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DARNI DARMIN | JAMRI KASIM

DEC5082

INTERACTIVE MULTIMEDIA APPLICATIONS

INTERACTIVE MULTIMEDIA APPLICATIONS exposes students to the process of creating interactive multimedia presentations including the role of and design of multimedia systems which incorporate digital audio, graphics and video, underlying concepts and representations of sound, pictures and video, data compression and transmission, integration of media, multimedia authoring, and delivery of multimedia. Students will produce a final digital interactive multimedia projects.

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CHAPTER 1

INTRODUCTION TO MULTIMEDIA

DEC5082 – Interactive Multimedia Applications

THE HISTORY OF MULTIMEDIA

Where Did It All Begin? That is hard to say, but one of the earliest and best-known examples of multimedia was the video game Pong. Developed in 1972 by Nolan Bushnell (the founder of a then new company called Atari), the game consisted of two simple paddles that batted a square "ball" back and forth across the screen, like tennis. It started as an arcade game, and eventually ended up in many homes.

A New Revolution In 1976, another revolution was about to start as friends Steve Jobs and Steve Wozniak founded a start-up company called Apple Computer. A year later they unveiled the Apple II, the first computer to use colour graphics. The computer revolution moved quickly: 1981 saw IBM's first PC, and in 1984 Apple released the Macintosh, the first computer system to use a graphical user interface (GUI). The Macintosh also bore the first mouse, which would forever change the way people interact with computers.

In 1985, Microsoft released the first version of its Windows operating system. That same year, Commodore released the Amiga, a machine which many experts consider to be the first multimedia computer due to its advanced graphics processing power and innovative user interface. The Amiga did not fare well over the years, though, and Windows has become the standard for desktop computing.

Computer developers started looking to multimedia – the delivery of information using text, pictures, audio, and video—as a way to utilize computers in a uniquely personal way. Multimedia computers could be used to increase efficiency and productivity on the job, provide information at out fingertips in the home, and help students learn more effectively both in and out of the classroom. These personal gains meant that people would see computers as practical and useful tools in their everyday lives.

Since the late 1980s, multimedia technology and applications have found many places in our lives:

- At home where a wide variety of games and reference products such as encyclopaedias and cookbooks are put to use

- At the office where marketing presentations and training are essential how to get a new job done
- At school where interactive software programs assist students in learning mathematics, science, and new languages
- In shopping malls where interactive computer terminals, called kiosks, help us to design greeting cards or to find out where specific stores are located

As we can see, the impact of multimedia technology on our daily lives is often more than we realize. The bottom line is that if there is a need to inform, teach, or entertain multimedia technology can play a key role.

THE ELEMENTS OF MULTIMEDIA

- Multimedia is the presentation of information using text, graphics, animation, audio and video. It uses at least three different data types.
- Multimedia has the potential to provide a better experience than any other information medium. It can combine the best of television, film, graphics, animation, books, magazines and radio.
- The result of using authoring software is called a multimedia product or a multimedia presentation.
- A key feature of multimedia is interactivity.
- It allows the user to choose the sequence and content of information.
- A multimedia product is often judged on the quantity of interactivity.
- Interactive multimedia accepts input from a mouse, touch screen or keyboard and performs some action.

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Video – One of the multimedia elements

THE CATEGORIES OF MULTIMEDIA

There are 2 categories of Multimedia:

i. Linear Multimedia Presentation

A Multimedia Presentation is identified as Linear when:

- It is not interactive
- User have no control over the content that is being showed to them.

Examples:

- A movie
- A non-interactive lecture
- A demo show

Scan this image using Aurasma Reader (Follow 'Darni')

A demo show – example of Linear Multimedia Presentation

ii. Non Linear Multimedia Presentation

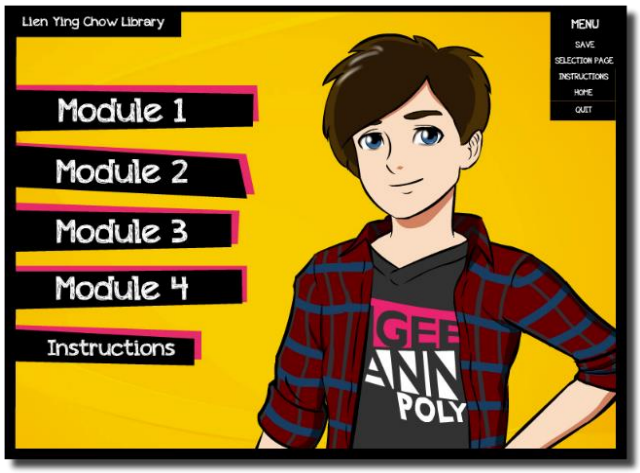
A Multimedia Presentation is identified as Non-Linear when:

- It is interactive
- Users have control over the content that is being showed to them
- Users are given navigational control

Example:

- Games
- Courseware
- E- Learning

Games



Courseware

THE APPLICATIONS OF MULTIMEDIA

Multimedia can be used/apply in different environment that provide a benefit over other forms of information presentation.

Examples:

- Education: e-learning, m-learning, distance learning, digital library, etc.
- Engineering: virtual surgeon in medical engineering
- Industry: e-business
- Creative Industries – games, movies, etc.
- Commercial- advertising
- Entertainment and Fine Arts
- Multimedia in Public Places: any kiosk to provide information or help

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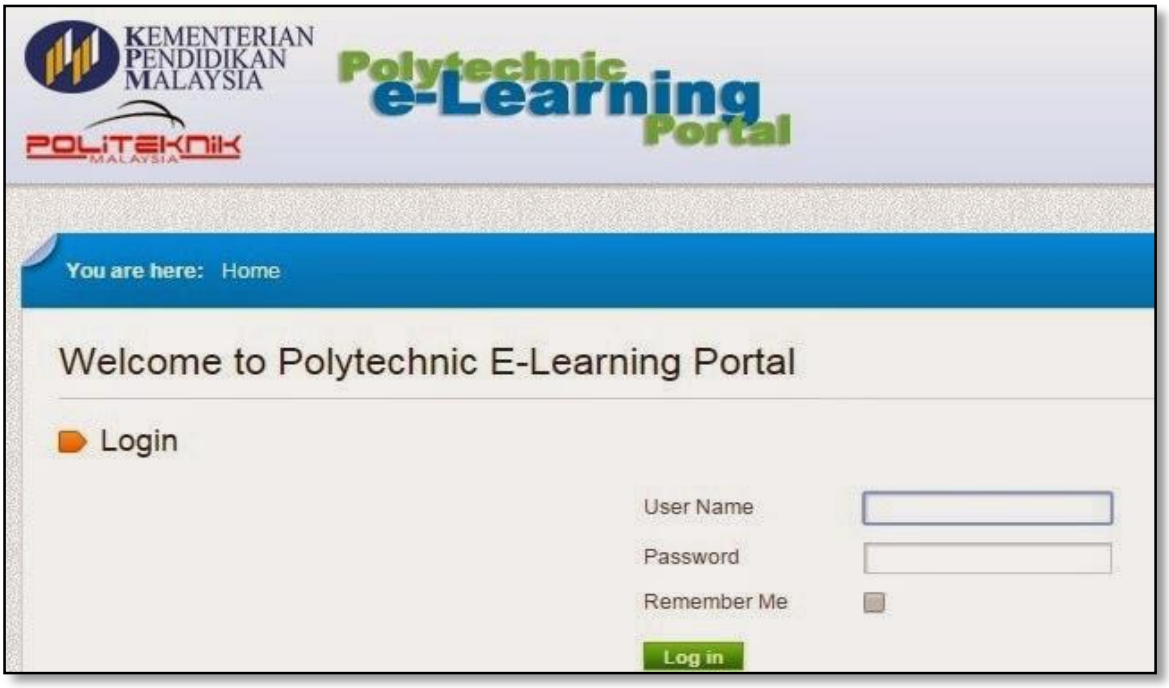
Advertising is one of the multimedia application in commercial area

Multimedia is extensively used in education, entertainment and information.

i. Education

- Multimedia is very effective at helping people to learn.
- The interactive nature of multimedia allows the user to control the learning. It addresses each user's particular needs.
- Multimedia also allows training to be carried out at convenient times and is developed to cater for a wide range of abilities. It is a cost effective method of teaching people.



E-Learning is an example of multimedia application in education area

ii. Entertainment

- Multimedia designed for entertainment is generally classified as *computer games*.
- Computer games provide a high level of interactivity. The responses of the user determine the game being played.
- The sequence of actions is determined by the game designer. Games tend to be time restricted and contain complex animation.

iii. Information

- Multimedia provides users with an easy way to display information.
- The user controls when, how and what information will be displayed.
- The interactive nature of multimedia allows the user to search using related keywords to find specific information.
- A *multimedia encyclopaedia* is a good example of multimedia being used to store information.

THE STAGES OF DEVELOPING MULTIMEDIA APPLICATION

A Multimedia application is developed in stages as all other software are being developed. In multimedia application development a few stages have to complete before other stages being, and some stages may be skipped or combined with other stages. Following are the four basic stages of multimedia project development:

Four basic stages of multimedia project development

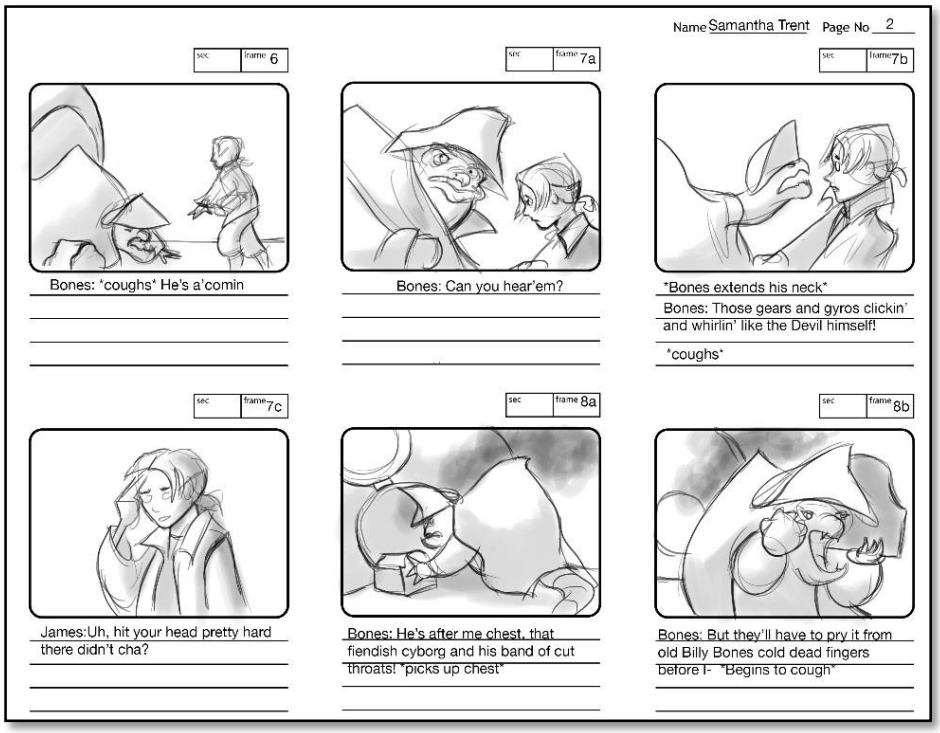
i. Planning and Costing

- Begins with an idea or need (objective)
- Plan what writing skills, graphic art, music, video and other multimedia expertise will be required
- Estimate the time, cost
- Draft the structure of navigation

Discussing on writing skills, graphic art, music, video and other multimedia expertise will be required in early stage of multimedia development

ii. Designing and Producing

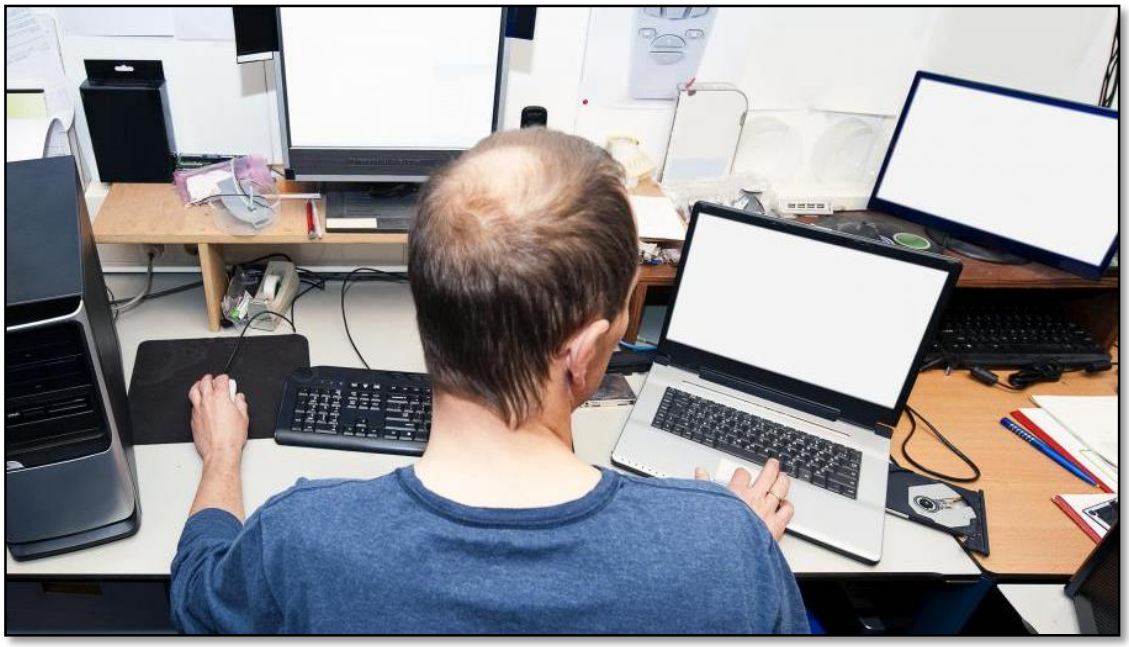
- Storyboarding the project
- Acquiring the multimedia resources
- Design the navigational structure and interface
- Execute each of the planned tasks and create a finished product



Example of the storyboard

iii. Testing & Debug

- For ensure the product free from bugs
- It is also necessary to test whether the multimedia project works properly on the intended deliver platforms and they meet the needs of the clients



Testing and debug for ensure the multimedia project works properly

iv. Delivering

- Means pack the project and deliver the completed project to the end user.
- Provide instruments for users to give their feedback on the product.
- This stage has several steps such as implementation, maintenance, shipping and marketing the product.

CHAPTER 2

MULTIMEDIA HARDWARE

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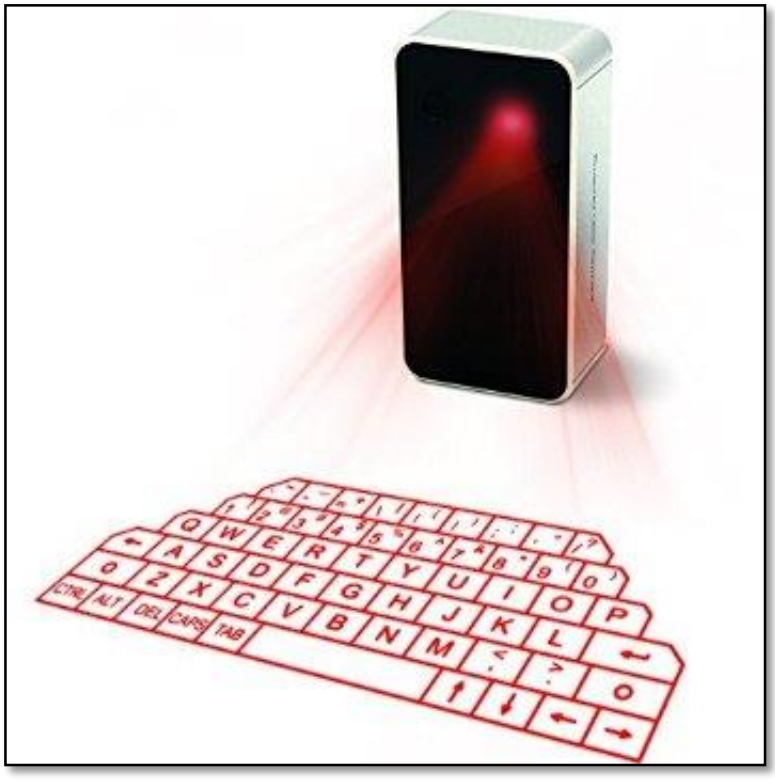
INPUT DEVICES

Input devices collect data and programs that are readable or understandable by humans and convert them into forms that can be processed by computers.

There are many types of input devices such as keyboard, mouse, touch screen, camera and voice input devices that can be used to develop and distribute a multimedia project.

i. Keyboard

External input device used to type data into some sort of computer system whether it be a mobile device, a personal computer, or another electronic machine.



A Virtual Infrared Keyboard

ii. Pointing devices

A pointing device, or sometimes called a pointing tool, is a hardware input device that allows the user to move the mouse cursor in a computer program or

operating system. Mouse, Light pen, Trackball and Touchpad are examples of pointing devices that can be used on a computer.

A Mouse

iii. Imaging and Video Input Devices

The introduction of digital video camera brings multimedia technology into a new era. This technology enables images or videos to be transferred directly from the digital video camera to a computer with just a cable extension.

A digital video camera

iv. Audio Input Devices

Audio input devices are used to capture sound. A microphone is an example of audio input device.

A microphone is used to capture sound

v. Touchscreen

A touchscreen is an input device normally layered on the top of an electronic visual display of an information processing system. A user can give input or control the information processing system through simple or multi-touch gestures by touching the screen with a special stylus and/or one or more fingers.

Touchscreen is used in tablet or other display device

OUTPUT DEVICES

Output device converts information that can be read by machines to a form that can be read by humans. The data entered and subsequently processed by the computer would remain in machine readable form until the output device converts it to a form that is readable by humans.

Output devices that are frequently used with multimedia computers are the monitor, printer, plotter, projector and voice output device.

i. Audio Output Devices

The term "audio output device" refers to any device that attaches to a computer for the purpose of playing sound, such as music or speech. The term can also refer to a computer sound card.

Examples of Audio Output Devices: Headphone and Speaker

ii. Monitors

A monitor is a device used for display. It is one of the most important hardware in a multimedia computer system. The monitor is required to develop a multimedia project depends on the nature of the multimedia application that you are developing and the type of computer that you are using. Among them are the Cathode Ray Tube (CRT) monitor, Liquid Crystal Display (LCD) monitor and LED monitor.

CRT monitor (left) and LED monitor (right)

iii. Projector

The projector is a tool that enables a multimedia presentation to be displayed to a large group of audience. Among the projectors available in the market are Liquid Crystal Display Panel and Three-Gun Video Projector.

Liquid Crystal Display (LCD) Panel projector has many interesting features such as a LCD panel, light source, computer and video input, and internal speakers that can operate computer signals and video. This type of portable projector is suitable for use because it is cheap and a high-quality.

Three-Gun Video Projector is capable of displaying high-quality images and is usually used in large halls. However, such projectors are very expensive.

LCD Projector (left) and Three-gun Video Projector (right)

iv. Printers

A printer is a device which receiving the signal from computer, transfers the information to paper or other form of output. The two most common printer are laser printers and inkjet printers. Now, 3D printers exist and capable to print three-dimensional objects builds from plastic, metal or other materials.

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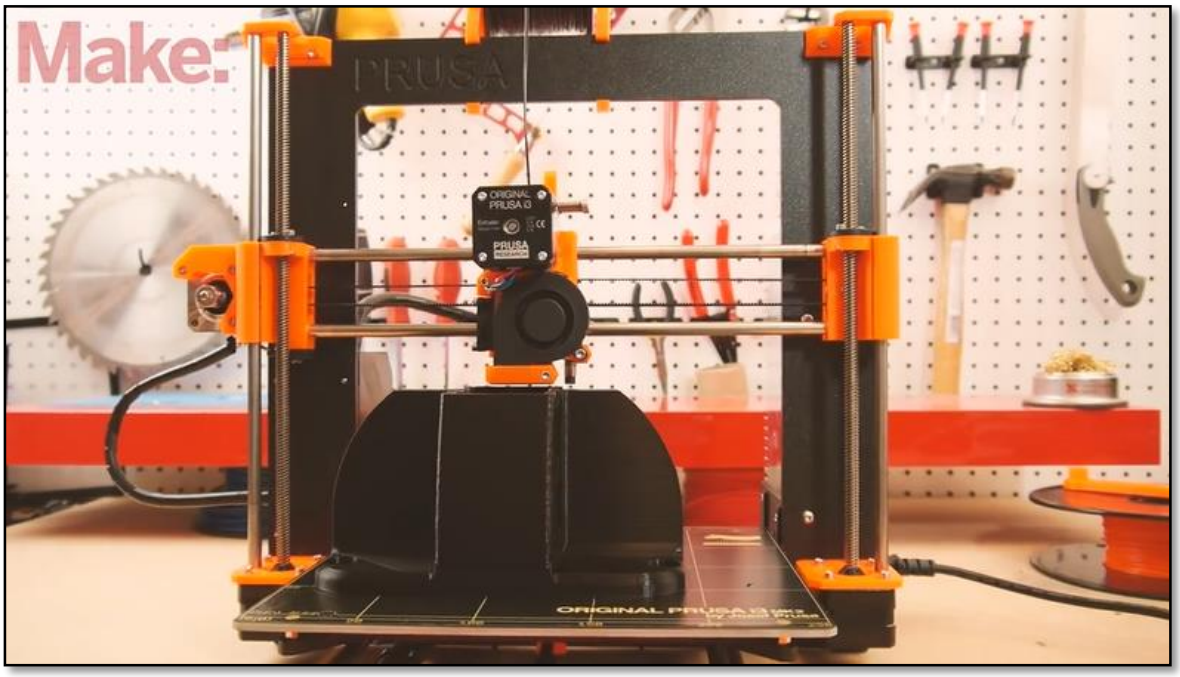

3D Printer Technology

COMMUNICATION DEVICES

Communication among workshop members and with the client is essential to the efficient and accurate completion of project. And when speedy data transfer is needed, immediately, a modem or network is required. If the client and the service provider are both connected to the Internet, a combination of communication by e-mail and by FTP (File Transfer Protocol) may be the most cost-effective and efficient solution for both creative development and project management.

In the workplace, it is necessary to use quality equipment and software for the communication setup. The cost–in both time and money–of stable and fast networking will be returned to the content developer.

i. Modem

Modems are used for data transfer from one computer network to another computer network through telephone lines. The computer network works in digital mode, while analogue technology is used for carrying massages across phone lines.

Modems can be connected to the computer externally at the port or internally as a separate board. Modem speed, measured in baud, is the most important consideration. Because the multimedia file that contains the graphics, audio resources, video samples, and progressive versions of your project are usually large, you need to move as much data as possible in as short a time as possible.

Telekom Malaysia's Modem

ii. Integrated Services Digital Network (ISDN)

Integrated Services Digital Network (ISDN) is a set of communication standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network. ISDN lines (and the required ISDN hardware, often misnamed 'ISDN modems even' though no modulation/demodulation of the analog signal occurs) are important for Internet access, networking, and audio and video conferencing.

CHAPTER 3

MEDIA ELEMENTS

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TEXT

Text is...

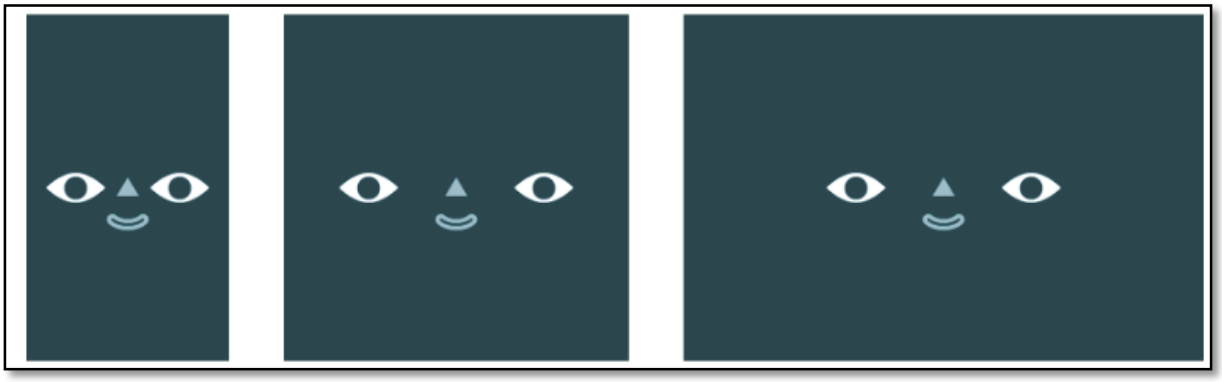
- A combination of letters that form words or sentences.
- To explain or discuss a topic which is known as text information.
- Some common file formats for text includes DOC, TXT, RTF, ASCII, and PDF.

In Multimedia Presentation?

Text is considered the best and safest form of communication medium to deliver messages effectively so that misunderstanding will not arise. It has to be combined with other multimedia elements in order to produce high quality presentations.

Text Is The Best Form Of Communication To Deliver A Message

Typeface and Font



The Analogy of Typeface and Font

Here, you see a family of three twins: John Smith, Jack Smith, and Tom Smith. Each brother shares the same face, but their weights vary – read: one is slim, the other is rather rotund.

Together, the brothers make up the Smith family. Typographically, John, Jack, and Tom are each fonts and together they make up the Smith typeface.

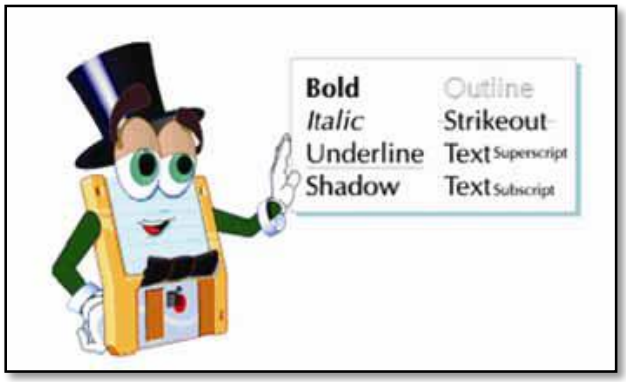
Typeface

- A typeface is a family of graphic characters that usually includes many type sizes and styles.
- Times New Roman, Courier and Arial are among common typefaces used.

Typefaces

Font

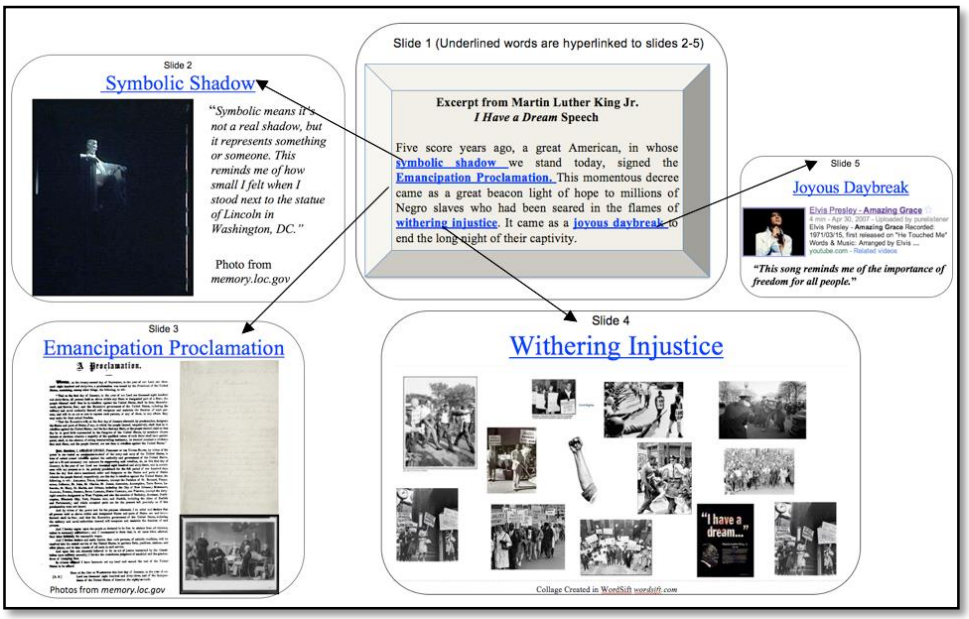
- A font is a collection of characters of a single size and style belonging to a particular typeface family. Typical font styles are bold-face and italic. Times New Roman, 12 point, Italic is an example of a font.



A Font Is A Collection Of Characters Of A Single Size And Style Belonging To A Particular Typeface Family

Hypertext

Hypertext is text displayed on a computer display or other electronic devices with references (hyperlinks) to other text which the reader can immediately access, or where text can be revealed progressively at multiple levels of detail.



Hypertext is text with references (hyperlinks) to other text

Hypermedia

Hypermedia, a term derived from hypertext, extends the notion of the hypertext link to include links among any set of multimedia objects, including sound, motion video, augmented reality or virtual reality.

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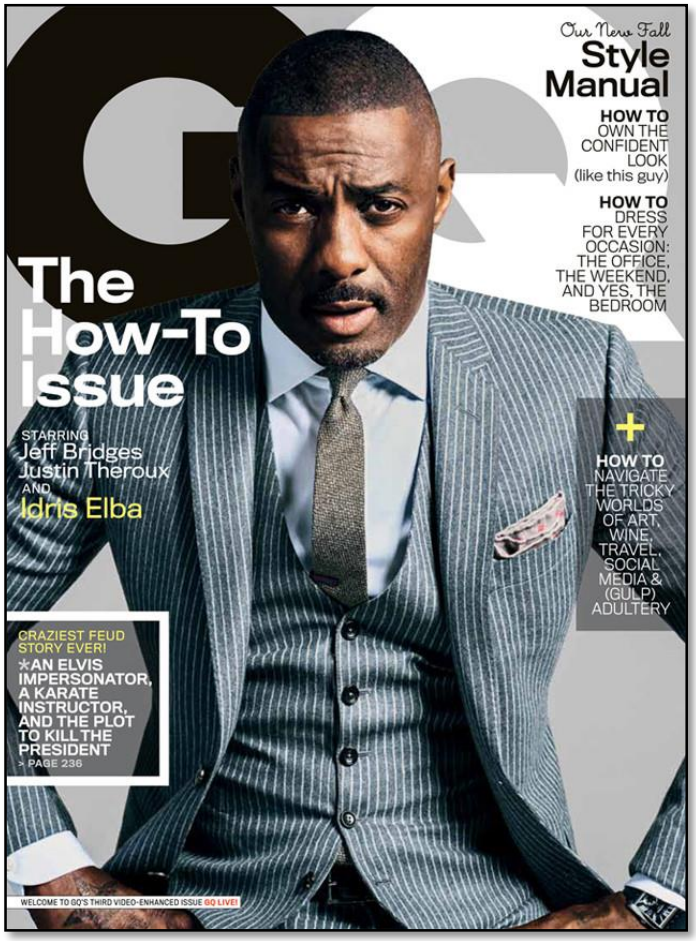
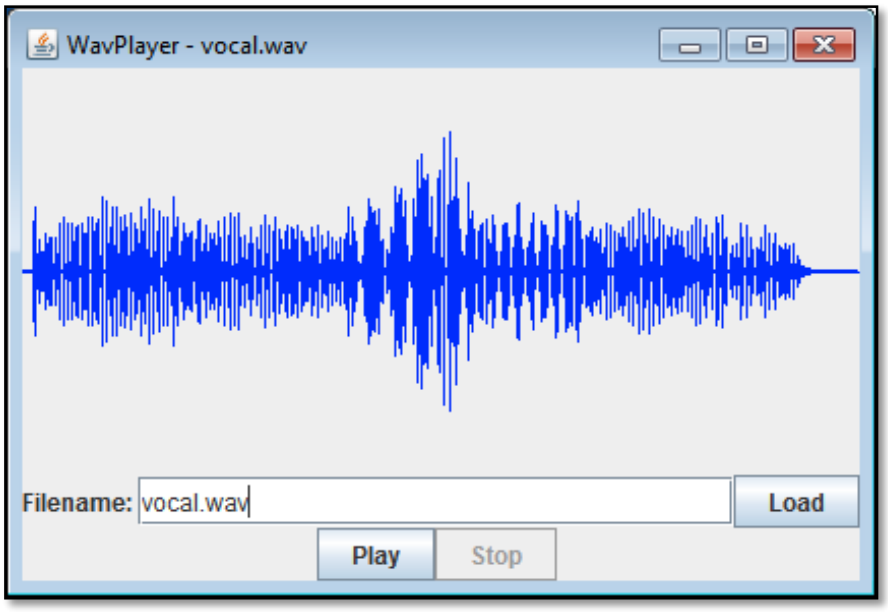


Augmented Reality: Example of Hypermedia

SOUND

- Sound travels through the air in waves with a particular amplitude (volume) and wavelength (pitch or note).
- Audio is sound that has been digitized or represented in the form of digits. Audio is used to explain concepts, reinforce selections and for special effects.
- Audio signals from a computer are converted into analogue sound waves for transmission through speakers.
- Some common file formats for audio include:
  - WAV (pronounced 'wave')
  - MP3 (MPEG audio layer 3)

- WMA (Windows Media Audio)
- MIDI (Musical Instrument Digital Interface, pronounced 'middy')



Wave Audio Player

How we classify a sound as…

Background Music

Music may be used for various purposes. It is used to generate an ambience or 'mood' for a presentation. For example, to attract the audiences' attention, we can use fast rhythmic music as the music setting for our presentation.

On the other hand, to produce a calm and soothing situation for audience, then it is better if we use slow and melodious music as background music.

Sound Effects

Let's say that we want to present a multimedia project which has A Star Wars' features, but we forgot to include sound effects in the said project. This situation is tantamount to watching a Formula One car race without sound and definitely we will not be impressed with the presentation.

Therefore, sound is also used as sound effect in multimedia presentations. For example, the 'ping' or 'ding' sound effects can be used to tell users that they have done something wrong.

Narration

Another method of using sound is by adding narrations. Usually the narrator and background music will be used alternatively where the music is used in the background and at a particular time the narrator will provide the explanation regarding the information that he wishes to convey.

 Scan this image using Aurasma Reader (Follow 'Darni')

Star Wars Trailer

Activity:

Identify the background music, sound effect or narration in the Star Wars Trailer above.

IMAGE

An image or graphic is a picture that has been created or copied and stored in electronic form. An image can be described in terms of vector graphics or raster graphics.

Vector graphics and raster graphics

Vector Graphic

Vector graphic also known as object oriented graphics or structured graphics. It refers to any image produced with the use of certain software and computer technology. Vector graphics are formed from lines that follow the mathematical equations called vector.

For example a bicycle tyre, in a vector graphic format is built from a mathematical definition– where a circle with a given radius, set in a specific location and filled with particular colors. Although the bicycle tyre can shift its location, change its size or color, the quality of graphic remains the same. Vector graphics are regularly used in technical areas such as CAD/CAM (Computer Aided Design/ Manufacture), scientific modelling, architecture, arts design and others.

Example of Vector Graphic

Vector graphics are most suitable for text (especially small text) and thick graphics (bold) which, when altering its size, the quality still remains the same. For example, logos. Among the applications that provide the environment based on vector graphics is Adobe Illustrator.

Vector Graphics Can Be Created Using Adobe Illustrator Software

Raster Graphic

Raster or bitmap graphic is image that produced from dots arranged specifically in metric form. These dots are known as pixels (Pixel = picture + element). This pixel image is known as bitmap image. Within the confines of metric, these pixels are arranged according to size, color and location. The image created on the computer screen is the combination of all these pixels.

Raster Image

Bitmap images are usually not produced by computer. Instead, it is obtained from an actual source and then translated into digital form by devices such as image scanners, digital camera and others. The following are some of the ways that might be used to produce a bitmap image:

- Producing the image from scratch by using computer drawing programs such as the Paint Program.
- Capturing the image direct from the screen (screen capture) and then pasting the image onto your computer drawing program or application.
- Taking the image of a photograph, drawing or television image by using a scanner or a video capture card to digitize the image.

Among the applications that are used to edit or modify a bitmap image is Adobe Photoshop. The bitmap image produced may be copied, modified, delivered via e-mail and used in various creative ways.

Bit-mapped graphics (raster graphics) file format are:

- BMP (bit-map)
- JPEG (JPG, Joint Photographic Experts Group, pronounced 'jay- peg')
- GIF (Graphics Interchange

  Format)

  TIFF (Tagged Image File Format)
- PICT (picture)

Vector graphics (object-oriented graphics) file format are:

- CDR (CorelDraw)
- WMF (Windows Metafile Format)
- EPS (encapsulated postscript)
- PICT (Picture)

Activity:

Discuss the capabilities and limitations of Vector and Raster Images.

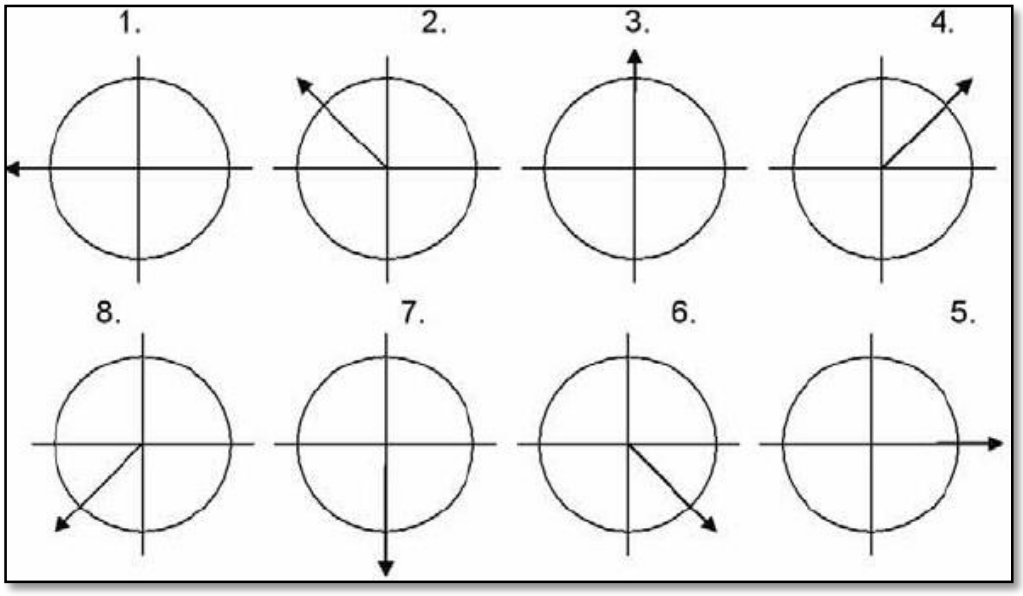
ANIMATION

Definition of Animation:

Animation is a technology that enables a still image to look as though it is alive, able to move, act and talk. This is made possible by cinematography graphics and plastic art techniques to create or to give the illusion of movement and life to cartoons, hand drawing, statues and three dimensional objects (Neo & Neo, 1997).

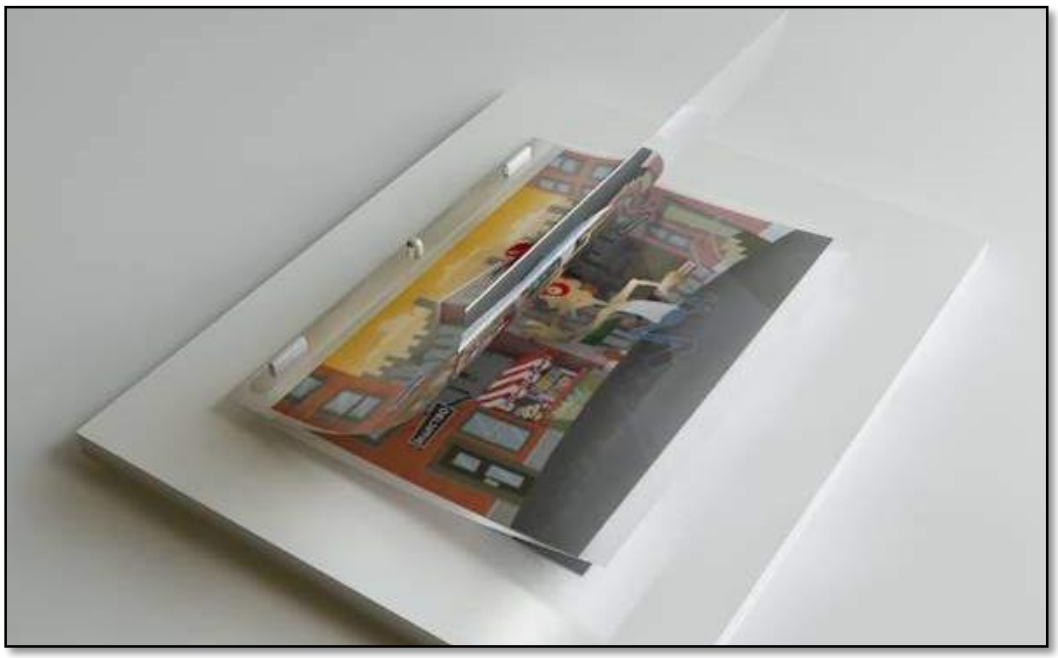
Principles of Animation

Animation is a series of images that are changed very slightly and very rapidly, one after the other, to seemingly blend together into a visual illusion of movement.



Principles of Animation

Computer animation refers to animation developed by using sophisticated electronic and computer technology. It may be divided into two categories: two dimensional animation (2D) and three dimensional animation (3D). 2D animation is the traditional animation method that has existed since the late 1800s. It is one drawing followed by another in a slightly different pose, followed by another in a slightly different pose, on and on for 24 frames a second.



Cell animation in 2D

Today most 2D animation involves using computer software to one degree or another, from just digitally colouring the cells to be photographed in the traditional method, to doing every single element in the computer. The examples of 2D animations are Bugs Bunny, Daffy Duck, Snow White, The Jungle Book, The Little Mermaid, The Simpson and South Park.

2D Animation Examples

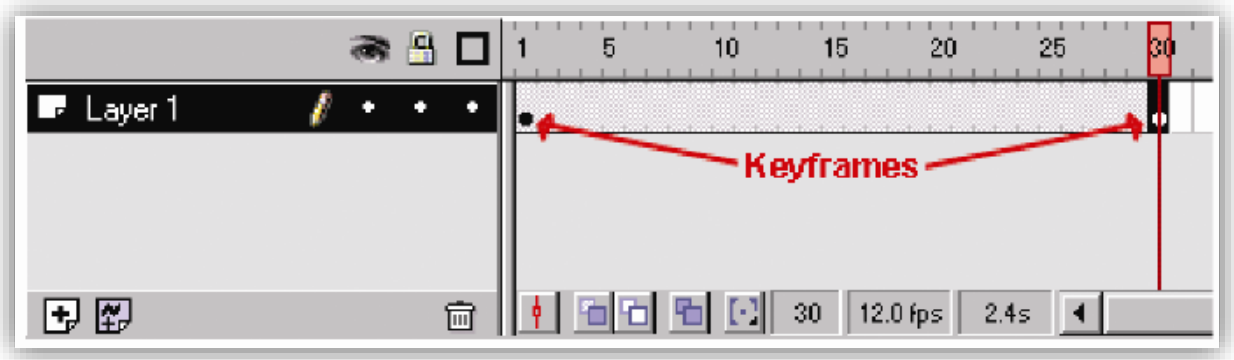
3D animation (aside from stop-motion, which really is a form of 3D animation), is completely in the computer. Things that we create in a 3D animation program exist in an X, Y & Z world. The examples of 3D animations are Shrek, Toy Story, The Incredible, Jurassic Park (the dinosaurs) and The Transformers (the robots).

3D allows us to do things that simply are not possible in 2D animation

Keyframe

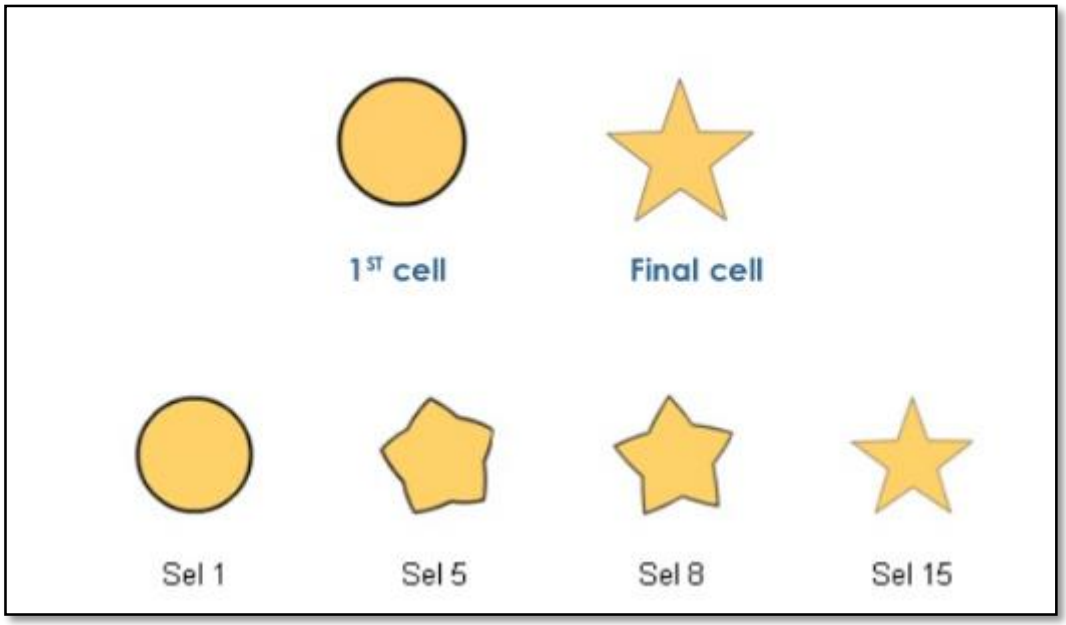
A key frame in animation and filmmaking is a drawing that defines the starting and ending points of any smooth transition. The drawings are called "frames" because their position in time is measured in frames on a strip of film. In computerized animation, it is no longer necessary to draw images by hand to generate the frame images between the key frames.

Instead, computers with selected animation software will automatically calculate insert or draw relevant images to be inserted in between the key frames. The more the number of key frames identified the smoother the animation produced. The software screen in figure below shows two frames that made up the key frames (frames no. 1 and 30) for a short animation. The area between both the arrows shows the process of tweening that occurs between both the key frames.



Tweening

Inbetweening or tweening is the process of generating intermediate frames between two images to give the appearance that the first image evolves smoothly into the second image.



Inbetweening or Tweening

Some common file formats for animation include:

- SWF (Shockwave Flash object)
- Animated GIF (Graphics Interchange Format)
- MOV (Movie)

VIDEO

A video is made up of frames that contain individual images. When the video is played, the frames are displayed in sequence. The number of frames per second is the frame rate. Video has a frame rate ranging from 15 to 60 frames per second (fps).

Some common file formats for video are:

- MPEG (MPG, Motion Picture Expert Group)
- AVI (audio/video interleaved)
- DivX is a compressed format based on MPEG-4 technology.
- WMV (Windows Media Video)
- MOV (Movie) developed by Apple QuickTime

The Implications of Using Digital Video in Multimedia

i. Attracting Attention

- Video is a media that attracts the users' attention immediately because it provides visual satisfaction with colorful displays and attractive videos. Therefore, video is very useful for advertising products and services.

- For example, while surfing web sites on the Internet, a window suddenly appears with a brief video displaying a new-product of a company. Our attention will immediately be redirected to this advertisement and generally this window would have a "click here for further information" button to carry us to further linkage of this advertisement.

ii. Display of Physical Procedure

- Have you ever experienced a situation where you were unable to understand a procedure or direction by just referring to the text? Instead, when this procedure is shown step by step through a video display, you are able to understand it immediately. This shows that video is the media that deserve our attention in multimedia especially when you want to show a sequence of complex actions and needs accurate descriptions. Besides that, video can also be used to show procedures or operation manuals that cannot be described by text or graphics alone.

iii. Scenario Presentation

- Sound and movement has made video a good and effective tool to depict a real-life situation or scenario in our daily lives. For example, it can be used to display an acting of an emergency situation to train doctors and nurses to familiarize themselves and act in a calm manner during a real emergency situation.

iv. Movement Analysis

- One of the special qualities of video, that is not available in other media, is its ability to pause an action, show an action in slow motion and fast mode. This quality makes video very useful for analysis. For example, the movements of a swimmer in a swimming pool can be analyzed through this movement analysis.

CHAPTER 4

MULTIMEDIA AUTHORING

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AUTHORING SOFTWARE SYSTEMS

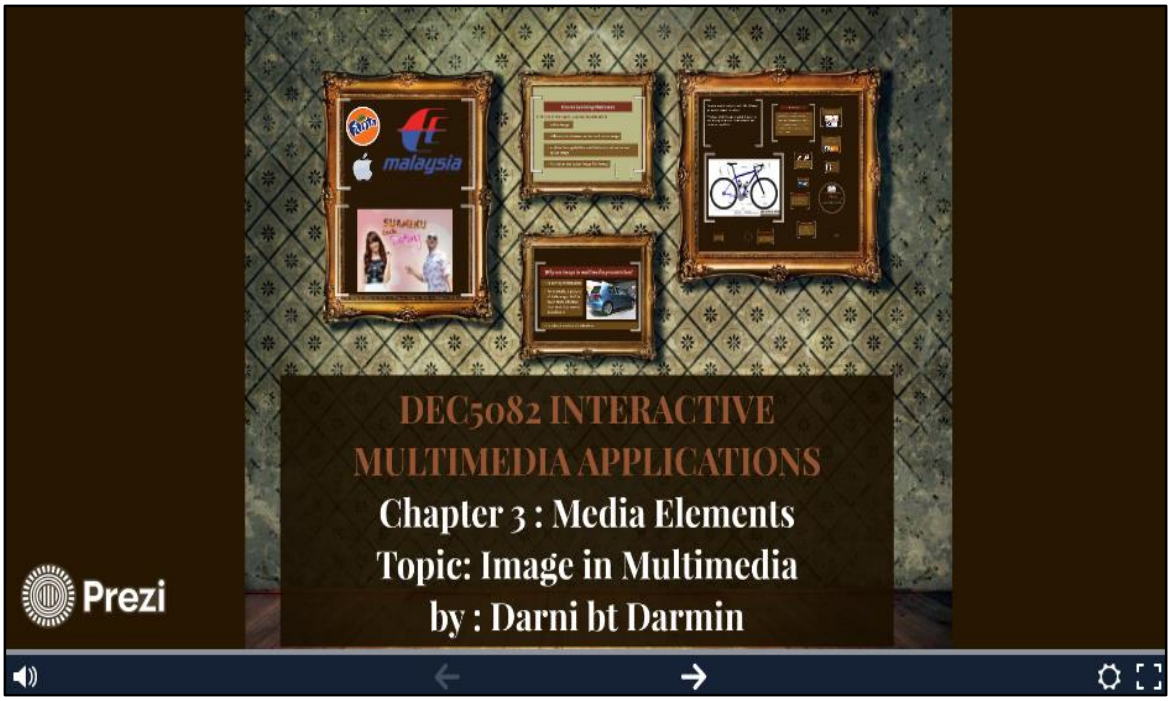
Multimedia is created and displayed using a range of multimedia software such as Presentation Software, Multimedia Authoring, and Web Authoring.

i. Presentation Software

Presentation software is used to make a multimedia presentation to a group of people. A presentation consists of a series of slides. A slide is an individual screen or page of the presentation. Each slide may contain text, graphics, animation, audio and video. Each of these elements is treated as an object.

A presentation is a group of objects positioned on one or more slides. Some popular presentation software includes Microsoft PowerPoint or Prezi. Presentation software often allows us to create several different types of documents such as:

- Onscreen presentations – slides displayed on a monitor or projected onto a screen. The timing of the presentation is controlled either automatically or manually. Automatic requires the user to set the timings for each slide so that the slides advance by themselves. Slides advance manually by clicking the mouse button.
- Audience handouts – content of one or more slides on a page. Handouts are given to people who attend the presentation.
- Overhead transparencies – slides printed on transparent film for use with an overhead projector. They can be in black and white or color, and in portrait or landscape orientation.
- Speaker's notes – notes the speaker may need to refer to when discussing the slides.



Prezi – An online presentation software

ii. Multimedia Authoring

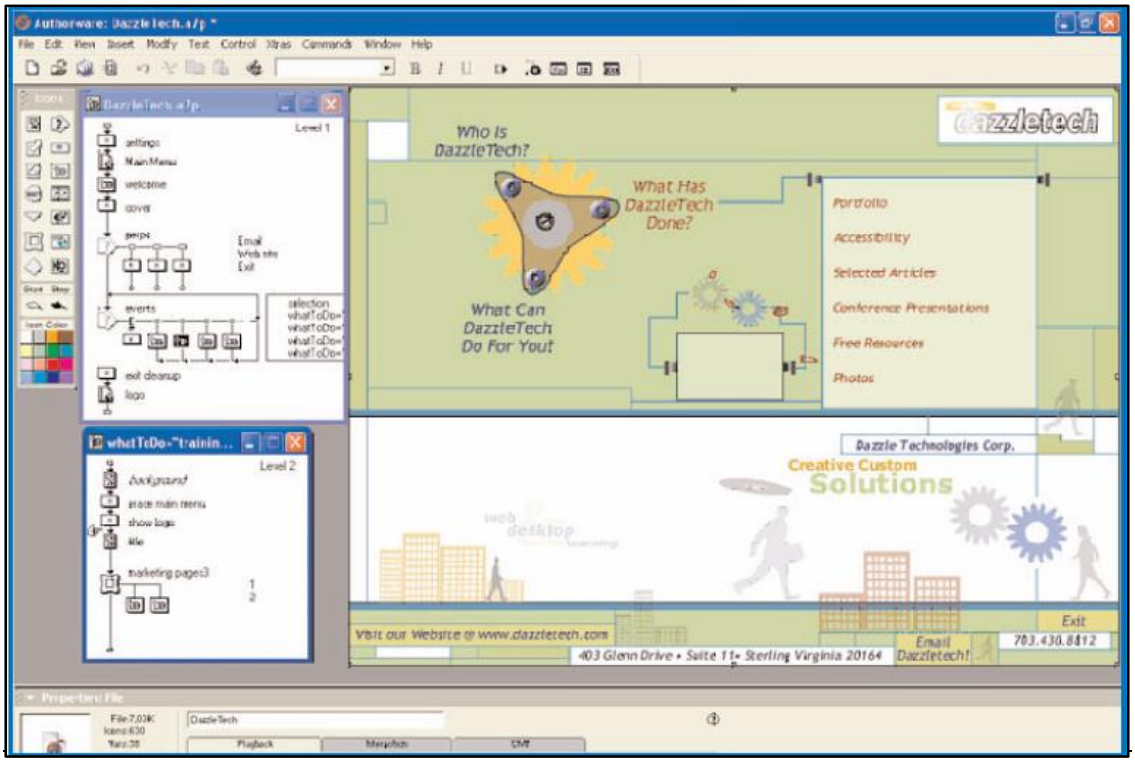
Multimedia authoring software is used to create and edit a multimedia product. It allows the user to combine the different media such as text, graphics, audio, animation and video.

Multimedia authoring software is designed to produce self-contained applications for a CD or DVD, as a part of an information kiosk or to run on the Internet. Multimedia authoring software provides a much greater level of interactivity than presentation software. A multimedia product is created by first developing each of the media (text, image, audio, animation or video). It is often completed by a group of people, each of them specializing in each of media. They create their part of the project using separate applications and import files into the authoring software.

Examples of multimedia authoring software are:

- Adobe Authorware

Uses a flowchart to create the multimedia product. A flowchart consists of a number of icons that represent a specific programming task such as a selection. Adobe Authorware specializes in creating multimedia training courses.



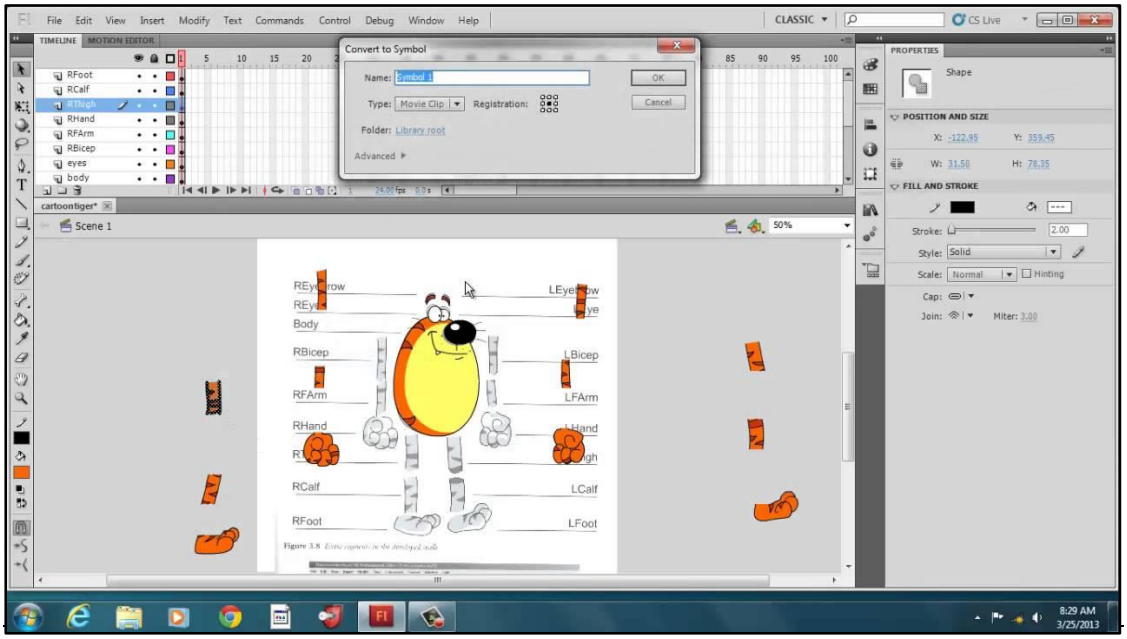
Adobe Authorware (previously Macromedia Authorware) software

- Adobe Flash

Adobe Flash (formerly called Macromedia Flash and Shockwave Flash) is a multimedia software platform for production of animations, browser games, rich Internet applications, desktop applications, mobile applications and mobile games. Flash displays text, vector graphics and raster graphics to provide animations, video games and applications.

Artists may produce Flash graphics and animations using Adobe Animate. Software developers may produce applications and video games using Adobe Flash Builder, Flash Develop, Flash Catalyst, or any text editor when used with the Apache Flex SDK.

Action Script programming language allows the development of interactive animations, video games, web applications, desktop applications and mobile applications.



Adobe Flash software

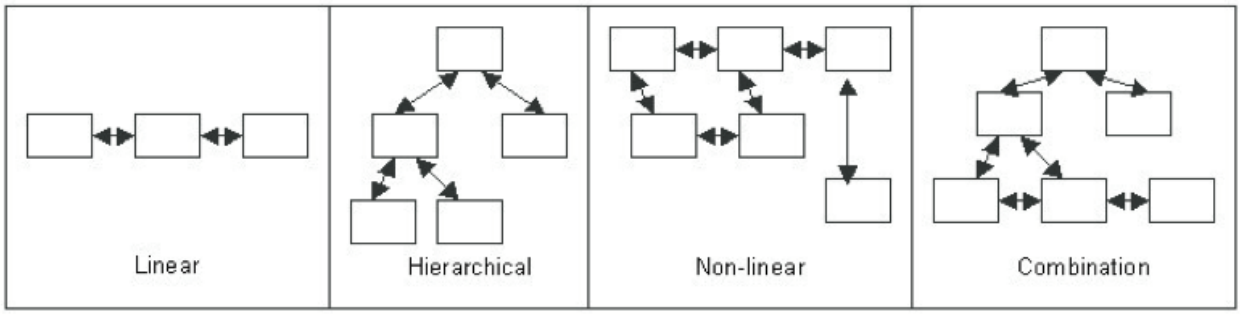
iii. Web Authoring

A web authoring package is specifically designed to allow us to create web pages and web sites. Examples include Dreamweaver and Microsoft Front Page.

How were things done before web authoring? Web designers would have to write the page using HTML code. Whilst this is very powerful, it is a lot slower than using a web authoring package. It is also possible to save word processed documents or dtp publications as a web page. However, this is not recommended because they produce large amounts of code which is not required.

A. Designing The Structure Of Multimedia Product

In the early stage of project development, we need to design the structure of the multimedia product based on:



i. Linear – a simple sequential path that is set up quickly. It is an appropriate layout when users are expected to examine each frame before moving to the next frame.

ii. Hierarchical – a sequential path in a top-down design. It starts at the beginning and moves down through the multimedia product. This layout allows users to choose their direction and explore a particular topic in greater depth.

iii. Non-linear (random) – no particular structure. It moves between different layouts in any direction. This layout is often used in multimedia encyclopedias as it gives users the opportunity to explore.

iv. Combination – a blending of the all these layout types.

While designing the structure, try to figure out these elements:

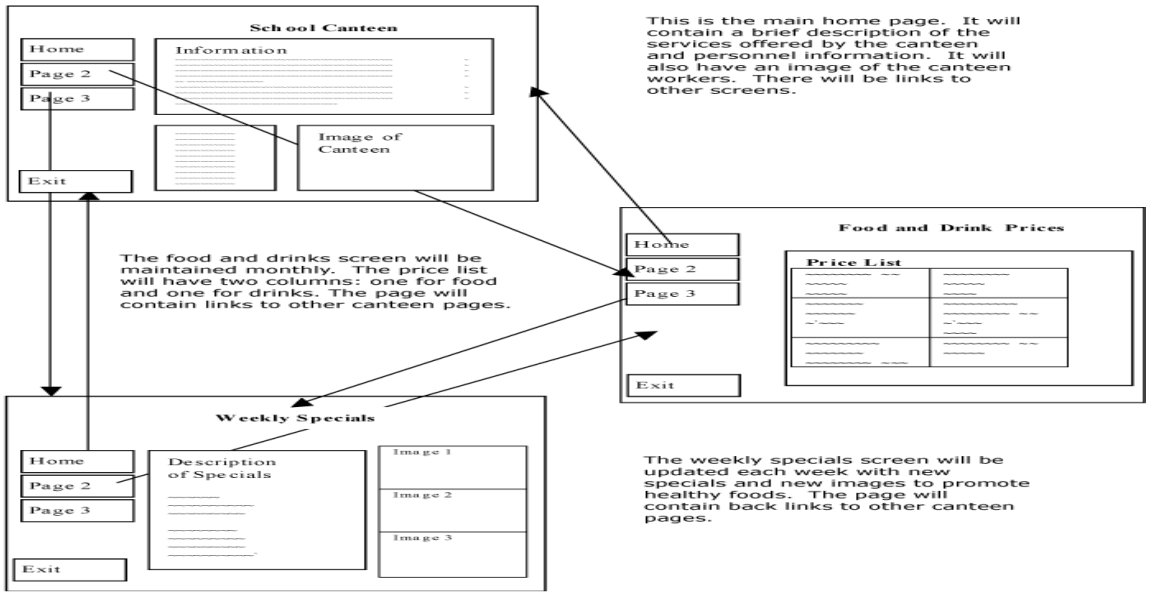
i. Navigation Maps/Site Maps

- Done early in the planning phase.

- Help organize the content and messages.
- Provide a hierarchical table of contents and a chart of the logical flow of the interactive interface.
- Essentially non-linear.

ii. Architectural Drawing

- Storyboards and navigation maps.
- Storyboards are linked to navigation maps during the design process, and help to visualize the information architecture.



Storyboard

iii. Hotspots

- Add interactivity to a multimedia project.
- Categories of hotspots: Text, Graphic or Icon.
- The simplest hot spots on the Web are the text anchors that link a document to other documents.

iv. Hyperlinks

- A hotspot that connects a viewer to another part of the same document, a different document, or another Web site.

v. Images Maps

- Larger images that are sectioned into hot areas with associated links.

vi. Icons and Buttons

- Icons are fundamental graphic objects symbolic of an activity or concept.
- A graphic image that is a hotspot is called a 'button'.
- Plug-ins such as Flash, Shockwave, or JavaScript enable users to create plain or animated buttons.
- Small JPEG or GIF images that are themselves anchor links can also serve as buttons on the Web.

vii. Graphical User Interface

- The GUIs of Macintosh and Windows are successful due to their simplicity, consistency, and ease of use.
- GUIs offer built-in help systems, and provide standard patterns of activity that produce the standard expected results.

B. Designing the user interface

A multimedia product needs to be carefully designed. It involves conforming to certain design principles.

The different media must be combined into one effective multimedia product. The design of each screen should be based on the three basic design principles: Consistent, Navigation and Simple.

i. Consistent

- Layout, format and style should be the same throughout the multimedia product unless different data types demand a change.
- Readability is improved when similar items are grouped.
- Grouping is achieved by spacing, use of color for the text and changing the backgrounds or borders.

ii. Navigation

- Users need to understand the structure of the multimedia product and be able to find information they want easily.
- The time taken to respond to a user's action is important.
- People become frustrated if they have to wait more than a few.

iii. Simple

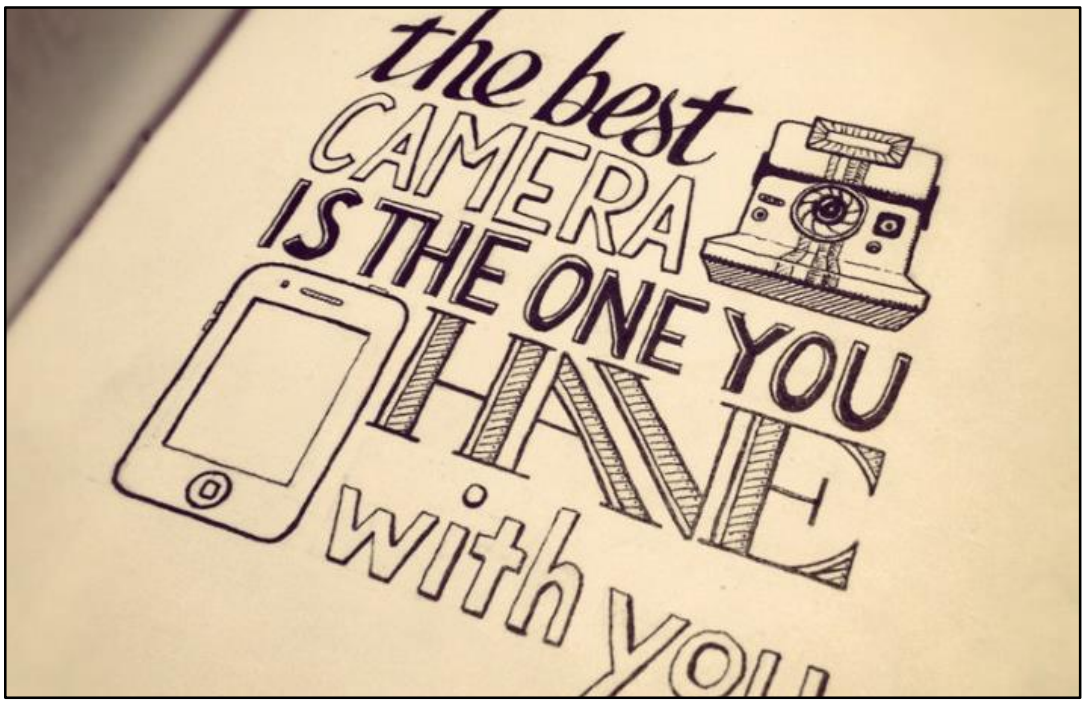
- Do not overuse design elements as this will create visual clutter and confuse the user.
- The overuse of color, sound and animations can be distracting.

While using text, it should be short, simple and relevant. It is better to provide text in concise bursts using short paragraphs. For longer sections of text, consider providing a brief introduction and then include a link to the full version on another page. Design principles to format text include: Fonts, Screen Layout and Color Scheme.

i. Fonts

- Use at most three different fonts. Both sans serif typefaces (such as Arial, Verdana or Georgia) and serif typefaces (such as Times Roman) can be used for text.
- Care should be taken using font variations such as bold and italic.

- Use different size headings to reflect their importance.



Text should be short, simple and relevant

ii. Screen layout

- Appropriate conventions exist for column width, alignment, line spacing, character spacing, indentation, hyphenation and kerning.
- Long lines of text are difficult to read. Double spacing improves readability.
- Bullets and numbering are common ways to organize text in a multimedia product.

Sometimes we need to get away from stuffy, professional presentation ideas to capture the audience's attention

iii. Color scheme

- This contributes to the style and theme of a multimedia product. Color draws attention to the text.
- Some colors should not be used together as they produce poor contrast and reduce readability.
- For example, blue text on a red background. Too many different colors can be distracting and reduce readability.
- Use color in a consistent way so users easily recognize the different elements.

Color is an extremely powerful nonverbal tool that we can use to guide our audience

Graphics and animations are used to create interest and provide information. However, they place extra demands on the multimedia product, so need to be used carefully.

The position and size of a graphic or animation is dependent on its importance and balance with the other design elements. It can support or weaken a multimedia product. If too many images are used the product loses its impact.

The same goes for animations. Animations should be used sparingly, such as to introduce a new section within the multimedia product. Images and animations are edited and adjusted to suit the screen resolution.

Audio and video are also used to create interest and provide information. An occasional burst of sound for special effect will focus the audience on the multimedia.

However, the frequent use of sound effects can draw attention away from the main information. Audio and video can be excellent media to explain concepts, however, they place extra demands on the user's computer system.

Audio and video files are usually very large and this factor must be taken into account before including them in the multimedia product.

PROJECTOR FILE

The SWF file format is a standard for delivering audio visual content over the Internet. These files can contain a mixture of vector graphics, audio files and Action Script for user interaction. SWF files are useful for delivering multimedia presentations to our business clients and can play inside a browser window if the correct plug-in is installed. If we need to mail a SWF file to a client, but we are not sure if the recipient has the means to view it, it is better to convert it to a Projector file, which is a standalone executable file.

CHAPTER 5

PROJECT DEVELOPMENT

DEC5082 – Interactive Multimedia Applications

MULTIMEDIA PROJECT DEVELOPMENT

Multimedia development encompasses many different aspects. Interactive multimedia is becoming increasingly popular in education, entertainment, and business. Because of the capability of incorporating various media, and of supporting interactivity and learner control, multimedia is often used in delivering instruction.

Interactive multimedia technology has potential for enhancing learning. Literature on instructional design has detailed the process for developing instruction in general terms. There are numerous instructional design models and whether they are constructivist, behavioristic or cognitive, linear or non-linear, these models and approaches emphasize the importance of identifying objectives, selecting appropriate strategies, and conducting formative and summative evaluations.

Stages of a Multimedia Project Development

- Planning and costing
- Designing and Producing
- Testing
- Delivering

i. Planning and costing

- Plan what writing skills, graphic art, music, video and other multimedia expertise required.
- Identify the mode of delivery.
- Develop a creative graphic look and feel.
- Draft the structure of navigation.
- Estimate the time for development (Refer Gantt Chart topic)
- Prepare the budget.

ii. Designing and Producing

- Imagining the look and feel of the application.
- Design the navigational structure and interface.
- Storyboarding the project.
- Acquiring the multimedia resources.
- Putting them together :Producing

iii. Testing

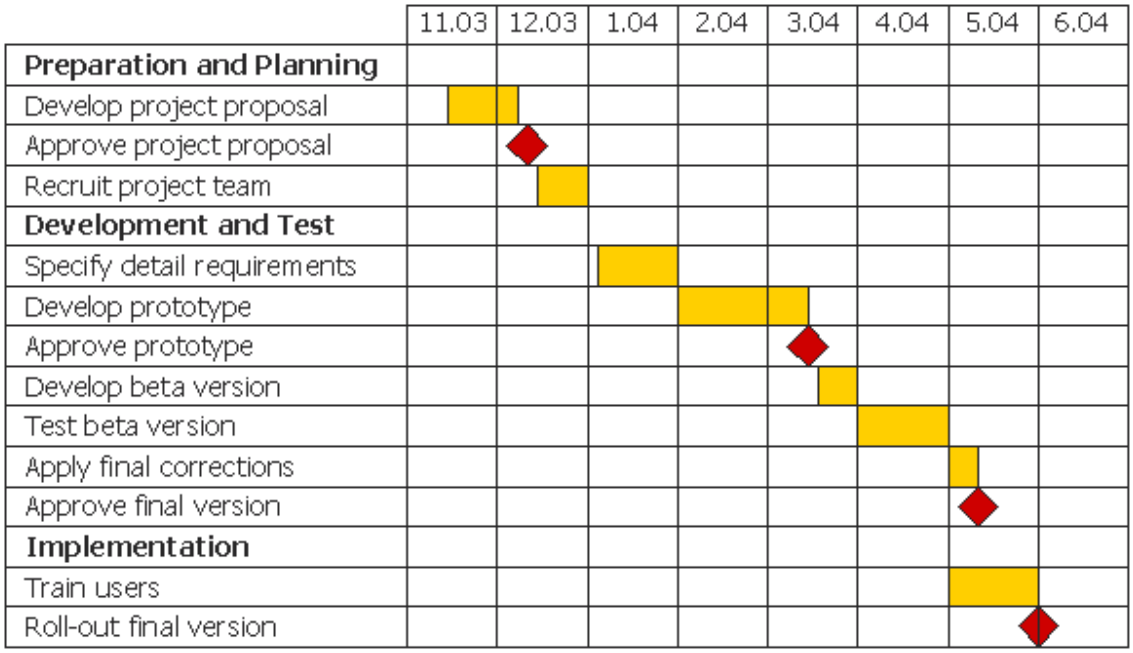
- Test the multimedia application to make sure that it meets the objectives of the project.
- Allow users to use it to identify if it meets the need of the targeted audience and is user friendly.

iv. Delivering

- Package it in suitable mode based on the delivery method identified
- Provide instruments for users to give their feedback on the product.

GANTT CHART

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time.



Gantt chart

On the left of the chart is a list of the activities and along the top is a time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity.

This allows us to see at a glance:

- What the various activities are.
- When each activity begins and ends.
- How long each activity is scheduled to last.
- Where activities overlap with other activities, and by how much.
- The start and end date of the whole project.
- To summarize, a Gantt chart shows you what has to be done (the activities) and when (the schedule).

PROJECT TEAM

The technology used in multimedia project development is changing rapidly. This situation tends to result in a considerable reliance on people who are familiar with the technology and aware of what is possible. When this expertise is not available on the project team, it may be necessary to seek the advice of a consultant. It should be ensured that advice sought is the best and most up to date possible. There may be a need to seek the advice of consultants.

Below are the suggestion expertise should participate in the project team:

- Project manager
- Multimedia Designers
- Writer
- Video Specialists
- Audio Specialist
- Multimedia Programmer

PROJECT PROPOSAL

A technical proposal, often called a 'Statement of Work' is a persuasive document. Its objectives are to: identify what work is to be done, explain why this work needs to be done and persuade the reader that the proposers (we) are qualified for the work, have a plausible management plan and technical approach.

What makes a good proposal? One attribute is Appearance. A strong proposal has an attractive, professional, inviting appearance. In addition, the information should easy to access.

A second attribute is Substance. A strong proposal has a well-organized plan of attack. A strong proposal also has technical details because technical depth is needed to sell your project.

Writing A Project Proposal

Example:

Grouping Project

By using Adobe Director, your group needs to develop an interactive multimedia application.

a. You may develop a courseware,

b. Company Profile or

c. Animated Movie/Story telling

You need to prepare a proposal in order to develop the multimedia application (10-15 pages). The proposal should explain about the developing of your multimedia application.

Below are the topics that you should include in the proposal:

a) Concept use

b) Objectives of the project

c) Target audience

d) Tone, approach, metaphor, emphasis

e) Interactive concept use

f) Storyboard

Example of Project Proposal based on the task given:

Title: Learn Basic Mathematic for 7 to 8 years old student

Introduction

In multimedia development process there are several steps need to be done. The steps can be categories as a pre-production, production and post-production. The post-production is also known as designing process. The designing process involved production and distribution. There are several designing model that can be used during the process of developing the multimedia application such as Hannafin & Peck Design Model, ADDIE Design Model and ASSURE Design Model. Even though there are a lot of model, the steps to develop the multimedia application is almost similar and the different is depend on the phases or stages. The different can be explain by referring to the below diagram.

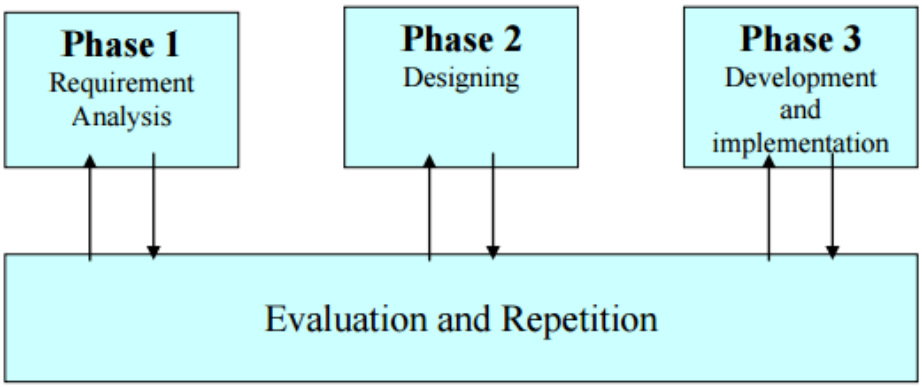


Diagram 1 : Hannafin & Peck Design Model

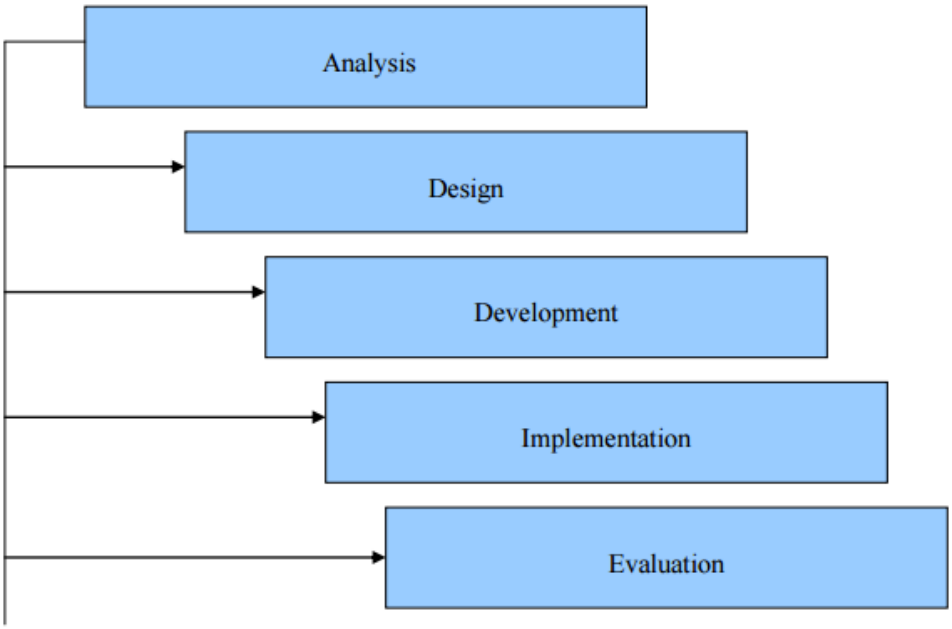


Diagram 2 : ADDIE Model

There are 3 phases in multimedia development process; Planning, Developing and Testing. The most important phase is the planning phase. The planning phase must be done in details and systematic and will be a reference for the whole process of development. This phase is started by having discussion/brainstorming, explaining the use concept, purpose, storyboard and all the elements of multimedia that are going to be apply in the application. It's must be well planning.

The second phase which is the development phase will be started by developing the contents of the application. It involved the process of collecting, translating and editing/modification of all the required elements. The last phase is testing.

Testing is the continuous process that will use to evaluate the performance of the developed multimedia project. In order to produce the multimedia application for learning the basic mathematics for 7 - 8 years old children's, there are a several things need to be considered in the planning phase. This is to make sure that it is suitable for the proposed application.

a. Concept

The concept for developing the multimedia application for learning the basic mathematics for 7 – 8 years old children's should be more to children's friendly and the learning style should be interactive and more to mathematics games. The users at this level didn't need the complex interactivity but it should be easily to conduct/use. The user can use the application without helping from other people. The fun of using the application is the main concept. The presentation can attract the user attention and it is balance in terms of thinking achievement for the children's. It is not to difficult or to easy for the children's to understand it.

b. Objective

i. To make the children understand the basic mathematics operation.
ii. To develop the intention to manipulate the multimedia elements in the application.
iii. To differentiate the mathematics operations in the process of learning by using the application.

c. Target Audience

This application is design for the children age between 7 to 8 years old. The users should be able to use computer to install this application. Guidance is needed in helping the users to use the application until the user become expert to use the application.

The locations of the users are from city and urban area but it quite difficult for the users who live in rural area which seldom interact with the computer. For those children who like adventurer and have the ability to use computer can try to use the application by their self. From the information and simple instruction provided, it will not be a big problem for the target audience.

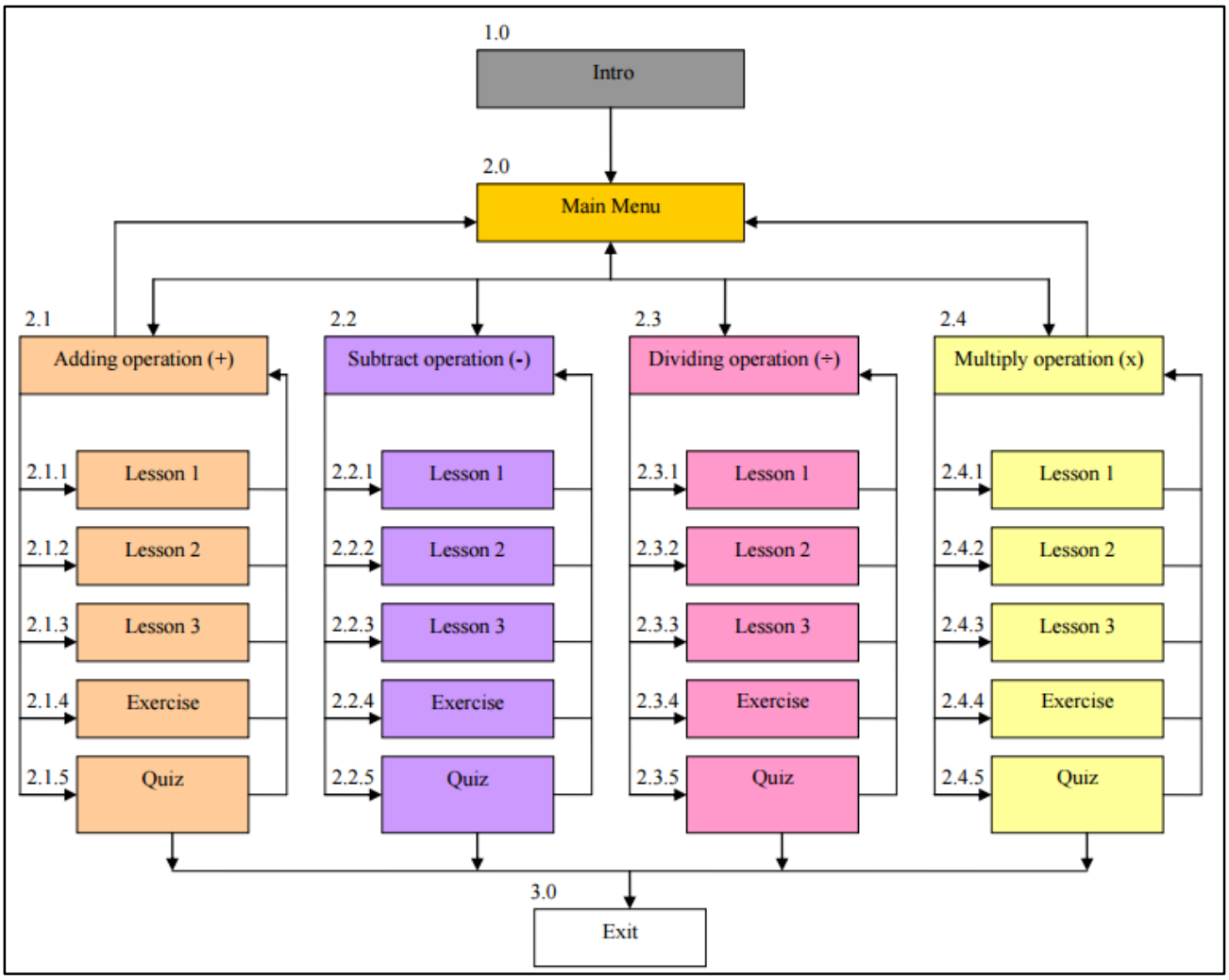
d. Tone, approach, metaphor, emphasis

Tone: In this application the chosen tone is simple and not serious. It is suitable for the level of the target audience. The used of funny animation is suitable with tone. The use of soft color like light green for the navigation buttons and the background color; and the used of background image like a group of fish is very interactive. The starting of the application with the children songs is also one of the elements that can persuade the children to use the application. The used of all the multimedia elements like texts, graphics, audio, animation and video also will influence the tone in this application.

Approach: Self exploration is suitable for this application. The used of minimal button will make the children easier to explore and determine the output. The short instruction also can make the children easier to understand. The children just need to click for the instruction and drag the numbers by using the mouse into the boxes.

Metaphor: The use of meaningful image. It shows the only one application that had been developing in market. Metaphor is used in menu screen because it is very often used by the user. The animated cartoon image and very cheerful background will persuade the children's. The used of navigation buttons will make the children easier to explore the contents of the application.

Interactive concept use: The interactive concept use are next button, home, exit and menu button. Hypermedia technique is used to represent the capabilities of application in order to allow user to access information without using the existing path like spreadsheet. Hypermedia allow user to get the information based on their interest and capabilities. The concept will encourage user to go more details of the contents without using the old met.


1.0
Intro
2.0
Main Menu
2.1
Adding operation (+)
2.2
Subtract operation (-)
2.3
Dividing operation (÷)
2.4
Multiply operation (x)
2.1.1
Lesson 1
2.1.2
Lesson 2
2.1.3
Lesson 3
2.1.4
Exercise
2.1.5
Quiz
2.2.1
Lesson 1
2.2.2
Lesson 2
2.2.3
Lesson 3
2.2.4
Exercise
2.2.5
Quiz
2.3.1
Lesson 1
2.3.2
Lesson 2
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Lesson 3
2.3.4
Exercise
2.3.5
Quiz
2.4.1
Lesson 1
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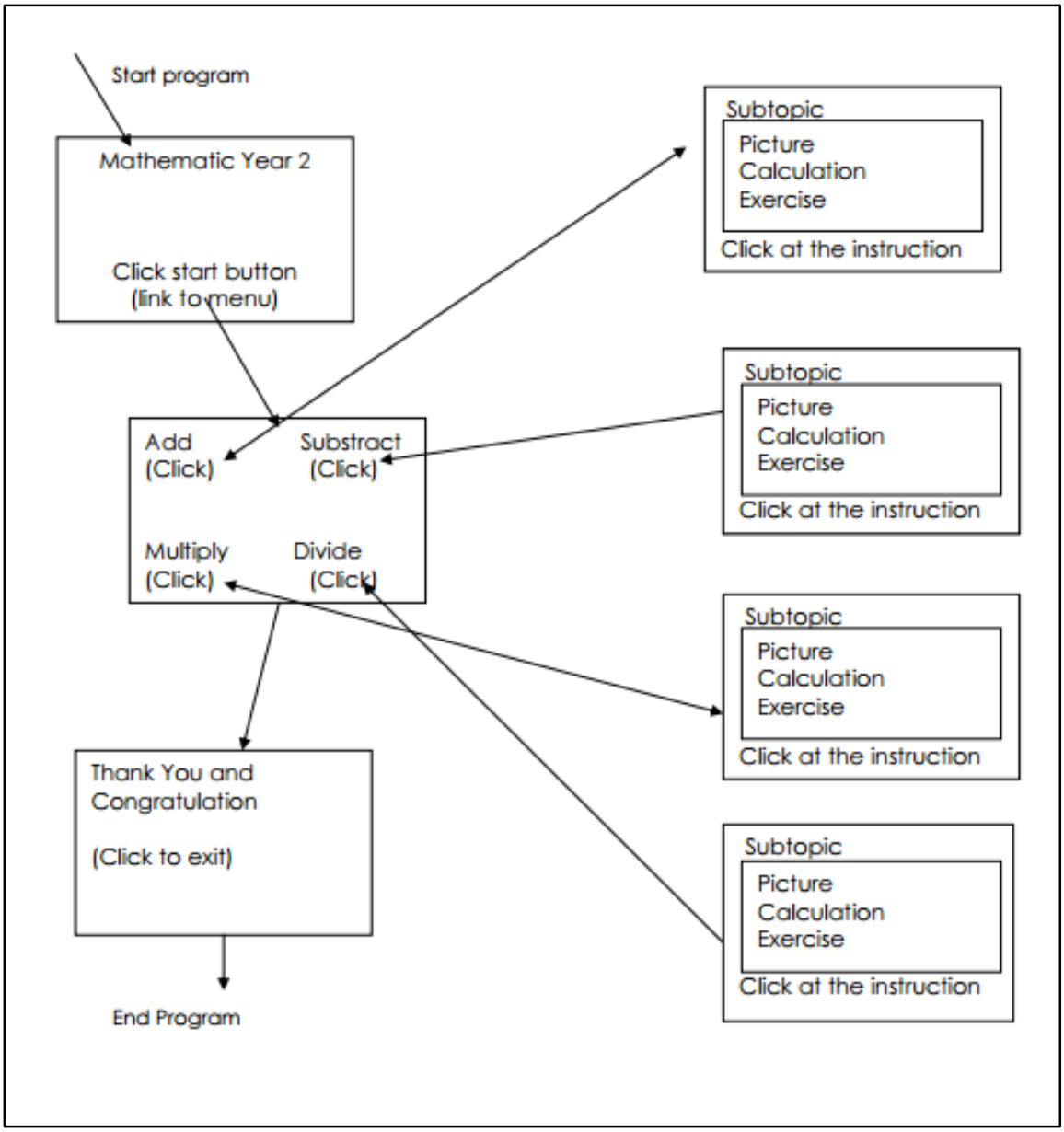
Exercise
2.4.5
Quiz
3.0
Exit


Start program
Mathematic Year 2
Click start button
(link to menu)
Add
(Click)
Substract
(Click)
Multiply
(Click)
Divide
(Click)
Thank You and
Congratulation
(Click to exit)
End Program
Subtopic
Picture
Calculation
Exercise
Click at the instruction
Subtopic
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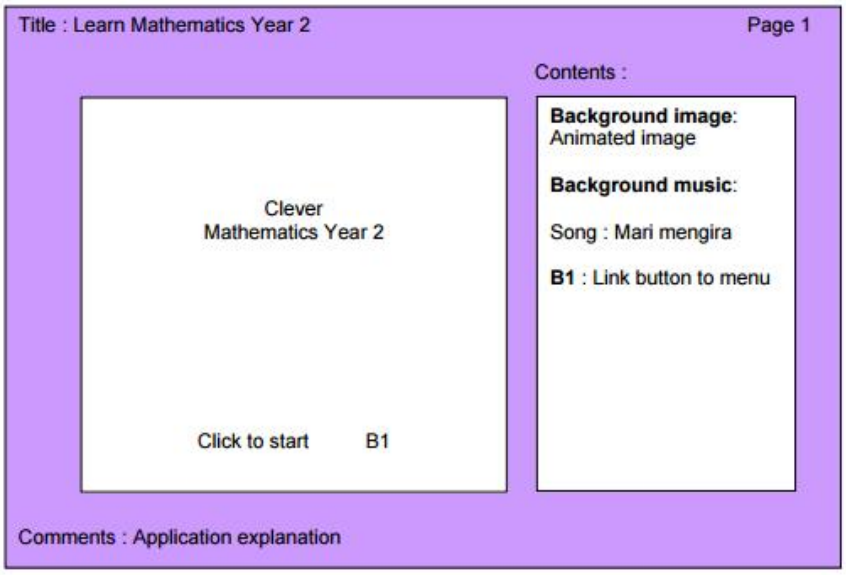
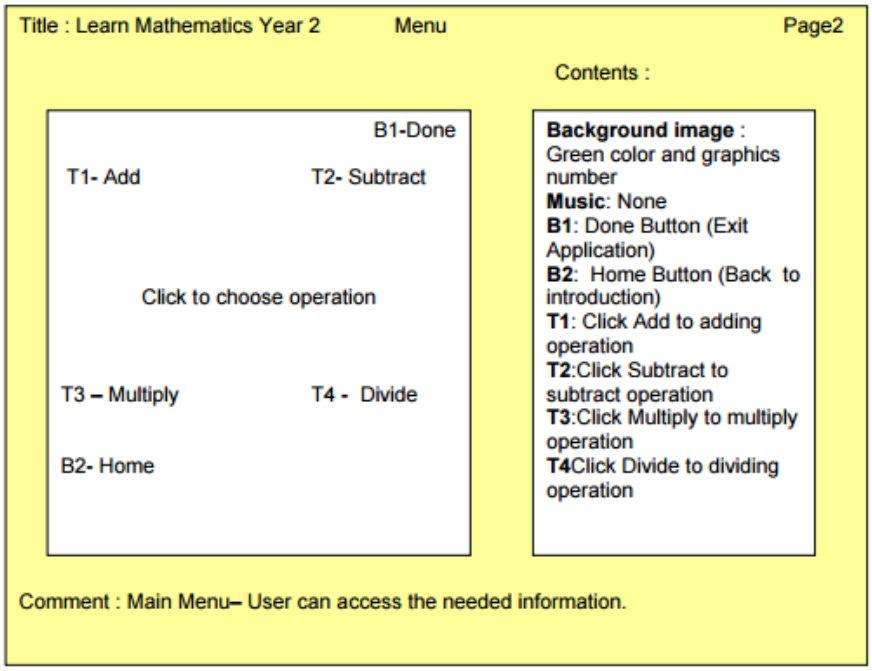
Storyboard Interface

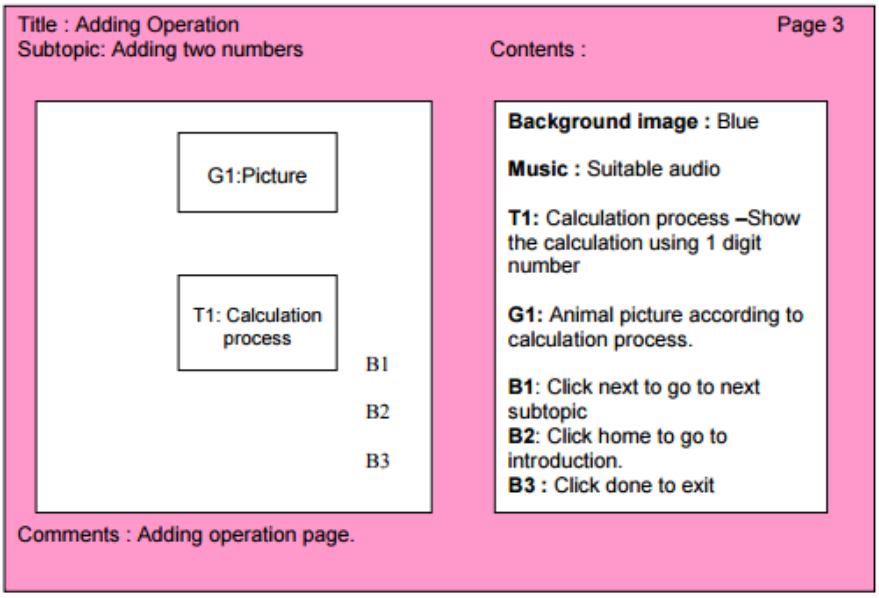
Introduction



Menu



Adding Operation



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STORYBOARD

What is a storyboard?

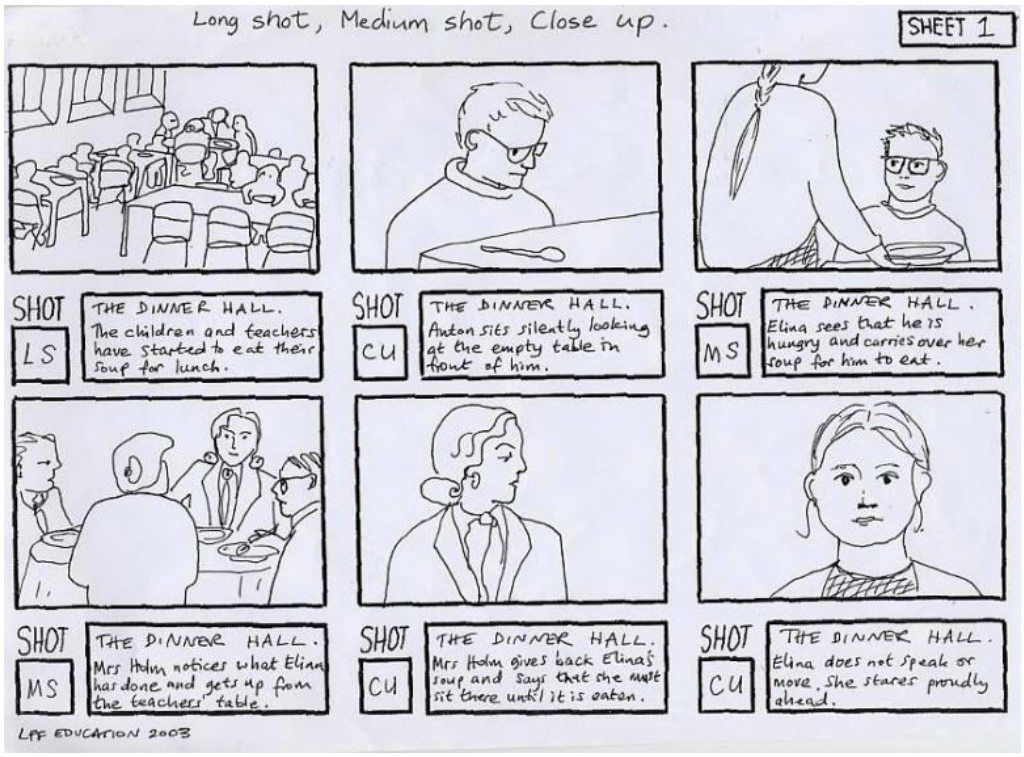
Think of the storyboard as a visual script, which acts as a blueprint for the 'look' of the completed project. What will we see on the computer screen or on a television?

A storyboard shows not only the individual shots (in the case of a video) or screens (for computer-based multimedia), but the sequence as well.

Developing video or multimedia projects without storyboarding is like trying to go some place we've never been without directions. Storyboarding is an essential tool for planning any multimedia (including Website design) or video production. Using a storyboard will reduce production time and frustrations.

Storyboards come in many shapes and sizes, depending on the project requirements, the director, and the storyboard artist.

Notice that each of the shots is numbered, and that some shots also have brief captions describing such things as the action, how long the shot lasts, and camera movements.



Storyboard example

Digital Story Storyboard Template

Name: _____

Page: _____

Image Description/Drawing:	**Image Description/Drawing:**	**Image Description/Drawing:**
Image Credit:	**Image Credit:**	**Image Credit:**
Spoken Text:	**Spoken Text:**	**Spoken Text:**
Written Text:	**Written Text:**	**Written Text:**

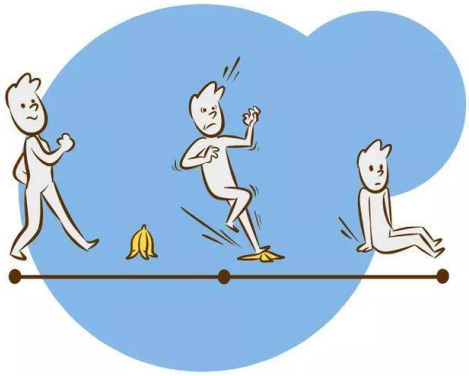
Example of storyboard template

How to create a storyboard

When we're planning a video, the first step in the process is to make a storyboard so we can bring our script to life and present it to other people.

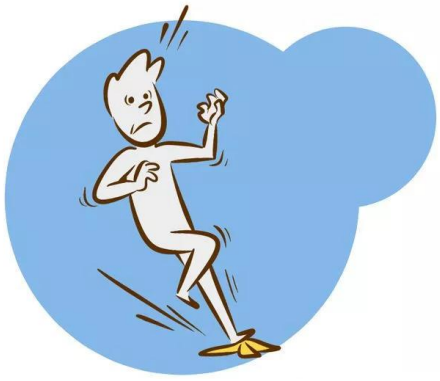
A storyboard is a series of thumbnails that show the breakdown of the video, illustrating the key scenes – how the setting will look, who will be present, and what actions will take place. It's often used as a mock-up for movie scenes, music videos, TV production, and more, and can be created by hand or using a digital medium.

Part 1: Story work



Establish a timeline

- Establishing the parameters for when and where our story takes place, and deciding in which order the events of the story happen chronologically, is the best way to organize our story so we can begin bringing it to life. If our story isn't completely linear, we can still should create a narrative timeline.
- Make a list of the main events of the story in the order they will be told. This is how they will appear on screen.
- If we're storyboarding for a commercial, establish what scenes will occur and in what order.

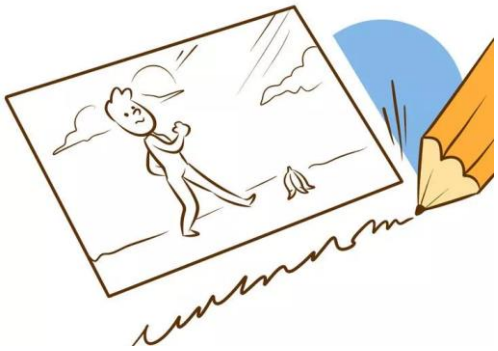


Identify the key scenes of the story

- A storyboard is meant to give its viewer the gist of how the story will translate to film. The point isn't to try to recreate the entire experience in a flip book, but to demonstrate important key parts that will draw the viewer in. Think our story through and brainstorm a list of the key moments that we want to illustrate on our storyboard.
- Pick scenes that show the plot developing from start to finish.
- Turning points are important to show. Any time there's a plot twist or an important change, include it in the storyboard to move the story along.
- We may also want to depict changes in setting. If the story begins in one city and moves to another, make sure that will be clear in our illustrations.
- If we're storyboarding for a commercial, the process is no different: pick key images that will represent the flow and direction of the film from start to finish. As a general guideline, keep in mind that for a typical 30–second commercial, a storyboard should have no more than 15 frames. Factor in two seconds per frame on average.

Decide how detailed to get

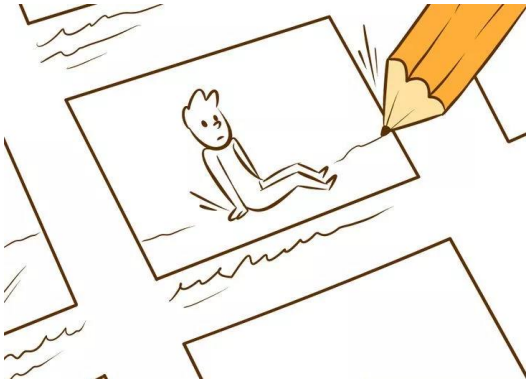
- A storyboard can be incredibly detailed, with illustrations depicting every shot. If we're in the preliminary stages of a feature-length film, we have too much ground to cover to get this detailed just now. However, we might eventually want to break the film down into individual scenes, with a separate storyboard for each one.
- If we're working on a film and breaking it down shot by shot, create what's called a shot list. For each shot on the list, we'll need to think about the shot's composition and other details involving how it will actually be filmed.
- Remember that the point of the storyboard is to provide visual clarity and keep everyone on the same page. It's not supposed to be a work of art in and of itself. Take a practical view when it comes to the level of detail you choose for our storyboard..
- A good storyboard will be easily understood by anyone viewing it.



Write a description of what each cell will show

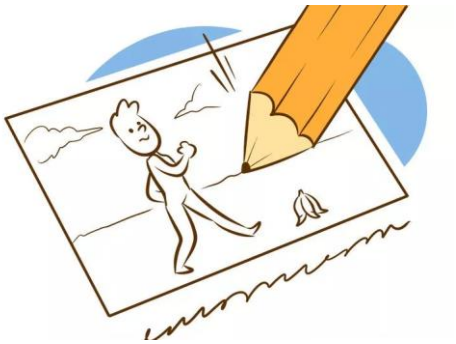
- Now that we know what main scenes we want to show, think about how to depict the action in each illustration. Go down the list of scenes and write a description of the most important elements of each one. This will help us to determine what exactly to draw for our storyboard.
- For example, we might want to have a cell that depicts a conversation between two main characters. What needs to be conveyed in this image? Are the characters fighting, smiling, or moving toward a destination? Some sort of action should take place in each drawing.
- Take the setting into account as well. Is it important to have a certain view in the background behind the characters?

Part 2: Design



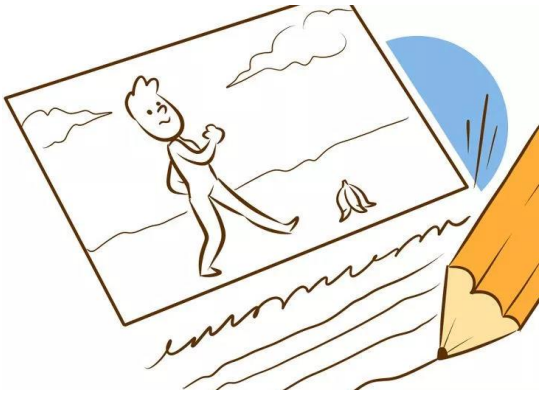
Decide what medium to use for the template

- We can draw a basic storyboard template by hand, simply dividing a poster board into empty frames of the same size using a pencil and a straightedge. The setup should look similar to that of a comic book, with rows of square cells that show how the scene will look on a screen.
- The cell sizes should be drawn in the same aspect ratio as the finished video, such as 4:3 for a TV screen or 16:9 for a feature film screen.
- A storyboard template for advertising should be comprised of rectangular frames into which we insert the visuals. If we want to include captions, make sure there's space where we can write in video descriptions.
- If we find yourself storyboarding for more than one project, it helps to have a good Wacom™ tablet, so we can board directly into Photoshop.
- If we don't want to design the images, we can hire a storyboard artist to provide the drawings. We will describe what goes on each frame and give the artist a written script to work from.



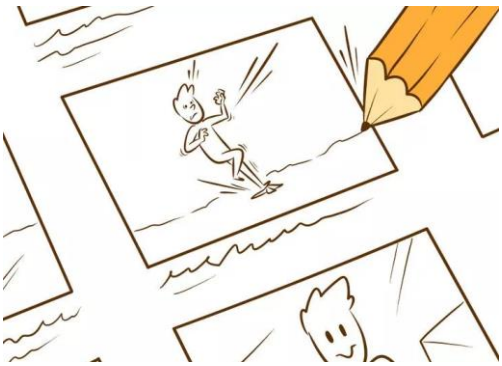
Sketch the thumbnails

- Start bringing the scenes to life by drawing the sketches we mapped out into the template we designed. This is just our rough draft, so don't try to make it perfect. As we sketch each scene, tinker with the following elements, erasing and redrawing as often as necessary:
- Composition (lighting, foreground/background, color palette, etc.)
- Angle from which the camera is shooting (high or low)
- The type of shot (wide shots, close-ups, over-the-shoulder shots, tracking shots, etc.)
- Props (objects in the frame)
- Actors (people, animals, cartoon talking couch, etc.: anything that can act rather than be acted upon)



Add other important information

- Next to or below each cell, fill in the description of what's happening in the scene. Include dialogue that will take place. Add information about the length of time the shot will take. Finally, number the cells so they're easy to reference when we discuss our storyboard with others.

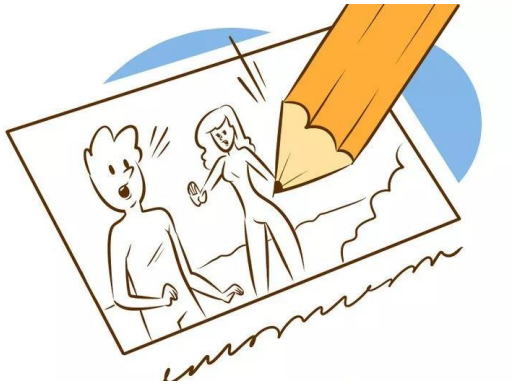


Finalize the storyboard

- Once we have identified the key points of the subject and worked out a design for each frame, review the work and make final changesIt's a good idea to have someone else review the storyboard to make sure it flows well and isn't confusing.
- Consider adding color. If we're creating an advertising storyboard, this will help our ideas pop.

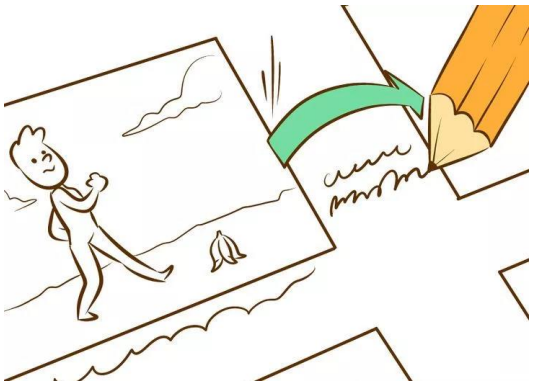
- Remember that it's not necessarily important that the drawings look realistic or perfect. Depending on the viewing audience, simple stick figures might suffice.

Part 3: Fine-Tuning



Think in three-point perspective

- While our storyboard illustrations don't need to look like they were created by a professional artist, there are a few artists' tricks we can use to make our images look more like movie scenes.
- Instead of drawing all of our characters as though they were standing on the same horizontal line, put them in perspective. Have some standing a little further from the camera and some standing closer.
- When it's time to translate the storyboard to film, we'll have a much better idea of how to direct the shot.



Have motivations for your cuts

- As we storyboard our film, think about the reasons for making each cut to a new shot. Advancing the story is about more than just hopping to the next plot point; we need to give a reason for why our characters do what they do.
- For example, if we want to cut from one room to another, have a character in the first room look toward the door because they hear a noise.
- This helps the story's continuity and keeps the viewer engaged.

Let our storyboard morph as we go

- Our storyboard can be an extraordinary tool to have at our disposal when we're setting up our shots and directing our film. However, relying heavily on our storyboard might end up being too confining.
- Remember to accept others' input as we go along, especially if we're working with a talented film crew. A storyboard is meant to be edited

and changed. It can often be improved by ideas we might not have thought up on our own.

- Most film directors have a different style when it comes to storyboarding. Some map out every last detail, while others use it as a loose guide.

CAREER OPPORTUNITIES

Being a multimedia developer is both a challenging and rewarding career. To be successful in this career, one should not only have some training and experience, but also possess some important characteristics. The following attributes are noted in a successful multimedia developer:

- Be very flexible
- Be willing to work hard and spend long hours
- Be willing to change what has been done to suit the needs of the client and changing technology
- Be open-minded to new ideas
- Be willing to learn
- Be detailed-oriented
- Be able to work under various constraints (i.e. time, resources, and/or budget constraints) and be very creative given these constraints
- Have strong interpersonal and communication skills.
- To become a graphic artist, programmer, video producer, or audio producer, mastering some popular technical tools is essential.
- Companies preferred hiring people who had computer experience and a good understanding of the limitations and capabilities of the tools they used.

- Be as varied as possible —writing, music, film, television, and creative arts. The experiences in these areas will help to produce a better product.
- Read everything from futurist novels to old English history. We can get ideas from them.
- Students should not only gain computer literacy on different platforms, but also study interface design.
- To gain some hands-on knowledge of how different multimedia tools work and their capabilities and limitations.
- Get as much hands-on experience as possible. Even though we may not be doing actual production, we can become aware of the issues that can come up. We can ask the right questions and do your job better.
- Having knowledge of the multimedia tools and the experience of how the tools work is critical for being a successful manager.

Because multimedia development is often a group effort, companies look for people who can relate to other people in a team.

- Being able to work collaboratively and having a positive attitude is more important than having some technical skills.
- Some companies do not hire just for skills, but hire for attitude. It is possible to train people for the specific skills for the project, but it will be hard to train someone to be responsible.

Possible job titles for a graduate of a Multimedia Technology diploma program include photographer, video designer, advertising photographer, graphic artist, computer programmer and website designer. Some graduates might also find jobs within the television industry.

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