

Chapter 1

Information Technology, the Internet, and You

Lecture Guide

- **Learning Objectives**

- Explain the parts of an information system: people, procedures, software, hardware, data, and the Internet.
- Distinguish between system software and application software.
- Differentiate between the three kinds of system software programs.
- Define and compare general purpose, and specialized, and mobile applications.
- Identify the four types of computers and the five types of personal computers.
- Describe the different types of computer hardware, including the system unit, input, output, storage, and communication devices.
- Define data and describe document, worksheet, database, and presentation files.
- Explain computer connectivity, the wireless revolution, the Internet, cloud computing and IoT.

Chapter Outline

- **Information Systems**

- Parts to an information system:
 - People – end users
 - Procedures – rules or guidelines to follow when using software, hardware, and data
 - Software – programs that consists of step-by-step instructions that tell the computer how to do its work
 - Hardware – the equipment that processes data to create information
 - Data – raw, unprocessed facts, including text, numbers, images and sounds
 - Internet - Almost all information systems provide a way to connect to other people and computers expanding the capability and usefulness of information systems.

- **People**

- Most important part of any information system
- Our lives are touched every day by computers and information systems.
- A variety of features throughout the book help you to become a more efficient and effective end user
 - Making IT Work for You
 - Practical IT applications
 - Tips
 - Numerous tips to make your computing safer, more efficient, and more effective
 - Privacy

- Important information on protecting the privacy of your personal information
- Environment
 - Important relevant environmental information
- Ethics
 - Numerous different ethical/unethical situations for your consideration
- Careers in IT
 - Specific careers in information technology providing job descriptions, projected employment demands, educational requirements, current salary ranges and advancement opportunities.
- **Procedures**
 - Computer users are required to follow rules or guidelines in order to effectively use software, hardware, and data.
 - Procedures are typically documented in manuals that are written by computer specialists.
 - Software and hardware manufacturers provide manuals with their products and are provided either printed or in electronic form.
- **Software**
 - Programs – the instructions that tell computers how to process data
 - Two major types of software:
 - System Software is software the computer uses
 - Enables application software to interact with computer hardware
 - System software is “background” software that helps the computer to manage internal resources.
 - A collection of programs
 - Operating system – coordinate computer resources, provide a user interface, and run applications; Windows 10 and Mac OS are stand-alone operating systems.
 - Tablets, cell phones, and other mobile devices use embedded operating systems known as RTOS (real-time operating systems).
 - Networks use network operating systems (NOS).
 - Utilities – perform specific tasks related to managing computer resources. One of the most essential utility programs that every computer system should have is an antivirus program.
 - Application Software is software for end users.
 - Three types – general purpose, specialized, and apps
 - General-purpose applications are widely used in nearly all careers. Examples include word processor, spreadsheet, database management system, and presentation applications.

- Specialized applications are narrowly focused on specific disciplines and occupations. Examples include graphics and web authoring programs.
 - Mobile apps or mobile applications, or simply apps, are small programs designed for mobile devices such as smartphones and tablets. The most popular mobile apps are for social networking, playing games, and downloading music and videos.
- **Hardware**
 - Four types of computers
 - Supercomputers
 - Most powerful type of computer
 - Special high-capacity computers
 - Fastest processing massive amounts of data
 - Used by large organizations
 - Used to analyze and predict worldwide weather patterns
 - Mainframe
 - Capable of great processing speeds and large amounts of data storage, though not as powerful as supercomputers
 - Used by large corporations
 - Midrange
 - Also referred to as servers
 - Less powerful than a mainframe computer but more powerful than a personal computer
 - Support or serve end users for specific needs such as retrieving data from a database or supplying access to application software
 - Personal, also known as PCs
 - Least powerful
 - Most widely used
 - Fastest growing segment
 - Five types of personal computers include:
 - Desktops
 - Fits on top of a desk
 - Too big to carry around
 - Laptops, also known as notebook computers
 - Portable and lightweight
 - Fit in most briefcases
 - Tablets, also known as tablet computers
 - Smaller, lighter, and generally less powerful than laptops
 - Typically use a virtual keyboard that appears on screen and is touch sensitive
 - Cell phones
 - The most widely used personal computer

- Cell phones with wireless connections to the Internet and processing capabilities
 - Wearables
 - Mobile computer
 - Like Apple's watch
- Cell Phones
 - Another type of computer
 - Many of the same components as desktops, laptops, and tablets
 - Capable of connecting to the Internet and running apps
- Personal Computer Hardware
 - System unit – houses components that make up a computer system
 - Two important components are the microprocessor and memory.
 - The microprocessor controls and manipulates data to produce information.
 - Memory is a holding area for data, instructions and information.
 - One type, random-access memory (RAM), holds the program and data that is currently being processed; known also as temporary storage.
 - Temporary storage contents will typically be lost if the electric power to the computer is disrupted.
 - Input/output devices translate data and programs that humans can understand into a form that the computer can process.
 - Input devices
 - Common input devices—keyboard and mouse
 - Output devices translate the processed information form the computer into a form that humans can understand.
 - Most common output device is the display, also known as a monitor.
 - Secondary storage holds data and programs even after electrical power to a computer system is off.
 - The most common secondary media are hard disks, solid-state storage, and optical disks.
 - Hard disks-typically store programs and very large data files on rigid metallic platters.
 - Solid-state-no moving parts, reliable, requires less power
 - Optical, use laser technology to store data and programs
 - Three types of optical discs include compact discs (CDs), digital versatile (or video) discs (DVDs), and Blue-ray discs (BD).
 - Communication/Communication devices communicate with other computer systems using the Internet.

- Modem is a widely used communication device that modifies audio, video, and other types of data so it can be transmitted over the Internet.
- **Data**
 - Raw unprocessed facts including text, numbers, images and sounds
 - Processed data becomes information.
 - Stored electronically in files
 - Can be used as input for system unit
 - Four types of files include:
 - Document files – created by word processors that include memos, term papers, and letters
 - Worksheet files – created by electronic spreadsheets to analyze things like budgets and predict sales
 - Database files – created by database management programs to contain highly structured and organized data
 - Presentation files - created by presentation graphics programs that may contain audience handouts, speaker notes, and electronic slides
- **Connectivity and the Mobile Internet**
 - Connectivity is the capability of a personal computer to share information with other computers.
 - Central to the concept of connectivity is the network, a communications system connecting two or more computers
 - The Internet is the largest computer network in the world.
 - The web provides a multimedia interface to the resources available on the Internet.
 - The Internet has driven the evolution of computers and their impact on our daily lives.
 - Three things driving the impact of technology on peoples' lives, in addition to the Internet, include cloud computing, wireless communication, and the Internet of Things (IoT).
 - Cloud computing uses the Internet and the web to shift computer activities from a user's computer to computers on the Internet.
 - Users use the Internet to connect to the cloud and access more powerful computers, software and storage.
 - Wireless communication has changed the way we communicate.
 - Experts predict that wireless applications are just the beginning of the wireless revolution which will dramatically affect communication and computer technology use.
 - The Internet of things (IoT) is the continuing development of the Internet that allows everyday objects embedded with electronic devices to send and receive data over the Internet.
 - It promises to connect all types of devices, from computers to cell phones to watches to any number of everyday devices.
 - Wireless communication, cloud computing, and IoT are driving the mobile Internet.
- **Careers in IT**

- There are different types of IT careers highlighted in each chapter.
 - Webmaster
 - Software engineer
 - Computer support specialist
 - Computer technician
 - Technical writer
 - Network administrator
- **A Look to the Future**
 - Using and Understanding Information Technology
 - The purpose is to help you use and understand information technology.
 - The Internet and the Web are considered the two most important technologies of the 21st Century.
 - Powerful Software is available to do an extraordinary number of tasks and help individuals in an endless number of ways.
 - Powerful Hardware includes personal computers that are more powerful than ever.
 - Cell phones, tablets, and communication technologies such as wireless networks are dramatically changing the ways to connect to other computers, networks and the Internet.
 - Privacy, Security, and Ethics are necessary as technology can impact our personal privacy and our environment.
 - Awareness of how technology can affect our personal privacy and our environment is essential.
 - Organizations rely on the quality and flexibility of their information systems to stay competitive.
 - Changing Times indicate that we live in a fast-paced age; look at the Evolution of the Computer Age section which tracks the major developments since computers were first introduced.

Teaching Tips/Suggestions

- **Information Systems**

- The purpose is to help students become highly efficient and effective computer users. This first chapter is an overview of an information system. Users need to recognize and understand:
 - Personal computers are common tools in all areas of life.
 - The wireless revolution is going to happen.
 - The role of information technology in personal and professional lives

- **People**

- Provide examples of how people are the most important part of the system as people come in contact with computers almost every day in some way.
- Ask the students to talk about the computers they use daily - both directly and indirectly. For example, computers are in microwaves, traffic lights, cars, etc. Which are direct uses, and which are considered indirect?
- As end users – there are different features to promote becoming efficient and effective computer users. Explain how the following textbook features can and will help students to better understand computers:
 - Making IT Work for You
 - Tips
 - Privacy
 - Environment
 - Ethics
 - Careers in IT

- **Software**

- Emphasize that there are two types of software –
 - System software is not a single program rather it is a collection of programs.
 - System software is the collection of “background” software that helps the computer manage its own resources.
 - Utilities perform specific tasks related to managing computer resources.
 - Application Software might be described as end user software. There are three types of application software – general purpose, specialized and apps.
- Engage the students in a discussion by asking them to name different types of System Software and Application Software. Further the discussion by asking students to differentiate between the three types of Application software how they use computers, which will help emphasize the importance of application software as well as mobile apps on cell phones.

- **Hardware**

- Emphasize the basic categories of computer hardware. Give examples of each.
- Mention that the categories are determined by their storage capacity and processing speeds. Mention examples of uses of computers in each category.
- Emphasize that personal computers are the least powerful, yet the most widely used. Ask students for reasons.
- Review the five types of personal computers.

- Review the four basic categories of personal computer hardware: system unit, input/output, secondary storage, and communication.
- **Data**
 - Data is raw, unprocessed facts, including text, numbers, images and sounds.
 - Data is stored electronically in files.
 - See Figure 1-16 for the four most common types of files: presentation, database, worksheet, and document.
- **Connectivity and the Mobile Internet**
 - A dynamic shift in connecting has been the widespread use of mobile or wireless communication devices and cloud computing. See Figure 1-17 for illustrations of the devices.
 - Discuss what cloud computing is and how it is used.
 - Ask the students to define and discuss the Internet of Things (IoT) and the continuing development allows everyday objects embedded with electronic devices to send and receive data over the Internet.
- **Careers in IT**
 - Figure 1-18 is a good reference for the different types of careers in IT. Each provides specific job descriptions, salary ranges, and advancement opportunities. What computer related jobs do students think about when computer careers are mentioned? The list in Figure 1-18 helps to bring a broader awareness of what exists and what may interest them.
- **A Look to The Future**
 - Review and discuss with students the six important information technology developments:
 - The Internet and the Web
 - Powerful Software
 - Powerful Hardware
 - Privacy, Security, and Ethics
 - Organizations
 - Changing Times

Key Terms

Key Term	Definition
application software	End user software
apps	Small programs designed for mobile devices
Blu-ray disc (BD)	Optical disc using laser technology to store data and programs
cloud computing	Uses the Internet and the web to shift many computer activities from a user's computer to computers on the Internet
communication device	Computer equipment that allows a computer to connect to other computer systems to share data and information
compact disc (CD)	Optical disc that stores data and programs
connectivity	Provides the capability for computers to connect and share information with other computers
data	Unprocessed facts including text, numbers, images, and sound
database file	Typically created by database management programs to contain highly structured and organized data
desktop computer	Use standalone operating systems like Windows 10 or macOS
digital versatile disc (DVD)	Optical device that provides great storage capacity and can be used to store many different types of data (See also digital video disc)
digital video disc (DVD)	Optical device that provides great storage capacity and can be used to store many different types of data (See also digital versatile disc.)
display	A monitor used to display information
document file	Created by word processors
embedded operating systems (RTOS)	Embedded operating system known as real-time operating system used in cell phones, tablets and other mobile devices
end user	People, the most important part of an information system (See also people)
general-purpose application	Application software that is used in nearly all careers
hard disk	Secondary storage device that uses magnetized charges to store information and programs
hardware	Physical equipment, controlled by software and processes data to create information
information	Processed facts
information system	How the critical parts of technology interact
information technology (IT)	Relates to computer software and hardware, and data
input device	Include keyboard and mouse and are translators between humans and computers
Internet	The largest computer network in the world
IoT (Internet of Things)	The continuing development of the Internet that allows everyday objects embedded with electronic devices to send and receive data over the Internet
keyboard	Input device that allows the user to input character data into the computer

Key Term	Definition
laptop computer	Also known as a notebook computer, is lightweight and portable
mainframe computer	Computer that is capable of great processing speeds and data storage
memory	Holds data and program instructions currently being processed (See also random-access memory)
microprocessor	An important component of a computer system, controls and manipulates data to produce information
midrange computer	Most widely used to support end users for specific needs such as retrieving data from a database or supplying access to application software
mobile app (application)	Known as apps and are small programs primarily designed for mobile devices such as cell phones and tablet computers
modem	Modifies audio, video, and other types of data into a form that can be transmitted across the Internet
monitor	Most common output device that displays the output
mouse	Input device that allows the user to point and click on items
network	A communications system connecting two or more computers
network operating system	Used by a network to coordinate network resources
notebook computer	Microcomputer, also known as a laptop, that is portable, lightweight, and fits into most briefcases
operating system	Coordinates computer resources, provides an interface, and runs applications
optical disc	Secondary storage device that uses laser technology and is used to hold data and programs
output device	Translator between humans and computers, most common output device is the computer monitor
PC	Personal Computer
people	The most important part of an information system (See also end user)
personal computer	PC
presentation file	Created by presentation graphics programs to save presentation materials
procedures	Rules or guidelines for people to follow when using software, hardware, and data
program	Step-by-step instructions that tell the computer how to do its work (See Software)
random-access memory (RAM)	Holds data and program instructions that is currently being processed (See also memory)
real-time operating system	Embedded operating systems used in mobile devices (See embedded operating system)
secondary storage	Holds data and programs even after electrical power to the computer system has been turned off
server	Most widely used to support end users for specific needs such as retrieving data from a database or supplying access to

Key Term	Definition
	application software (See midrange computer)
smartphone	Most widely used handheld computer. Smartphones are cell phones with wireless connections to the Internet with processing capabilities.
software	Step-by-step instructions that tell the computer how to do its work (See also program)
solid-state storage	Secondary storage device that has no moving parts
specialized application	Computer programs that are narrowly focused on specific disciplines and occupations (See also special-purpose application)
stand-alone operating system	Used in desktop computers and include Windows 10 and Mac OS
supercomputer	Most powerful type of computer that is a special high-capacity computer used by very large organizations
system software	Enables the application software to interact with the computer hardware and helps the computer manage its own internal resources
system unit	Contains electronic circuitry, including microprocessors and memory
tablet	Also known as a tablet computer, is smaller and lighter and generally less powerful than a laptop, usually has a flat screen and a virtual keyboard
tablet computer	Also known as a tablet, is smaller and lighter and generally less powerful than a laptop, usually has a flat screen and a virtual keyboard
utility	A part of the system software that performs specific tasks related to managing computer resources
virus	Malicious program that can damage software, hardware, and compromise the security and privacy of your personal data
wearable	Mobile computer that can be worn
web	Provides a multimedia interface to the numerous resources available on the Internet
wireless communication	Communication between wireless communication devices such as cell phones and tablets
wireless revolution	A revolution that is expected to dramatically affect the way we communicate and use computer technology
worksheet file	Created by electronic spreadsheets to analyze things like budgets and to predict sales

Answers to End-of-Chapter Materials

Chapter 1

Num	Multiple Choice Answers	Matching Answers
1	A	F
2	B	G
3	A	I
4	A	A
5	D	J
6	B	D
7	D	H
8	B	B
9	A	E
10	B	C

Open Ended Questions:

1. Explain the parts of an information system. What part do people play in this system?

- People- Personal computers make people, or end users, more productive.
- Procedures- Rules or guidelines for people to follow when using software, hardware, and data
- Software- A program consisting of the step-by-step instructions that tell the computer how to do its work. The purpose of software is to convert data (unprocessed facts) into information (processed facts).
- Hardware- Equipment that processes the data to create information
- Data- Raw, unprocessed facts, including text, numbers, images, and sounds
- Connectivity- typically uses the Internet and allows users to greatly expand the capability and usefulness of their information systems

People are the most important part of any information system. Lives are touched every day by computers and information systems, directly or indirectly.

2. What is system software? What kinds of programs are included in system software?

- System software enables the application software to interact with the computer hardware. System software is “background” software that helps the computer manage its own internal resources. It is not a single program; it is a collection of programs that include:

- Operating systems that coordinate computer resources and provide an interface between users and the computer
- Utilities which perform specific tasks related to managing computer resources

3. Define and compare general purpose applications, specialized applications and apps. Describe some different types of general-purpose applications. Describe some types of specialized applications.

- General purpose applications are widely used in nearly all career areas. They are the kinds of programs you have to know to be considered an efficient and effective end user.
 - Examples of general-purpose applications include word processors, spreadsheets, databases, presentation graphics programs and browsers.
- Specialized applications include thousands of other programs that are more narrowly focused on specific disciplines and occupations.
 - Two examples are graphics, and web authoring programs.
- Apps are small programs designed for mobile devices such as cell phones, tablet computers, and other mobile devices.
 - The most popular apps are for social networking, playing games, and downloading music and videos.

4. Describe the different types of computers. What is the most common type? What are the types of personal computers?

- There are four types of computers- supercomputers, mainframe computers, midrange computers, and personal computers.
- Personal computers are the most widely used and fastest-growing computer type.
- There are five types of personal computers- desktop, laptop, tablet, cell phone and wearables.

5. What is connectivity? What is a computer network? What are the Internet and the Web? What is cloud computing, the wireless revolution, and IoT?

- Connectivity is the capability of a computer to share information with other computers.
- Wireless communication has changed the way we communicate with one another. These wireless applications are just the beginning of the wireless revolution, a revolution that is expected to dramatically affect the way we communicate and use computer technology.
- A computer network is a communications system connecting two or more computers.
- The largest network in the world is the Internet. It is like a giant highway that connects you to millions of other people and organizations located throughout the world. The web, also

known as the World Wide Web or WWW, provides a multimedia interface to the numerous resources available on the Internet.

- Cloud computing is the ability to store and access programs, files, and other activities via the web and Internet, rather than relying solely on a user's computer.
- The IoT (Internet of Things) is the continuing development of the Internet allowing everyday objects embedded with electronic devices to send and receive data over the Internet.