UNIT – 02 : MULTIMEDIA SYSTEM AND ITS APPLICATIONS

➢ Sound and Video cards.

➢ Compression techniques.

➢ Memory & Storage devices.

➢ Input devices, Output hardware,

➢ Communication device.

➢ Introduction of Multimedia authoring tools & its types.

Questions to be discussed:

1. What is multimedia system?
2. Discuss about sound card and video card in details.
3. Explain different types of compression technique in multimedia.
4. What is multimedia authoring tools? Discuss different types of authoring tools in multimedia.
5. Write short notes on :
   a. Communication devices
   b. Storage devices

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What are Multimedia Systems?

- Any system that process multimedia data like text, sound, video, graphics, and animation is called multimedia system.
- A multimedia system is responsible for developing a multimedia application.
- A multimedia application is a bundle of different kinds of data.
- A multimedia system is a system that can process, integrate, store two or more types of media materials in digital form, such as audio, image, video, and text information.

What is sound card?

- A sound card is an expansion card for producing sound on a computer.
- A sound card mainly digitizes the analog signal and these digitized voice can be stored on hard disk.
- Its output sound can be heard with the help of speakers or headphones.
- A sound card is also known as an audio output device, sound board, or audio card.
- It was invented by Sherwin Gooch in 1972.
- The primary use of a sound card is to provide sound that you hear from playing music.
- There are many applications where a sound card can be used :
  - Games.
  - Watch movies.
  - Audio and video conferencing.
  - Business presentations.
 - Listening to music.

What is video card?

- Video card is hardware component of computer.
- It is used to create videos or images on the computer screen.
- A video card is an expansion card that connects to the motherboard.
- Video card is also known as graphics card, video adapter or video controller etc.
- IBM developed their first two video cards, the MDA (Monochrome Display Adapter) and CGA (Color Graphics Adapter), in 1981.

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Compression techniques :

- It is a technique in which the size of data is reduced without loss of information.
- Data compression is used whenever there is a need to reduce the size of data.
- The use of data compression techniques in digital communication greatly helps in
  - reducing the time for a file transfer,
  - the cost of storage, and
  - traffic in the network.
- It is also known as compaction.
- There are two types of data compression techniques:
  1. Lossy
  2. Lossless
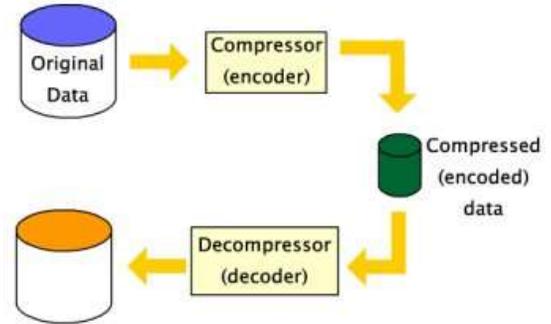
Difference between Lossy Compression and Lossless Compression:

Lossy Compression	Lossless Compression
Lossy compression reduces the size of data.	Lossless Compression does not reduce the size of data. It only "packs" data into a smaller file size.
In Lossy compression, Data's quality is compromised.	But Lossless Compression does not compromise the data's quality.
In Lossy, A file does not restore in its original form.	While in Lossless, A file can be restored in its original form.
It is also termed as irreversible compression.	It is also termed as reversible compression.
Lossy compression is used in Images, audio, video.	Lossless Compression is used in Text, images, sound.

Memory & Storage devices :

- A storage unit is a part of the computer system where data & instructions to be processed and stores the result after processing when required.
- Without a storage device, a computer would not be able to run or even boot up.
- we can say that a storage device is hardware that is used for storing data files.
- It can also store information/data both temporarily and permanently.
- Computer storage is of two types:
  1. Primary Storage Devices
  2. Secondary Storage Devices

Primary Storage Devices:

- It is also known as internal memory and main memory.
- This is a section of the CPU that holds program instructions, input data, and intermediate results.
- It is generally smaller in size, costly and high speed semiconductor memory.
- RAM (Random Access Memory) and ROM (Read Only Memory) are examples of primary storage.

Secondary Storage Devices:

- Secondary storage is a memory that is stored external to the computer.
- It is mainly used for the permanent and long-term storage of programs and data.
- Hard Disk, CD, DVD, Pen/Flash drive, SSD, etc, are examples of secondary storage.

Input Devices :

- It is a hardware component of computer system.
- It is used to enter the data & instruction into the computer.
- Input device enables the user to send data, information, or control signals to a computer.
- The CPU of a computer receives the input and processes it to produce the output.
- Some of the popular input devices are:
  - Keyboard
  - Mouse
  - Scanner
  - Joystick
  - Light Pen etc.

Output hardware:

- Presentation of multimedia project needs some devices through which the multimedia elements may be delivered to the user.
- It is a hardware component of computer system which is used to view result.
- Some of the popular output hardware are:
  - Monitor
  - Amplifiers & speakers
  - Video digitizing board
  - Projectors etc.

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Communication device:

- Any hardware that can send & receive data, instructions & information is called communications device.
- It is a hardware device capable of transmitting an analog or digital signal over the telephone, other communication wire, or wirelessly.
- The most common example of a communication device is a computer modem.
- Communication device examples :
  - Bluetooth devices
  - Infrared devices
  - Modem (over phone line)
  - Network card (using Ethernet)
  - Smartphone
  - Wi-Fi devices.

Multimedia Authoring:

- Multimedia authoring is a process of assembling different types of media contents like text, audio, image, animations and video as a single stream of information with the help of various software tools.

Multimedia Authoring tools :

- An authoring tool is a software program that enables the developer to create presentation by combining text, audio, video, graphics and animation. Multimedia Authoring tools are also known as author ware.
- It gives the framework for organizing and editing the components of a multimedia project.
- These are the tools which provide the capability for creating a complete multimedia presentations.
- There are 4 types of multimedia authoring tools :
  1. Card or Page based authoring tools
  2. Icon based or Event driven authoring tools
  3. Time based authoring tools

Card or Page based authoring tools:

- In these authoring tool, elements are organized as pages of a book or a stack of cards.
- It contains media objects such as text fields, buttons and graphics object.
- It provide facility for linking object to page and cards.
- You can jump from page to another page because all pages can be interrelated.
- Every page or cards may contain many media elements like sounds, videos and animations etc.
  - ❖ Hypercard (Mac)
  - ❖ Tool book (Windows)
  - ❖ PowerPoint (Windows)

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Advantages

➢ Easy to understand.

➢ One screen = 1card or 1page.

➢ Easy to use as these tools provide template.

➢ Short development time.

Disadvantages

➢ Some run only on one platform.

➢ Tools are not powerful.

Icon based or Event driven authoring tools:

▪ Icon-based tools has simplest and easiest authoring process.

▪ It contains multimedia elements that are organized in the form of flowchart.

▪ Flowchart can be built by dragging appropriate icons from the library and adding the content.

▪ Each icon does a specific task, for example- plays a sound, open an image etc.

▪ Some examples of icon based tools are:

➢ Author ware Professional (Mac/Windows)

➢ Icon Author (Windows)

Advantages:

➢ Clear Structure.

➢ Easy editing and updating

Disadvantages:

➢ Difficult to learn.

➢ Expensive.

Time based authoring tools :

▪ Time based authoring tools allow the designer to arrange various elements and events of the multimedia project along a well defined time line.

▪ As the time advances from starting point of the project, the events begin to occur, one after another.

▪ The speed at which these transitions occur can also be accurately controlled.

▪ These tools are best to use for those projects, wherein the information flow can be directed from beginning to end much like the movies.

▪ Some example of Time based tools are:

➢ Macromedia's Director

➢ Macromedia Flash

Advantages

➢ Good for creating animation.

➢ Branching, user control, interactivity facilities.

Disadvantages

➢ Expensive

➢ Large file size