

Chapter Five

Input

Discovering Computers 2012

**Your Interactive Guide
to the Digital World**



Objectives Overview

Define input and differentiate among a program, command, and user response

Identify the keys and buttons commonly found on desktop computer keyboards, and describe how keyboards for mobile computers and devices differ from desktop computer keyboards

Describe different mouse types and explain how to use a mouse

Describe various types of touch screens and explain how a touch-sensitive pad works

Describe various types of pen input, and identify other types of input for smart phones

Summarize the purpose of various game controllers

Objectives Overview

Explain how resolution affects the quality of a picture captured on a digital camera

Describe the uses of voice recognition, Web cams, and video conferencing

Discuss how various scanners and reading devices work

Summarize the various biometric devices

Discuss how POS terminals, automated teller machines, and DVD kiosks work

Identify alternative input devices for physically challenged users

What Is Input?

- **Input** is any data and instructions entered into the memory of a computer



What Is Input?

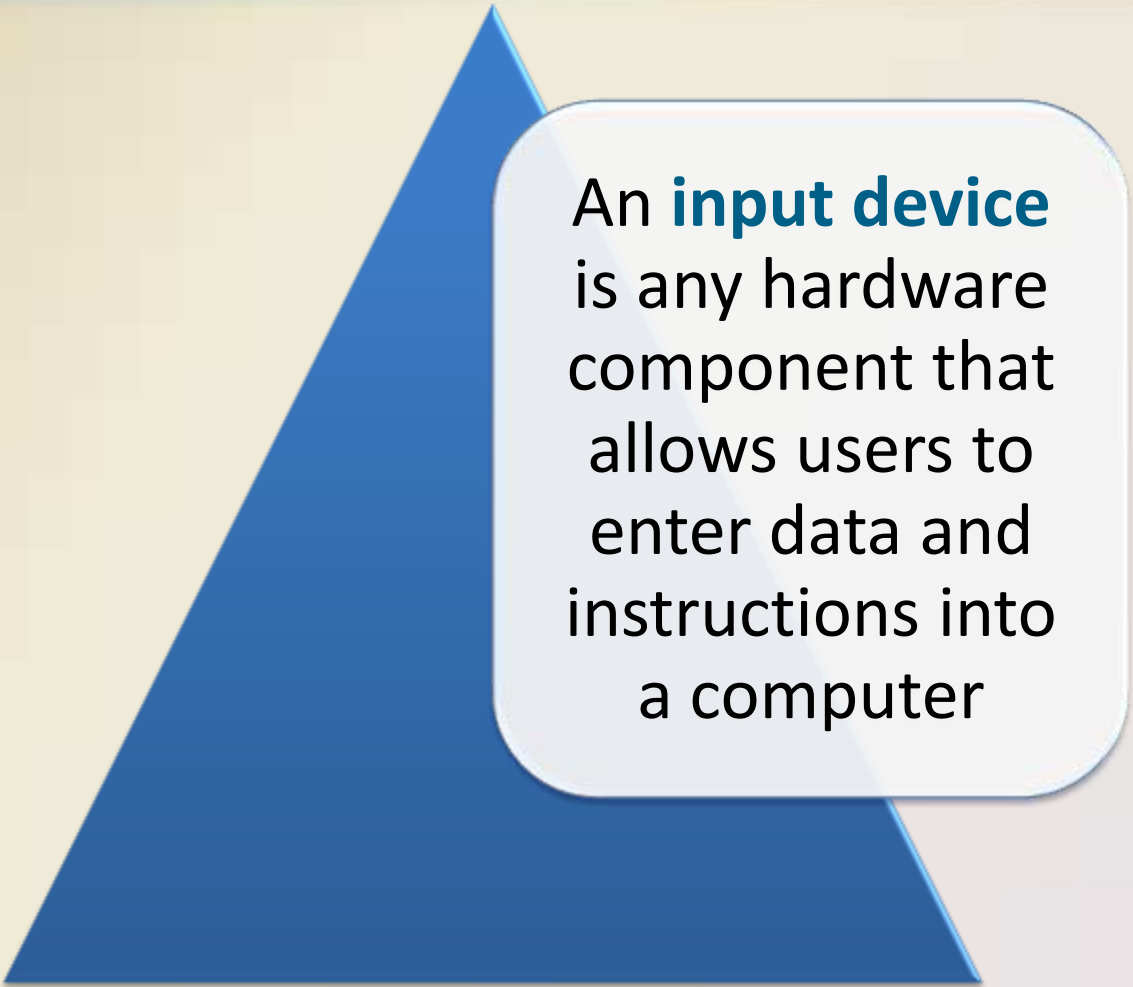
- Instructions can be entered into the computer in the form of programs, commands, and user responses

A program is a series of related instructions that tells a computer what tasks to perform and how to perform them

Programs respond to commands that a user issues

A user response is an instruction a user issues by replying to a question displayed by a program

What Are Input Devices



An **input device** is any hardware component that allows users to enter data and instructions into a computer

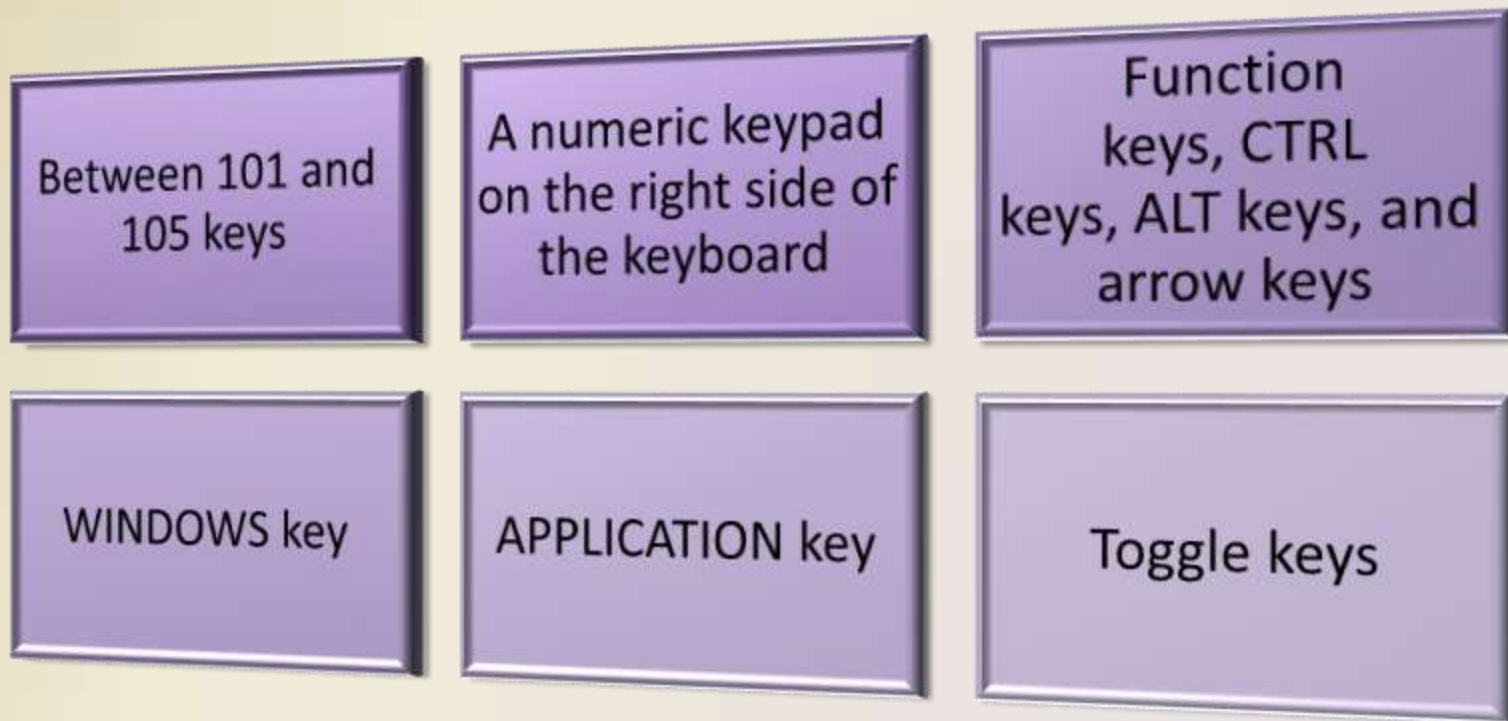
The Keyboard

- A **keyboard** is an input device that contains keys users press to enter data and instructions into a computer



The Keyboard

- Most desktop computer keyboards have...



The Keyboard

- The **insertion point**, also known as the cursor, is a symbol on the screen that indicates where the next character you type will appear



The Keyboard

Wired
Keyboards

USB port

Wireless
Keyboards

Bluetooth

IrDA

The Keyboard

- An ergonomic keyboard has a design that reduces the chance of wrist and hand injuries
- **Ergonomics** incorporates comfort, efficiency, and safety into the design of the workplace



The Keyboard

- Keyboards on mobile devices typically are smaller and/or have fewer keys
- Some phones have predictive text input, which saves time when entering text using the phone's keypad



Pointing Devices

A **pointing device** is an input device that allows a user to control a pointer on the screen

A **pointer** is a small symbol on the screen whose location and shape change as a user moves a pointing device

Mouse

- A **mouse** is a pointing device that fits under the palm of your hand comfortably
 - Most widely used pointing device on desktop computers
- A mouse can be wired or wireless



Mouse

- Mouse operations

Point

Click

Right-click

Double-click

Triple-click

Drag

Right-drag

Rotate
wheel

Free-spin
wheel

Press wheel

Tilt wheel

Press thumb
button

Other Pointing Devices



Trackball

- A **trackball** is a stationary pointing device with a ball on its top or side



Touchpad

- A **touchpad** is a small, flat, rectangular pointing device that is sensitive to pressure and motion

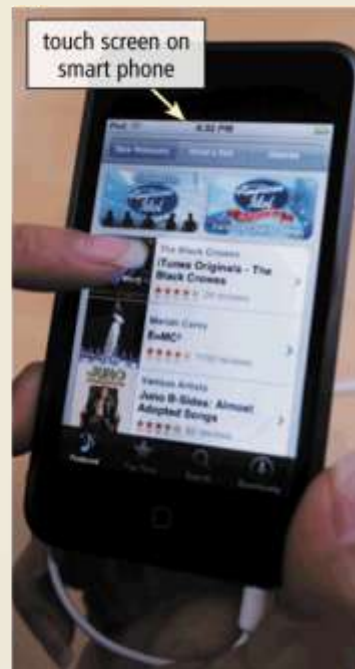


Pointing Stick

- A **pointing stick** is a pressure-sensitive pointing device shaped like a pencil eraser that is positioned between keys on a keyboard

Touch Screens and Touch-Sensitive Pads

- A **touch screen** is a touch-sensitive display device

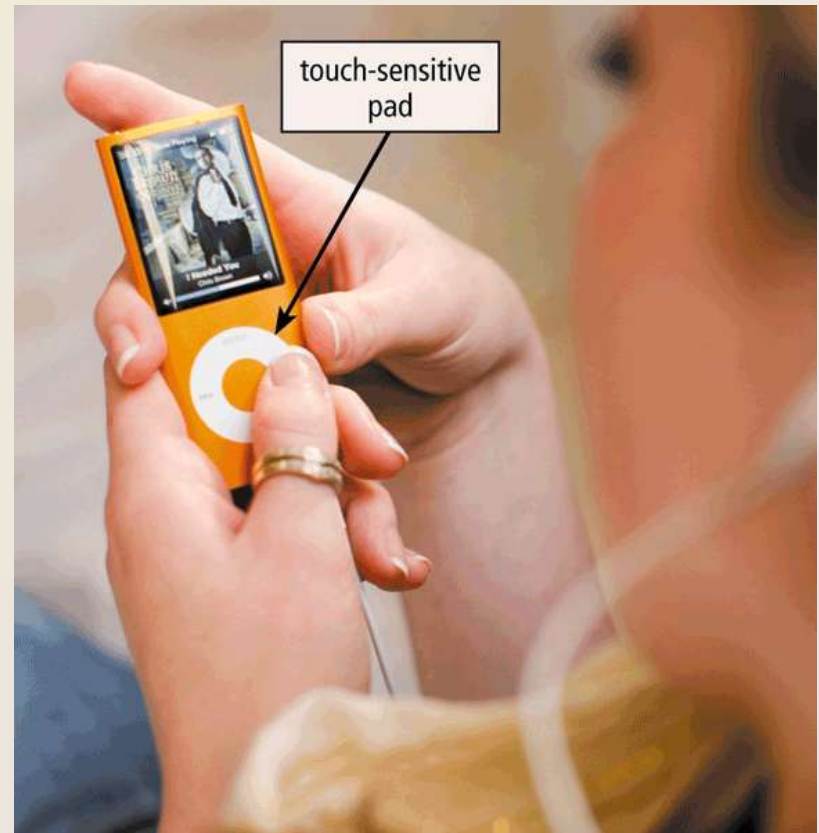


Touch Screens and Touch-Sensitive Pads

Microsoft Surface



Touch-sensitive pads



Pen Input

- With **pen input**, you touch a **stylus** or **digital pen** on a flat surface to write, draw, or make selections



Other Input for Smart Phones



Game Controllers

- Video games and computer games use a **game controller** as the input device that directs movements and actions of on-screen objects

Gamepads

**Joysticks and
Wheels**

Light guns

Dance pads

**Motion-
sensing
controllers**

Game Controllers



Digital Cameras

- A **digital camera** is a mobile device that allows users to take pictures and store them digitally

Studio cameras

Field cameras

Point-and-shoot camera

Digital Cameras

How a Digital Camera Might Work

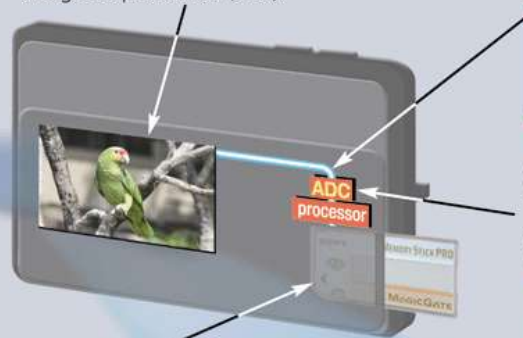
Step 1

Point to the image to photograph and take the picture. Light passes into the lens of the camera.



Step 2

The image is focused on a chip called a *charge-coupled device (CCD)*.



Step 3

The CCD generates an analog signal that represents the image.

Step 4

The analog signal is converted to a digital signal by an analog-to-digital converter (ADC).

Step 5

A processor in the camera adjusts the quality of the image and usually stores the digital photo on media inserted in the camera.



Digital Cameras

- Two factors affect the quality of digital camera photos:

Resolution

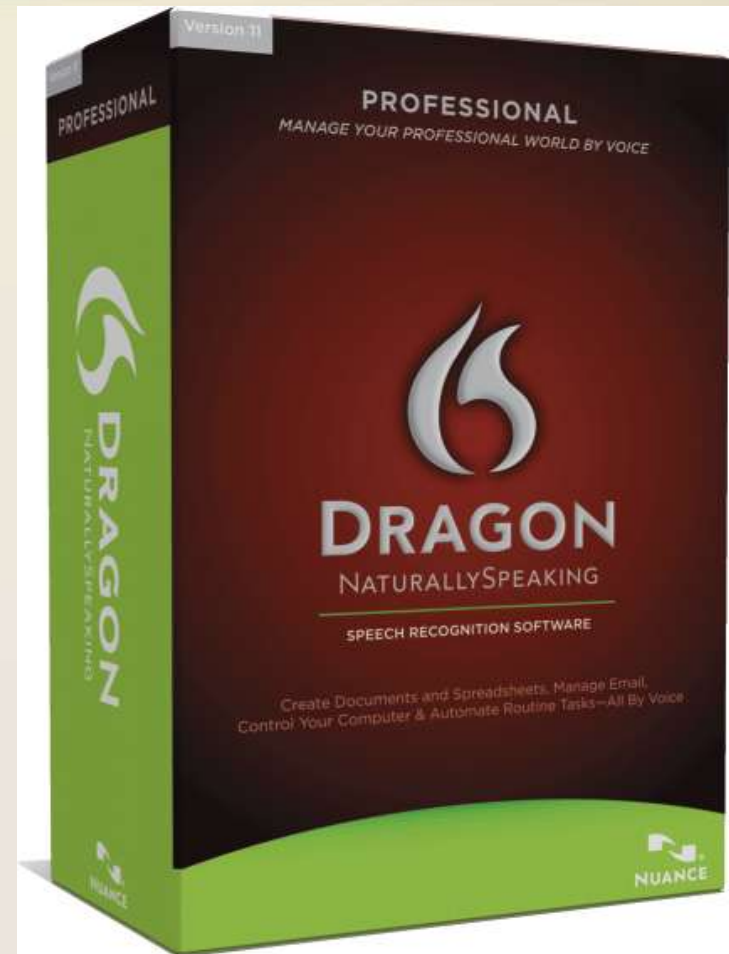
- **Resolution** is the number of horizontal and vertical pixels in a display device
- A pixel is the smallest element in an electronic display

Number of bits stored in each pixel

- Each pixel consists of one or more bits of data
- The more bits used to represent a pixel, the more colors and shades of gray that can be represented

Voice Input

- **Voice input** is the process of entering input by speaking into a microphone
- **Voice recognition** is the computer's capability of distinguishing spoken words



Voice Input

- **Audio input** is the process of entering any sound into the computer

Speech

Music

Sound Effects

Voice Input


- Music production software allows users to record, compose, mix, and edit music and sounds



Video Input

- **Video input** is the process of capturing full-motion images and storing them on a computer's storage medium

Record video on a **digital video (DV) camera** or use a video capture card to convert analog signals to digital



Connect the camera to a port on the system unit



Transfer video and images

Video Input



Video Input

- A **Web cam** is a type of digital video camera that enables a user to:

Capture video and still images

Send e-mail messages with video attachments

Add live images to instant messages

Broadcast live images over the Internet

Make video telephone calls

Video Input

- A **video conference** is a meeting between two or more geographically separated people



Scanners and Reading Devices



Flatbed



Pen or Handheld



Sheet-fed



Drum

Scanners and Reading Devices

How a Flatbed Scanner Works

Step 1

Place the document to be scanned face down on the glass window. Using buttons on the scanner or the scanner program, start the scanning process.



Step 2

The scanner converts the document content to digital information, which is transmitted through the cable to the memory of the computer.

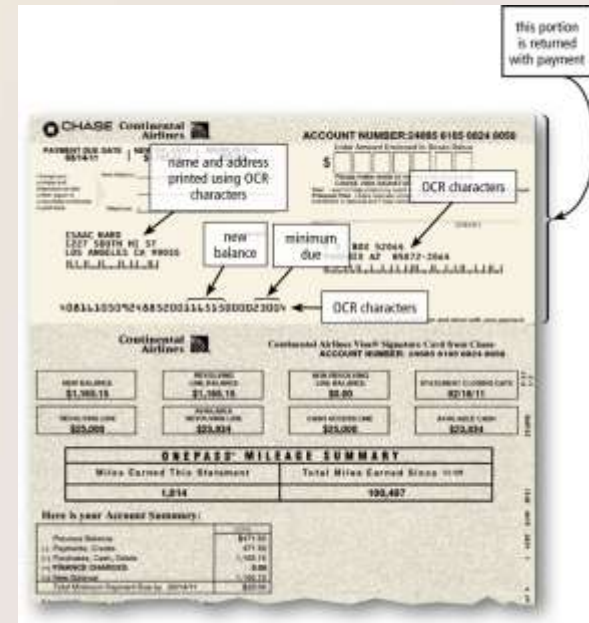
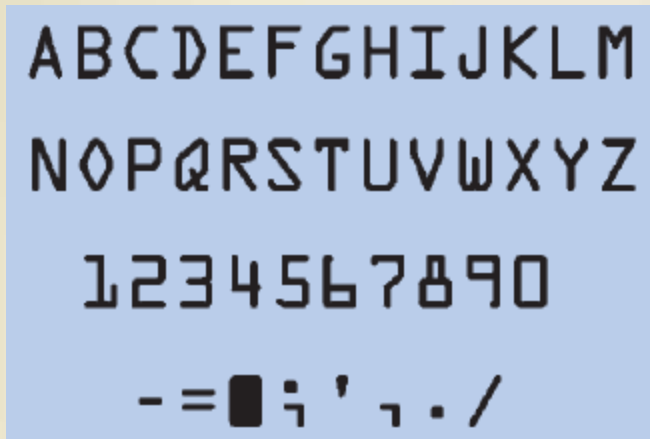


Step 3

Once in the memory of the computer, users can display the image, print it, e-mail it, include it in a document, or place it on a Web page.

Scanners and Reading Devices

- **Optical character recognition (OCR)** involves reading characters from ordinary documents
- A **turnaround document** is a document you return to the company that creates and sends it



Scanners and Reading Devices

- **Optical mark recognition (OMR)** reads hand-drawn marks such as small circles or rectangles
- An OMR device scans the documents and matches the patterns of light



Scanners and Reading Devices

- A **bar code reader**, also called a **bar code scanner** uses laser beams to read **bar codes**



Scanners and Reading Devices

- **RFID** (radio frequency identification) uses radio signals to communicate with a tag placed in or attached to an object
- An **RFID reader** reads information on the tag via radio waves
- RFID can track:

Tracking times of runners in a marathon

Tracking location of soldiers

Employee wardrobes

Airline baggage

Checking lift tickets of skiers

Managing inventory

Gauging pressure and temperature of tires

Checking out library books

Tracking toll payments

Scanners and Reading Devices

- **Magnetic stripe card readers** read the magnetic stripe on the back of cards such as:

Credit cards

Entertainment cards

Bank cards

Other similar cards



Scanners and Reading Devices

- **MICR** (magnetic ink character recognition) devices read text printed with magnetized ink
- An **MICR reader** converts MICR characters into a form the computer can process
- Banking industry uses MICR for check processing



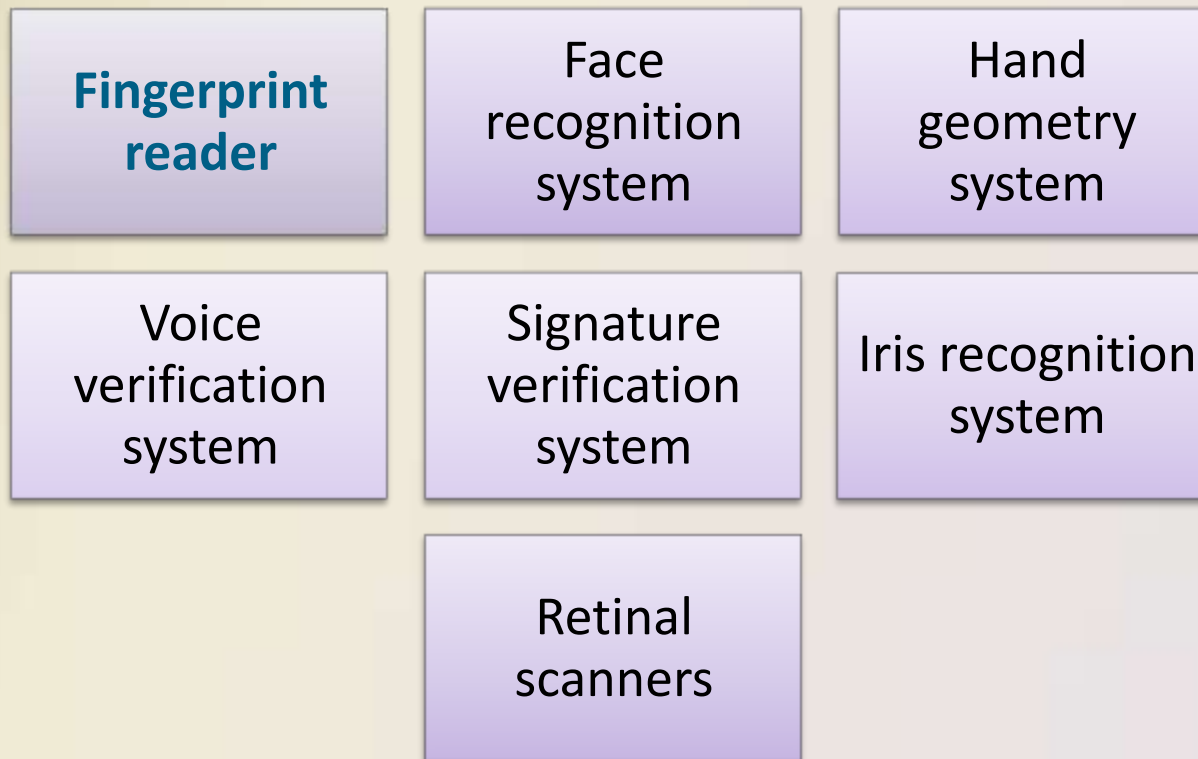
Scanners and Reading Devices

- Data collection devices obtain data directly at the location where the transaction or event takes place
- Used in:
 - Restaurants
 - Grocery stores
 - Factories
 - Warehouses
 - The outdoors



Biometric Input

- Biometrics authenticates a person's identity by verifying a personal characteristic



Biometric Input



fingerprint reader



hand geometry system



iris recognition system



Terminals

- A terminal is a computer that allows users to send data to and/or receive information from a host computer



A **POS terminal** records purchases, processes payment, and updates inventory



An **automated teller machine (ATM)** allows users to access their bank accounts



A **DVD kiosk** is a self-service DVD rental machine

Putting It All Together


Suggested Input Devices by User	
User	Input Device
Home 	<ul style="list-style-type: none">• Enhanced keyboard or ergonomic keyboard• Mouse• Stylus for smart phone or other mobile device• Game controller(s)• 30-bit 600 × 1200 ppi color scanner• 7 MP digital camera• Headphones that include a microphone (headset)• Web cam• Fingerprint reader
Small Office/ Home Office 	<ul style="list-style-type: none">• Enhanced keyboard or ergonomic keyboard• Mouse• Stylus and portable keyboard for smart phone or other mobile device, or digital pen for Tablet PC• 36-bit 600 × 1200 ppi color scanner• 8 MP digital camera• Headphones that include a microphone (headset)• Web cam

Putting It All Together

Suggested Input Devices by User

User	Input Device
Mobile 	<ul style="list-style-type: none">• Wireless mouse for notebook computer• Touchpad or pointing stick on notebook computer• Stylus and portable keyboard for smart phone or other mobile device, or digital pen for Tablet PC• 7 or 8 MP digital camera• Headphones that include a microphone (headset)• Fingerprint reader for notebook computer
Power 	<ul style="list-style-type: none">• Enhanced keyboard or ergonomic keyboard• Mouse• Stylus and portable keyboard for smart phone or other mobile device• Pen for graphics tablet• 48-bit 1200 × 1200 ppi color scanner• 9 to 12 MP digital camera• Headphones that include a microphone (headset)• Web cam

Putting It All Together

Suggested Input Devices by User	
User	Input Device
Enterprise 	<ul style="list-style-type: none">• Enhanced keyboard or ergonomic keyboard• Mouse• Stylus and portable keyboard for smart phone or other mobile device, or digital pen for Tablet PC• Touch screen• 42-bit 1200 × 1200 ppi color scanner• 9 to 12 MP digital camera• OCR/OMR readers, bar code readers, MICR reader, or data collection devices• Microphone• Video camera for video conferences• Fingerprint reader or other biometric device

Input Devices for Physically Challenged Users

- Several input devices are available to assist physically challenged users:

Keyguard

Keyboards
with larger
keys

On-screen
keyboard

Various
pointing
devices

Head-
mounted
pointer

Gesture
recognition

Computerized
implant
devices

Input Devices for Physically Challenged Users

Keyboard with larger keys



Head-mounted pointer



Summary

Various techniques of entering input

Several commonly used input devices

Keyboard, mouse, and other pointing devices; touch screens, pen input, other input for smart phones, game controllers, digital cameras, voice input, video input, scanners and reading devices, biometric input, and terminals

Input devices for physically challenged users

Chapter Five

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Chapter 5 Complete

