

Using Information Technology

A Practical Introduction to Computers & Communications

9e



Williams/Sawyer

McGraw-Hill

Introduction to Information Technology

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Chapter Topics & Key Questions

- 1.1** **The Practical User: How Becoming Computer Savvy Benefits You** What does being *computer savvy* mean, and what are its practical payoffs?
- 1.2** **Information Technology & Your Life: The Future Now** What is information technology, and how does it affect education, health, money, leisure, government, and careers?
- 1.3** **Infotech Is All-Pervasive: Cellphones, Email, the Internet, & the E-World** How does information technology facilitate email, networks, and the use of the internet and the web; what is the meaning of the term *cyberspace*?
- 1.4** **The “All-Purpose Machine”: The Varieties of Computers** What are the five sizes of computers, and what are clients and servers?
- 1.5** **Understanding Your Computer: How Can You Customize (or Build) Your Own PC?** What four basic operations do all computers use, and what are some of the devices associated with each operation? How does communications affect these operations?
- 1.6** **Where Is Information Technology Headed?** What are three directions of computer development and three directions of communications development?

1.1 Why become computer savvy?

- Know how to make better buying decisions
- Know how to fix ordinary computer problems
- Know how to upgrade equipment
- Know how to guard against online villains
- Know how to effectively use the internet
- Know how computer knowledge can advance your career

Discussion Question: What was your worst computer problem?

1.2 IT & Your Life: The Future Now

Definition: Information Technology (IT) describes any technology that helps to produce, manipulate, store, communicate, and/or disseminate information

- Part 1: Computer Technology
- Part 2: Communication Technology

Discussion Question: How many times today did YOU use one of these technologies?

1.2 How is IT being used in Education?

- 99% of schools have internet access
- 1/5 of college students report they were using computers between ages 5 and 8
- All college students report using computers by the time they were 16-18 years old
- Many college classes are either taught online or have a class website

Definition: *Distance Learning is online education*

Discussion Question: *Have you ever used the computer in your classroom for something other than the work in that class?*

1.2 Rules for Computers in Classrooms

- Problem: Computers in the classroom can be *used* or *misused*.
- *What should they be used for?*
 - Following the lecture slides
 - Working along with the instructor
 - Performing instructor-assigned internet searches
 - Completing assignments for this class
- *What is misuse?*
 - Text messaging or emailing friends
 - Surfing the internet for entertainment
 - Doing assignments for other classes

1.2 Health: High Tech for Wellness

- Telemedicine: Medical care via telecommunications lets doctors treat patients from far away
- 3D Computer models allow accurate tumor location inside a skull
- Robots permit precise microsurgery
- Health websites provide medical information

1.2 Money: Cashless Society?

- Definition: *Virtual means something that is created, simulated, or carried on by means of a computer or a computer network*
- Virtual money
 - Cash-value cards
 - “Electronic wallets” (e.g., PayPal)
 - Electronic payroll deposit
 - Online bill paying
 - Micropayments for online music

Discussion Question: How important is security if all your money is virtual?

1.2 Leisure: Infotech in Entertainment & the Arts

- Videogames
- Downloading
 - Music
 - Movies
- Digital animation
- Digital editing

Discussion Question: How are your leisure activities affected by information technology?

1.2 IT in Government & Democracy

- It helps governments deliver better services.
- It makes government operations more transparent.
- IT changes the nature of politics.
 - Easier fund raising from small donors
 - Gerrymandering—redraw voting districts for partisan advantage
 - Voting machine problems

Discussion Question: How have computers changed government and politics? What could happen in the future?

1.2 Jobs & Careers

- Hotels: Desk clerks use computerized reservations systems
- Law Enforcement: Officers use computers
 - On patrol
 - To check stolen cars
 - To check criminal records
 - To check arrest warrants
- Entertainment:
 - Office uses such as budgets, payroll, ticketing
 - Also virtual set design, 3-D animation, special effects

1.2 Jobs & Careers

- Office careers: Budget, payroll, letter-writing, email
- Teaching: Automated grading systems, emailing parents
- Fashion: Sales/inventory control systems, ordering, personnel
- Job-hunting:
 - Use word processor to create resumes
 - Post resumes online
 - Online job searches

Discussion Question: Can anyone think of a career that does NOT require computer skills at all?

1.3 The Telephone Grows Up

- 1973: First cellphone call
- Mobile phone use estimated to rise to 3.9 billion users by 2013
- Today's cellphones:
 - Can connect to the internet
 - Can send and receive text messages
 - Can take and send pictures (and sometimes video)
 - Can obtain news and TV programs

Discussion Question: Why are cellphones banned in high-security military bases?

1.3 Email's Mass Impact

- Introduced in 1981
- Reached 10 million users in about one year
- Fastest growing technology
- 1998 surpassed hand-delivered mail
- In business, at least, email requires writing skills

Discussion Question: Is text messaging going to replace email?

1.3 Internet, World Wide Web, & Cyberspace

- Cyberspace
 - Term coined by William Gibson in *Neuromancer* (1984)
 - Described a futuristic computer network people “plugged” into directly with their brains
 - Now term *cyberspace* encompasses:
 - The internet & the World Wide Web in particular
 - The wired and wireless communications world in general
 - Thus, cyberspace includes chat rooms, blogs, ATMs, etc.
 - Two most important aspects: internet and web

1.3 Internet, World Wide Web, & Cyberspace

- Internet
 - The worldwide computer network that links thousands of smaller networks
 - Links educational, commercial, nonprofit, and military entities, plus individuals
 - Originally developed to share only text and numeric data

1.3 Internet, World Wide Web, & Cyberspace

- World Wide Web
 - The multimedia part of the internet
 - An interconnected system of servers that support specially formatted documents in multimedia form
 - Includes text, still images, moving images, sound
 - Responsible for the growth and popularity of the internet

Discussion Question: How much do you think the web influences your life?

1.4 Five Computer Types

- Supercomputers
 - Priced from \$1 million to \$350 million
 - High-capacity machines with thousands of processors
 - Multi-user systems
 - Used for U.S. Census, weather forecasting, designing aircraft, etc.
- Mainframe Computers
- Workstations
- Microcomputers
- Microcontrollers

1.4 Five Computer Types

- Supercomputers
- Mainframe Computers
 - Priced from \$5,000 to \$5 million
 - Water-cooled or air-cooled
 - Used by banks, airlines, colleges for millions of transactions
- Workstations
- Microcomputers
- Microcontrollers

1.4 Five Computer Types

- Supercomputers
- Mainframe Computers
- Workstations
 - Introduced in early 1980s
 - Expensive, powerful personal computers
 - Required for scientific, mathematical, engineering, computer-aided design (CAD), computer-aided manufacturing (CAM)
 - Used for designing cars, drugs, movie special effects
- Microcomputers
- Microcontrollers

1.4 Five Computer Types

- Supercomputers
- Mainframe Computers
- Workstations
- Microcomputers
 - Personal computers that cost \$500 to \$5000
 - Used either stand-alone or in a network
 - Types include: desktop, tower, notebooks, netbooks, mobile internet devices (MIDs), personal digital assistants (PDAs)
- Microcontrollers

1.4 Five Computer Types

- Supercomputers
- Mainframe Computers
- Workstations
- Microcomputers
- Microcontrollers
 - Also called embedded computers
 - Tiny, specialized microprocessors inside appliances & automobiles
 - They are in: microwaves, programmable ovens, blood-pressure monitors, air bag sensors, vibration sensors, MP3 players, digital cameras, keyboards, car engines, etc.

1.4 Servers

- Server name describes the way a computer--whether mainframe, workstation, or PC--is used.
- A central computer
- Purpose: Hold data and programs to connect to and supply services for clients
 - Clients are other computers, such as PCs or workstations, on which users run applications

Discussion Question: Are you currently in a lab that uses a server?

1.5 Understanding Your Own Computer

- 3 key concepts
 - Purpose of a computer
 - Turn data into information
 - Data: the raw facts and figures
 - Information: data that has been summarized and manipulated for use in decision making
 - Hardware vs. Software
 - Hardware is the machinery and equipment in the computer
 - Software is the electronic instructions that tell the computer how to perform a task

1.5 Understanding Your Own Computer

- 3 key concepts (continued)
 - The basic operations
 - Input: What goes in to the computer system
 - Processing: The manipulation a computer does to transform data into information
 - Storage:
 - **Primary storage**, or **memory**, is temporary storage.
 - **Secondary storage** is permanent storage: media such as DVDs and CDs
 - Output: What comes out
 - Numbers or pictures on the screen, printouts, sounds
 - Communications: Sending and receiving data

1.5 Building Your Own PC

- What would you need?
 - Keyboard & Mouse
 - Inside the system cabinet
 - Case and power supply
 - Processor chip – the Central Processor Unit (CPU)
 - Memory chips – Random Access Memory (RAM)
 - Motherboard – the system board
 - Memory chips plug in
 - Processor chip plugs in
 - Motherboard attaches to system cabinet
 - Power supply is connected to system cabinet
 - Power supply wire is connected to motherboard

1.5 Building Your Own PC

- Storage Hardware: Floppy, Hard Drive, CD/DVD Drive
 - Storage capacity is represented in bytes
 - 1 byte = 1 character of data
 - 1 kilobyte = 1,024 characters
 - 1 megabyte = 1,048,576 characters
 - 1 gigabyte = over 1 billion characters
 - 1 terabyte = over 1 trillion characters
 - 1 petabyte = about 1 quadrillion characters
 - Permanently installed: floppy-disk drives, hard drives, CD/DVD drives
 - Removable media: floppy disks, CDs, DVDs

1.5 Building Your Own PC

- Output hardware
 - Video
 - Sound cards
 - Monitor
 - Speakers
 - Printer
- Communications hardware
 - Modem

1.5 Software

- System Software—performs essential operating tasks
 - Most important part: operating system
 - Operating system options
 - Windows
 - Unix
 - Linux
 - Mac OS
- Application Software—enables user to perform tasks
 - Install after the OS
 - Application depends on OS, for example
 - Linux applications won't work on Windows
 - Windows applications won't work on Linux

1.6 Future of Information Technology

- 3 directions of Computer Development
 - Miniaturization
 - Speed
 - Affordability
- 3 directions of Communications Development
 - Connectivity
 - Interactivity
 - Multimedia

1.6 When Computers & Communications Combine: Five Results

- Convergence--the combination of 5 industries
 - Computers
 - Communications
 - Consumer electronics
 - Entertainment
 - Mass media
- Portability
- Personalization
- Collaboration
- Cloud computing

1.6 Ethics

- Definition: *Ethics is the set of moral values or principles that govern the conduct of an individual or group*
- *3 ethical considerations resulting from development of IT:*
 - Speed & scale
 - Unpredictability
 - Complexity

Discussion Question: How important is ethics if all your personal information, health information, AND virtual money is stored on computers?