

**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.

# Information System / Information Technologies

- 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.

# Types of Information Systems

- 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.

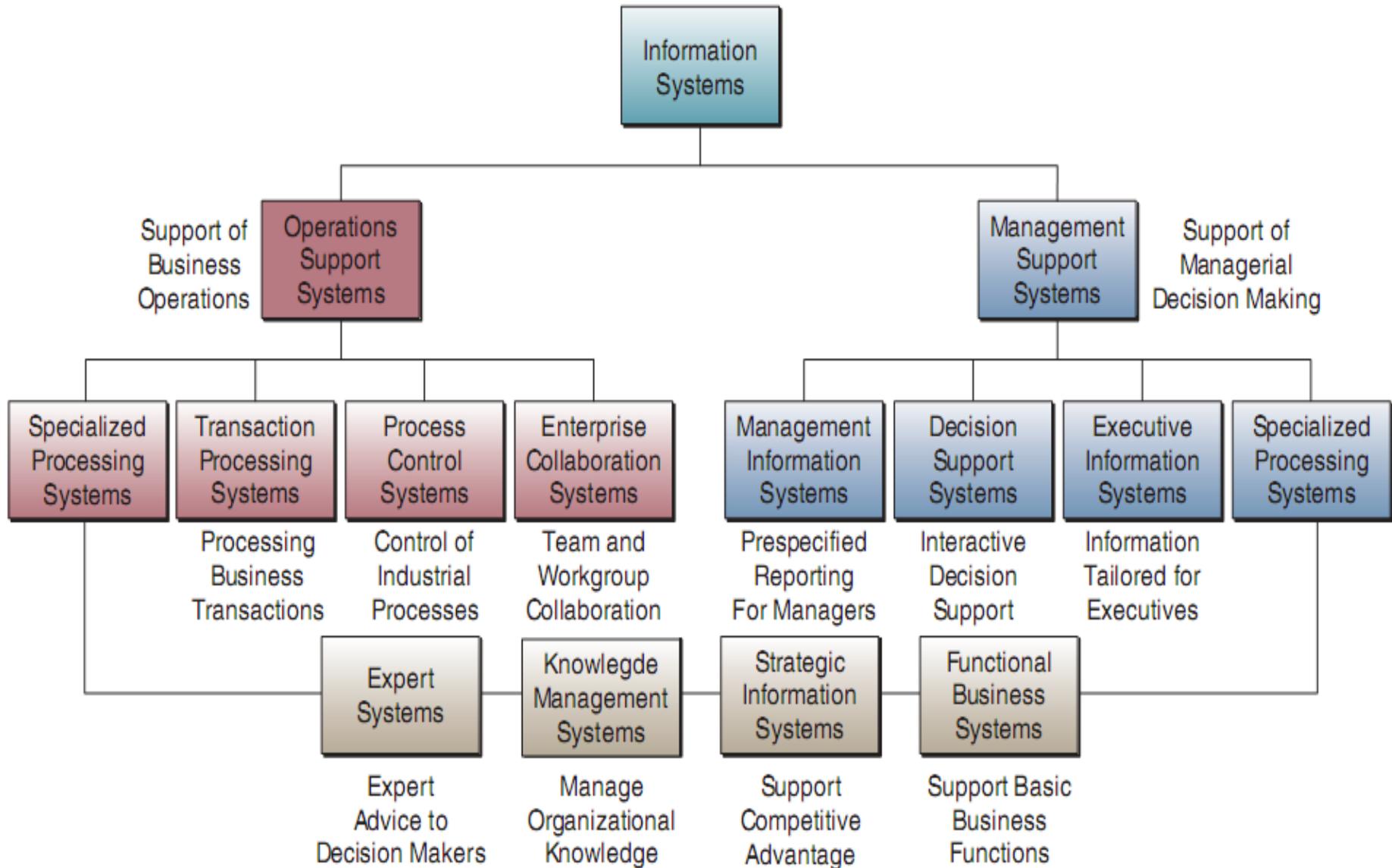
# Mgn Support Systems(continued)

- Decision support systems.
  - Provide decision-making processes of managers and other business professionals.
  - Examples: product pricing, profitability forecasting, and risk analysis systems.

# Mgn Support Systems(continued)

- 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



# Other Classifications Of Information Sys

- 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.

## Other Categories of IS (continued)

- 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

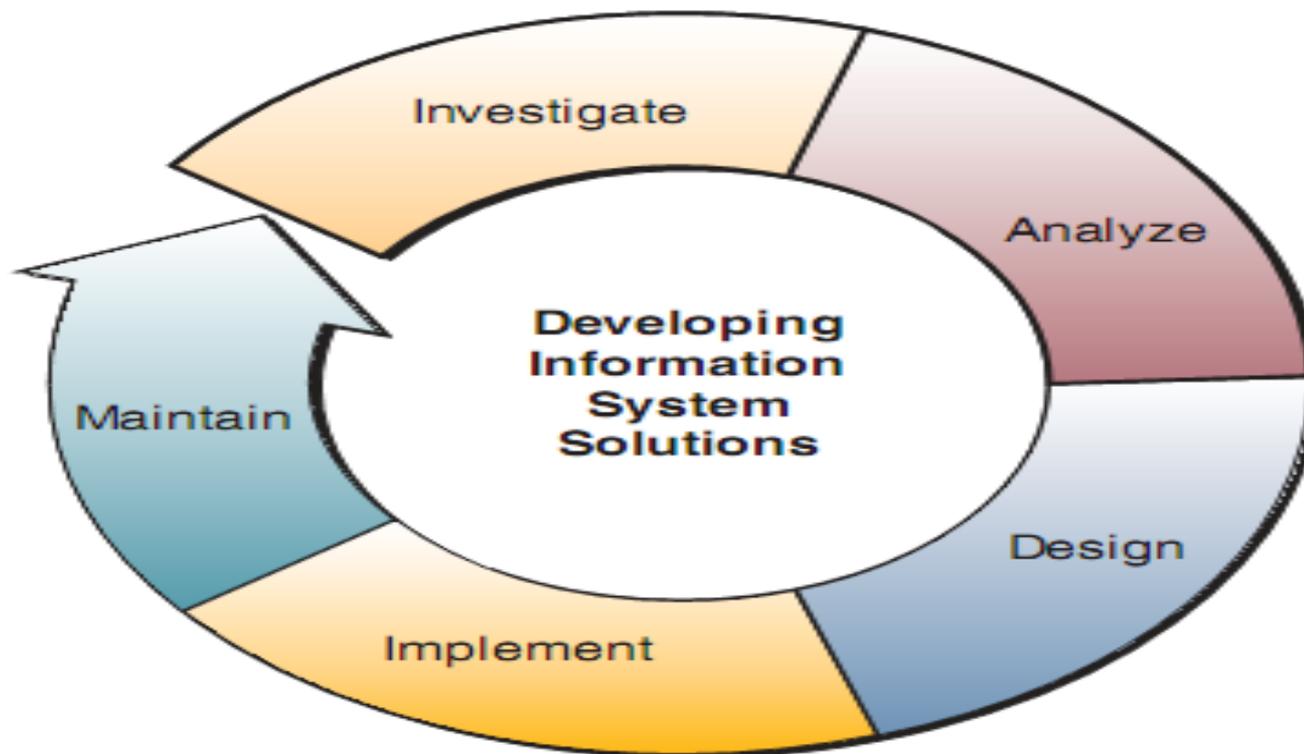
- Success should be measured by the effectiveness of information technology in supporting:
  - an organization's business strategies
  - enabling its business processes
  - enhancing its organizational structures and culture
  - increasing the customer and business value of the enterprise

# 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?

# The IS Function

- 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.

# Foundation Concepts: The Components of IS

- 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.

# Software 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.

# Data Resources

- 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.

# Recognizing Information Systems

- 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.