

UNIT-I

①

CONCEPT OF MULTIMEDIA ⇒

Multimedia is simply multiple forms of media integrated together. Media can be text, graphics, audio, animation, video, data etc.

Multimedia is the field concerned with the computer controlled integration of text, graphics, drawings, still and moving images (video), animation, audio and any other media where every type of information can be represented stored, transmitted and processed digitally.

for example ⇒ E-mail, Yahoo Messenger, Video Conferencing

Multimedia

Linear

It is a type of a multimedia that is designed to be presented in a sequential manner.

It is usually intended for display purpose with not much interaction from the audience.

ex Movie, Powerpoint presentation

Non Linear

It is a nonsequential type of media where the person's participation is crucial.

→ In this type of media

person needs to interact with computer program.

ex Website, Game DVD menu screen.

History of Multimedia => Newspaper were the first mass communication medium to employ Multimedia.

They used mostly text, graphics, and images.

In fact the term Multimedia is said to date back to 1965 and was used to describe a show by the Exploding Plastic Inevitable (Series of multimedia event).

This show include a performance that integrated music, cinema, special lighting & human performance.

Today, the word multimedia is used quite frequently, from DVD's to CD ROMs to even a magazine that includes text and pictures.

→ The term 'multimedia' was coined by Bob Goldstein to promote the July 1966 opening of his "Light Works".

→ In 1968 the term "multimedia" was re-appropriated to describe the work of a political consultant, ~~David~~ David Sawyer.

The evolution of Multimedia is a story of the emergence & convergence of these technologies.

Elements of Multimedia ⇒ Various components⁽³⁾

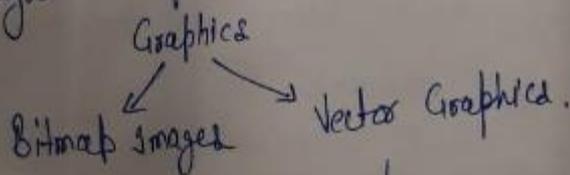
used in multimedia system are! →

1 Text ⇒ It is the primary component of multimedia. Text are used to create words, sentence and paragraph. Text in multimedia is mostly used for titles, menu, headlines, flash messages etc.

All multimedia productions contain some amount of text. The text can have various types of fonts and sizes to suit the professional presentation of multimedia software.

2 Graphics ⇒ A digital representation of non text information such as photographs, images, drawings etc are known as graphics. Every multimedia presentation is based on graphics. Graphics can be used with text in various projects.

It makes the multimedia application attractive. In many cases people don't like reading large amount of textual matter on the screen. So, graphics are used more often than text to explain a concept, present background information etc.



Bitmap Images \Rightarrow Bitmap images are real ^(u)

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.

Also called Raster image.

Bitmaps are comprised of individual pixels of color. Each pixel contributes to the overall image.

File types include: \Rightarrow .jpg, .gif, .bmp, when created by raster programs.

Vector Graphics: \Rightarrow Vector graphics are drawn on the computer and only require a small amount of memory.

Vector images are made up of paths, each with a mathematical formula (vector) that tells the path how to it is shaped and what color it is bordered with or filled by.

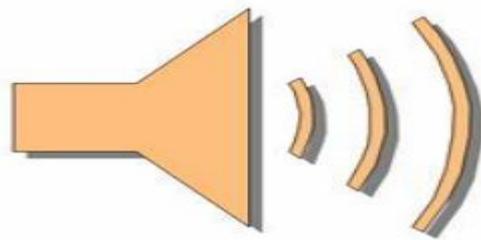
Vector images can be created and edited in programs such as Illustrator, CorelDraw, etc.

Because vectors can be infinitely scaled without loss of quality, they are excellent for logos, embroidery, artwork.

File types include: .ai, .cdr, .svg when created by vector programs.

3)Audio:- Sound can enhance your website design and social media platforms.

It is multimedia application that uses dialogue, recorded narration, music and sound effects. Audio is one of the important components of multimedia. The sound in form of speech, music or other way can be combined with animation and graphics to make the presentation more attractive and add more clarity to it. MP3, WMA ,Wave MIDI are common audio formats.



4)Video:-Video means moving pictures with sound. Video is a visual multimedia application that combines a sequence of images to form moving pictures and sound. Video can have an impact on websites and on social media platforms in a very unique and powerful way. It makes the presentation more presentable and save a large amount of time. Common digital video formats are flash,MPEG,AVI,WMV etc.



5)Animation:-The illusion of motion created by the consecutive display of images of static elements.

Flipping through a series of still images. It is a series of graphics that create an illusion of motion.



Hardware and Software for Multimedia-

Multimedia application usually requires more computer memory and processing power as compared to same information represented by text alone. A computer running multimedia application must have fast cpu, extra electronics memory and its screen should be enable to draw complex images. It should also have high capacity hard disk to store and retrieve multimedia information. In general the hardware requirement of multimedia system includes keyboard, monitor, mouse, sound card, memory faster processor and graphics display card.

Similarly multimedia application cannot work on any of the software.

Multimedia computers should support the capture, editing and viewing of video and audio data and provide facilities for the transfer of these data types between computers either through modems or through local and wide area networks.

To develop multimedia application we need the following hardware components:-

Most of the computers now-a-days come equipped with the hardware components required to develop/view multimedia applications. Following are the various categories in which we can define the various types of hardware required for multimedia applications.

Various hardware parts and their organisation in multimedia system is shown below in fig. 1.1.



Fig. 1.1. Parts of Multimedia Computer

The requirement of hardware components to play multimedia include following:

Processor: Intel pentium dual core or AMD A4APU.

Memory: 2 GB RAM

Hard Disk: 80 GB hard drive with at least 15% free space.

USB: Universal Serial Bus

MIDI: Musical Instruments Digital Interface

NIC: Network Interface Card

Generally the minimum requirement of multimedia computer is

- Processor: Pentium II 350 MHz
- Memory: 64 Mbytes
- Disk : 4 Gbytes
- CD ROM : 24 speed
- Sound Card: 16 or 32 bits
- Graphics card: one with 4 Mbytes of memory

These are the minimum requirements. The list can be expanded and specifications can be enhanced as per the needs.

1.3.1 Hardware Components of Multimedia

Various hardware components of multimedia system are:

- Capturing devices
- Storage devices
- Communication network

- Computer systems
- Display devices

Capturing Devices: Include Video camera, Video recorder, Web cam, Digital camera, Audio microphone, mouse, key board. Graphics tablets, digitisers, 3D input devices, scanners etc. They can capture various elements of multimedia like pictures, video, images, text, graphics etc.

Storage Devices: Include Hard disk, CD-ROM, Sound card, Jaz, Zip drives, MIDI, DVD etc. All of them can store various elements of multimedia.

Communication Networks used for multimedia system can be Ethernet, FDDI, Token ring, ATM, Intranets or Internet.

Computer Systems are the communication devices that include multimedia desktop computers, Workstations, MPEG/VIDEO/DSP hardware etc.

Display Devices include monitors, CD quality speakers, HDTV, SVGA, colour printers, plotters etc.

1.3.2 Multimedia Software

Hundreds of software packages are available from different manufacturers for creation of multimedia on PC. Most of these software are capable of performing graphics and image editing, audio and sound editing, video editing and animation authoring.

In image editing, these software provide the functions to merge images, alter image size, crop images, adjust colours, Remove unwanted part of image, sharpening and softening of image, orientation changes of image, contrast changes and adding text onto image etc.

Audio and sound editing part of these software's allow you to create audio clip with various sound effects like fading, echo etc.

The video editing tools of these software allow you to create your own original and unique movies for personal or business purposes. These software's have special built in effects for various types of video creations.

The animation authoring ability of these software allow you to create simple animation, advertisements, on line banners, web log or even your personal homepage with more ease. Adobe flash is one of the animation authoring software which has a capability to create on line web applications, movies, games etc. Thus any software that contains a basic tool set of painting and drawing tools, 3D

modelling and animation tools, image editing tools, sound editing tools, animation video and digital movie tools can be categorised as multimedia design software.

1.3.3 Various Categories of Multimedia Software

A multimedia design software is required for building multimedia projects. Any such software should have a basic tool set that can perform the tasks discussed in previous section. Thus the basic tool set of multimedia software can be classified as :

- Painting and drawing tools
- Image editing tools
- Sound editing tools
- Animation Video and Digital movie tools
- 3-D modeling and animation tools.

Accordingly various classes of multimedia design software are:

- Word processors
- Graphic packages
- Audio software packages
- Video software packages
- Animation software
- CD/DVD burner software
- Web publishing packages

Word Processors: are computer applications that are used for the production of any sort of printing material including composition, editing, formatting and printing. They include MS office word, Word perfect, Abiword, K word etc.

Graphics Packages are programs that allow you to create graphic items and figures. They allow to create images, graphs and other graphical designs. Some graphic packages include photoshop, paint shop pro, Ms paint, Illustrator etc.

Audio Software are programs that are used to edit and modify audio clips. They also allow you to create audio clips from existing audio lines or recorded audio. Examples of such packages are Audacity, Gold wave, Wavosaur, power sound editor, wave pad sound editor etc.

Video Software are the programs that capture and edit the video from VCR, camcorder or video recorder stored in a computer. They allow you to manipulate the source video, combine other elements to an existing video, editing a video and thus to produce a finished video as per your requirement. They also allow you to take any

scene from video and to set it at any location as per your need or into any other video to complete your project. These packages include adobe systems, i Movie, sony vegas movie studio, clesh, windows movie maker etc.

Animation software are those programs that allow graphics to be created, edited, manipulated and adjusted in such a way that characters are brought to life. This is called animation. Some 2D animation software include flash, Creation, Animatonish, Flip Boom etc. Similarly the 3D animation software are 3D studio max, swift 3D, Maya, Animator, Blender etc.

CD/DVD burner software are the programs that allow the user to record the text, video, graphics, sound, animation etc. into the device. Some such software are Nero Burning ROM, NCH express Burn etc.

Web publishing packages are those packages or applications which allow the user to design and create the projects and then publish them on the web. Examples of such software are adobe dream weaver, blogger, i web etc.

1.3.4 Software Need of Multimedia

To develop a multimedia project all classes of multimedia software should be installed in your personal computer so that the project can be developed and published properly. For example for your PC following software need to be installed to complete your multimedia project:-

- Adobe Dreamweaver CS4
- Adobe Flash CS3
- Note pad + +
- Adobe photoshop
- Sound editing application
- Video editing application

The multimedia software can be classified as

- System software
- Multimedia authoring tools

The **system software** sets up the communications between the system hardware and the application program (Authoring tool). It includes the examples video for windows, Quick time, Microsoft multimedia technologies, digital video interactive etc.

Multimedia Authoring tools are programs that help you write hypertext or multimedia applications. They enable you to create a final application by linking objects such as text, illustration, picture, clip, graph, song etc, together. They are also known as author ware. They provide the capability for creating a complete multimedia presentation including interactive user control. The examples include macromedia Flash, macromedia director, quest, Author ware, photoshop, Frontpage etc. Various types of authoring tools are card and page based tools, Icon based tools, event driven tools and time based tools.

Quality Criteria & Specifications of Different Capturing Devices, Comm. Devices etc =>

1) Processor => The heart of any multimedia computer is its processor. Today case 15 or higher processor is recommended for a multimedia computer.

- > CPU is considered as the brain of the computer.
- > CPU performs all types of data processing operations.
- > It stores data, intermediate result and instructions.
- > It control the operations of all parts of computer.

Some manufacturers adapted special microprocessor for multimedia applications.

MPoint / 6000 => is a multimedia accelerator chip developed by Chromatics is an example of such an approach.

Intel included the MMX technology in its processors to make them compatible to multimedia applications.

2. Multimedia Capturing Devices => The devices used for taking multimedia input like images, sound, video, input etc. are called as capturing devices.

Some of examples are: => keyboard, Touch Screen, Scanners

(1) Keyboard \Rightarrow The 101 key style keyboard is the most common keyboard used with multimedia PC. Now a days keyboards with special keys, LED's etc are also ~~in use~~ in use with multimedia PC. It helps in inputting the data to the computer.

(2) Mouse \Rightarrow It is the most popular pointing device. It is also called as cursor - control device. They are used for clicking, dragging, double clicking in multimedia projects.

(3) Touch Screen \Rightarrow are the monitor having texture coating across the glass face. They are excellent for application in a kiosk.

(4) Scanner \Rightarrow It is the most useful equipment for multimedia projects. They are of 3 types namely flat bed, hand held & drum scanners. Multimedia applications use coloured flat bed scanners that provide resolution of 600 dots per inch or better.

(5) OCR Device \Rightarrow OCR (Optical Character Reader) \Rightarrow convert a scanned document into word processing character. It scan text optically character by character.

2) Voice Recognition System \Rightarrow are used for hand free interaction with computer. They provide unidirectional cardioid, noise cancelling microphones that automatically filter out the background noise & learn to recognise voice prints.

~~Voice~~

Video Camera \Rightarrow are capable of recording live motion video with audio.

(a) Webcam \Rightarrow It is a simple digital camera that can take video or still images for transmission over the Internet. They are generally used in live chat like video conferencing.

\hookrightarrow features of Webcam

1) Megapixels \Rightarrow tiny dots of colour that make the resulting visual image, when combined.
for good image \Rightarrow 640 x 480 pixels.
HD specification \Rightarrow 1280 x 720 pixels.

2) Frame Rate \Rightarrow is what controls how smooth the video quality is. It decides how many images display per second.
Higher quality webcam \Rightarrow 60 FPS

Lens Quality \Rightarrow criteria for sharp image. Glass lens is better than plastic lens.

Continuous Autofocus \Rightarrow enables the webcam to keep you as main focus.

Low Light Quality \Rightarrow It enables the image quality in low light condition like evening or cloudy day.

(b) Digital Camera \Rightarrow that captures the image in digital memory.

Many digital cameras can record moving videos with sound. Some digital cameras can perform various image edition functions.

Features \Rightarrow 1) Resolution must be higher for clear picture.

2) Lens Aperture \Rightarrow Lenses not slower than f/2.8 are better for your multimedia project.

3) Lens Quality \Rightarrow Glass lens have better quality.

(c) MIDI \Rightarrow Musical Instrument Digital Interface \Rightarrow It is a standard protocol for describing communications b/w computers & musical instrument.

(d) Microphone \Rightarrow It is used to convert sound into electrical signals. Its sensitivity & Directivity are main features.

(e) Sound Cards \Rightarrow Sound cards are plug in boards in PCs of multimedia.

• Criteria \Rightarrow o/p voltage, Linearity, signal to noise, frequency response, input voltage etc.

(f) Video Capturing Card \Rightarrow are used to capture live video from various sources including VCRs, Cable TV, Broadcast TV etc.

Multimedia Storage Devices \Rightarrow Multimedia Data requires

very high storage capacity.

ex RAM, Hard disk, Magnetic Tapes, magnetic discs, Pen Drives, External hard disk etc.

RAM : for multimedia applications: RAM should be very good. As it needs to store graphics, Audio & video production along with writing of multimedia products. Graphics Memory (VRAM) for high resolution color display is required with multimedia PC.

Hard Drive \Rightarrow PC needs faster hard drive system for processing Audio, video & graphics, 120 GB hard disk is recommended for multimedia production.

Magnetic Discs \Rightarrow are thin plates (made of plastic mostly) coated with magnetized recording material on both sides. Floppy disk, hard disc are examples of them. They are usable as data stored on them can be erased, or deleted.
ex 2ff disc, 3oz disc etc.

Optical Disc \Rightarrow can store extremely large amount of data. They have smaller size than magnetic disc with much more capacity. They are found in form of CD-R, CD-RW, DVD, DVD-RW etc.

PEN DRIVES \Rightarrow It is the latest development in storage. They are small in size with large capacity in form of a small rectangular pen. They can be connected to your PC with USB port and can be carried anywhere with much ease & least or no damage.

COMMUNICATION DEVICE \Rightarrow The communication channel & transferring devices are counted in communication devices for multimedia.

The key issue for multimedia communication is bandwidth bcoz the size of multimedia data file (especially for audio, video & graphics) is extremely large.

Bandwidth \Rightarrow It is the amount of information that can be transmitted across a network within a stipulated (certain) time period. Measured in bits per second.

Types of Multimedia Products

Synchronous

Asynchronous

1) Synchronous or Real time Applications transmit & receive data in real time, thus allowing the user to view and hear when created & captured directly without delay.

2) Asynchronous applications first stores the data and then forward it to user through the communication channel. So they ~~are~~ are stored first for future use.

Various communication devices used for multimedia applications include => Modem, New devices, VCI card etc.

Modem => modulates & demodulates analog signals so that they can move on communication lines.

Today's multimedia standard dictate atleast a 56 kbps modem. Cost over long distance can be reduced using compression.

ISDN (Integrated Services Digital Net) by telephone department is high speed network devices/lines.

They offer 128 kbps data transfer rate & hence recommended for multimedia projects. ISDN & DSL modems are external devices in which one end connects to the telephone line & other end connect to port on system.

USB \Rightarrow Universal Serial Bus \Rightarrow With the introduction of multimedia applications the number of devices connected to the computers have increased considerably and this has created problem in management & maintenance of the systems. To avoid the increased no. of connectors being used the USB has been developed. Using the USB the following devices can be connected to the computer from the single port.

- \Rightarrow Peripheral Devices.
- \Rightarrow Telephony Equipment.
- \Rightarrow I/O devices \rightarrow Networking Devices.

Sound Card \Rightarrow It is one of the communication device used with multimedia computer.

Video Graphics Interface Card \Rightarrow It is used to display a digital data on an analog monitor. A graphics adapter should be capable of displaying a 350×240 video at 30 frames per second without dropping any frames.

Network Interface Card \Rightarrow It is an adapter card, USB network adapter card that enables a computer or device that doesn't have networking capability to access a network. A n/w card follows the guidelines of a particular n/w communications standards such as Ethernet or token ring.

• Router \Rightarrow A router is a communication device that connects multiple computers or other routers together and transmits data to its correct destination on the Net. Can be used at any size of Net.

Multimedia Display Devices \Rightarrow There are variety of display devices that are used with multimedia system to display. Display device is an output device used to represent the information in the form of images (visual form).

Display systems are mostly called a video monitor or video display unit (VDU).

Monitor or CRT \Rightarrow Cathode ray tube. This technology is used in traditional computer monitor and televisions.

CRT is a particular type of vacume tube that display images when an electron beam collides on a radiant surface. They use refreshing of 30 to 100 times a second for clearer and stable image, common refresh rate is 70Hz.

\rightarrow Higher the refresh rate more stable & clearer is the image. Series multimedia developer attach more than one monitor using add-on graphics board usually.

LCD \rightarrow Liquid Crystal Display. \rightarrow are more energy efficient with lesser weight, size and power consumption. It uses a layer of material that can change its optical properties when electric current is applied to it.

Video Projectors \rightarrow are very costly and they have digital light processor in it.

Video Display devices also called graphics adapters enable PC to display images in upto 16 million colours. Video digitizing board can be used to display television picture on computer.

Speakers & Sound System \rightarrow are in fact not displaying anything but are an integral part of display devices in multimedia.

Multimedia File Format:→ There are various file format that are used to transport multimedia data .

What is a file format?

Clip slide

A **file format** is the structure of how information is stored (encoded) in a computer **file**. **File formats** are designed to store specific types of information, such as JPEG and TIFF for image or raster data, AI (Adobe Illustrator) for vector data, or PDF for document exchange.

Categories Based on Purpose:->

1)General Purpose Format:→are designed as transports to carry many different types of data for many different types of applications.Example:->

MPEG:-> MPEG is used to encode audio, video, text, and graphical data within a single, synchronized data stream.

2)Special Purpose Formats:-that are geared towards a special purpose.Example:->a) Sega FILM format:used on may Sega CD and Sega Saturn CD-ROM.

b)Bink Format:description of RAD GameTools(.bik) file format

Categories of files

- ▶ **Uncompressed**- files that are not compressed and are capable of having a large file size.
- ▶ **Lossless**- files that are compressed but doesn't lose any quality to the file.
- ▶ **Lossy**- files that lose some quality when being compressed.

TYPES OF FILE FORMAT

- ❖ Animation File Format
- ❖ Audio File Format
- ❖ Video File Format
- ❖ Image File Format

AUDIO FILE FORMAT

- ▶ **Audio** is an electrical or other representation of sound.
- ▶ An **audio file format** is a file format for storing digital audio data on a computer system.
- ▶ It can be a raw bitstream, but it is usually a container format or an audio data format with defined storage layer.



1) MPEG:-Moving picture Export Group :-> (.MP3)

- a. Lossy Data Compression
- b. One minutes of music take up approx... 1MB space.

- c. MPEG Layer-3 format is the most popular format for storing and downloading music. The MP3 files are roughly compressed to one-twelfth of the size of original file.

2) WAV :-> Waveform audio File Format (.wav)

- a. Uncompressed File
- b. It is a proprietary format that is sponsored by Microsoft and IBM
- c. 1 minutes audio needs 10 MB storage(approx.)
- d. Also stores the information about the file's number of track, sample rate, bit depth or whether it is mono or stereo.

3) MIDI:-Musical Instrument Digital InterfaceⓈ.mid/.midi)

- a. MIDI, or Musical Instrument Digital Interface, is a standard protocol for the interchange of musical information between musical instruments, synthesizers, keyboard controllers, sound cards, computers and all other electronic instruments
- b. It is a description of how to create a sound based on predefined sound.
- c. MIDI files differ from most other types of music files in that they do not contain encoded sound (e.g. as in a WAV file).
- d. A MIDI file is very small, often as small as 10 KB for a 1-minute playback
- e. Not Compressed.

4) OGG file format;->(.ogg)

- a. Compressed Format
- b. OGG is a free, open container format created under unrestricted software patents by the Xiph.

5) WMA:->(.WMA)

- a. Compressed
- b. Microsoft file format

VIDEO FILE FORMAT

Video files are collections of images, audio and other data. The attributes of the video signal include the pixel dimensions, frame rate, audio channels, and more. In addition, there are many different ways to encode and save video data. This page outlines the key characteristics of the video signal, and the file formats used to capture, work with, and deliver that data.

1) AVI: → (.avi)

- ❖ Developed by Microsoft(1992).
- ❖ One of the oldest video format
- ❖ AVI file are able to run on different systems like windows,macintosh, Linux.

2) WMV: → (WINDOW MEDIA VIDEO)

- ❖ **Developed by Microsoft .**
- ❖ **Originally designed for Web Streaming applications.**
- ❖ WMV files are the tinnest video files over the web.
- ❖ **Due to compression, result in poor video quality.**

3) MOV: → MOV(Apple Quick Time Movie):-

- ❖ Developed by Apple.
- ❖ Usec for saving movies and videos.
- ❖ MOV files are of High quality and usually big in file size.

4) MP4(Moving Pictures Expert Group4):-

- ❖ **It is a standatd developed by Motion Pictures Expert Group who was responsible for setting industry standards regardind digital audio and video.**
- ❖ Lossy Data Compression
- ❖ **Quality remains high even after compression.**

IMAGES FILE FORMAT:→ Provide Standardized method of organizing and storing data.

1)JPEG:→(.jpg or .jpeg)

- ❖ JPEG" stands for Joint Photographic Experts Group, the name of the committee that created the JPEG standard and also other still picture coding standards.
- ❖ Using Lossy Compression Technique allowing very small files of lower quality.
- ❖ Suitable for photographs.
- ❖ Supported by all browsers.

TIF:→ (Tagged Image file format)

- ❖ Used in desktop publishing.
- ❖ Highest quality format of commercial work.
- ❖ Very large file size
- ❖ May or may not be compressed.
- ❖ Not supported by all browsers.
- ❖

3)GIF:→Group interchange Format(.gif)

- ❖ **Suitable for text, artwork, icons.**
- ❖ **Supported by all web browsers.**
- ❖ Support 8 bit colors.
- ❖ Used lossless compression

4)PNG(Portable Network Graphics):→(.png)

- ❖ Support for text , icons, etc.
- ❖ Support 24 bit colors.
- ❖ Not supported by all web browsers.
- ❖ Used looseless compression techniqe.
- ❖ Can replace GIF.

ANIMATION FILE FORMAT:→specially designed for containing the animation.

- .dir and .dcr - Director files.
- .fli and .flc - AnimatorPro files.
- .max - 3D Studio Max files.
- .pics - SuperCard and Director files.
- .fla and .swf - Flash files.
- GIF89a file format:
 - It is a version of the GIF image format.
 - GIF89a allows multiple images to be put into a single file and then be displayed as an animation in the Web browser.

Multimedia Application \Rightarrow Common Multimedia Applications include

games, learning, software, reference material, art, engineering etc.

(a) Multimedia in Public Places: In hotels, train stations, shopping malls, museums & grocery stores, multimedia will become available at stand-alone terminals to provide information and help.

Such installation reduce demand of traditional information booths and personnel, add value, & they can work around the clock, even live help is off duty.

(b) Creative Industry: \Rightarrow Creative industry use multimedia for a variety of purpose ranging from fine arts, to entertainment, to commercial art, to journalism, to media, and s/w services provided for any of the industries.

(c) Commercial \Rightarrow The commercial application of multimedia especially include the advertising. Attractive presentations are used to grab and keep attention for advertising. Governmental services & nonprofit services applications are also developed by commercial multimedia developers.

(d) Entertainment & fine Arts \Rightarrow Multimedia is largely used in the entertainment industry. It is used to develop special effects in movies and animations. Multimedia is also used for creating wonderful games. Some video games also use multimedia features.

(e) Education \Rightarrow Multimedia is successfully used to provide computer based training courses and reference books like encyclopedias. A CBT lets the user go through a series of presentations, text about a particular topic.

Education + Entertainments \Rightarrow Edutainment
↓
Provides education through entertainment.

(f) Engineering \Rightarrow Multimedia is used in Computer Simulations by software engineers for anything from entertainment to training such as military or industrial training.

(g) Industry \Rightarrow It is used as a way to help present information to shareholders, superiors and coworkers in industries. Also helpful for providing employee training, advertising & selling products all over the world.

(b) Mathematical & Scientific Research : It is mainly used for modeling and simulation in the field of mathematics and scientific research.

(c) Medicine \Rightarrow Multimedia learner also can be used by doctors to get fascinated by looking at a virtual Surgery. They can also simulate how the human body is affected by diseases spread by viruses & bacteria with the help of any such application.

(d) Document Imaging \Rightarrow is a technique that takes hard ~~base~~ copy of an image/document & convert it into digital format & this is possible with the help of multimedia.

(e) Telemedicine Document Imaging : It is the exchange of medical information from one location to another using electronic communication, which improves patient health status. We can use telephone, satellite technology, video-conferencing equipment to conduct a real time consultation b/w medical specialists at two different locations.

(1) KIOSK \Rightarrow It is a computer terminal that provides information access via electronic method

The first self-service kiosk was developed in 1977 at the University of ~~Ill~~ Illinois by a student, Murray Lappe. Lappe's kiosk called The PLATO HOTLINE allowed students and visitors to find movies, maps, bus schedules, courses & email student organizations.

ex Gaming kiosk, Food Order kiosk, Internet Cafe, Electronic kiosk, Hoteling, ATM Machine, Pharmacy

Benefits & Problem with Multimedia

Benefits \Rightarrow 1) Deep Understanding \Rightarrow Multimedia leads to deeper understanding of any problem. Images, animation & video can be used very effectively to emphasize a point. A picture can speak a thousand words, so the saying goes.

- 2) ~~is~~ More appealing.
- 3) Gains & hold Attention.
- 4) Increase learning effectiveness.
- 5) Reduce training cost.
- 6) Multi-Sensory

- 7) Integrated & Interactive.
- 8) Entertaining & Educational
- 9) Increase Learning effectiveness.
- 10) It is Entertaining as well as Educational.

11) Provide good quality of information representation

Disadvantages of Multimedia

- 1) The hardware requirement is much more.
- 2) The application development is costly and time consuming
- 3) The application development needs experts and multimedia experts are less available.
A person with less knowledge can't create a meaningful multimedia application.
- 4) The multimedia projects are much more complex
- 5) Limitation of Technology.
- 6) Take time to complete