Computer Hardware  Chapter Summary

**Computer Systems.** Major types and trends in computer systems are summarized in the diagrams below dig 1 and 2. A computer is a system of information processing components that perform input, processing, output, storage, and control functions. Its hardware components include input and output devices, a central processing unit (CPU), and primary and secondary storage devices. The major functions and hardware in a computer system are summarized in dig 3.

Dig 1

*Microcomputers*
- Personal computers, network computers, technical workstations, personal digital assistants, information appliances, etc.

*Midrange Computers*
- Network servers, minicomputers, web servers, multiuser systems, etc.

*Mainframe Computers*
- Enterprise systems, superservers, transaction processors, supercomputers, etc.

Dig 2
Microcomputer Systems. Microcomputers are used as personal computers, network computers, personal digital assistants, technical workstations, and information appliances. Like most computer systems today, microcomputers are interconnected in a variety of telecommunications networks. This typically includes local area networks, client/server networks, intranets and extranets, and the
Internet.

**Other Computer** Systems. Midrange computers are increasingly used as powerful network servers, and for many multiuser business data processing and scientific applications. Mainframe computers are larger and more powerful than most midsize computers. They are usually faster, have more memory capacity, and can support more network users and peripheral devices. They are designed to handle the information processing needs of large organizations with high volumes of transaction processing, or with complex computational problems. Supercomputers are a special category of extremely powerful mainframe computer systems designed for massive computational assignments.

**Peripheral** Devices. Refer to Figures 11.16, 11.17, 11.23, 11.26, and 11.27 to review the important trends and capabilities of peripheral devices for input, output, and storage discussed in this chapter.

**Key Terms and Concepts**
These are the key terms and concepts of this chapter.

1. Binary representation
2. Central processing unit
3. Computer system
4. Computer terminal
5. Digital cameras
6. Direct access
7. Generations of computing
8. Information appliance
9. Laptop computer
10. Liquid crystal displays
11. Magnetic disk storage
   a. Floppy disk
   b. Hard disk
   c. RAID
12. Magnetic ink character recognition
13. Magnetic stripe
14. Magnetic tape
15. Mainframe computer
16. Microcomputer
17. Microprocessor
18. Midrange computer
19. Minicomputer
20. Network computer
21. NetPC
22. Network server
23. Network terminal
24. Offline
25. Online
26. Optical character recognition
27. Optical disk storage
28. Optical scanning
29. Pen-based computing
30. Peripheral devices
31. Personal digital assistant
32. Pointing devices
   a. Electronic mouse
   b. Pointing stick
   c. Touchpad
   d. Trackball
33. Primary storage
34. Printers
35. Secondary storage
36. Semiconductor memory
   a. RAM
   b. ROM
37. Sequential access (417)
38. Smart cards
39. Speech recognition
40. Storage capacity elements
   a. Bit
   b. Byte
   c. Kilobyte
   d. Megabyte
   e. Gigabyte
41. Storage media trade-offs
42. Supercomputer
43. Time elements
   a. Millisecond (404)
   b. Microsecond (404)
   c. Nanosecond (404)
Review Quiz

Match one of the previous key terms and concepts with one of the following brief examples or definitions. Try to find the best fit for answers that seem to fit more than one term or concept. Defend your choices.

1. Computers will become smaller, faster, more reliable, easier to use, and less costly.
3. A computer is a combination of components that perform input, processing, output, storage, and servers for its control functions.
4. The main processing component of a computer system.
5. A small, portable PC.
6. Devices for consumers to access the Internet.
7. The memory of a computer.
8. Magnetic disks and tape and optical disks perform this function.
9. Input/output and secondary storage devices for a computer system.
10. Connected to and controlled by a CPU.
11. Separate from and not controlled by a CPU.
12. Results from the presence or absence or change in direction of electric current, magnetic fields, or light rays in computer circuits and media.
13. The central processing unit of a microcomputer.
14. Can be a desktop/laptop, or hand-held computer.
15. A computer category between microcomputers and mainframes.
16. A computer that can handle the information processing needs of large organizations.
17. Hand-held microcomputers for communications and personal information management.
18. Low-cost microcomputers for use with the Internet and corporate intranets.
19. Low-cost network-enabled PCs with reduced features
20. A terminal that depends on network software and processing power.
21. A computer that manages network communications and resources.
22. The most powerful type of computer.
23. A magnetic tape technology for credit cards.
24. One billionth of a second.
25. Roughly one billion characters of storage.
26. Includes electronic mice, trackballs, pointing sticks, and touchpads.
27. You can write on the pressure-sensitive LCD screen of hand-held microcomputers with a pen.
28. Moving this along your desktop moves the cursor on the screen.
29. You can communicate with a computer by touching its display.
30. Produces hard copy output such as paper documents and reports.
31. Promises to be the easiest, most natural way to communicate with computers.
32. Capturing data by processing light reflected from Images.
33. Optical scanning of bar codes and other characters.
34. Bank check processing uses this technology.
35. A debit card with an embedded microprocessor and memory is an example.
36. A device with a keyboard and a video display net worked to a computer is a typical example.
37. Photos or video can be captured and downloaded to your PC for image processing.
38. A video output technology.
39. A hand-held device that reads bar coding.
40. Storage media cost, speed, and capacity differences.
41. You cannot erase the contents of these storage circuits
42. The memory of most computers consists of these storage circuits.
43. The property that determines whether data are lost or retained when power fails.
44. Each position of storage can be accessed in approximately the same time.
45. Each position of storage can be accessed according to a predetermined order.
46. Microelectronic storage circuits on silicon chips.
47. Uses magnetic spots on metal or plastic disks.
48. Uses magnetic spots on plastic tape.
49. Uses a laser to read microscopic points on plastic disks.
50. Vastly increases the storage capacity and image and sound quality of optical disk technology.

Discussion Questions
1. Do you agree with the statement: "The network is the computer"? Why or why not?
2. What trends are occurring in the development and use of the major types of computer systems?
3. Refer to the Real World Case on BTG, NEC Electronics, and Biogen in the chapter. Will compute-farms make traditional mainframes and supercomputers obsolete? Why or why not?
4. Do you think that network computers (NCs) will replace personal computers (PCs) in business applications? Explain.
5. Are networks of PCs and servers making mainframe computers obsolete? Explain.
6. Refer to the Real World Case on Longs Drugs and Textron in the chapter. Is there a role for network computing in business other than replacing office desktop PC systems? Discuss.
7. What are several trends that are occurring in the development and use of peripheral devices? Why are these trends occurring?
8. When would you recommend the use of each of the following: (1) network computers, (2) NetPCs, (3) network terminals, or (4) information appliances in business applications?
9. What processor, memory, magnetic disk storage, and video display capabilities would you require for a personal computer that you would use for business purposes? Explain your choices.
10. What other peripheral devices and capabilities would you want to have for your business PC? Explain your choices.

Application Exercises
1. Input Alternatives
   1. Which method of input would you recommend for the following activities? Explain your choices.
      a. Entering data from printed questionnaires.
      b. Entering data from telephone surveys.
      c. Entering data from bank checks.
      d. Entering data from merchandise tags.
      e. Entering data from business documents.

2. Output Alternatives
   1. Which method of output would you recommend for the following information products? Explain your choices.
      b. Legal documents.
c. Color photographs.
d. Financial results for top executives.
e. Responses for telephone transactions.

3. Purchasing Computer Systems for Your Workgroup
1. You have been asked to get pricing information for a potential purchase of 5 PCs for the members of your work group. Go to the Internet to get prices for these units from at least two prominent PC suppliers. The list below shows the specifications for the basic system you have been asked to price and potential upgrades to each feature. You will want to get a price for the basic system described below and a separate price for each of the upgrades shown.

<table>
<thead>
<tr>
<th>Basic Unit</th>
<th>Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU (gigahertz)</td>
<td>1.3</td>
</tr>
<tr>
<td>Hard Drive (gigabytes)</td>
<td>40 80</td>
</tr>
<tr>
<td>RAM (megabytes)</td>
<td>256 512</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>48 speed</td>
</tr>
<tr>
<td>Monitor (inches)</td>
<td>17 21</td>
</tr>
</tbody>
</table>

Network cards and modems will not be purchased with these systems. These features will be added from stock already owned by the company. Take the standard warranty and servicing coverage offered by each supplier, but be sure to note any differences in coverage.

Your Task
a. Prepare a spreadsheet summarizing this pricing information and showing the cost, from each supplier, of the following options:
   a. 5 units with the basic configuration,
   b. 3 units with the basic configuration and 2 units with all of the upgrades,
   c. 3 units with the basic configuration plus the monitor upgrade and 2 units with all upgrades.
   d. all 5 units fully upgraded.

b. Prepare a set of power point slides or similar presentation materials summarizing your results. Include a discussion of the warranty and servicing contract options available from each supplier.