

Introduction to Multimedia

Multimedia means that computer information can be represented through audio, video, and animation in addition to traditional media (i.e., text, graphics/drawings, and images). Multimedia is a media that uses multiple forms of information content and information processing.

Multimedia is an interactive media and provides multiple ways to represent information to the user in a powerful manner. It provides an interaction between users and digital information. It is a medium of communication. Some of the sectors where multimedia is used extensively are education, training, reference material, business presentations, advertising and documentaries.

A TV system is a multimedia device as it gives information by using sound and video media. Similarly, a book having both text and diagrams is also a multimedia device as it gives information by using text and graphics.

A multimedia computer system requires:

- Larger storage devices for storing files
- Faster CPU for quicker processing of data
- Large memory for running programs having large data size
- Good graphics terminals for better images, animation and video
- Input-output devices to play any audio associated with multimedia application programs

Definition of Multimedia

By definition Multimedia is a representation of information in an attractive and interactive manner with the use of a combination of text, audio, video, graphics and animation. In other words we can say that Multimedia is a computerized method of presenting information combining textual data, audio, visuals (video), graphics and animations. For examples: E-Mail, Yahoo Messenger, Video Conferencing, and Multimedia Message Service (MMS).

Multimedia as name suggests is the combination of Multi and Media that is many types of media (hardware/software) used for communication of information.

Components of Multimedia

Following are the common components of multimedia:



- **Text**- All multimedia productions contain some amount of text. The text can have various types of fonts and sizes to suit the professional presentation of the multimedia software.
- **Graphics**- Graphics makes the multimedia application attractive. In many cases people do not like reading large amount of textual matter on the screen. Therefore, graphics are used more often than text to explain a concept, present background information etc. There are two types of Graphics:
 - **Bitmap images**- Bitmap images are real images that can be captured from devices such as digital cameras or scanners. Generally bitmap images are not editable. Bitmap images require a large amount of memory.
 - **Vector Graphics**- Vector graphics are drawn on the computer and only require a small amount of memory. These graphics are editable.
- **Audio**- A multimedia application may require the use of speech, music and sound effects. These are called audio or sound element of multimedia. Speech is also a perfect way for teaching. Audio are of analog and digital types. Analog audio or sound refers to the original sound signal. Computer stores the sound in digital form. Therefore, the sound used in multimedia application is digital audio.
- **Video**- The term video refers to the moving picture, accompanied by sound such as a picture in television. Video element of multimedia application gives a lot of information in small duration of time. Digital video is useful in multimedia application for showing real life objects. Video have highest performance demand on the computer memory and on the bandwidth if placed on the internet. Digital video files can be stored like any other files in the computer and the quality of the video can still be maintained. The digital video files can be transferred within a computer network. The digital video clips can be edited easily.
- **Animation**- Animation is a process of making a static image look like it is moving. An animation is just a continuous series of still images that are displayed in a sequence. The animation can be used effectively for attracting attention. Animation also makes a presentation light and attractive. Animation is very popular in multimedia application.

Multimedia Authoring Tools

Authoring tools are the software programs that allow people to create and deliver an experience for the end user. These are required, to create and present information on the computer because they provide an alternative to custom programming. Authoring tools provide ways to generate certain types of common interactions through the use of reusable templates or software modules that can be customized by a designer for a particular objective e.g. many training programs use multiple choice question format. An authoring tool can provide that format to a designer as a standard part of the system that can be modified to produce many variations on the format. There are various types of authoring tools available for the designer. These are:

1. Card or Page based authoring tools

This tool provides a simple and easily understandable metaphor for organizing multimedia elements. The designers first arrange their images into logical sequences or groups like chapters and pages of a book or cards in a catalog. Then the navigation routines become directives to go to a page or card that contains required elements. It contains media objects such as buttons, text files and graphic objects. It provides facilities for linking objects to pages (or) cards. The software required is hyper card. Hyper card is an authoring tool made for Macintosh machines. It comes with ready-to-use template stacks (e.g., data book, graph maker, phone dialer etc.). These templates help the new multimedia developers to learn it very easily and in less time.

2. Icon based or Event driven authoring tools

Icons (or) object based tools are the simplest event driven authoring object. Its provision of simple branching has the ability to go to another section of multimedia production. Multimedia elements and interaction are organized in the flowchart. A flow chart can be build by dragging appropriate icons from a library and then dropping them in the required field finally adding multimedia elements to it. The software required is Icon Author and Authorware which is available for macintosh and windows systems. Authorware has a complete set of tools for incorporating and editing multimedia elements created by other softwares.

3. Time based authoring tools

Time based tools are best suited for a message with a beginning and an end so that a message can be passed within a stipulated time period. Few time based tools facilitate navigation and interactive control. It has the branching technique so that different loops can be formed for different multimedia applications and time period can be set for these individual applications. The software required is Adobe's Directors, and is available for macintosh and windows systems. It is a powerful and complex authoring tool developed by macromedia. The major features of director are multimedia presentation creation, animations and interactive multimedia applications. It requires more time to learn.

4. Object-Oriented authoring tools

Object oriented authoring tools support environment based on object. In object-oriented authoring tools, the elements and events become objects that live in a hierarchical order of parent and child relationships. These objects use messages passed among them to do things according to the properties assigned to them. These are particularly useful for games, which contain many components with many personalities and for simulating real life situations, events and their constituent objects. For example, a video object will likely have a duration property i.e. how long the video plays and a source property that is the location of the video file. This video object will likely accept commands from the system such as play and stop. Some examples of the object oriented tools are: mTropolis (Mac/Windows), Apple Media Tool (Mac/Windows), Media Forge (Windows).

Applications of Multimedia

Following are the common areas of applications of multimedia.

- **Multimedia in Business-** Multimedia can be used in many applications in a business. The multimedia technology along with communication technology has opened the door for information of global work groups. Today the team members may be working anywhere and can work for various companies. Thus the work place will become global. The multimedia network should support the following facilities:
 - Voice Mail
 - Electronic Mail
 - Multimedia based FAX
 - Office Needs
 - Employee Training
 - Sales and Other types of Group Presentation
 - Records Management
- **Multimedia in Marketing and Advertising-** By using multimedia marketing of new products can be greatly enhanced. Multimedia boost communication on an affordable cost opened the way for the marketing and advertising personnel. Presentation that have flying banners, video transitions, animations, and sound effects are some of the elements used in composing a multimedia based advertisement to appeal to the consumer in a way never used before and promote the sale of the products.

- **Multimedia in Entertainment-** By using multimedia marketing of new products can be greatly enhanced. Multimedia boost communication on an affordable cost opened the way for the marketing and advertising personnel. Presentation that have flying banners, video transitions, animations, and sound effects are some of the elements used in composing a multimedia based advertisement to appeal to the consumer in a way never used before and promote the sale of the products.
- **Multimedia in Education-** Many computer games with focus on education is now available. Consider an example of an educational game which plays various rhymes for kids. The child can paint the pictures, increase reduce size of various objects etc apart from just playing the rhymes. Several other multimedia packages are available in the market which provide a lot of detailed information and playing capabilities to kids.
- **Multimedia in Bank-** Bank is another public place where multimedia is finding more and more application in recent times. People go to bank to open saving/current accounts, deposit funds, withdraw money, know various financial schemes of the bank, obtain loans etc. Every bank has a lot of information which it wants to impart to its customers. For this purpose, it can use multimedia in many ways. Bank also displays information about its various schemes on a PC monitor placed in the rest area for customers. Today on-line and internet banking have become very popular. These use multimedia extensively. Multimedia is thus helping banks give service to their customers and also in educating them about banks attractive finance schemes.
- **Multimedia in Hospital-** Multimedia best use in hospitals is for real time monitoring of conditions of patients in critical illness or accident. The conditions are displayed continuously on a computer screen and can alert the doctor/nurse on duty if any changes are observed on the screen. Multimedia makes it possible to consult a surgeon or an expert who can watch an ongoing surgery live on his PC monitor and give online advice at any crucial juncture.

In hospitals multimedia can also be used to diagnose an illness with CD-ROMs/ Cassettes/ DVDs full of multimedia based information about various diseases and their treatment. Some hospitals extensively use multimedia presentations in training their junior staff of doctors and nurses. Multimedia displays are now extensively used during critical surgeries.

- **Multimedia Pedagogues-** Pedagogues are useful teaching aids only if they stimulate and motivate the students. The audio-visual support to a pedagogue can actually help in doing so. A multimedia tutor can provide multiple numbers of challenges to the student to stimulate his interest in a topic. The instruction provided by pedagogue have moved beyond providing only button level control to intelligent simulations, dynamic creation of links, composition and collaboration and system testing of the user interactions.

- **Communication Technology and Multimedia Services-** The advancement of high computing abilities, communication ways and relevant standards has started the beginning of an era where you will be provided with multimedia facilities at home. These services may include:
 - Basic Television Services
 - Interactive entertainment
 - Digital Audio
 - Video on demand
 - Home shopping
 - Financial Transactions
 - Interactive multiplayer or single player games
 - Digital multimedia libraries
 - E-Newspapers, e-magazines

Advantages of Multimedia

- Multimedia **enhances the presentations** containing only text by adding sounds and attractive visuals.
- The viewers are **more attentive** to multimedia messages than traditional presentations like slides or overhead transparencies.
- Multimedia is **entertaining and educational**.
- The people show **more interest** in multimedia messages that combine the elements of text, audio, graphics and video. The **combination of communication modes** provides better understanding and retention of information.
- It can be used for a **wide variety of audiences**, ranging from one person to a whole group.
- It is **flexible**. Being digital, this media can easily be changed to fit different situations and audiences.