Chapter 7

Input and Output
Competencies (Page 1 of 2)

• Define input
• Describe keyboard entry, pointing devices, and scanning devices
• Discuss image capturing devices, including digital cameras, digital video cameras, and audio input devices
• Define output
• Describe monitors, printers, and audio output devices
• Discuss combination input and output devices, including fax machines, multifunctional devices, Internet telephones, and terminals
Introduction

Do you ever wonder how information gets into your computer and comes out in a form you can use?

Input devices convert what we understand into what the system unit can process.

Output devices convert what the system unit has processed into a form that we can understand.

Input and output devices are the focus of this chapter.
What is Input?

• Any data or instructions used by a computer
• Input devices
  – Hardware
    • Keyboards
    • Pointing devices
    • Scanning devices
    • Other devices
  – Translates data into a form that the system unit can process
Keyboard Entry  (Page 1 of 2)

• **Keyboards**
  – Traditional keyboards
  – Flexible keyboards
  – Ergonomic keyboards
  – Wireless keyboards
  – PDA keyboards

• **Features**
  – Typewriter keyboard with numeric keypad
  – Special purpose keys
    • **Toggle** and combination keys
Keyboard Entry (Page 2 of 2)

Traditional Keyboard

**Escape Key**
- typically cancels a selection or a procedure.

**Function Keys**
- shortcut for specific tasks. F1, for example, typically displays online Help.

**Numeric Keypad**
- enters numbers and arithmetic symbols and controls cursor or insertion point.

**Windows Key**
- displays the Start menu.

**Spacebar**
- enters blank spaces between characters.

**Navigation Keys**
- control the cursor or insertion point on the screen.
Pointing Devices (Page 1 of 2)

- **Mice**
  - Mechanical
  - Optical
  - Cordless or wireless

- **Three similar devices to mice**
  - Trackball
  - Touch pads
  - Pointing stick
Pointing Devices (Page 2 of 2)

- Joystick
- Touch Screen
- Light Pen
- Stylus
Scanning Devices (Page 1 of 2)

- **Optical scanners**
  - Flatbed scanners
  - Portable scanners

- **Card Readers**
  - Magnetic card readers
  - Radio Frequency card readers
Scanning Devices (Page 2 of 2)

- **Bar code readers**
  - Handheld **wand readers or platform scanners**
  - Contain photoelectric cells that read **bar codes**

- **Character and mark recognition devices**
  - Magnetic ink character recognition (MICR)
  - Optical-character recognition (OCR)
  - Optical-mark recognition (OMR)
Image Capturing Devices

- **Digital cameras**
  - Images recorded digitally on a disk
  - Images can be downloaded to a computer

- **Digital video cameras**
  - Records motion digitally
  - Can take still images as well
  - **WebCams**
    - Specialized digital video cameras
    - Broadcast images over the Internet
Webcams And Instant Messaging

- Exchange messages and files with friends
- Voice and video capabilities
- Application sharing
Audio-Input Devices

- **Voice recognition systems**
  - Use a microphone, a sound card, and special software
  - Users can operate computers and create documents using voice commands
What is Output?

- Processed data or information
- Types of output
  - Text
  - Graphics/Photos
  - Audio & video
- Output devices
  - Monitors
  - Printers
  - Other Devices
Monitors (Page 1 of 2)

- Known as screens or display screens
- Output referred to as soft copy
- Features
  - Resolution/pixels
  - Dot pitch
  - Refresh rate
  - Size

<table>
<thead>
<tr>
<th>Standard</th>
<th>Pixels</th>
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<tbody>
<tr>
<td>SVGA</td>
<td>800 x 600</td>
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<tr>
<td>XGA</td>
<td>1,024 x 768</td>
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<tr>
<td>SXGA</td>
<td>1,280 x 1,024</td>
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<td>UXGA</td>
<td>1,600 x 1,200</td>
</tr>
<tr>
<td>QXGA</td>
<td>3,048 x 1,636</td>
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</table>
Monitors (Page 2 of 2)

- **Cathode-ray tube (CRT) monitors**
- **Flat-panel monitors**
  - Require less power to operate
  - Portable and thinner than CRTs
- **Other monitors**
  - E-books
  - Data projectors
  - High-definition television (HDTV)
Printers (Page 1 of 2)

- Translates information that has been processed by the system unit
- Output referred to as **hard copy**
- Features
  - Resolution
  - Color capability
  - Speed
  - Memory
Printers (Page 2 of 2)

- Ink-jet printer
- Laser printer
  - Personal laser printers
  - Shared laser printers
- Thermal printer
- Other printers
  - Dot-matrix printers
  - Plotters
  - Photo printers
  - Portable printers
Audio-Output Devices

• Translates audio information from the computer into sounds that people can understand

• **Common devices**
  – Speakers
  – Headphones

• **Digital Music Players**
  – iPod, iRiver, Zune
Multifunctional Devices (MFD)

- Many devices combine input and output capabilities and offer cost and space advantages
- Fax machines
- Internet telephones
  - known as Internet telephony
  - IP telephony
  - and Voice-over IP (VoIP)
  - Three approaches
- Terminals
Internet Telephone Approaches

• **Computer-to computer**
  – Free long distance calls
  – Requires computers to be connected to the Internet
  – MSN is most widely used software

• **Computer-to traditional telephone**
  – Place the call from a computer to a phone
  – Requires an Internet phone service provider
    • Software requirements
    • Small monthly and/or per-minute fee

• **Traditional telephone-to-traditional telephone**
  – Does not require a computer
  – Subscription required to a special Internet phone service provider
    • Special hardware adapter
    • Cost is similar to the computer-to-traditional telephone approach
Terminals

- An input and output device
- Connects to a mainframe or server
- Types of terminals
  - Dumb terminal
  - Intelligent terminal
  - Network terminal
Careers In IT

- **Technical writers** prepare instruction manuals, technical reports, and other scientific or technical documents.
- Typically requires a college degree:
  - Communications
  - Journalism
  - English
  - Specialization or familiarization with a technical field
- Technical writers can expect to earn $41K to $69K annually.
A Look to the Future
Electronic Translators May Be in Your Future

- Electronic Interpretation may soon exist to provide personal interpretation for foreign languages and images.
- Prototype portable handheld electronic interpreters are currently in a testing phase at the U.S. Office of Naval Research.
- Creating is labor intensive using both linguists and programmers.
Discussion Questions (Page 1 of 2)

• Define input and input devices.
• Describe the different types of pointing, scanning, image capturing, and audio-input devices.
• Describe the three categories of output devices.
Discussion Questions (Page 2 of 2)

• Define output and output devices.
• What are combination input and output devices? Describe four such devices.