MultiMedia Revision

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In The Name Of ALLAH

Module 1 (Intro to Multimedia)

- Every One has a different **Viewpoint** for "Multimedia" Word:
  - **PC Vendor**: as a collection of **HW** devices (Sound Capability - DVD Rom – and Perhaps understand that they have Microprocessor Capabilities)
  - **Consumer for Entertainment**: as a **TV** with hundreds of Channels
 - **CS Student**: *Application* that use multiple **modalities (Images , Text , animation , Video , interactivity)**

Multi (multus) : "**numerous, multiple**"
Media (medium): "**middle, center**" (hardware + software) used for **dissemination** (distribute) and **representation of information**
usage of multiple **agents (text, audio, video, images)** for disseminating and presenting information to audience
simultaneous use of more than one medium
better name is **"Integrated media".**
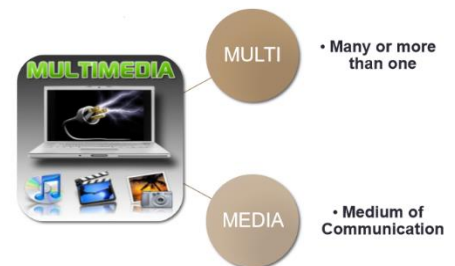
Multimedia Consists of

**all applications** that involve a combined use of **different kinds of media**

- The Presentation that use them Called => **Multimedia Presentation**
- The Software also use them => **Multimedia Software**
- System ….. => **Multimedia System**

Multimedia Application is an application which uses a collection of multiple media sources like (— World Wide Web, — Multimedia Authoring, e.g. Adobe/Macromedia Director, — Video-on-demand, — Interactive TV, — Computer Games, — Digital video editing and production systems, — Multimedia Database systems.)

- **Business: (Sales / Marketing Presentation ꝏ Trade show production ꝏ Staff Training Application ꝏ Company Kiosk)**
- **Education: (Courseware / Simulations E-Learning / Distance Learning , Information Searching)**
- **Entertainment: (Games (Leisure / Educational) , Movies , Video on Demand)**
- **Public places: Information Kiosk , Smart Cards, Security**
- **Home : Television Satellite TV , SMS services (chats, voting, reality TV)**

Multimedia System: A system that involves generation, representation, storage, transmission, search and retrieval, and delivery of multimedia information => 3 Processes inherent to these systems:

- **Multimedia content creation or multimedia authoring:** digitizing media
  - variety of different instruments, which capture different media types in a digital format.
  -
- **Storage and compression:** minimize necessities for storage and distribution
- **Distribution :** distribution across a variety of low bandwidth and high-bandwidth networks.
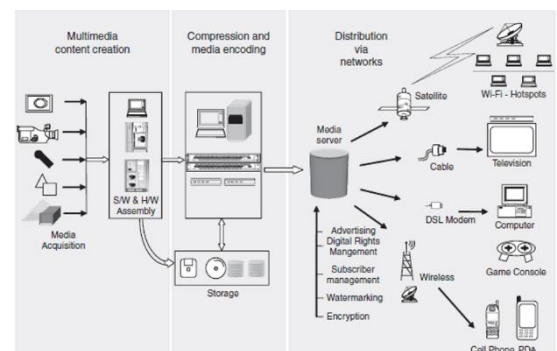
o   Distribution normally follows **standards protocols**, which are responsible for **collating and reliably** sending information to end receivers.

Inherent Qualities of Multimedia Data

- **Digital**: digital nature allows it to be combined together to produce rich content.
- **Voluminous**: size of the data resulting from combining these medias is **Large** and **Voluminous** => we need **compression techniques => Care of** storage and transmission bandwidth limitations
- **Interactive:** many options to do with the same multimedia e.g you can click on areas of an image causing an action to be taken, Web site consisting of hyperlinked text**.**
- **Real-time and synchronization:** need much transmission speed Real-time => can be only **a very small** and bounded delay while transmitting information

Different Media Types Used Today

- Text:
    - commonly used to express information
    - text information has evolved from simple text to more meaningful and easy-to-read formatted text
    - **hypertext** is commonly used in digital documents, allowing **nonlinear access to information**.
    - **Linear multimedia:** active content progresses without any navigation control for the viewer such as a cinema presentation or movie.
    - **Non-linear multimedia**: user interactivity, such as selection buttons or hyperlinks, 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.
- Image:
    - consist of a set of units called pixels => 2 dimensional array (Width - Height) => the same bit depth for each pixel in the same image.
    - **Bit depth** : number of bits assigned to each pixel. => control the level of colors and types (monochrome , intensity , color image , indexed images)
    - **Size = Width * Height * Bit Depth.**
    - **Formats :** application-specific (jpeg , png , faxes , …………)
    - **Dimensionality:** singularly or combined => just an image or stereo image (Panoramas)
- Video**:**
    - represented as a sequence of images
    - Width , Height , Pixel Depth , frames per second or fps.
    - **Size = W * H * pixel Depth * frames per second * duration of video**
    - **Aspect ratio:** The ratio of the Width: Height=> common aspect ratio for video is 4:3, High Definition 16:9
    -
    - **Scanning format:** convert the frames of video into a one-dimensional signal for broadcast.
        - **Interlaced scanning:** Scanning odd rows then even's , Flickers problem **(The Middle of Last Century 1950's)**
        - **progressive scanning:** all rows scanned on one frame, Better quality
        -
- 2D Graphics:
    - commonplace in multimedia presentations

- o   represented by **2D vector** coordinates and normally has properties such as a fill color, boundary thickness, and so on.
  - o   effectively used to create 2D animations **to better illustrate information**.
- 3D Graphics:
  - o   used today for **high-end content** in movies, computer games, and advertising.
  - o   have advanced considerably as a science

Table 1.1 Classification of Multimedia Systems

Static	o multimedia data remains the same within a <mark>certain finite time</mark> o slide of a Microsoft PowerPoint presentation or one HTML Web page.
Dynamic	o data is changing like watching a video
Real-time	o Playing online shooting games Pubg , Watching Youtube
orchestrated	o refers to cases when there is no real-time requirement. o compressing content on a DVD and distributing it. Common for download the media
Linear	o proceed **linearly** through the information o reading an eBook or watching a video.
Non-Linear	o make **use of links** that <mark>map</mark> one part of the data to another. o The term hypermedia generalizes the concept of accessing media nonlinearly.
Person-to-machine vs person-to-person	the end user is interacting with a machine or with another person.
Single user, peer-to-peer, peer-to-multipeer, and broadcast	o Just me , Unicast , Multicast , Broadcast o the manner of information distribution. o **Broadcasting** is the most <mark>general-purpose scenario</mark>, where information is sent not to any specific listener(s) but available to all those who want to listen, such as television and radio broadcasts.