

# CHAPTER 7: MULTIMEDIA AND THE WEB

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# INTRODUCTION

- **Multimedia**
  - Two words multi and media combined to form multimedia
  - The integration of a variety of media, such as text, images, video, animation, and sound
- **Web-Based Multimedia (also called rich media)**
  - Multimedia (sound, video, animation) located on Web pages
- **Multimedia Sites**
  - Are interactive
  - Often contain elements that users interact with directly
  - Display information as requested by the Web page visitor

# WHAT IS WEB BASED MULTIMEDIA?

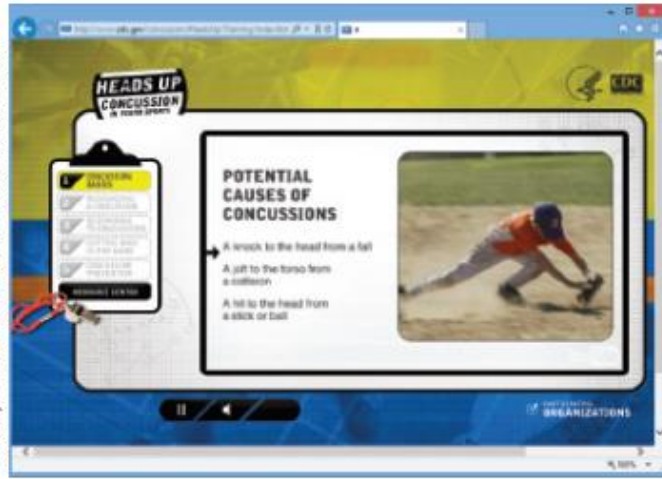
- Fast computers and broadband Internet connections make Web-based multimedia much more feasible than in the past
- Vast majority of Web sites today include multimedia (advertisements, TV shows, podcasts, user generated content)
- Why Learn About Web-Based Multimedia?
  - Multimedia is an integral component of the Web
  - Businesses and individuals need to understand the characteristics of the various types of multimedia elements and the impact of adding them to a Web site

# WEB-BASED MULTIMEDIA APPLICATIONS

- Information Delivery
  - Photos of products, video clips and podcasts, and users' manuals are used to convey information
  - Important component in Web-based training (WBT)
- E-Commerce
  - Online catalogs, samples of movies and music, etc.
  - Virtual Reality (VR)
    - Augmented Virtual Reality - overlaying computer generated images on top of real time images

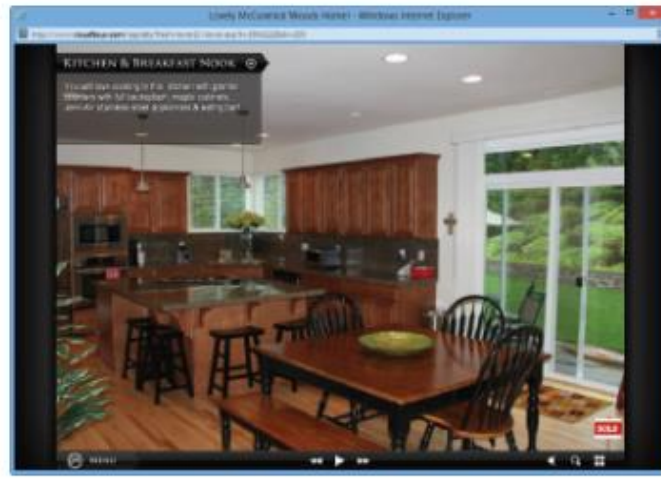
# WEB-BASED MULTIMEDIA APPLICATIONS

- Entertainment
- Social Media and Virtual Worlds
  - Photos and videos on many social networking sites
  - 3D Virtual Worlds (Second Life)



### INFORMATION DELIVERY

Images, video, audio, and animation are often used to convey information, such as via this Web-based training course offered by the CDC.



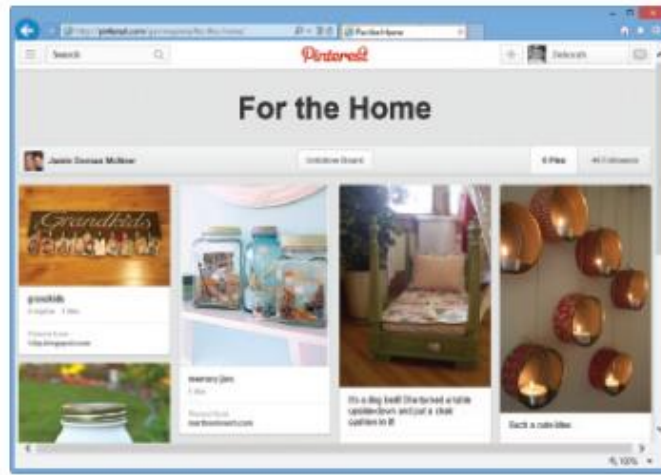
### E-COMMERCE

Images and video are often used for e-commerce purposes, such as this virtual reality tour of a home for sale.



### ENTERTAINMENT

Video and audio are often used in entertainment applications, such as Web sites like Hulu that offer TV shows for online viewing.



### SOCIAL MEDIA

Many social media sites such as Pinterest, shown here, include photos and video.

# ADVANTAGES AND DISADVANTAGES OF WEB BASED MULTIMEDIA

- Advantages
  - Can deliver some content that could not be delivered otherwise
  - Can address a variety of learning styles •
    - Visual learners
    - Auditory learners
    - Kinesthetic learners
    - Material more interesting and enjoyable
    - Many ideas are easier to convey in multimedia format



# ADVANTAGES AND DISADVANTAGES OF WEB BASED MULTIMEDIA

- Disadvantages
  - Time and cost of development
  - The cost of hosting and delivering the multimedia needs to be considered
  - The impact on visitors that have slow Internet connections or low bandwidth caps

# MULTIMEDIA ELEMENTS

- Text
- Images
  - Digital representations of photographs, drawings, charts, and other visual images
  - Images are static and are available in many formats: TIF, BMP, GIF, JPEG, and PNG
  - Clip art consists of pre-drawn images
  - Stock photos are also available online
- Graphics
- Audio
- Sound
- Animation

Serif



Times New Roman



Cooper Black

### SERIF TYPEFACES

No serif



Arial

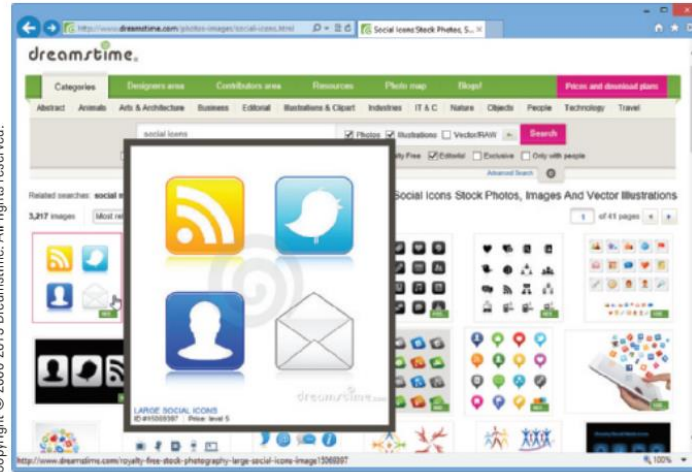


Dom Casual

### SANS SERIF TYPEFACES

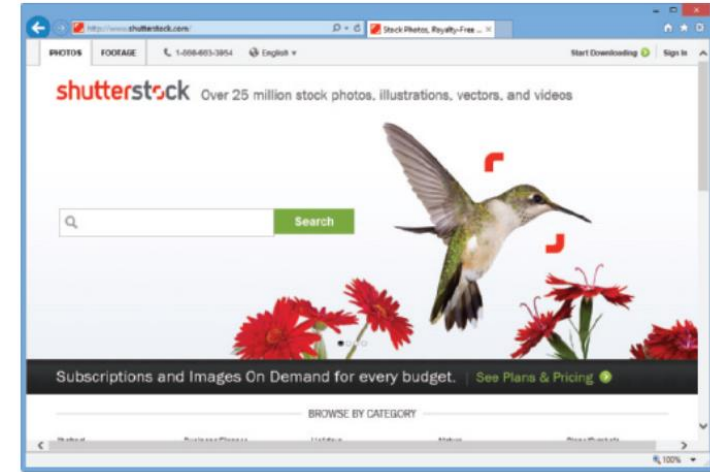
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#### CLIP ART IMAGES

Typically use the PNG or JPEG format and can be downloaded from a variety of Web sites. Some of the images on this site are free for both personal and commercial use.



#### STOCK PHOTOGRAPHS

Typically use the JPEG format and can be downloaded from stock photograph agencies. The agency shown here has a variety of images organized by topics; all images require a fee for use, but all are royalty free.

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# MULTIMEDIA ELEMENTS

- Graphics

- A graphic, or graphical image, is a digital representation of non-text information such as a drawing, chart, or photo. Many Web pages use colorful graphical designs and images to convey messages.

- Images

- An image which can be also called as Still Image, Digital image is the binary representation of any type of visual information like drawings, individual video frames, logos, pictures, graphs etc.

# MULTIMEDIA ELEMENTS

- GIF(Graphics Interchange Format)
  - Graphic Interchange Format
  - Commonly used for Web page images
  - Used with logos, banners, other nonphotographic images
  - 256 colors max
  - Uses lossless file compression
  - Can be transparent
  - Can be interlaced

## NONTRANSPARENT VS. TRANSPARENT GIFS

Nontransparent GIF (the image's white background is visible on top of the page's yellow background).

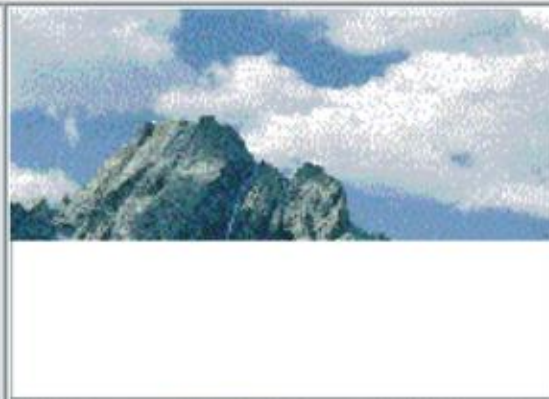


Transparent GIF with white specified as the transparent color (the yellow background is visible through the transparent areas of the image so the image appears to be nonrectangular).

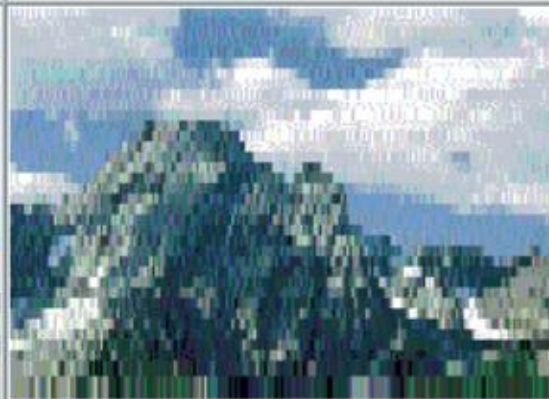
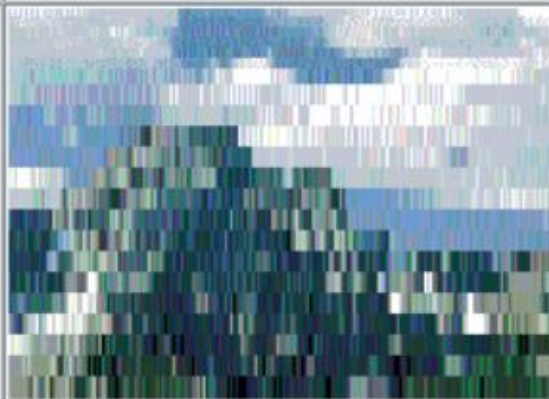


## NONINTERLACED VS. INTERLACED GIFS

Noninterlaced GIF (the image is displayed top to bottom).



Interlaced GIF (the complete image is displayed initially, but the quality is progressively increased).



# MULTIMEDIA ELEMENTS

- PNG(Portable Network Graphics)
  - Format designed specifically for use with Web page images in 1996
  - Uses lossless compression
  - Can compress more efficiently than GIF
  - Can use specific color palette of 256 colors or true color palette of 16 million colors
  - Can also be transparent and interlaced

# MULTIMEDIA ELEMENTS

- JPEG
  - Joint Photographic Experts Group
  - Standard format for Web page photos
  - Uses lossy file compression
    - Image quality is lost during compression
  - Can use true color(24 bit color or 16 millions color)
  - Can be progressive
  - The amount of compression is specified when the file is saved



# COMPRESSION IN JPEG IMAGE



No compression  
(37 KB)



40% compression  
(13 KB)



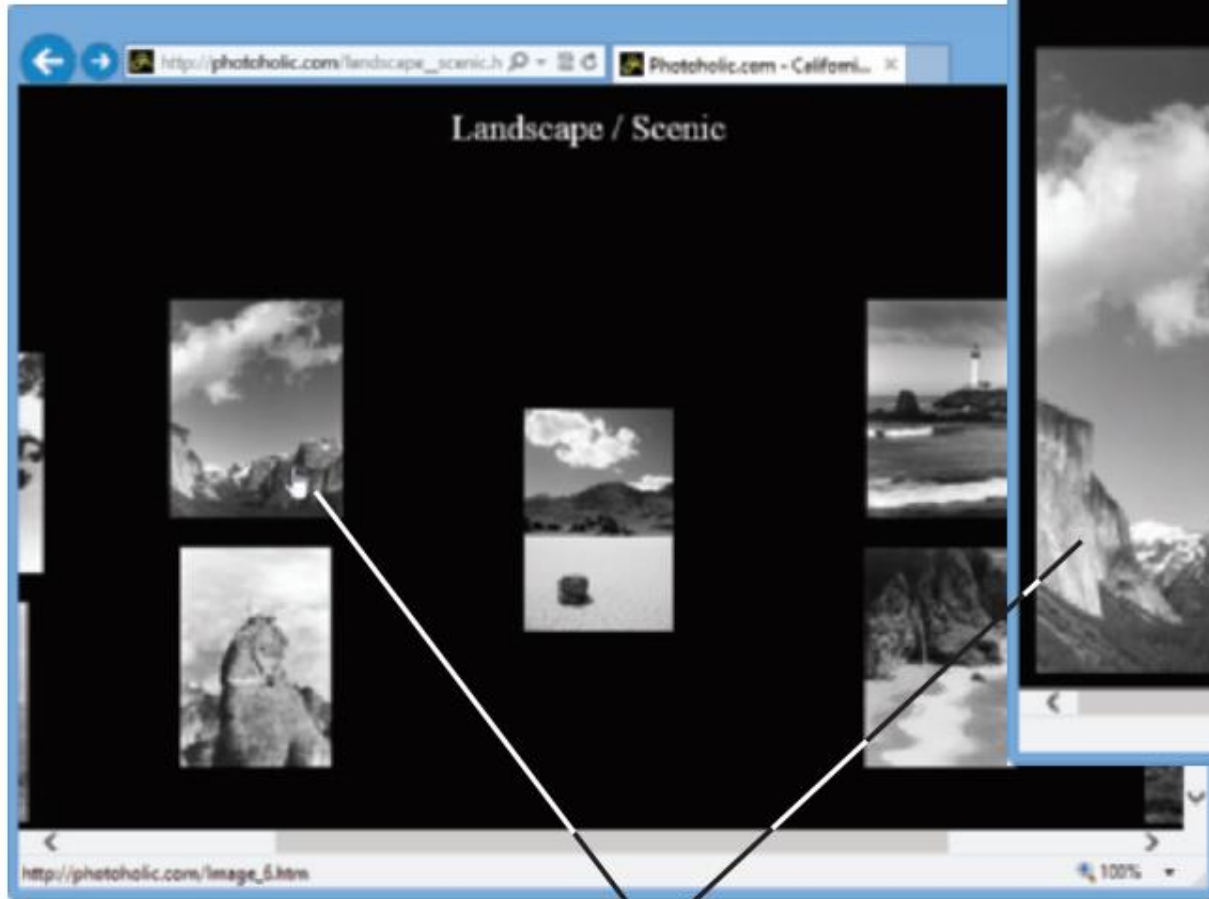
80% compression  
(7 KB)



100% compression  
(3 KB)

# MULTIMEDIA ELEMENTS

- Choosing a Graphic Format
  - GIF or PNG
    - typically used for line art (clip art, logos, navigation buttons, etc.)
  - JPEG
    - typically used for photographs
    - Use thumbnail images when very large images are required



Courtesy Photoholic.com

Clicking a thumbnail image displays the full-sized image.

# MULTIMEDIA ELEMENTS

- Animation
  - A series of graphical images are displayed in succession to simulate movement
- Java Applet
  - A small program inserted into a Web page that performs a specific task
- Animated GIF
  - A group of GIF images saved as an animated GIF file that is inserted in a Web page
  - Displayed one after another to simulate movement

# MULTIMEDIA ELEMENTS

- For more complex animations, developers can use JavaScript or another scripting language
  - Flash, Silverlight
- Many Web-based animations require a plug-in
- Animation and interactivity can also be achieved using programming languages

# MULTIMEDIA ELEMENTS

## ■ Audio

- Audio means the sensation resulting from stimulation of the auditory mechanism by airwaves or vibrations.
- It is the format to express sounds which is in audible range of the human. Music, recordings, voice conversations are the example of audio data.
- We can hear audio using headphone, earphone or speaker.
- Inside the computer, the sound card plays the role of playing and recording sound.
- All types of sound including music, spoken voice, sound effects
- Can be recorded using a microphone or MIDI instrument, captured from CDs, or downloaded from the Internet(Musical Instrument Digital Interface)

# MULTIMEDIA ELEMENTS

## ■ Audio

- Often played when an event occurs on a Web page or when the visitor clicks a link
- Streaming audio is used to speed up delivery
- Common audio file formats include:
  - Waveform (.wav)
  - Moving Picture Experts Group Audio Layer 3 (.mp3)
  - Audio Interchange Format File (.aiff)
  - Advanced Audio Coding (.aac or .m4a)

# MULTIMEDIA ELEMENTS

## ■ Video

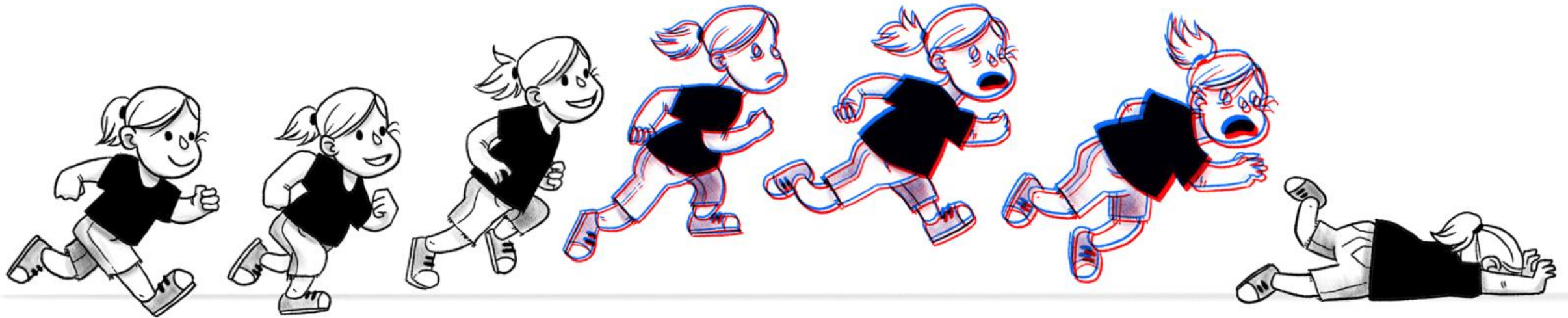
- Begins as a continuous stream of visual information, which is then broken into separate images (frames) when the video is recorded
- Video data, like audio data, is usually compressed
- Streaming video is recommended to speed up delivery
- Common video formats are:
  - avi .mp2 .mov .flv .mp4 .wmv etc



# MULTIMEDIA ELEMENTS

- Animation
  - Animation is the creation of the illusion of motion and change by rapidly displaying a sequence of static images that minimally differ from each other.
  - It can be used for various purposes such as in movies, television shows, video games, advertisements, and educational content.
  - Animation can be hand-drawn or created using computer software, and it can be 2D or 3D.
  - The techniques used in animation have evolved over the years and continue to advance with advancements in technology.

# MULTIMEDIA ELEMENTS(ANIMATION)



# TEST YOUR ABILITY

- 1. The most common file format for Web page photographs is 
  - a. GIF b. JPEG c. PNG
- 2. True or False: Delivery speed is one potential disadvantage of using Web-based multimedia.
- 3. A small image that is linked to a larger version of the same image is called a(n)

# PICTURE VS GRAPHICS

- A graphic is a visual representation of information, data, or ideas that is created to communicate a message or convey information. It can be in the form of charts, diagrams, illustrations, or other visual elements.
- A picture, on the other hand, is a representation of an image or scene, either still or moving, captured by a camera or created by an artist. It can be a photograph, painting, drawing, or any other type of visual representation of a scene or object.
- In general, graphics are created for a specific purpose such as conveying information or making data easier to understand, while pictures are typically created for artistic or aesthetic purposes.
- While a picture can be considered a type of graphic, not all graphics are pictures.

# MULTIMEDIA WEB SITE DEVELOPMENT

- Web Site Development
  - The process of creating, testing, publishing, and maintaining a Web site
    - Occurs after the site is designed
    - Can be performed in-house or outsourced
  - Creating the Multimedia Elements
    - Usually several different software programs are used
      - Image editing and animation software
      - Audio and video editing software
    - Each element should be saved in the appropriate size, resolution, and file format

# MULTIMEDIA WEB SITE DEVELOPMENT

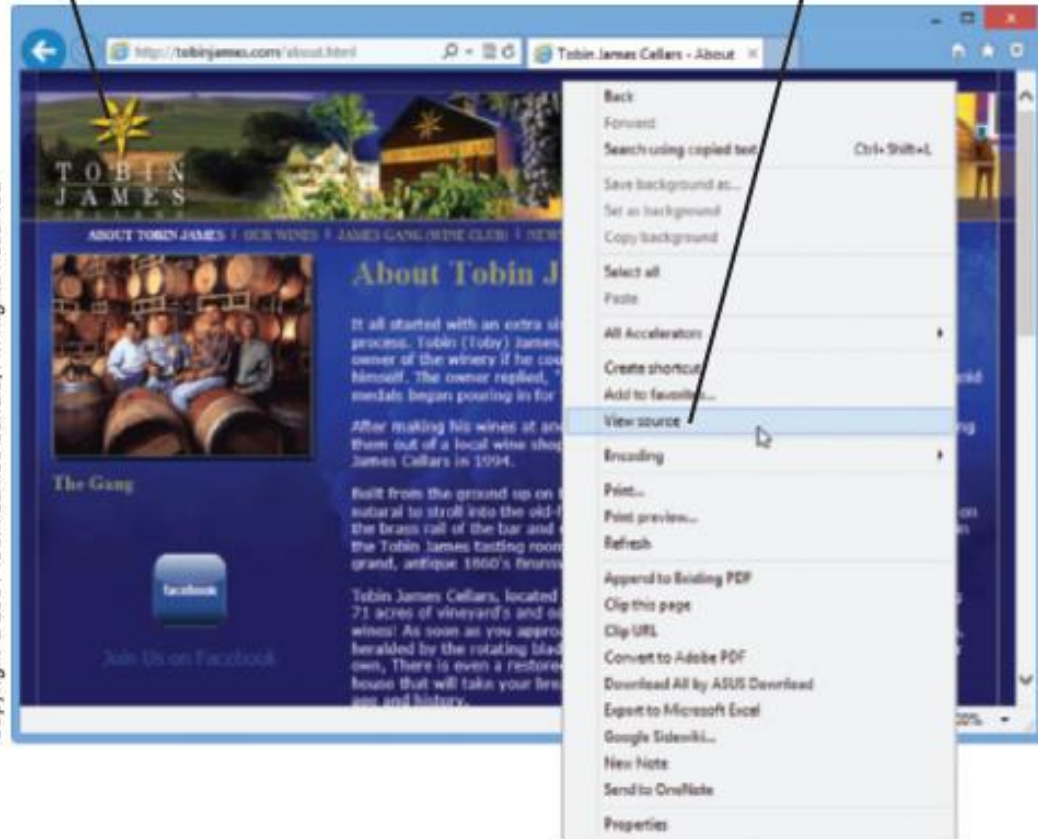
- Creating the Web Site
  - Markup Language
    - Uses symbols or tags to describe what a document should look like when it is displayed in a Web browser
- JavaScript or other scripting languages can be used to add dynamic content
- Web site authoring software is often used to create an entire site

# MULTIMEDIA WEB SITE DEVELOPMENT

- Hypertext Markup Language (HTML)
  - The original markup language
  - Uses HTML tags to indicate where effects and elements belong in the Web page
  - Some tags are paired
  - The computer and browser being used still determines exactly how the Web page will display

Web page as displayed in browser.

Right-click page and then click this option to view the Web page's source code.



HTML source code for the Web page.

This is an XHTML page.

Specifies the title displayed on the browser's title bar.



The page is organized using a table.

The page's text begins with a heading.

Defines a photo's title, source, and alt text.



# MULTIMEDIA WEB SITE DEVELOPMENT

- Extensible Markup Language (XML)
  - A set of rules for exchanging data over the Web
  - Addresses the content but not the formatting
  - Uses XML tags to identify data
  - Allows data to be extracted and reused as needed
- Extensible Hypertext Markup Language (XHTML)
  - A newer version of HTML based on XML
  - Controls the appearance and format of a Web page like HTML
  - Stricter rules than HTML

# MULTIMEDIA WEB SITE DEVELOPMENT

- HTML5
  - Newest version is designed to replace the previous versions of both HTML and XHTML
  - Includes new tags and features that support the creation of more complex and dynamic Web pages
  - Is open standard
  - No proprietary software or plug-ins required
  - New tags include `<video>` and `<audio>` for media, `<canvas>` that creates a bitmapped surface to work with, and section tags to identify the parts of a Web page
  - (`<header>`, `<article>`, `<nav>`, etc.)

**DECLARATION**  
Indicates this is an HTML page.

**HEAD**  
Indicates the page title and character set being used.

**BODY**  
Contains the body of the Web page (header, sections, and footer).

HTML closing tag ends the Web page.

```
A Simple HTML5 Web page.html - Notepad
File Edit Format View Help
<!DOCTYPE html>
<html>
  <head>
    <title>A Simple HTML5 Web Page</title>
    <meta charset="UTF-8">
  </head>
  <!--THIS IS A COMMENT - IT WON'T DISPLAY WHEN THE WEB PAGE IS VIEWED-->
  <body>
    <header>This is the header; it contains this text and the sample nav bar below.
      <nav>
        <a href='http://mywebsite.com'>Home</a>
        <a href='http://google.com'>Google</a>
        <a href='http://dictionary.com'>Dictionary.com</a>
      </nav>
    </header>
    <section>
      <p>This is the first section of the page. It can be divided into articles.</p>
    </section>
    <section>
      This is the second section of the page.
      <h1>this text is defined as Heading 1.</h1>
      <b>This text is bold.</b>
      <p>This text is in a new paragraph. A video link comes next.</p>
      <video width="320" height="200" controls>
        <source src="video_sample.mp4" type="video/mp4">
      </video>
      <p>This is another new paragraph. A horizontal rule comes next.</p>
      <hr>
    </section>
    <footer>This is the footer; it contains this text.
  </footer>
</body>
</html>
```

Video tag displays the specified video.

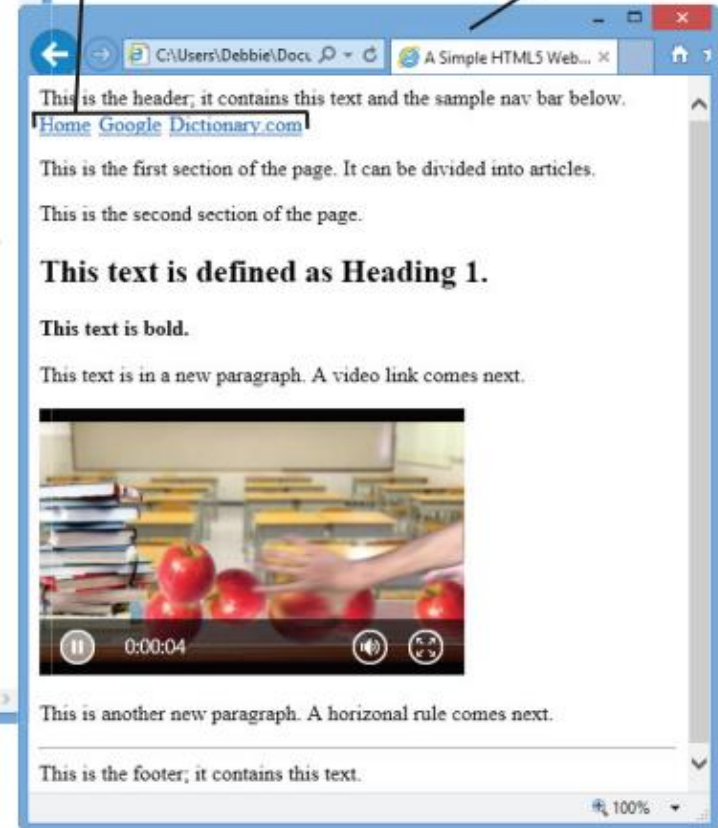
Many tags are paired tags.

HTML5 file being created in Notepad.

Comments don't display in a browser.

Nav bar code contains hyperlinks.

HTML5 file being viewed in Internet Explorer.



# MULTIMEDIA WEB SITE DEVELOPMENT

- Cascading Style Sheets (CSSs)
  - Used to specify the styles used with a Web page or an entire Web site
  - Specified in an Internal style sheet (head section of Web page) or in an External style sheet
    - Normally used in an external style sheet and connected to web pages through a link statement in the head section of the desired pages
  - Styles are applied to all of the linked Web pages at one time
  - Improves consistency and efficiency

# MULTIMEDIA WEB SITE DEVELOPMENT

- Virtual Reality Modeling Language (VRML) and X3D
  - A language used to create 3D Web pages
  - Successor is X3D

# THE FUTURE OF WEB BASED MULTIMEDIA

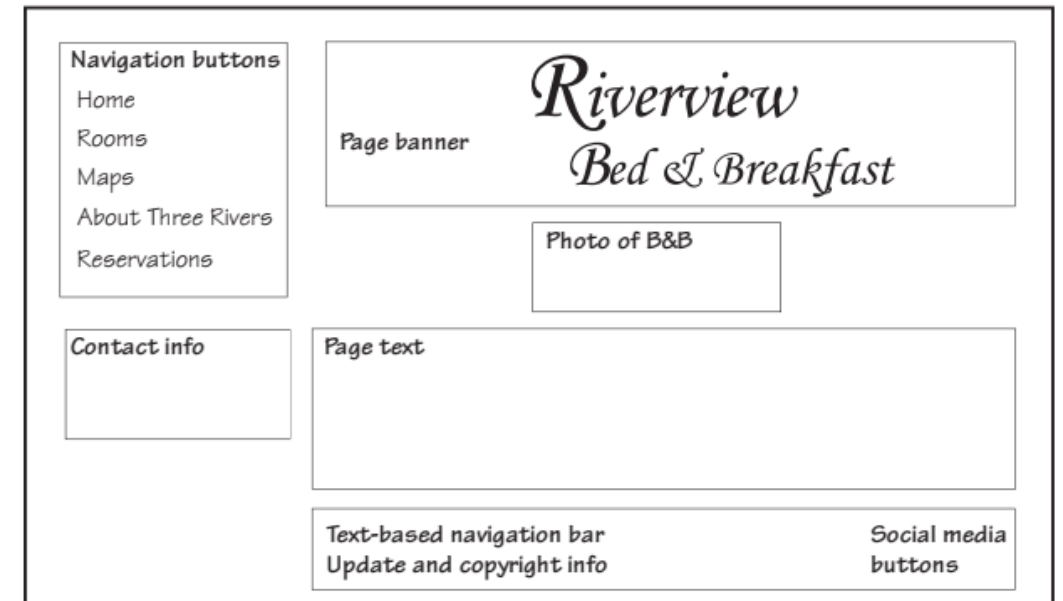
- Web-based multimedia will be more exciting and more embedded into everyday events
- Web-based content, cloud services, and home entertainment devices will likely continue to converge to allow seamless access to desired content on the user's device of choice
- Technology will evolve to support mobile multimedia
- Usage of multimedia applications that are tied to a geographical location or current status and that involve user generated content will also likely continue to grow

# FLOWCHART AND PAGE LAYOUT



## FLOWCHARTS

Describe the logical organization of the site. Each box represents a separate Web page.



## PAGE LAYOUTS

Illustrate the basic design and navigational structure of a Web site. There are typically two layouts—one for the home page (shown here) and one for all other pages on the site.

## QUESTIONS- PROJECT WORK

- Online news sites typically contain a wide variety of multimedia content and are a common means of obtaining the news today. For this project, visit at least two news Web sites (onlinekhabar.com, ekantipur.com, or any you like), investigate the types of multimedia features they offer, and evaluate their usefulness. What multimedia components are available? Do the components work smoothly and add value to your experience? Are there any multimedia components missing that you think would be useful? What are the advantages to using an online news site compared with radio or television news broadcasts? Are there any disadvantages? Do you use an online news site as your primary source of news? Why or why not? At the end of your research, prepare a one page summary of your finding and opinions and submit it



# ASSIGNMENTS

1. List three types of software programs that might be used when creating a multimedia Web site. Explain what each program would be used for and list one example (program name and publisher) of each.
2. Discuss the possible use of Web-based multimedia in the future.
3. Explain how markup languages, scripting languages, and other tools are used today to create multimedia Web pages.
4. Describe each of the following multimedia elements: text, images, animation, audio, and video and tell how they differ
5. Define Web-based multimedia and list some advantages and disadvantages of using multimedia.

# ASSIGNMENTS

- Animation vs Video
- How has the Internet changed the music industry today and what impact do you expect it to have in the future?
- How important is it today to include multimedia on a Web site?

## LAB QUESTION

- The Web site for XZY Corporation should include information about Products, Orders, Corporate Information, and Contact Us. Sketch a brief flowchart and one possible page layout for the home page of the site