Video materials on the Web

Significance:

With the increased use of the Internet resources and more emphasis on authenticity and interactivity of the Web pages, video materials on the Web are especially intriguing for use to distinct from those “static” contents. Well-designed video materials can add more stimulation and interaction to the web pages. That is why this topic will be explored here.

Discussion on the topic based upon my research:

The minimum system / hardware requirements for video editing is a 166 MHz MMX Pentium-class machine with at least 32 Megabytes of memory. A CD-ROM drive to install the included software is essential as well. The hard disk should have at least 300 Megabytes of free space, but it is recommended for video editing to have at least 2 Gigabytes or more.

A video clip can be converted from analog to digital, and then stored as data on a hard disk or other mass-storage device; that clip can be played back on the computer’s monitor without overlay boards, videodisc players, or second monitors. This playback will need players, such as QuickTime or Real Player. (Vaughan, 1998)

To reduce the file size, streaming technologies are being implemented to provide reasonable quality low-bandwidth video on the Web. By starting playback of a video as

soon as enough data has transferred to the user's computer to sustain this playback, users do not have to wait for very large files to download.

When we think about adding video to Web pages, there is a need to learn about different formats and embedding techniques. After the success of QuickDraw (the technology that allowed Macs to display and print graphics along with text), Apple developed QuickTime as a video file format and multimedia architecture to handle "time-based" media. QuickTime became the industry standard for desktop video production.

File formats for storing and playing digitized video to and from disk files are available with QuickTime and AVI (audio/video interleaved). AVI is the video file-type used by Video for Windows, which is a multimedia architecture developed for Windows. AVI is supposed to play back faster and smoother than other formats by interleaving the audio data with every video frame. On the other hand, QuickTime handles audio and video interleaving in larger blocks (half-seconds or seconds). Both QuickTime and AVI are cross-platform compatible, though they require special playback software on non-native machines. QuickTime files can be created and viewed on a PC by installing QuickTime for Windows; it will integrate with the system and appear as a file option in video-editing programs. To bring AVI compatibility to Mac, it is necessary to install the Video for Windows Apple Macintosh Utilities. AVI is ideal for integrating video into Word documents and PowerPoint presentations created on a Windows machine, but QuickTime is good at compression, which makes it better suited for the Web. In that environment, any increased playback speed is nominal. (Choosing the Right Video Format: http://hotwired.lycos.com/webmonkey/html/96/44/index2a.html?tw=multimedia)

How can we keep the video file size as small as possible? This can be achieved in two basic ways: reducing the frame rate (numbers of video frames displayed per second), and compressing the finished file. Fluid motion in film and video is an illusion our eyes and brains play on us; these movies display about 30 fps (frames per second) to achieve fluid motion. However, desktop video can be run around half as fast, and the video clip will appear to the viewer at an acceptable quality level. As we edit, the frame rate can be adjusted but should be about 15 to 8 fps. For basic editing, if it is affordable, Premiere for Mac or Windows is recommended. There is also Strata VideoShop 3.0+ (formerly known as Avid VideoShop and bundled with newer Macs) and Speed Razor Mach III for Windows. Shareware tools like Movie Cleaner Lite or QuickEditor 3.61 on the Mac, or VidEdit for Windows can work as well. It is important not to skimp too much on the audio since jerky sound is much more jarring than a discontinuous picture. After all, a good audio track can go a long way toward distracting the viewers from a low frame rate. Mono 8-bit sound at 22.05Hz is enough for music, and more than adequate for voice. And then proceed to the step of compression. (Choosing the Right Video Format: http://hotwired.lycos.com/webmonkey/html/96/44/index2a.html?tw=multimedia)

How do we place a clip on a Web page? Web-based video can be placed in one of two ways: the anchor tag (<a href>) and the <embed> tag. Using <a href> is the same as placing any link within an HTML document. For example:
goldenrod. If using this method, users will either save the file to their desktops and launch a helper application, or load a new browser page, depending on how they have set their preferences and which browser they are using.
If we would like video to stream during download or to appear on the same page as the rest of the contents, we will have to embed the clip in the page using <embed>. The

<embed> tag is syntactically similar to the <img> tag, using many of the same elements. Incidentally, the embed tag requires users to have the appropriate plug-in installed; if not, the embedded materials will not be seen. The HTML for an embedded video file goes as below:

<embed src="/Dr. Liu/MM/Research Project/hao.mov" height=108 width=33% controller=false autoplay=true playeveryframe=false pluginspage="oops.html" loop=palindrome> (Choosing the Right Video Format: http://hotwired.lycos.com/webmonkey/html/96/44/index2a.html?tw=multimedia)

After the format issue, three video technologies used on personal computers will be introduced here. They are MPEG, QuickTime (for Windows and Mac.) and AVI (for Windows only).

MPEG: It is a standard for compressing sound and movie files into a small size format for downloading--or even streaming--across the Internet. The MPEG family of standards includes MPEG-1, MPEG-2 and MPEG-4. MPEG-1 takes key frames of video and fills only the areas which change between the frames. MPEG-1 produces only adequate quality video, far below that of standard TV. MPEG-2 compression improves video quality dramatically. With MPEG-2, a properly compressed video can be shown at near-laserdisc clarity with a CD-quality stereo soundtrack. Because of the quality afforded by MPEG-2, modern video delivery mediums use MPEG-2, such as digital satellite services and DVD. MPEG-4 builds on the three fields: digital television, interactive graphics applications (synthetic content) and the World Wide Web (distribution of and access to content). It provides the standardized technological

elements enabling the integration of the production, distribution and content access paradigms of the three fields.

QuickTime: Developed by Apple Computer, QuickTime is a method of storing sound, graphics, and movie files. Although QuickTime was originally made for the Macintosh, player software is available for Windows now. When a file contains the .mov extension, it requires QuickTime multimedia technology to run the file. MOV files can be movie clips, such as Video for Windows AVI files, or still images, such as GIFs.

In AVI (Audio/Video Interleave), picture and sound elements are stored in alternate interleaved chunks in the file. QuickTime and AVI provide a methodology for interleaving or blending audio and video data. Therefore, sound remains synchronized with video. Both technologies cannot provide high quality full-screen images at 30 frames per second without the aid of special add-on boards. Both technologies allow data to stream from disk into memory in a buffered and organized manner. (Vaughan, 1998)

Full-size, full-motion video requires that the computer deliver data at about 30 MB per second, which Mac and PC cannot handle. This problem can be overcome by digital video compression schemes or codecs (coder/decoder or compression/ decompression algorithm). Codecs are used to encode and decode (or compress and decompress) various types of data, particularly those that could otherwise use up disk space, such as sound and video files. Common codecs include those for converting analog video signals into compressed video files (such as MPEG) or analog sound signals into digitized sound (such as RealAudio). Codecs can be used with either streaming (live video or audio) or files-based (AVI, WAV) content.

FireWire (also known as IEEE-1394) is the digital interconnect for DV camcorders, DVCRs, and computers used for desktop video editing. It is a high-speed serial bus cable, designed by Apple to provide a cheap digital interface for consumer-grade products. While broadcast-quality video requires a heavy sustained transfer rate, FireWire can accommodate this heavy transfer with relative ease. It is also a peer-to-peer technology. A straight digital-to-digital transfer is possible by connecting FireWired video footage to a FireWired VCR.

References used:

1. Vaughan, T. (1998). Multimedia: Making It Work. Osborne/ McGraw-Hill.

2. Webmonkey: Multimedia: Video
http://hotwired.lycos.com/webmonkey/97/34/index1a.html?tw=multimedia

3. MPEG Home Page: http://drogo.cselt.stet.it/mpeg/

4. Codec: http://hotwired.lycos.com/webmonkey/97/34/index1a.html?tw=multimedia

5. CNET Resources: Glossary: QuickTime/AVI/MPEG:
http://coverage.cnet.com/Resources/Info/Glossary/

6. Choosing the right video format:
http://hotwired.lycos.com/webmonkey/html/96/44/index2a.html?tw=multimedia

7. FireWire: http://hotwired.lycos.com/webmonkey/98/13/index3a.html?tw=multimedia

8. Desktop Video World: http://idiots-guide.matroxusers.com/

Related links on the web for the topic:

1. Hypertech: http://www.hypertech.co.uk/vidsite/digvid.html

2. Silver List: http://www.well.com/user/richardl/theSilverList.html

3. MPEG: http://www.mpeg.org

4. Digital Video and IEEE-1394 Technical Papers and Videos:

http://www.chumpchange.com/parkplace/Video/TechPapers.htm

5. Digital Procer: http://www.digitalproducer.com/aHTM/HomeSet.htm

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