

Unit 1: Foundations of Information Systems (IS) in Business

- *Why study information systems?*
- *Why do businesses need information technology?*
- *What do you need to know about the use and management of information technologies in business?*
- *The introductory chapters are designed to answer these fundamental questions about the role of information systems in business.*

The real world of information system

- Information systems have become as integrated into our daily business activities as accounting, finance, operations management, marketing, human resource management, or any other major business function.
- Information technologies, including Internet-based information systems, are playing vital and expanding roles in business.
- Information technology can help all kinds of businesses improve the efficiency and effectiveness of their business processes, managerial decision making, and workgroup collaboration, which strengthens their competitive positions in rapidly changing marketplaces.
- Information technologies and systems are, quite simply, an essential ingredient for business success in today's dynamic global environment.

What Is an Information System?

- An information system (IS) can be any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization.
- Following figure illustrates a framework that outlines the major areas of information systems knowledge needed by business professional.



Fig: A framework that outlines the major areas of information systems knowledge needed by business professionals.

- **Foundation Concepts:** Fundamental behavioral, technical, business, and managerial concepts about the components and roles of information systems.
- **Information Technologies:** Major concepts, developments, and management issues in information technology - that is, hardware, software, networks, data management, and many Internet-based technologies.
- **Business Applications:** The major uses of information systems for the operations, management, and competitive advantage of a business.
- **Development Processes:** How business professionals and information specialists plan, develop, and implement information systems to meet business opportunities.
- **Management Challenges:** The challenges of effectively and ethically managing information technology at the end-user, enterprise, and global levels of a business.

The fundamental Roles of IS in Business

There are three vital roles that information systems can perform for a business enterprise:

- a. Support of business processes and operations.
- b. Support of decision making by employees and managers.
- c. Support of strategies for competitive advantage.

Following figure illustrates how the fundamental roles interact in a typical organization:



Fig: The three fundamental roles of the business applications of information systems.

- a. **Support of Business Processes and Operations:** As a consumer, you regularly encounter information systems that support the business processes and operations at the many retail stores where you shop. For example, most retail stores now use **computerbased information systems** to help their employees record customer purchases, keep track of inventory, pay employees, buy new merchandise, and evaluate sales trends. Store operations would grind to a halt without the support of such information systems.
- b. **Support of Business Decision Making:** Information systems also help store managers and other business professionals make better decisions. For example, decisions about what lines of merchandise need to be added or discontinued and what kind of investments they require are typically made after an analysis provided by computer-based information systems. This function not only supports the decision making of store managers, buyers, and others, but also helps them look for ways to gain an advantage over other retailers in the competition for customers.
- c. **Support of Strategies for Competitive Advantage:** Gaining a strategic advantage over competitors requires the innovative application of information technologies. For example, store management might make a decision to install touch-screen kiosks in all stores, with links to the e-commerce Web site for online shopping. This offering might attract new customers and build customer loyalty because of the ease of shopping and buying merchandise provided by such information systems. Thus, strategic information systems can help provide products and services that give a business a comparative advantage over its competitors.

The role of e-business in business

- e-business can be more generally considered an online exchange of value.
- Any online exchange of information, money, resources, services, or any combination thereof falls under the e-business umbrella.
- The Internet and Internet-like networks - those inside the enterprise (intranet) and between an enterprise and its trading partners (extranet) - have become the primary information technology infrastructure that supports the e-business applications of many companies.
- These companies rely on e-business applications to:

- reengineer internal business processes,
- implement e-commerce systems with their customers and suppliers, and
- promote enterprise collaboration among business teams and workgroups

Types of Information Systems

Several types of information systems can be classified as either operations or management information systems.

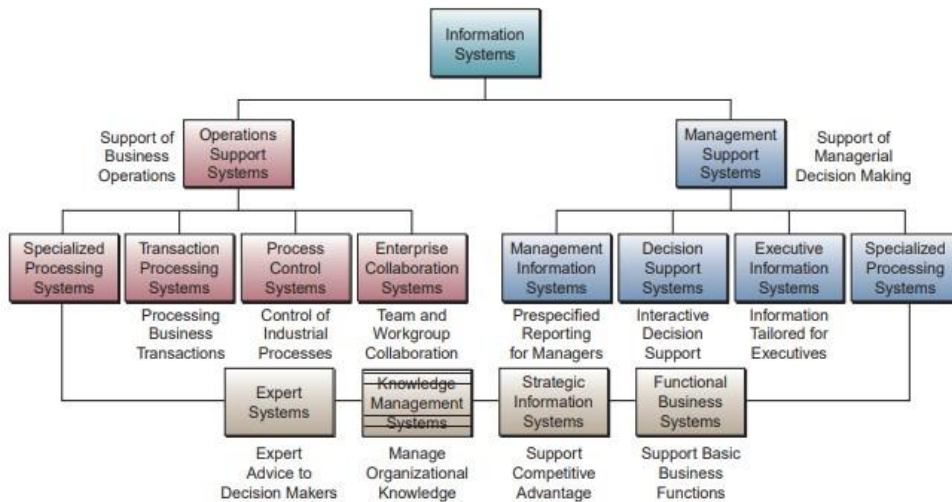


Fig: Operations and management classifications of information systems.

a. Operations support systems:

- Operations support systems produce a variety of information products for internal and external use; however, they do not emphasize the specific information products that can best be used by managers.
- Further processing by management information systems is usually required.
- The role of a business firm's operations support systems is to process business transactions, control industrial processes, support enterprise communications and collaborations, and update corporate databases efficiently.
 - **Transaction processing systems:** Process data resulting from business transactions, update operational databases, and produce business documents. Examples: sales and inventory processing and accounting systems.
 - **Process control systems:** Monitor and control industrial processes. Examples: petroleum refining, power generation, and steel production systems.
 - **Enterprise collaboration systems:** Support team, workgroup, and enterprise communications and collaborations. Examples: email, chat, and video conferencing groupware systems.

b. Management support systems:

- When information system applications focus on providing information and support for effective decision making by managers, they are called management support systems.

- **Management information systems:** Provide information in the form of prespecified reports and displays to support business decision making. Examples: sales analysis, production performance, and cost trend reporting systems.
- **Decision support systems:** Provide interactive ad hoc support for the 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 tailored 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.

c. Other classifications of IS

- **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.
- **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.
- **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.

Managerial Challenges of Information Technology (IT)

- Success in today's dynamic business environment depends heavily on maximizing the use of Internet-based technologies and Web-enabled information systems to meet the competitive requirements of customers, suppliers, and other business partners in a global marketplace.

Success and Failure with IT

- The success of an information system should not be measured only by its efficiency in terms of minimizing costs, time, and the use of information resources.
- Success should also be measured by the effectiveness of the information technology in supporting an organization's business strategies, enabling its business processes, enhancing its organizational structures and culture, and increasing the customer and business value of the enterprise.

- It is important to realize, however, that information technology and information systems can be mismanaged and misapplied in such a way that IS performance problems create both technological and business failures.

Developing IS solutions

- Most computer-based information systems are conceived, designed, and implemented using some form of systematic development process.

FIGURE 1.13

Developing information systems solutions to business problems can be implemented and managed as a multistep process or cycle.

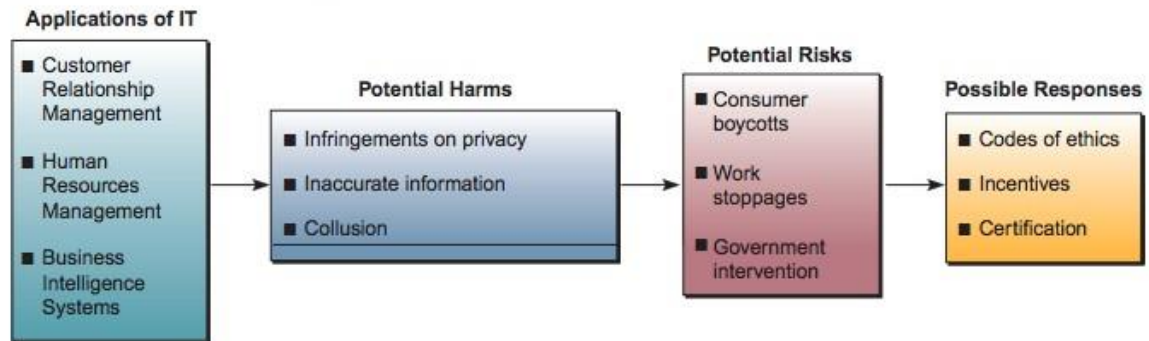


- In this development process, end users and information specialists design information system applications on the basis of an **analysis** of the business requirements of an organization.
- Examples of other activities include **investigating** the economic or technical feasibility of a proposed application, acquiring and learning how to use any software necessary to **implement** the new system, and making improvements to **maintain** the business value of a system.

Challenges and Ethics of IT

- What uses of information technology might be considered improper, irresponsible, or harmful to other people 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?
- These are some of the questions that outline the ethical dimensions of information systems.

FIGURE 1.14 Examples of some of the ethical challenges that must be faced by business managers who implement major applications of information technology.



[**infringement**: the action of breaking the terms of a law, agreement, etc.; violation.] [**collusion**: secret or illegal cooperation or conspiracy in order to deceive others.]

Challenges of IT careers

- In recent years, economic downturns have affected all job sectors, including IT.
- Further, rising labor costs in North America, Canada, and Europe have resulted in a largescale movement to outsource basic software programming functions to India, the Middle East, and Asia-Pacific countries.
- Despite this move, employment opportunities in the information systems field are strong, with more new and exciting jobs emerging each day as organizations continue to expand their use of information technology.
- In addition, these new jobs pose constant human resource management challenges to all organizations because shortages of qualified information systems personnel frequently occur.
- Dynamic developments in business and information technologies cause constantly changing job requirements in information systems, which will ensure that the long-term job outlook in IT remains both positive and exciting.
- According to recent reports by the U.S. Department of Labor, computer systems analysts, database administrators, and other managerial-level IS positions are expected to be among the fastest-growing occupations through 2012.
- Despite the recent economic downturn among information technology firms, IS professionals still enjoy favorable job prospects.
- Perhaps the time has come to put a sharper edge on this message: The field of information systems is growing at an increasingly rapid pace, and there is no risk of being unemployed upon graduation!

The IS Function

The successful management of information systems and technologies presents major challenges to business managers and professionals. Thus, the information systems function represents:

- A major functional area of business equally as important to business success as the functions of accounting, finance, operations management, marketing, and human resource management.
- An important contributor to operational efficiency, employee productivity and morale, and customer service and satisfaction.
- A recognized source of value to the firm.
- 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. ● A strategic resource.