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VCZ

CHAPTER 9

MULTIMEDIA (Part 1)

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MULTIMEDIA

- It is a kind of technology that **combines** various forms of **media** in order to better represent the information provided to the user so the communication between users and computers to become more efficient and pleasant.
  - **Text**
  - **Graphics**
  - **Sound**
  - **Animation**
  - **Video**

  } media forms

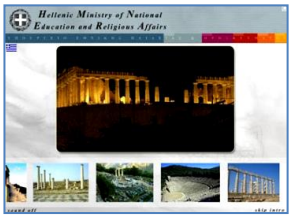
- In multimedia technology many pieces of information are interconnected in a **non-linear** way (e.g. world wide web or windows on –line help).
- It allows users to develop an **interactive** relationship with computers, so as to be able to select any kind of information needed.

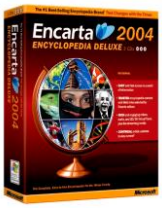
INTERACTIVITY

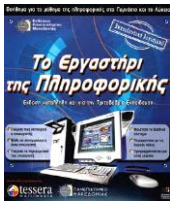
The most important feature of multimedia technology is interactivity, with which in a non-linear application, the user:

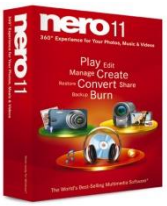
- is **not a passive user** of application who just watches the information provided but he has also the ability to determine the way it is displayed.
- is an active user who determines the **form**, the **order** and the **speed** of information each time he uses an application.

Linear	No Linear
School book	Educational software (e-books)
Encyclopedia	Electronic encyclopedia
Book pages	Webpages
TV channels	Computer, Web-TV
Video (VCR)	DVD Player









MULTIMEDIA EQUIPMENT

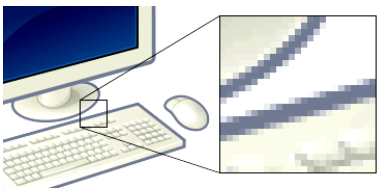
Nowadays, there is a wide variety of **input** and **output devices** that act as additional equipment for multimedia technology in order to create a virtual environment for the user (3D environment), making his work more attractive and more impressive. These multimedia devices include:

- special joysticks
- electronic gloves
- stereoscopic glasses
- large screens & video projectors
- high performance audio systems

APPLICATIONS OF MULTIMEDIA

- **EDUCATION** (educational software, virtual labs)
- **ENTERTAINMENT** (electronic games with 3-D graphics and sound effects)
- **TOURISM – INFORMATION** (info-kiosks placed in airports, train stations, museums etc.)
- **ADVERTISING - SALES** (on-line stores for shopping and market research)

GRAPHICS - IMAGES



- When an image is **digitalized**, it is represented as a **bitmap** (map of bits, **.bmp** files),that means as a number of **pixels** (picture elements) on the screen each of which carries a specific color.
- Image digitalization can be done either through software (e.g. Windows Paint, Photoshop etc.), or hardware input (e.g. scanner, digital camera etc.).
- **Magnification** of a bitmap image leads to quality deterioration, showing sharp defects (coloured square areas are more intense).

IMAGE RESOLUTION

- The **number of pixels** that constitute an image **in each dimension** e.g. 372x175 is known as image resolution.
- The more pixels on an image, the more detailed it is .This allows users to enlarge it as much possible.

COLOUR MODEL

- Each pixel on the screen carries a specific colour which is produced by the combination of 3 basic colours (**RGB model**).
- The basic colours of an RGB model are **Red**, **Green** and **Blue**.
- Each shade of 3 basic colours corresponds to a specific **binary number** (each number is between 0 - 255).

COLOUR DEPTH

- The **number of bits**, which are used to represent the colour shade of an individual **pixel** are known as colour depth.
- It also indicates the **number of different colours** a computer uses to cover the area of the screen.

Color Depth	Number of Colors
8 bit	256
16 bit	65.536
24 bit	16.777.216
32 bit	4.294.967.296

IMAGE SIZE

Image Size = (Pixels Horizontally) * (Pixels Vertically) * (Color Depth) : 8 bytes

- The **number of bytes** (image capacity) occupied by an image in a storage device (e.g. hard disk, flash memory) are referred to as IMAGE SIZE.

e.g. an image with resolution 1024x768 color depth 16 bits, needs capacity (1024*768*16):8 = 6.291.456 bytes (image size)

IMAGE PROCESSING

An image in **digital form** can be easily modified with the appropriate software (**Image Processing Software**) e.g. *Adobe Photoshop*, *Adobe Illustrator*, *Corel Draw* etc.

TYPE OF IMAGES

Bitmap - Pixmap images

They are images that **consist of pixels** (map of bits) and can be distorted when magnified. Sometimes, the term bitmap implies one bit per pixel, while pixmap is used for images with multiple bits per pixel.

Vector images

These are small size images that **consist of geometrical shapes** (points, lines, rectangles, ellipses, polygons etc.), which retain their quality after magnification.