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UNIT-1

Introduction to Computers

⊛ Introduction to multimedia system, history and applications:

The computer information that can be represented through audio, video, text, image, graphics, animation etc. is called multimedia. Multimedia system is any system that supports more than a single kind of media. like any system processing text and image will be a multimedia system.

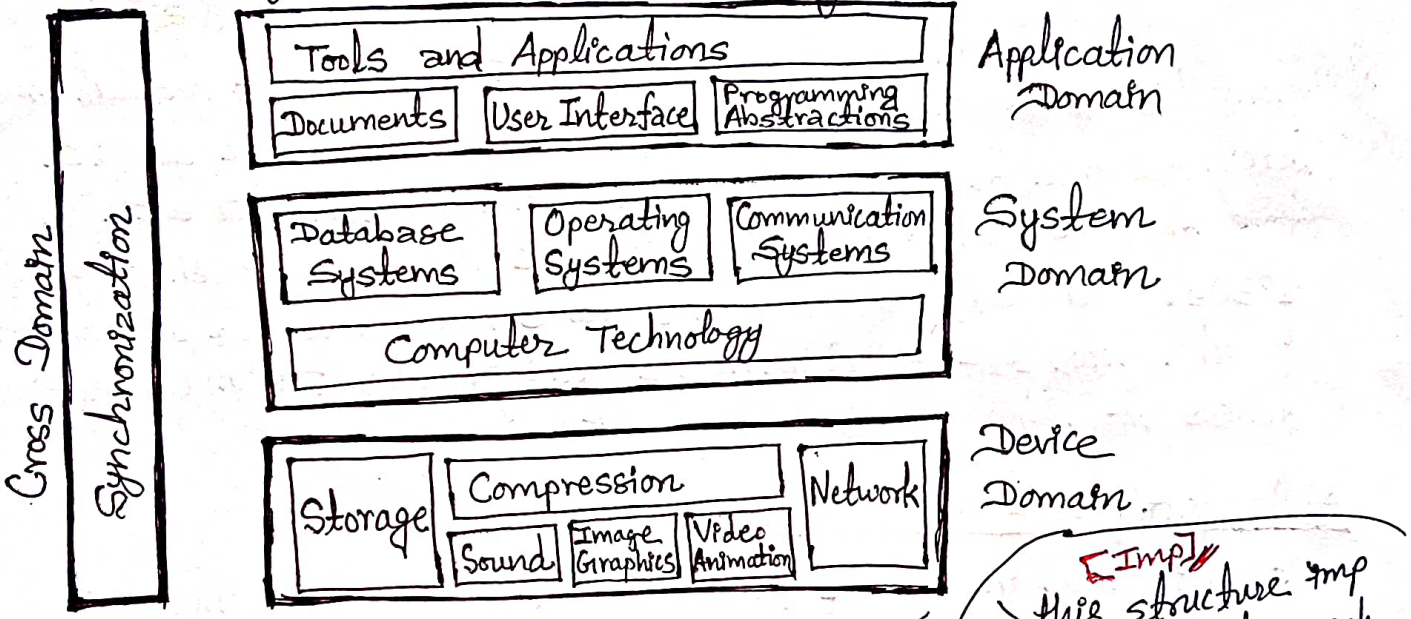

Fig: Global structure of multimedia.

Device Domain → It provides basic concepts for the processing of digital audio and video data that are based on digital signal processing. Different methods for the processing of image, graphics and animation are described. The audio techniques section includes music (MIDI) and speech processing. The understanding of video techniques is mainly built on TV development including digital representation and HDTV.

System Domain → It includes all supports for using the functions of the device domain e.g, operating systems, communication systems and database systems. The interface between the device domain and system domain is specified by the computer technology.

Application Domain → It provides functions to the user to develop and present multimedia projects. This includes software tools, and multimedia projects development methodology.

⑧. History of Multimedia: (lesser imp)

The use of multimedia to communicate ideas might begin with newspapers, which were perhaps the first mass communication medium using text, graphics and images. Before still-image camera was invented, these graphics and images were generally hand-drawn.

Joseph Nicephore Niepce captured the first natural image from his window in 1826 using a sliding wooden box camera. Later, Alphonse Giroux built the first commercial camera with a double-box design. Motion pictures were originally conceived in 1830s. Gradually multimedia systems were developed and improved in the year 1967 to 1998. No we have modern advanced multimedia devices with huge quality and features.

⑨. Applications of Multimedia:

→ Multimedia in business for voice mail, electronic mail, employee training, Records management etc.
→ Multimedia in marketing and advertising.
→ Multimedia in Entertainment.
→ Multimedia in education. ← we can describe these points in short if asked in exam
→ Multimedia in bank.
→ Multimedia in hospital.
→ Digital video editing and production systems.
→ World Wide Web.
→ Video Conferencing.

⊛. Medium:

A medium is a third-party or element through which a message is communicated. For example computer system medium can be text, image, sound, video.

Types of medium/Classification of media: [Imp]

1) **Perceptron medium** → Perceptron medium/media help human to sense their environment. The question is how human get information in a computer environment. The answer is through seeing and hearing.
   Seeing → through seeing text, image and video.
   Hearing → hearing media such as music noise and speech.

2) **Representation medium** → Representation media are defined by internal computer representation of information. The question is how the computer information is coded? The answer is that various format are used to represent media information in computer.
   → Text, character is coded in ASCII code.
   → Image can be coded as JPEG format.

3) **Presentation medium** → Presentation media refers to the tools and devices for the input and output of the information.
   Output media: paper, screen and speaker.
   Input media: Keyboard, mouse, camera, microphone.

4) **Storage medium** → Storage media refer to the data carrier which enables storage of information. The question is how will information be stored? The answer is hard disk, CD-ROM etc.

5) **Transmission medium** → Transmission media are the different information carrier that enables continious data transmission. The question is over which information will be transmitted? The answer is co-axial cable, fiber optics as well as free air.

6) **Information exchange medium** → Information exchange media includes all storage and transmission media. The question is which information carrier will be used for information exchange between different places? The answer is combine uses of storage and transmission media. E.g. electronic mailing system.

⊛ Representation Dimension of media:

Media are divided into two types in respect to time in their representation space:

1) Time independent (discrete) → Information is expressed only in its individual value. E.g. text, image etc.

2) Time dependent (continious) → Information is expressed not only its individual value, but also by the time of it's occurrences. E.g: sound and video.

⊛ Properties of Multimedia System:

Q. The uses of term multimedia are not every arbitrary combination of media. Justify.

1). Combination of media: A simple text processing program with an corporate image is often called multimedia application. Because two media are processed through one program. But one should talk multimedia only when both continious and discrete media are utilized. So text processing program with incorporated images is not a multimedia application.

2) Computer support integrated: Computer is idle tool for multimedia application.

3) Independence: An important aspect of different media is their level of independence from each other.

⊛ Characteristics of a Multimedia System:

→ Multimedia systems must be computer controlled.
→ Multimedia systems are integrated.
→ The information they handle must be represented digitally.
→ The interface to the final presentation of media is usually interactive.

⊛. Challenges for Multimedia System:

1) Supporting multimedia applications over a computer network renders the application distributed. This will involve many special computing techniques.

2) Temporal relationship between data:
   - → Render different data at the same time continuously.
   - → Sequencing within the media (playing frames in correct order / time frame in video).
   - → Synchronization (inter media scheduling).
   - → Distributed Network.

⊛. Components of Multimedia System: [Imp]

1) **Capture devices:-** These devices take input from environment using camera, sensors and other devices. Video Camera, Video Recorder, Audio Microphone, Keyboards, mouse, 3D input devices, VR devices are some capture devices.

2) **Storage devices:-** These devices help to store data for future use. Hard disks, CD-ROMs, DVD etc are storage devices.

3) **Communication networks:-** These devices help to communicate or transfer data between two or more than two devices. Ethernet, Token Ring, Intranets, Internets etc. are communication networks.

4) **Computer Systems:-** Multimedia desktop machines, Workstations, MPEG/VIDEO Hardware etc. are computer systems.

5) **Display Devices:-** HDTV, SVGA, Hi-Res monitors, Colour printers etc. are display devices.