

Web Site Training – Cell 425
Session 5 – Graphics and Images
(Total 20 minutes)

Doug Kupec
Version 1.32
Revised July 23, 2002

A. Introduction (2 minutes)

This section is intended to help you be aware of the different file formats available, the relationship between resolution and file size, thumb nailing, introduce you to multimedia formats, help you be familiar with several terms, and several graphic/imaging tools.

This section will not teach you everything you will need to know about graphics, imaging, or multimedia. If you want to become a good digital graphics/imaging designer or a good multimedia producer there are several excellent books available. Classes are also available at local art schools or colleges throughout the country. The web is an important and helpful resource as well.

B. Why Graphics, Images, and Multimedia?

Graphics and images provide web sites with appeal, help illustrate ideas, promote events, and help provide more information to users. Specific concepts like maps and charts are better explained with images. Most web sites today use graphics and images to direct attention to different content areas and help give the site an overall look and feel.

Over use of these same ideas or bad choices of color schemes will lead to a web site that is not pleasant to view or a web site that users avoid. Finding the correct combination of colors to use in your scheme can take some time.

Getting feedback as you develop images and multimedia for your web site is essential. Be aware that everyone will have a different opinion about what colors to use and what content to include. But if someone says something is “distracting, unreadable, or hurts the eyes to read” you will then have a chance to rethink the idea before deploying it to your web site.

Multimedia takes your images to the next level. It gives you the opportunity to present short movie clips, audio, and a more rich presentation of content. It allows you to have a dynamic and interesting part of your site. Be careful not put everything into these formats, as the file size is quite large. Also, not everyone can appreciate these types of technologies. Remember that most users will be using dial-up connections to access your site. You do not want them to be waiting all the time to get information from your site. Use multimedia appropriately and be sure to have a text version available for users who can not access the multimedia content.

NOTE: Throughout this session the term graphic and image will be used interchangeably. If you wanted to distinguish between the two, you may visualize a graphic as some drawing or symbol that is used to bring attention to an area on the site. An image would be better described as a photograph or picture that has been digitized by scanning or taken with a digital camera. All terms and techniques described here apply to both graphics and images.

C. Graphic and Imaging Formats (4 minutes)

Today there are currently two standard image formats for the web, GIF and JPEG. This is not to say that you can not produce images in other formats, but that these two are the

most commonly found formats on the web. In the past couple of years PNG has gained a strong following as a replacement for GIF for numerous reasons.

Each format has its own strength and weaknesses. Some are more suitable for specific uses such as the web or documents, while others are good general formats.

It is important to remember that the different file formats can greatly change the size of the files. Use your image editing software to try the different formats and the settings to get an image that is small, yet looks as intended. Most tools have an optimize feature to help produce smaller images and allow you to see the different file formats in separate panes.

- a. BMP (Bit Map)
 - i. Image made up of individual pixels called bit maps.
 - ii. Not suitable for web graphics as there is not built in compression.
 - iii. Sometimes used as a scanning format.
 - iv. Used in Windows Paint.
- b. TIFF (Tagged Image File Format)
 - i. Good for Scanning.
 - ii. High quality format.
 - iii. Compression is “lossless”.
 - iv. Often used for scanning or by high quality digital cameras.
 - v. Needs to be converted to a better web format before using on a web site.
- c. GIF (Graphics Interchange Format)
 - i. Good Web Format.
 - ii. Palette-based format.
 - iii. 256 (8 bit) is the maximum colors available, but less colors can be selected to help reduce the overall file size.
 - iv. Web Safe Palette (216 colors)
 1. These colors are standard colors that all Mac and Windows computers can display, the other 40 colors vary between the two platforms. Using these colors will help insure that the image is represented properly.
 2. Web Safe colors are defined by using three double numbers or letters using 00, 33, 66, 99 and CC and FF. For example white is FFFFFFFF and black is 000000.
 3. Most computers today support more than 216 colors.
 - v. Adaptive Palettes
 1. Allows the colors chosen to be chosen for that specific image.
 2. May use different colors than web safe palettes.
 - vi. Can have transparent backgrounds.
 - vii. Excellent for images with:
 1. Few colors.
 2. Line art and drawings.
 3. Black and white images.
 4. Sharp lines are also represented well.

- viii. Most photographs will not look the best since there are a limited number of colors used in the image.
- ix. Complex textures can create large file sizes.
- d. JPEG – (Joint Photographer's Experts Group compression)
 - i. Good Web Format.
 - ii. Good for true color and gray scale, photo quality images.
 - iii. Uses all colors possible, 24-bit color, but can use fewer colors.
 - iv. File sizes can get large with the added colors.
 - v. High Compression, but is a “lossy” compression. Quality or smoothing should be set between 70-90% or medium to high depending on the features of your imaging software.
 - vi. Usually used for colored photographs or graphics that have gradients or other color blending effects applied to them.
- e. PNG (Portable Network Graphics) – Good Web Format
 - i. Pronounced “ping”.
 - ii. Replacement for GIF and TIFF.
 - iii. Supports true color, grayscale, and palette-based (8-bit) color.
 - iv. Contains all the layer information that the original file did. This is good for updating files later on.
 - v. Transparent images are supported.
 - vi. Does not support animations.
 - vii. PNG-8 supports 8-bit color, the same as GIF does.
 - viii. PNG-24 supports 24-bit color, the same as JPEG does.

D. Flash, Streaming Video/Audio, PDF Formats (3 minutes)

- a. Macromedia Flash
 - i. Flash allows you to create superb multimedia presentations that have become a standard on the web today.
 - ii. It has a small file size, but high quality.
 - iii. Good for short video clips.
 - iv. Not needed for information driven web sites (such as the National Web Site), but looks good for promotions (fellowships) and advertising.
- b. Streaming Audio/Video
 - i. Currently there are three major players and streaming servers – Microsoft Windows Media, Real Media, and QuickTime.
 - ii. Each of these players (and servers) support different codecs. Codec stands for compression/decompression and it is used to take large audio and video files and make them smaller.
 - 1. A variety of factors affect the final quality of the output and size of the file, including which codec is used.
 - 2. MPEG-4 is becoming the dominant video format standard.
 - 3. MP3 is the dominant audio format standard.
 - iii. Server software is needed to support live or rebroadcast streaming of audio/video.
 - iv. The big advantage of streaming video/audio is the ability to skip to any part of a file without downloading the entire file.

- v. No local copy is made from a streaming server to the client computer.
- c. PDF (Portable Document Format)
 - i. Small file size that is excellent for text and forms.
 - ii. Should down sample images in documents.
 - iii. Standard for documents on the web.
 - iv. Appropriate for newsletters and forms, information that needs to retain the format when printed.
 - v. Allows for documents to not be altered by others (dependant upon creation software).
 - vi. Excellent for delivering documents across multiple platform. Supports a variety of platforms, including Macintosh, Microsoft Windows, Linux, Palm OS, and Pocket PC (with appropriate creating or viewing software installed on the computer or handheld).

E. Resolution vs. File Size (2 minutes)

File size is extremely important when you develop a web site and create images. You need to create for your general user, who may have a slower dial-up connection (28.8 or 56K modem). Keep in mind that it generally it takes approximately 45 seconds to download about 100 KB of information on a dial-up connection.

- a. Most screens display only 72 Dots Per Inch (DPI) (Windows) to 96 DPI (Mac)
 - i. The resolution of a monitor does not change the DPI of an image. The DPI is set at the time of creation or by changing it in a software utility.
- b. For quality printing want 300 DPI or greater.
- c. Want to optimize the image by reducing DPI for on screen images.
 - i. A 300 DPI image and a 72 DPI image will have the same quality on the screen, but they will be different when printed from imaging software such as Adobe Photoshop.
 - ii. File sizes are larger for higher DPI images that have the same printable size as a lower DPI image.
 - iii. If two images have different DPI's, but the same pixel width and height, the image will display the identical on the screen. In this case a higher DPI image could have exactly the same file size as the lower DPI image.
 - iv. In general, a smaller DPI is better for screen images.

F. Resizing Images/Thumbnail Pictures (1.5 minutes)

Resizing large images that are scanned or taken from digital cameras is an important step to placing images on the web. Many times images from these sources are 100-500 KB, thousands of pixels wide or high, and contain a higher DPI then what is needed. A user trying to view several images on a page could spend several minutes downloading the pictures before viewing. It is best to resize images and create a photo gallery that has thumb nailed images that users can pick and choose what image to see. Try to have a caption with the images as well.

- a. Images should be an appropriate width and height.
 - i. Standard screen resolution is at 800 pixels wide by 600 pixels high.
 - ii. Keep the image smaller than this to prevent unnecessary scrolling.

- iii. Smaller imager will have a smaller file size.
 - b. Images on the site should all use a constant size (where appropriate, i.e. photo galleries).
 - i. All images are 400 to 500 pixels wide.
 - ii. Thumbnails are 100 to 150 pixels wide.
 - iii. The height can be variable.
 - c. Photographs should be thumb nailed with links to larger versions.
 - i. This allows for faster downloads of pages for users.
 - ii. DO NOT resize an image by using HTML tags and expect the file size to be smaller. This only changes how large the file displays on the screen; it does not change the file size.
 - iii. Most HTML development tools have built-in thumb nailing utilities. This creates a smaller image from a large one.

G. Dithering, Interlacing, Anti-Aliasing, and Gamma (1.5 minutes)

These are several terms you should be familiar with when creating images. Most of these have several settings that can be changed in imaging software.

- a. Dithering is a way to reduce the size of an image by using fewer colors. This is done in GIF and PNG-8 images. It can often produce a grainy effect in photographs and produce less sharp images since. The grainy effect is caused by using two colors to produce a third color that is a pixel mix of the two colors.
- b. Interlacing can show an image in passive stages, producing a sharper image after each pass. This is an option available in GIF, PNG-8, and PNG-24 images. This allows a user to see an image as it is being downloaded.
- c. Anti-Aliasing is a way to smooth out fonts and diagonal lines on the screen. This will help make fonts more readable in images. Make sure you have this option checked in your imaging software.
- d. Gamma is an adjustable setting for how bright an image is. Different operating systems use different levels of gamma. Most web designers darken and add contrast to images created on Windows and lighten images slightly when creating on a Mac.

H. Imaging Tools (6 minutes)

There are hundreds of imaging tools available. Some of these tools are more designed for specific niches. These tools can cost several thousand dollars or be as cheap as free. No matter what utility you use, knowing the options and how to use the software is essential to creating good quality images.

Below is a list of the more popular imaging tools that can be used to develop for the web.

- a. *Photoshop - Adobe*

Photoshop is considered one of the best imaging tools available. Adobe has made considerable improvements to the software to enhance for use on the web.

 - i. Current Version Photo Shop 7, \$550.
 - ii. Expensive, very professional, large amounts of options.
 - iii. Image Ready is great for web images.
 - iv. Supports slicing and HTML output of image mapping, rollover buttons.

- v. Built in filters with programmable macros.
 - vi. Supports GIF, JPG, PNG, as well as other formats.
 - vii. Available for Mac and Windows.
- b. *Paint Shop Pro - Jasc Software*
 Paint Shop Pro offers many features similar to Adobe Photoshop. It is easier to learn and contains most of the features needed to create good web graphics and images.
- i. Current Version Paint Shop Pro 7, \$100.
 - ii. Ability to optimize for the web.
 - iii. Built in Animation Shop 3 for animated images.
 - iv. Available for Windows Only.
- c. *Fireworks - Macromedia*
 Macromedia has made many leaps in imaging software. They have also integrated Fireworks into other Macromedia products such as Dreamweaver, which is used for creating HTML pages.
- i. Current Version Fireworks MX, \$299.
 - ii. Supports slicing and HTML output of image mapping, rollover buttons.
 - iii. Tightly integrates with other Macromedia products.
 - iv. Uses PNG format to save its files.
- d. *LView Pro - MMEdia Research*
 A less expensive imaging and graphics tool. Provides common functionality found in most tools and a few advanced features.
- i. Current Version LView Pro 2002, \$50.
 - ii. Allows editing of images, layers.
 - iii. Web Gallery Creation tool allows easy creation of web galleries for images.
 - iv. Does not support PNG graphics.
 - v. Available for Windows Only.
- e. *Flash & Shockwave - Macromedia*
 In recent years Flash and Shockwave have become the multimedia formats for the web. These formats provide rich content in images and sound. Today mostly the Flash format is used.
- i. Current Version Flash MX, \$499.
 Macromedia Flash is the ideal solution for creating multimedia rich content for the web.
 - ii. Current Version Director 8.5 Shockwave Studio, \$1,199.
 Macromedia Director 8.5 Shockwave Studio is the ideal solution for interactive multimedia presentations and longer movie type presentations.
 - iii. Superb multimedia presentations.
 - iv. Flash has a small file size and is one of the major benefits of this format.
 - v. Very professional look.

I. Summary (1 minute)

- a. JPEG and GIF (or PNG) formats are good for web graphics and images. PDF documents are good for newsletters and forms.
- b. Small file size is important to keep in mind when creating graphics and images.

- c. Thumbnail photographs in a web gallery.
- d. Multimedia formats, such as Flash, can add extra appeal to web sites.
- e. Graphics tools are important. Try to learn the tool the best you can. PhotoShop and Fireworks are very powerful tools that can take a while to learn, but may be worthwhile to do so in the long run.

There are many good books that are available that can help you with these products. Also check the web and for any local classes that may be offered.

J. References and Suggested Sites

- a. <http://www.webstyleguide.com> – Good resource for building web sites and images
- b. <http://www.adobe.com> – Contains tutorials on using Photoshop and applying filters.
- c. <http://www.wpdfd.com> – Web Page Design for Designers site
- d. <http://share.studio.adobe.com> – Adobe Xchange Excellent site to find plug-ins, actions, enhancements, etc. for Photoshop