**VISION INSTITUTE OF MANAGEMENT**

**COMPUTER GRAPHICS & MULTIMEDIA APPLICATION**

**BCA 2nd YEAR/4th SEM**

**UNIT 5**

**MULTIMEDIA**

Multimedia is content that uses a combination of different content forms such as text, audio, images, animations, video and interactive content. Multimedia contrasts with media that use only rudimentary computer displays such as text-only or traditional forms of printed or hand-produced material.

## **Literal Meaning of Multimedia**

In this section, we will understand the literal meaning of multimedia.

* **Multi** − it means more than one
* **Medium** − it is singular and it means intermediary or mean
* **Media** − it is plural and it means conveying the information

Likewise, Multimedia is the field of Computer Science that integrates different forms of information and represents in the form of audio, video, and animation along with the traditional media, i.e., text, graphics/drawings, images, etc.

### Significant Features of Multimedia Computer System

Following are the major features multimedia computer system −

* Its Central Processing Unit (CPU) is very fast, as it needs to process large amount of data.
* It has huge storage capacity.
* It has huge memory power that helps in running heavy data programs.
* It has high capacity graphic card that helps in displaying graphics, animation, video, etc.
* The sound system makes it easy to listen to audio.
* With all these features (discussed above), a computer system is known as high end multimedia computer system.
* However, all the features listed above are not essentially required for every multimedia computer system, but rather the features of a multimedia computer system are configured as per the need of respective user.

## **Multimedia Components**

Following are the major components of a multimedia computer system −

### Text

It contains alphanumeric and some other special characters. Keyboard is usually used for input of text; however, there are some internal (inbuilt) features to include such text.

### Graphics

It is technology to generate, represent, process, manipulate, and display pictures. It is one of the most important components of multimedia application. The development of graphics is supported by a different software.

### Animation

Computer animation is a modern technology, which helps in creating, developing, sequencing, and displaying a set of images (technically known as ‘*frames*’). Animation gives visual effects or motion very similar to that of a video file (see image given below).

 

### Audio

This technology records, synthesizes, and plays audio (sound). There are many learning courses and different instructions that can be delivered through this medium appropriately.

### Video

This technology records, synthesizes, and displays images (known as frames) in such sequences (at a fixed speed) that makes the creation appear as moving; this is how we see a completely developed video. In order to watch a video without any interruption, video device must display 25 to 30 frames/second.

## **Multimedia Application**

Let us now see the different fields where multimedia is applied. The fields are described in brief below −

### Presentation

With the help of multimedia, presentation can be made effective.

### E-books

Today, books are digitized and easily available on the Internet.

### Digital Library

The need to be physically present at a library is no more necessary. Libraries can be accessed from the Internet also. Digitization has helped libraries to come to this level of development.

### E-learning

Today, most of the institutions (public as well as private both) are using such technology to education people.

### Movie making

Most of the special effects that we see in any movie, is only because of multimedia technology.

### Video games

Video games are one of the most interesting creations of multimedia technology. Video games fascinate not only the children but adults too.

### Animated films

Along with video games, animated film is another great source of entertainment for children.

### Multimedia conferencing

People can arrange personal as well as business meetings online with the help of multimedia conferencing technology.

### E-shopping

Multimedia technology has created a virtual arena for the e-commerce.

**Different stages for developing any MultiMedia project**

Multimedia and web projects must be undertaken in stages. Some stages should be completed before other stages begin, and some stages may be skipped or combined.

There are the four basic stages in any multimedia projects developing:-

 **1. Planning and costing:**

A project always begins with an idea or a need that you then refine by outlining its messages and objectives. Identify how you will make each message and objective work within your authoring system. Before you being developing, plan out the writing skills, graphic art, music, video, and other multimedia expertise that you will require.
Develop a creative graphic look and feel, as well as a structure and a navigational system that will allow the viewer to visit the messages and content. Estimate the time you'll need to do all the elements and then prepare a budget. Work up a shot prototype or proof of concept, a simple working example to demonstrate whether or not your ide is feasible.
The ease with which you can create materials with today's production and authoring tools tempts new developers to immediately move into production-jumping in before planning. This often results in false starts and wasted time and, in the long run, higher development cost.
The more time you spend getting a handle on your project by defining its content and structure in the beginning the faster you can later build it, and the less reworking and rearranging will be required midstream.
Think it through before you start! Your creative ideas and trails will grow into screens and buttons and your proof of concept will help you test whether your ideas will work. You may discover that by breaking the rules, you can invent something terrific!

 **2. Designing and producing:**

Perform each of the planned tasks to create a finished product. During this stage, there may be many feedback cycles with a client until the client is happy.

 **3. Testing:**

Test your programs to make sure that they meet the objectives of your project, work properly on the intended delivery platforms, and meet the needs of your client or end user.

 **4. Delivering:**

Package and deliver the project to the end user.

**Production of Multimedia Resources**

**Infrastructure**

Multimedia resources are based on the ability of the computer to capture, process, and present text, pictures, audio and video. Selection of proper hardware, software and file format for developing multimedia product is based on the budget and type of content in the product and delivery requirements. Following is a description of infrastructure requirement for producing multimedia resources-

**Hardware Requirement**

The special hardware requirement can be described in four categories i. e. Input devices, Output devices, Storage devices and Communication devices.

1. **Input Devices**

Input devices usually used for the production of multimedia resources are as follows-

1. **Keyboard**

A keyboard is the most common method of interaction with a computer. The most common keyboard for PCs is the 101 style, although many styles are available with more or fewer special keys, LEDs, and other features.

1. **Mouse**

A mouse is the standard tool for interacting with a graphic user interface. The buttons on the mouse provide additional user input, such as pointing and double-clicking to open a document, or the click and drag operation, or to move to and select an item on a pull down menu, to access context sensitive help.

1. **Touch screen**

Touch screens are monitors that usually have a textured coating across the glass face. This coating is sensitive to pressure and registers the location of the user’s finger when it touches the screen initiative to pressure and registers 89 the location of the user’s finger when it touches the screen. Touch screens are excellent for applications in a kiosk, at a trade show or in a museum delivery system.

1. **Scanner**

Scanner is the most useful equipment used in a multimedia project. It may be flat bed, hand held and drum scanners. The most commonly used scanner for multimedia application is colour flatbed scanners that provide resolute of 600 dots per inch (dpi) or better.

1. **Optical Character**

 Recognition Device After scanning, a document can be converted into a word processing document on the computer without retyping or rekeying, with the help of OCR system. OCR system uses a combination of hardware and software to recognise characters. Some examples of OCRs are Omni page from Scan soft, Recore from Maxsoft-Ocron. The OCR terminal can be of use to a multimedia developer because it recognizes not only printed characters but also handwriting. This facility may be beneficial at a kiosk or in general education environment where user friendliness is a goal, because there are growing demand for a more personal and less technical interface to data and information.

1. **Voice Recognition System**

Voice Recognition systems can be used for the hands-free interaction with the computer. These behavioural biometric systems usually provide a unidirectional cardioid, noise cancelling microphone that automatically filters out background noise and learn to recognize voice prints. These systems can trigger common menu events such as save, open, quite, print and other commands that are more specific to the application.

1. **Digital Camera and Video Camera**

Digital cameras capture the still image or video of a given number of pixels (resolution) and the images are stored in the camera’s memory to be uploaded later to a computer. The resolution of digital camera is determined by 90 megapixel rating. Video camera is a camera capable of recording live motion video with audio for later display. Data may be uploaded from the camera’s memory using a USB cable connected to the computer.

1. **Output Devices**

Following is a brief description of output devices used in a multimedia project-

1. **Monitors**

The monitors for a multimedia application must be high-end, large screen graphics monitor and liquid crystal display. Serious multimedia developers often attach more than one monitor to their computer, using add-on graphics boards. This is because many authoring systems allow working with several open windows at a time. So one monitor may be dedicated to view the work the developer is designing, and editing tasks can be performed in windows on other monitors that do not block the view of the work.

1. **Audio devices**

All the computers are equipped with an internal speaker and a dedicated sound chip, and they do are capable of audio without additional hardware. To abate advantages of inbuilt stereo sound external speakers are required. Altec Lansing’s three piece amplified speaker system is designed for multimedia applications.

1. **Video devices**

Video display devices, often called graphics adapters, enable the computer to present information on monitors capable of displaying up to 16 million colours. Television pictures can be displayed on the computer by installing a video digitizing board.

1. **Projectors**

Projector is required to show the presentation to large number of viewers. Cathode ray tube projectors, liquid crystal display, digital high 91 processing projectors, and liquid crystal on silicon projectors may be used for the multimedia applications.

1. **Printers**

With the advent of reasonably priced colour printers, a hard copy output has entered the multimedia scene. Many printers are available in the market i.e. laser printer, solid-ink printer, dye-sublimation printer, liquid inkjet printer and printers based on toner technology. Laser printers are the best in terms of quality output.

1. **Storage Devices**

Multimedia data requires very high storage capacity. The storage devices used are given as follows-

1. **RAM**

The Random Access Memory should be very good for graphics, audio and video production and writing multimedia products. Graphics memory also called VRAM (Video random access memory) for high resolution colour display may be used.

1. **Hard Disc**

There should be relatively fast hard drive systems for processing graphics, audio and video. Now fast, less expensive and large capacity HDD are available in the market. 120GB Hard disc is recommended for multimedia production.

1. **Magnetic Tapes**

It is a plastic ribbon which is usually ½ inch or ¼ inch wide, and 50 to 2400 feet long. Data are recorded on the tape in the form of tiny invisible magnetised and non-magnetised spots on the coated surface of the tape. The tape ribbon is itself stored in reels or in small cartridge or cassette. Four mm digital audio tape is most widely used type of magnetic tape in multimedia 92 applications. It uses a tape ribbon of 4mm and 60 or 90 meters long enclosed in a cartridge.

1. **Magnetic Disc**

Magnetic disc is a thin plate made of plastic usually coated on both sides with a magnetisable recording material. The information written on it can be erased or reused indefinitely. The information stored can be read many times, without affecting its quality. Floppy disc and hard disc are examples of magnetic disc. Most popular magnetic discs used in multimedia application are Zip disc, Jaz disc, super disc etc.

1. **Optical Disc**

Optical discs can store extremely large amount of data in a limited space. An optical-disc storage system consists of a rotating disc, which is coated with a thin metal or some other material that is highly reflective. Laser beam technology is used for recording and reading data on the disc. These are also called laserdiscs. It is found in the form of CD-R, CD-RW, and DVD. CDR is Compact Disc Recordable., CD- RW is Compact Disc Rewritable, and DVD is Digital Video Disc. There are three types of DVD, DVD-RW, DVDVideo and DVD-ROM. CDs and DVDs are the best for multimedia storage because of its huge storage capacity.

1. **Pen Drive and External Hard Disc**

The latest development in storage is the evolution of pen-drive and external hard-disc.