Multimedia and Web

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Introduction

- The word multimedia is made up of two separate words:-
  - Multi means many
  - Media means material through which information may be conveyed.
- So, multimedia means being able to communicate in more than one way.
- It is also the integration of multiple media elements together so that it can be presented in attractive and interactive manner.

Introduction

- Multimedia includes presentation which involves two or more media performing at the same time where media can be text, graphic, audio, video and animation. It typically means one of the following:-
  - Text and sound
  - Text , sound and still or animated graphics images.
  - Text, sound and video images.
  - Video and sound
  - Multiple display areas, images or presentations presented concurrently

Elements or components of Multimedia

- Text
- Graphics
- Audio
- Video
- Animation

Elements or components of Multimedia

- Text:
  - Characters that are used to create words, sentences and paragraphs. Text alone provides just one source of information. But it is the good at providing basic information. It is the vital element of multimedia menu, navigation system and content. It uses different styles, fonts and colors that can be used to emphasize specific points.
- Graphics:
  - Any figure that could be manually created by drawing, paintings or carvings etc. or by computer graphic technology is called graphics. It is the pictorial representation of data. In many circumstances, people dislike reading big amounts of material on computers. As a result, pictures are more frequently used than words to clarify concepts, offer background information, and so on. The use of visuals in multimedia enhances the effectiveness and presentation of the concept. Adobe Photoshop is a popular graphics editing program that allows you to effortlessly change graphics and make them more effective and appealing..

Elements or components of Multimedia

- Audio:
  - Sound is the most serious aspect of multimedia, delivering the joy of music, special effects, and other forms of entertainment. Audio files must occasionally be distributed using plug-in media players when they appear within online applications and webpages. MP3, WMA, Wave, MIDI, and RealAudio are examples of audio formats. MP3, WAV, AAC, AMR etc. are the popular file formats that supports audio.
- Video
  - Any thing that can be seen on the screen visually is called the video. They are the Photographic images that appear to be in full motion and are played back at speeds of 15 to 30 frames per second. he term video refers to a moving image that is accompanied by sound, such as a television picture. Of course, text can be included in videos, either as captioning for spoken words or as text embedded in an image, as in a slide presentation. The following programs are widely used to view videos: Real Player, Window Media Player, etc.

Elements or components of Multimedia

- Animation
  - Animation is the process of making a still image appear to move. A presentation can also be made lighter and more appealing by using animation. In multimedia applications, the animation is quite popular. The following are some of the most regularly used animation viewing programs: Fax Viewer, Internet Explorer, etc.

Application of multimedia

- Education and training
- Entertainment and fine arts
- Journalism and broadcasting
- Advertisement and marketing

Assignments

- What is multimedia ? Explain the elements/ components of multimedia.
- What are the applications of multimedia explain briefly.

Image file formats

- Image file formats are standardized specifications for storing digital images. Each format has its own unique characteristics, including compression methods, color depth, and transparency support. Here are some common image file formats:-
  - **JPEG (Joint Photographic Experts Group)**
  - **PNG (Portable Network Graphics)**
  - **GIF (Graphics Interchange Format)**
  - **TIFF (Tagged Image File Format)**
  - **BMP (Bitmap)**
  - **SVG (Scalable Vector Graphics)**
  - **WebP**
  - **HEIF/HEIC (High-Efficiency Image Format)**

JPEG (Joint Photographic Experts Group):

- JPEG (Joint Photographic Experts Group) is one of the most common image file formats used for storing digital photographs and images. JPEG uses lossy compression, meaning that it achieves smaller file sizes by discarding some image data. Due to its lossy compression, JPEG images can exhibit compression artifacts, such as blurriness, particularly at high levels of compression. Careful adjustment of compression settings can help minimize these artifacts while balancing file size. This compression can lead to a reduction in image quality, especially noticeable in areas with high levels of detail or sharp edges. However, the degree of compression can be adjusted to balance file size and image quality. JPEG supports 24-bit color, which allows for millions of different colors in an image. This makes it suitable for storing photographs and images with complex color gradients. JPEG is widely supported by image editing software, web browsers, and digital cameras, making it a versatile choice for sharing and displaying images across different platforms and devices.

JPEG (Joint Photographic Experts Group):

- JPEG is well-suited for photographs and images where a balance between file size and image quality is desired, such as sharing photos online or storing images on digital devices. However, it may not be the best choice for images with sharp edges or text, where lossless compression formats like PNG may be more appropriate.

PNG (Portable Network Graphics):

- PNG (Portable Network Graphics) is a raster graphics file format that was designed as a free and open-source alternative to GIF (Graphics Interchange Format). PNG uses lossless compression, meaning that it preserves all image data when saving a file. This results in high-quality images without any loss of detail or clarity. PNG supports alpha channel transparency, allowing for portions of an image to be completely transparent, partially transparent, or fully opaque. This makes PNG ideal for graphics such as logos, icons, and illustrations that require a transparent background. PNG supports various color depths, including 8-bit (256 colors), 24-bit (true color), and 32-bit (true color with alpha channel). This flexibility allows PNG to accurately represent a wide range of colors and color gradients. PNG files are platform-independent and can be displayed on different operating systems and web browsers without compatibility issues. This makes PNG a popular choice for web graphics and digital images that need to be shared across multiple platforms.

PNG (Portable Network Graphics):

- PNG files can include metadata such as textual information, copyright details, and creation date. This metadata can be useful for organizing and cataloging images, as well as providing information about the image's origin and usage rights. PNG files tend to be larger in size compared to compressed formats like JPEG, especially for images with complex or detailed content. However, the lossless compression ensures that the image quality remains high, making PNG suitable for images where preserving detail is important. PNG supports interlacing, a method of displaying images in a series of passes that gradually increase in detail. This can provide a better user experience when loading images on the web, as users can see a low-resolution preview of the image before it fully loads.
- PNG is well-suited for graphics, illustrations, and images that require transparency or lossless compression, such as logos, icons, and images with text. It is commonly used for web graphics, digital art, and images that need to be edited or manipulated without sacrificing quality.

GIF (Graphics Interchange Format):

- The Graphics Interchange Format (GIF) is a bitmap image format developed by CompuServe in the late 1980s. GIF uses lossless compression, meaning that no image data is lost during compression. This makes GIF ideal for images with sharp edges, text, or simple animations where preserving every detail is important. GIF images are limited to a maximum of 256 colors, which is suitable for simpler graphics with solid colors or images with limited color depth. This restriction allows for efficient compression while maintaining reasonable image quality. GIF supports animation by storing multiple frames within a single file. Each frame can have its own set of colors, allowing for simple animations such as looping sequences or short video clips. GIF animations are commonly used for memes, banners, and social media graphics. GIF supports transparency, allowing pixels in an image to be fully transparent, partially transparent, or fully opaque. This feature is useful for creating images with irregular shapes or for overlaying graphics on top of other content without a solid background. GIF files tend to be larger in size compared to more modern image formats like JPEG or PNG, especially for images with complex or detailed content. However, the lossless compression ensures that the image quality remains high, making GIF suitable for certain types of images and animations.

GIF (Graphics Interchange Format):

- GIF is well-suited for simple graphics, animations, and images where a limited color palette and lossless compression are desired. It remains popular for its wide support across different platforms and its ability to create lightweight animations that can be easily shared and viewed on the web.

TIFF (Tagged Image File Format):

- TIFF (Tagged Image File Format) is a flexible and widely used file format for storing raster graphics images. TIFF supports both lossless and lossy compression methods. Lossless compression retains all image data without any loss of quality, making TIFF suitable for preserving high-quality images in formats such as LZW (Lempel-Ziv-Welch) or ZIP compression. Lossy compression, such as JPEG compression within TIFF files, can be used to reduce file size but at the expense of image quality. TIFF supports various color depths, including grayscale, indexed color, true color (24-bit), and CMYK color spaces. This flexibility allows TIFF to accurately represent a wide range of images, from black-and-white photographs to full-color illustrations and photographs. TIFF files are platform-independent and can be used across different operating systems and software applications without compatibility issues. This makes TIFF a popular choice for storing high-quality images in various industries, including publishing, printing, and photography. TIFF files can be large in size, especially when storing high-resolution images or images with multiple layers and channels. While this can result in large file sizes, it ensures that the image quality is preserved, making TIFF suitable for archival purposes and high-quality printing.

TIFF (Tagged Image File Format):

- TIFF is a powerful and versatile file format for storing high-quality raster graphics images, with support for lossless compression, multiple layers and channels, extensive metadata, and platform independence. It is commonly used in industries such as publishing, printing, photography, and graphic design, where image quality and flexibility are paramount.

BMP (Bitmap):

- BMP (Bitmap) is a standard raster graphics image file format used to store bitmap digital images, independent of display device capabilities. BMP files are typically uncompressed, meaning they contain raw pixel data without any compression applied. This results in larger file sizes compared to compressed formats like JPEG or PNG but ensures that there is no loss of image quality due to compression artifacts. BMP files are platform-independent and can be used across different operating systems and software applications without compatibility issues. This makes BMP a reliable choice for storing bitmap images that need to be shared or viewed on different devices.
- BMP is a straightforward and widely supported format for storing bitmap images, particularly for applications where image quality and platform independence are priorities. However, its lack of compression and limited support for advanced features like transparency and metadata make it less suitable for certain use cases compared to other formats like PNG or TIFF.

SVG (Scalable Vector Graphics)

- SVG (Scalable Vector Graphics) is a vector graphics format based on XML (Extensible Markup language). SVG images are resolution-independent and can be scaled to any size without losing quality. This is because SVG images are defined using mathematical equations to describe shapes and paths, rather than using a fixed grid of pixels like raster graphics formats such as JPEG or PNG. It is primarily used for representing vector graphics, which are composed of geometric shapes such as lines, curves, and polygons. This makes SVG ideal for graphics that need to be scaled or resized, such as logos, icons, illustrations, and diagrams. SVG files are typically smaller in size compared to raster graphics formats like JPEG or PNG, especially for simple or geometrically complex images. This can result in faster loading times and improved performance for web-based applications. SVG is well-supported by modern web browsers, making it a popular choice for web graphics and interactive web applications. However, older versions of Internet Explorer (prior to IE9) have limited or incomplete support for SVG, requiring fallback options for compatibility.

SVG (Scalable Vector Graphics)

SVG allows for precise control over colors, gradients, strokes, and fills using CSS (Cascading Style Sheets) or inline styling. This flexibility enables designers to create visually rich and customizable graphics with sophisticated styling effects.

SVG is a versatile and widely supported format for creating scalable vector graphics with rich styling and interactivity. It is commonly used for web graphics, icons, logos, illustrations, charts, maps, and other types of visual content where scalability, flexibility, and interactivity are important considerations.

Web based multimedia

Web-based multimedia, however, is a term used to describe the multimedia (sound, video, or animation, text and images) found within web pages.

They are the multimedia content that is delivered and consumed over the internet through web browsers. This can include various types of media such as text, images, audio, video, animations, and interactive elements. Here are some key components and characteristics of web-based multimedia:

- HTML
- CSS
- JavaScript
- Images
- Audio and Video

Web based multimedia

Web-based multimedia plays a central role in modern web design and development, enabling the creation of interactive, dynamic, and visually compelling experiences for users across a wide range of devices and platforms.

Assignments

1. Explain about different web based multimedia.
2. Discuss about the future of web based multimedia
3. Explain the use of multimedia in business.