Topics

• Introduction to Multimedia
• Multimedia Elements
• Multimedia Application
• Multimedia Systems
Introduction to Multimedia

Definition of Multimedia:

Multimedia means that computer information can be represented through audio, video, and animation in addition to traditional media (i.e., text, graphics drawings, images).
Introduction to Multimedia

Definition of Multimedia:

**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.
Multimedia Elements

Multimedia Elements:

- Text
- Graphics
- Animation
- Video
- Sound
Text

- Text constitutes the main part of a multimedia package.
- It is used to provide most of the information intended to be conveyed and it is even stated that other multimedia data types are used to enhance text.
Text

- Text data is the most familiar learning resource.
- It has been available since the advent of the printing process.
- It requires only 7-8 bits per character.
- It is usually processed by automatic programs.
Multimedia Elements

Categories of Text

- Alphabet - A B C a b c
- Number - 0 1 2 3 …
- Punctuation - ! ; , : . ? /
- Symbol - $ % & # @
Multimedia Elements

Text Usages

- Heading / Title
- Paragraph / Body text
- Navigation / Hyperlinks
- Bullet lists
- Text as graphic
Multimedia Elements

Text Usages

"Computer technology" redirects here. For the company, see Computer Technology Limited. For other uses, see Computer (disambiguation).

This article may be too long to comfortably read and navigate. Please consider splitting content into sub-articles and using this article for a summary of the key points of the subject. (June 2009)

A computer is a machine that manipulates data according to a set of instructions.

Although mechanical examples of computers have existed through much of recorded human history, the first electronic computers were developed in the mid-20th century (1940–1945). These were the size of a large room, consuming as much power as several hundred modern personal computers (PCs). Modern computers based on integrated circuits are millions to billions of times more capable than the

[Include additional text or image]
Multimedia Elements

Formatting Text

- Font
- Font size
- Text color
- Alignment
- Line spacing
Multimedia Elements

Software

- Word processor
  - Microsoft Word
  - Lotus WordPro
  - Word Perfect
  - Apple Pages

- Text Editor
  - Notepad
  - TextEdit
Multimedia Elements

Graphics

- Also known as images or digital graphics.
- Two types of digital graphics:
  - Bitmap graphics
  - Vector graphics
Multimedia Elements

Graphics

Bitmap graphic

Vector graphic
Multimedia Elements

Bitmap Graphics

- The method for representing graphical images through bit maps, in which the image is composed of a pattern of dots.
Multimedia Elements

Vector Graphics

• Use geometrical formulas to represent images.
Multimedia Elements

Graphics

7x Magnification

Vector

Bitmap

Ice Cream
Multimedia Elements

Graphics Quality

- Image size
- Color depth
- Resolution
Multimedia Elements

Graphic Usages

Diagram

Illustration
Multimedia Elements

Graphic Usages

Chart

Icons
Multimedia Elements

Graphic Usages

Clip arts  Logo
Multimedia Elements

Software

• Image editing
  – Photoshop
  – GIMP
  – Ulead PhotoImpact

• Drawing
  – Illustrator
  – Inkscape
Multimedia Elements

Video and Animation

- A video clip or an animation sequence can express an idea in a much better way than text or images.
- Video clips used in multimedia systems are more flexible in the sense that they are EASIER TO EDIT and also EASIER TO ACCESS.
Multimedia Elements

Video and Animation

- **Digital Video** can be created from VCRs, using cameras or directly recorded from broadcasts.
- Either way they are captured, stored and edited before they are used in multimedia presentations.
- Video is usually played at 25 or 30 frames per second and will have to be COMPRESSED in order to reduce it to acceptable sizes.
Multimedia Elements

Video and Animation

• **Animation** is similar to video, in that it uses the display of moving pictures to convey information.

• The pictures are constructed artificially, however, and they can be very useful to explain abstract concepts.
Multimedia Elements

Software

• Video
  – Adobe Premiere
  – Windows Movie Maker

• Animation
  – Flash
  – Adobe Image Ready
  – CoffeeCup GIF Animator
Multimedia Elements

Sound

- Sound is another data type used in multimedia applications.
- Sound requires more space than text but is better when compared to video clips.
Multimedia Elements

Sound Usages

• Background music
• Narration
• Special effects
Multimedia Elements

Sound Conversion

Diagram:
- Analogue input (microphone, guitar)
- Analogue to Digital Conversion
- Digital numerical data, "samples"
- Digital System
- Electrical voltage variations
- Digital to Analogue Conversion
- Analogue output (loudspeaker)
Multimedia Elements

Sound Quality

- Sample rate
- Bit depth
- Channel
Multimedia Elements

Software

- Adobe Audition
- Windows Sound Recorder
- Sony Sound Forge
- Wave Editor
Multimedia Application

Definition of Multimedia Application:

A Multimedia Application is an Application which uses a collection of multiple media sources e.g. text, graphics, images, sound/audio, animation and/or video.
Multimedia Application

Advantages of Multimedia Application:

• Can be used for many purposes training, marketing, games, information transmission
• It is self paced. A user can go through it his/her own pace.
• It is available when required. Not like a TV program or a lecture for example which is set at a specific time(on demand).
Multimedia Application

Advantages of Multimedia Application:

- It is **portable**. Can be transferred to another location.
- It is **interruptible**. Can be stopped or resumed at the user's will.
- It is **flexible**. You may learn what you want to learn.
- It requires less time to learn the same material.
Multimedia Application

Types of Multimedia Application:

• Interactive
• Non-Interactive
Multimedia Application

Types of Multimedia Application:

Interactive

- Accepting input from a human.
- Interactive computer systems are programs that allow users to enter data or commands.
Multimedia Application

Types of Multimedia Application:

Interactive

- Using input devices such as:
  - Keyboard
  - Mouse
  - Touchpad
  - Touch screen
  - Gamepad / Joystick
Multimedia Application

Types of Multimedia Application:

Non-Interactive

- A non-interactive program is one that, when started, continues without requiring human contact.
Multimedia Application

Examples of Multimedia Application:

• World Wide Web
• Courseware
• Computer games
• Virtual Reality
• Multimedia Information Kiosks
• Multimedia Database System
• Interactive TV
Multimedia Systems

Characteristics of Multimedia Systems:

• 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.
Multimedia Systems

Benefits of Multimedia Systems:

• Easy to understand and easy to use
• Integrated and interactive
• Conducive to cooperative work environment
• Flexible
• Supportive of large audience
Multimedia Systems

Challenges of Multimedia Systems:

• Application distribution
• Multimedia systems may have to render a variety of media at the same instant
• Data has to be represented digitally so many initial source of data needs to be digitize
• Storage capacity
Multimedia Systems

Desirable Features for a Multimedia Systems:

• Very High Processing Power
• Multimedia Capable File System
• Data Representations/File Formats that support multimedia
• Efficient and High I/O
• Special Operating System
• Storage and Memory
• Network Support
Multimedia Systems

Components of Multimedia Systems:

1. Capture devices
   - Video Camera, Video Recorder, Audio Microphone, Keyboards, mice, graphics tablets, 3D input devices, tactile sensors, VR devices. Digitising/Sampling Hardware
Multimedia Systems

Components of Multimedia Systems:

2. Storage devices
   - Hard disks, CD-ROMs, Jaz/Zip drives, DVD, etc
Multimedia Systems

Components of Multimedia Systems:

3. Communication Networks

- Ethernet, Token Ring, FDDI, ATM, Intranets, Internets.
Multimedia Systems

Components of Multimedia Systems:

4. Computer System
- Multimedia Desktop machines, Workstations, MPEG/VIDEO/DSP Hardware
Components of Multimedia Systems:

5. Display Devices

- CD-quality speakers, HDTV, SVGA, Hi-Res monitors, Color printers etc.
Hypermedia

Definition of Hypermedia

The use of text, data, graphics, audio and video as elements of an extended hypertext system in which all elements are linked so that the user can move between them at will.
Hypermedia

Hypertext

• A special type of database system, invented by Ted Nelson in the 1960s, in which objects (text, pictures, music, programs, and so on) can be creatively linked to each other.

• When you select an object, you can see all the other objects that are linked to it.
Hypermedia

Hypertext

- Hypertext systems are particularly useful for organizing and browsing through large databases that consist of disparate types of information.
Hypermedia

Hypertext

IM3026
Current Issues in Multimedia
World Wide Web

- The largest and most commonly used hypermedia application.
- Contain large amount of information available from web servers around the world.
- Three goals of WWW:
  - Universal access
  - Effectiveness of navigating available information
  - Responsible used for posted material
- HTML is a language for publishing WWW.
- SMIL is a language for creating online Multimedia presentation.