge management systems (KMSs):** an organized collection of people, procedures, software, databases, and devices to create, store, share, and use the organization's knowledge and experience
- **Artificial intelligence (AI):** field in which the computer system takes on the characteristics of human intelligence

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Artificial Intelligence

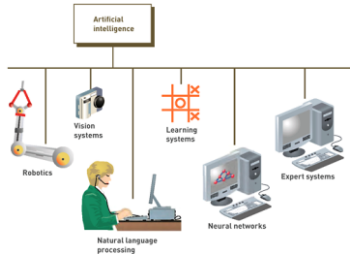

Figure 1.14: The Major Elements of Artificial Intelligence

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Expert Systems

- Give the computer the ability to make suggestions and act like an expert in a particular field
- Allow organizations to capture and use the wisdom of experts and specialists
- The knowledge base contains the collection of data, rules, procedures, and relationships that must be followed to achieve value or the proper outcome

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Virtual Reality

- Simulation of a real or imagined environment that can be experienced visually in three dimensions
- Immersive virtual reality
- Applications that are not fully immersive
- Can be a powerful medium for communication, entertainment, and learning

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Systems Development

- **Systems development:** the activity of creating or modifying existing business systems
- A systems development project can be:
  - Done by people within the company
  - Outsourced
- To improve results of a systems development project, it is divided into several steps

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Systems Development (continued)

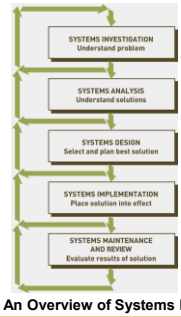

Figure 1.16: An Overview of Systems Development

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Systems Investigation and Analysis

- Systems investigation: gain a clear understanding of the problem to be solved or opportunity to be addressed
- Systems analysis: defines the problems and opportunities of the existing system

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Systems Design, Implementation, and Maintenance and Review

- Systems design: how the new system will work to meet the business needs defined during systems analysis
- Systems implementation: creating or acquiring the various system components defined in the design step, assembling them, and putting the new system into operation
- Systems maintenance and review: check and modify the system so that it continues to meet changing business needs

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Information Systems in Society, Business, and Industry

- Information systems must be implemented thoughtfully and carefully
- Information systems face a variety of threats from unethical people

Security, Privacy, and Ethical Issues in Information Systems and the Internet

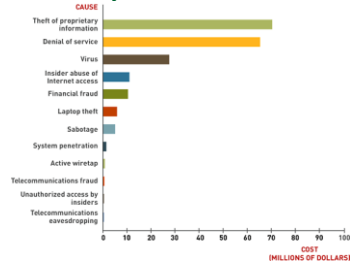

Figure 1.17: The Cost and Cause of Computer Attacks

Computer and Information Systems Literacy

- **Computer literacy:** knowledge of computer systems and equipment and the ways they function
- **Information systems literacy:** knowledge of how data and information are used by individuals, groups, and organizations

Global Challenges in Information Systems

- Cultural challenges
- Language challenges
- Time and distance challenges
- Infrastructure challenges
- Currency challenges

Global Challenges in Information Systems (continued)

- Product and service challenges
- Technology transfer issues
- State, regional, and national laws
- Trade agreements

Summary

- Data: raw facts
- Information: collection of facts organized in such a way that they have value beyond the facts themselves
- System: a set of elements that interact to accomplish a goal
- Components of an information system: input, processing, output, and feedback

Summary (continued)

- Computer-based information system (CBIS): a single set of hardware, software, databases, telecommunications, people, and procedures that are configured to collect, manipulate, store, and process data into information
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Summary (continued)

- Management information system (MIS): an organized collection of people, procedures, software, databases, and devices that provides routine information to managers and decision makers
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- Systems development: creating or modifying existing business systems