*

Multimedia Introduction

By

Hiba Ameer Jabir

2022 - 2023

*What is Multimedia

*Multimedia is the media that uses multiple forms of information content and information processing (e.g. text, audio, graphics, animation, and video, interactivity) to inform or entertain the user. Multimedia also refers to the use of electronic media to store and experience multimedia content.

*Thus, multimedia means that the computer information can be represented through audio, video and animation in addition to traditional media, for example text, images, graphics.

*Categories of Multimedia

*Multimedia may be broadly divided into **<u>linear</u>** and **<u>non-linear</u>** categories.

* Linear active content progresses without any navigation control for the viewer such as a cinema presentation.

* Non-linear content offers user interactivity to control progress as used with a computer game or used in self-paced computer based training. Non-linear content is also known as hypermedia content.

* Hypertext is a text which contains links to other texts. Hypertext is therefore usually non-linear. Hypermedia is not constrained to be text-based. It can include other media, e.g., graphics, images, and especially the continuous media – sound and video.
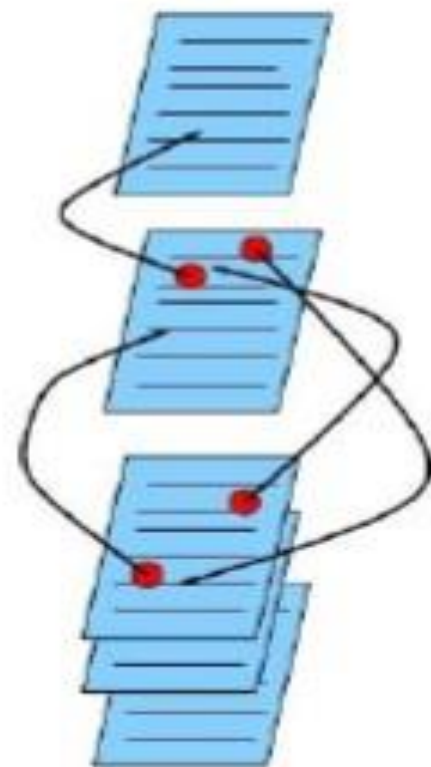
Hypertext and Normal Text

*Multimedia System

* A multimedia system is a system capable of processing multimedia data and applications and supports more than a single kind of media. It is characterized by the processing, storage, generation, manipulation and rendition of Multimedia information.

* The development of powerful multimedia computers and the evolution of the Internet have led to an explosion of applications of multimedia world wide. These days' multimedia systems are used for education, in presentations, as information kiosks. In information technology, a kiosk is a small physical structure (often including a computer and a display screen)

*

***Characteristics of a Multimedia System**

A Multimedia system has four basic characteristics:

1-Multimedia systems must be computer controlled.

2-Multimedia systems are integrated.

3-The information they handle must be represented digitally.

4-The interface to the final presentation of media is usually interactive.

*Challenges for Multimedia Systems

* Supporting multimedia applications over a computer network renders the application distributed. This will involve many special computing techniques. Multimedia systems may have to render a variety of media at the same instant a distinction from normal applications.

* There is a temporal relationship between many forms of media (e.g. Video and Audio). The key issues multimedia systems need to deal with here are:

    * How to represent and store temporal information.
    * How to strictly maintain the temporal relationshipson play back/retrieval
    * What process are involved in the above.

*Data has to represented digitally so many initial source of data needs to be digitize (translated from analog source to digital representation).

*It will involve scanning (graphics, still images), sampling (audio/video) although digital cameras now exist for direct scene to digital capture of images and video. The data is large several Mb, therefore storage, transfer (bandwidth) and processing overheads are high. Data compression techniques very common.

*Desirable Features for a Multimedia System

*Given the above challenges the following feature a desirable (if not a prerequisite) for a Multimedia System:

1-Very High Processing Power — needed to deal with large data processing and real time delivery of media. Special hardware commonplace.

2-Multimedia Capable File System — needed to deliver real-time media — e.g. Video/Audio Streaming. Special Hardware/Software needed e.g RAID technology.

3-Data Representations/File Formats that support multimedia —Data representations/file formats should be easy to handle yet allow for compression/decompression in real-time.

4-Efficient and High I/O — input and output to the file subsystem needs to be efficient and fast. Needs to allow for real-time recording as well as playback of data. e.g. Direct to Disk recording systems.

6-Special Operating System — to allow access to file system and process data efficiently and quickly. Needs to support direct transfers to disk, real- time scheduling, fast interrupt processing, I/O streaming etc.

7-Storage and Memory — large storage units (of the order of 50 -100 Gb or more) and large memory (50 -100 Mb or more). Large Caches also required and frequently of Level 2 and 3 hierarchy for efficient management.

8-Network Support — Client-server systems common as distributed systems common.

9-Software Tools — user friendly tools needed to handle media, design and develop applications, deliver media.