

# MULTIMEDIA APPLICATIONS

## 1 INTRODUCTION TO MULTIMEDIA

Multimedia has become an inevitable part of any presentation. It has found a variety of applications right from entertainment to education. The evolution of internet has also increased the demand for multimedia content.

### 1.1. Definition

**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. Multimedia is similar to traditional mixed media in fine art, but with a broader scope. The term “rich media” is synonymous for interactive multimedia.

### 1.2. History of Multimedia Systems

Newspapers were perhaps the first mass communication medium to employ Multimedia -- they used mostly text, graphics, and images.

In 1895, Guglielmo Marconi sent his first wireless radio transmission at Pontecchio, Italy. A few years later (in 1901) he detected radio waves beamed across the Atlantic. Initially invented for telegraph, radio is now a major medium for audio broadcasting.

Television was the new media for the 20th century. It brings the video and has since changed the world of mass communications.

Some of the important events in relation to Multimedia in Computing include:

1945 - Bush wrote about Memex

1967 - Negroponte formed the Architecture Machine Group at MIT

1969 - Nelson & Van Dam hypertext editor at Brown

Birth of the Internet

1971 - Email

1976 - Architecture Machine Group proposal to DARPA: Multiple Media

1980 - Lippman & Mohl: Aspen Movie Map

1983 - Backer: Electronic Book

1985 - Negroponte, Wiesner: opened MIT Media Lab

1989 - Tim Berners-Lee proposed the World Wide Web to CERN (European Council for Nuclear Research)

1990 - K. Hooper Woolsey, Apple Multimedia Lab, 100 people, educ.

1991 - Apple Multimedia Lab: Visual Almanac, Classroom MM Kiosk

1992 - The first M-bone audio multicast on the Net

1993 - U. Illinois National Center for Supercomputing Applications: NCSA Mosaic

1994 - Jim Clark and Marc Andreessen: Netscape

1995 - JAVA for platform-independent application development. Duke is the first applet.

1996 - Microsoft, Internet Explorer.

## **1.3. Multimedia hardware and software-various classes**

### **1.3.1 MULTIMEDIA HARDWARE REQUIREMENTS**

#### ***1.3.1.1 CPU***

Central Processing Unit (CPU) is an essential part in any computer. It is considered as the brain of computer, where processing and synchronization of all activities takes place. The efficiency of a computer is judged by the speed of the CPU in processing of data. For a multimedia computer a Pentium processor is preferred because of higher efficiency.

#### ***1.3.1.2 Monitor***

The monitor is used to see the computer output. Generally, it displays 25 rows and 80 columns of text. The text or graphics in a monitor is created as a result of an arrangement of tiny dots, called pixels. Resolution is the amount of details the monitor can render. Resolution is defined in terms of horizontal and vertical pixel (picture elements) displayed on the screen.

#### ***1.3.1.3 Video Grabbing Card***

We need to convert the analog video signal to digital signal for processing in a computer. Normal computer will not be able to do it alone. It requires special equipment called video grabbing card and software to this conversion process. This card translates the analog signal it receives from conventional sources such as a VCR or a video camera, and converts them into digital format.

#### ***1.3.1.4 Sound Card***

Today's computers are capable of creating the professional multimedia needs. Not only you can use computer to compose your own music, but it can also be used for recognition of speech and synthesis. It can even read back the entire document for you. But before all this happens, we need to convert the conventional sound signal to computer understandable digital signals. This is done using a special component added to the system called sound card.

#### ***1.3.1.5 CD-ROM***

CD-ROM is a magnetic disk of 4.7 inches diameter and it can contain data up to 680 Megabytes. It has become a standard by itself basically for its massive storage capacity, faster data transfer rate. To access CD-ROM a very special drive is required and it is known as CD-ROM drive.

### **1.3.2 MULTIMEDIA SOFTWARE REQUIREMENTS**

For the creation of multimedia on the PC there are hundreds of software packages that are available from manufacturers all over the world.

These software packages can cost anything from being absolutely free (normally this software is called freeware or shareware) to anything upwards of £500.

#### ***1.3.2.1 Adobe CS4***

Adobe CS4 is a collection of graphic design, video editing, and web development applications made by Adobe Systems many of which are the industry standard that includes

#### ***1.3.2.2 Adobe Dreamweaver***

Although a hybrid WYSIWYG and code-based web design and development application, Dreamweaver's WYSIWYG mode can hide the HTML code details of pages from the user, making it possible for non-coders to create web pages and sites. WYSIWYG (What You See Is What You Get) web development software that allows users to create websites without using Html, everything can be done visually.

#### ***1.3.2.3 Adobe Fireworks***

A graphics package that allows users to create bitmap and vector graphics editor with features such as: slices, the ability to add hotspots etc.) For rapidly creating website prototypes and application interfaces.

#### ***1.3.2.4 Gimp***

Is an alternative to Photoshop and cheaper but not quite as good.

#### ***1.3.2.5 Google Sketchup***

SketchUp is a 3D modelling program designed for architects, civil engineers, filmmakers, game developers, and related professions.

#### ***1.3.2.6 Microsoft FrontPage***

As a WYSIWYG editor, FrontPage is designed to hide the details of pages' HTML code from the user, making it possible for novices to easily create web pages and sites.

#### ***1.3.2.7 Apple Quicktime***

QuickTime is an extensible proprietary multimedia framework developed by Apple, capable of handling various formats of digital video, 3D models, sound, text, animation, music, panoramic images, and interactivity.

#### ***1.3.2.8 Photoshop Pro***

Adobe Photoshop, or simply Photoshop, is a graphics editing program developed and published by Adobe Systems. It is the current market leader for commercial bitmap and image manipulation software, and is the flagship product of Adobe Systems. It has been described as “an industry standard for graphics professionals”

#### ***1.3.2.9 Microsoft PowerPoint***

PowerPoint Presentations are generally made up of slides may contain text, graphics, movies, and other objects, which may be arranged freely on the slide.

#### ***1.3.2.10 Adobe Flash Player***

Adobe Flash (formerly Macromedia Flash) is a multimedia platform that is popular for adding animation and interactivity to web pages. Originally acquired by Macromedia, Flash was introduced in 1996, and is currently developed and distributed by Adobe Systems.

Flash is commonly used to create animation, advertisements, and various web page Flash components, to integrate video into web pages, and more recently, to develop rich Internet applications.

#### ***1.3.2.11 Adobe Shockwave***

Adobe Shockwave (formerly Macromedia Shockwave) is a multimedia player program, first developed by Macromedia, acquired by Adobe Systems in 2005. It allows Adobe Director Applications to be published on the Internet and viewed in a web browser on any computer which has the Shockwave plug-in installed.

## 1.4. Components of a Multimedia System

Components (Hardware and Software) required for a multimedia system:

1. Capture devices
  - Video Camera, Video Recorder, Audio Microphone, Keyboards, mice, graphics tablets, 3D input devices, tactile sensors, VR devices. Digitising/Sampling Hardware
2. Storage Devices
  - Hard disks, CD-ROMs, Jaz/Zip drives, DVD, etc
3. Communication Networks
  - Ethernet, Token Ring, FDDI, ATM, Intranets, Internets.
4. Computer Systems
  - Multimedia Desktop machines, Workstations, MPEG/VIDEO/DSP Hardware
5. Display Devices
  - CD-quality speakers, HDTV, SVGA, Hi-Res monitors, Color printers etc.

## 1.5. Elements of Multimedia

Multimedia means that computer information can be represented through audio,

Graphics, image, video and animation in addition to traditional media (text and graphics).

Hypermedia can be considered as one type of particular multimedia application.

## 1.6. Categories of Multimedia

Multimedia may be broadly divided into **linear** and **non-linear** 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.

Multimedia presentations can be live or recorded. A recorded presentation may allow interactivity via a navigation system. A live multimedia presentation may allow interactivity via interaction with the presenter or performer.

## 1.7. Applications of Multimedia

Multimedia finds its application in various areas including, but not limited to, advertisements, art, education, entertainment, engineering, medicine, mathematics, business, scientific research and spatial, temporal applications.

A few application areas of multimedia are listed below:

### 1.7.1 Creative industries

Creative industries use multimedia for a variety of purposes ranging from fine arts, to entertainment, to commercial art, to journalism, to media and software services provided for any of the industries listed below. An individual multimedia designer may cover the spectrum throughout their career. Request for their skills range from technical, to analytical and to creative.

### 1.7.2 Commercial

Much of the electronic old and new media utilized by commercial artists is multimedia. Exciting presentations are used to grab and keep attention in advertising. Industrial, business-to-business, and interoffice communications are often developed by creative services firms for advanced multimedia presentations beyond simple slide shows to sell ideas or live-up training. Commercial

Multimedia developers may be hired to design for governmental services and non-profit services applications as well.

### **1.7.3 Entertainment and Fine Arts**

In addition, multimedia is heavily used in the entertainment industry, especially to develop special effects in movies and animations. Multimedia games are a popular pastime and are software programs available either as CD-ROMs or online. Some video games also use multimedia features. Multimedia applications that allow users to actively participate instead of just sitting by as passive recipients of information are called *Interactive Multimedia*.

### **1.7.4 Education**

In Education, multimedia is used to produce computer-based training courses (popularly called CBTs) and reference books like encyclopaedia and almanacs. A CBT lets the user go through a series of presentations, text about a particular topic, and associated illustrations in various information formats. Edutainment is an informal term used to describe combining education with entertainment, especially multimedia entertainment.

### **1.7.5 Engineering**

Software engineers may use multimedia in Computer Simulations for anything from entertainment to training such as military or industrial training. Multimedia for software interfaces are often done as collaboration between creative professionals and software engineers.

### **1.7.6 Industry**

In the Industrial sector, multimedia is used as a way to help present information to shareholders, superiors and coworkers. Multimedia is also helpful for providing employee training, advertising and selling products all over the world via virtually unlimited web-based technologies.

### **1.7.7 Mathematical and Scientific Research**

In Mathematical and Scientific Research, multimedia is mainly used for modeling and simulation. For example, a scientist can look at a molecular model of a particular substance and manipulate it to arrive at a new substance. Representative research can be found in journals such as the *Journal of Multimedia*.

### **1.7.8 Medicine**

In Medicine, doctors can get trained by looking at a virtual surgery or they can simulate how the human body is affected by diseases spread by viruses and bacteria and then develop techniques to prevent it.

### **1.7.9 Multimedia in Public Places**

In hotels, railway stations, shopping malls, museums, and grocery stores, multimedia will become available at stand-alone terminals or kiosks to provide information and help. Such installation reduce demand on traditional information booths and personnel, add value, and they can work around the clock, even in the middle of the night, when live help is off duty.

A menu screen from a supermarket kiosk that provide services ranging from meal planning to coupons. Hotel kiosk list nearby restaurant, maps of the city, airline schedules, and provide guest services such as automated checkout. Printers are often attached so users can walk away with a printed copy of the information. Museum kiosk are not only used to guide patrons through the exhibits, but when installed at each exhibit, provide great added depth, allowing visitors to browser through richly detailed information specific to that display.

## **1.8. Different multimedia file formats**

### 1.8.1 Common Video Formats

Format	File	Description
MPEG	.mpg .mpeg	MPEG. Developed by the Moving Pictures Expert Group. The first popular video format on the web. Used to be supported by all browsers, but it is not supported in HTML5 (See MP4).
AVI	.avi	AVI (Audio Video Interleave). Developed by Microsoft. Commonly used in video cameras and TV hardware. Plays well on Windows computers, but not in web browsers.
WMV	.wmv	WMV (Windows Media Video). Developed by Microsoft. Commonly used in video cameras and TV hardware. Plays well on Windows computers, but not in web browsers.
QuickTime	.mov	QuickTime. Developed by Apple. Commonly used in video cameras and TV hardware. Plays well on Apple computers, but not in web browsers. (See MP4)
RealVideo	.rm .ram	RealVideo. Developed by Real Media to allow video streaming with low bandwidths. It is still used for online video and Internet TV, but does not play in web browsers.
Flash	.swf .flv	Flash. Developed by Macromedia. Often requires an extra component (plug-in) to play in web browsers.
Ogg	.ogg	Theora Ogg. Developed by the Xiph.Org Foundation. Supported by HTML5.
WebM	.webm	WebM. Developed by the web giants, Mozilla, Opera, Adobe, and Google. Supported by HTML5.
MPEG-4 or MP4	.mp4	MP4. Developed by the Moving Pictures Expert Group. Based on QuickTime. Commonly used in newer video cameras and TV hardware. Supported by all HTML5 browsers. Recommended by YouTube.

### 1.8.2 Audio Formats

Format	File	Description
MIDI	.mid .midi	MIDI (Musical Instrument Digital Interface). Main format for all electronic music devices like synthesizers and PC sound cards. MIDI files do not contain sound, but digital notes that can be played by electronics. Plays well on all computers and music hardware, but not in web browsers.
RealAudio	.rm .ram	RealAudio. Developed by Real Media to allow streaming of audio with low bandwidths. Does not play in web browsers.
WMA	.wma	WMA (Windows Media Audio). Developed by Microsoft. Commonly used in music players. Plays well on Windows computers, but not in web browsers.
AAC	.aac	AAC (Advanced Audio Coding). Developed by Apple as the default format for iTunes. Plays well on Apple computers, but not in web browsers.

WAV	.wav	WAV. Developed by IBM and Microsoft. Plays well on Windows, Macintosh, and Linux operating systems. Supported by HTML5.
Ogg	.ogg	Ogg. Developed by the Xiph.Org Foundation. Supported by HTML5.
MP3	.mp3	MP3 files are actually the sound part of MPEG files. MP3 is the most popular format for music players. Combines good compression (small files) with high quality. Supported by all browsers.
MP4	.mp4	MP4 is a video format, but can also be used for audio. MP4 video is the upcoming video format on the internet. This leads to automatic support for MP4 audio by all browsers.

### 1.8.3 Animation File Formats

Some file formats are designed specifically to contain animations and they can be ported among application and platforms with the proper translators.

- Director \*.dir, \*.dcr
- AnimationPro \*.fli, \*.flc
- 3D Studio Max \*.max
- SuperCard and Director \*.pics
- CompuServe \*.gif
- Flash \*.fla, \*.swf

Following is the list of few Software used for computerized animation:

- 3D Studio Max
- Flash
- AnimationPro

### 1.8.4 Image File Formats

- Format Extension
- Microsoft Windows DIB .bmp .dib .rle
- Microsoft Palette .pal
- Autocad format 2D .dxf
- JPEG .jpg
- Windows Meta file .wmf
- Portable network graphic .png
- CompuServe gif .gif
- Apple Macintosh .pict .pic .pct

### Software used for creating images

- Coreldraw
- MSPaint
- Autocad

## 1.9. Advantages of Multimedia:

- 1.9.1 Increased learning effectiveness
- 1.9.2 Gains and holds attention
- 1.9.3 More appealing
- 1.9.4 Reduces training cost
- 1.9.5 Easy to use
- 1.9.6 Give information cost
- 1.9.7 Provides high quality of presentations
- 1.9.8 Multi-sensorial

- 1.9.9 Integrated and interactive
- 1.9.10 Can be used as a wide variety of audience

### **1.10. Disadvantages of Multimedia:**

- 1.10.1 Expensive
- 1.10.2 Not always ready to configure
- 1.10.3 Requires special hardware
- 1.10.4 Not always compatible
- 1.10.5 Takes time to compile
- 1.10.6 Information overload
- 1.10.7 Misuse and/or overuse
- 1.10.8 Limitations of technology

## **2 Content and Project Planning, Designing and development**

### **2.1. Project Planning**

Project planning refers to everything you do to set up your project for success. It's the process you go through to establish the steps required to define your project objectives, clarify the scope of what needs to be done and develop the task list to do it.

### **2.2. Planning steps**

- 2.2.1 Mobilize quickly. When you use the right tools and templates, you don't have to start from scratch.
- 2.2.2 Break down your deliverables and get input from your team on the tasks that are required.
- 2.2.3 Create a timeline which specifies the steps necessary to complete the work.
- 2.2.4 Look for resources, both people and equipment, tools and templates.
- 2.2.5 Use project management software to share and collaborate with your team.

### **2.3. Planning process**

- 2.3.1 **Defining the Goal:** The Goal of a multimedia application is defined by the scope of work, which is a written description of the proposed multimedia project. The scope of work clarifies your ideas and goals regarding the proposed project. It also helps the development team members to visualize the basic objectives of the programme.
- 2.3.2 **Outlining:** Once the goal and the objectives of the programme are clear, the next step is to create Outline of the project. The outlining of Multimedia structure is translated into branches or points of decision on the screen. Even the main outlining headings may become options available to the user in the main menu of the Multimedia presentation program with sub-heading becoming the Sub-Menu entries.
- 2.3.3 **Logic flow chart:** The logic flow chart is an important component of an Interactive Multimedia Programme. A logic flow chart is a graphical road map of the proposed application. The Authoring team takes the help of this flowchart to produce the final multimedia Application.
- 2.3.4 **Program storyboard:** The storyboard is a graphical representation of the proposed multimedia project. The storyboard is an extension of ideas presented in the programme script. It is presented with a series of templates used for various purposes. These templates are very useful information and help the developer to keep a production log or history of the work. They also help in keeping track of the production design and help in identifying the design parameters for the application development.
- 2.3.5 **Planning for creation of multimedia building blocks:** The development of multimedia building blocks is an extensive process and requires a number of production steps.
- 2.3.6 **Copyright Issue and Its Management:** While designing multimedia application, copyright issue plays a crucial role because of two fundamental reasons.
- 2.3.7 **Defining the Production Schedule:** A Timeline, defining the activities needed the person responsible for each activity and the start/end time of each activity should be developed.
- 2.3.8 **Devising a Technical Plan:** A technical plan defines how an end user will experience the project and accordingly lays down the system requirement conditions like screen requirement, CD-ROM speed, memory requirement and hard disk requirement.



- 2.3.9 **Project Budgeting:** Once the project timeline or schedule is ready, the next step is to prepare the project budget. This is essential as time and money are not infinite resources.
- 2.3.10 **Hardware Issues:** Hardware issues include deciding, securing the fastest CPU and RAM and largest monitors that is affordable, sufficient disk storage for all working files and records, file sharing for collaborative work via networks or e-mail and establishing a file back-up system.
- 2.3.11 **Authoring Software Selection:** Selection of appropriate authoring software depends on team expertise, funds required to acquire new software and to train the manpower. Two most widely used authoring applications today are Macromedia Director and Macromedia Authorware.

## 2.4. Data compression

**Data compression** is the process of modifying, encoding or converting the bits structure of **data** in such a way that it consumes less space on disk. It enables reducing the storage size of one or more **data** instances or elements. **Data compression** is also known as source coding or bit-rate reduction.

Two compression techniques are mostly used: Lossless and Lossy compression.

### 2.4.1 Lossless compression

A **lossless compression** algorithm eliminates only redundant information, so that one can recover the data exactly upon decompression of the file.

Lossless data compression is compression without any loss of data quality. The decompressed file is an exact replica of the original one.

### 2.4.1 Lossy compression

A **lossy compression** method is one where compressing data and then decompressing it retrieves data that may well be different from the original, but is "close enough" to be useful in some way. The algorithm eliminates irrelevant information as well, and permits only an approximate reconstruction of the original file. Lossy compression is also done by re-writing the data in a more space efficient way

## 2.5. Text encoding

**Encoding** is the process of putting a sequence of **characters** (letters, numbers, punctuation, and certain symbols) into a specialized format for efficient transmission or storage. ... **Encoding** and decoding are used in data communications, networking, and storage.

Character encoding is the process of representing individual characters using a corresponding encoding system made up of other symbols and types of data. Character coding is used for many different purposes.

Character encoding is also known as a character set or character map.

## 2.6. Audio encoding techniques

Audio compression and coding techniques are used to compress audio signals and can be based on sampling or on signal processing of audio sequences.

Audio is the most important medium to be transmitted in a conference-like application. In order to be able to successfully transmit audio through a low bandwidth network, however, one needs to compress it, so that its required bandwidth is manageable.

## 2.7. Types of images

### 2.7.1 TIFF (also known as TIF), file types ending in .tif

TIFF stands for Tagged Image File Format. TIFF images create very large file sizes. TIFF images are uncompressed and thus contain a lot of detailed image data (which is why the files are so big) TIFFs are also extremely flexible in terms of color (they can be grayscale, or CMYK for print, or RGB for web)

and content (layers, image tags).TIFF is the most common file type used in photo software (such as Photoshop).

### **2.7.2 JPEG (also known as JPG), file types ending in .jpg**

JPEG stands for Joint Photographic Experts Group, which created this standard for this type of image formatting. JPEG files are images that have been compressed to store a lot of information in a small-size file. Most digital cameras store photos in JPEG format, because then you can take more photos on one camera card than you can with other formats

### **2.7.3 GIF, file types ending in .gif**

GIF stands for Graphic Interchange Format. This format compresses images but, as different from JPEG, the compression is lossless (no detail is lost in the compression, but the file can't be made as small as a JPEG).GIFs also have an extremely limited color range suitable for the web but not for printing. This format is never used for photography, because of the limited number of colors. GIFs can also be used for animations.

### **2.7.4 PNG, file types ending in .png**

PNG stands for Portable Network Graphics. It was created as an open format to replace GIF, because the patent for GIF was owned by one company and nobody else wanted to pay licensing fees. It also allows for a full range of color and better compression.

It's used almost exclusively for web images, never for print images. For photographs, PNG is not as good as JPEG, because it creates a larger file. But for images with some text, or line art, it's better, because the images look less "bitmappy."

### **2.7.5 Raw image files**

Raw image files contain data from a digital camera (usually). The files are called raw because they haven't been processed and therefore can't be edited or printed yet.

When you snap a photo with your camera, it's saved immediately in a raw file format. Only when you upload your media to a new device and edit it using image software is it saved using one of the image extensions

## **2.8. Capturing images using camera/scanner,**

An image scanner is able to scan and capture text, imagery and objects and then turn them into a digital image, the most common scanners are flatbeds.

Digital Cameras like scanners are capable of image capture, except a digital camera is more transportable making them the preferable choice

## **2.9. Coding techniques for Moving Images, Editing**

Moving images are an illusion. When we view an animation or video we are viewing a series of still pictures presented in rapid succession. The success of the illusion is dependent on the quality of the individual images and the rate at which they are presented.

### **2.9.1. Animation**

Animations are generally a series of 8-bit graphic images created in a graphics program. The images can then be compiled into an animated GIF file or QuickTime movie file for use in multimedia presentations and on the World Wide Web. Frame rates in animations will vary according to the content.

### **2.9.2. Video**

Video can be captured using a standard video recorder and then digitized using video digitizing hardware within a multimedia computer. For video to be effective, the frame rate must be at least 10 frames per second and the bit depth of the individual frames must be 16 or greater. The dimensions of the digitized video can be as small as 160 by 120 or as large as 640 by 480 pixels.

## **2.10. Editing of images**

Image editing software has become ubiquitous in this digital age. Whether you're creating a web interface or simply cropping and enhancing your family photos.

Image editing tools are used to edit existing bitmap images and pictures.

You'll need your favourite image editor to do it.

### 2.10.1. Adobe Photoshop

Adobe Photoshop is a cutting-edge image processing software package that enables you to create and edit images on computers. One can manipulate one's images with special effects and techniques.

Images can be imported and exported across programs in any format. These tools have been used to edit and create images for motion pictures, animations and for artwork.

### 2.10.2. Photo Publisher

Photo Publisher is a professional photo retouching or image-editing package designed to enable retouching and enhancing photos faster. It has powerful masking and retouching tools and more than 30 special effects and filters. It has an image browser, processor, scanner, printer calibration, a stitching tool and over 50 ready to use textures and images.

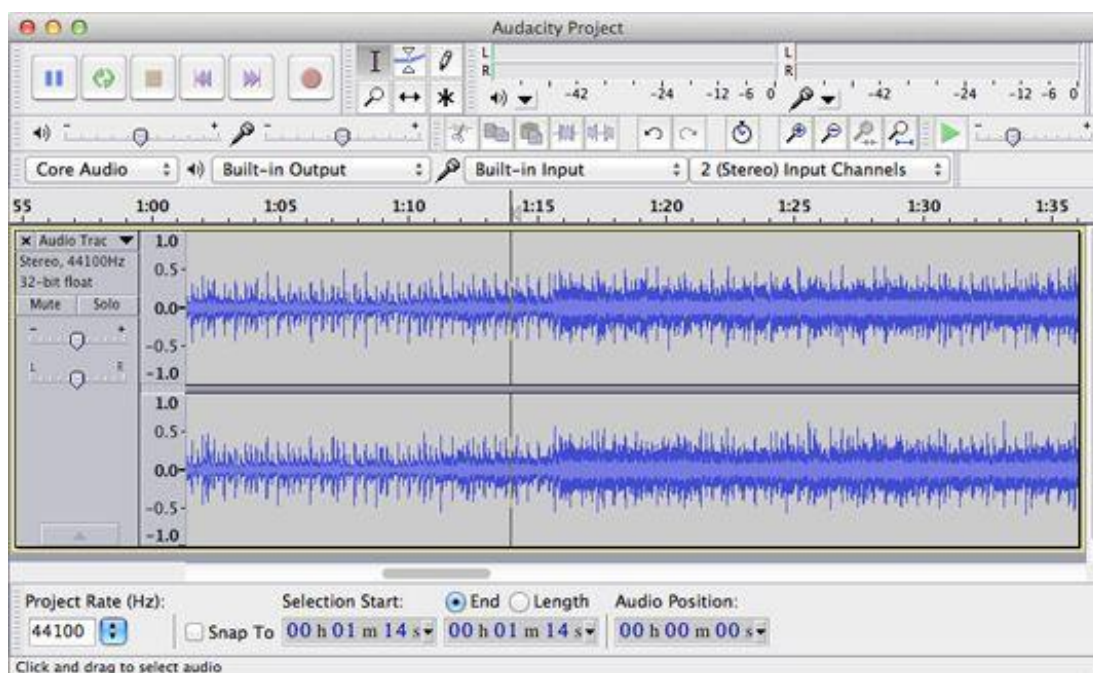
## 2.11. Editing Audio

"Sound" is really a catch-all for many things like music (live recordings or digitally created), singing voices, speaking voices, sound effects, and environmental sounds. These items can be used alone, or in various combinations when creating anything from a podcast, to a full length movie.

Basic editing includes things like removing annoying "pops" and "ticks". But even today's simplest editors offer very sophisticated toolsets that include things like EQ, adding environmental effects, octave shifting, slowing or speeding up the clips (without changing octaves!)

All audio editors can be used to record audio as well. So you can capture the sounds that you will later edit.

### 2.11.1. Audacity



If you do any type of creative work at all, this program should just be on your hard drive, period. It is an open source (i.e., free and available on Mac, Windows and Linux)

### 2.11.2. Sony Sound Forge Pro

It's safe to say that Sony knows audio, and this program is a very capable and versatile professional tool with an exhaustive list of features. It is designed for the professional, and has a price to match.

### 2.11.3. Adobe Audition

This is an excellent and very versatile package that allows extensive non-destructive editing, effects work, video support, and various levels of multitrack support.

## 2.12. Text editing tools

A text editor (like notepad) is useful for making quick changes and quick typing of the text and it a great tool to write out HTML code.

2.12.1 **A word processor** (like MS Word) has a plethora of options with which one can format the text and can insert special symbols, colours, line spacing and a whole lot of other things that can't do with a normal text editor.

2.12.2 **Fontographer** (sometimes abbreviated FOG), is a software application used to create digital fonts, available for both Microsoft Windows and Apple Macintosh platforms. It was originally developed by Altsys but is now owned by Font Lab Ltd.

#### 2.12.3 **Mapping Text:**

Character mapping allows bullets, accented characters, and other curious characters that are part of the extended character set on one platform to appear correctly when text is moved to the other platform.

### 2.13. Video editing tools

Video editing tools enable us to edit and assemble video clips captured from camera, animations and other sources. The completed clip with added transition and visual effects could be played back. Adobe Premiere and Media Shop Pro are two good examples of these tools.

#### 2.13.1 Adobe Premiere

Adobe Premiere is a powerful tool for professional digital video editing. It is primarily used to produce broadcast quality movies. It has excellent editing tools that enable the programmer to work with complete flexibility. This software first digitizes the sound and video and then allows the programmer to edit them to preserve picture quality. It can edit video and multimedia movies in AVI as well as MPEG format. It can create titles and graphics and then add them to the multimedia project. This software has applications in film editing and movie making.

#### 2.13.2 Final Cut Pro

Final Cut Pro is a video editing program made by Apple. It is the editing software of choice for multimedia journalists using Apple computers, and is comparable to Adobe's Premiere video editing program.

#### 2.13.2 Media Studio Pro

Media Studio Pro also gives the most complete set of advanced video editing tools. It can capture the video from VCR, TV or camcorders. It is capable of capturing a batch of scenes. It brings all the components of a multimedia project like video, sound, animation and titles together. One can add effects and transitions and finally save the video in the desired format. It can retouch videos by painting directly over any frame in a video sequence. It has an audio editor, which can remove background noise and add another sound to your video.

### 2.13. Navigation and User Interface Designing

User interface (UI) design is the process of making interfaces in software or computerized devices with a focus on looks or style. Designers aim to create designs users will find easy to use and pleasurable. UI design typically refers to graphical user interfaces but also includes others, such as voice-controlled ones.

#### Designing UIs for User Delight

User interfaces are the access points where users interact with designs. Graphical user interfaces (GUIs) are designs' control panels *and* faces; voice-controlled interfaces involve oral-auditory interaction,

#### How to make Great UIs

To deliver impressive GUIs, remember – users are humans, with needs such as comfort and low cognitive loads. Follow these guidelines:

1. Make elements such as buttons and other [common elements](#) perform predictably (including responses such as pinch = zoom) so users can unconsciously use them everywhere. Form should follow function.

2. Maintain high discoverability. Clearly label icons and include well-indicated affordances.
3. Keep interfaces simple and create an “invisible” feel. Every element must serve a purpose.
4. Respect the user’s eye and attention regarding layout; focus on hierarchy and readability:
  - Alignment – minimize your number of alignment lines (think justified text); typically choose edge (over center) alignment.
  - Draw attention to key features using:
    - Color, brightness and contrast. Avoid including colors or buttons excessively.
    - Text via font sizes, bold type/weighting, italics, capitals and distance between letters. Users should pick up meanings just by scanning.
5. Minimize the number of actions for performing tasks but focus on one chief function per page; guide users by indicating preferred actions. Ease complex tasks by using progressive disclosure.
6. Put controls near objects users want to control.
7. Keep users informed vis-à-vis system responses/actions with feedback.
8. Consider defaults to reduce user burdens (e.g., pre-fill forms).
9. Use reusable design patterns to guide behavior regarding navigation and search functions.
10. Concentrate on maintaining brand consistency.

## Navigation

The term navigation is commonly used in multimedia to refer to the means by which the reader or user of a work interacts with and moves about within a multimedia work, whether it be text, image, 3-D or moving image based.

### 2.14. Use of various codes like bar code, QR code

#### 2.14.1 Bar code

Anyone who buys stuff from stores must have seen barcodes; however, whether or not they realize it’s a barcode they are looking at is a different matter altogether! A barcode is a visual representation of machine-readable information about the product to which it’s attached. To put it down for a layman, a barcode is that small box printed on the packaging of a product that has a small collection of black parallel lines of varying widths.



This isn’t just another box printed atop the cover of the product, it contains important information like the manufacturer’s name, type of item, price and so on, which can only be read by dedicated barcode reader machines. Since it only consists of data stored in horizontal direction, it is also dubbed as linear or 1D (1-dimensional).

### 2.14.2 QR code

Quick Response code, often abbreviated as QR code, is much similar to a barcode. In fact, it's a type of barcode. Like barcode, it also contains machine-readable information concerning the item to which it is attached. But, unlike a regular barcode, a QR code is two-dimensional, i.e. it contains information both in vertical and horizontal directions.

QR codes contain a lot of information within them. From giant corporate organisations to next-door grocery store, everyone can create their own QR code and attach them to their products.



There are certain QR code scanner apps that can be downloaded for free on smartphones. So the moment you see a QR code, just scan it using the app on your phone (the app generally uses the primary camera of the phone to scan the code) and the pre-determined action (like opening a website, sending a tweet, download an app etc.) attached to the code will be triggered.

### **3. Using Image Processing Tools**

#### **3.1. Photo-shop workshop**

Adobe Photoshop enables individuals to create and design digital images and illustrations for print and Web publication. Photoshop developed from a small photo editing tool to an Industry leading software that dictates the global graphic designing and multimedia industries.

#### **3.2. Image editing tools**

With the image editing and enhancement features of the software.

Using the Crop tool, you can trim edges, change the shape and size of a photo, and even straighten a crooked shoreline or horizon. Adobe Photoshop editing tools are: Blur, Sharpen, Smudge, Dodge, Burn and Sponge

#### **3.3. Specifying and Adjusting Colors**

Adjusting image color and tone with adjustment layers

In the Adjustments panel, click the tool icon for the adjustment you want to make:

1. For tonality and color, click Levels or Curves.
2. For adjusting color, click Color Balance or Hue/Saturation.
3. For converting a color image to black and white, click Black & White.
4. In the Properties panel, adjust the adjustment layer tool settings.

#### **3.4 using gradient tools**

1. Choose the Gradient tool and click the Gradient Editor Button on the Options bar. ...
2. Click a stop and click the color swatch to the right of the word Color to open the Color Picker and assign a different color to the stop.
3. Click anywhere below the gradient preview to add more color stops.
- 4.

#### **3.5 (a) Adobe Photoshop – Selection Tools**

Selection tools make life easy for photographers, Graphic designers and every professional that is associated with multimedia. The precision of selection has been improved over years, and the detail we obtain is fabulous.

#### **3.5(b) Move Tool in Photoshop**

The move tool in Adobe Photoshop can perform numerous functions such as move the content of a layer, copy layers, directly move layers from one document to another, apply transforms, plus select and align multiple layers.

#### **3.6 Transforming Path Drawing and Editing Tools**

Do one of the following:

1. To select a path component (including a shape in a shape layer), select the Path Selection tool , and click anywhere inside the path component. ...
2. To select a path segment, select the Direct Selection tool , and click one of the segment's anchor points, or drag a marquee over part of the segment.

#### **3.7 using channels**

##### **Select and edit channels**

1. To select a channel, click the channel name. Shift-click to select (or deselect) multiple channels.
2. To edit a channel, select it and then use a painting or editing tool to paint in the image. You can paint on only one channel at a time.

### **3.8. Adobe Photoshop – Layers**

With Layers palette, you can draw or design various elements of your document independently in layers and stack them up as per the order of display. With this advantage, control over every single object is catered at the click of a mouse. Mistakes happen, but the effects of the mistake are limited to the part of the canvas, you can choose to work on the particular part and leave the rest of the canvas as it is. This benefit is lacking in the traditional painting method. Artists are not allowed to relax at any part of the drawing or painting, once their concentration is diverted and a stroke of painting goes wrong! They are bound to change the whole canvas.

### **3.9 filters and actions**

#### **3.9.1 Filters**

You can use filters to clean up or retouch your photos, apply special art effects that give your image the appearance of a sketch or impressionistic painting, or create unique transformations using distortions and lighting effects.

1. Do one of the following:

- To apply a filter to an entire layer, make sure the layer is active or selected.
- To apply a filter to an area of a layer, select that area.
- To apply a filter non-destructively so you can change your filter settings later, select the Smart Object that contains the image content you want to filter.

2. Choose a filter from the submenus in the Filter menu.

If no dialog box appears, the filter effect is applied.

3. If a dialog box or the Filter Gallery appears, enter values or select options, and then click OK.

#### **3.9.2 Actions**

##### **Steps**

Launch Photoshop and open an image. ...

- Click "Create New Action" in the Actions Panel. ...
- Choose your action settings. ...
- Click on "Record."...
- Edit your image. ...
- Click on "Stop Recording" to finish. ...
- Test your action on another image. ...
- Perform an action on multiple images at once.



## 4. Multimedia Authoring Tools

5.

### 4.1 Multimedia Authoring Tools

Multimedia Authoring Tools are also known as Author ware. It is a program that helps the author (user/programmer) writes hyper text (or) multimedia application.

### 4.2 Types of Authoring programmes

4.2.1. Card and page based tools

4.2.2. Icon based- event driven tools

4.2.3. Time based tools

#### 4.2.1 Card and page based tools:

This tool provides a simple and easily understandable metaphor for organizing multimedia elements. It contains media objects such as buttons, text files and graphic objects. It provides facilities for linking objects to pages (or) cards. The software required is Hyper card and Linked card tool box.

##### 4.2.1.1 Advantages:

- Easy to understand
- Easy to use
- Easy to link metaphor1=screen1=card1= page1
- It consumes very less time for developing an application.

##### 4.2.1.2 Disadvantages:

- Few applications run only on one platform.
- Card and page tools are not powerful as unique stand alone.

#### 4.2.2. Icon based- event driven tools

Icons (or) object based tools are the simplest event driven authoring object. Its provision of simple branching has the ability to go to another section of multimedia production. Multimedia elements and interaction are organized in the flowchart. A flow chart can be build by dragging appropriate icons from a library and then dropping them in the required field finally adding multimedia elements to it. The software required is Icon Author and Author ware.

##### 4.2.2.1 Advantages:

- It has a clear structure [appropriately designed flow charts].
- Easy to edit and update the elements.

##### 4.2.2.2 Disadvantages:

- Learning process is very difficult.
- Very expensive in nature.

#### 4.2.3. Time based tools

Time based tools are best suited for a message with a beginning and an end so that a message can be passed within a stipulated time period. Few time based tools facilitate navigation and interactive control. It has the branching technique so that different loops can be formed for different multimedia applications and time period can be set for these individual applications. The software required is Adobe's Directors.

#### 4.2.3.1 Advantages:

- These tools are good for creating animation.
- Branching, user control interactivity.

#### 4.2.3.2 Disadvantages:

- Steep learning curve for advance features.
- Music and sound files embedded in Flash movies increases the file size and increases the download time.
- Very expensive.

### 4.3 Story boarding/scripting

A **two-column script** is an easy way to structure and plan for your digital story. Even if you don't know exactly what images or sounds you will acquire, writing a script *predicting* what you want your final digital story to look like is a great way to stay organized. Once you do gather all your images and sounds, you can update your two-column script to reflect what you actually have to work with.

Creating a live-action or animated film is a long and complex process, but - if all goes well - has a rewarding outcome. Using Storyboard That to plan your next film gives you an easy way to keep your project organized every step of the way!

Storyboarding has great potential for the filmmaking process. You can make plot drafts and character maps for planning, and use the traditional shot-by-shot storyboarding method for the actual filming.

### 4.4 object oriented working in macromedia flash

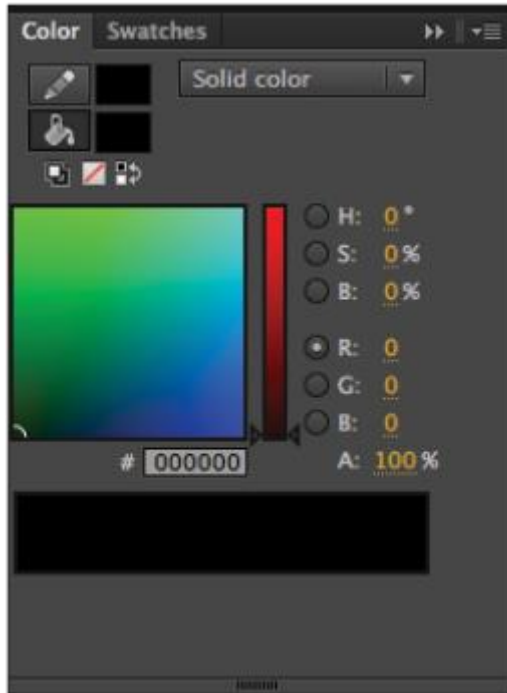
Object-oriented programming (OOP) is a way of organizing the code in a program by grouping it into objects. The term object in this sense means an individual element that includes information (data values) and functionality. When you use an object-oriented approach to organizing a program you group particular pieces of information together with common functionality or actions associated with that information. For example, you could group music information like album title, track title, or artist name with functionality such as "add track to playlist" or "play all songs by this artist". These pieces are combined into a single item, an object (for example, an "Album" or "MusicTrack"). Bundling values and functions together provides several benefits. One key benefit is that you only needing to use a single variable rather than multiple ones. In addition, it keeps related functionality together. Finally, combining information and functionality allows you to structure programs in ways that more closely match the real world.

### 4.5 Exploring interface using selection of PEN tools

Flash has a Pen Tool. Some developers groused over the addition of this new feature, saying that the original drawing set was fine and that this was only being added to attract new users who might be more familiar with FreeHand or other drawing programs. Frankly, these people sounded like members of a child's club, comfortable in their tree fort, as they haul up the rope ladder.

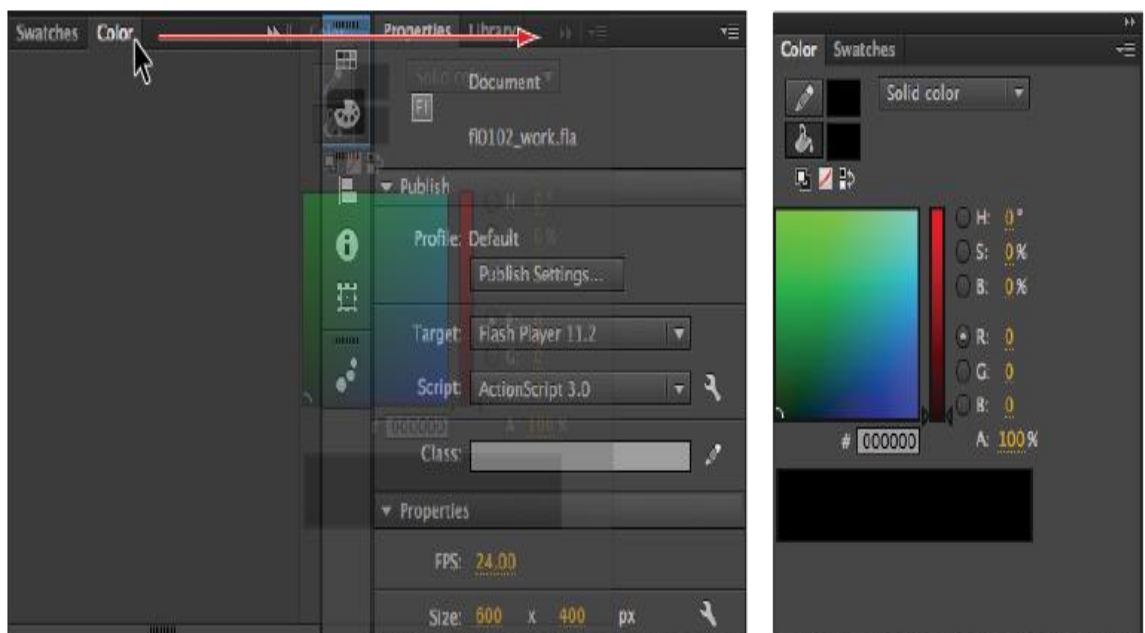
### 4.6 Working with drawing and painting tools





The Swatches and Color panels are grouped together by default

2 Drag the panel group by its title bar over the Property Inspector and Library panel on the right-hand side, releasing the mouse when you see a light blue line. The two panels should now appear docked in the panel group above the Property Inspector and Library panel.



Move the Color and Swatches panel group to the Properties and Libraries panel group

#### 4.8 Manipulating time line

The position, size, and shape of the timeline can be manipulated to better suit your workflow, much like any other Flash window or panel. On a dual monitor system, the timeline can be exiled to the second monitor, together with all the panels leaving the stage clear and unencumbered for wild creativity.

- Move the timeline by dragging it by the Timeline Title Bar, which is the bar at the top that says timeline. If the timeline is docked, click anywhere in the gray area above the layer stack to undock the timeline and reposition it.

- If undocked, resize the timeline by dragging on the lower right corner (PC), or the size box (Mac), which is also in the right corner. If docked, drag the bar at the bottom of the timeline that separates the layers from the application window, either up or down.
- To resize the name and icon controls (either to accommodate longer names or to apportion more of the timeline to frames), click and drag the bar that separates the name and icon controls from the frames area.

## **4.9 Animating**

Flash is the premier medium for Animation on the Internet, and even on other formats such as Television. Creating a simple Flash Animation in Flash is actually fairly simple to accomplish, as Flash provides a lot of useful Tools that simplify the entire process. If you've got an idea for a Flash Animation or a Cartoon, you can probably have a rough sketch going in just a couple hours.

### **4.9.1 Understand the basics of frame-by-frame animation**

"Traditional" method of animation, in that each frame has the same picture but slightly altered. When the frames are played together, the images appear to move. This is the same basic technique used by traditional hand-animators, and is more time-consuming than tweening.

By default, Flash will produce animations at 24 frames per second (FPS). That means one second of animation will have 24 frames, but not every frame has to be different. You can adjust this if you'd like, and many Flash animations use 12 FPS, but 24 will produce much "smoother"-looking animation.

### **4.9.2 Tweening**

Tweening is great for a couple of reasons. Tweened animation is a huge time-saver because it doesn't require that you draw out your animation frame-by-frame. Instead, you establish endpoints and make drawings for each of those end points. Then you let Flash interpolate, or tween, the changes between them. Tweening also minimizes file size because you do not have to save the contents for each frame in the animation.

## **4.10 Processing**

Flash Programming Algorithms are a piece of software to erase or download applications to Flash devices. A Pack with Device Support usually contains predefined Flash algorithms for programming the devices that are supported by the DFP. A template for creating new algorithms are available in the ARM:CMSIS Pack. The following section describes the process in more detail.

## **4.11 Guiding layers**

Guide layers make it easy to keep the layout of your movie consistent, or to trace images, drawings, or other materials from which you want to develop an item. When employed as Motion Guides, you can use Guide layers to create the complex motion of a frame-by-frame animation with the ease of a tweened animation. Guide layers are not exported with the rest of the movie they're just guides. So use them as much as you want.

### **4.11.1 Using Guide layers for layout**

Guide layers are great when you need a little help drawing in Flash. Use them as guides for your layout, as aids for drawing a complex graphic, or for anything else that you might need. To reemphasize, because Guide layers aren't exported with the movie, they do not add to the file size of the final.

### 4.11.2 Adding a Guide layer

here are the steps for adding a Guide layer:

1. Draw or import your guide art into a layer by itself. This can be anything from a hand-drawn sketch of your layout to a full-blown prototype of your design.
2. Open the Layer Properties dialog for this layer by double-clicking the icon to the left of the layer's name.
3. Set the Layer Type to Guide, as shown in Figure below (using either the Layer Properties or the Contextual Menu, which is accessed with a right-click/ Control+click on the Layer name), and then press OK.
4. Use Control+⇐Test Movie to test the movie. Do you see the guide art in the movie? You shouldn't! Remember, because it's a guide layer, it isn't exported with the rest of the movie.

## 4.12 Importing and editing sound and video clips in flash

An audio gives additional effect to the flash file and often adds to the viewers interest. Audio files can also be used as event sounds, button sounds, etc.

### 4.12.1 Importing sound

#### Steps

1 Open Adobe Flash (or Macromedia flash) and select ActionScript 2.0 or 3.0 as your version.

2 Create a new layer.

3 Then go to "file" menu on the top and select ->"import to library" from the drop down, browse to the location on to the hard disk and select the audio file.

Once selected flash imports the file to the library, open library panel and the audio file will be displayed as a waveform in the library window.

4 Drag the audio file from the library on to the stage, make sure the layer currently selected is the new blank layer.

5 Add a new keyframe to the layer after any number of frames. The audio can be clearly seen as a waveform.

6 Go to "control" menu from the top and select play from drop down. The play head moves forward and the sound plays.

### 4.12.2 Editing Import Audio in Flash

- 1) Select the keyframe on which the sound is placed.
- 2) In the Property inspector, locate and click the Edit Sound Envelope button (the pencil icon to the right of the Effect drop-down list) in the Sound section. ...
- 3) Move these sliders to edit the in and out points of the sound or to trim unnecessary silence.

### 4.12.3 Importing video clips

To import video in Flash, you should begin by selecting the Import Video option from the File > Import menu in Flash 8. Upon doing this, you will see the Select Video screen, which allows you to browse to a video clip. Once you've picked the clip you'd like to convert, you can proceed to the next step, Deployment. Deployment is simply choosing the manner that you will include the video into your flash movie

#### **4.12.4 Editing video clips in Flash**

The Editing the Video portion allows you to specify clips that you will edit by dragging markers to the video timeline. Upon doing so you can rename the clips, whereupon they show up on the left side in a field that allows you to select different ones and will eventually show up as individual symbols in your Library.

## 1. Small Questions

### Q1. Do as directed.

- a) Define the term Optical Disk.
- b) Define the use of Crop Tool.
- c) Define Multimedia.
- d) What is the use of touch screen?
- e) Define Kiosks.
- f) Define CD-ROM.
- g) What do you mean by Quick Time Format?
- h) Define rotating.
- i) What do you mean by Transformation?
- j) Give two differences between MPEG-1 and MPEG-2?
- k) What do you mean by multimedia development functions?
- l) What do you mean by Joystick?
- m) List four file types used in Multimedia.
- n) What do you mean by AVI Files?
- o) Define RGB Mode.
- p) Define transformation of an Image.
- q) What is the importance of Selection tool in Flash?
- r) What do you mean by Anchor Point?

## 2. Short Answer Type Questions

### Q2. Attempt any six questions.

- i) How would you convert text to vector?
- ii) Explain the working of DVD.
- iii) Explain the working of touch screen.
- iv) What do you mean by Cropping? Explain.
- v) What are the applications of multimedia in Education?
- vi) Explain various types of printers in brief.
- vii) List the steps of delete a layer.
- viii) What do you mean by Compression? Explain in brief?
- ix) Write short note on Filters.
- x) What is tweening? Give one example of Tweening.
- xi) What are the major components of Director Interface?
- xii) What is the difference between drawing and painting tools?
- xiii) Give the limitations of laser printer.



- xiv) What is hypertext? Write an example of converting a normal text to hypertext.
- xv) What are the benefits of multimedia applications in science and technology?

### **3. Long Type Questions**

Q.3 what is computer animation? Explain different types of Computer animation techniques.

Q.4 Explain the usage of OCR and digital camera in multimedia.

Q.5 Explain various Video File Formats.

Q.6 what do you mean by Multimedia? List various real life applications where the multimedia is being used.

Q.7 what is Flash? Write Step by step instructions for creating Flash File?