

1 Foundations of Information Systems in Business

I. LECTURE OVERVIEW

Foundation Concepts: Foundations of Information in Business presents an overview of the five basic areas of information systems knowledge needed by business professionals, including the conceptual system components and major types of information systems.

Why Information Systems Are Important – An understanding of the effective and responsible use and management of information systems and technologies is important for managers, business professionals, and other knowledge workers in today’s internetworked enterprises. Information systems play a vital role in the e-business and e-commerce operations, enterprise collaboration and management, and strategic success of businesses that must operate in an internetworked global environment. Thus, the field of information systems has become a major functional area of business administration.

An IS Framework for Business Professionals – The IS knowledge that a business manager or professional needs to know is illustrated in Figure 1.2 and covered in this chapter and text. This included (1) foundation concepts: fundamental behavior, technical, business, and managerial concepts like system components and functions, or competitive strategies; (2) information technologies: concepts, developments, or management issues regarding hardware, software, data management, networks, and other technologies; (3) business applications: major uses of IT for business processes, operations, decision making, and strategic/competitive advantage; (4) development processes: how end users and IS specialists develop and implement business/IT solutions to problems and opportunities arising in business; and (5) management challenges: how to effectively and ethically manage the IS function and IT resources to achieve top performance and business value in support of the business strategies of the enterprise.

System Concepts – A system is a group of interrelated components working toward the attainment of a common goal by accepting inputs and producing outputs in an organized transformation process. Feedback is data about the performance of a system. Control is the component that monitors and evaluates feedback and makes any necessary adjustments to the input and processing components to ensure that proper output is produced.

An Information System Model – An information system uses the resources of people, hardware, software, data, and networks to perform input, processing, output, storage, and control activities that convert data resources into information products. Data are first collected and converted to a form that is suitable for processing (input). Then the data are manipulated and converted into information (processing), stored for future use (storage), or communicated to their ultimate user (output) according to correct processing procedures (control).

IS Resources and Products - Hardware resources include machines and media used in information processing. Software resources include computerized instructions (programs) and instruction for people (procedures). People resources include information systems specialists and users. Data resources include alphanumeric, text, image, video, audio, and other forms of data. Network resources include communications media and network support. Information products produced by an information system can take a variety of forms, including paper reports, visual displays, multimedia documents, electronic messages, graphics images, and audio responses.

Business Applications of Information Systems - Information systems perform three vital roles in business firms. Business applications of IS support an organization’s business processes and operations, business decision-making, and strategic competitive advantage. Major application categories of information systems include operations support systems, such as transaction processing systems, process control systems, and enterprise collaboration systems, and management support systems, such as management information systems, decision support systems, and executive information systems. Other major categories are expert systems, knowledge management systems, strategic information systems, and functional business systems. However, in the real world most application categories are combined into cross-functional information systems that provide information and support for decision-making and also perform operational information processing activities. Refer to Figures 1.13, 1.15, and 1.17 for summaries of the major application categories of information systems.

II. LEARNING OBJECTIVES

Learning Objective

- 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 information systems can support a firm's business processes, managerial decision-making, and strategies for competitive advantage.
- Provide examples of several major types of information system from your experiences with business organizations in the real world.
- Identify several challenges that a business manager might face in managing the successful and ethical development and use of information technology in a business.

III: LECTURE NOTES

Section I: Foundation Concepts: Information Systems and Technologies

WHY INFORMATION SYSTEMS ARE IMPORTANT

An understanding of the effective and responsible use and management of information systems is important for managers and other business knowledge workers in today's global information society. Information systems and technologies have become a vital component of successful businesses and organizations. Information systems constitute an essential field of study in business administration and management, as they are considered a major functional area in business operations.

THE REAL WORLD OF INFORMATION SYSTEMS

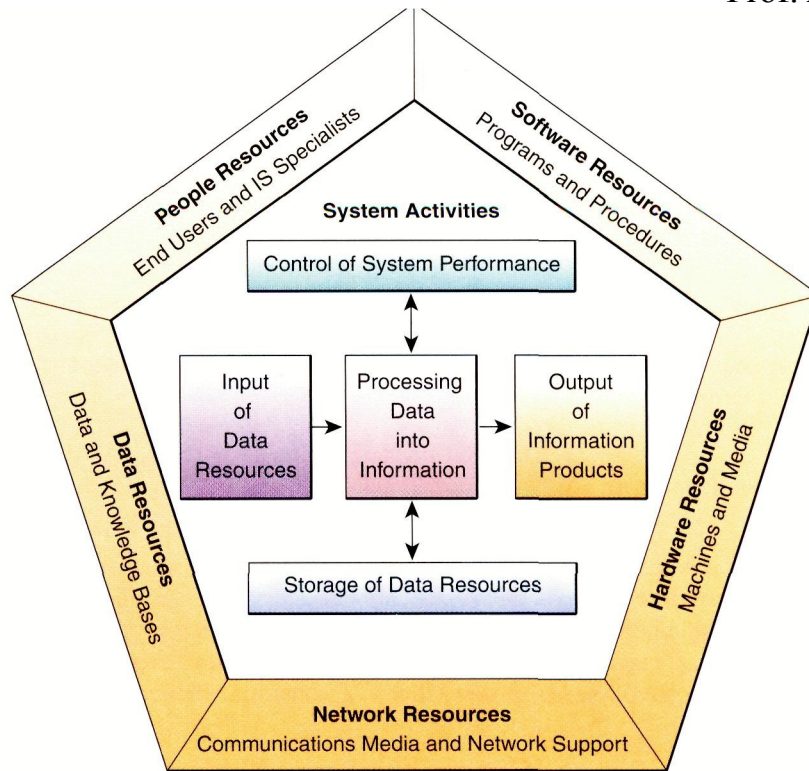
Analysing BellSouth Corp.

We can learn a lot about the importance of information technology and information systems from this case. Take a few minutes to read it, and we will discuss it (See BellSouth Corporation: The Business Payback of Information Technology in Section IX).

WHAT YOU NEED TO KNOW

Managerial end users need to know how information systems can be employed successfully in a business environment. The important question for any business end user or manager is: What do you need to know in order to help manage the hardware, software, data, and network resources of your business, so they are used for the strategic success of your company?

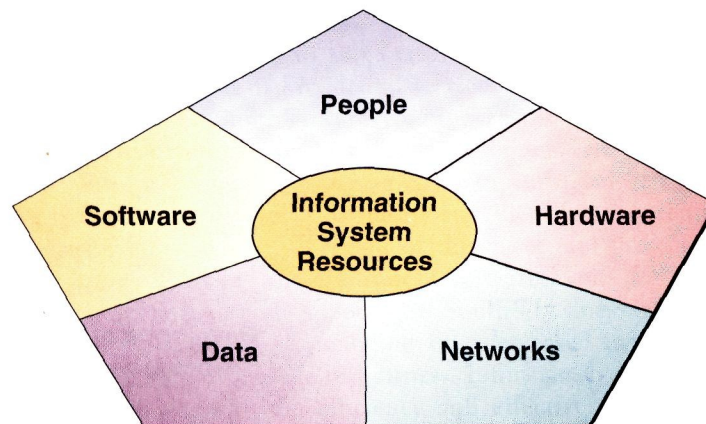
An IS Framework for Business Professionals: [Figure 1.2]



Managers or business professionals are not required to know the complex technologies, abstract behavioral concepts, or the specialized applications involved in the field of information systems. **Figure 1.2** illustrates a useful conceptual framework that outlines what a manager or business professional needs to know about information systems. It emphasizes five areas of knowledge:

- Foundation Concepts
- Information Technologies
- Business Applications
- Development Processes
- Management Challenges

What is an Information System? [Figure 1.3]



An **information system (IS)** can be any organized combination of people, hardware, software, communications networks, and data resources that collect, transforms, and disseminate information in an organization.

Information Technologies:

Business professionals rely on many types of information systems that use a variety of information technologies.

For example:

- Types of IS**
- Manual (paper-and-pencil) information systems
 - Informal (word-of-mouth) information systems
 - Formal (written procedures) information systems
 - Computer-based information systems

Computer-based *information systems* (IS) use hardware, software, the Internet, and other telecommunications networks, computer-based data resource management techniques, and other forms of *information technologies (IT)* to transform data resources into a variety of information products for consumers and business professionals.

SYSTEM CONCEPTS - A FOUNDATION

System concepts underlie the field of information systems. Understanding system concepts will help you understand many other concepts in the technology, applications, development, and management of information systems. System concepts help you understand:

- **Technology.** That computer networks are systems of information processing components that uses a variety of hardware, software, data and telecommunication technologies.
- **Applications.** That electronic business and commerce involves interconnected business information systems.
- **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?

Question: What is a system as it applies to the concept of an information system?

Answer: A **system** is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

A system (sometimes called a *dynamic* system) has three basic interacting components or functions. These include:

- **Input** involves capturing and assembling elements that enter the system to be processed.
- **Processing** involves transformation processes that convert input into output.
- **Output** involves transferring elements that have been produced by a transformation process to their ultimate destination.

Feedback and Control:

Two additional components of the system concept include feedback and control. A system with feedback and control components is sometimes called a *cybernetic* system, that is, a self-monitoring, self-regulating system.

- **Feedback** is data about the performance of a system.
- **Control** involves monitoring and evaluating feedback to determine whether a system is moving toward the achievement of its goals. The control function then makes necessary adjustments to a system's input and processing components to ensure that it produces proper output.

Other System Characteristics:

A system does not exist in a vacuum; rather, it exists and functions in an *environment* containing other systems.

Subsystem: A system that is a component of a larger system, where the larger system is its environment.

System Boundary: A system is separated from its environment and other systems by its system boundary.

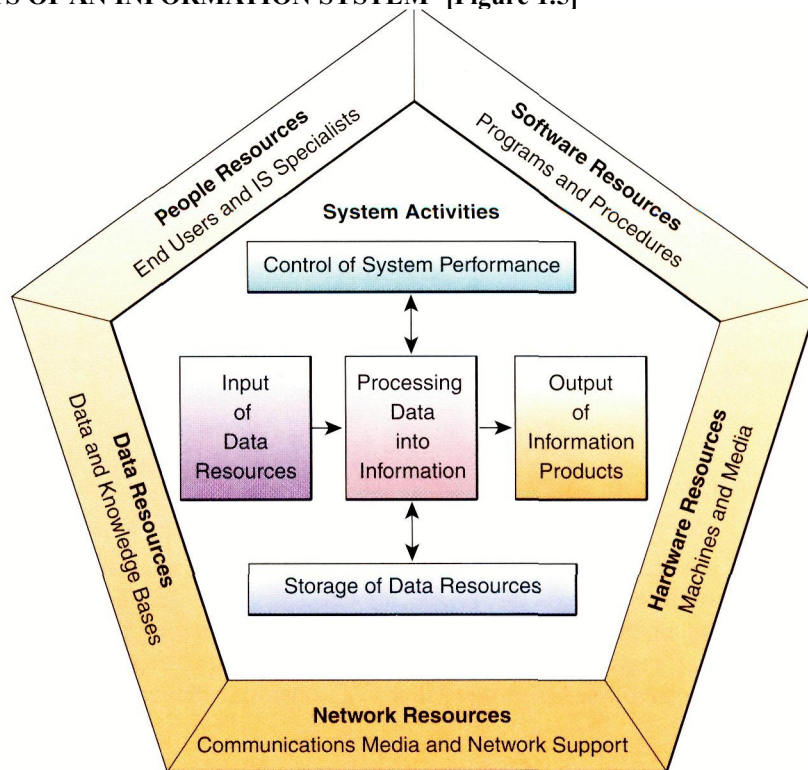
Interface: Several systems may share the same environment. Some of these systems may be connected to one another by means of a shared boundary, or interface.

Open System: A system that interacts with other systems in its environment is called an open system (connected to its environment by exchanges of inputs and outputs).

Adaptive System:

A system that has the ability to change itself or its environment in order to survive is called an adaptive system.

COMPONENTS OF AN INFORMATION SYSTEM -[Figure 1.5]



An *information system model* expresses a fundamental conceptual framework for the major components and activities of information systems. An information system depends on the resources of people, hardware, software, data, and networks to perform input, processing, output, storage, and control activities that convert data resources into information products.

The information systems model outlined in the text emphasizes four major concepts that can be applied to all types of information systems:

- People, hardware, software, data, and networks, are the five basic resources of information systems.
- People resources include end users and IS specialists, hardware resources consist of machines and media, software resources include both programs and procedures, data resources can include data and knowledge bases, and network resources include communications media and networks.
- Data resources are transformed by information processing activities into a variety of information products for end users.
- Information processing consists of input, processing, output, storage, and control activities.

INFORMATION SYSTEM RESOURCES

The basic IS model shows that an information system consists of five major resources:

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

People Resources:

People are required for the operation of all information systems. These people resources include end users and IS specialists.

- **End Users** (also called users or clients) are people who use an information system or the information it produces. Most of us are information system end users. And most end users in business are **knowledge workers**, that is, people who spend most of their time communicating and collaborating in teams of workgroups and creating, using, and distributing information.
- **IS Specialists** are people who develop and operate information systems. They include system analysts, software developers, system operators, and other managerial, technical, and clerical IS personnel.

Systems analysts – design information systems based on the information requirements of end users.

Software developers – create computer programs based on the specifications of systems analysts.

System operators – monitor and operate large computer systems and networks.

Hardware Resources:

Hardware resources include all physical devices and materials used in information processing.

- **Machines** - physical devices (computers, peripherals, telecommunications networks, etc.)
- **Media** - all tangible objects on which data are recorded (paper, magnetic disks etc.)

Examples of hardware in computer-based information systems are:

- **Computer Systems** – which consist of central processing units containing microprocessors, and a variety of interconnected peripheral devices.
- **Computer peripherals** – which are devices such as a keyboard or electronic mouse for input of data and commands, a video screen or printer for output of information, and magnetic or optical disks for storage of data resources.

Software Resources:

Software resources include all sets of information processing instructions.

- **Program** - a set of instructions that causes a computer to perform a particular task.
- **Procedures** - set of instructions used by people to complete a task.

Examples of software resources are:

- **System software** – such as an operating system program, that controls and supports the operations of a computer system.
- **Application software** – are programs that direct processing for a particular use of computers by end users.
- **Procedures** – are operating instructions for the people who will use an information system.

Data Resources:

Data constitutes a valuable organizational resource. Thus, **data resources** must be managed effectively to benefit all end users in an organization. The data resources of information systems are typically organized into:

- **Databases** - a collection of logically related records or files. A database consolidates many records previously stored in separate files so that a common pool of data records serves many applications.
- **Knowledge Bases** - which hold knowledge in a variety of forms such as facts and rules of inference about various subjects.

Data versus Information. The word **data** is the plural of *datum*, though *data* is commonly used to represent both singular and plural forms. The term's *data* and *information* are often used interchangeably. However, you should make the following distinction:

Data: - are raw facts or observations, typically about physical phenomena or business transactions. More specifically, data are objective measurements of the *attributes* (characteristics) of *entities*, such as people, places, things, and events.

Information: - is processed data, which has been placed in a meaningful and useful context for an end user. Data is subjected to a “value-added” process (data processing or information processing) where:

- Its form is aggregated, manipulated, and organized.
- Its content is analyzed and evaluated
- It is placed in a proper context for a human user

Network Resources:

Telecommunications networks like the Internet, intranets, and extranets have become essential to the successful electronic business and commerce operations of all types of organizations and their computer-based information systems. Telecommunications networks consist of computers, communications processors, and other devices interconnected by communications media and controlled by communications software. The concept of **network resources** emphasizes that communications networks are a fundamental resource component of all information systems. Network resources include:

- **Communications media** (twisted-pair wire, coaxial cable, fiber-optic cable, and microwave, cellular, and satellite wireless systems).
- **Network support** (people, hardware, software, and data resources that directly support the operation and use of a communications network).

INFORMATION SYSTEM ACTIVITIES

Information processing (or data processing) activities that occur in information system include the following:

- Input of data resources
- Processing of data into information
- Output of information products
- Storage of data resources
- Control of system performance

Input of Data Resources:

- Data about business transactions and other events must be captured and prepared for processing by the **input** activity. Input typically takes the form of *data entry* activities such as recording and editing.
- Once entered, data may be transferred onto a machine-readable medium such as magnetic disk or type, until needed for processing.

Processing of Data into Information:

- Data is typically subjected to **processing** activities such as calculating, comparing, sorting, classifying, and summarizing. These activities organize, analyze, and manipulate data, thus converting them into information for end users.
- A continual process of correcting and updating activities must maintain quality of data stored in an information system.

Output of Information Products:

- Information in various forms is transmitted to end-users and made available to them in the **output** activity. The goal of information systems is the production of appropriate **information products** for end users.

Storage of Data Resources:

Storage is a basic system component of information systems.

- Storage is the information system activity in which data and information are retained in an organized manner for later use.

Control of System Performance:

An important information system activity is the **control** of its performance.

- An information system should produce feedback about its input, processing, output, and storage activities.
- Feedback must be monitored and evaluated to determine if the system is meeting established performance standards.
- Feedback is used to make adjustments to system activities to correct deficiencies.

RECOGNIZING INFORMATION SYSTEMS

As a business professional, you should be able to recognize the fundamental components of information systems 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.

Analysing BellSouth's Information System

From the Real World Case of BellSouth Corporation, we will try to recognize or visualize the resources used, activities performed, and information products produced by their information systems.

IS Resources:

- People resources include end users like BellSouth's online customers and employees, and IS specialists like CIO Fran Dramis and project leader Lori Groves.

Hardware Resources:

- Thousands of PC server
- Other computers that BellSouth and its customers must be using

Software Resources:

- Web browsers
- Operating systems
- e-commerce websites software
- Oracle's customer relationship management system
- Other proprietary BellSouth business software.

Network Resources:

- Communications media and network support components that are part of the network resources that BellSouth would need to support the e-business and e-commerce activities of such a large telecommunications company.

Data Resources:

- Computer-accessible databases of data about their customers, employees, services, and other necessary business information.

Information Products:

- Displays on customer and employee networked PCs that provide information about and support the provision of BellSouth's services, such as you would find by visiting their Websites at www.bellsouth.com and www.bellsouthcorp.com.

IS Activities:

- Input activities include the input of Web site navigation clicks and e-commerce and e-business data entries and selections, and online collaboration queries and responses made by customers, suppliers, and employees.

Processing Activities:

- Processing activities are accomplished whenever any of BellSouth's computers executes the programs that are part of their e-business and e-commerce software resources.

Output Activities:

- Output activities primarily involve the display or printing of information products mentioned earlier.

Storage Activities:

- Storage activities take place whenever business data is stored and managed in the files and databases on the disk drives and other storage media of BellSouth's computer systems.

Control Activities:

- Control activities include the use of passwords and other security codes by customers, suppliers, and employees for entry into BellSouth's e-business and e-commerce websites, and access of their databases and knowledge bases.

Section II: Foundation Concepts: Business Applications, Development, and Management

THE FUNDAMENTAL ROLES OF IS APPLICATIONS IN BUSINESS

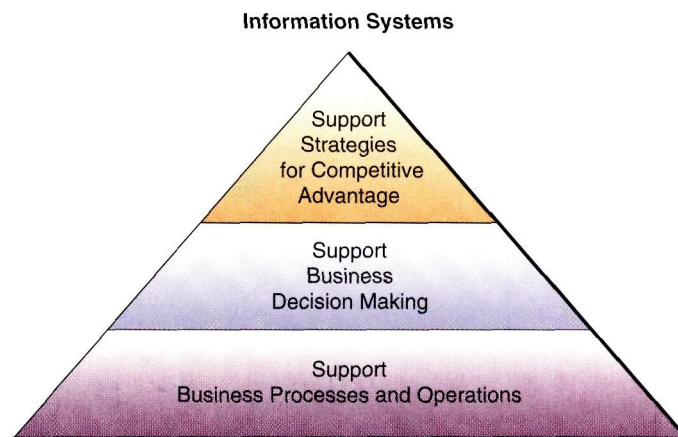
Information systems perform three vital roles in any type of organization. That is, they support an organization's:

- Business processes and operations
- Decision making by employees and managers
- Strategies for competitive advantage

Analysing Royal Caribbean International

We can learn a lot about the challenges of revitalizing and redirecting information technology in a company from the Real World Case of Royal Caribbean International. Take a few minutes to read it, and we will discuss it (See Royal Caribbean International: Renewing and Realigning IT with Business in Section IX).

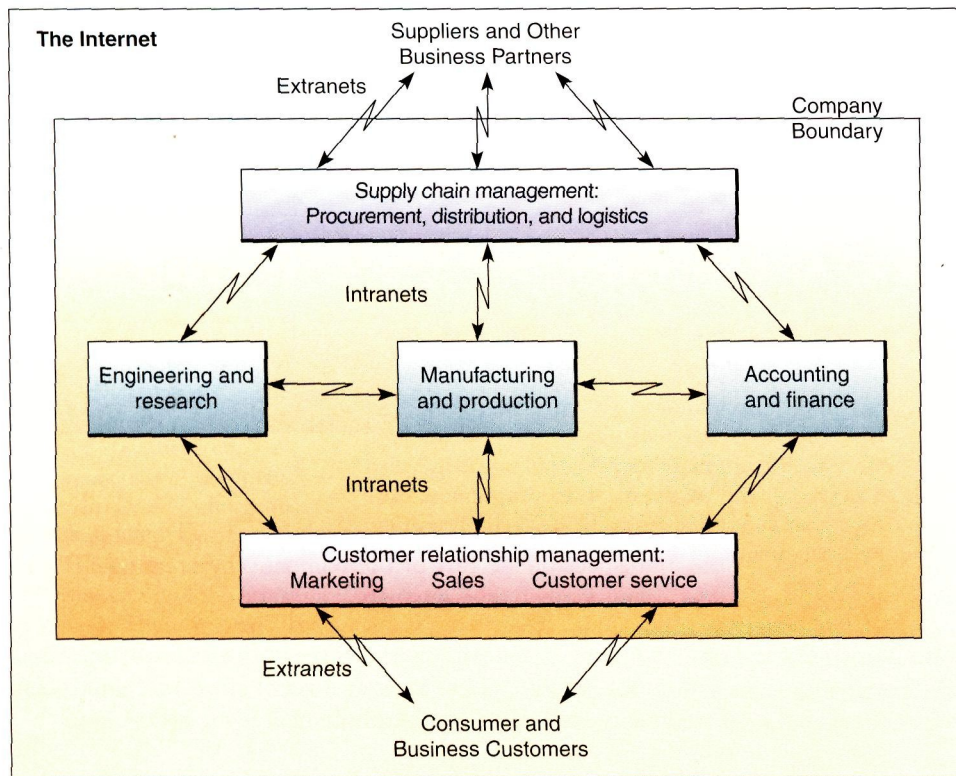
The Major Roles of IS: Examples [Figure 1.9]



Three major roles of the business applications of information systems include:

- Support Business Processes – involves dealing with information systems that support the business processes and operations in a business.
- Support Decision Making – help decision makers to make better decisions and attempt to gain a competitive advantage.
- Support Competitive Advantage – help decision makers to gain a strategic advantage over competitors requires innovative use of information technology.

e-BUSINESS IN BUSINESS - [Figure 1.10]
Concepts



The explosive growth of the Internet and related technologies and applications is revolutionizing the way businesses are operated and people work, and how information technology supports business operations and end user work activities.

Businesses are becoming *e-business enterprises*. The Internet and Internet-like networks – inside the enterprise (*intranets*), and between an enterprise and its trading partners (*extranets*) – have become the primary information technology infrastructure that supports the business operations of many companies. e-business enterprises rely on such technologies to:

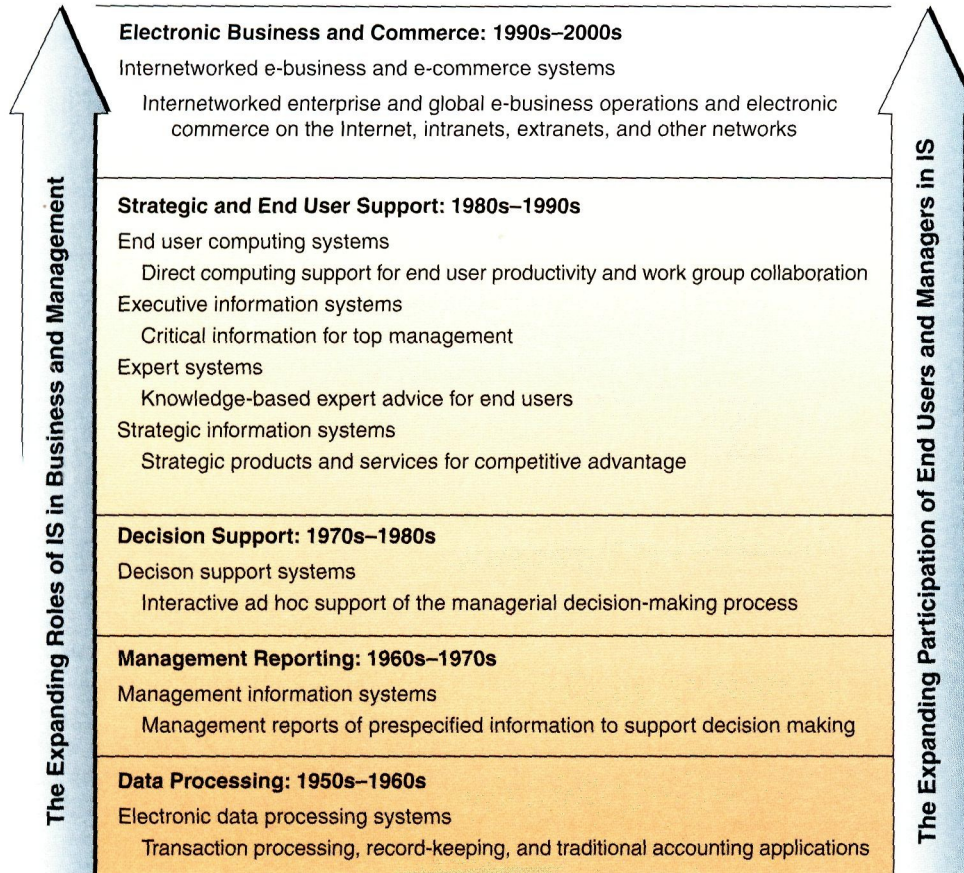
- Reengineer and revitalize internal business processes.
- Implement electronic commerce systems among businesses and their customers and suppliers.
- Promote enterprise collaboration among business teams and workgroups.

e-business is defined as the use of Internet technologies to internetwork and empower business processes, electronic commerce, and enterprise communication and collaboration within a company and with its customers, suppliers, and other business stakeholders.

Enterprise collaboration systems involve the use of groupware tools to support communication, coordination, and collaboration among the members of networked teams and workgroups. An internetworked e-business enterprise depends on intranets, the Internet, extranets, and other networks to implement such systems.

Electronic commerce is the buying and selling, and marketing and servicing of products, services, and information over a variety of computer networks. An internetworked e-business enterprise uses the Internet, intranets, extranets, and other networks to support every step of the commercial process.

TRENDS IN INFORMATION SYSTEMS - [Figure 1.11]



The roles given to the information systems function have expanded significantly over the years.

1950s - 1960s - Data Processing - Electronic data processing systems

Role: Transaction processing, record keeping, and accounting, and other *electronic data processing* (EDP) applications

1960s - 1970s - Management Reporting – Management information systems

Role: Providing managerial end users with predefined management reports that would give managers the information they needed for decision-making purposes.

1970s - 1980s - Decision Support - Decision support systems

Role: The new role for information systems was to provide managerial end users with ad hoc support of their decision-making process. This support would be tailored to the unique decision-making styles of managers as they confronted specific types of problems in the real world.

1980s - 1990s - Strategic and End User Support

Role: End users could use their own computing resources to support their job requirements instead of waiting for the indirect support of corporate information services departments.

- *End User Computing Systems*

Role: Direct computing support for end user productivity and work group collaboration.

- *Executive Information Systems (EIS) -*

Role: These information systems attempt to give top executives an easy way to get the critical information they want, when they want it, tailored to the formats they prefer.

- *Expert Systems (ES) and other Knowledge-Based Systems*

Role: Expert systems can serve as consultants to users by providing expert advice in limited subject areas.

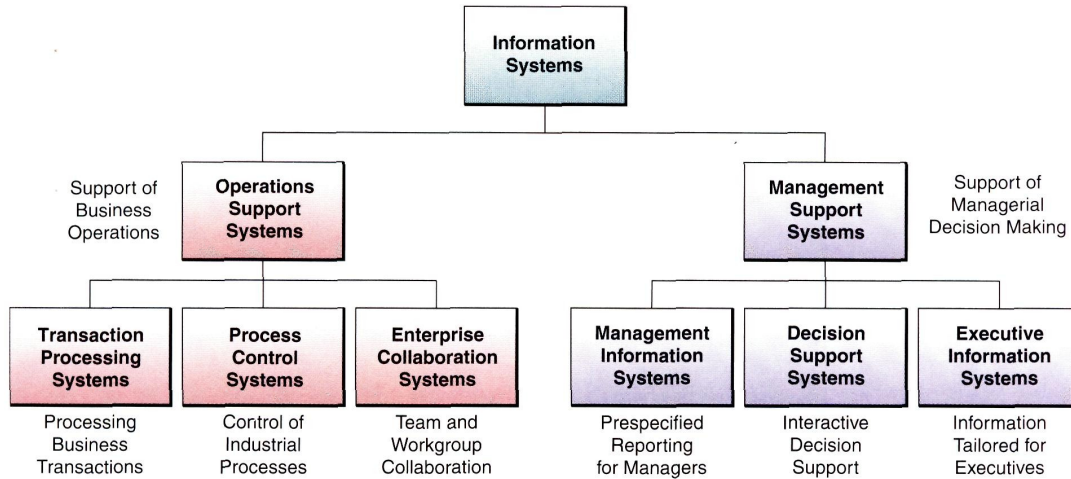
- *Strategic Information Systems (SIS)*

Role: Information technology becomes an integral component of business processes, products, and services that help a company gain a competitive advantage in the global marketplace.

1990s - 2000 – **Electronic business and commerce systems**

Role: The rapid growth of the Internet, intranets, extranets, and other interconnected global networks has revolutionising the operations and management of today’s business enterprises.

TYPES OF INFORMATION SYSTEMS - [Figure 1.12]



Information Systems perform important operational and managerial support roles in businesses and other organizations. Therefore, several types of information systems can be classified conceptually as either:

- Operations Support Systems
- Management Support Systems

Operations Support Systems

Information systems are needed to process data generated by and used in business operations. Such *operations support systems* (OSS) produce a variety of information products for internal and external use. However, they do not emphasize producing 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:

- Effectively process business transactions
- Control industrial processes
- Support enterprise communications and collaboration
- Update corporate databases

Transaction Processing Systems (TPS)

Focus on processing the data generated by business transactions and operations. *Transaction processing systems* record and process data resulting from business transactions (sales, purchases, inventory changes). TPS also produce a variety of information products for internal or external use (customer statements, employee paychecks, sales receipts etc.).

TPS process transactions in two basic ways:

- **Batch Processing** - transactions data is accumulated over a period of time and processed periodically.
- **Real-time (or online) processing** - data is processed immediately after a transaction occurs.

Process Control Systems (PCS) - Process control systems are systems, which make use of computers to control ongoing physical processes. These computers are designed to automatically make decisions, which adjust the physical production process. Examples include petroleum refineries and the assembly lines of automated factories.

Enterprise Collaboration Systems - Enterprise collaboration systems are information systems that use a variety of information technologies to help people work together. Enterprise collaboration systems help us:

- Collaborate - to communicate ideas
- Share resources
- Co-ordinate our cooperative work efforts as members of the many formal and informal process and project teams

The goal of enterprise collaboration systems is to use information technology to enhance the productivity and creativity of teams and workgroups in the modern business enterprise.

Management Support Systems (MSS) -

Management support systems focus on providing information and support for effective decision making by managers. They support the decision-making needs of strategic (top) management, tactical (middle) management, and operating (supervisory) management. Conceptually, several major types of information systems support a variety of decision-making responsibilities:

- Management Information Systems (MIS)
- Decision Support Systems (DSS)
- Executive Information Systems (EIS)

Management information systems are the most common form of management support systems. They provide managerial end users with information products that support much of their day-to-day decision-making needs. MIS provide a variety of prespecified information (reports) and displays to management that can be used to help them make more effective, structured types of day-to-day decisions. Information products provided to managers include displays and reports that can be furnished:

- On demand
- Periodically, according to a predetermined schedule
- Whenever exceptional conditions occur

Decision support systems provide managerial end users with information in an interactive session on an ad hoc (as needed) basis. Managers generate the information they need for more unstructured types of decisions in an interactive, computer-based information system that uses decision models and specialized databases to assist the decision-making processes of managerial end users.

Executive information systems provide top and middle management with immediate and easy access to selective information about key factors that are critical to accomplishing a firm's strategic objectives. EIS are easy to operate and understand.

Other Classifications of Information Systems:

Several other categories of information systems that support either operations or management applications include:

- Expert Systems
- Knowledge Management Systems
- Functional Business Information Systems
- Strategic Information Systems
- Cross-functional Information Systems

MANAGERIAL CHALLENGES OF INFORMATION TECHNOLOGY

For managerial end users, the information systems function represents:

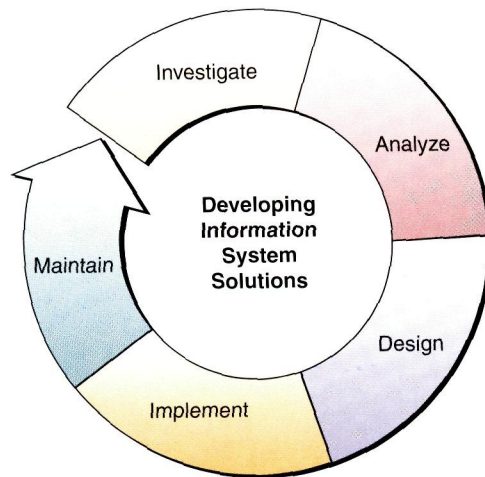
- A major functional area of business that is important to a business' success
- An important factor affecting operational efficiency, employee productivity and morale, and customer service and satisfaction.
- A major source of information and support needed to promote effective decision making by managers.
- An important ingredient in developing competitive products and services that give an organization a strategic advantage in the marketplace.
- A major part of the resources of an organization and its cost of doing business
- A vital, dynamic, and challenging career opportunity for many men and women.

Success and Failure with IT:

Is important that students realize that information technology and information systems can be mismanaged and misapplied so that they create both technological and business failure.

<i>Top Five Reasons for Success</i>	<i>Top Five Reasons for Failure</i>
User involvement	Lack of user input
Executive management support	Incomplete requirements and specifications
Clear statement of requirements	Changing requirements and specifications
Proper planning	Lack of executive support
Realistic expectations	Technological incompetence

Developing IS Solutions: [Figure 1.20] [Chapter 10, 11, & 12]



Developing successful information system solutions to business problems is a major challenge for business managers and professionals today. As a business professional, you will be responsible for proposing or developing new or improved use of information systems for your company. As a business manager, you will also frequently manage the development efforts of information systems specialists and other business end users.

Most computer-based information systems are conceived, designed, and implemented using some form of systematic development process. Figure 1.20 shows that:

- Several major activities must be accomplished and managed in a complete IS development cycle.
- In the development process, end users and information specialists *design* information system applications based on an *analysis* of the business requirements of an organization.
- *Investigating* the economic or technical feasibility of a proposed application.
- Acquiring and learning how to use the software required to *implement* the new system, and make improvements to *maintain* the business value of a system.

Challenges of Ethics and IT:

As a prospective managerial end user and knowledge worker in a global society, you should also become aware of the **ethical responsibilities** generated by the use of information technology. For example:

- What uses of information technology might be considered improper, irresponsible, or harmful to other individuals or to society?
- What is the proper use of an organization’s information 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?

Ethical dimensions of information systems deal with ensuring that information technology and information systems are not used in an improper or irresponsible manner against other individuals or to society.

A major challenge for our global information society is to manage its information resources to benefit all members of society while at the same time meeting the strategic goals of organizations and nations. For example, we must use information systems to find more efficient, profitable and socially responsible ways of using the world's limited supplies of material, energy, and other resources.

Challenges of IT Careers:

- Information technology and its uses in information systems have created interesting, highly paid, and challenging career opportunities.
- Employment opportunities in the field of information systems are excellent, as organizations continue to expand their use of information technology.
- Employment surveys continually forecast shortages of qualified information systems personnel in a variety of job categories.
- Job requirements in information systems are continually changing due to dynamic developments in business and information technology.

The IS Function:

The information systems function represents:

- A major functional area of business that is 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 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 gives 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 internetworked e-business enterprise.

IV. KEY TERMS AND CONCEPTS - DEFINED

Computer-Based Information System:

An information system that uses computer hardware and software to perform its information processing activities.

Control:

The systems component that evaluates feedback to determine whether the system is moving toward the achievement of its goal and then makes any necessary adjustments to the input and processing components of the system to ensure that proper output is produced.

Data:

Facts or observations about physical phenomena or business transactions. More specifically, data are objective measurements of the *attributes* (characteristics) of *entities*, such as people, places, things, and events.

Data or Information Processing:

The act of converting data into information.

Data Resources:

Data, model, and knowledge bases

Developing Business/IT Solutions:

End users and IS specialists develop and implement business/IT solutions to problems and opportunities arising in businesses.

Electronic Business:

Using the Internet, intranets, and extranets as the IT platform for internal business operations, electronic commerce, and enterprise collaboration.

E-Business in Business:

Businesses today are using Internet technologies to web-enable business processes and create innovative e-business applications.

Electronic Commerce:

The buying and selling, marketing and servicing, and delivery and payment of products, services, and information over the Internet, intranets, extranets, and other networks, between an internetworked enterprise and its prospects, customers, suppliers, and other business partners.

End User:

Anyone who uses an information system or the information it produces.

Enterprise Collaboration System:

The use of groupware tools and the Internet, intranets, extranets, and other computer networks to support and enhance communication, coordination, collaboration, and resource sharing among teams and workgroups in an internetworked enterprise.

Extranet:

Interorganizational Internet-like networks among trading partners.

Feedback:

Data or information concerning the components and operations of a systems performance.

Hardware Resources:

Includes all physical devices and materials used in information processing (Machines and media).

Information - Products:

The degree to which information has the appropriate information that is useful for users. Information products include messages, reports, forms, and graphic images.

Information - Quality:

The degree to which information has content, form, and time characteristics that gives it value to specific end users.

Information System:

A system that uses the resources of hardware, software, and people to perform input, processing, output, storage, and control activities that transform data resources into information products.

Information System Activities:

Input, processing, output, storage, and control

Information System Model:

An information system uses people, hardware, software, network, and data resources to perform input, processing, output, storage, and control activities that transform data resources into information products.

Information Technology:

Hardware, software, telecommunications, database management, and other information processing technologies used in computer-based information systems.

Intranet:

Internet-like networks and websites inside a company.

IS Knowledge Needed by Business Professionals:

Fundamental concepts about information systems, their technology, development, applications, and management.

Knowledge Workers:

People whose primary work activities include creating, using, and distributing information.

Management Challenges of IS:

Managing the IT resources of a company effectively and ethically to improve its business performance and value.

Network Resources:

Network resources include communications media and network support.

People Resources:

IS Specialists and end users.

Roles of IS Applications in Business:

Information systems perform three vital roles in any type of organization:

1. Support of business operations
2. Support of managerial decision-making
3. Support of strategic competitive advantage

Software Resources - Programs:

A set of instructions that cause a computer to perform a particular task.

Software Resources - Procedures:

Set of instructions used by people to complete a task.

System:

A system is a *group of interrelated components* working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

Trends in Information Systems:

See Figure 1.11

Types of Information Systems - Cross-Functional Systems:

Information systems that cross the boundaries of functional business areas in order to support business processes across the organization.

Types of Information Systems - Management Support Systems:

Include executive information systems, decision support systems, and management information systems.

Types of Information Systems - Operations Support Systems:

Include office automation systems, transaction processing systems, and process control systems.

V. DISCUSSION QUESTIONS

- How can information technology support a company's business processes and decision making, and give it a competitive advantage?
- How does the use of the Internet, intranets, and extranets by an e-business enterprise support their e-commerce activities?
- Why do big companies still fail in their use of information technology? What should they be doing differently?
- How can a manager demonstrate that he or she is a responsible end user of information systems?
- What are some of the toughest management challenges in developing IT solutions to solve business problems and meet new e-business opportunities?
- Why are there so many conceptual classifications of information systems? Why are they typically integrated in information systems found in the real world?
- In what major ways have the roles of information systems applications in business expanded during the last 40 years? What is one major change you think will happen in the next 10 years?
- Can the business use of Internet technologies help a company gain a competitive advantage?