Discovering Computers
Technology in a World of Computers, Mobile Devices, and the Internet

Chapter 3
Computers and Mobile Devices

Objectives Overview

- Describe the characteristics and uses of desktops, laptops, tablets, and handheld computers
- Describe the characteristics and types of servers
- Differentiate among POS terminals, ATMs, and self-service kiosks
- Describe cloud computing and identify its uses
- Describe the characteristics and uses of smartphones, digital cameras, portable media players, and e-book readers

See Page 104 for Detailed Objectives
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Objectives Overview

- Describe the characteristics and ways to interact with game devices
- Identify uses of embedded computers
- Identify safeguards against hardware theft and vandalism and hardware failure
- Discuss ways to prevent health-related injuries and disorders caused from technology use, and describe ways to design a workplace ergonomically
- Differentiate a port from a connector, identify various ports and connectors, and differentiate among Bluetooth, Wi-Fi, and NFC wireless device connections

See Page 104 for Detailed Objectives

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Computers and Mobile Devices

- Types of computers include:
  - Desktop and mobile computers
  - Servers and terminals
  - Smartphones, digital cameras, e-book readers and portable media players
  - Game devices
  - Embedded computers

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Desktops and Mobile Computers

- A personal computer (PC) is a computer that can perform all of its input, processing, output, and storage activities by itself and is intended to be used by one person at a time.
- A mobile computer is a portable personal computer, designed so that a user easily can carry it from place to place.
Desktops and Mobile Computers

• A **desktop**, or desktop computer, is a personal computer designed to be in a stationary location, where all of its components fit on or under a desk or table.

![Desktop Computer Diagram]

Desktops and Mobile Computers

• A **laptop**, also called a notebook computer, is a thin, lightweight mobile computer with a screen in its lid and a keyboard in its base.

![Laptop Diagram]
Desktops and Mobile Computers

• A **tablet** is a thin, lightweight mobile computer that has a touch screen

![Slate tablet in stand](image1)

![Convertible tablet](image2)

Desktops and Mobile Computers

• A **handheld computer** is a computer small enough to fit in one hand

![Handheld computer](image3)
Servers

- A **server** is a computer dedicated to providing one or more services to other computers or devices on a network
  - Rack server
  - Blade server
  - Tower server

**Table 3-1 Dedicated Servers**

<table>
<thead>
<tr>
<th>Type</th>
<th>Main Service Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application server</td>
<td>Stores and runs apps</td>
</tr>
<tr>
<td>Backup server</td>
<td>Backs up and restores files, folders, and media</td>
</tr>
<tr>
<td>Database server</td>
<td>Stores and provides access to a database</td>
</tr>
<tr>
<td>Domain name server</td>
<td>Stores domain names and their corresponding IP addresses</td>
</tr>
<tr>
<td>File server (or storage server)</td>
<td>Stores and manages files</td>
</tr>
<tr>
<td>FTP server</td>
<td>Stores files for user upload or download via FTP</td>
</tr>
<tr>
<td>Game server</td>
<td>Provides a central location for online game play</td>
</tr>
<tr>
<td>Home server</td>
<td>Provides storage, Internet connections, or other services to computers and devices in a household</td>
</tr>
<tr>
<td>List server</td>
<td>Stores and manages email lists</td>
</tr>
<tr>
<td>Mail server</td>
<td>Stores and delivers email messages</td>
</tr>
<tr>
<td>Network server</td>
<td>Manages network traffic</td>
</tr>
<tr>
<td>Print server</td>
<td>Manages printers and documents being printed</td>
</tr>
<tr>
<td>Web server</td>
<td>Stores and delivers requested webpages to a computer via a browser</td>
</tr>
</tbody>
</table>
Servers

• A mainframe is a large, expensive, powerful server that can handle hundreds or thousands of connected users simultaneously

Supercomputers

• A supercomputer is the fastest, most powerful computer — and the most expensive
Terminals

- A terminal is a computer, usually with limited processing power, that enables users to send data to and/or receive information from a server, or host computer.
- A thin client is a terminal that looks like a desktop but has limited capabilities and components.
- Most retail stores use a POS terminal to record purchases, process credit or debit cards, and update inventory.

Terminals

- An ATM (automated teller machine) is a self-service banking terminal that connects to a host computer through a network.
## Terminals

- A self-service kiosk is a freestanding terminal that usually has a touch screen for user interaction.

### Table 3-2 Self-Service Kiosks

<table>
<thead>
<tr>
<th>Type</th>
<th>Typical Services Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial kiosk</td>
<td>Pay bills, add minutes to phone plans, add money to prepaid cards, and perform other financial activities.</td>
</tr>
<tr>
<td>Photo kiosk</td>
<td>Print photos from digital images. Some allow editing of digital photos. Users may print directly at the kiosk or may send an order to a photo lab to be printed.</td>
</tr>
<tr>
<td>Ticket kiosk</td>
<td>Print tickets. Located in airports, amusement parks, movie theaters, rental companies, and train stations.</td>
</tr>
<tr>
<td>Vending kiosk</td>
<td>Dispenses items after payment is received. Examples include DVD rentals and license plate renewals.</td>
</tr>
<tr>
<td>Visitor kiosk</td>
<td>Manage and track visitors upon check-in. Located in businesses, schools, hospitals, and other areas where access is controlled or registration is required.</td>
</tr>
</tbody>
</table>

## Cloud Computing

- **Cloud computing** refers to an environment of servers that house and provide access to resources users access through the Internet.
Mobile Devices

- A **smartphone** is an Internet-capable phone that usually also includes a calendar, an appointment book, an address book, a calculator, a notepad, games, browser, and numerous other apps.
- Many smartphones have touch screens. Instead of or in addition to a touch screen, some have a built-in mini keyboard on the front of the phone or a keyboard that slides in and out from behind the phone.
Mobile Devices

- A **digital camera** is a mobile device that allows users to take photos and store the photographed images digitally.

![Digital Camera Diagram]

**Figure 3-16**

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Mobile Devices

![Diagram of Digital Camera Process]

**Figure 3-17**

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Mobile Devices

• A portable media player, sometimes called a personal media player, is a mobile device on which you can store, organize, and play or view digital media.

Mobile Devices

• An e-book reader (short for electronic book reader), or e-reader, is a mobile device that is used primarily for reading e-books and other digital publications.
Game Devices

- A **game console** is a mobile computing device designed for single-player or multiplayer video games.
- A **handheld game device** is a small mobile device that contains a screen, speakers, controls, and game console all in one unit.
- Game controllers include gamepads, joysticks and wheels, dance pads, and a variety of motion-sensing controllers.
Embedded Computers

• An **embedded computer** is a special-purpose computer that functions as a component in a larger product.

- **Consumer electronics**
- **Home automation devices**
- **Automobiles**
- **Process controllers and robotics**
- **Computer devices and office machines**

Cars equipped with wireless communications capabilities, called telematics, include features such as navigation systems, remote diagnosis, and alerts, and Internet access.

Adaptive cruise control systems direct if vehicles in front of you are too close and, if necessary, apply the vehicle’s throttle, or apply brakes, online sound an alarm.

- Electronic stability control automatically applies brakes, and may reduce engine power, when you lose control of steering or traction.

- Drive-by-wire systems sense pressure on the gas pedal and communicate electronically to the engine how much and how fast to accelerate.

- Tire pressure monitoring systems send warning signals if the pressure is insufficient.
Table 3-3 Categories of Computers and Mobile Devices

<table>
<thead>
<tr>
<th>Category</th>
<th>Physical Size</th>
<th>Number of Simultaneously Connected Users</th>
<th>General Price Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal computers (desktop)</td>
<td>Fits on a desk</td>
<td>Usually one (can be more if networked)</td>
<td>Several hundred to several thousand dollars</td>
</tr>
<tr>
<td>Mobile computers and mobile devices</td>
<td>Fits on your lap or in your hand</td>
<td>Usually one</td>
<td>Less than a hundred dollars to several thousand dollars</td>
</tr>
<tr>
<td>Game consoles</td>
<td>Small box or handheld device</td>
<td>One to several</td>
<td>Several hundred dollars or less</td>
</tr>
<tr>
<td>Servers</td>
<td>Small cabinet to room full of equipment</td>
<td>Two to thousands</td>
<td>Several hundred to several million dollars</td>
</tr>
<tr>
<td>Supercomputers</td>
<td>Full room of equipment</td>
<td>Hundreds to thousands</td>
<td>Half a million to several billion dollars</td>
</tr>
<tr>
<td>Embedded computers</td>
<td>Miniature</td>
<td>Usually one</td>
<td>Embedded in the price of the product</td>
</tr>
</tbody>
</table>

Ports and Connections

- A **port** is the point at which a peripheral device attaches to or communicates with a computer or mobile device so that the peripheral device can send data to or receive information from the computer or mobile device.
Ports and Connections

- A **connector** joins a cable to a port. A connector at one end of a cable attaches to a port on the computer or mobile device, and a connector at the other end of the cable attaches to a port on the peripheral device.

Table 3-4: Popular Ports and Connectors

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Connector Type</th>
<th>Port Photo</th>
<th>Port Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>DisplayPort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDMI (audio)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firewire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB (frosted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headphone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lightning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microphone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mini USB</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3-4: (Continued)
Ports and Connections

- A **USB port**, short for universal serial bus port, can connect up to 127 different peripheral devices together with a single connector.
- Instead of connecting peripheral devices directly to ports on a mobile computer, some mobile users prefer the flexibility of port replicators and docking stations.
Ports and Connections

• Instead of connecting computers and mobile devices to peripheral devices with a cable, some peripheral devices use wireless communications technologies

Bluetooth  Wi-Fi  NFC

Protecting Hardware

• Some schools and businesses use cables to lock computers and help prevent theft of equipment
Protecting Hardware

• Hardware can fail for a variety of reasons: aging hardware; random events such as electrical power problems; and even errors in programs or apps
  – Undervoltage
  – Overvoltage or power surge

Protecting Hardware

• A surge protector, also called a surge suppressor, uses electrical components to provide a stable current flow and minimize the chances of an overvoltage reaching the computer and other electronic equipment
Protecting Hardware

• An **uninterruptible power supply (UPS)** is a device that contains surge protection circuits and one or more batteries that can provide power during a temporary or permanent loss of power.

Health Concerns of Using Technology

• A repetitive strain injury (RSI) is an injury or disorder of the muscles, nerves, tendons, ligaments, and joints.

• **Computer vision syndrome (CVS)** is a technology-related health condition that affects eyesight.

• **Ergonomics** is an applied science devoted to incorporating comfort, efficiency, and safety into the design of items in the workplace.

• **Technology addiction** occurs when the technology consumes someone’s entire social life.
Health Concerns of Using Technology

Summary

- Characteristics of and purchasing guidelines for desktops, laptops, tablets, smartphone, digital cameras, and portable media players
- Handheld computers, servers, supercomputers, point-of-sale terminals, ATMs, self-service kiosks, e-book readers, game devices, embedded computers, and cloud computing
- Ports and connections
- Ways to protect hardware
- Health concerns of using technology and preventative measures
Chapter 3
Computers and Mobile Devices
Chapter 3 Complete