

Module 1

- Introduction To Information Systems (IS)
- Computer Based Information Systems
(Chapter 1)
 - Impact of IT on organizations (Chapter 1)
 - Importance of IS to Society (Chapter 1)
- Organizational Strategy (Chapter 2)
- Competitive Advantages and IS(Chapter 2)

- Information technology (IT) refers to any computer-based tool that people use to work with information and to support the information and information processing needs of an organization
- Information System (IS)
 - collects, processes, stores, analyzes and disseminates information for the specific purposes

Information technology (IT)

- IT has far reaching effect on individuals,organizations and our planet
- IT has created a significant impact on individuals,societies,global economy and physical environment.
- IT is making world smaller and enabling people to communicate,collaborate and compete
- Environment is global,massively interconnected,intensely competitive,24/7/365, real time , rapidly changing and information intensive....so organisation must use IT effectively

Why should I study IS

- This network is created by constant cooperation between the digital devices you carry (e.g., laptops, media players, and smartphones); the wired and wireless networks that you access as you move about; and Web-based tools for finding information and communicating and collaborating with other people.
- network enables you to pull information about virtually anything from anywhere, at any time, and to push your own ideas back to the Web, from wherever you are, via a mobile device.
- Think of everything you do online, often with your smart phone:
 - ✓ register for classes; take classes (and not just at your university); access class syllabi, information, PowerPoints, and lectures; research class papers and presentations;
 - ✓ conduct banking; pay your bills; research, shop, and buy products from companies or other people; sell your “stuff”;
 - ✓ search for, and apply for, jobs; make your travel reservations (hotel, airline, rental car);
 - ✓ create your own blog and post your own podcasts and videocasts to it; design your own page on Facebook; make and upload videos to YouTube; take, edit, and print your own digital photographs;
 - ✓ “burn” your own custom-music CDs and DVDs; use RSS feeds to create your personal electronic newspaper; text and tweet your friends and family throughout your day; and many other activities.

Why should I study IS

- **The Informed User**

There are several reasons why you should be an informed user

- ✓ First, you will benefit more from your organization's IT applications because you will understand what is "behind" those applications
- ✓ Second, you will be in a position to enhance the quality of your organization's IT applications with your input.
- ✓ Third, even as a new graduate, you will quickly be in a position to recommend—and perhaps help select—the IT applications that your organization will use.
- ✓ Fourth, being an informed user will keep you abreast of both new information technologies and rapid developments in existing technologies. Remaining "on top of things" will help you to anticipate the impacts that "new and improved" technologies will have on your organization and to make recommendations on the adoption and use of these technologies.
- ✓ Fifth, you will understand how using IT can improve your organization's performance and teamwork as well as your own productivity.
- ✓ Finally, if you have ideas of becoming an entrepreneur, then being an informed user will help you use IT when you start your own business.

Why should I study IS

IT skills open
many doors because IT is so
widely used.



Why should I study ISIT Offers Career Opportunities

Information Technology Jobs	
Position	Job Description
Chief Information Officer	Highest-ranking IS manager; is responsible for all strategic planning in the organization
IS Director	Manages all systems throughout the organization and the day-to-day operations of the entire IS organization
Information Center Manager	Manages IS services such as help desks, hot lines, training, and consulting
Applications Development Manager	Coordinates and manages new systems development projects
Project Manager	Manages a particular new systems development project
Systems Manager	Manages a particular existing system
Operations Manager	Supervises the day-to-day operations of the data and/or computer center
Programming Manager	Coordinates all applications programming efforts
Systems Analyst	Interfaces between users and programmers; determines information requirements and technical specifications for new applications
Business Analyst	Focuses on designing solutions for business problems; interfaces closely with users to demonstrate how IT can be used innovatively
Systems Programmer	Creates the computer code for developing new systems software or maintaining existing systems software
Applications Programmer	Creates the computer code for developing new applications or maintaining existing applications
Emerging Technologies Manager	Forecasts technology trends; evaluates and experiments with new technologies
Network Manager	Coordinates and manages the organization's voice and data networks
Database Administrator	Manages the organization's databases and oversees the use of database-management software
Auditing or Computer Security Manager	Oversees the ethical and legal use of information systems
Webmaster	Manages the organization's World Wide Web site
Web Designer	Creates World Wide Web sites and pages

Managing Information Resources

- Managing information systems in modern organizations is a difficult, complex task.
- Several factors contribute to this complexity.
 - ✓ First, information systems have enormous strategic value to organizations. Firms rely on them so heavily that, in some cases, when these systems are not working (even for a short time), the firm cannot function. (This situation is called “being hostage to information systems.”)
 - ✓ Second, information systems are very expensive to acquire, operate, and maintain.
 - ✓ A third factor contributing to the difficulty in managing information systems is the evolution of the management information systems (MIS) function within the organization.
- ✓ When businesses first began to use computers in the early 1950s, the MIS department “owned” the only computing resource in the organization, the mainframe. At that time, end users did not interact directly with the mainframe.
- ✓ In modern organization MIS department now act as a consultants to end users, viewing them as customers
- ✓ MIS department is to use IT to solve end user problems

Traditional Functions of the MIS Department

1. Managing systems development and systems project management
- ✓ As an end user, you will have critical input into the systems development process.
2. Managing computer operations, including the computer center
3. Staffing, training, and developing IS skills
4. Providing technical services
5. Infrastructure planning, development, and control
- ✓ As an end user, you will provide critical input about the IS infrastructure needs of your department.

New (Consultative) Functions of the MIS Department

- Initiating and designing specific strategic information systems
 - As an end user, your information needs will often mandate the development of new strategic information systems.
 - You will decide which strategic systems you need (because you know your business needs better than the MIS department does), and you will provide input into developing these systems.
- Incorporating the Internet and electronic commerce into the business
 - As an end user, you will be primarily responsible for effectively using the Internet and electronic commerce in your business. You will work with the MIS department to accomplish this task.
- Managing system integration including the Internet, intranets, and extranets
 - As an end user, your business needs will determine how you want to use the Internet, your corporate intranets, and extranets to accomplish your goals. You will be primarily responsible for advising the MIS department on the most effective use of the Internet, your corporate intranets, and extranets.
- Educating the non-MIS managers about IT
 - Your department will be primarily responsible for advising the MIS department on how best to educate and train your employees about IT.
- Educating the MIS staff about the business
 - Communication between the MIS department and the business units is a two-way street. You will be responsible for educating the MIS staff on your business, its needs, and its goals.
- Partnering with business-unit executives
 - Essentially, you will be in a partnership with the MIS department. You will be responsible for seeing that this partnership is one "between equals" and ensuring its success.
- Managing outsourcing
 - Outsourcing is driven by business needs. Therefore, the outsourcing decision resides largely with the business units (i.e., with you). The MIS department, working closely with you, will advise you on technical issues such as communications bandwidth, security, etc.
- Proactively using business and technical knowledge to seed innovative ideas about IT
 - Your business needs often will drive innovative ideas about how to effectively use information systems to accomplish your goals. The best way to bring these innovative uses of IS to life is to partner closely with your MIS department. Such close partnerships have amazing synergies!
- Creating business alliances with business partners
 - The needs of your business unit will drive these alliances, typically along your supply chain. Again, your MIS department will act as your advisor on various issues, including hardware and software compatibility, implementing extranets, communications, and security.

Overview of Computer-Based Information Systems

- Information systems has been defined as getting the right information to the right people, at the right time, in the right amount, and in the right format.
- Because information systems are intended to supply useful information, we need to differentiate between information and two closely related terms: data and knowledge

- Data items refer to an **elementary description of things, events, activities, and transactions**
- that are recorded, classified, and stored but are not organized to convey any specific meaning.
- Data items can be numbers, letters, figures, sounds, and images.
- Examples of data items are collections of numbers (e.g., 3.11, 2.96, 3.95, 1.99, 2.08) and characters (e.g., B, A, C, A, B, D, F, C).

- Information refers to data that have been organized so that they have meaning and value to the recipient.
- For example, a grade point average (GPA) by itself is data, but a student's name coupled with his or her GPA is information.
- The recipient interprets the meaning and draws conclusions and implications from the information..

- Knowledge consists of data and/or information that have been organized and processed to convey understanding, experience, accumulated learning, and expertise as they apply to a current business problem.
 - For example, suppose that a company recruiting at your school has found over time that students with grade point averages over 3.0 have experienced the greatest success in its management program.
 - Based on this accumulated knowledge, that company may decide to interview only those students with GPAs over 3.0.
 - This example presents an example of knowledge because the company utilizes information—GPAs—to address a business problem—hiring successful employees. As



Data



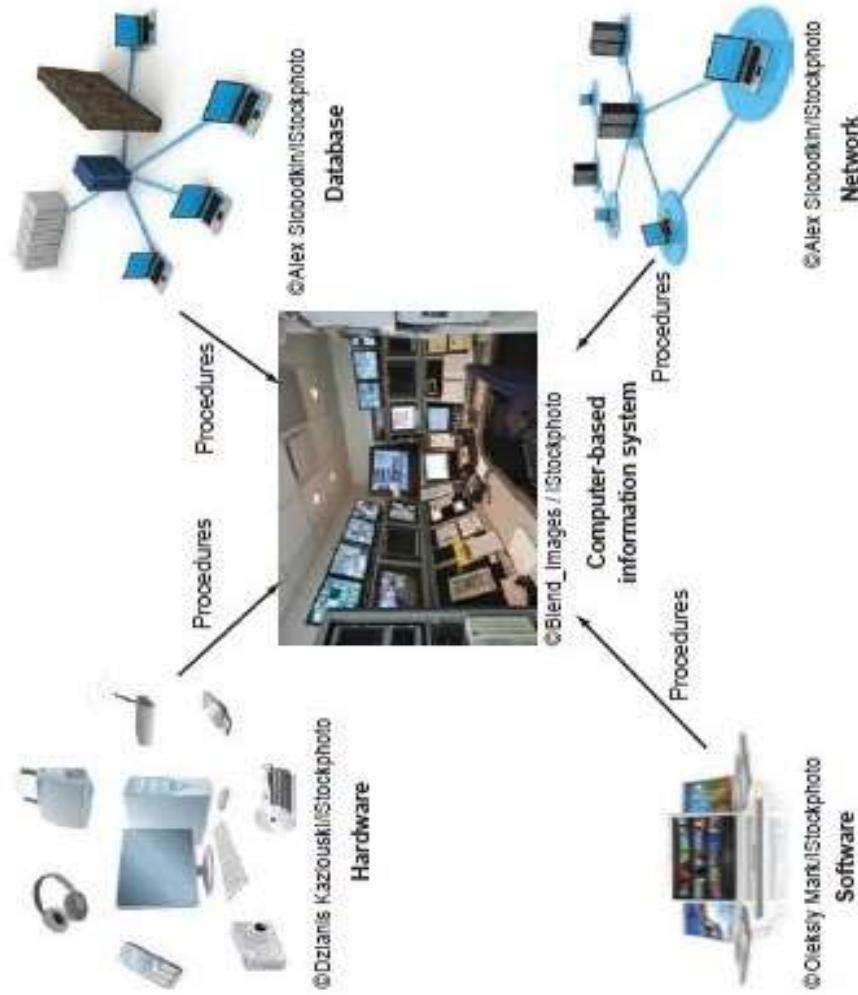
Exactstock/SuperStock
Information



© Tatiana Popova/iStockphoto
Knowledge

A computer-based information system (CBIS)

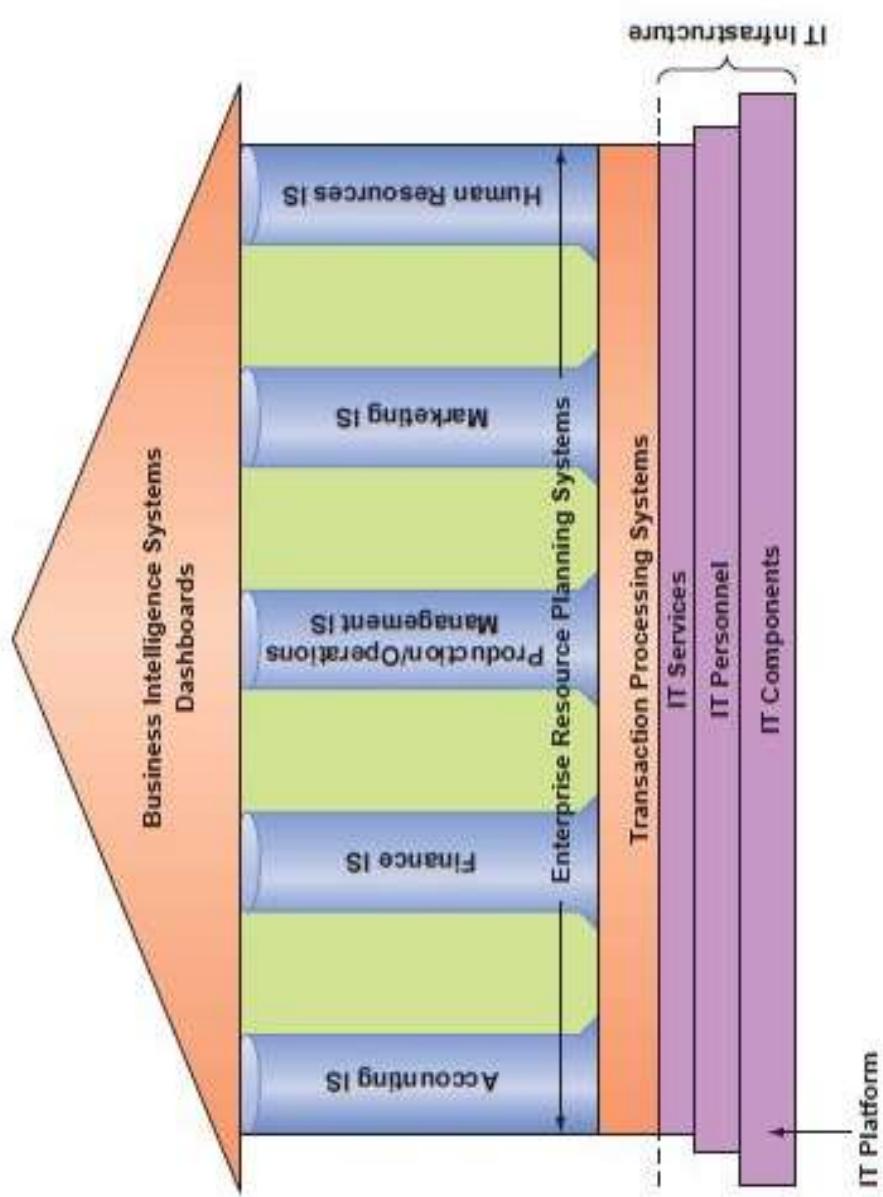
FIGURE 1.3 It takes technology (hardware, software, databases, and networks) with appropriate procedures to make a CBIS useful for people.



A computer-based information system (CBIS)

- A computer-based information system (CBIS) is an information system that uses computer technology to perform some or all of its intended tasks.
- Four components interact to form a CBIS.
 - ✓ Hardware consists of devices such as the processor, monitor, keyboard, and printer.
 - Together, these devices accept, process, and display data and information.
- ✓ Software is a program or collection of programs that enable the hardware to process data.
- ✓ A database is a collection of related files or tables containing data.
- ✓ A network is a connecting system (wireline or wireless) that permits different computers to share resources.
- **Procedures are the instructions for combining the above components to process information** and generate the desired output.
- *People are those individuals who use the hardware and software, interface with it, or utilize its output.*

Information technology inside your organization.



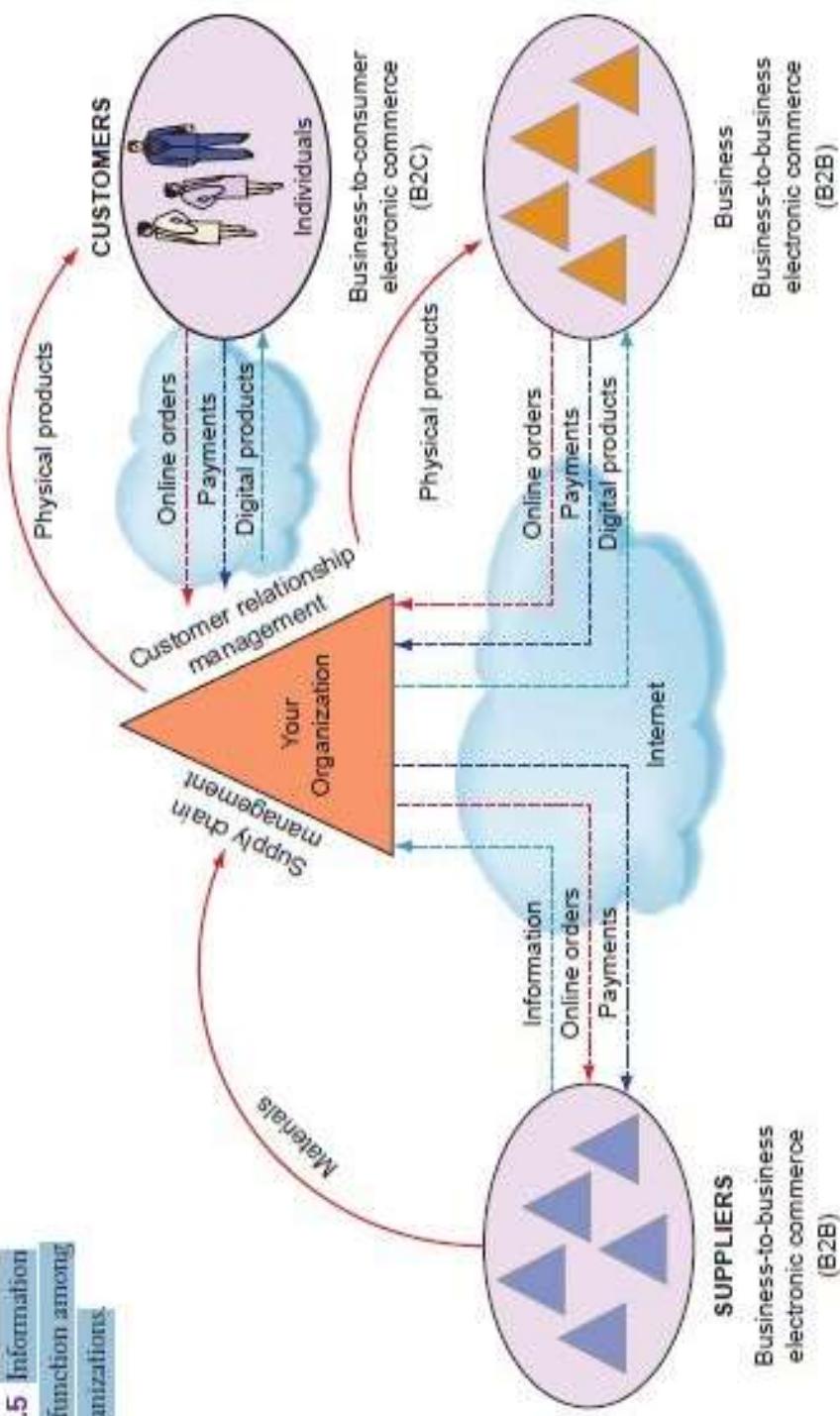
- IT components of hardware, software, networks (wireline and wireless), and databases form the **information technology platform**.
- IT personnel use these components to develop information systems, oversee security and risk, and manage data.
- These activities cumulatively are called **information technology services**.
- The IT components plus IT services comprise the organization's **information technology infrastructure**.
- **At the top of the pyramid are the various organizational information systems.**

Major Capabilities of IS

- Perform high-speed, high-volume numerical computations.
- Provide fast, accurate communication and collaboration within and among organizations.
- Store huge amounts of information in an easy-to-access, yet small space.
- Allow quick and inexpensive access to vast amounts of information, worldwide.
- Interpret vast amounts of data quickly and efficiently.
- Automate both semiautomatic business processes and manual tasks.

Information systems that function among multiple organizations

FIGURE 1.5 Information systems that function among multiple organizations.



Types of Computer-Based Information Systems

Table 1.4
Types of Organizational Information Systems

Type of System	Function	Example
Functional area IS	Supports the activities within specific functional area.	System for processing payroll
Transaction processing system	Processes transaction data from business events.	Walmart checkout point-of-sale terminal
Enterprise resource planning	Integrates all functional areas of the organization.	Oracle, SAP system
Office automation system	Supports daily work activities of individuals and groups.	Microsoft® Office
Management information system	Produces reports summarized from transaction data, usually in one functional area.	Report on total sales for each customer
Decision support system	Provides access to data and analysis tools.	“What-if” analysis of changes in budget
Expert system	Mimics human expert in a particular area and makes decisions.	Credit card approval analysis
Executive dashboard	Presents structured, summarized information about aspects of business important to executives.	Status of sales by product
Supply chain management system	Manages flows of products, services, and information among organizations.	Walmart Retail Link system connecting suppliers to Walmart
Electronic commerce system	Enables transactions among organizations and between organizations and customers.	www.dell.com

- **functional area information systems (FAISs)**
- supporting pillars for the information systems located at the top, namely, business intelligence systems and dashboards
- each FAIS supports a particular functional area within the organization. Examples are accounting IS, finance IS, production/operations management (POM) IS, marketing IS, and human resources IS.
- Functional area information systems summarize data and prepare reports, primarily for middle managers, but sometimes for lower-level managers as well.
- Because these reports typically concern a specific functional area, report generators (RPGs) are an important type of functional area IS

- In finance and accounting, managers use IT systems to forecast revenues and business activity, to determine the best sources and uses of funds, and to perform audits to ensure that the organization is fundamentally sound and that all financial reports and documents are accurate.
- In sales and marketing, managers use information technology to perform the following functions:
 - ✓ *Product analysis: developing new goods and services*
 - ✓ *Site analysis: determining the best location for production and distribution facilities*
 - ✓ *Promotion analysis: identifying the best advertising channels*
 - ✓ *Price analysis: setting product prices to obtain the highest total revenues*
- Marketing managers also use IT to manage their relationships with their customers.
 - In *manufacturing*, managers use IT to process customer orders, develop production schedules, control inventory levels, and monitor product quality. They also use IT to design and manufacture products. These processes are called *computer-assisted design (CAD) and computer-assisted manufacturing (CAM)*.
 - Managers in *human resources* use IT to manage the *recruiting process, analyze and screen job applicants, and hire new employees*. They also employ IT to help employees manage their careers, to administer performance tests to employees, and to monitor employee productivity. Finally, they rely on IT to manage compensation and benefits packages.

- **Enterprise resource planning (ERP) systems are**
 - designed to correct a lack of communication among the functional area ISs.
 - ERP systems were an important innovation because the various functional area ISs were often developed as standalone systems and did not communicate effectively (if at all) with one another.
 - ERP systems resolve this problem by tightly integrating the functional area ISs via a common database.
- In doing so, they enhance communications among the functional areas of an organization.

- A **transaction processing system (TPS)** supports the monitoring, collection, storage, and processing of data from the organization's basic business transactions, each of which generates data.
- When you are checking out at Walmart, for example, a transaction occurs each time the cashier swipes an item across the bar code reader.
- Significantly, within an organization, different functions or departments can define a transaction differently. In accounting, for example, a transaction is anything that changes a firm's chart of accounts.
- The information system definition of a transaction is broader: A transaction is anything that changes the firm's database

- Electronic commerce (e-commerce) systems are another type of interorganizational information system.
- These systems enable organizations to conduct transactions, called business-to-business (B2B) electronic commerce, and customers to conduct transactions with businesses, called business-to-consumer (B2C) electronic commerce. E-commerce systems typically are Internet-based.

- Knowledge workers are **professional employees such as financial and marketing analysts, engineers, lawyers, and accountants.**
- All knowledge workers are experts in a particular subject area. They create information and knowledge, which they integrate into the business.
- Knowledge workers, in turn, act as advisors to middle managers and executives.
- Finally, *executives* make decisions that deal with situations that can significantly change the manner in which business is done. Examples of executive decisions are introducing a new product line, acquiring other businesses, and relocating operations to a foreign country

- **Office automation systems (OASS) typically support the clerical staff, lower and middle managers, and knowledge workers.**
- These employees use OASS to develop documents (word processing and desktop publishing software), schedule resources (electronic calendars), and communicate (e-mail, voice mail, videoconferencing, and groupware).

- Business intelligence (BI) systems provide computer-based support for complex, nonroutine decisions, primarily for middle managers and knowledge workers. (They also support lower-level managers, but to a lesser extent.)
- These systems are typically used with a data warehouse, and they enable users to perform their own data analysis

- **Expert systems (ESs) attempt to duplicate the work of human experts by applying reasoning capabilities, knowledge, and expertise within a specific domain.**
- They have become valuable in many application areas, primarily but not exclusively areas involving decision making.
- For example, navigation systems use rules to select routes, but we do not typically think of these systems as expert systems. Significantly, expert systems can operate as standalone systems or be embedded in other applications

- Dashboards (also called digital dashboards) are a special form of IS that support all managers of the organization.
- They provide rapid access to timely information and direct access to structured information in the form of reports.
- Dashboards that are tailored to the information needs of executives are called *executive dashboards*.

How Does IT Impact Organizations?

- **IT Reduces the Number of Middle Managers**
 - IT makes managers more productive, and it increases the number of employees who can report to a single manager.
 - Thus, IT ultimately decreases the number of managers and experts.
- It is reasonable to assume, therefore, that in coming years organizations will have fewer managerial levels and fewer staff and line managers.
- If this trend materializes, promotional opportunities will decrease, making promotions much more competitive

IT Changes the Manager's Job

- A major consequence of IT has been to change the manner in which managers make their decisions.
- In this way, IT ultimately has changed managers' jobs.
- IT often provides managers with near-real-time information, meaning that managers have less time to make decisions, making their jobs even more stressful.
- Fortunately, IT also provides many tools—for example, business analytics applications such as dashboards, search engines, and intranets—to help managers handle the volumes of information they must deal with on an ongoing basis.

information technology can affect

managers and nonmanagerial workers

Potential IT impacts on managers:

- IT may reduce the number of middle managers;
- IT will provide managers with real-time or near-real-time information, meaning that managers will have less time to make decisions;
- IT will increase the likelihood that managers will have to supervise geographically dispersed employees and teams.

Potential IT impacts on nonmanagerial workers:

- IT may eliminate jobs;
- IT may cause employees to experience a loss of identity;
- IT can cause job stress and physical problems, such as repetitive stress injury.

positive and negative societal effects of information system

Positive societal effects:

- IT can provide opportunities for people with disabilities;
- IT can provide people with flexibility in their work (e.g., work from anywhere, anytime);
- Robots will take over mundane chores;
- IT will enable improvements in healthcare.

Negative societal effects:

- IT can cause health problems for individuals;
- IT can place employees on constant call;
- IT can potentially misinform patients about their health problems

IT Impacts Employees' Health and Safety.

- Although computers and information systems are generally regarded as agents of “progress,” they can adversely affect individuals’ health and safety. IT: job stress and long-term use of the keyboard.
- An increase in an employee’s workload and/or responsibilities can trigger *job stress*.
- Although computerization has benefited organizations by increasing productivity, it also has created an ever-expanding workload for some employees.
- Some workers feel overwhelmed and have become increasingly anxious about their job performance.
- These feelings of stress and anxiety can actually diminish rather than improve workers’ productivity while jeopardizing their physical and mental health. Management can help alleviate these problems by providing training, redistributing the workload among workers, and hiring more workers.
- On a more specific level, the long-term use of keyboards can lead to *repetitive strain injuries* such as backaches and muscle tension in the wrists and fingers.
- *Carpal tunnel syndrome* is a particularly painful form of repetitive strain injury that affects the wrists and hands.

IT Provides Opportunities for People with Disabilities.

- Computers can create new employment opportunities for people with disabilities by integrating speech-recognition and vision-recognition capabilities.
- For example, individuals who cannot type can use a voice-operated keyboard, and individuals who cannot travel can work at home.
- Going further, adaptive equipment for computers enables people with disabilities to perform tasks they normally would not be able to do.
- For example, the Web and graphical user interfaces (GUIs; e.g., Windows) can be difficult for people with impaired vision to use. To address this problem, manufacturers have added audible screen tips and voice interfaces, which essentially restore the functionality of computers to the way it was before GUIs became standard.

Importance of Information Systems to Society

- **IT Affects Our Quality of Life**
 - ✓ The workplace can be expanded from the traditional 9-to-5 job at a central location to 24 hours a day at any location.
 - ✓ IT can provide employees with flexibility that can significantly improve the quality of leisure time, even if it doesn't increase the total amount of leisure time.
 - ✓ Robots are becoming widely used in a variety of areas. three additional types of robots: telepresence robots, autonomous cars, and drones.