

# THE INTERNET AND THE WORLD WIDE WEB

## Application of Information and Communication Technologies

Dr. Muhammad Abdullah

---



Faculty of Computing and Information Technology (FCIT)  
University of the Punjab, Lahore, Pakistan.

# Learning Objectives

1. Discuss how the Internet evolved and what it is like today.
2. Identify the various types of individuals, companies, and organizations involved in the Internet community and explain their purposes.
3. Describe device and connection options for connecting to the Internet, as well as some considerations to keep in mind when selecting an ISP.
4. Understand how to search effectively for information on the Internet and how to cite Internet resources properly.

# Learning Objectives

5. List several ways to communicate over the Internet, in addition to e-mail.
6. List several useful activities that can be performed via the Web.
7. Discuss censorship and privacy and how they are related to Internet use.

# Overview

- This chapter covers:
  - The evolution of the Internet
  - The Internet community
  - Different options for connecting to the Internet
  - Internet searching
  - Common applications available via the Internet
  - Societal issues that apply to Internet use

# Evolution of the Internet

- Internet
  - Largest and most well-known computer network, linking millions of computers all over the world
  - The Internet has actually operated in one form or another for several decades
- ARPANET
  - The predecessor of the Internet
    - Created in 1969 and named after the Advanced Research Projects Agency (ARPA), which sponsored its development
  - Initially connected four supercomputers; eventually evolved into today's Internet

# Evolution of the Internet

- The World Wide Web
  - The collection of Web pages available through the Internet
  - Proposed by Tim Berners-Lee in 1989
  - Originally only text-based content; release of the Mosaic browser in 1993 led to graphical content
  - Web 2.0
    - Wide variety of content available via Web pages today such as social networking, RSS, podcasts, blogs and wikis
  - The World Wide Web and the Internet are not owned by any person, business, or organization

# Evolution of the Internet

- Primary infrastructure that makes up the Internet backbone is typically owned by communications companies
- Internet2
  - Consortium of researchers, educators, and technology leaders from industry, government, and the international community
  - Dedicated to the development of revolutionary Internet technologies
  - Research and development tool, much of which is focused on speed

# Evolution of the Internet

- The Internet Community Today
  - Users
    - People who use the Internet
  - Internet Service Providers (ISPs)
    - Provide access to the Internet, typically for a fee
    - Include most communication and media companies



**FIGURE 8-2**

Companies that provide Internet access today include telephone, cable, and satellite companies.

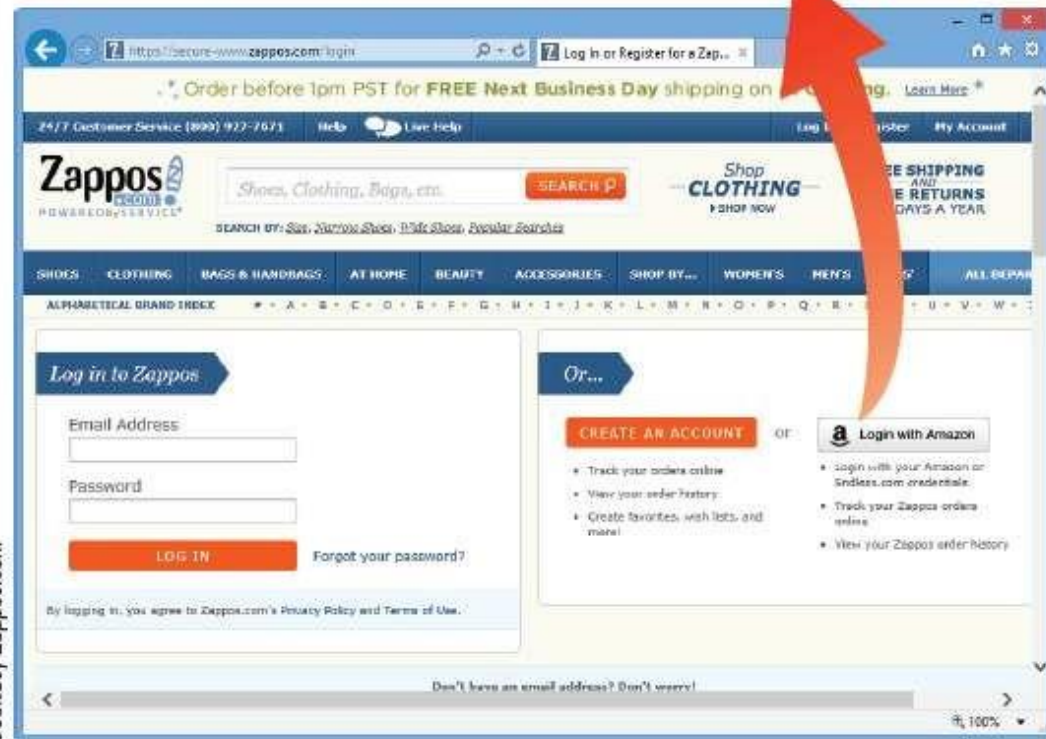
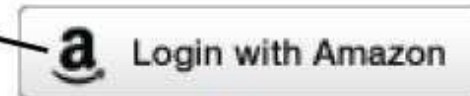


# Evolution of the Internet

- Internet Content Providers
  - Persons or organizations that provide Internet content
    - Businesses, non-profit organizations, educational institutions, individuals
- Application Service Providers (ASPs) and Web Services
  - Companies that manage and distribute Web-based software services over the Internet
    - Cloud software, Software as a Service (SaaS), cloudware
    - Often fee-based business software
  - Web service: self-contained business application that operates over the Internet

# Evolution of the Internet

Clicking this button logs a Zappos.com customer in via an Amazon Web service.



**FIGURE 8-3**

**Web services.** This Web service enables Web developers to use Amazon's authentication system for users.

Courtesy Zappos.com

# Evolution of the Internet

- Infrastructure Companies
  - Enterprises that own or operating the physical structure of the Internet
  - Conventional and mobile phone companies, cable companies, and satellite Internet providers
- Hardware and Software Companies
  - Provide the hardware and software used in conjunction with the Internet and Web

# Evolution of the Internet

- The Government and Other Organizations
  - Some countries limit information and access
  - FCC influences communications
  - Internet Society (ISOC)
    - Addresses issues impacting the future of the internet
  - Internet Corporation for Assigned Names and Numbers (ICANN)
    - Domain and IP management
  - World Wide Web Consortium (W3C)
    - Protocols and standards, ensures interoperability

# Myths About the Internet

- Myth 1: The Internet is Free
  - Most people and businesses pay for Internet access
  - Businesses, schools, and libraries lease communications lines from phone companies
  - Mobile phone users pay hotspot providers or mobile phone providers for access
  - Fee-based content is growing at a rapid pace
    - Music/movie downloads
    - Donation-based sites

**FIGURE 8-4**  
**Fee-based Web content.** The use of fee-based Web content, such as streaming movies via Netflix as shown here, is growing.



# Myths About the Internet

- Myth 2: Someone Controls the Internet
  - No single group or organization controls the Internet
  - Governments can regulate Internet use within its country, but difficult to enforce
- Myth 3: The Internet and World Wide Web are identical
  - Internet is the physical network
  - WWW is the collection of Web pages available over the Internet
  - Other resources are available via the Internet, for example, FTP

# Getting Set Up to Use the Internet

- Type of Device
  - Combination of factors to consider
    - Devices available to you
    - Whether you need access just at home or while on the go
    - What types of Internet content you want to access
  - Personal Computers
  - Smartphones, Media Tablets, and Other Mobile Devices
  - Gaming Devices and Televisions

# Getting Set Up to Use the Internet



PERSONAL COMPUTERS



SMARTPHONES



SMART TVS



**FIGURE 8-5**

A variety of devices can be used to access the Internet.



# Types of Connection and Internet Access

- Computer must be connected to the Internet to obtain access
- Most connections today are broadband
- Dial-up vs. Direct Connections
  - Dial-up connections use standard phone lines
    - Uses modem to dial-up ISP
    - Inconvenient
    - Slower, but cheaper
    - Ties up phone lines
    - Relatively secure from hackers

# Types of Connection and Internet Access

- Direct connections

- Device is continually connected to the Internet
- Access Internet using a browser—Internet Explorer, Chrome, or Firefox
- Direct connections are typically broadband
- Because you are always connected, it is important to protect your computer from hackers

# Types of Connection and Internet Access

- Conventional Dial-Up
  - Uses dial-up modem connected to standard telephone jack
  - Most often used with home computers for users who do not need or do not want to pay for broadband
    - Inexpensive hardware
    - Easy to set up and use
    - Widespread availability
    - Slow connection speed

# Types of Connection and Internet Access

- Cable
  - Most widely used home broadband connection
  - Fast, between 15 and 50 Mbps
  - Requires a cable modem
- DSL
  - Broadband delivered over telephone lines
  - Must be less than 3 miles from a switching station
  - Transmits over telephone lines but does not tie up the line
  - Typically 1-15 Mbps

# Types of Connection and Internet Access

- Satellite
  - Broadband option for rural areas
  - Slower and more expensive than cable or DSL
  - Requires satellite modem and transceiver dish
  - Performance might degrade or stop altogether during bad weather
- Fixed Wireless
  - Uses radio transmission towers rather than satellites
  - Requires a modem and, sometimes, an outside-mounted transceiver
  - Uses WiMAX technology to broadcast

# Types of Connection and Internet Access

- Broadband over Fiber (BoF)
  - Delivers over fiber-optic cabling all the way to the building
  - Also called fiber-to-the-premises (FTTP)
  - Most often installed by telephone companies
  - Download speeds between 15 Mbps and 150 Mbps
  - Requires special networking equipment
- Mobile Wireless
  - Access via a smartphone or media tablet
  - Typically requires a data plan

# Types of Connection and Internet Access

TYPE OF INTERNET CONNECTION	AVAILABILITY	APPROXIMATE MAXIMUM SPEED*	APPROXIMATE MONTHLY PRICE
Conventional dial-up	Anywhere there is telephone service	56 Kbps	Free–\$20
Cable	Virtually anywhere cable TV service is available	3–100 Mbps	\$30–110
DSL	Within 3 miles of a switching station that supports DSL	1–25 Mbps	\$20–65
Satellite	Anywhere there is a clear view of the southern sky and where a satellite dish can be mounted and receive a signal	5–15 Mbps	\$40–100
Fixed wireless	Selected areas where service is available	1–12 Mbps	\$35–75
Broadband over fiber (BoF)	Anywhere fiber has been installed to the building	15–150 Mbps	\$45–130
Mobile wireless (3G/4G)	Virtually anywhere cellular phone service is available	1–30 Mbps	Varies greatly; often bundled with mobile phone service

\* Download speed; most connections have slower upload speeds.

**FIGURE 8-7**  
Typical home Internet connection options.

# Types of Connection and Internet Access

- Wi-Fi Hotspots
  - Public wireless networks (Wi-Fi)
  - Both free and fee-based are available



**COFFEEHOUSES AND OTHER PUBLIC LOCATIONS**  
Often fee-based, though some are available for free.



**HOTELS AND CONFERENCE CENTERS**  
Often free for guests.

## FIGURE 8-9

### Wi-Fi hotspots.

Hotspots are used to wirelessly connect to the Internet via the Internet connection belonging to a business, city, school, or other organization.



**HOSPITALS, BUSINESSES, AND OTHER ORGANIZATIONS**  
Usually designed for employees but are sometimes also available free to visitors.



**COLLEGE CAMPUSES**  
Usually designed for students and faculty; sometimes used directly in class, as shown here.



# Selecting an ISP and Setting Up Your Computer

- Selecting an ISP
  - Type of device used, type of Internet connection, and service desired, geographic location will likely determine your ISP options
  - Questions to ask include speed, outages, support, limits, pricing options, etc.
  - Pricing options between different ISP companies will vary
    - Many ISPs offer tiers or different levels (speeds) of service for different prices

# Selecting an ISP and Setting Up Your Computer

- Setting Up Your Computer
  - Install necessary hardware
    - Some may require professional installation, i.e., satellites and broadband over fiber
  - Select user name and a payment method
  - Perform any necessary set-up to share the connection with other computers or devices

# Quick Quiz

1. The Internet began as an experimental network known by which name?
  - a. ARPANET
  - b. Internet2
  - c. World Wide Web
2. True or False: Cable is a common type of direct Internet connection.
3. A type of always-on broadband Internet access available through conventional phone lines that does not tie up your phone line is \_\_\_\_\_.

*Answers:*

*1) a; 2) True; 3) DSL*

# Searching the Internet

- Search Sites
  - Web sites designed to help users search for Web pages that match specified keywords or selected categories
    - Typically use a search engine in conjunction with a database containing information about Web pages to locate appropriate Web pages
    - Many search sites available (Google, Bing, Yahoo, Ask.com, etc.)
    - Real-time search engines are emerging
      - Search the Web live rather than relying on a database, i.e., MyLiveSearch

# Searching the Internet

- Keyword Search
  - Keywords are typed in a search box to locate information on the Internet
  - Matching Web pages are called hits
  - Clicking on a Web page name displays that page
- Directory Search
  - Categories are selected to locate information on the Internet
- Search Site Tools
  - Search for music files, image files, news articles, maps, people, videos
  - Google is one of the most versatile search sites

# Searching the Internet

FUNCTION	EXPLANATION
Calculator	Enter a mathematical expression or a conversion to see the result.
Currency converter	Enter an amount and currency types (such as <i>10 Euro in USD</i> ) to see the corresponding value.
Dictionary	Enter the term <i>define</i> followed by a term to view definitions for that term from online sources.
Earthquakes	Enter the term <i>earthquake</i> to see recent earthquake activity around the world.
Flight information	Enter an airline and a flight number to see status information.
Movie showtimes	Enter the term <i>movie</i> followed by a ZIP Code to view movies showing in that area.
Number search	Enter a UPS, FedEx, or USPS tracking number; an area code; or a UPC code to view the associated information.
Sports scores	Enter a team name or league name to see scores, schedules, and other information.
Sunrise/sunset	Enter the term <i>sunrise</i> or <i>sunset</i> followed by a city name to see the time of the sunrise or sunset in that city.
Street maps	Enter an address to find a map to that location.
Time	Enter the term <i>time</i> followed by a city name to see the current time in that city.
Weather	Enter the term <i>weather</i> followed by a city name or ZIP Code to view the weather for that location.
Yellow pages	Enter a type of business and city name or ZIP Code to view businesses in that local area.

**FIGURE 8-13**  
Google search tools.

**EXAMPLES:**

# Search Strategies

- Using Phrases
  - Phrase searching is typing more than one keyword in a keyword search

SEARCH PHRASE USED	SEARCH SITE	NUMBER OF PAGES FOUND	TITLE OF FIRST TWO NONSPONSORED PAGES FOUND*
dogs	Google	1,420,000,000	Dogs – Wikipedia, the free encyclopedia Dog: Dog Breeds, Adoption, Bringing a Dog Home and Care
	Bing	53,200,000	Dog – Wikipedia, the free encyclopedia Dog Supplies   Dog Accessories & Dog Products – Dog.com
hand signals	Google	26,300,000	Hand Signals – Wikipedia, the free encyclopedia California Driver Handbook – Safe Driving Practices
	Bing	17,400,000	Hand Signals – Wikipedia, the free encyclopedia Hand Signs Part 1
dog hand signals	Google	1,830,000	DDEAF Training Hand Signs – Deaf Dog Education Action Fund Dog Training Hand Signals – Dog Training Excellence
	Bing	6,500,000	How to Teach a Dog Hand Signals   eHow.com Dog Training Hand Signals, A Different Type of Communication
"dog hand signals"	Google	51,500	DDEAF Training Hand Signs – Deaf Dog Education Action Fund Utilize Dog Hand Signals in Your Training: Dog Obedience Training
	Bing	6,490	How to Teach a Dog Hand Signals   eHow.com Dog Training Hand Signals, A Different Type of Communication

\* Highlighted entries indicate Web pages about dog hand signals.

**FIGURE 8-14**

Examples of phrase searching. Using different search phrases and different search sites can significantly change the search results.

# Search Strategies

- Using Boolean Operators
  - Use AND, OR, and NOT to further refine a search
    - Check to see what operators can be used on the site
- Using Multiple Search Sites
  - Different search sites can return different results
- Using Appropriate Keywords, Synonyms, Variant Word Forms, and Wildcards
  - Synonyms are different words that mean the same thing
  - Variations of your keywords, alternate spellings, etc.
  - Wildcards, such as \*, can be used to search for keyword patterns



# Search Strategies

- Using Field Searches
  - Field searches are searches limited to a particular characteristic, such as page title, page text, URL, top level domain or Web site

FIELD TYPE	EXAMPLE	EXPLANATION
Title	title: "tax tips"	Searches for Web pages containing the words "tax tips" in the page title.
Text	text: "tax tips"	Searches for Web pages containing "tax tips" in the text of the page.
Site	forms site:irs.gov	Searches for Web pages associated with the keyword "forms" that are located only on the irs.gov Web site.
Domain	tax tips site:*.gov	Searches for Web pages associated with the keywords "tax tips" that are located on government Web sites (they can have anything for the first part of the domain name, but must have a .gov TLD).

**FIGURE 8-15**

**Field searching.**  
Field searches limit search results to just those pages that match specific field criteria, in addition to any specified search criteria.

# Evaluating Search Results

- Does the title and listed description sound appropriate for the information you are seeking?
- Is the URL from an appropriate company or organization?
- You should also evaluate:
  - The author
  - The source
    - Determine if reliable or biased
  - The date
    - Many online articles are years old
- Verify online information with a second source

# Citing Internet Resources

- To avoid plagiarism, proper citation procedures should be used for all Internet content used in a paper, book, or on a Web site
- Citation should include:
  - Author
  - Date of publication
  - Article or Web page title
  - “Retrieved” statement listing the date the article was retrieved from the Internet and the URL used

# Citing Internet Resources

TYPE OF RESOURCE	CITATION EXAMPLE
Web page article (magazine)	Dvorak, J. (2013, June 3). The Google assumption engine. <i>PC Magazine</i> . Retrieved from <a href="http://www.pcmag.com/article2/0,2817,2419867,00.asp">http://www.pcmag.com/article2/0,2817,2419867,00.asp</a>
Web page article (journal)	Dickens, C. (2013, June). Health literacy and nursing: An update. <i>American Journal of Nursing</i> , 113(6), 52–57. Retrieved from <a href="http://journals.lww.com/ajnonline/Fulltext/2013/06000/Health_Literacy_and_Nursing__An_Update.29.aspx">http://journals.lww.com/ajnonline/Fulltext/2013/06000/Health_Literacy_and_Nursing__An_Update.29.aspx</a>
Web page article (not appearing in a periodical)	Elias, P. (2013, June 01). Judge orders Google to turn over data to FBI. Retrieved from <a href="http://www.nbcnews.com/technology/judge-orders-google-turn-over-data-fbi-6C10157219">http://www.nbcnews.com/technology/judge-orders-google-turn-over-data-fbi-6C10157219</a>
Web page content (not an article)	<i>Security 101 - Internet Security Glossary   Norton</i> . (n.d.) Retrieved from <a href="http://us.norton.com/security-101">http://us.norton.com/security-101</a>
E-mail (cited in text, not reference list)	M. Rodriguez (personal communication, March 28, 2014)

**FIGURE 8-16**

## Citing Web sources.

These examples follow the American Psychological Association (APA) citation guidelines.

# Quick Quiz

1. With which of the following does the user select a category matching the topic for which he or she is searching?
  - a. keyword search
  - b. directory search
  - c. field search
2. True or False: The search phrase “trailer NOThorse” would locate Web pages about horse trailers
3. The program used by many search sites to retrieve matching Web pages from their database is called a(n)\_\_\_\_\_.

*Answers:*

*1) b; 2) False; 3) search engine*

# Beyond Browsing and E-Mail

- Many types of other online communications methods exist
- Instant Messaging (IM) and Text Messaging
  - Instant Messaging
    - Exchanging real-time messages
    - Example of presence technology
  - Text Messaging
    - Used by mobile phone users
    - Also called Short Message Service (SMS)
    - Beginning to replace e-mail for personal communication
    - Can be group messages



**FIGURE 8-18**  
**Group messaging.**  
Works the same as traditional IM, just with more people.

# Beyond Browsing and E-Mail

- Twittering and Social Networking Updates
  - Users post short updates called tweets
  - Used in both business and personal lives
  - Other types of status updates are available via some social networking sites



**FIGURE 8-19**

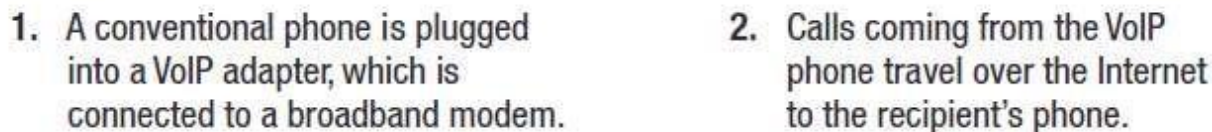
**Twitter.** Allows individuals to post and view tweets.

# Beyond Browsing and E-Mail

- Forums
  - Web page that enables individuals to post messages on a particular topic for others to read and respond to
- Voice over Internet Protocol (VoIP)
  - Making telephone calls over the Internet
  - Computer to computer
    - Skype, IM, etc.
  - More permanent VoIP setups replace landline phones
  - Relatively inexpensive—as little as \$25 per month
  - Does not work when Internet connection or power is out



Courtesy Vonage; Courtesy D-Link Systems, Inc.; © S. Bonaime/Shutterstock.com



**Voice over IP (VoIP).** Permanent VoIP setups allow telephone calls to be placed via a broadband Internet connection using a conventional telephone.

# Beyond Browsing and E-Mail

- Web Conferences and Webinars
  - Web Conference
    - Face-to-face meeting (videoconferencing) taking place via the Internet
    - Typically takes place using a personal computer or mobile phone
    - Used by individuals and businesses
    - Business Web conferencing is often used for meetings between individuals located in different geographical locations

# Beyond Browsing and E-Mail

- Webinar
  - A seminar presented via the Web
- Webcast
  - A completely one-way presentation
- Social Networking/Social Media
  - Social Networking Site
    - A site that enables a community of individuals to communicate and share information
  - Social Media
    - The collection of social networking sites and other communications channels used to share information

# Beyond Browsing and E-Mail

## Social Media Uses:

- Share information about yourself (Facebook, etc.)
- Connect people in specific geographic areas
- Check in to locations
- Sign in to Web sites
- Business marketing tool
- For security and safety reasons, users should be careful not to reveal too much about themselves
- Sites are increasingly monitored by colleges and employers
  - Carefully check what is posted and remove anything that might be potentially embarrassing

# Beyond Browsing and E-Mail



**FIGURE 8-22**  
Social networks are integrated into many Web sites.

# Online Shopping and Investing

- Online Shopping
  - Buying products or services over the Internet
- Online Auction
  - Bids are placed for items and the highest bidder purchases the item
- Online Banking
  - Performing banking activities via the Web
- Online investing
  - Buying and selling stocks or other types of investments via the Web

# Online Entertainment

- Online Music
  - Music played or obtained via the Web
- Online TV, Videos, and Movies
  - Videos watched or downloaded via the Web
  - Live or recorded TV shows available via the Web
  - Feature films available via the Web
  - Video-on-demand (VoD)
    - Downloading movies and television shows, on demand, via the Web
  - Internet Protocol Television (IPTV) – content delivered directly to your TV

# Online Entertainment

**FIGURE 8-26**  
Online TV and movies.



© 2013 Hulu

## ONLINE TV AND MOVIES

TV shows and movies can be watched online for free via a variety of Web sites.



Courtesy Barnes & Noble, Inc.; © Disney/Pixar.  
All Rights Reserved.

## VIDEO-ON-DEMAND

Rented or purchased TV shows and movies can be delivered to your computer, TV, or mobile device.



# Online Entertainment

- Online Gaming
  - Playing games via the Web
  - Web-based games, online multiplayer games, etc.
  - Quite often associated with Internet addiction
    - The inability to stop using the Internet or to prevent extensive use of the Internet from interfering with other aspect's of one's life
  - Gamification trend involves using gaming elements (earning points or rewards) in a non-entertainment context, such as for customer and employee engagement

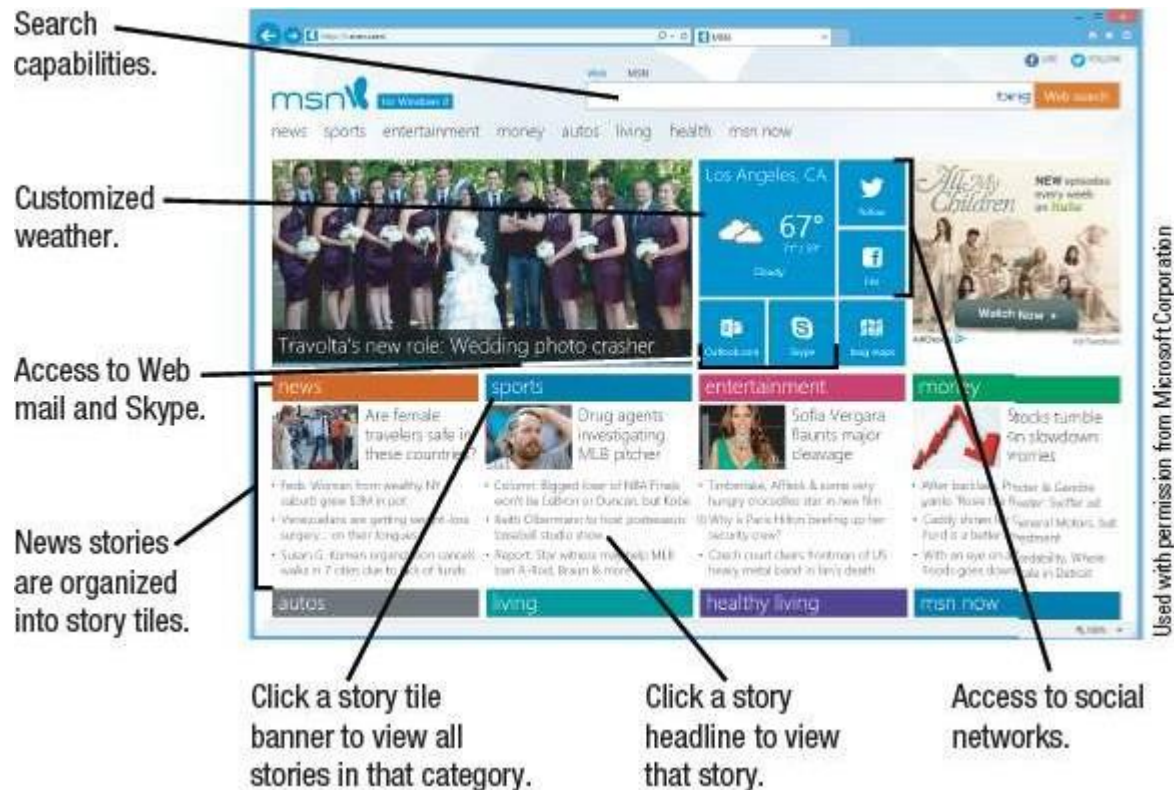
# Online News, Reference, and Information

- Online News
  - Available through Web sites belonging to news organizations, television networks, newspapers, magazines, etc.
  - Usually updated on a continual basis
  - Growing trend is to abandon print subscriptions and provide Web-only service--mainly due to cost
  - News archives are often available (sometimes requires a fee)

# Online News, Reference, and Information

- Reference Sites
  - Provide access to specific types of useful information
  - Phone and address directories, weather, maps, home values, encyclopedias, dictionaries, etc.
- Portal Web page
  - Designed to be selected as a browser's home page; typically can be customized

# Online News, Reference, and Information



**FIGURE 8-28**

**Portal pages.** Portal pages can contain a wide variety of customized news and information.

# Online News, Reference, and Information

- Product, Corporate, Government, and Other Information
  - Vast amount of product and government information available online
    - Product specifications
    - Instruction manuals
    - Tax forms
    - Government publications
    - Legislative bills
  - Wide variety of information from non-profit organizations, conservation groups, political parties, etc., also available

# Trend Box

## Internet of Things (IoT)

- Everyday objects are connected to and uniquely identified on the Internet
- Also called Machine-to-Machine (M2M)
- Will include sensors in shoes and other objects, smart fitness devices, home automation systems, smart farm equipment, smart freeways and traffic lights, etc.
- Devices will communication with each other and provide feedback to users as needed
- Initial applications include home automation and wearable technology

# Trend Box

1. Wear the FuelBand on your wrist during the day (you can recharge it when needed via a USB port).



2. The FuelBand tracks your activity—look at the lights on the band or press a button to display your NikeFuel total to view your progress.

3. The FuelBand syncs your data with your PC or smartphone so you can review your activity history and monitor your achievement streaks for motivation, as well as share and compare your progress with others.



# Online Education and Writing

- Online Education
  - Using the Internet to facilitate learning
  - Web-based learning management systems
    - Used to deliver course content, manage assignments and grades, and more
  - Student response systems
    - Students use a special device or their mobile phone to respond to surveys or review questions during lectures



# Online Education and Writing

- Web-based training (WBT)
  - Any instruction delivered via the Web
  - Commonly used for employee training
- Distance Learning
  - Students take classes from a different location from the one where the delivery of instruction takes place
- Online Testing
  - Taking tests via the Internet
    - Available for both objective and performance-based exams
    - Typically graded automatically
    - Cheating is an issue

# Online Education and Writing

- Online Writing
  - Blogs
    - A Web page that contains short, frequently updated entries in chronological order, typically by just one individual
  - Wikis
    - A collaborative Web page that is designed to be edited and republished by a variety of individuals
    - Wikipedia is one of the largest
    - Carefully evaluate content, as irresponsible individuals can enter erroneous information
  - E-portfolios
    - A collection of an individual's work accessible via the Web

# Summary

- Evolution of the Internet
- Getting Set Up to Use the Internet
- Searching the Internet
- Beyond Browsing and E-Mail