Introduction to Computers CS-101

Class: BS 3rd Semester

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Types/categories of Computers

- Depending on their size, speed, processing power, and price

CATEGORIES OF COMPUTERS

Category	Physical Size	Number of Simultaneously Connected Users	General Price Range
Personal computers (desktop)	Fits on a desk	Usually one (can be more if networked)	Several hundred to several thousand dollars
Mobile computers and mobile devices	Fits on your lap or in your hand	Usually one	Less than a hundred dollars to several thousand dollars
Game consoles	Small box or handheld device	One to several	Several hundred dollars or less
Servers	Small cabinet	Two to thousands	Several hundred to a million dollars
Mainframes	Partial room to a full room of equipment	Hundreds to thousands	$300,000 to several million dollars
Supercomputers	Full room of equipment	Hundreds to thousands	$500,000 to several billion dollars
Embedded computers	Miniature	Usually one	Embedded in the price of the product

FIGURE 1-12 This table summarizes some of the differences among the categories of computers.

Personal Computers

PERSONAL COMPUTERS

WEB LINK 1-7

Personal Computers

For more information, visit scsite.com/dcf4e/ch1/weblink and then click Personal Computers.

A **personal computer** is a computer that can perform all of its input, processing, output, and storage activities by itself. A personal computer contains a processor, memory, and one or more input, output, and storage devices. They also often contain a communications device.

Two popular styles of personal computers are the PC (Figure 1-13) and the Apple (Figure 1-14). These two types of computers use different operating systems. PC and PC-compatible computers usually use a Windows operating system. Apple computers usually use a Macintosh operating system (Mac OS X). The term, PC-compatible, refers to any personal computer based on the original IBM personal computer design. Companies such as Dell, Gateway, and Toshiba sell PC-compatible computers.

Two types of personal computers are desktop computers and notebook computers.

FIGURE 1-13 The PC and PC-compatible computers usually use a Windows operating system.

FIGURE 1-14 Apple computers, such as the iMac, usually use a Macintosh operating system.

Mobile Computers and Mobile devices

FIGURE 1-15 On a typical notebook computer, the keyboard is on top of the system unit, and the display attaches to the system unit with hinges.

TABLET PC Resembling a letter-sized slate, the **Tablet PC** is a special type of notebook computer that allows you to write or draw on the screen using a digital pen (Figure 1-16). For users who prefer typing instead of handwriting, you can attach a keyboard to Tablet PCs that do not include one already. Tablet PCs are useful especially for taking notes in locations where the standard notebook computer is not practical.

FIGURE 1-18 Smart phones allow you to check e-mail, access the Web, listen to music, and share photos and videos.

Game consoles

mobile computing device designed for single-player or multiplayer video games

FIGURE 1-19 Game consoles provide hours of video game entertainment.

Servers

- A **server** controls access to the hardware, software, and other resources on a network and provides a centralized storage area for programs, data, and information.
- Servers support from two to several thousand connected computers at the same time.

Mainframes

- A **mainframe** is a large, expensive, powerful computer
- can handle hundreds or thousands of connected users simultaneously.
- mainframes process more than 83% of transactions around the world.
- Servers and other mainframes can access data and information from a mainframe

FIGURE 1-21 Mainframe computers can handle thousands of connected computers and process millions of instructions per second.

Supercomputers

- A **supercomputer** is the fastest, most powerful computer — and the most expensive.
- Medicine
- Aerospace,
- Automotive design
- Online Banking
- weather forecasting,
- nuclear energy research
- petroleum exploration

FIGURE 1-22 This supercomputer simulates various environmental occurrences such as global climate changes, pollution, and earthquakes.

Embedded computer

- 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

Because embedded computers are components in larger products, they usually are small and have limited hardware. Embedded computers perform various functions, depending on the requirements of the product in which they reside. Embedded computers in printers, for example, monitor the amount of paper in the tray, check the ink or toner level, signal if a paper jam has occurred, and so on. Figure 1-23 shows some of the many embedded computers in cars.

FIGURE 1-23 Some of the embedded computers designed to improve your safety, security, and performance in today's automobiles.

Computer usage

- **Home Users**
- **Small Office/Home Office User**
- **Mobile User**
- **Power User**
- **Large Business User**

Computer Applications in Society

- **Education**
- **Banking**
- **Finance**
- **Government**
- **Health care**
- **Science**
- **Research**

The Internet and World Wide Web

- Worldwide collection of networks that links millions of businesses, government agencies, educational institutions, and individuals.
- Access to global information and instant communications.
- Project of U.S. Department of Defense. That network, called ARPANET, became functional in September 1969
- The goal was to build a network that:

(1) Allowed scientists at different locations to share information and work together on military and scientific projects

(2) could function even if part of the network were disabled or destroyed by a disaster such as a nuclear attack.

Evaluation of Internet

- At first only 4 main computers were connected.

i. The University of California at Los Angeles.

ii. The University of California at Santa Barbara.

iii. The Stanford Research Institute.

iv. The University of Utah.

- By 1984, the network had more than 1,000 individual computers linked as hosts.
- Today, more than 350 million hosts connect to this network, which became known as the Internet.
- A **host**'s role is to share and consume resources found on the network.
- A **server**'s role is to provide services.

The Internet

- The internet consists of many local, regional, national, and international networks.
- No single person, company, institution, or government agency controls or owns the Internet.
- The **World Wide Web Consortium** (**W3C**), oversees research and sets standards and guidelines for many areas of the Internet.
- Nearly 400 organizations from around the world are members of the W3C.
- https://www.w3.org/

Connecting to the Internet

- Employees and students often connect to the Internet through a business or school network.
- Some homes and small businesses use dial-up access to connect to the Internet.
- **Dial-up access** takes place when the modem in your computer uses a standard telephone line to connect to the Internet.
- A dial-up connection is slow-speed technology.
- **DSL** (digital subscriber line) is a technology that provides high-speed Internet connections using regular telephone lines.
- A **cable modem** allows access to high-speed Internet services through the cable television network

Connecting to the Internet

- A **cable modem** allows access to high-speed Internet services through the cable television network.
- **Fixed wireless** high-speed Internet connections use a dish-shaped antenna on your house or business to communicate with a tower location via radio signals.
- A **Wi-Fi** (wireless fidelity) network uses radio signals to provide internet connections to wireless computers and devices.
- **Hot spots** provide Wi-Fi Internet connections.

Access Providers

- An **access provider** is a business that provides access to the Internet.
- It can be Free or for a fee.
- **ISP** (**Internet service provider**) is a regional or national access provider.
- **online service provider** (OSP) also has many members-only features.

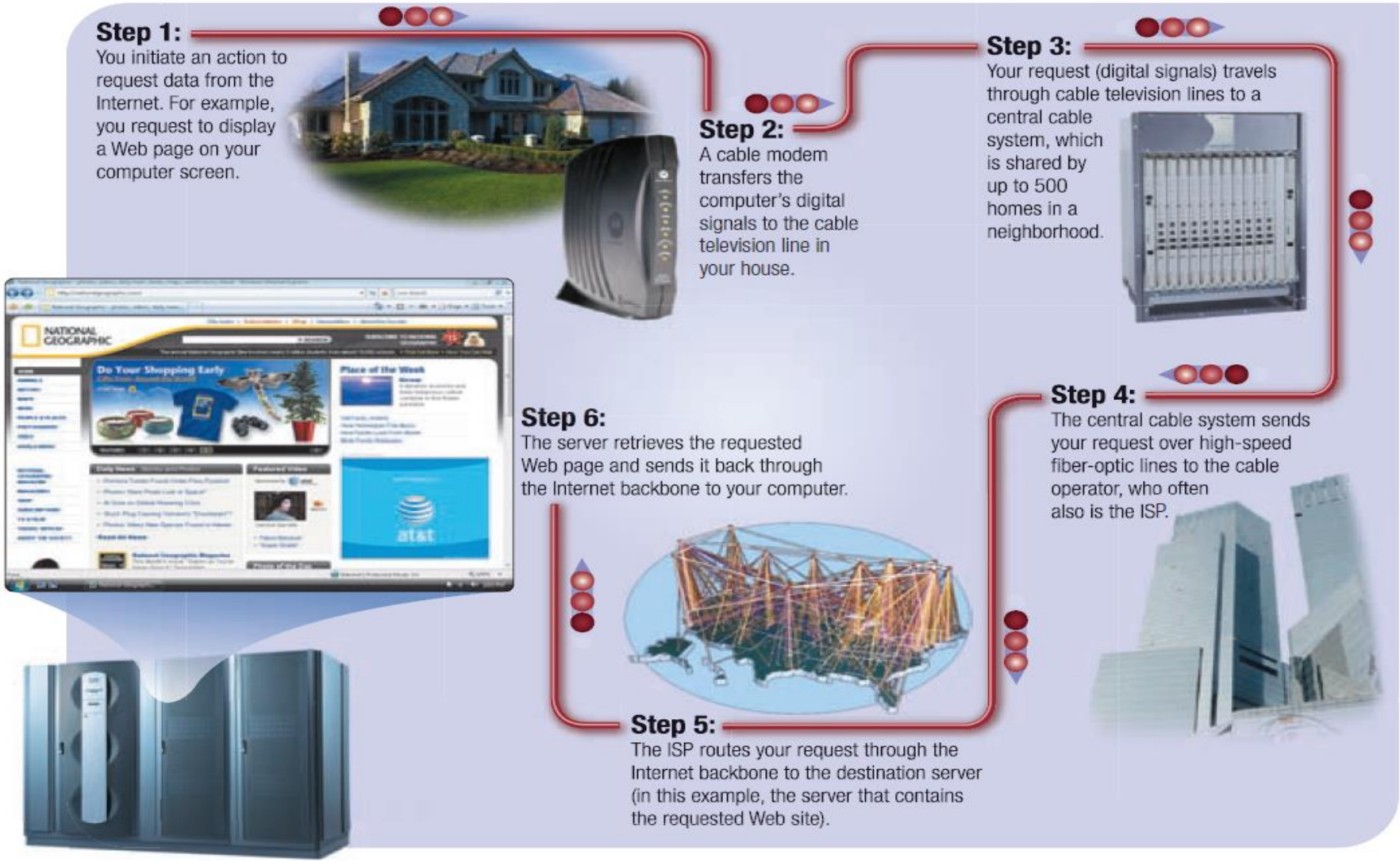
i. News, weather, legal information, financial data, hardware and software guides, games, travel guides, e-mail, photo communities, online calendars, and instant messaging.

- A **wireless Internet service provider** (**WISP**) is a company that provides wireless Internet access to computers and mobile devices. E.g:

i. Boingo Wireless
ii. Cingular Wireless,
iii. T-Mobile
iv. Verizon Wireless.

How Data Travels the Internet

FIGURE 2-2 HOW A HOME USER'S DATA MIGHT TRAVEL THE INTERNET USING A CABLE MODEM CONNECTION



Internet Addresses

FIGURE 2-3 The IP address and domain name for the Google Web site.

- "Internet Protocol": is the set of rules governing the format of data sent via the internet or local network.
- IP addresses are the identifier that allows information to be sent between devices on a network: they contain location information and make devices accessible for communication.
- The IP address usually consists of four groups of numbers, each separated by a period.
- Ranges from 0.0.0.0 to 255.255.255.255.
- They are mathematically produced and allocated by the Internet Assigned Numbers Authority (IANA), a division of the Internet Corporation for Assigned Names and Numbers (ICANN).
- In general, the first portion of each IP address identifies the network and the last portion identifies the specific computer.

Domain Names

- Every domain name contains a **top-level domain** (**TLD**), which is the last section of the domain name.
- Generic TLD (gTLD): com, org
- country code TLD (ccTLD): fr, us, pk
- When we specify a domain name, a server translates the domain name into its associated IP address so data can be routed to the correct computer.
- This server is an Internet server that usually is associated with an Internet access provider.

EXAMPLES OF GENERIC TOP-LEVEL DOMAINS

Original Generic TLD	Intended Purpose
com	Commercial organizations, businesses, and companies
edu	Educational institutions
gov	Government agencies
mil	Military organizations
net	Network provider
org	Nonprofit organizations
Newer Generic TLD	**Intended Purpose**
aero	Aviation community members
biz	Businesses of all sizes
cat	Catalan cultural community
coop	Business cooperatives such as credit unions and rural electric co-ops
info	Businesses, organizations, or individuals providing general information
jobs	Employment or human resource businesses
mobi	Delivery and management of mobile Internet services
museum	Accredited museums
name	Individuals or families
pro	Certified professionals such as doctors, lawyers, and accountants
tel	Internet communications
travel	Travel industry

FIGURE 2-4 In addition to the TLDs listed in this table, proposals for newer TLDs continually are evaluated.

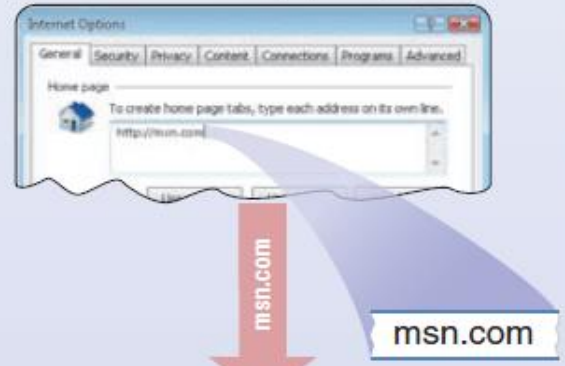
THE WORLD WIDE WEB

- The **World Wide Web** (**WWW**), or **Web**, a widely used service on the Internet, consists of a
- A **Web site** is a collection of related Web pages and associated items, such as documents and pictures, stored on a Web server. worldwide collection of electronic documents.
- A **Web browser** is application software that allows users to access and view Web pages (to look around the web).
- The activity of moving from page to page or site to site on the World Wide Web.

FIGURE 2-5 HOW A WEB BROWSER DISPLAYS A HOME PAGE

Step 1:
Click the Web browser program name to start the Web browser software.

Step 2:
Behind the scenes, the Web browser looks up its home page setting. For illustration purposes only, the screen below shows the home page setting is msn.com.



msn.com

msn.com

Step 3:
The Web browser communicates with a server maintained by your Internet access provider. The server translates the domain name of the home page to an IP address and then sends the IP address to your computer.

207.68.172.234

Step 4:
The Web browser uses the IP address to contact the Web server associated with the home page and then requests the home page from the server. The Web server sends the home page to the Web browser, which formats the page for display on your screen.

Web Addresses

- A Web page has a unique address, which is called a **URL** (Uniform Resource Locator) or **Web address**.
- A Web address consists of a protocol, domain name, and sometimes the path to a specific Web page or location on a Web page.
- The first portion of the domain name identifies the type of Internet server. For example, www indicates a Web server.

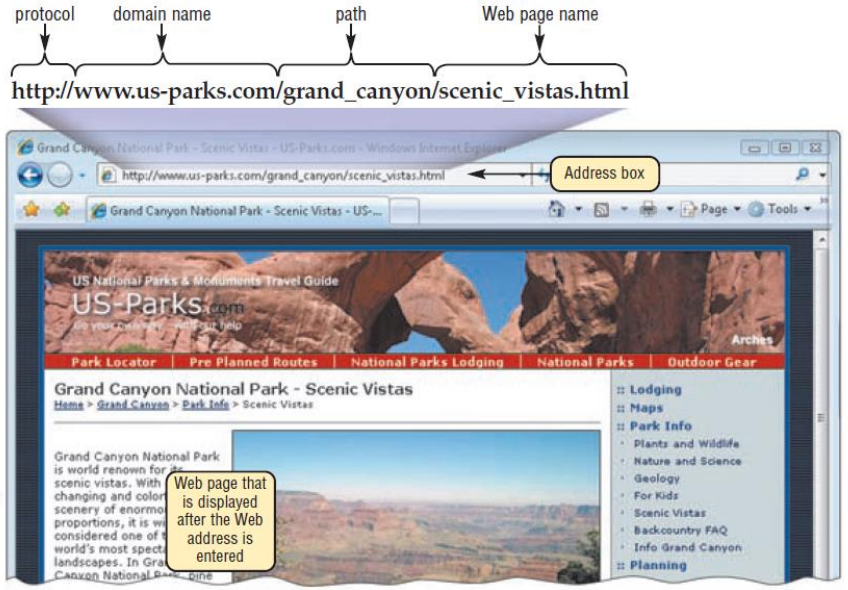


FIGURE 2-6 After entering the Web address http://www.us-parks.com/grand_canyon/scenic_vistas.html in the Address box, this Web page at the US National Parks Travel Guide Web site is displayed.

Searching for Information on the Web

- A **search engine** is a program that finds Web sites, Web pages, images, videos, news, and other information.
- Yahoo! and Google are widely used search engines
- **SUBJECT DIRECTORIES** provides categorized lists of links arranged by subject.
- you can locate a particular topic by clicking links through different levels, moving from the general to the specific.

WIDELY USED SEARCH TOOLS

Search Tool	Web Address	Subject Directory	Search Engine
A9.com	a9.com		X
AlltheWeb	alltheweb.com		X
AltaVista	altavista.com		X
AOL Search	search.aol.com	X	X
Ask.com	ask.com		X
Dogpile	dogpile.com		X
Excite	excite.com	X	X
Gigablast	gigablast.com	X	X
Google	google.com	X	X
Live Search	live.com		X
LookSmart	looksmart.com	X	X
Lycos	lycos.com		X
MSN	msn.com	X	X
Netscape Search	search.netscape.com		X
Open Directory Project	dmoz.org	X	X
Overture	overture.com		X
WebCrawler	webcrawler.com		X
Yahoo!	yahoo.com	X	X

FIGURE 2-8 Many subject directories and search engines allow searching about any topic on the Web.

SEARCH ENGINES

- Instead of clicking through links, search engines require that you enter a word or phrase called **search text.**

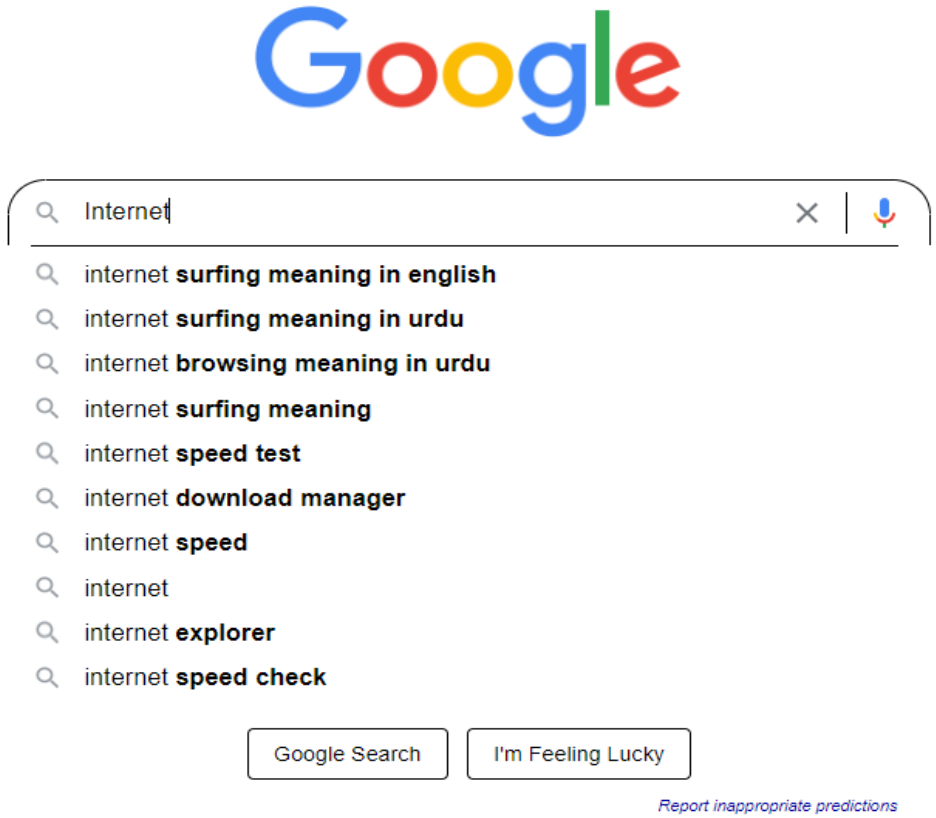
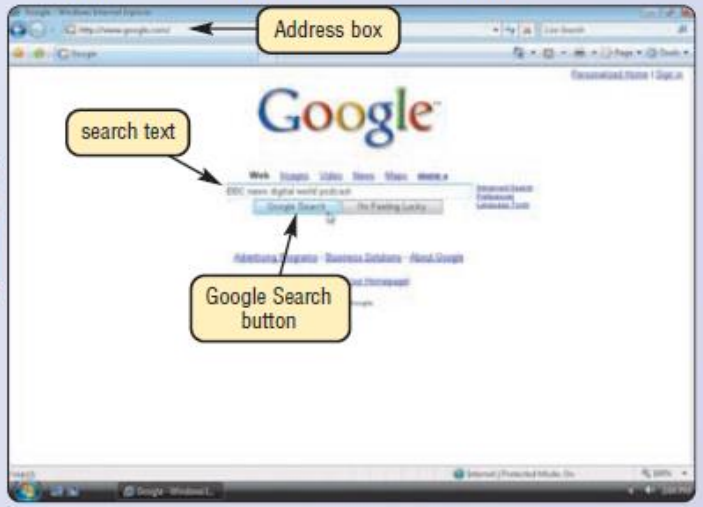


FIGURE 2-10 HOW TO USE A SEARCH ENGINE

Step 1:
Type the search engine's Web address (in this case, google.com) in the Address box in the Web browser.

Step 2:
Press the ENTER key. When the Google home page is displayed, type `BBC news digital world podcast` as the search text and then point to the Google Search button.



Step 3:
Click the Google Search button. When the results of the search are displayed, scroll through the links and read the descriptions. Point to the BBC News | Technology | Go Digital: Your digital world link.

Step 4:
Click the BBC News | Technology | Go Digital: Your digital world link to display a Web page with a description and links to the Go Digital: Your digital world podcast.

Types of Web Sites

- **PORTAL**: is a Web site that offers a variety of Internet services

from a single, convenient location.

- AltaVista, AOL, Excite, GO.com, LookSmart, Lycos, MSN, NBCi, Netscape, and Yahoo!.
- **NEWS:** newsworthy material including stories and articles relating to current events, life, money, sports, and the weather.
- **INFORMATIONAL:** Web site contains factual information.

i. Public transportation schedules

ii. Published research findings.

Types of Web Sites (cont...)

- **BUSINESS/MARKETING**
- **ADVOCACY:** usually present views of a particular group or association.
- **ENTERTAINMENT**
- **EDUCATION**
- **WIKI:** is a collaborative Web site that allows users to create, add to, modify, or delete the Web site content via their Web browser.
- **BLOGS**
- **ONLINE SOCIAL NETWORKS**
- **CONTENT AGGREGATOR:** a website or program that collects related items of content and displays them or links to them.
- **PERSONAL**

GUIDELINES FOR EVALUATING THE VALUE OF A WEB SITE

Evaluation Criteria	Reliable Web Sites
Affiliation	A reputable institution should support the Web site without bias in the information.
Audience	The Web site should be written at an appropriate level.
Authority	The Web site should list the author and the appropriate credentials.
Content	The Web site should be well organized and the links should work.
Currency	The information on the Web page should be current.
Design	The pages at the Web site should download quickly and be visually pleasing and easy to navigate.
Objectivity	The Web site should contain little advertising and be free of preconceptions.

FIGURE 2-12 Criteria for evaluating a Web site's content.