About the Presentations

- The presentations cover the objectives found in the opening of each chapter.

- All chapter objectives are listed in the beginning of each presentation.

- You may customize the presentations to fit your class needs.

- Some figures from the chapters are included. A complete set of images from the book can be found on the Instructor Resources disc.

Principles of Information Systems, Tenth Edition

Chapter 1

An Introduction to Information Systems

Principles and Learning 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 value of data

Principles and Learning Objectives (continued)

- Computers and information systems help make it possible for organizations to improve the way they conduct business

  – Name the components of an information system and describe several system characteristics

Principles and Learning Objectives (continued)

- Knowing the potential impact of information systems and having the ability to put this knowledge to work can result in a successful personal career and in organizations that reach their goals
    - List the components of a computer-based information system
    - Identify the basic types of business information systems and discuss who uses them, how they are used, and what kinds of benefits they deliver

Principles and Learning 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

Principles and Learning Objectives (continued)

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

Why Learn About Information Systems?

- Information systems used by:
  - Sales representatives
  - Managers
  - Financial advisors
- Information systems:
  - Indispensable tools to help you achieve your career goals

Introduction

- Information system (IS):
  - A set of interrelated components that collect, manipulate, and disseminate data and information and provide feedback to meet an objective

- Businesses:
  - Can use information systems to increase revenues and reduce costs

Information Concepts

- Information:
  - One of an organization's most valuable resources
  - Often confused with the term *data*

Data, Information, and Knowledge

- Data:
  - Raw facts

- Information:
  - Collection of facts organized in such a way that they have value beyond the facts themselves

- Process:
  - Set of logically related tasks

- Knowledge:
  - Awareness and understanding of a set of information

Data, Information, and Knowledge (continued)

Data	Represented by
Alphanumeric data	Numbers, letters, and other characters
Image data	Graphic images and pictures
Audio data	Sound, noise, or tones
Video data	Moving images or pictures

Table 1.1

Types of Data

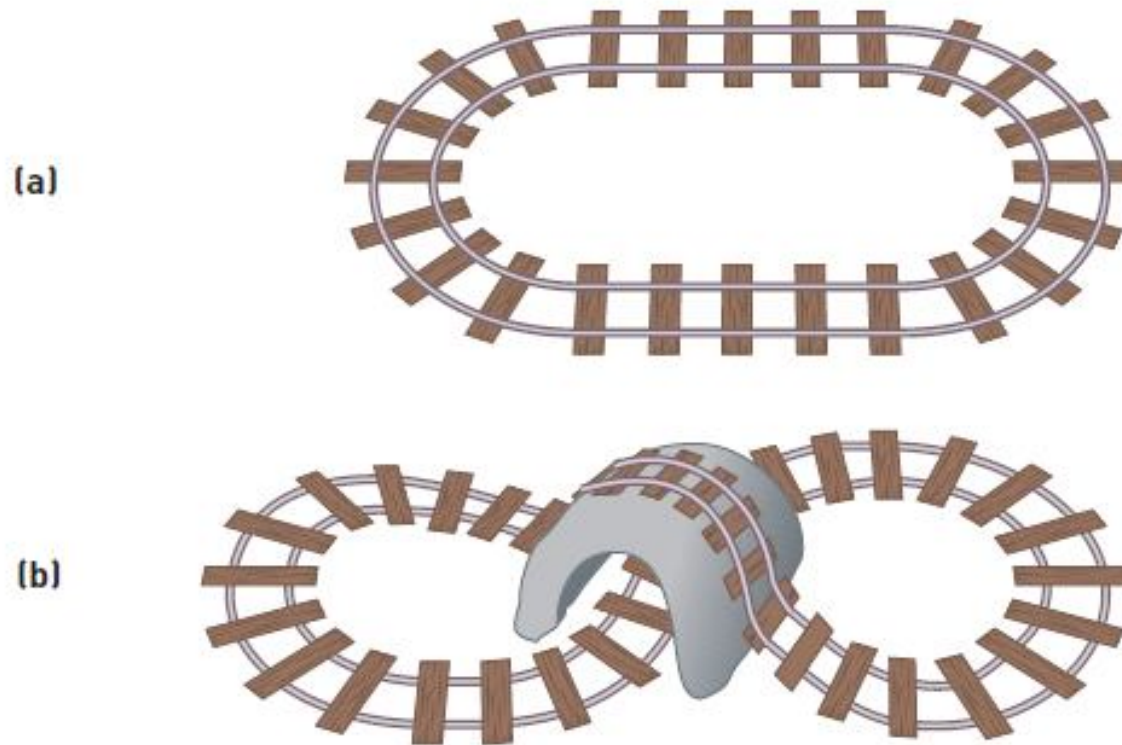# Data, Information, and Knowledge (continued)

(a)

(b)

Figure 1.1

Defining and Organizing Relationships Among Data Creates Information

Data, Information, and Knowledge (continued)
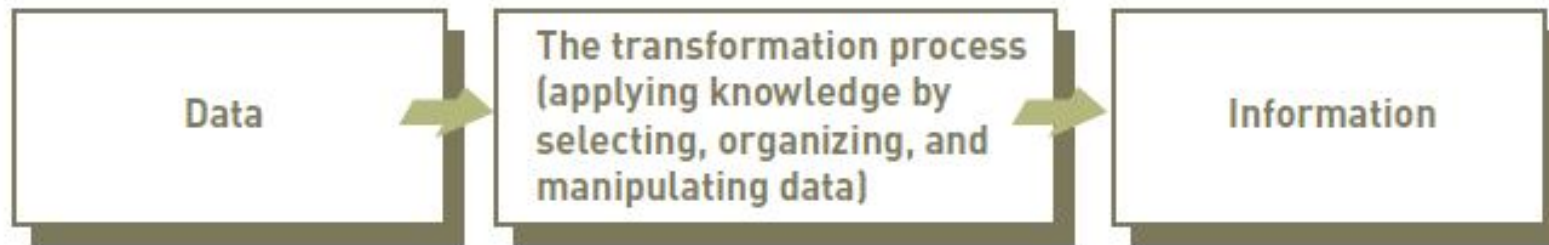

Figure 1.2

The Process of Transforming Data into Information

The Characteristics of Valuable Information

- If an organization's information is not accurate or complete:
  - People can make poor decisions, costing thousands, or even millions, of dollars

- Depending on the type of data you need:
  - Some characteristics become more important than others

The Characteristics of Valuable Information (continued)

Characteristics	Definitions
Accessible	Information should be easily accessible by authorized users so they can obtain it in the right format and at the right time to meet their needs.
Accurate	Accurate information is error free. In some cases, inaccurate information is generated because inaccurate data is fed into the transformation process. (This is commonly called garbage in, garbage out [GIGO].)
Complete	Complete information contains all the important facts. For example, an investment report that does not include all important costs is not complete.
Economical	Information should also be relatively economical to produce. Decision makers must always balance the value of information with the cost of producing it.
Flexible	Flexible information can be used for a variety of purposes. For example, information on how much inventory is on hand for a particular part can be used by a sales representative in closing a sale, by a production manager to determine whether more inventory is needed, and by a financial executive to determine the total value the company has invested in inventory.
Relevant	Relevant information is important to the decision maker. Information showing that lumber prices might drop might not be relevant to a computer chip manufacturer.
Reliable	Reliable information can be trusted by users. In many cases, the reliability of the information depends on the reliability of the data-collection method. In other instances, reliability depends on the source of the information. A rumor from an unknown source that oil prices might go up might not be reliable.
Secure	Information should be secure from access by unauthorized users.
Simple	Information should be simple, not overly complex. Sophisticated and detailed information might not be needed. In fact, too much information can cause information overload, whereby a decision maker has too much information and is unable to determine what is really important.
Timely	Timely information is delivered when it is needed. Knowing last week's weather conditions will not help when trying to decide what coat to wear today.
Verifiable	Information should be verifiable. This means that you can check it to make sure it is correct, perhaps by checking many sources for the same information.

Table 1.2

Characteristics of Valuable Information

The Value of Information

- Directly linked to how it helps decision makers achieve their organization's goals

- Valuable information:
  - Can help people and their organizations perform tasks more efficiently and effectively

System Concepts

- System:
  - Set of elements or components that interact to accomplish goals

- Components of a system:
  - Inputs
  - Processing mechanisms
  - Outputs
  - Feedback
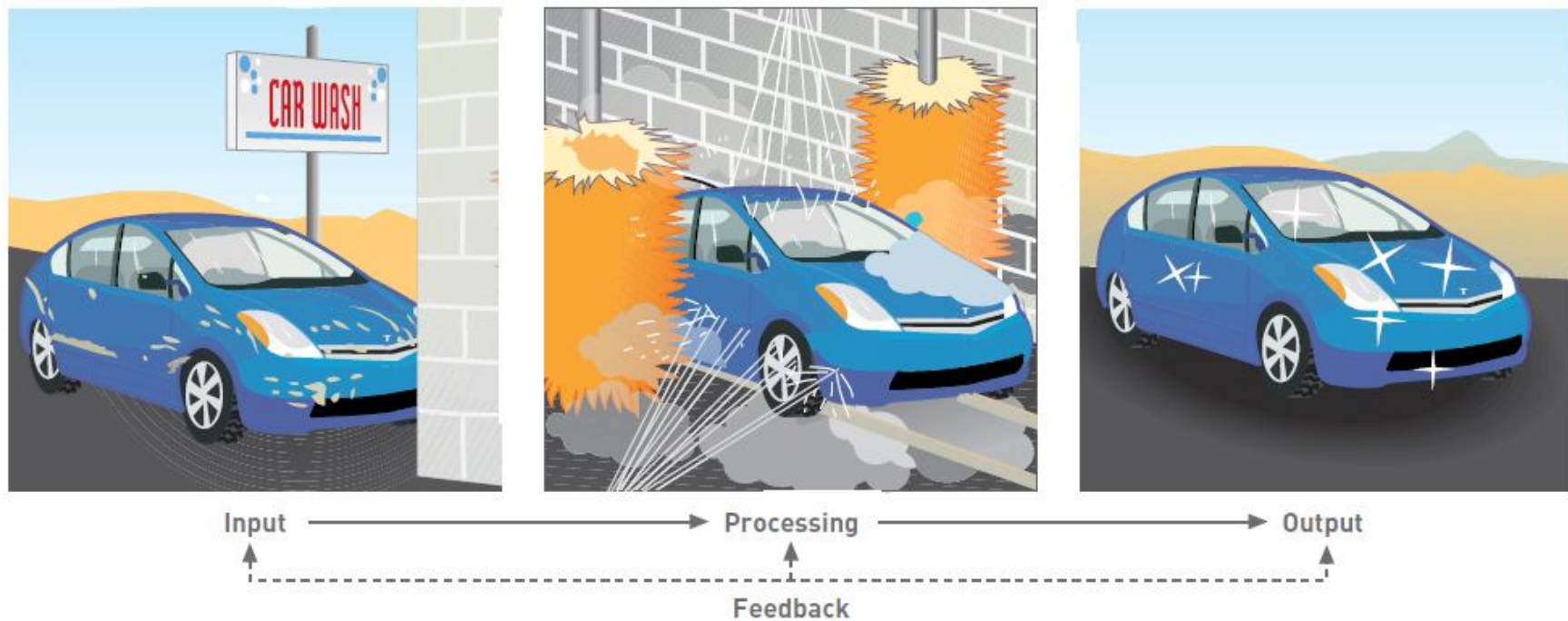
System Concepts (continued)

Input → Processing → Output

Feedback

Figure 1.3

Components of a System

A system's four components consist of input, processing, output, and feedback.

System Performance and Standards

- Efficiency:
  - Measure of what is produced divided by what is consumed

- Effectiveness:
  - Measure of the extent to which a system attains its goals

- System performance standard:
  - Specific objective of the system
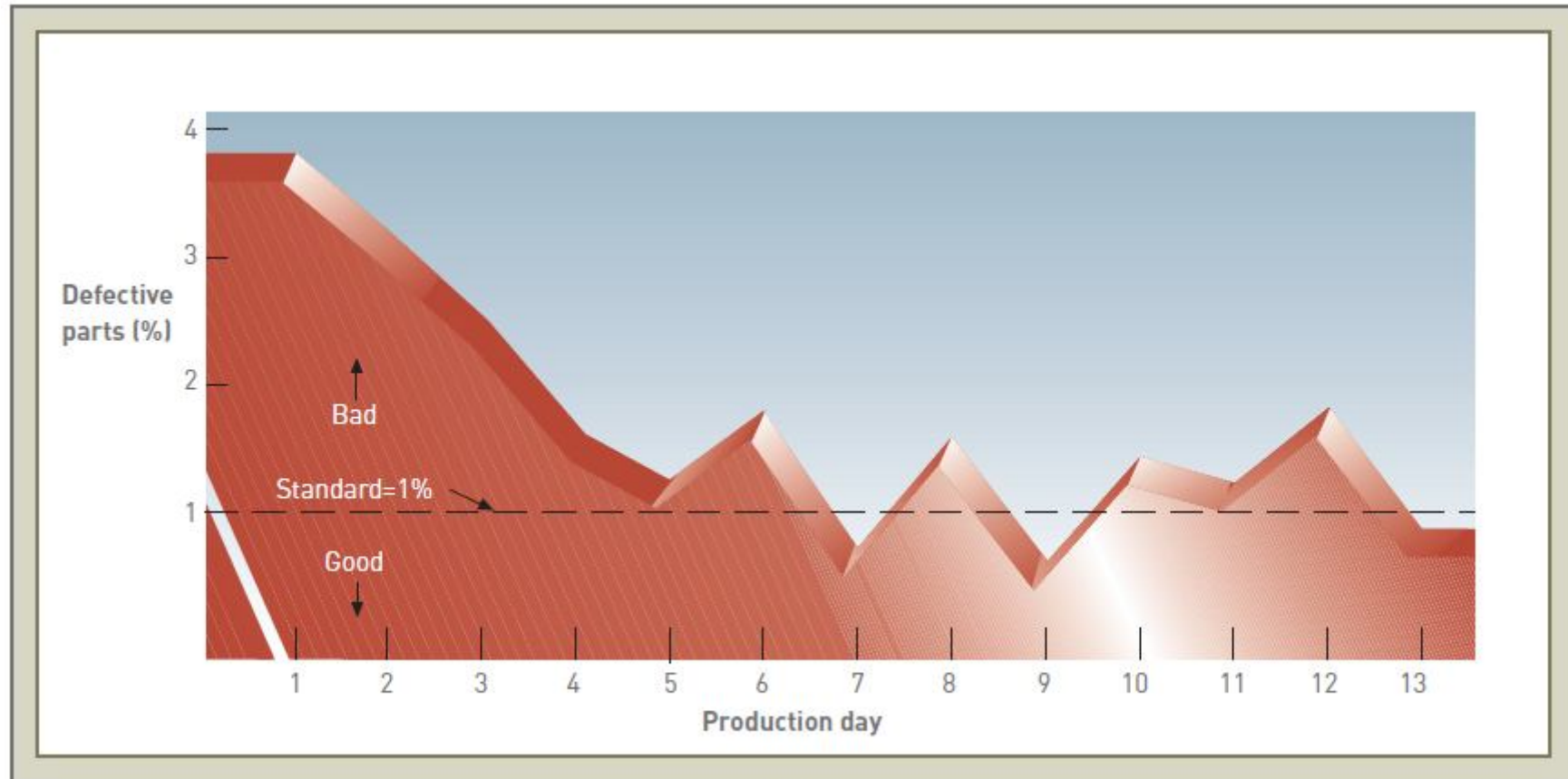
System Performance and Standards (continued)
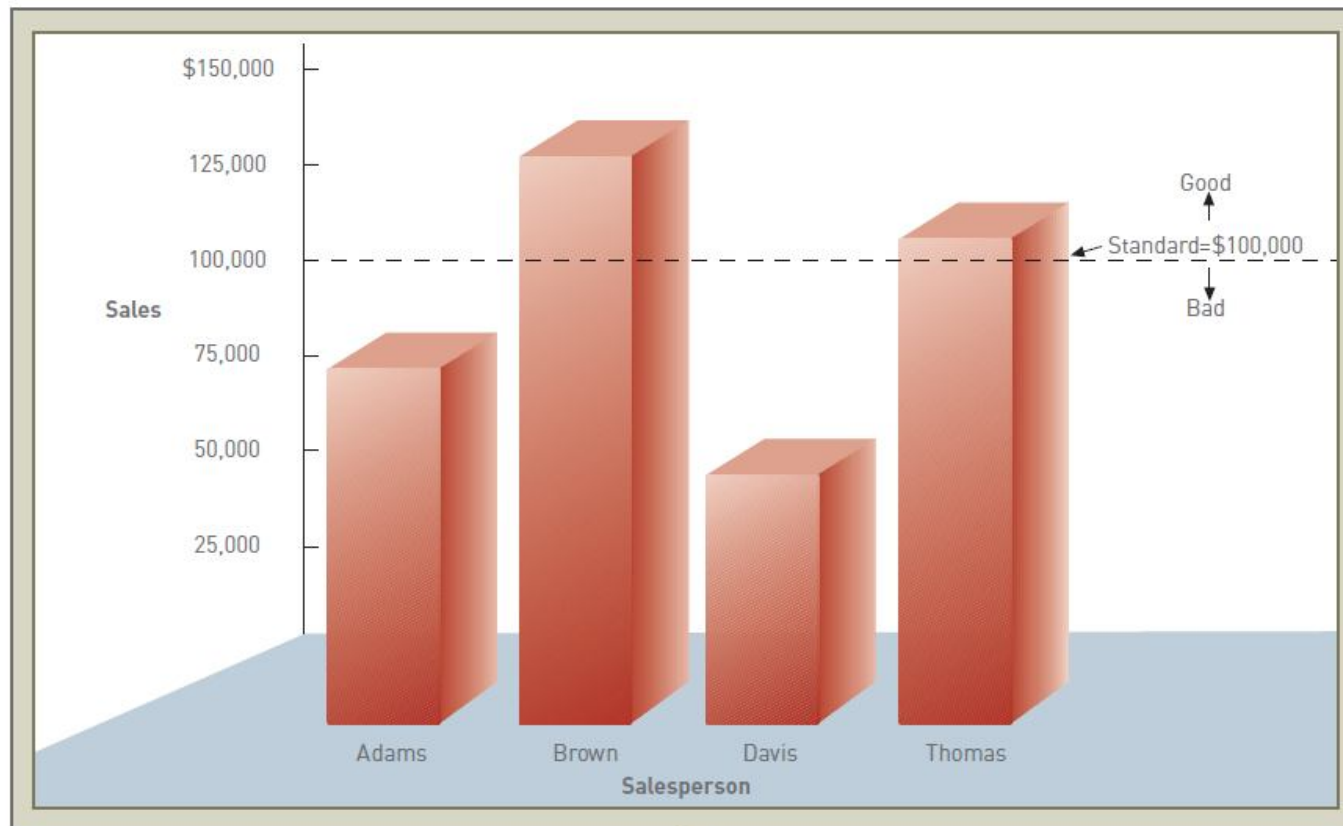
Figure 1.4

System Performance Standards

System Performance and Standards (continued)

(b)

Figure 1.4

System Performance Standards

What is an Information System?

- Information system (IS) is a set of interrelated elements that:
  - Collect (input)
  - Manipulate (process)
  - Store
  - Disseminate (output) data and information
  - Provide a corrective reaction (feedback mechanism) to meet an objective

What is an Information System? (continued)

Figure 1.5

The Components of an Information System

Feedback is critical to the successful operation of a system.

Input, Processing, Output, Feedback

- Input:
  - Activity of gathering and capturing raw data

- Processing:
  - Converting data into useful outputs

- Output:
  - Production of useful information, usually in the form of documents and reports

- Feedback:
  - Information from the system that is used to make changes to input or processing activities

Manual and Computerized Information Systems

- An information system can be:
  - Manual or computerized

- Example:
  - Investment analysts manually draw charts and trend lines to assist them in making investment decisions

- Computerized information systems:
  - Follow stock indexes and markets and suggest when large blocks of stocks should be purchased or sold

Computer-Based Information Systems

- Single set of hardware, software, databases, telecommunications, people, and procedures:
  - That are configured to collect, manipulate, store, and process data into information

- Technology infrastructure:
  - Includes all hardware, software, databases, telecommunications, people, and procedures
    - Configured to collect, manipulate, store, and process data into information

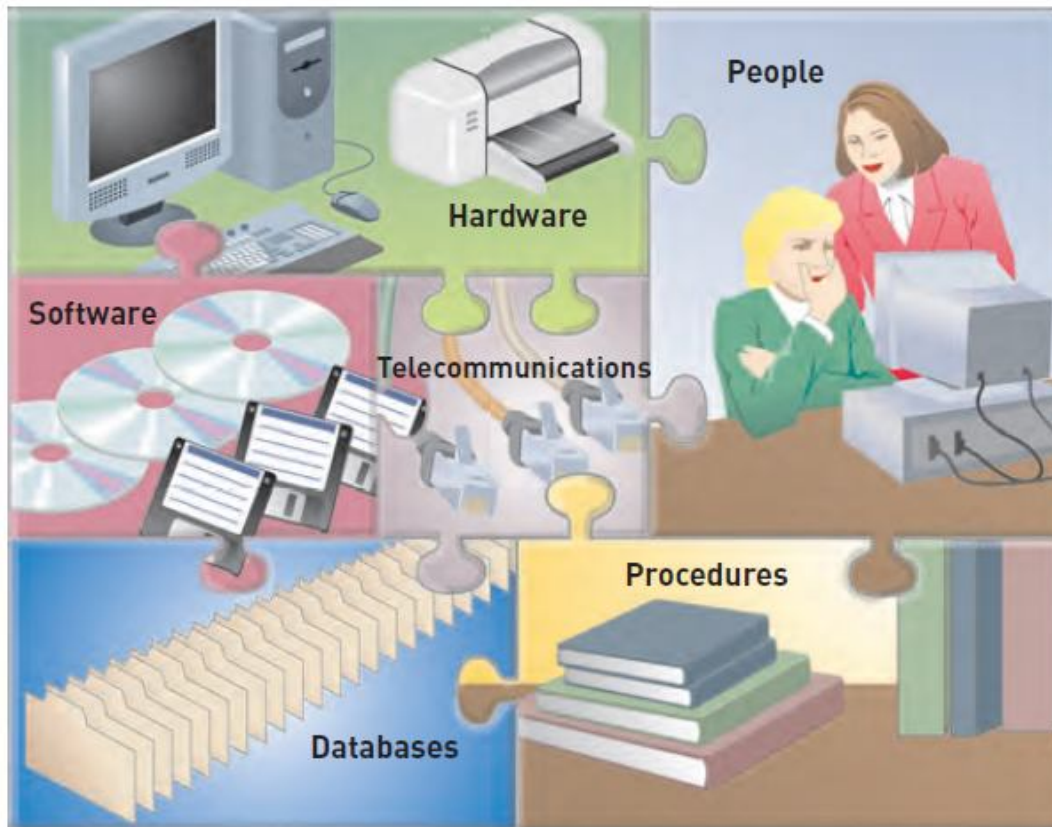# Computer-Based Information Systems (continued)

Figure 1.6

The Components of a Computer-Based Information System.

Computer-Based Information Systems (continued)

- Hardware:
  - Consists of computer equipment used to perform input, processing, and output activities

- Software:
  - Consists of the computer programs that govern the operation of the computer

- Database:
  - Organized collection of facts and information, typically consisting of two or more related data files

Computer-Based Information Systems (continued)

- Telecommunications, networks, and the Internet
  - The electronic transmission of signals for communications

- Networks
  - Connect computers and equipment to enable electronic communication

- Internet
  - World's largest computer network, consisting of thousands of interconnected networks, all freely exchanging information

Computer-Based Information Systems (continued)

- Intranet:
  - Internal network that allows people within an organization to exchange information and work on projects

- Extranet:
  - Network that allows selected outsiders, such as business partners and customers, to access authorized resources of a company's intranet

Computer-Based Information Systems (continued)

- People:
  - The most important element in most computer-based information systems

- Procedures:
  - Include strategies, policies, methods, and rules for using the CBIS
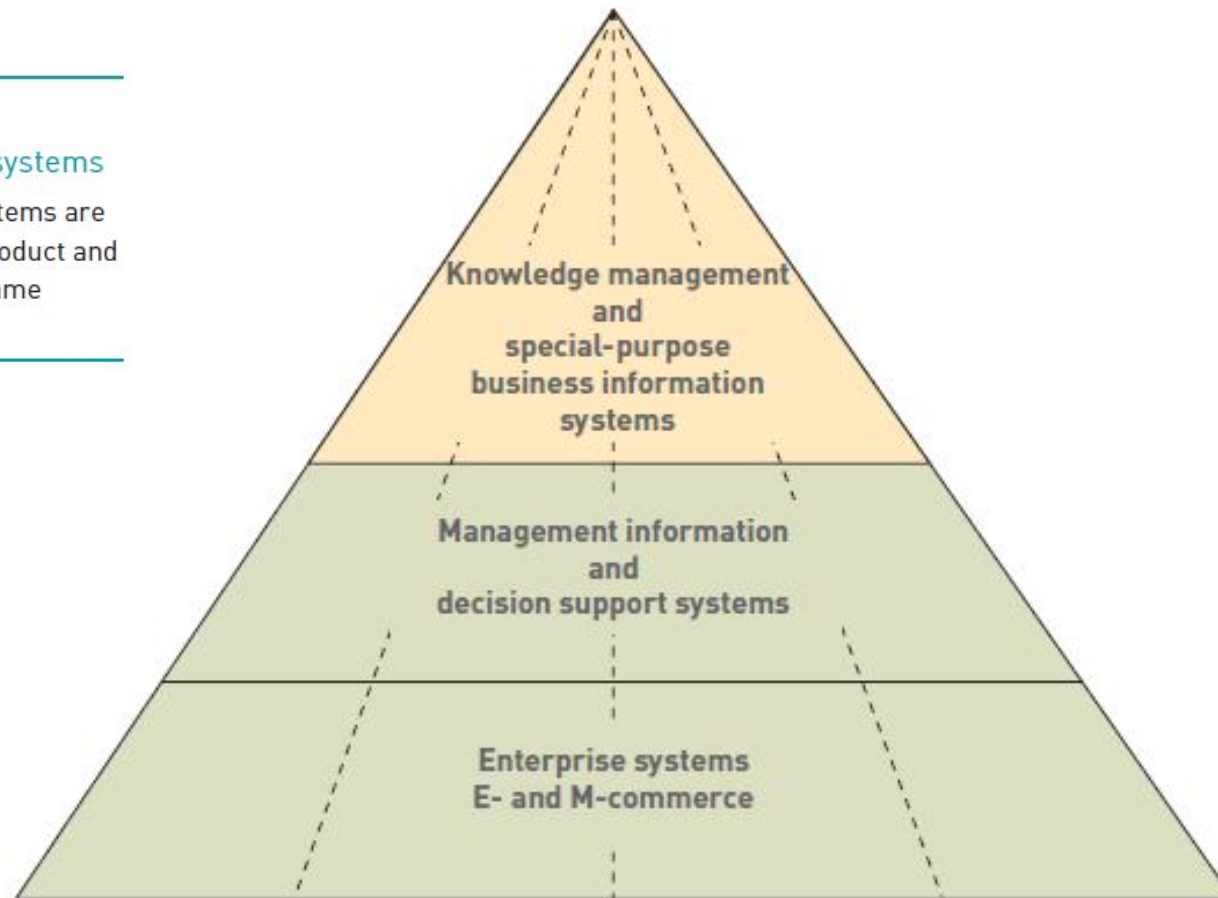
Business Information Systems

- Most common types of information systems:
  - Those designed for electronic and mobile commerce, transaction processing, management information, and decision support

- Some organizations employ:
  - Special-purpose systems, such as virtual reality, that not every organization uses

Business Information Systems (continued)

Figure 1.7

Business information systems

Business information systems are often integrated in one product and can be delivered by the same software package.

Knowledge management and special-purpose business information systems

Management information and decision support systems

Enterprise systems
E- and M-commerce

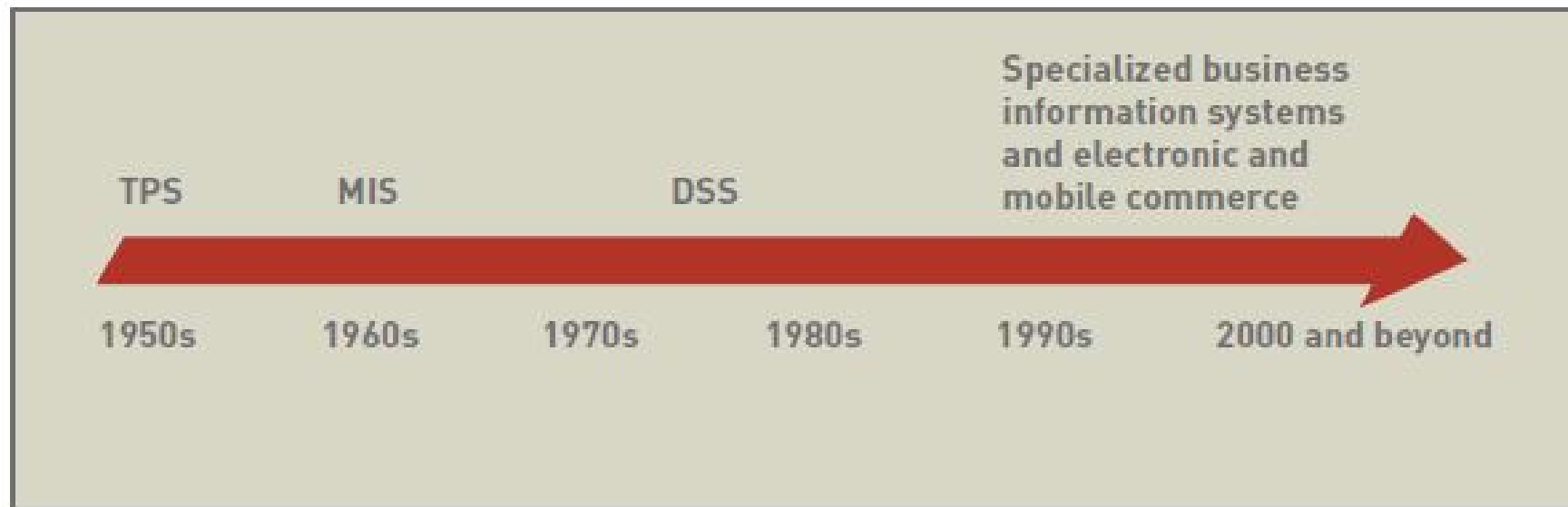# Business Information Systems (continued)

Figure 1.8

The Development of Important Business Information Systems

Electronic and Mobile Commerce

- E-commerce:
  - Any business transaction executed electronically between:
    - 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

# Electronic and Mobile Commerce (continued)

- Mobile commerce (m-commerce):
  - The use of mobile, wireless devices to place orders and conduct business

- E-commerce:
  - Can enhance a company's stock prices and market value

- Electronic business (e-business):
  - Uses information systems and the Internet to perform all business-related tasks and functions

Electronic and Mobile Commerce (continued)

Figure 1.10

Electronic Business

E-business goes beyond e-commerce to include using information systems and the Internet to perform all business-related tasks and functions, such as accounting, finance, marketing, manufacturing, and human resources activities.

E-BUSINESS

Management

Suppliers
E-procurement

Organization
and its partners

Customers
E-commerce
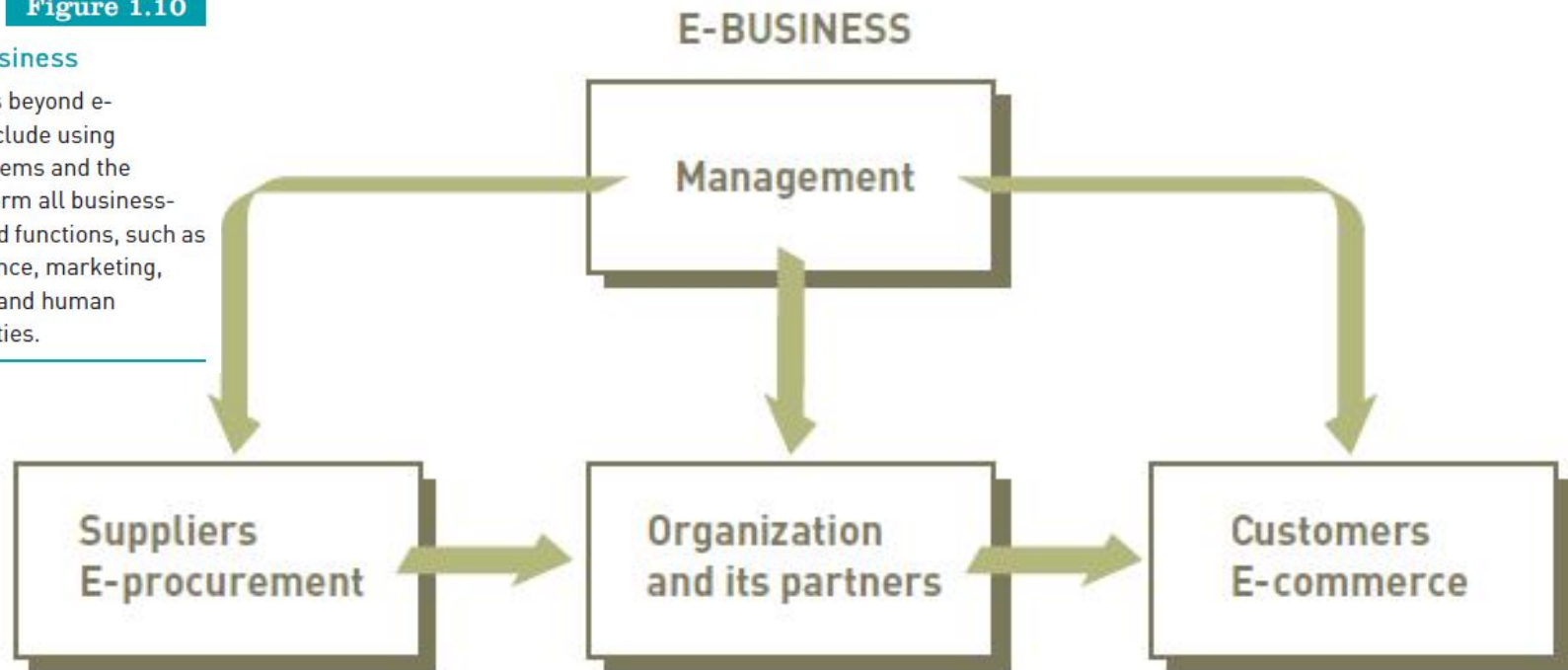
Enterprise Systems: Transaction Processing Systems and Enterprise Resource Planning

- Transaction:
  - Any business-related exchange, such as payments to employees and sales to customers

- Transaction processing system (TPS):
  - Organized collection of people, procedures, software, databases, and devices used to record completed business transactions

Enterprise Systems: Transaction Processing Systems and Enterprise Resource Planning (continued)
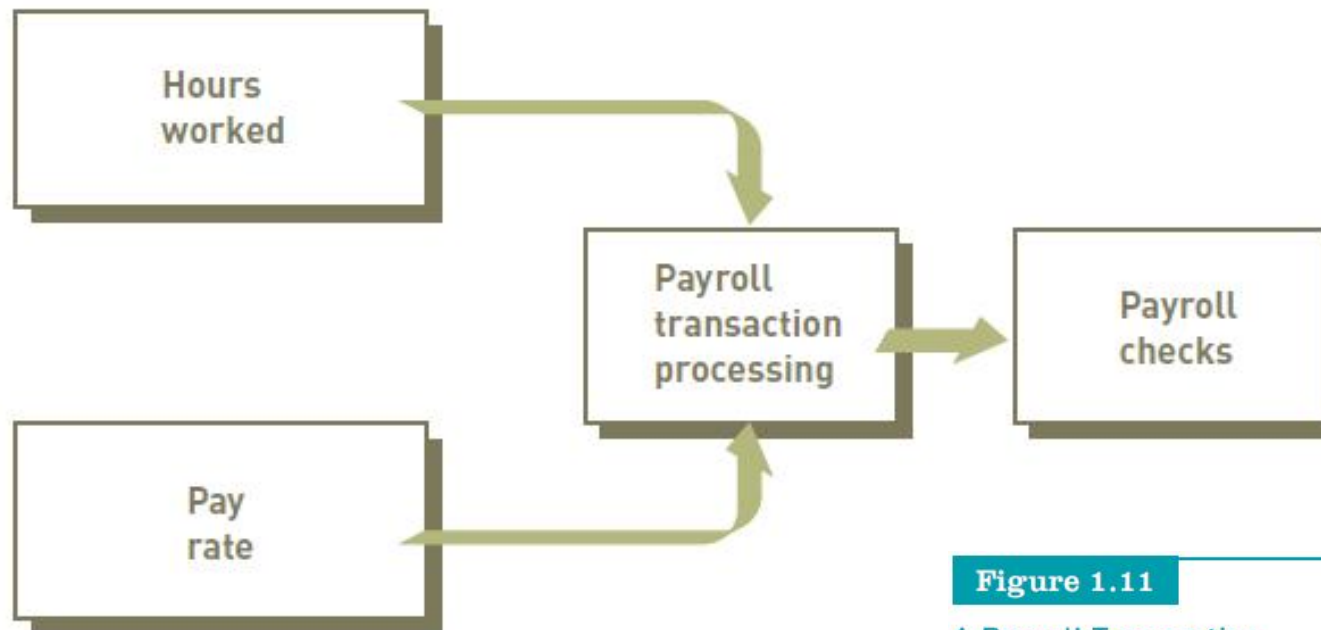

Figure 1.11

A Payroll Transaction Processing System

In a payroll TPS, the inputs (numbers of employee hours worked and pay rates) go through a transformation process to produce outputs (paychecks).

Enterprise Systems: Transaction Processing Systems and Enterprise Resource Planning (continued)

- Enterprise resource planning:
  - Set of integrated programs that:
    - Manages the vital business operations for an entire multisite, global organization
  - Most systems provide integrated software to support manufacturing and finance

Information and Decision Support Systems

- Management information system (MIS):
  - Organized collection of people, procedures, software, databases, and devices that:
    - Provides routine information to managers and decision makers

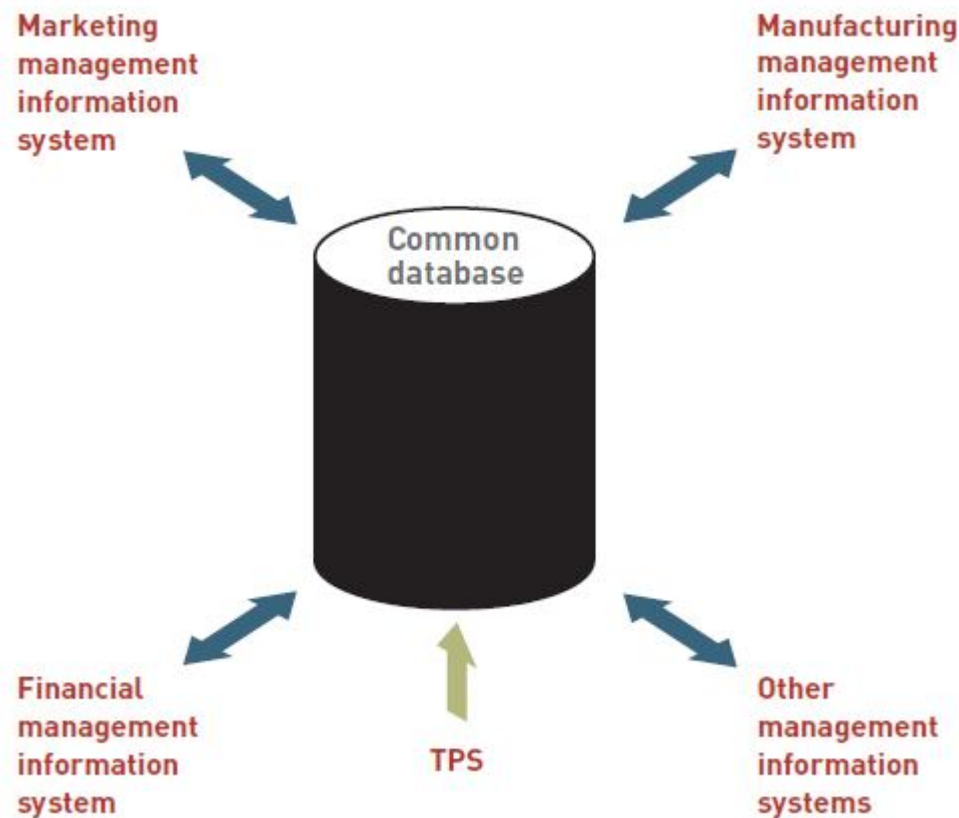# Information and Decision Support Systems (continued)

Marketing management information system

Manufacturing management information system

Common database

Financial management information system

TPS

Other management information systems

Figure 1.12

Management Information System

Functional management information systems draw data from the organization's transaction processing system.

Information and Decision Support Systems (continued)

- Decision support system (DSS):
  - Organized collection of people, procedures, software, databases, and devices that support problem-specific decision making
  - Used when problem is complex and information needed to determine appropriate action is difficult to obtain

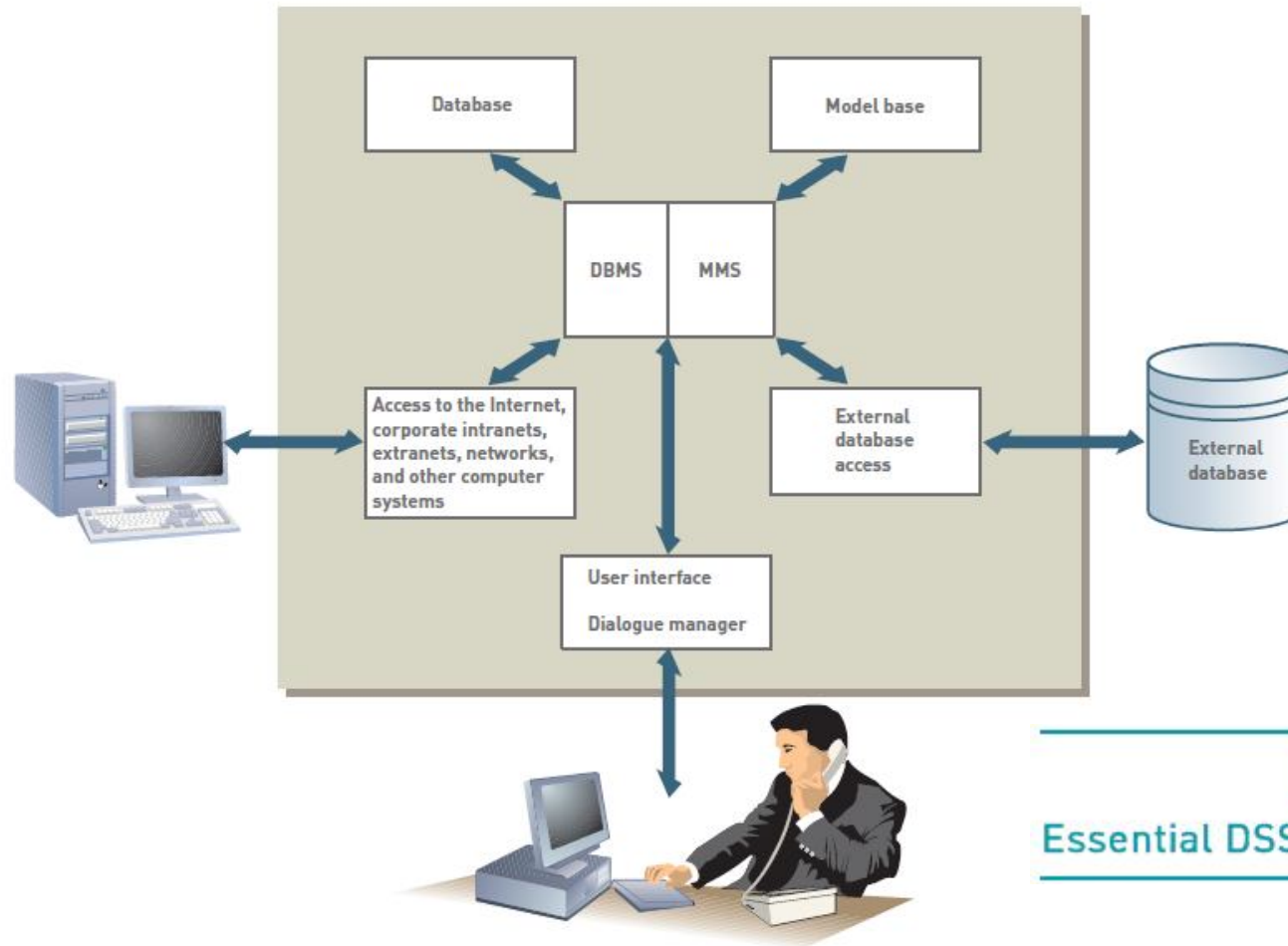# Information and Decision Support Systems (continued)

Figure 1.13

Essential DSS Elements

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

- Knowledge management systems (KMSs):
  - Organized collection of people, procedures, software, databases, and devices to:
    - Create, store, share, and use the organization's knowledge and experience

- Artificial intelligence (AI):
  - Computer system takes on characteristics of human intelligence

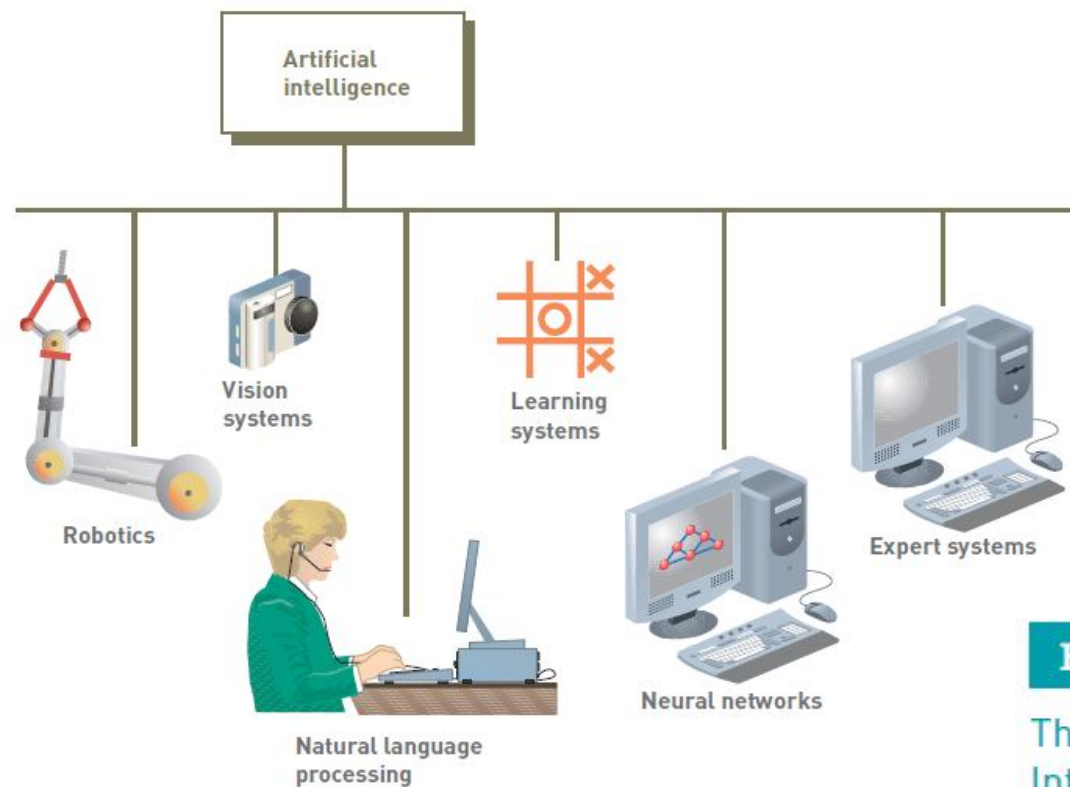# Specialized Business Information Systems (continued)

Figure 1.14

The Major Elements of Artificial Intelligence

Specialized Business Information Systems (continued)

- Expert systems:
  - Give computer ability to make suggestions and function like an expert in a particular field

- Virtual reality:
  - Simulation of a real or imagined environment that can be experienced visually in three dimensions

Systems Development

- Systems development:
  - The activity of creating or modifying existing business systems

- Outsourcing:
  - Allows a company to focus on what it does best and delegate other functions to companies with expertise in systems development

Systems Development (continued)
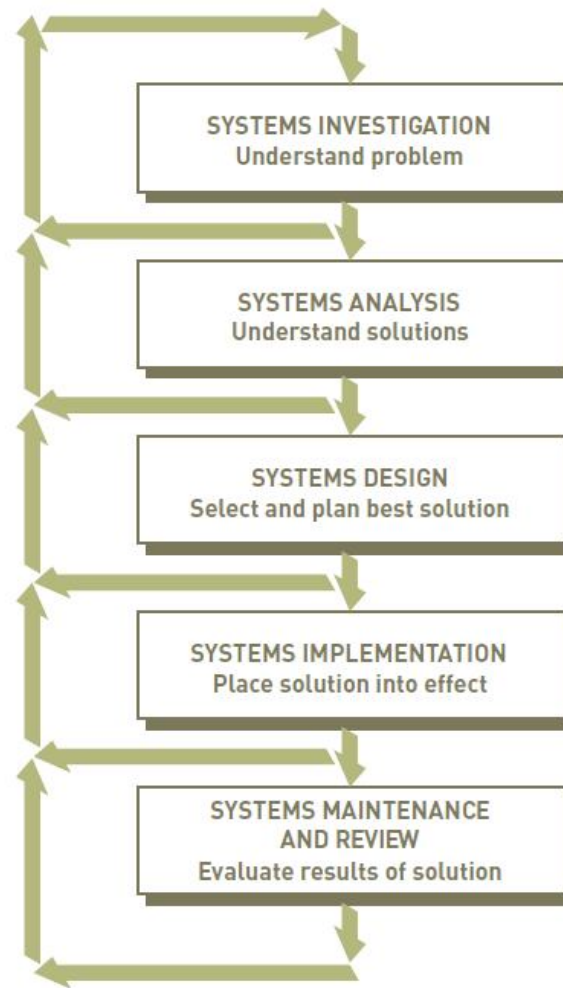
Figure 1.16

An Overview of Systems Development

SYSTEMS INVESTIGATION
Understand problem

SYSTEMS ANALYSIS
Understand solutions

SYSTEMS DESIGN
Select and plan best solution

SYSTEMS IMPLEMENTATION
Place solution into effect

SYSTEMS MAINTENANCE
AND REVIEW
Evaluate results of solution

Systems Investigation and Analysis

- Goal of systems investigation:
  - To gain clear understanding of the problem to be solved or opportunity to be addressed
- Systems analysis:
  - Defines the problems and opportunities of the existing system

Systems Design, Implementation, and Maintenance and Review

- Systems design:
  - Determines how new system will work to meet business needs defined during systems analysis

- Systems implementation:
  - Acquiring various system components defined in design step, assembling them, and putting the new system into operation

- Systems maintenance and review:
  - Checks and modifies the system so that it continues to meet changing business needs

Information Systems in Society, Business, and Industry

- Information systems:
  - Have been developed to meet the needs of all types of organizations and people
  - Speed and widespread use opens users to a variety of threats from unethical people

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

- Drawbacks of information systems:
  - Personal data, including Social Security and credit card numbers, can be lost or stolen

- To protect against threats to your privacy and data:
  - Install security and control measures

- Use of information systems:
  - Raises work concerns, including job loss through increased efficiency

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

Information Systems in the Functional Areas of Business

- Functional areas and operating divisions of business:
    - Finance and accounting
    - Sales and marketing
    - Manufacturing
    - Human resource management
    - Legal information systems

Information Systems in Industry

- Industries:
  - Airline industry
  - Investment firms
  - Banks
  - Transportation industry
  - Publishing companies

Information Systems in Industry (continued)

- Industries (continued):
  - Healthcare maintenance organizations (HMOs)
  - Retail companies
  - Power management and utility companies
  - Professional services
  - Management consulting firms

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
- System:
  - Set of elements that interact to accomplish a goal
- Components of an information system:
  - Input, processing, output, and feedback
- Components of a computer-based information system (CBIS) include:
  - Hardware, software, databases, telecommunications and the Internet, people, and procedures

Summary (continued)

- E-commerce involves:
  - Any business transaction executed electronically between parties such as companies (business-to-business), companies and consumers (business-to-consumer), business and the public sector, and consumers and the public sector

- Transaction processing system (TPS):
  - Handles the large volume of business transactions that occur daily within an organization

Summary (continued)

- Decision support system (DSS):
  - Organized collection of people, procedures, software, databases, and devices that help make problem-specific decisions
- Systems development:
  - Creating or modifying existing business systems
- Computer and information systems literacy:
  - Prerequisites for numerous job opportunities, not only in the IS field