ABSTRACT

The project entitled "Journey into the Net" (JITN) is an interactive multimedia learning package. A CD-ROM based multimedia learning-teaching application for all level users.

The purpose of this package is to introduce Internet to everyone. This project is not involving any hardware or circuit such as home automation controller or hi-tech gadget or even a simple circuit. You can go through them right off your screen. This project involves developing a user interface with a content design and screen design which is link together.

At the end of this project, JITN is expected to be such as other interactive multimedia that existence to provide an overview of the Internet especially to users that interested.

ACKNOWLEDGEMENT

It is my greatest pleasure to be help by so many people in accomplishing my final year thesis.

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CHAPTER 1 ~ INTRODUCTION

1.0 OVERVIEW

This chapter gives an overview of project objectives, project scope, significance and its outcome. It also shows the project schedule on how much time is taken to complete the project.

1.1 PROJECT INTRODUCTION

In short, interactive multimedia learning is really not much different than classroom learning. But, instead of using up valuable reference resources and attending classes, they remain in digital format within a computer or several computers. This saves not only the cost, but it also gives you the freedom to learning at your on paste and at any place. You can go through them right off your screen.

JOURNEY INTO THE NET (JITN) is the title proposed for this interactive multimedia-learning package. An interactive learning package specially tailored for all level users and can be used on their own computer without being on line. **JITN** is a CD-ROM based-learning package. The purpose of this package is to introduce Internet to everyone. It will also illustrate to you how information requested through a browser is retrieved from the Internet. We would go behind the scene where it shows components involved and how they work together to make this possible.

You will be taken step by step through those tasks that you will most often use on the Internet.

1.2 PROJECT OBJECTIVE

Below listed are the main objectives in developing this interactive multimedia-learning project:

1.2.1 To provide better understanding of how the Internet work.

One of the biggest misconceptions most people have about the Internet is that it is a "thing." They want to put it in a box and try to describe it as if it were a single mechanism instead of a collection of different parts. Therefore, the main objective of this project is to help you understand even better about all the components involve and how they work together.

1.2.2 To develop an interactive multimedia learning.

It will be a CD-ROM based multimedia learning – teaching project for all level users. This can be used as a teaching material in a self-learning program for the current user due to its high interactivity level.

1.2.3 To create an interesting and effective teaching and learning tool

Multimedia presents a learning method in a memorable, arresting way compared to conventional methods. The incorporated multimedia elements will stimulate one's mind rather than the groggy passive learning in the uneventful classroom or through books. You gain more in the sense of knowledge procurement and remembrance as to a single medium.

1.2.4 Cost-effective learning

It provides more economic learning alternative to other methods such as expensive reference books and incentive courses.

1.3 PROJECT SCOPE

Scope in this project is focus to several aspects. The scope of the project involves the following:

- This interactive learning package will consist of multimedia presentation. Emphasis will be given on GUI features, easy navigation and show how the information packet journey into the Internet.
- Develop a graphical and animation application by using current assisting macromedia software and not involving any hardware or circuit.
- CD-ROM based learning. The application will be develop on a stand-alone basis.

1.4 PROJECT SCHEDULE

To make certain that this project is completed in time, a project schedule was done. The various stages involved during the project will be carried out in two stages. First stage is involves activities such as project initiation, research and literature review, system analysis and requirements, system design and program design. This first stage will explain and schedule the project development process. Second stage is emphasis on designing/coding, implementation, testing and documentation.

The schedule for the activities of both stages is shown in table 1.4.

Table 1.4: Project Schedule for **JITN**

Duration	Jul '03				Aug '03				Sep '03				Oct '03				Nov '03				Dec '03				Jan '04				Total
Task / Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Preliminary Investigation & Feasibility Study																													2
Literature Review																													4
System Analysis & Requirements																													4
System Design & Program Design																													5
Designing / Coding																													14
Unit testing & Implementation																													4
Testing																													2
Documentation																													22
Total duration proposed to develope JITN application is 24 weeks																													

1.5 EXPECTED OUTCOME

The realization of the project proposal as a whole:

- Successfully implemented and interactive multimedia learning project **JITN** (CD-ROM based learning package).
- An animation that provides a clearer way to understand how does the information packet flow from one end to the other.
- Helps to understand better the features and function of each Internet devices involve.

1.6 CONCLUSION

Chapter 1 is a foundation of the **JITN** project, it provide a general description about the proposed project. This will help to proceed for the further development of my project. The next chapter, i will discuss literature review for this project.

CHAPTER 2 ~ LITERATURE REVIEW

2.0 OVERVIEW

Literature review is a background research on information gathered to develop a project or a system. The research intended to equip the developer with development environment and some knowledge of the strengths and limitations of several development tools. Literature review is also done to help the developer in choosing the right tools to develop the project. It will also help the developer of a system to know some of the existing features offered by a similar project. However, if there is no existing similar project has been developed; literature review is a useful step to develop a new project or a system. In this chapter, emphasis is given on fact finding, tools research and computer configuration.

2.1 FACT REVIEW

To develop a project, a lot of information needs to be gathered about the project itself, the procedures involved to develop the project and the methodologies used to develop the project. All this information can be obtained from various sources. Different sources will yield different information and facts and it depends on how the search is done. Several facts finding methods have been used in this project to collect all information needed. Below is the method, which has been proposed to use for gathering more detail information.

2.1.1 Observation

Observation method is an easy way to gather relevant information in the sense that it is laid back, number of problems or trepidation in voicing ideas and opinions; a refreshing and somewhat unorthodox way to achieve better and speedier results. My target emphasis on all level users or public and current demand for multimedia productions.

2.1.2 Questionnaire

Questionnaire is sets of question asked to determine the existing degree of optimism. This is also a good method in order to get information. People are more likely to respond and are honest with their answers. Responses can be tabulated and analyzed quickly. Around 100 copies of questionnaire will be distributed around offices, schools, students and public. The questions are tested on three different categories; computer literacy, multimedia and Internet (Please refer to the Appendix section for the list of the questions).

2.1.3 Research and Reviews

This part of the preparation consist of researching and reviewing books, journals, conferences paper and newspaper articles. It also involves summarizing related info, comparison of software tools, which will be require to develop **JITN** project, and other relevant tasks that will be useful in the preparation.

2.1.4 Surfing the Internet

In today's ever changing world where new technologies are being introduced almost every day, Internet surfing is a very efficient way of gathering information. Information that can be gathered on the Internet ranges from very useful information. The main objective of this activity is to analysis the features, interfaces, system designs and user friendliness characteristics.

2.2 REVIEWS ON INTERACTIVE MULTIMEDIA LEARNING

In recent years, research activities on uses of computers in schools in western countries such as United States of America and Britain, have increased greatly. However, the use of computers in education in Malaysia schools is not so promising. Therefore it is very important to create interactive multimedia learning modules suitable for Malaysian schools, teachers to encourage the use computers in their education. This is because it is a new learning technique, which has growing popularity and efficiency. Besides, it is also to ensure that all the generation is also exposed to current technology and not just learning the traditional way. The nation that users learn by constructing their own knowledge is highly popular among educational theorists. A learner ought to be doing something, not merely watching it. Multimedia technologies offer learner the opportunities of learning 'actively' by allowing them to construct knowledge as interactive multimedia documents (example; Multimedia stories)

2.2.1 What is Multimedia?

Multimedia is not a single technology. Multimedia stands for the convergence of several streams of development in the computing, audio, video and communication industries. The term multimedia is often used but hard to define. As a buzzword it is used to advertise different products such as video games, computer-based training, sales presentations, etc. Basically multimedia can be understood as the integration of more than one medium. When distilled to its root elements its meaning can be devised multi ('much' or 'many') and media (from medium meaning 'means of communication'). Using multimedia, then, is simply using a variety of media whether visual or auditory, with the intent of communicating. Computers have become such a pervasive force because of their unique ability to help humans understand better and easy.

2.2.1.1 Typical Multimedia Areas

The spectrum of multimedia development tools can be further subdivided into three typical multimedia application areas:

- Text base Application
- Interactive Application
- Wide Area Application

Depending on the application, which is to be developed, what information is to be conveyed, who the audience will be, and how much interaction there will be between the application and the user, an appropriate tool can be chosen. Some of the typical multimedia applications areas and the specific packages that would cater to each development area are discussed below.

- **Text base Application**

Many multimedia applications provide efficient navigation through a large resource of primary text based information. These applications need to be searchable so that relevant information can be found easily and quickly. Development tools, which cater to this type of application generally, provide hypertext capabilities. Hypertext is similar to regular text, except that it contains information printing to another point in an application. Microsoft Window Help is an example of a hypertext, searching program.

There are specific tools, which provide good development environments for text-intensive applications. Microsoft's Multimedia Viewer 2.0 is a sophisticated information viewer with multimedia, hypertext and sophisticated search capabilities. Adobe Acrobat is another text-based package, which is hypertext-capable, but has limited search capabilities. Both of these packages provide an overview of the content, to reader through the maze of information, and allow importing existing word processor documents. All multimedia application are capable of storing text and moving through quantities of it, but some tools are specifically designed to work more efficiently with large volumes of it.

- **Interactive Application**

The majority of Multimedia applications are fully into the category of interactive, graphical applications. These tools are fully capable multimedia tools, which can handle all media formats, as well as providing interactivity with the user. This is often desirable in an education setting as it provides the

ability to allow specific feedback to a user, keep track of results, and customize the application to a specific user as a function of responses. Although most tools provide these capabilities, some are better suited to complicated interactive applications is often related to their cost, example Author wave Professional 2.0.1 from Macromedia and the Apple Media tool and Programming Environment from Apple. Meanwhile, development packages like Asymetrix Corp's Multimedia Toolbook 3.0 and Claris Corp's Hypercard 2.2 are very much lower. The goals of the multimedia project must provide the specific criteria for choosing between several development tool alternatives. This often requires first hand experience with the development environment to assess the tool's capabilities and example application.

- **Wide Area Applications**

A new area of multimedia applications is emerging with the purpose of providing information to an audience over a wide geographical area. This is in part being made possible via the Internal in conjunction with new technologies such as the World Wide Web and Mosaic. These new technologies compose an information distribution system providing services to 10-20 million people from commercial and academic organizations. Mosaic is a WWW browser and is capable of retrieving information from all over the world via the Internet in the form of text, graphics, sounds, and movies. One of the important capabilities of the WWW is support of hypertext, which allows users to maneuver quickly from one WWW site to another with the click of a button. There is an enormous wealth of

information available on the Internet, and contributing to this body of information is, in essence, providing multimedia access to information. If a multimedia application is to be implemented with a geographically diverse, academic audience as its recipients, this technology is very suitable.

2.2.2 Interactive Multimedia

Interactive Multimedia is any package of materials that includes some combination of texts, graphics, still images, animation, video and audio. Multimedia programs bring to education the extraordinary storage and delivery capabilities of computerized material. This is especially important for schools, libraries, and learning institutions where books are difficult to obtain and updated. Multimedia is a powerful and efficient source for acquiring learning resources. Multimedia can also provide educational institutions access to other kinds of in accessible materials, such as hard to find historical films, rare sound recordings of famous speeches, illustrations from difficult to obtain periodicals and so on. Multimedia can put primary and secondary source material as the fingertips of users in even the remotest locations from major research facilities.

Furthermore, interactive multimedia programs, usually integrate some combination of orientation tools further point to the third major benefit of multimedia: the personalization or individualization of the learning experience. It can be a powerful learning and teaching tool because it engages multiple senses. As one educator enthusiastically put it, As humans we seem hard-wired for multiple input consider that we remember only

about 10% of what we read; 20% if we hear it; 30% if we can see visuals related to what we're hearing; 50% if we watch someone do something while explaining it, but almost 90% if we do the job ourselves, if only as a simulation.

2.2.3 Types Of Media Included To Create A Multimedia Production

Every once in a while a new tool is developed that can have great impact on the way things are. Interactive multimedia is such a toll. Yet the elements used in Multimedia have all existed before. Multimedia simply combines these elements into a powerful new toll. Interactive multimedia can weave 5 basic types of media into a multimedia production.

1. Text

Out of the entire element, text has the most impact on the quality of the Multimedia title. Generally, text provides the important information. But too much text on a page can be a detriment. Readers will soon head for the nearest exit button. About 4 or 5 sentences per screen works' well. Text acts as the key-stone typing all of the other media elements together where as a picture is only worth a thousand words. It is well written text that makes a production wonderful. Suddenly editing becomes more than an exercise, it becomes a necessity.

2. Sound and Audio

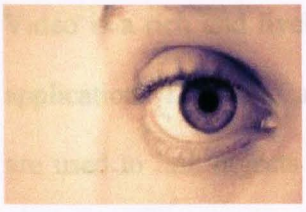
Sound is probably the most misunderstood part of a Multimedia title. Sometimes sound is being neglected because it is thought that sound is unnecessary. Three type of sound formats that are currents used in multimedia applications. They comprise of MIDI (Musical Instrument Digital Interface), waveform audio and compact disc audio. MIDI provides a very efficient way to record the performance data required to play music.

Every sound has a waveform that constitutes frequency and amplitude. All

recorded music available on compact disc is in computer addressable form and can hold up to 75 minutes of high fidelity recorded sounds. Sound can be used to provide emphasis or highlight a transition from one page to another. A project on India demands a few bars of northern classical sound music. With the insertion of the 'sarod' music in the project, it would be easier to achieve the purpose of this project.

Audio broadcasts information or data in a format which can be heard and may include instruction which is redundant with text or unique. It may also include warning sounds and sounds which are used to determine the state of things, for example a badly-tuned automobile engine.

3. Images and Graphics



Images are non-revisable because their document contains no structural data. Exist in both real and virtual forms. Files in the forms of .jpg and gif are chosen to store images because .jpg extension is the standard compression and decompression method for color and non-color images .It saves storage area because file sizes are smaller compared to .bmp file formats.

Graphics provide the most creative possibilities for a title. Whatever art form that is created for computers. There are two forms of graphic formats, firstly bit-mapped format and secondly object-oriented format. Bit-mapped supports .bmp, .gif, .jpg, .cpx, .msp, .thga, .tiff, .wpg and .wmf extensions. Object-oriented format supports .cdr, .img, .cgm, .drw, .eps and .gcm extensions. They can be photographs, drawings graphs from a spreads-sheet, pictures from CD-ROM, or something pulled from the Internet. With a scanner, hand-drawn work can be included. In developing Multimedia system the selection of the graphic is crucial. The graphic should complement the text on the page. By searching for the best graphic a whole new sense of visual literacy can be development.

4. Video

Video is a rich and lively resource for multimedia application. There are a few kinds of videos that are used to link objects in multimedia application; live video feeds, videotape, videodisc and digital video. Live video feeds provide interesting led-time objects of multimedia links. Any television or live camera feed can be the object of link. The most widespread video medium is videotape. It can be the object of multimedia links. However, this medium is limited by two factors, namely videotapes are linear and most videotape players are not computer controlled. Digital video is the most promising and exciting video storage medium. Stored on hard discs or CD-ROMs and can be served over computer networks. When it comes to making an impact, video is right there at the top of the list. It takes a lot of computing power to incorporate video into a production, but it takes even more visual skill. Great ideas can be found by analyzing the video shown on TV. The video shown must captured, edited compressed and stored. A video file is an expensive resource. It can take up a huge amount of space on a hard drive. The images must tell their story quickly yet completely. When, combined in a clear and organized manner the final production, called a title, become interactive.

5. Animation is primarily used to demonstrate an idea or illustrate a concept. Video is usually taken from life, where as animations are based on drawings. There are two types of animation: Cell based and Object based. Cell based animation consists of multiple drawings, each one a little

different from the others. When shown in rapid sequence, the drawing

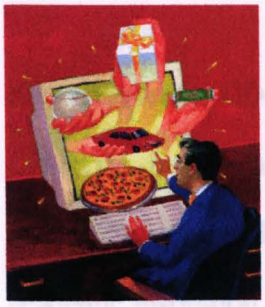
appears to move. Cell animation can be used to show, for example how a stick man walks. Object based animation (also called slide or path animation) simply moves an object across a screen. The object itself does not change. Object animation can be used to illustrate a point imagine a battle map of Gettysburg where troop movement is represented by sliding arrows.

2.2.4 Navigation

Navigation refers to the process of acquiring information from a rich multimedia database, which has no obvious organizational pattern. The WWW is an example of the latter. It is intuitive and attractive to believe that navigation as a learning system will result in significantly better learning them highly structured learning. To date, there is little research in this area. The conclusion, which seems to be emerging, is that the effectiveness of navigation cannot be assumed present for all learning situations. While research on navigation is quite new and as yet limited, it is expected to increase dramatically in the next few years.

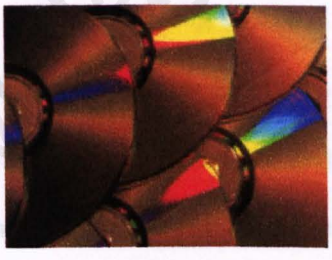
2.2.5 Interactive

Interactivity, except for the computer driven by a microprocessor, multimedia are by the large designed for transmission of information about content from a knowledgeable source to the user (information transmission)



and is incapable of interaction. There are many definitions of interaction but they generally require that to things be able to carry out activities, which elicit a response from one another. Perhaps the highest level of interactivity is a series of activities, which result in the student learning or processing information at a cognitive level which is higher than rate memorization.

2.3 CD-ROM



What is a CD? Firstly CD is an acronym for Compact Disc. There are for main types of Compact Disc formats:

- CD Audio
- CD-ROM (Compact Disc-Read Only Memory)
- CD-1 (Compact Disc-Interactive)
- CD-Rom/XA (CD-ROM Extended Architecture)

The data is written in CLV (Constant Linear Velocity) format as opposed to CAV (Constant Angular Velocity)

What is a CD-ROM? A CD-ROM is about 654.74 MB or 74.5 minutes of audio. It has one spiral groove with a few billion "pits" and "lands". It is written in CLV format. It can be gold in color (a CD recordable disc) or silver (commercially replicated)

2.3.1 An Overview of CD-ROM – based learning

CD-ROM, based learning (a major subcomponent of the broader term "e-learning") is one of the tools with which education is delivered. In traditional academic institution, CD-ROM based learning system are generally housed administratively in a "distance education" department along side other at distance delivery methods such as correspondence, satellite broadcast, two way video-conferencing, and videotape delivery system. All such system seeks to serve learners at some distance from their learning facilitator. Many such system attempts to serve learners interacting with the learning source at different chronological times (for example, email). Distance education then is often referred to as those delivery modalities that seek to reduce the barriers of time and space to learning thus the frequently used phrase "anytime, anywhere learning".

The simplest definition of interactive CD-ROM based learning is the delivery of interactive training or education which is also known as computer-based training. It is the structured transfer of skill or knowledge that takes place by using an interactive CD. The way this interactive learning is designed and implemented varies greatly. A full service learning community offering will likely have to support many approaches to interactive CD learning design and delivery. The varieties of interactive CD based learning are usually defined by the technology used, or by the approach to learning that the technology supports. More recently CD-

ROM's are becoming multi functional and often fall somewhere in the middle of a continuum.

2.4 MULTIMEDIA AUTHORING

An authoring tool is simply something that helps to develop front ends for applications, cut development time in doing so and increases programmer on efficiency due to ease of use. However, a common definition would be a software package which has pre-programmed elements for development of interactive multimedia software titles that can create multimedia presentations. Authoring tools provide true interactivity; not just button pressing; and powerful control over media elements. Authoring systems vary widely in orientation, capabilities and learning curve. There is no such thing as complete point-to-click authoring system; some knowledge of heuristic thinking and algorithm design is necessary. You may not need to know the intricacies of a programming language, or worse, an API, but you do need to understand how the programming works.

There are literally hundreds of software packages available to assist developers in designing web sites. A great majority of them are freeware, sharewares and public domain. Web based authoring tools seem to fall roughly into 3 categories:

1 **Developer** tools are typically multimedia tools cum web production gadgets with some tacked on administrative capabilities. The learning

curve is fairly steep as it requires serious programming or scripting to best utilize these tools. Example would be Authorware 5.1

2 **Instructor** tools are the developer tools made simple. These no-programming tools are ideal for the subject matter expert, but they lack some of the power and flexibility of the more difficult to master tools. Example is ToolBook II Assistant.

3 **Delivery** tools are not really authoring tools but rather 'containers'. They really are class management tools. They organize content into classroom like formats; chatting rooms, threaded discussions, class scheduling, registration and other manners of administration details. Typically, the content is created and organized externally and imported. Top-Class and Virtual-U are examples of this category.

2.4.1 Introducing to types of authoring tool in the market

1. Director MX

It is the latest authoring tool in the market, emphasizing on animation manipulation with sound. Its roots as a sprite-animation program are unmistakable and its inclusion of Lingo (object-oriented scripting language) has made the yardstick for other tools in terms of animation capability. The After Burner compression Xtra creates Shockwave files, allowing Web playback. It also accepts almost any form of

.bmp files, Lingo script with own debugger allows more control including xternal devices; VCR and video players. Lingo, the high-level scripting language for Director (being the scripting language for Macromedia products), user can write script to control objects, branching and even foreign device.

Advantage:

- Able user to create run-time versions of user program called projectors. Anyone can run your projector, even if they do not have your program.
- Mon Better control in terms of utilization (object oriented) compared to their authoring tools.
- Can be run on different platforms
- Incorporates (notably) Flash and Shockwave Studio files, amongst others.

Disadvantage:

- Costly in terms of overhead and pricing
- Numerous features may confuse new users.

2. Flash MX

Standard for interactive vector based graphics and low bandwidth animation for the web .Web designers use Flash to create beautiful, resizable and extremely compact navigation interfaces,

technical illustrations, long-form animations and dazzling effects for their sites. Graphics and animation will anti-alias and scale based on the viewer's screen size, providing high quality viewing. Flash advances web animation with exciting transparency and shape blending effects. Flash offers the only standard playback of vector graphics and animations in a web browser. Flash movies break the bandwidth barrier with fantastic animations, navigation interfaces and banners, logos, long-form cartoons and much more.

Advantage:

- Capabilities of the Technology ~ unique combination of quality, performance and compactness along with built-in support for animation and interactivity. Key attributes of its technology are speed, flexibility, built-in- language (ActionCsript), platform independent, animation, sound and bitmap support.
- Player Ubiquity ~ the potentiality of Flash in terms of development and use is defined by the size of the installed based of PC browsers and Internet devices that include a Flash player. Macromedia has done an outstanding job in ensuring that Flash has the largest installed base possible and is available across the broadcast range of the Internet.
- Attraction among users ~ without saying, Flash animations and designs will attract the attention of users, especially students.

Disadvantage:

- Hardware requirements ~ like Director and Authorware, Flash is also a resource hog. Bigger RAM is a must when creating and running and a fast processor is good to have to run it at an acceptable rate.

3. Shockwave

Shockwave plug-in lets users view interactive web content like games, interactive multimedia product demos, business presentations, entertainment and advertisements from their Web browsers. However, the web content mentioned here have to be made with one of the following authoring tools from macromedia: Director, Flash or Authorware. "Plug-ins add the power of multimedia to web browsers by allowing users to view and interact with new types of documents and images". However; the important thing we should bear in mind is that plug-ins are just tolls for users to view contents made with certain programs. Among the various powerful multimedia plug-in, Shockwave becomes one of those few plug-ins that survive the test of time. It also becomes major concerns to the multimedia content developers. Shockwave plug-ins become popular is largely because of the content they are able to deliver and the authoring tools that create the content.

Advantage:

- Authoring tools – Shockwave content is authored in Director. Although an application called Shockwave can be used to 'shock' multimedia projects made with Authorwave Director is the only program that can author Shockwave content.
- Web Oriented (delivery) – Director has a larger history than Flash. Thus, its original target for delivery is CD-ROMs not the WWW. Although as the dramatic development of the Web, the new version, of the Director

add on features like stream ability and commands built into lingo (the programming language for Director) to help manage web resources, Director developers have to work hard to get the Shockwave movies stream properly on the web. However; with the new Director 8 Shockwave Studio, delivering Shockwave content has been streamlined for developers. It not only exports compact and stream Shockwave files, but also uses HTML templates to integrate with overall site design.

- Interactivity – from the definition of Shockwave plug-ins, we can see that the Shockwave content can be highly interactive multimedia application and games. The extendible features of Director such as Lingo and Xtras make it possible for Director to allow great interactivity in the multimedia programs it creates. For instance, once you go to a games store, you will be shocked by the various striking Shockwave games, not to mention the large number of multimedia application made with Director.

Disadvantage:

- Price issue – money always matters. Although shockwave and Flash plug-ins can be obtained for free, the price difference between Director and Flash can be a critical factor while considering developing context for Shockwave or Flash.

4. 3D Studio Max 6

3ds max contains the essential high-productivity tools required for creating eye-catching film and television animation, cutting-edge games, and distinct design visualizations. 3ds Max 6 is the world's most popular animation modeling, and rendering solution for film, television, games and design visualization. The 3ds max 6 is powerful for the ultimate in:

i. Realism

- Global illumination with exposure control, photometric lights and new shades.
- Now includes reactor® – premiere dynamics software integrated with 3ds max
- Export to real-time 3D environments with Render-to-Texture, Normal Maps, and Light Maps
- Support for Vertex Color Baking of Radiosity solutions

ii. Expression

- New intuitive Curve and Dope Sheet Editor, Draw Curves, and Soft Key Selections
- Enhanced animation capabilities with a new Set Key system to streamline pose-to-pose animation

iii. Productivity

- Perfect control over mapping coordinates with a new UVW Unwrap modifier
- Unmatched polygonal modeling
- Free 5th-generation backburner™ network rendering & management utility for management of 3ds max and combustion®

Advantages:

- Character Node - This brings an assembly of elements together for management of rigging and animation data. Makes management of scenes easier, gives artists more time to concentrate on creating rather than searching.
- Bone Tools - Build IK chains faster, re-purpose existing chains easier, and find all Bone-related tools in a single place.
- Set-key animation system - Animators can now use multiple animation methods within 3ds max software, and Set Key animation allows for a more interactive "Pose and Key" approach without worrying about rogue key frames or unexpected results.
- Progressive Morphing - Removes the need to do extra work between the desired morph targets to build non-linear interpolation. Gives animators flexibility to control morphing more fully by allowing for extra interpolation steps between morphs.
- Function Curve editor - Greatly enhanced interactivity with Function Curves makes the animation process more fluid, improving feedback for the artist and giving a better "feel" for how animations are timed.

- UV tools - Create automatic texture layouts to save time painting your textures - work faster (and probably have more fun). Work predictably with the model and retain the control needed to dig into the details when needed.
- PSD support - Build textures faster, and manage assignment of Light Maps, Normal Maps, specular, diffuse, & all of the channels you might need to assign through one single texture file
- Named selection sets - Keep track of scene data, assign groups of objects to multiple selection sets, build scenes with Compositing Layers in mind.
- Layers - Keep track of scene data, build 3D elements with Compositing Layers in mind. Intelligently groups scene data and provides commonly used Layering commands.
- Render to texture - Render to texture allows game and visual effects artists to build more surface details on their meshes and use low-poly objects to represent high-detail scenes. Great for Games, Set Design, Film Pre-visualization, and working with higher detail in the viewport.

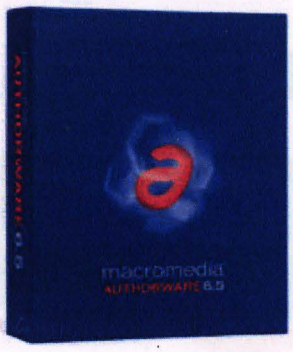
Disadvantage:

- Overall it needs 50% high level of technical proficiency.

5. Author wave 7

It is authoring tool of considerable power. A visual rich media authoring solution for on-line learning applications. A training course is developed by building a flowchart of the course structure. The flowchart is built from a small set or powerful icons that are displayed in a toolbox on the screen. The

flowchart is fundamental to design processes and prevents the author from



branching to paths that do not exist. This encourages the author to make detailed improvements that might be too tedious or expensive with other tools. There is a Media Library that stores graphics, sound, animations and other digital media. It eases problems of updating and tailoring courses for different clients or user groups. Provide portfolio models and templates that are designed to support and train developers as they work with them.

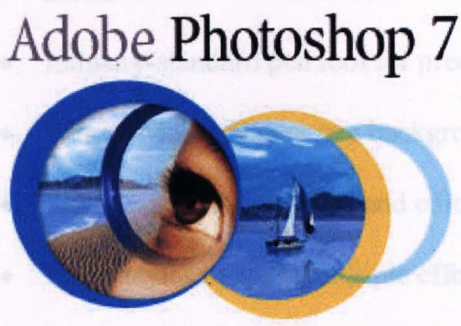
Advantages:

- Ideal for programs that require heavy and complex interactivity. It specifies targeted interaction results with more ease than other tools.
- The Decision icon provides built in flow of control functionally.
- Using Framework and Navigation Icons, navigation components that take you anywhere in the program can be created without scripting.

Disadvantage:

- Authorware cannot run on computers that have little memory.
- IO file is not possible over the Internet. Authorware's local hard disc file is good, but all the built-in functions are disabled when the program is run over the net.

6. Adobe PhotoShop 7



Photoshop contains an endless selection of drawing tools, filters, color adjustment capabilities, and other tools designed to manipulate images in almost any way. Originally designed for bitmap images, Photoshop now incorporates vector drawing tools and layer design features, an expanded Web toolkit, and improvements to the user interface. You can use this program to edit photos in just about any way, from simply lightening dark photos to adding things or people that weren't originally in a picture. Adobe Photoshop software, the professional image-editing standard, helps you work more efficiently, explore new creative options, and produce the highest quality images for print, the Web, and anywhere else. Create exceptional imagery with easier access to file data, streamlined Web design, faster, professional-quality photo retouching, and more. Adobe® Photoshop® 7.0 software helps you work more efficiently, explore new creative options, and produce the highest quality images for print, the Web, and anywhere else.

The professional image-editing standard:

Express your creativity: Photoshop 7.0 lets you experiment freely without sacrificing precision - or edit ability.

i. Enjoy unlimited creative options

- Sophisticated painting tools including brushes that simulate natural media
- Industry-standard pen tool for precision drawing
- Pattern Maker to generate background textures automatically
- Layer effects for instant - and editable - effects
- Layer styles to apply multiple effects instantly
- More than 95 special effects filters
- Liquefy tools and Turbulence brush to distort images with precision
- Create compelling Web graphics
- Tools to define and edit slices directly in Photoshop
- Transparency controls including dithered transparency for edges that blend into any background
- Weighted optimization - use channels for high-resolution display in critical areas
- Vector output options for resolution-independent text and shapes
- Instant GIF animations from layered Photoshop and Adobe Illustrator® files
- Document States palette to manage rollovers, animations, and image maps
- Rollover palette for access to slices, rollovers, image maps, and animations
- Image map, URL-link, and CSS (Cascading Style Sheet) generation
- Publish hi-res, modem friendly, zoom and pan images for any Website with ease using Viewpoint Zoom View

iii. Enhance your photography

- Powerful color correction tools
- Healing brush to remove flaws while preserving tonality and texture
- Layers for editable compositing
- Precision masking
- Picture Package tools to print a folder of images quickly
- Watermarking to protect artwork posted on the Web
- Sophisticated crop tool that corrects perspective as it crops

Stay ahead of your deadlines: Intuitive tools and advanced automation controls in Photoshop 7.0 help you work efficiently - and edit with ease.

i. Work more efficiently

- Comprehensive toolset for drawing, painting, photo retouching, and compositing
- Context-sensitive options bar for instant access to specific tool settings
- File Browser to inspect images before you open them
- History palette to undo or redo multiple steps with ease
- Layers to organize your images and keep editing options open
- Customizable workspace controls to save your palette arrangement
- Tool presets - customize any tool and save it to use again
- Flexible measurement system - set the unit of measure you want or combine them freely

ii. Automate repetitive tasks

- Data-driven graphics to generate design variations on the fly

- File Browser lets you create, rename, and manage folders
- Actions palette and droplets for batch processing of common production tasks
- Extract Image feature to create complex masks automatically
- Auto Color command for fast and reliable color correction
- XMP (eXtensible Metadata Platform) support lets you repurpose, archive

Develop a reliable workflow: Photoshop 7.0 provides sophisticated controls and security setting for superior images, precise output, and worry-free file sharing.

i. Enjoy precise typographic control

- Vector text - text remains editable until you rasterizing it
- Text warping and other type effects
- Paragraph and character formatting
- Convert-to-outline function to use text as a mask
- Multilingual spelling checker with search-and-replace capability

ii. Collaborate with confidence

- Annotation tools to add typed notes or recorded voice comments to review files
- Cross-platform support for a smooth workflow between Microsoft® Windows® and Mac OS
- PDF security to allow password protection for your Photoshop PDF files
- WebDAV workflow management tools
- Tight integration with other Adobe software

iii. Maintain color precisely

- Color management controls for soft-proofing and consistent color across every device
- Spot-color and duotone support
- Precise controls for dot gain, black-plate generation, and more
- Tools to identify out-of-gamut color before you go to print

Advantages:

- The ability to grab images directly from a scanner.
- The manipulation tools are excellent.
- Support for graphics tablets.
- Excellent range of brush types.
- Literally create anything you want.

Disadvantage:

- Steep learning curve.

2.5 COMPUTER CONFIGURATION

The following are the minimum requirement to use the above mention macromedia authoring tools:

- **Operating System**

Operating system is the "executive manager", the part of the computing system that manages all of the hardware and all of the software. It controls every file, every device, every section of main memory, and every nanosecond of processing time. It controls who can use the system and how. Therefore, when the user sends a command, the operating system must make

sure that the command is executed or, if it's not executed, must arrange for the user to get a message explaining the error. This does not necessarily mean that the operating system executes the command or sends the error message, but it does control the parts of the system that do.

The minimum requirement for Microsoft Windows is Windows 9x, Windows 2000 or later. Meanwhile for Macintosh is Macintosh G3 running System 10.1 or later.

- **Microprocessor**

A microprocessor also known as a CPU or central processing unit, is a complete computation engine that is fabricated on a single chip. A microprocessor executes a collection of machine instructions that tell the processor what to do. Based on the instructions, a microprocessor does three basic things:

- Using its ALU (Arithmetic/Logic Unit), a microprocessor can perform mathematical operations like addition, subtraction, multiplication and division. Modern microprocessors contain complete floating point processors that can perform extremely sophisticated operations on large floating point numbers.
- A microprocessor can move data from one memory location to another.
- A microprocessor can make decisions and jump to a new set of instructions based on those decisions.

The minimum requirement for Microsoft Windows is Intel Pentium II 200 or later. Meanwhile for Macintosh is Macintosh G3 running System 10.1 or later.

- **Hard disk / disk drive**

Nearly every desktop computer and server in use today contains one or more hard-disk drives. Every mainframe and supercomputer is normally connected to hundreds of them. These billions of hard disks do one thing well they store changing digital information in a relatively permanent form. They give computers the ability to remember things when the power goes out. Hard disks started as large disks up to 20 inches in diameter holding just a few megabytes. They were originally called "fixed disks" or "Winchesters" (a code name used for a popular IBM product). They later became known as "hard disks" to distinguish them from "floppy disks." Hard disks have a hard platter that holds the magnetic medium, as opposed to the flexible plastic film found in tapes and floppies. A hard disk is able to store an amazing amount of information in a small space. A hard disk can also access any of its information in a fraction of a second. A typical desktop machine will have a hard disk with a capacity of between 10 and 40 gigabytes. Data is stored onto the disk in the form of files. A file is simply a named collection of bytes.

The minimum requirement for Microsoft Windows and Macintosh is 64 MB space plus 100 MB of available disk space, but for better performance you

will need 128 MB of RAM. As for Microsoft Windows is 128 MB plus 100 MB of available disk space

- **Other standard computer peripherals**
  - 16 it sound card
  - 4Mb SVGA video card
  - Quick time 3.0 or later
  - Color monitor
  - Speakers
  - CD ROM drive

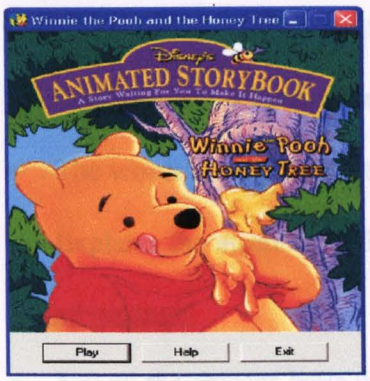
2.6 COMPARISON OF EXISTING INTERACTIVE MULTIMEDIA LEARNING PACKAGE

Two systems, similar to my own were reviewed and analyzed to gain information as how a typical system is; interface, features and functionalities. One of the systems is a stand-alone system and another is a web-based system. From analyzing these systems, I hope I can improve upon the flaws and drawbacks these systems experience as well as try to integrate their good features and displays into my system. (By integrating I don not mean copying but rather adapting its good qualities.)

2.6.1 System 1

A stand-alone application titled "Winnie the Pooh and the Honey Tree. This animated story was developed for the children age group of 3 to 6 years.

1. Cover Screen



Play: Start the application.

Help: Describe how the system works, system requirement and contact numbers of the software development.

Exit: Quit the application.

Figure 2.6.1(1): Start Screen

2. Main Screen

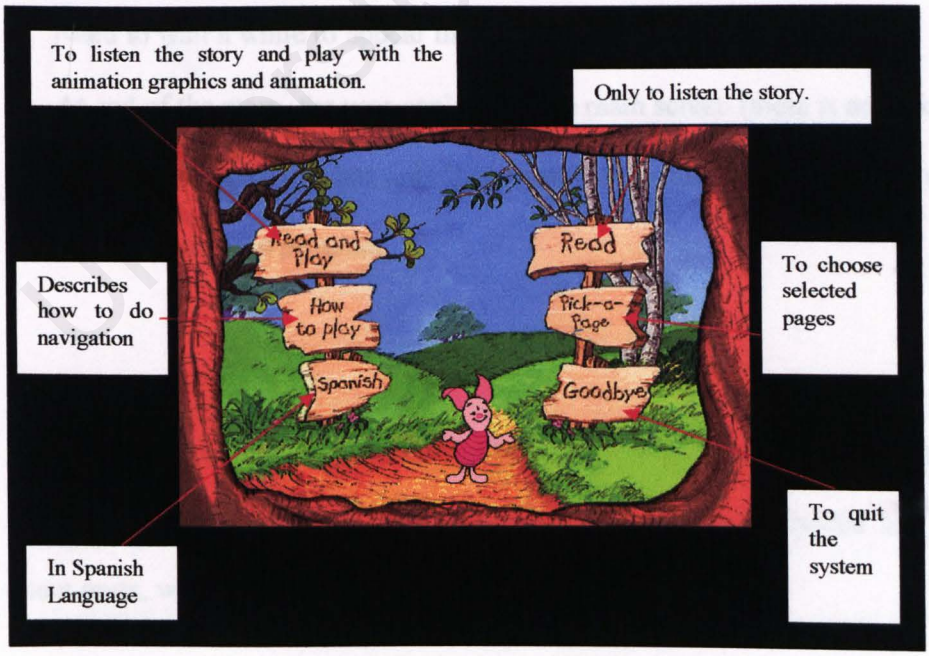


Figure 2.6.1(2): Main Screen

When the user select the any of the menu on the screen, the system will read the words that appear on the screen automatically and the sentences will be highlighted green in color, so that the user can know the wordings and it is easy to follow up with the systems reading.

Advantages:

- Animation and graphics are presented in good manner.
- Reads the story for the user.
- The words are highlighted when the story was read by the system.
- Explains the meaning of the difficult words.

Disadvantage:

- Not all the screens have the navigation icon for 'previous and next page'.
- The icons' are not named, i.e. to repeat the story.
- Did not indicate which items to click for play with the animation pictures. The users need to try error.
- Need to wait a while to appear the next screen.
- At end of the story, the user can't go to the main screen (there is no link to the main screen) ; it has only 2 options, (1) to continue the same story and (2) to exit the program

2.6.2 System 2

The second system is http://www.funbrain.com web-based learning. This site is game-based learning system. Overall, this system is divided into 3 main parts, which are; Kids and games, Teachers, and Parents.

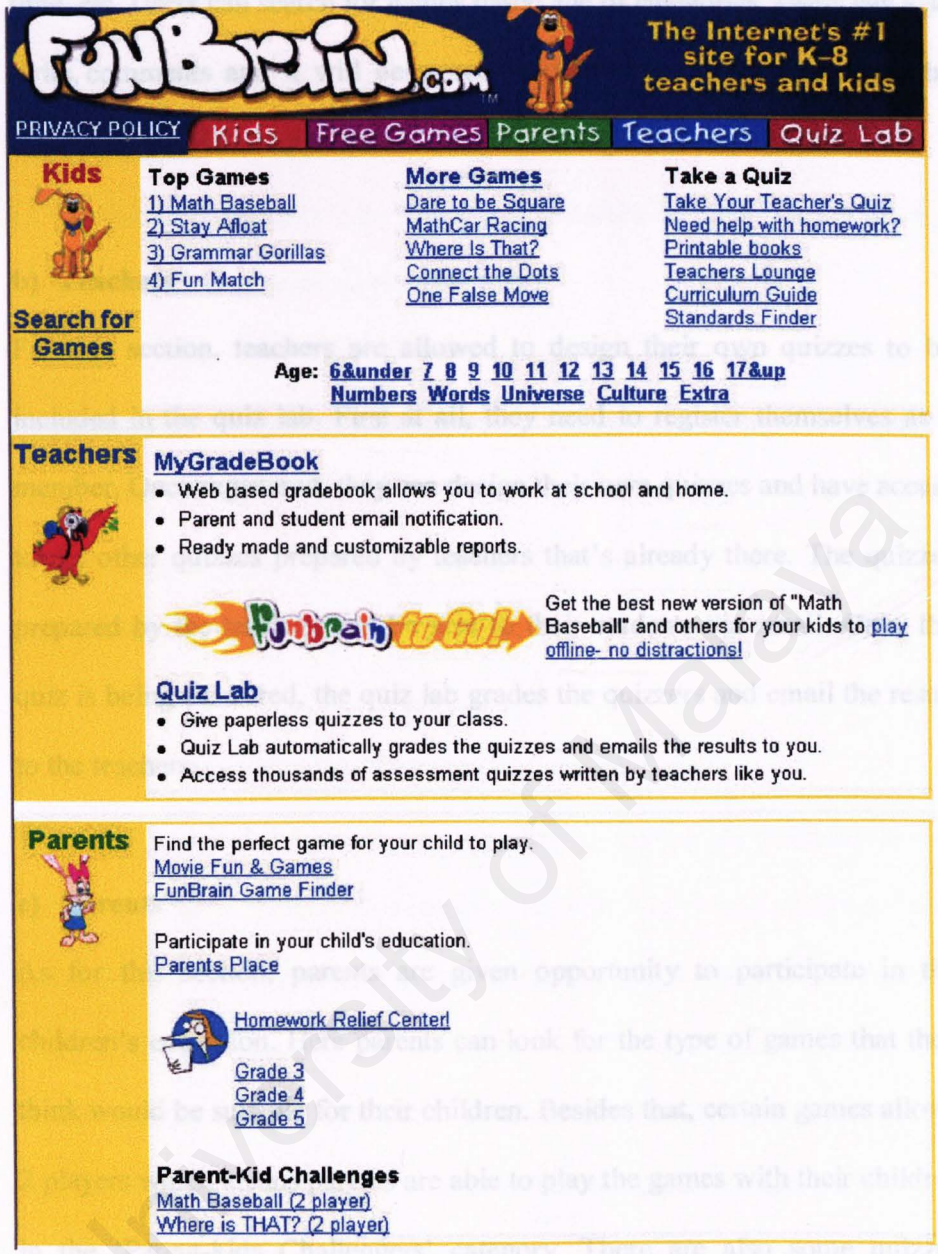


Figure 2.6.2: Web screen of FunBrain

a) Kids and games

For this section, all the games that can be played is listed. The games are based certain categories such as numbers, words, universe, culture, etc. The games here tests the kid's knowledge in mathematics, science, geography, sports stars, history, grammar, memory, IQ, puzzles, counting money, telling

time, etc. Users can search for games based age or categories. Users can also write comments and it will be stored in the writers' bloc, which can be viewed by teachers or parents.

b) Teachers

For this section, teachers are allowed to design their own quizzes to be included in the quiz lab. First at all, they need to register themselves as a member. Once registered, they can design their own quizzes and have access to the other quizzes prepared by teachers that's already there. The quizzes prepared by the teachers can be sent to their students via email. Once the quiz is being answered, the quiz lab grades the quizzers and email the result to the teachers.

c) Parents

As for this section, parents are given opportunity to participate in the children's education. Here parents can look for the type of games that they think would be suitable for their children. Besides that, certain games allows 2 players which means parents are able to play the games with their children in the 'Parent-kids Challengers' category. There are also some quizzes meant for parents that enable them to understand their children more. The quizzes are based on school age children, preschoolers, toddlers, and infant behavior.

Advantages:

- Many types of games available.

- Simple and easy to use.
- Covers various subjects and topics for a wide age group.

Disadvantage:

- No tutorials are provided. Users are expected to have the knowledge beforehand to play the games available.

Conclusion

The conclusion I have reached after analyzing the existing systems is that to achieve a good quality package, we must combine both user interactivity; user-friendly features and quality of content; a full coverage of materials.

2.7 JITN – INTERACTIVE MULTIMEDIA LEARNING

This is an interactive learning package that's aims people of all levels and age group. The purpose of this package is to introduce Internet to everyone and make learning more interesting with multimedia features. **JITN** package will be divided into two phase, content design and screen design. The content design has 5 topic about Internet, meanwhile the screen design consist of a short movie of how information requested through a browser is retrieved from the Internet.

Proposed criteria used in designing JITN

- **Screen Design**

As microcomputers have proliferated, so has concern over how information is presented on the multitude of screens in use. Resolution of screen is the first style consideration taken when the package is designed. The screens

used with some microcomputers have very low resolution, meaning they do not produce high quality images. In general anything written or drawn on a computer screen will be of low quality or resolution. When screen are designed three aspects was considered: the kind of information that's going to be presented, the screen components, and the readability of the information that will be shown.

- **Screen Information**

Words, graphics and space are the three kinds of information that will be basically on a computer screen. All these components are used to design an effective screen design for **JITN**. Graphics will be designed according to the level of realism required by the level of sophistication of the users who will use the package. This is because abstracts symbols will not be understood by users who have not had sufficient realistic experiences with the content of the symbol. In my opinion it is best if one idea or topic is presented on one screen at a time, simplicity is usually better than complexity. This is because multiple ides shown on one screen have a tendency to confuse the user. On the other hand the topics, which are closely related, portions of one screen will be retained when a new topic is presented. The users they will be given the option of reviewing screens shown previously. In general when graphics or drawings are shown to users, they tend to look at them in a clockwise sequence. Usually the eyes first look at the upper left quadrant of the screen and moves in a clockwise manner around the screen. Therefore prompts such as arrows or directions are used to reinforce or alter this natural viewing pattern.

- **Screen Components**

The computer screen in the package is organized to give the user a feeling of control. No. learners enjoy being placed in a situation where they have no input about what is happening. Firstly, the screen will provide orientation information to the user. This includes statements about where the users is in the sequence of the package (location of the user), analogous to page numbering in a book. Some call this information the 'cognitive maps' because it is a hypothetically easy to get lost in an application, especially a hypermedia package, it is important that users know where they are. A cognitive map gives orientation information. It is also important that users know how to move through the application. A 'navigation system' is incorporated in the package. A simple page turning or screen changing, a kind of navigation system, and more sophisticated application that have easy to use ways of 'jumping around' in a package, such as to the beginning of a section, or back to the lesson's beginning has been implemented in the package. To design an effective package the cognitive maps and navigation system have been built into the package. To indicate where the users are in a within the lesson, lesson section title and visual symbols is need. Directions are clearly given to user about what they are expected to do. These directions are simple as 'click me to see more' or detailed. The information about the user's response is important therefore it's taken into consideration: what the user types at the keyboard will be shown at the screen. For example, what key to press to get help to ship this page or to go back and review, are important component to design the package effectively. Again a

well designed screen gives the user the feeling of being in control not being controlled.

- **Readability**

Because the resolution of a computer screen is generally lower than for a page of a book, extreme must be taken to ensure that what is written can be read. First, the writings will be simple, long complex prose is not meant to be read from a computer screen. Secondly, upper and lowercase lettering will be used if reading easier. Thirdly, justified right margins will be avoided. This is because ragged right margin show up better on more computer screens. Fourthly, shorter rather than longer lines are best to be used. About eighty column text displays should be avoided, if for all text module. Larger titles will be used, but the use of 3 or 4 types of sizes for the main textual portion of the content will be avoided because it will distract the reader. Readability and legibility can sometimes be improved by the use of underlining, reverse printing and blinking words. Although effective in many situations, overuse of these techniques in the package can be distracting and detrimental to learning. Screen design is a critical component of the package. If design is haphazard, then learning will be affected. The kind of information presented, the components found in each screen and the readability of the text will be considered when it is designed and evaluated.

2.8 CONCLUSION

Here in this Chapter 2, all the information gathered are carefully read and processed in order for the analysis to begin. It is safe to say that Literature

Review is the core of this proposal. Without the information procured during this stage, it's almost impossible to move forward and conduct the analysis and design. It also gives the project clearer concept and provides a general description about the Multimedia, Authoring Tools and fact finding techniques are explained.

It helps us to proceed for the further development of our project. In the next chapter, we will discuss system methodology that been chosen for developing **JITN** project.

CHAPTER 3 ~ METHODOLOGY

3.0 INTRODUCTION

The objective of this chapter is to introduce the development process chosen for this **JITN** application. Basically, there are many different engineering disciplines may be involved in creating an application or a system. Once a decision has been made they are very expensive to change. That is why development process has become so important in developing application or a system, which it allows for flexibility as changes can be made during the application development in response to new requirement.

3.1 WHAT IS THE DEVELOPMENT PROCESS?

Software Engineering (SE) paradigms, or process models as they are sometimes known, describe general patterns of how to approach software development. At a very abstract level all software development can be described by a generic problem solving process, but for an SE paradigm to be applicable to a particular real-world project it is necessary for it to be tailored to that particular type of project (based on the nature of the project and applications). It consists of a set of steps that encompass methods, tools and procedures to be used, the controls and deliverables that are required, often referred to as software life cycle models.

3.2 TYPES OF SOFTWARE DEVELOPMENTS

Different processes are used to develop different parts of the system. There are four types of process model, which will discuss here, are:

3.2.1 Waterfall Model

This takes the fundamental process activities of specification, development, validation, and evolution and represents them as separate process phase such as requirement specification, software design, implementation and testing. Because of the cascade from one phase to another, this model is known as the "waterfall model" or software life cycle.

There are 5 phase in this model

1. Requirement analysis and definition: The system's services, constraints and goals are established by consultation with system users. They are then defined in details and serve as a system specification.
2. System and software design: The system design process partitions the requirements to either hardware or software systems. It establishes an over all system architecture. Software design involves identifying and describing the fundamental software system abstraction and their relationships.
3. Implementation and unit testing: During this stage, the software design is realized as a set of programs or program units. Unit testing involves verifying that each unit meets its specification.
4. Integration and system testing: The individual program units or programs are integrated and tested as a complete system to ensure that the software requirements have been met. After testing, the software system is delivered to the customer.

5. Operation and maintenance : Normally, this is the longest life-cycle phase. The system is installed and put into practical use. Maintenance involves correcting errors which were not discovered in earlier stages of the life cycle, improving the implementation of system units and enhancing the system's services as new requirements are discovered.

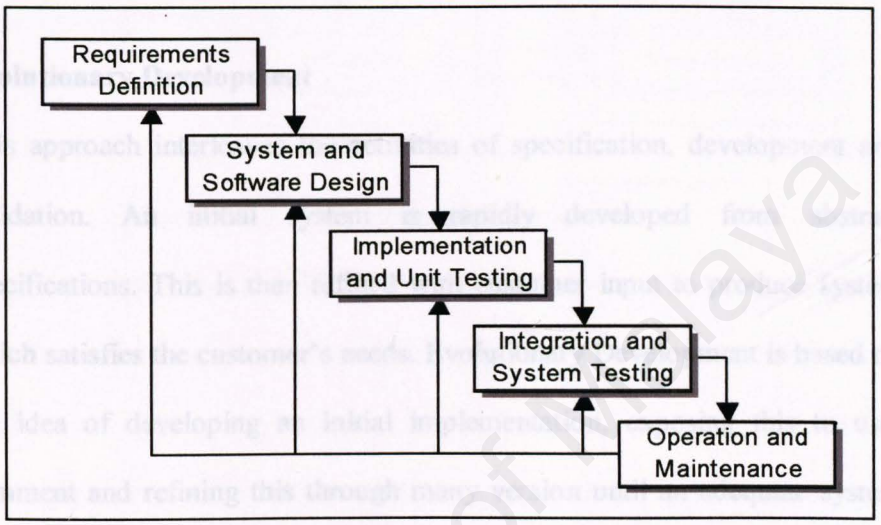


Figure 3.2.1: The Waterfall Model

The following phase should not start until the previous phase has finished. In practice, these stags overlap and feed information to each other. During design, problems with requirements are identified; during coding design problems are found. The software process is not a simple linear model but involves a sequence of iterations of the development activities. During the final life-cycle phase the software is put into use. Errors and omissions in the original software requirements are discovered. Program and design errors emerge and the need for new functionality is identified. The system must therefore evolve to remain useful. Making these changes may involve to repeating some or all previous process stages. The problem with the waterfall model is its

inflexible partitioning of the project into these distinct stages. Commitments must be made at an early stage in the process and this means that it is difficult to respond to changing customer requirements. Therefore, the waterfall model should only be used when the requirement are well understood.

3.2.2 Evolutionary Development

This approach interleaves the activities of specification, development and validation. An initial system is rapidly developed from abstract specifications. This is then refined with customer input to produce system which satisfies the customer's needs. Evolutionary Development is based on the idea of developing an initial implementation, exposing this to user comment and refining this through many version until an adequate system has been developed. Rather than have separate specification, development and validation activities, these are carried out concurrently with rapid feedback across these activities.

There are two types of Evolutionary Development:

1. Exploratory Development: Objective is to work with customers and to evolve a final system from an initial outline specification. The developer should start with well-understood requirements.
2. Throw Away Prototyping: Objective is to understand the system requirements. The developer should start with poorly understood requirements.

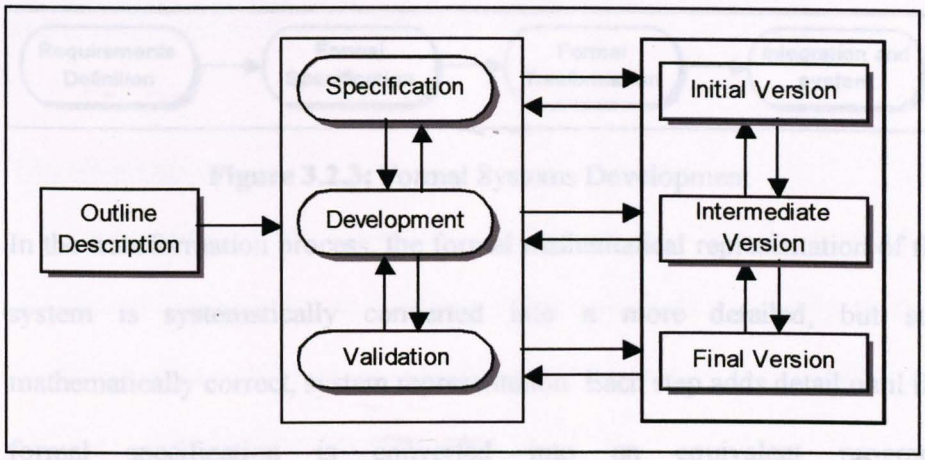


Figure 3.2.2: Evolutionary Development

An Evolutionary approach to software development is often more effective than the waterfall approach in producing systems which meet the immediate needs of customers. The advantage of a software process which is based on an evolutionary approach is that the specification can be developed incrementally. As users develop a better understanding of their problem, this can be reflected in the software system.

3.2.3 Formal Systems Development

This approach is based on producing a formal mathematical system specification and transforming this specification, using mathematical methods, to construct a program. Verification of system components is carried out by making mathematical arguments that they conform to their specification. Formal system development is an approach to software development which has something in common with the waterfall model but where the development process is based on formal mathematical transformation of a system specification to an execute program.

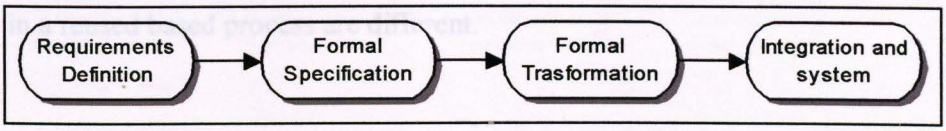


Figure 3.2.3: Formal Systems Development

In the transformation process, the formal mathematical representation of the system is systematically converted into a more detailed, but still mathematically correct, system representation. Each step adds detail until the formal specification is converted into an equivalent program. Transformations are sufficiently close that the effort of verifying the transformations is not excessive. The advantage of the transformational approach compared to proving that a program meets its specification is that the distance between each transformation is less than the distance between a specification and a program. A transformational approach made up of a sequence of smaller steps is more tractable. However, choosing which transformation to apply is a skilled task and proving the correspondence of transformation is difficult.

3.2.4 Reuse Based Development

This approach is based on the existence of a significant number of reusable components. The system development process focuses on integrating these components into a system rather than developing them from scratch. This reused oriented approach relies on a large base of reusable software components which can be accessed and some integration framework for these components. While the initial requirements specification stage and the

validation stage are comparable with other process, the intermediate stages in a reused based process are different.

The stages are:

1. Component analysis: Given the requirement specification, a search is made for components to implement that specification. Usually, there is not an exact match and the components which may be used provide only some of the functionality required.
2. Requirements modification: During this stage, the requirements are analyzed using information about the components which have been discovered. They are then modified to reflect the available components. Where modifications are impossible, the component analysis activity may be re-entered to search for alternative solutions.
3. System design with reuse: During this stage, the framework of the system is designed or an existing framework is reused. The designers take into account the components which are reused and organize the framework to cater for this. Some new software may have to be designed if reusable components are not available.
4. Development and integration: Software which cannot be bought in is developed and the components and COTS systems are integrated to create the system. System integration in this model may be part of the development process rather than a separate activity.

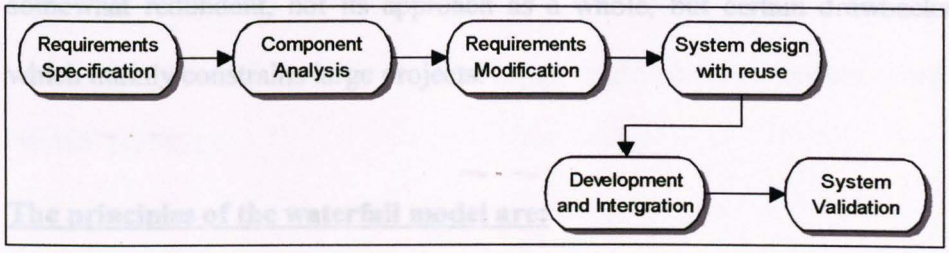


Figure 3.2.4: Reuse Based Development

The advantages of this model are that it reduces the amount of software to be developed and so reduces cost and risk. It usually also lead to faster delivery of the software. However, requirements compromises are inevitable and this may lead to a system which does not meet the real needs of users. (Sommerville, 2001)

3.3 SOFTWARE DEVELOPMENT PROCESS FOR JITN

The methodology used to develop **JITN** application is Waterfall with Prototyping model. The reason why I chose this methodology will be elaborated below but to do so, we must first discuss its two integral parts; why neither one is chosen and the justification of the merge.

3.3.1 The Waterfall model

The Waterfall approach has dominated software development for a number of years. Software development is split up into a number of independent steps that are carried out in sequence one after the other. Each stage produces a product that is the input into the next stage. This is the main concept of using this methodology where each phase has to be completed before proceed to the next phase. Even though the waterfall model, as said, has been the chosen methodology for the past few years, it has now become

somewhat redundant, not its approach as a whole, but certain drawbacks which mainly constrains large projects.

The principles of the waterfall model are:

- It is a series of steps (like a production line)
- Each step is well defined
- Each step creates a definite product (this is often a piece of paper)
- Each product forms the basis for the next step.
- The correctness of each step can be checked. (Verification or validation)

Advantages:

- It divides a complex task into smaller, more manageable tasks.
- Each task produces a well defined deliverable.
- Recognizes the importance of backtracking (feedback) in software development.

Disadvantages:

- Assumes that user requirement can be precisely specified.
- Requires the customer to be extremely patient.
- It implies that any stage should be frozen before continuing with later stages.

3.3.2 Prototyping model

Prototyping is involved in the early stage of the application requirement where there was a high degree of uncertainty in several areas in the application requirements. Prototyping means building a small version of a

system, usually with limited function. Its process is iterative; build a prototype, evaluate, consider how changes might improve system, build another prototype.

Advantage:

- It mainly helps user to identify key requirements of a application and demonstrate the feasibility of a design approach.

Disadvantage:

- Prototyping is bland and sometimes the cost of its development covers a very large fraction of the total cost.

Therefore, it is practical to merge both methodologies to create a powerful yet subtle method to follow in order to achieve desired results. Below is the diagram of Waterfall with Prototyping Methodology use for **JITN** project and its properties.

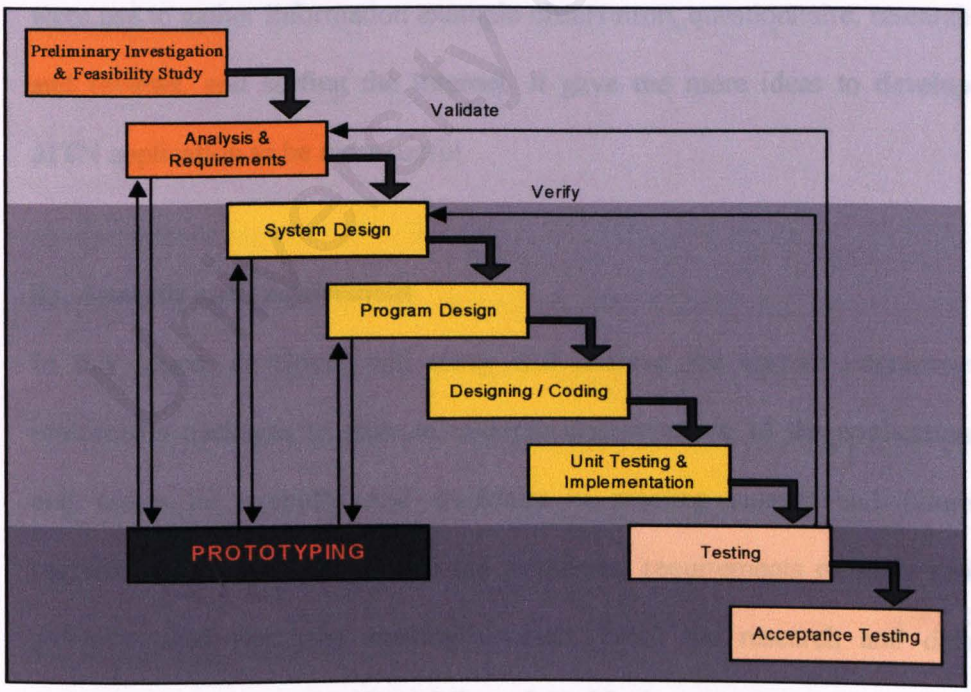


Figure 3.3.2: Waterfall Process Model with Prototyping

The Primary Phase

In the primary phase, it gets better understanding on the limitation and accomplishes the requirements needed in making **JITN** application successfully develop. Below stated are the phases that are involved in the primary phase.

i) Preliminary investigation &Feasibility Study

A preliminary investigation is to evaluate the existing interactive multimedia packages to determine whether a new sophisticated application is indeed necessary, or the existing application needs an enhancement or replacement. Several techniques that used to collect information such as examining existing documents, surfing the Internet, conducting interviews with public, office staff, teachers and students using questionnaires and own observation were use to gather information example observation, questionnaire, research and reviews, and surfing the Internet. It gave me more ideas to develop **JITN** application to be more useful.

ii) Analysis and requirement

In this phase, developer will study and analyze the current interactive multimedia packages to gain an in-depth understanding of the application and assess its strengths and weakness in meeting current and future requirements. It also determines the processes, requirements of tools and software used from the existing product. From the research and data gathering, I find that the Waterfall model with the prototype will be more suitable to use for **JITN** project. I also find that Macromedia Director MX

will be the best authoring software to develop **JITN** application. Directors support very well with graphical and animation tools like Flash MX, 3D Max Studio and Photoshop

The Intermediate Phase

In the intermediate phase, it establishes **JITN** overall application structure and finally to develop the **JITN** application. Below stated are the phases that are involve in the development activities.

i) System design

Using the information obtained in the analysis phase, the system design will propose with new requirement. It will cover all the hardware requirements and operating tools that are require by the **JITN** application. Example the operating system, processor, monitor, keyboard, mouse, drive, hard disk, RAM, speakers, sound cards and so on.

ii) Program design

From the analysis phase, the developer will identify and describe the fundamental software needed for **JITN** application and also include the functions that the system must perform as well as how they will be integrated. It will involve the system abstractions and their relationship.

iii) Designing/Coding

Basically, this phase is connected with synthesizing or putting all the parts together into a viable and workable **JITN** application. It includes the system

models design, system flow chart and user interface design. It shows how the user and the computer interaction and the graphical user interface.

iv) Unit Testing and Implementation

During this phase, the software design is realized as a set of programs or program units. Unit testing involves verifying that each unit meets its specification. System implementation includes user guide, testing and documenting the **JITN** application.

The Final Phase

In the final phase, the **JITN** application will be tested as a complete system to ensure that the application is running properly.

i) Testing

The purpose of testing is to uncover software errors. Proper testing will minimize the number of errors before release or publish the **JITN** application. This will improve the quality of **JITN** application.

ii) Acceptance Testing

The integration of the **JITN** application will be tested as a complete application to ensure that the requirements have been met. After acceptance testing, the **JITN** application will be release or publish

3.3.3 Justification of the chosen combination of Waterfall Model and Prototype Model methodology

There is some benefit from Waterfall model with prototyping. Thus, it is easy to associate each milestone since one phase is completed before the next phase started, where the development process more visible, and deliverable.

As known, waterfall model is basically linear sequential model. I chose this combination because in the waterfall model, the steps are predestined. Therefore this creates a systematic development process. It allows me to analyze the requirements thoroughly before moving on to the next phase. In the design phase, it allows me to design **JITN** data structures and **JITN** application architecture. Moreover, the implementation will be done mechanically. This is where the prototype model comes in, especially during requirements phase. With the combination, it permits us to get the feedback and rectify a problem at an early stage. Even though there is a slight backtracking in the phase flow but with the combination even though there are changes occurring but the development process still goes on. For instance, if I was designing **JITN** data structure and there is a new requirement, I can always modify **JITN** data structure immediately to suit my new requirement. It will reduce my project schedule in the long run. In waterfall alone, during the unit testing and implementation phase testing, bugs will be found and enhancement will have to be done and in prototyping model alone, the process of building a throw away prototype must be done. All this will waste time and resource. Therefore the combination allows the

user to state their requirements and gain satisfaction accordingly. This eliminates the production of bug infested the **JITN** application.

CHAPTER 4 ~ SYSTEM ANALYSIS & SYSTEM REQUIREMENTS

4.0 INTRODUCTION

System analysis and requirement is a systematic approach to identifying problems, opportunities and the objective of the project. It helps to analyze the information flows in organizations and to design computerized information system to solve a problem. As information proliferates a systematic, planned approach to the introduction, modification, and maintenance of information systems is essential.

Eventually in this chapter the various aspects of the system, such as data gathering, functional and non-functional requirements, chosen development tools for the system, analysis on the survey which was carried out and research on other similar course-wares will be put forth to provide the needed data and information to build and implement a complete and competent application.

4.1 DATA GATHERING

In Chapter 2, Literature Review item 2.2 Fact Review, four different types of data gathering method was use. Below are the feedbacks from the fact review.

1. Observation

From my observation, I had learnt that this kind of products is popular among the younger generation. Lack of multimedia knowledge and fear

with the term "multimedia" would be a main reason why some people is not interested.

2. **Questionnaire**

The survey from the distributed questionnaire was quite successful. Manage to collect 75% of the distributed copies and the feedback was tabulated and analyzed. Please refer to the Appendix II section.

The questionnaire results are summarized below:

- Computer Literacy

Almost everyone is familiar with a computer citing a full 100% use of Windows operating system. Majority uses it for their work meanwhile others use it for entertainment. The frequency of use at home and amongst friends range from often to mediocre use.

- Internet and Networking

The analysis shows that the usage of Internet is very high among the users. This is a positive start in achieving global communication and building a computer literate society. However, there is still a small percentage that is not in touch with Internet facility whereby they are still in nut-shell. This is a stopper in the progress of IT.

- Multimedia and Interactive Multimedia

Only a few are really aware of multimedia, most answering unsure and moderate. Some of them have heard or used learning package but most of them are totally lost.

3. **Research and Review**

I have tapped into textbook references, modules and articles to gather as much information as possible to support **JITN** project. Though it seems

arbitrary with the advent of the net, it does provide one with vital information, which may not be available elsewhere. Research on past cases, updates in the software as well as the hardware market also contributes to **JITN** project. Please refer to the list of source in Reference attached.

4. **Surfing the Internet**

   Search engines such as www.msn.com, www.yahoo.com, and www.google.com provide relevant sites to reach and obtain apt information using queries function. Search engines are very important in identifying the existing system for analysis. Please refer to the list of web site visited in References attached.

4.2 SYSTEM REQUIREMENT

Generally, system requirement is divided to two main part, the requirements process and requirements elicitation.

4.2.1 The requirements process

Before developing an application, it is very important to capture all the necessary requirements. A requirement is a feature of the system or a description of something the system or a description of something the system is capable of doing in order to fulfill the system's purpose (Pfleeger, 1998). As for this **JITN** project, the requirements were gathered through research on the Internet and books, analyzing on the results from the survey conducted, and review of the existing system.

4.2.2 Requirements elicitation

Requirements elicitation is an especially critical part of the process. A variety of techniques must be used to determine the user's needs and what they really want in the system. Requirements can be separated into 3 categories:

- Requirements that absolutely must be met
- Requirements that are highly desirable but not necessary
- Requirements that are possible but could be eliminated

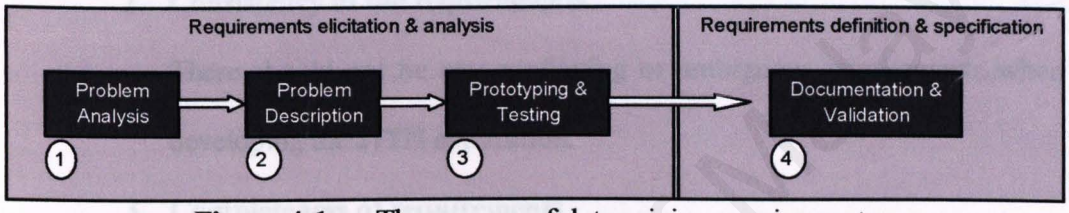


Figure 4-1: The process of determining requirements

1. Have we captured all the user's need?
2. Are we using the right techniques or views?
3. Is this function feasible?
4. Have we captured what the user expects?

4.3 WHY ARE REQUIREMENTS IMPORTANT

Requirements for Interactive Multimedia package, IT For All (ITFA). Through the information gathered, the outline for **JITN** is prepared. Basically requirements are divided into 3 namely, domain requirements, functional requirements and non-requirements.

4.3.1 Domain requirements

Requirements describe not only the flow of information to and from a system and the transformation of data by the system but also the constraints on the system's performance.

Below are the requirements characteristics of the **JITN** application:

1. **Accuracy of requirements**

   The requirements must meet the **JITN** objectives and be stated clearly without error.

2. **Consistency of the requirements**

   There should not be any conflicting or ambiguous requirements when developing the **JITN** application.

3. **Completeness of requirements**

   The requirements will complete if all possible states, state changes, inputs, products and constraints are stated and followed.

4. **Level of realistic**

   Make sure the requirements in developing **JITN** are plausible. The development of the application has to be realistic.

5. **Description of each requirements, are met.**

   No additional or unnecessary functions should be added. This will only confuse the developer and later the user. Each requirement should describe the need of '**JITN**'.

6. **Verifiability of the requirements**

   All the requirements stated should be able to be demonstrated by the application.

4.3.2 Functional requirements

A functional requirement describes an interaction between the system and its environment. It also describes how the system should react to particular situations.

Basically in **JITN** application, functional requirement is divided into a few sections, which are stated below.

1. **Display/Menu for JITN**

   The application has to be equipped with a proper menu of contents. The user must be able to comprehend fully on what is offered (the scope) of the application. Needless to say, the interface must be attractive, clear and concise in order to capture the user's attention.

2. **Sequenced application**

   JITN application falls in between tree and window structuring. The initial selection screen is very important. It sets the expectations and understanding of the user. It gives an indication of the scope of the content and techniques needed to navigate through it. This does not restrict the users by any means; they could browse from page to page, choose whatever sections, going through every function.

3. **Accessories**

   JITN allows users to download freeware and shareware, hyperlink to some useful site and narration of terms or glossary. It also allows users to forward any comments, feedback and give their rating about the **JITN** application. This would enhance the usability of the **JITN** application.

4. **About JITN**

This acts as a prologue to the application. It details the basic idea and potential of the application, certain details about the steps taken to develop this application and a bit on the developer as well.

4.3.3 Non-functional requirements

A nonfunctional requirement or constraint describes a restriction on the application that limits our choices for constructing a solution to the problem. These constraints usually narrow our selection of language, platform, or implementation techniques or tools: however, the selection is made at the design stage, after the requirements have been specified.

Below are the nonfunctional requirements that are needed for **JITN** application.

1. **User friendly**

   Users are able to browse the pages/screen without any problem. It is to make more that users are comfortable and do not encounter difficulties while using the application ease of use. **JITN** implements the user-centered design concept: visibility and affordance. The correct parts will be visible and conveyed correct message. Affordances can provide strong clues to the operations of things. Controls will be visible, with good mapping with their effects, and their design will suggest their functionality. This is to give direction to the user on how to use the application.

2. **Attractive Interface**

As the application is designed for all level users, the interface of **JITN** application should be very simple, yet sophisticated to create a level of maturity. At the same time, the graphics will be animated and colored in colorful order to attract and maintain the users interest and attention. Fonts and background color that would be used will be dark colors, mysterious background, futuristic looking graphics and animation.

3. **Easy to Navigate**

   As mentioned earlier, this application is designed for all level user, so the navigation buttons and icons are either graphics, symbols or fonts which is a self-explanatory of each function of the icon to increase understanding and confidence.

4. **Interactive**

   Teaching and learning is a two way process. Therefore it is very important to make sure that **JITN** application is interactive. The **JITN** application aims to trigger the user's interpretation of the message embedded in the content, therefore the techniques used in this application is easy and not does have double meaning.

5. **Learn ability**

   Learn ability refers to the ease with which new or occasional users may accomplish certain tasks in using the application. Users are able to understand the most basic comments and navigation options and to use them to locate wanted information. In addition to easily understanding functionality of the application, it will be easy to remember. The casual users should have no problems in remembering how to use and navigate in the system after periods of non-use. Memo ability will give users the

ability to transfer their knowledge of use and navigation of one information base to the use of another information base in the application.

6. **Performance effectiveness**

   The application will be designed to achieve a high level of productivity. Effectiveness of the application will be measured in terms of speed and error, whereby it refers to levels of user performance. After learning and exploring the **JITN** application the users will have a basic understanding of network and Internet and hopefully it could foster a deeper interest in the technology world.

7. **User satisfaction**

   JITN is designed to be enjoyable to use an aesthetically pleasing to users. User satisfaction will be within acceptable levels of user cost in terms of tiredness, discomfort, frustration and individual effort so that satisfaction cause continued and enhanced usage of the **JITN** application. Motivational elements including typographical cueing, color, graphical images, animation and sound in the package will motivate the user and increase satisfaction.

4.4 THE PROPOSED MULTIMEDIA TOOLS USED FOR DEVELOPING JITN.

Analysis into a wide range of programming and development tools technology which will guide to choose the most suitable combination technologies to implement the proposed system. The factor such as the user-friendliness, ease of use and learning curve of development tools for programming technology considered to come up with the compatible

technology for this system development. A conscientious analysis, which has been carried out in Chapter 2, provides an insight look at all the strength and weakness of the technologies. The development tools which are considered for the development of **JITN**.

4.4.1 Hardware Requirement

For the development of the **JITN** application, I will be using my personnel computer and devices.

1. **Computer**
   - Windows 2000 / XP Professional – Operating System.
   - Pentium IV /III – Microprocessor
   - 256 MB of RAM – Disk Drive
   - 20 GB of Hard disk
   - Color Monitor
   - Keyboard & Mouse
   - CD ROM Drive
2. **Other standard computer peripherals**
   - CD Writer
   - Speakers
   - Scanner
   - Microphone

4.4.2 Software Requirement

The development tools, which are considered for the development of **JITN** are Director MX, Flash MX, 3D Max Studio and Adobe Photoshop 7.

- **Why use Macromedia Director MX?**

1. Director has a full comprehensive features incorporated in it. It has some of the features from other Multimedia tools such as Asymetrix Toolbooks, Macromedia Authorware, Apple Media Toolkit, Supercard.
2. Excellent animation possibilities – allowing the developer to specify which layer a graphic is in relative to others and removing the drudgery of setting up animations in other packages.
3. Cross-platform compatibility – allowing playback on Mac or PC given certain limitations. It is now being written for Silicon Graphics workstations too.
4. Object orientation allows greater levels of control than on icon-based procedural package such as Authorware.
5. Ability to set up a multi-window program, fully utilizing the potential of windows and allowing message to be sent between window.
6. Director can be extended using Xobjects, code segements written in C++ or another lower level language to address Windows (or the Mac OS) directly
7. Royalty free distribution.
8. Cost-effective. Much cheaper than Authorwave if want to sell the package. Other useful packages: a sound editor, Photoshop and Adobe Premiere.

computation of the graphic definition of the text, resulting in a smooth and mathematically perfect final product. An object has been manipulated as a package, where the terms, which define the contents of that package remain unchanged and directly effect the manner in which the objects manipulation is mathematically calculated.

Rasterized image data, on the other hand, is nothing but a two dimensional, single-layered bitmap, where, say, curves are considered an arbitrary assembly of dots as opposed to a graphic object defined by a formula depicting the relationship of those dots to one another. In the case of the text example, manipulation will most likely yield imperfect results, as there exists no rule by which text perfection is preserved. Bending, rotating even resizing text is considered by Photoshop as a manipulation of an assembly of pixels.

In conclusion, there is no such thing as an object in Photoshop other than a temporary selection; once a selection is deselected it takes the place of those pixels it covers and merges with the flatness of the composite image. This is important to realize, as Photoshop lacks the versatility afforded to object-oriented programs to rearrange graphic elements at any time.

- **Why use 3D Max?**

Increased Flexibility (during the animation process) which is non-destructive to animation tracks, allows tweaking of mesh and animation within the same scene to build better results per shot. It also has great improvement in management of keyframe data - allows for repurposing of animation data and gives studios flexibility for creating and using larger animation libraries.

Easier To Animate Limbs & Extensions (tails, etc). Focus on the nuance of animation, rather than fighting chains of small bones. By using Spline tangency to define animation interpolation; giving new controls to animators to find the exact result they need for the task at hand. It has improved workflow for dealing with Vertex Weight Assignments and Efficiently Manage Keyframes Of Complex Scenes. A simple, easy to read graph of animation data makes keyframe management easier for the artist. Greater Control Of Dynamics Solutions, build dynamics solutions quickly with interactive testing of Hard Body, Soft Body, Rope/Chain, Cloth, and Fluid Surface Solvers.

Superior Animation Control, define an object's animation style exactly, by applying and weighting multiple controllers to get the desired effect.

Recreate realistic lights, as simple as dragging lighting information from the web, giving Set Designers, Visualization Experts, Game Developers, and CG Artists a faster pathway to building the most realistic 3D scenes. Higher Quality Renderings, Flexibility and Easily build realistic environments through Global Illumination algorithms that mimic how light works in the real world.

Create Highly Stylized Imagery, Faster. The Toon Shader is a perfect starting point for rendering cartoon-shaded or surrealistic imagery, with specific controls for ink width & consistency, and paint style.

4.5 SUMMARY

This chapter 4 concludes by presenting the functional requirements and non-functional requirements of the animated model to be designed. Detail of the system design will be discussed in the following chapter.

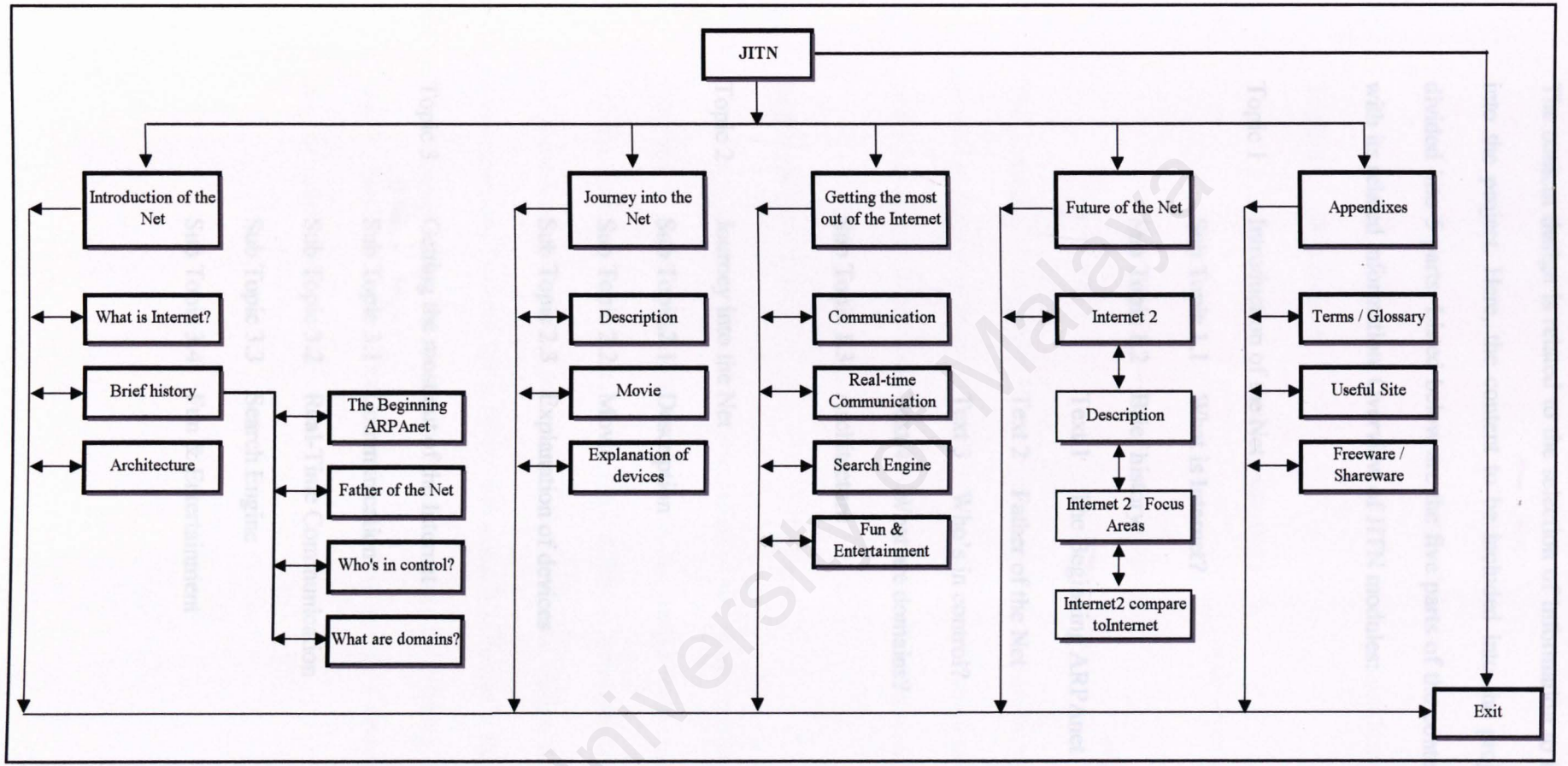
CHAPTER 5 ~ SYSTEM DESIGN

5.0 INTRODUCTION

The design phase builds on the knowledge obtained from the analysis phase and it uses the requirement to design an application or a system. Design focuses both on the logical and physical or technical aspects of the application. The design will include flowchart, interactive navigation sequences and the user interface of the application. At the same time, to make an application more interesting and attractive, its content graphics, pictures, suitable page layout, fonts, color and other elements make the application more interesting and attractive.

5.1 SYSTEM DESIGN FOR JITN

In the development of this project, the system design has been divided into two phases, the content design and the screen design. **JITN** application is designed based on the structured design technique. Structured design is a process oriented technique for breaking up a large system into a hierarchy of structure chart of modules that result in a structure chart that simplified the understanding of the whole system. Structure chart is like a tree like diagram. The modules in the structure chart are depicted by named rectangles. Modules are factored from top down into sub modules. Figure 5.1 shows the structure chart flow of the main menu for the project after integration. Users should be able to link all the different sections in the module easily during the viewing process.



5.2 CONTENT DESIGN

The content design is related to the selection of information to be included into the project. Here, the content to be included into the project can be divided into 5 parts. Listed below are the five parts of the content together with its related information. Overview of JITN modules:

Topic 1 Introduction of the Net

- Sub Topic 1.1 What is Internet?
- Sub Topic 1.2 Brief history
  - Text 1 The Beginning ARPAnet
  - Text 2 Father of the Net
  - Text 3 Who's in control?
  - Text 4 What are domains?
- Sub Topic 1.3 Architecture

Topic 2 Journey into the Net

- Sub Topic.2.1 Description
- Sub Topic 2.2 Movie
- Sub Topic 2.3 Explanation of devices

Topic 3 Getting the most out of the Internet

- Sub Topic 3.1 Communication
- Sub Topic 3.2 Real-Time Communication
- Sub Topic 3.3 Search Engine
- Sub Topic 3.4 Fun & Entertainment

Topic 4 Future of the Net

Sub Topic 4.1 Internet2

Text 1 Description

Text 2 Internet2 Focus Areas

Text 3 Internet2 Compare to Internet

Topic 5 Appendixes

Sub Topic 5.1 Terms / Glossary

Sub Topic 5.2 Useful Site

Sub Topic 5.3 Freeware / Shareware

The division of the contents has to be made in order to ease the management as well as the development process. It makes the development process much easier in terms of maintainability, reusability, testability and speed.

5.3 SCREEN DESIGN

The design phase emphasizes on the design of the screen layout or the user interface. In order to obtain the best results, the design must consider many criteria since different users many have different perceptions as well as different level of viewing satisfaction. User Interface design describes the communication between the software and users. The design is focuses on the effectiveness of the screen layout to attract users by creating a complete, easy to handle and user friendliness layout. The interface design should be easy to understand and easy to use.

Below is the layout of the interface design for JITN. It is not a permanent design and can be subjected to changes. Figure 5.3(i) shows the design content layout of the main menu where users can select which section of information they want. Figure 5.3(ii) shows the screen layout of the submenu where users can select which sub topic they want to view. Figure 5.3(iii) shows the screen layout of the sub-content where users can select which texts they want to view. Figure 5.3(iv) shows the screen layout of the content where users can view the information provided.

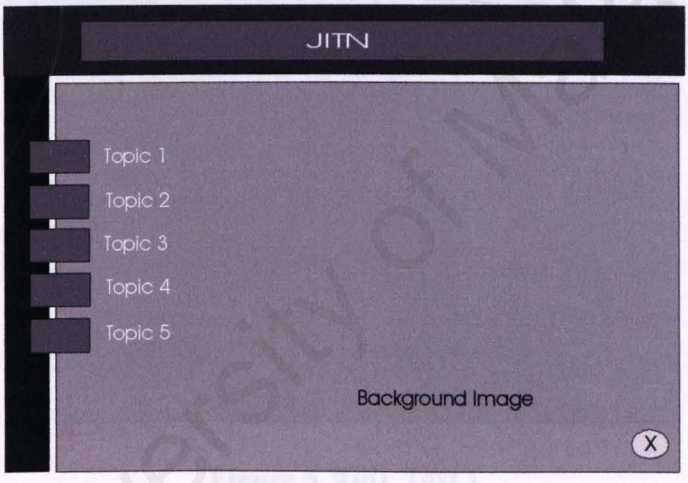


Figure 5.3(i): Main Menu

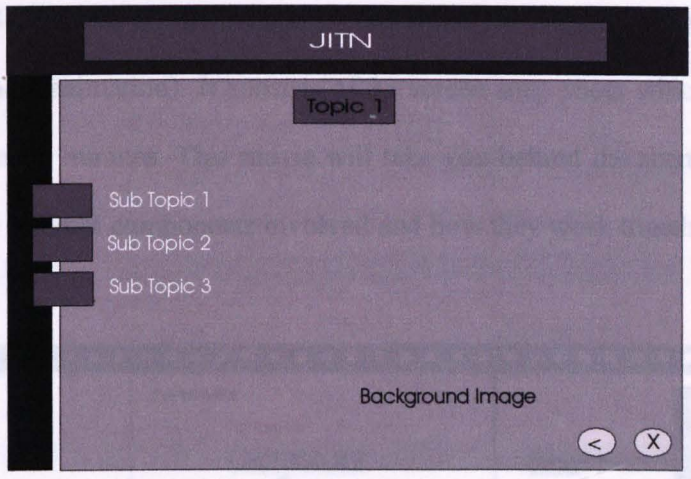


Figure 5.3(ii): Sub Topic

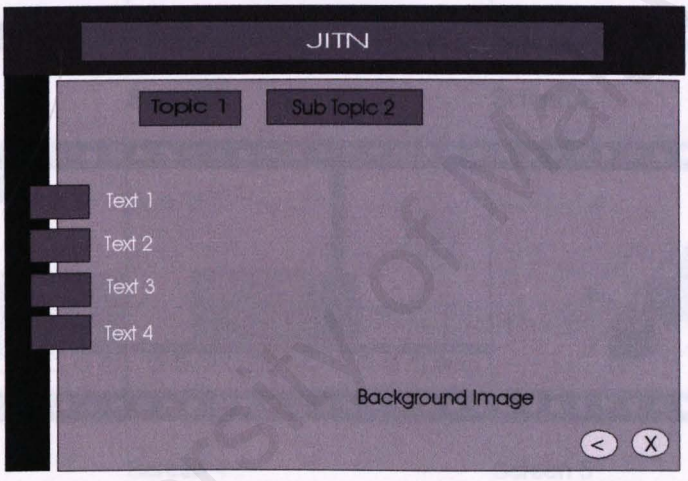


Figure 5.3(iii): Text 1

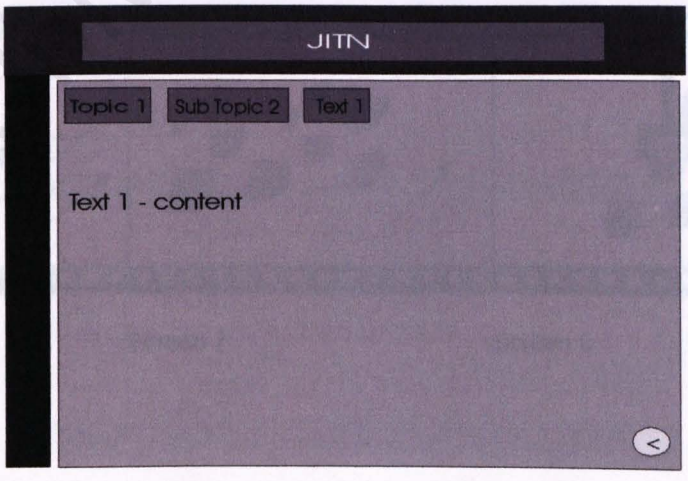
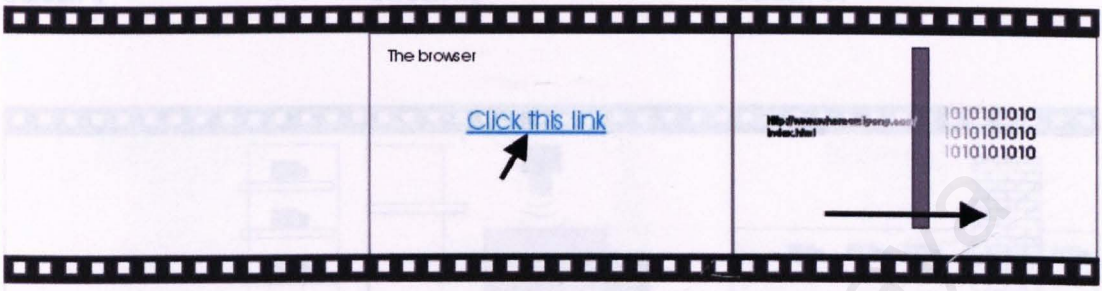
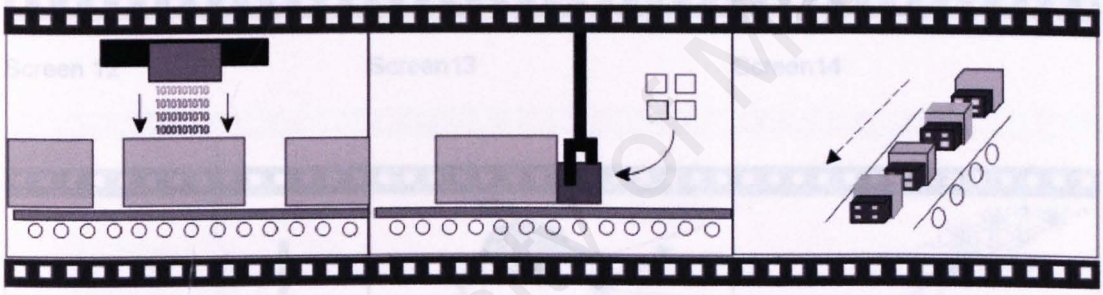


Figure 5.3(iv): Text 1 - Content

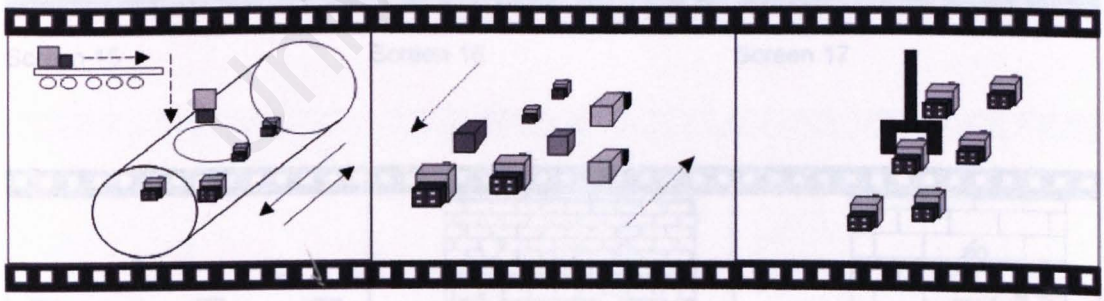
Figure 5.3(v) below shows the screen design for the Topic 2, Sub Topic 2 - **movie** (short animation). It consists of 33 screen snap shots which will run for at least 12 minutes. This movie will take you behind the scene where it shows the Internet components involved and how they work together.



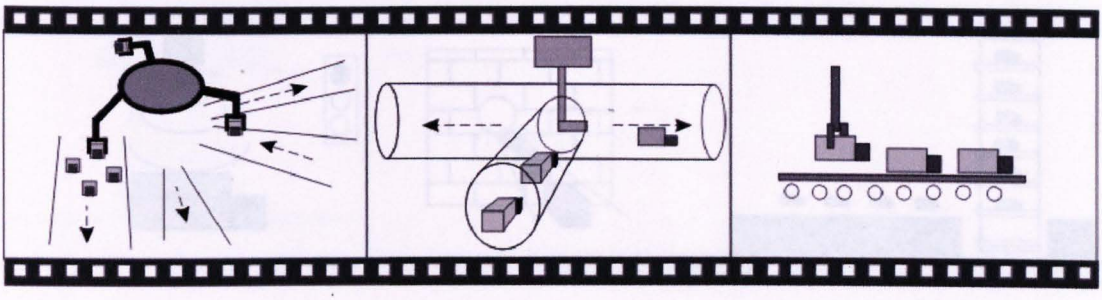
Screen 1 Screen 2



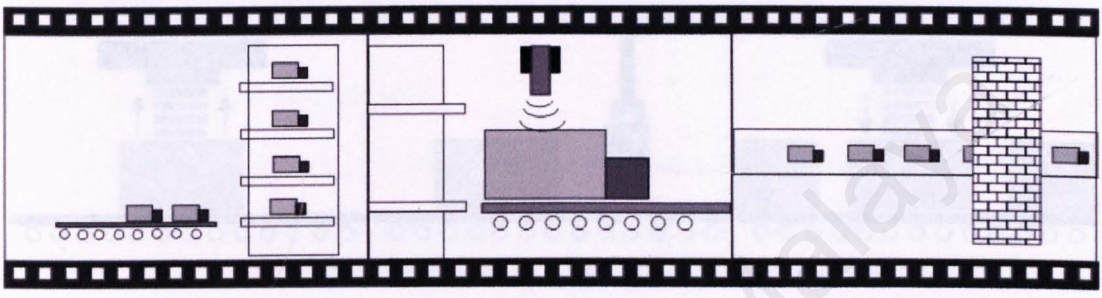
Screen 3 Screen 4 Screen 5



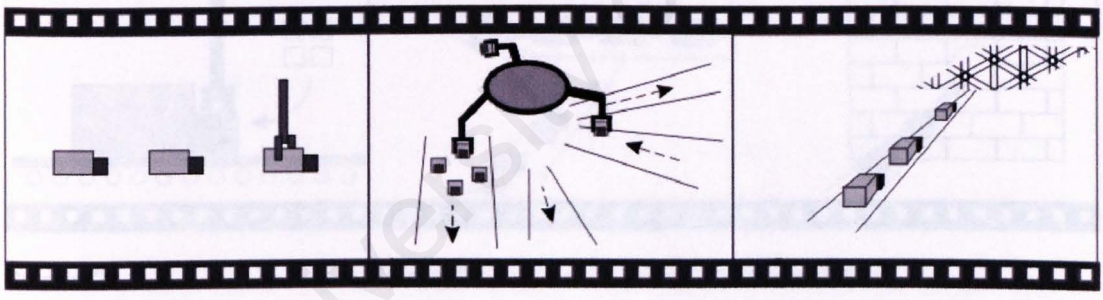
Screen 6 Screen 7 Screen 8



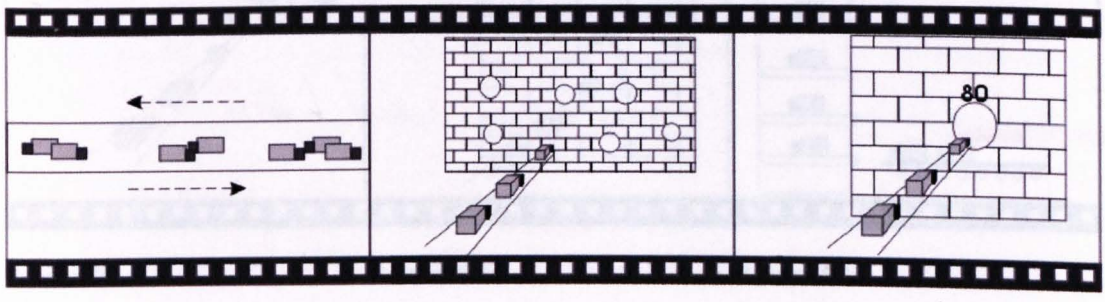
Screen 9 Screen 10 Screen 11



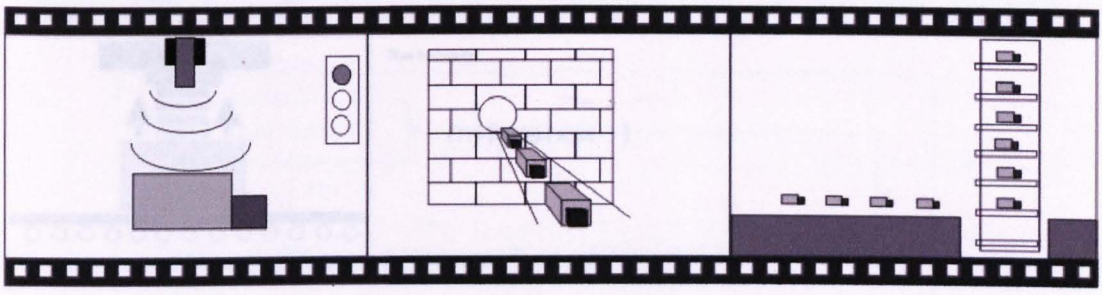
Screen 12 Screen13 Screen14



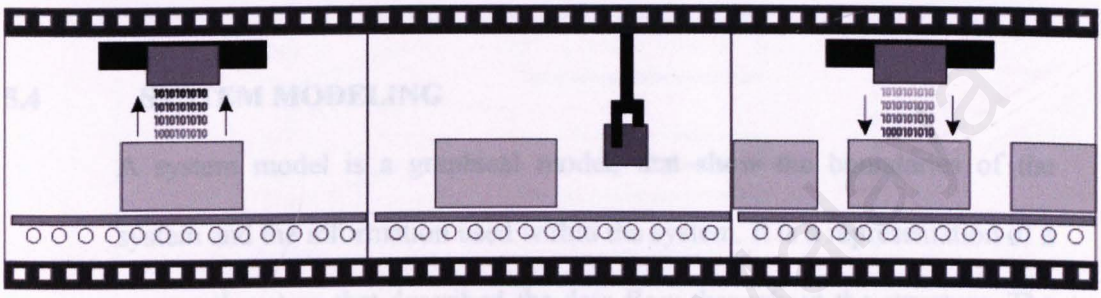
Screen 15 Screen 16 Screen 17



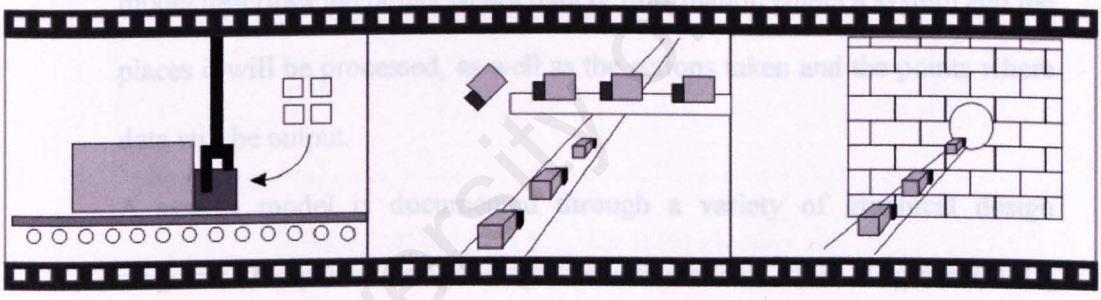
Screen 18 Screen 19 Screen 20



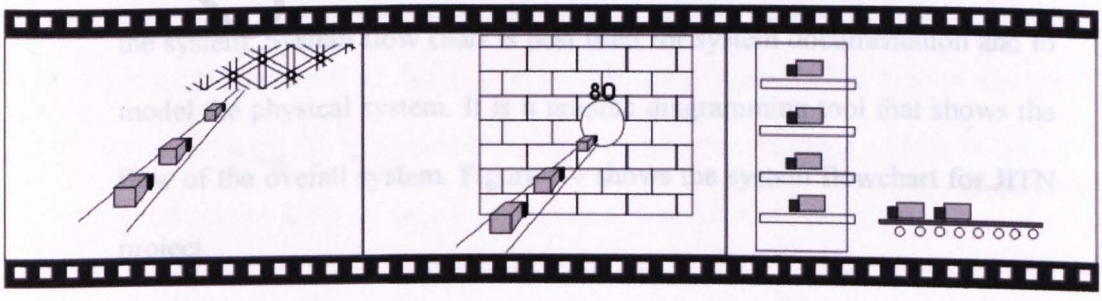
Screen 21 Screen 22 Screen 23



Screen 24 Screen 25 Screen 26



Screen 27 Screen 28 Screen 29



Screen 30 Screen 31 Screen 32

Screen 32 Screen 33

Figure 5.3(v): Shows a 33 Screen shot of **JITN**

5.4 SYSTEM MODELING

A system model is a graphical model, that show the boundaries of the system and the information used within the system. It is a representation of a proposed system that described the data flow throughout the structure. The model describes the points where data or information enters a system and the places it will be processed, as well as the actions taken and the points where data will be output.

A system model is documented through a variety of graphical design diagrams. Graphical design diagrams include data flow diagram (DFD) system flow charts, entity relationship diagram, structured charts and decision trees. For the JITN project, system flow chart was chosen to model the system. System flow chart is best used for system documentation and to model the physical system. It is a graphic diagramming tool that shows the flow of the overall system. Figure 5.4 shows the system flowchart for JITN project.

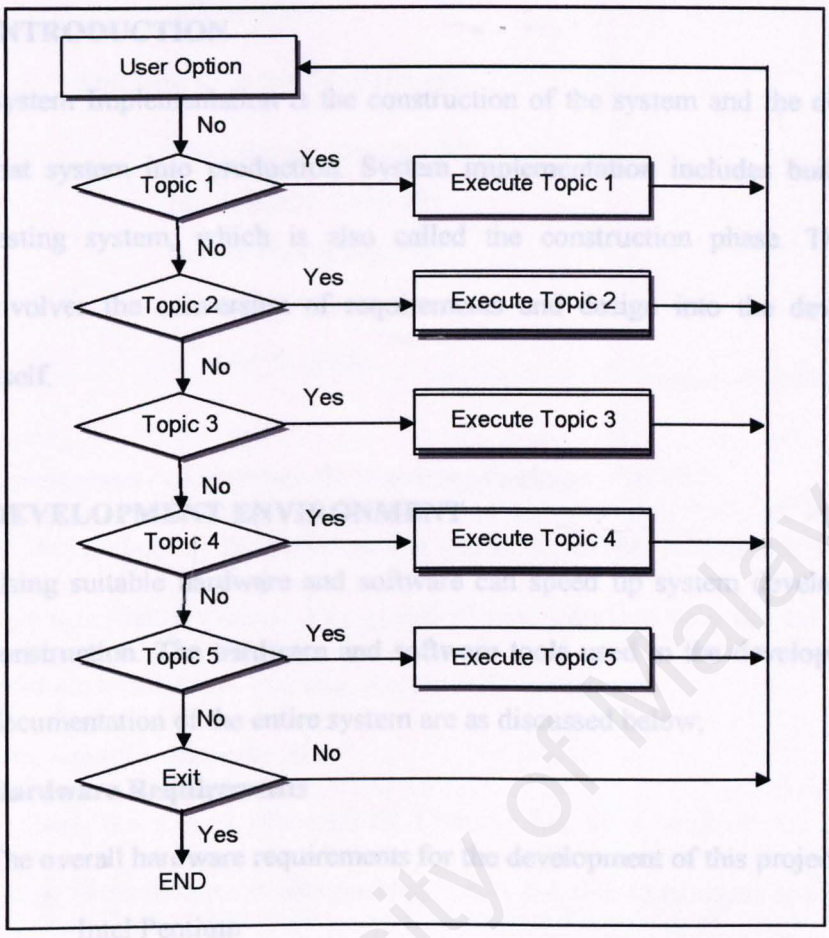


Figure 5.4: Process flow for JITN project

5.5 CONCLUSION

This chapter is mainly about the design of the proposed system. Some specific guidelines to design this system are discussed. The system design provides a guideline to system developers in implementing a system. Thus, a good system design is an important key to a successful system

CHAPTER 6 ~ SYSTEM IMPLEMENTATION

6.0 INTRODUCTION

System Implementation is the construction of the system and the delivery of that system into production. System implementation includes building and testing system, which is also called the construction phase. This phase involves the conversion of requirements and design into the development itself.

6.1 DEVELOPMENT ENVIRONMENT

Using suitable hardware and software can speed up system development or construction. The hardware and software tools used in the development and documentation of the entire system are as discussed below;

6.1.1 Hardware Requirements

The overall hardware requirements for the development of this project are: -

- Intel Pentium
- 256 MB RAM
- Color Monitor
- CD Rom Read and Write Drive
- 4MB SVGA graphics adapter
- 32 bit sound card
- Speaker
- Microphone
- Keyboard
- Mouse
- Other standard desktop PC compliance

6.1.2 Software Tool Requirements

- Software Tool requirements

- Software tool for documentation and analysis Microsoft
- Widows XP

- Software tools for developments
  - Macromedia Director Mx
  - Macromedia Flash Mx
  - Adobe Photoshop 7.0
  - Adobe Premier 6.0
  - 2nd speech center

6.2 Development of Multimedia Learning Package –"JITN"

At initial stage of the development phase, developer is required to create a very user friendly movie like graphical user interface with the aid of all the software listed above this was success fully carried out.

6.2.1 Macromedia Director Mx

Through the use of Macromedia Director Mx as a platform for creating a movie like software for this package, users are able to navigate easily without much hassle with the integration of multimedia elements embedded in it. The rational behind using Macromedia Director Mx as a development platform for this package is due to the fact that during requirement phase, it was clearly stated that this will be an interactive package where elements of multimedia will be used from the beginning. Director enables this by providing a cast/score/scripting paradigm, which make it the tool of choice for animation content. Multimedia events are defined by making menu selections and defining objects or using a score window – a timeline/spread sheet format defining special effects. Rows and columns describe changes in frames and

channels to manipulate objects over time and create repeatable loops for animating multiple objects.

Due to the fact the Director is versatile where by files and movies created for Macintosh can be transferred to PCs equipped with Director and vice versa makes it easier for user to view this package on either platform at any given time. Its lingo scripting language enables sophisticated interactive controls, and its ability to combine "rich" media such as audio video and bitmap graphics gives it greater creative scope. It's also better for interactive applications that can be distributed via CD-ROM. In this package Lingo scripting is used to insert a behavior to a particular sprite (object). One the later fixtures are the enabling voice accessibility. To help visually impaired users experience your Director movies, you can add the ability for your text cast members to be spoken aloud by the computer. You can also specify text to be spoken when sprites are selected. Because the text-to-speech feature in Director assumes that users are visually impaired, the feature is designed to be used with the keyboard navigation feature. Each text-to-speech behavior requires that the Accessibility Target, Accessibility Item or Accessibility Text Edit Item, Accessibility Group Order, and Accessibility Keyboard Controller also be applied to the appropriate sprites.

6.2.2 Macromedia Flash Mx

In the development of this package, Flash Mx is used during the introduction of this package to create a futuristic look and the aim is to grab the user's attention. This was achieved through the frame by frame vector animations. The background logo "JITN" on each page is constantly moving giving a lively feeling when browsing to the pages. All the buttons in the package is

developer using Flash and this adds more interactivity when the user is navigating through the package used to create the text to speech and its also used to hyperlink text with pictures.

6.2.3 Adobe Photoshop 6.0

Both of this software was used for graphic editing purposes. All the icons used in this package were custom mode and designed specifically for the use of this package. Background images and other interfaces was created and enhanced with the help of these software to give a lasting impact but at the same time be easy on the eye of the users. All the background images used in this package are to promote a professional outlook and therefore the images were carefully chosen to create the impact that the developer intended.

6.2.4 2nd Speech Center

2nd Speech Center lets you listen to text instead of reading on screen. It uses 'Text to Speech' technology to synthesize natural sounding speech from ordinary text. Just copy text to the clipboard or import from text files and listen as 2nd Speech Center reads it back to you. It also allows you to convert text into a MP3/WAV audio file so you can listen later. Create MP3 files from your email, news articles, any text you want, download to your portable MP3 player and off you go.

6.2.5 Adobe Premier 6.0

This software was used solely for video purposes namely editing and writing video's that's been used in this package.

6.3 Graphical User Interfaces

The package is required to have very user-friendly interfaces in order for users to browse easily. This package uses the GUI application approach for better visual effects to the end users. The usage of meaningful captions and icons will help users to use this package confidently with a minimum duration. The icons used in this software were custom made according to the semantic of each intended function so that user will be able to recognize and remember it easily.

Here, users can choose any button to navigate through the entire learning package. User is able to navigate through the topic using the mouse click button on the left side of the menu as shown below. All the same time the user can navigate through the flow button for back page, homepage and exit program. Below are the icons used in this software and its meaning.

No.	Icons	Meaning
1.		Go back
2.		Exit program
3.		Home
4.		Navigation
5.		Start

Table 6.1- Icons and Meaning

6.4 The Flow of "JITN"

Shown below are the basic navigation buttons that has been implemented.

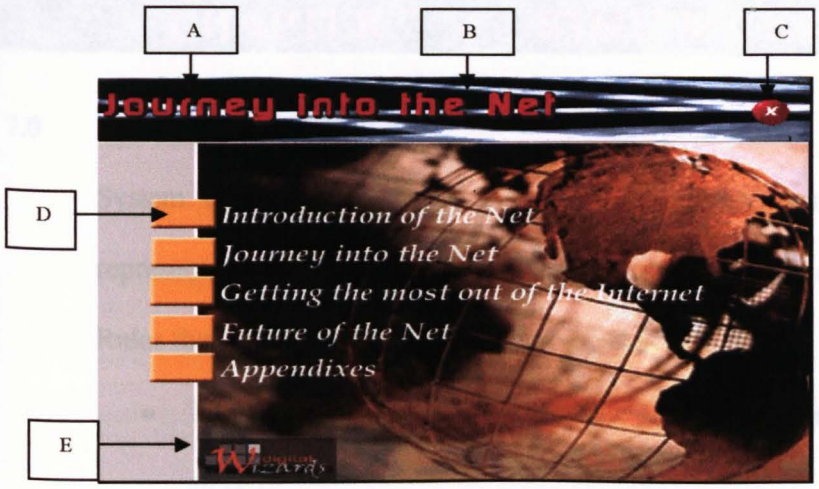


Figure 6.1: "JITN" main menu

A	The Title Journey Into The Net will be displayed in all the interface pages
B	An animated background frame has been placed in all the interface pages.
C	The exit button is placed at the main screen only and the purposes to exit out of the program.
D	This navigation buttons are to go to the sub topics by clicking on the buttons.
E	The logo Digital Wizard displayed in all the interface pages but only at the main screen, it is link to the introduction of JITN and it will play from the start again.

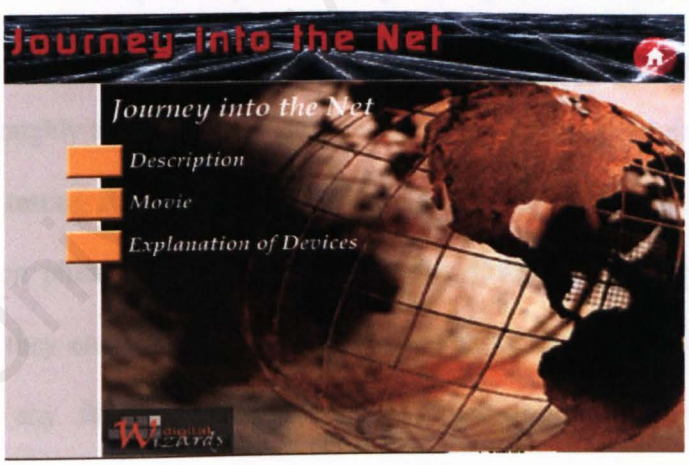


Figure 6.2 shows to the movie

The above figure 6.2 shows the user interface after the user click on the Journey into the Net button. The movie button here is link to flash file and it will play a short animated movie call Journey Into the Net. Above the screen the user can click Home buttons to go back the main menu.

CHAPTER 7 ~ SYSTEM TESTING

7.0 INTRODUCTION

System testing is a critical elements of software quality assurance and represents the ultimate review of specification, design and lingo scripting. Rules that can serve well as testing objectives are;

- Testing is a process of executing a program with the intent of finding an error.
- A good test case is one that has high probability of finding an undiscovered error.
- A successful test is one the uncovers a yet undiscovered error.

A software module is exposed to testing both during the development phase testing and the integration phase testing. During the development phase, each function or procedure that is part of the module is independently developed and thoroughly tested until the entire module is complete.The major difference between testing a module during its development phase testing and during the integration phase testing is that during the developement phase, errors are fixed as they are found. While during the testing in the integration phase, if there is any failure are recorded, the failed module is returned to the development team along with an explanation of failure.

7.1 STAGES OF TESTING

This multimedia learning package has undergone 3 stages of testing before it was considered as a complete system. They are unit testing, integration testing and system testing.

7.1.1 Unit Testing

Historically quality software relied on testing each functions module. This practice called unit testing which effective is extremely time consuming and labor intensive. Using the detail design description as guidance control parts are tested to uncover errors within the boundary of the module. This relative complexity of tests and errors detected as a result limited by the constrained scope established for unit testing. Unit testing is also referred to as module testing and is usually performed by the software developer. For this package, unit testing was done during the implementation phase, in Macromedia Director Mx itself. After the functionality of each module was developed reviewed and verified, test cases were designed. The module was tested to ensure that it operates correctly. Each module were tested individually.

1. **Navigation**

   This module were tested to ensure that each page was linked accurately. The mouse click button on the left of the page were also tested to ensure it linked to the correct sub-module. The back page, homepage and exit button were tested to ensure the page skip to home, go back and exit out.

2. **Module**

   - The module was tested to ensure the audio response for each page is accurate and activated.

- In this module the use of page were tested to ensure that the correct movie and page is played and the narration accompanying it were simultaneous.
- This module was tested to ensure that it's fully functional. The movie are tested repeatedly is fined out the possible errors and flow. Functions are included to overcome these weaknesses.
- The animation on the modules was also tested to ensure it is fully functional.

7.1.2 Integration Testing

Testing a specific feature together with the other newly developed features is known as integration testing. Testing the interface of components explores how components interact with each other.

Previously captured unit test scripts can be combined to create a variety of integration test cases, with minimum effort. For instance, units test scripts tested on each function can be schedule with previous function to create an integration test on the entire system.

Incremental integration approach was applied during the development of this package. The Multimedia Learning Package "JITN" was constructed and test is small arguments in lingo scripting, where errors were easier to isolate and corrected. Errors will be corrected before proceeding to the next integration.

7.1.3 System Testing

System Testing is designed to reveal bug that cannot be attributed to individual component or to the interaction among components and other

objects. System testing studies all the concern issue and behaviors that can only be exposed by testing the performance stress, usability, data integrity and start-up. System testing verifies that the overall system performance of this package is functioning properly and ensures all objectives are achieved. There are several steps to test a system;

- **Function Testing**

System Testing begins with function testing. The first step focuses on functionality. Each function can be associated with these system components that accomplish it. For some function, the part may comprise the entire system. Logically it should be easier to find the cause of a problem in small set of components than in larger set. Effective function tests have a high probability of detecting a fault.

The Multimedia Learning Package –"JITN" users some guidelines for function testing listed below:

- Have a high probability of detecting a fault
- Know the expected action
- Have stopping criteria

- **Performance Testing**

When the system performs the function required by the requirements, it turns to the way in which these function are performed. Thus functional testing addresses the function requirements and performance testing addresses the non-functional requirements. System performance is measured against the performance objectives set by the user as expressed in the non-functional requirements. In the Multimedia Learning Package –"JITN", performance

testing examines how well the system works, the speed and response to the user interactive and accessibility of the text to speech.

- **Stress Test**

This is to determine the program fulfills the requirements defined for it. It is equally important to ensure that the program works, as it should under extreme conditions. In order to perform stress testing, execute the system in a manner that demands resources in abnormal quantity, frequency or value.

7.2 ACCEPTANCE TESTING

When the function and performance testing are completed, the system is convinced and meets all requirements specified during the initial stages of the software development. The next step is to ask the user, the user leads testing and define the cases to be tested. The purpose of acceptance testing and defines the cases to be tested. The purpose of acceptance testing is to enable the user to determine if the system built really matches the needs and expectation. Thus acceptance test are written, conducted and evaluated by the users, with assistance form the developer only when the user requires an answer to a technical question.

7.3 MAINTENANCE

As the Multimedia Learning Package "JITN" has not been used by any user this there are no steps taken to pursue this cause. If they were to be, then maintenance of this package will involve the updating of each module to ensue the information is abreast with the revolving technology.

7.4 CONCLUSION

All the necessary details of implementation and testing strategies for this package have been included here for better understanding of the analysis done so that all the requirements are met and caters o the users needs.

CHAPTER 8 ~ SYSTEM EVALUTION

8.0 INTRODUCTION

System evaluation is done to identify its strengths, weaknesses, limitations and possibilities for future development. **JITN** has thus far, achieved its main objectives and fulfilled all the criteria in the proposal. It covers the targeted topics conducted in the survey and will gratify its end users. The concept of learning via computer is not new and there are many other on-line systems on the net, but they cover to many topics; all jumbled up and a sole system is need to teach all range and we say that our system does justice in doing just that.

8.1 PROJECT PROBLEMS AND SOLUCTIONS

Throughout the development of the Multimedia Learning Package "**JITN**" several problem were encountered. **JITN** is a multimedia project, which acquires the use of all multimedia elements such as images, graphics, audio, animation and text integrated in it. Below is the list of problems along with the approaches and solutions was taken.

8.1.1 Problems and solutions encountered during project studies and analysis

a) Choosing software to develop the system.

The major problem faced during project studies and analysis is choosing the suitable software for developing this project.

b) Choosing the icons and animations actions

By choosing the rights buttons, images, animation, pictures and others to make learning "**JITN**" package interesting for the user. To insert the pictures and animations actions into each page in Flash Mx took us a long time.

c) Lack of time in research

At the beginning time an effort were put into the research by conducting survey discussion with friends and lecturers. Research was also conducted via the Internet and comparing existing systems but the time constraint was immense for we had to distribute our time to concentrate on another courses. Especially there was a 12 week course paper, **Object Oriented Programming,** which the exam was due on the 12/02/04. However the lack at time was somehow relived after the exam and this bought us time to enhance our system to our satisfactory level.

d) Wide area of studies

In order to successfully develop and implement **JITN**, researches have to be done. Furthermore, various technologies and tools had to be explored in order to choose the right tools. The Internet was a great help in helping to obtain necessary information. Research papers published by academic institution and other organizations were studied. Other similar systems were also studied. Besides, knowledge was also obtained from reading of printed materials.

8.1.2 Problems and solutions encountered during system implementation and testing

As there is no prior knowledge in software Flash Mx and Director MX lingo script-based environment, a lot of studies need to be done to familiarize with

the concept of software. Lingo script programming languages and various software development tools seed to be learnt within a short time span. Choosing the lingo script as the programming language was a wise decision due to its short learning curve. Discussion with course-mates, seeking advice from the Internet and self studies also helped resolved the problems faced.

a) Unfamiliar programming languages.

It was difficult to learn few programming languages such as Director Lingo Script and software such as Flash Mx in this short period. Most of the reference book provided guidance in using help sessions and internet. However, the help session is difficult to understand and not that details in its functionality and therefore was not considered a viable option. Help was sought from friends in using alternatives methods to solve the problems.

b) Choosing the rights links

When testing is done on another computer some of the features or links cannot be presented properly. Therefore step such as testing it on other computers a couple of times were carried out.

8.2 SYSTEM STRENGTH

The Multimedia Learning Package "JITN" has several features of quality listed below.

- Attractive and interactive user interface which are is overwhelming too. For all beginners, who wants to know about internet and what is all about will understand after using this learning package.

- Easy to follow the links and navigation because of meaningful and recognizable icons and buttons. The users will find it easy to use because the icons and buttons will help them to go the other pages to know about the particular topics and with the back & home buttons will make is easier to go back to main menu.
- Audio narration and accompanying movie to increase understanding of the particular component By using the sound system the user will understand about the movie play which each screen will be explain what is happening in the screen. Because user will understand about what that the routers can do switch & other who will play the main movie. Sound & music is added to make the learning package for life full and interesting for the user.
- User friendliness of the system which is developed based on GUI. The user interfaces are predictable in order for the user to get use to the entries system in a short time and this gaining can confidence in the system.
- Better understanding about internet and how does the data packets are sent and retrieve through the browser works thru the movie. The notes about the internet and future internet give a very good understanding about our learning packages.

8.3 SYSTEM LIMITATIONS

The Multimedia Learning Package "**JITN**" as some limitations as follows:-

8.3.1 Difficulty in finding suitable images and extra effects.

There are loads of images and effects on the net, but only a few were suitable for our site. The theme for my site is *mettalic* and *dark* and there aren't many images that suite this criteria. Moreover, if simply paste the images just for the

sake of filling up the space, the whole interface will look stuffy. The apparent lack of images is an interface limitation but does not impoverish the site.

8.3.2 Speed Limitations

As a learning packages system, problems with system speed may arise under conditions of slow. Furthermore, the time to load Flash images and other heavy images take time and these slow up the system.

8.3.3 No printing capability

There is no printing facility provided in the learning package. Printing will be more powerful printing feature should be integrated into the application.

8.4 FUTURE ENHANCEMENT

8.4.1 Increased diversity in contents.

Perhaps in the future, more diverse module, pictures and other links could be added to make the system more attractive.

8.5 GOALS

The goals of the system comprises of its expectations and objectives. Below are listed the pertaining information:

8.5.1 Expectations

As a whole, the general expectations of the proposal have been fulfilled. A proper interface and user-friendliness as well some multimedia elements are also incorporated.

8.5.2 Objectives

In short, the fundamental objectives of the system are met with. **JITN** is a competent system, able to deliver and suits its targeted users. An administration module has been added to maintain for the user to use the learning package.

APPENDIX I

QUESTIONNAIRE
GETTING TO KNOW HOW THE INTERNET WORKS
(An Interactive Multimedia Learning Project)

INTRODUCTION

Introducing myself, Malarvili G K, matrix no.: WQT 000001, a final year student from University Malaya. I am undergoing my degree program in IT Multimedia. The title of my thesis is "**JOURNEY INTO THE NET**".

"**JOURNEY INTO THE NET**" is an interactive multimedia-learning project. It, illustrates to you how information requested through a browser is retrieved from the Internet. We would go behind the scene where it shows components involved and how they work together to make this possible. Basically, below is some questionnaire, which I have prepared to survey how much do you know about the Internet and how it really works.

I would very much appreciate, if you could complete this questionnaire and return back to me for my further analysis. Your cooperation on this matter is very important, as it will help me enhance and accomplish my thesis.

Thanking you in advance.

Date: _____

* PERSONAL DATA

Name

Gender ○ Male ○ Female

Occupation

Company

Contact No. Office Home/Mobile

E-mail

* The information given would be treated as private and confidential.

Remember that this is only a questionnaire and <u>NOT a TEST</u>. Please complete the form basic on your own understanding, and do not attempt for any assistant. It will defect the purposes of this questionnaire.

COMPUTER LITERACY

1. Do you have a computer at home?

   Yes No

2. What platform(s)/ operating system(s) you use and comfortable with? You may select more than one.

   Windows XP Home / Pro

   Windows 2000 Pro

   Windows Me

   Windows 98 / 98 SE

   Windows 95

   Linux

   Others (please specify)

3. Use the space below to tell me what types of software applications you use regularly (e.g. word processing, spreadsheet, database, CAD, graphics, etc.):

4. Do you have a modem?

   Yes No

5. Have you used the Internet before?

   Yes No

6. From where do you access the Internet? Starting from the most frequent accessed location.

   1.
   2.
   3.
   4.

7. Mainly for what purpose do you use the Internet? Starting form the most frequent use.

1.
2.
3.
4.
5.
6.

8. How frequent do you use the Internet in a day.

Less than 1 hour

2 to 3 hours

More than 3 hours

Varies

9. With your own word, how would you describe the Internet?

10. Please name one or more component that you know which is part of the Internet. (E.g. ISP, modem etc.)

1.
2.
3.
4.
5.
6.

11. Please name the type of web browser you currently use and you heard about.

1.
2.
3.

12. Do you know what is an "IP packet"? If yes, please describe.

Yes No

13. Please describe how firewall protects your computer and network.

14. What `port 80' means to you?

15. What is TCP/IP?

16. How well do you understand the term "Multimedia"?

Not sure

Moderate

Quite well

Very well

17. Do you have a CD ROM or DVD drive?

Yes No

18. Does your computer have a sound card so you can listen to multimedia content?

Yes No

19. Do you know the difference between "Interactive multimedia" and "multimedia"?

Yes No

If yes, please explain in your own word.

20. Have you heard of the interactive multimedia learning before?

Yes No

If yes, please specify

21. If your answer for question 20 is "Yes", how do you find the learning package? Please specify:

22. Continue from question 21. In your opinion, will the interactive multimedia-learning package make a difference compare to ordinary books?

Yes No

Give reason(s) why you chose that answer:

23. **What is a computer network?**

24. What are the advantages of using a computer network?

1. 2. 3.

25. Do you know the two basic network configurations?

Yes **No**

If yes, please specify.

1. 2.

APPENDIX II

APPENDIX II

Simplified statistic of the Questionnaire

Note: Please refer to Appendix I for questions corresponding to the statistic given here:

Question	Yes	No
1	64	10
4	54	20
5	69	5

Question 2	XP	2K	ME	9x	Lx	O
	19	22	9	46	4	2

Question 3	WP	SS	DB	CAD	G
	63	28	14	5	19

Question 6	OFF	HSE	CC	HTL	SCH
	47	40	17	1	3

Question 7	Info	Chat	Ent	Mail	Stock
	64	19	25	35	3

Question 8	< 1	2 < 3	> 3	Varies
	26	14	10	20

Question 9	Poor	Moderate	Good
	14	44	5

Question 10	Wrong	Ok	Blank
	16	39	

Question 11	Msn	Yahoo	Explorer	Lyos	Google	Infoseek	Netscape
	10	21	31	1	8	1	24

Question 12	Y/N	Poor	Moderate	Good
Yes	23	3	6	5
No	51			

Question	Poor	Moderate	Good	Blank
13	7	26	4	37
14	6	8	2	58
15	10	13	3	48

Question	Poor	Moderate	Good	Blank
16	11	47	14	2

Question	Yes	No
17	65	9
18	64	10

Question 19	Y/N	Poor	Moderate	Good
Yes	51	2	4	16
No	23			

Question 20	Y/N	Poor	Moderate	Good
Yes	43	4	5	12
No	31			

Question	Poor	Moderate	Good	Blank
21	4	8	8	Balance
22	10	36	8	Balance
23	6	37	11	Balance

Question 24	Y/N	Poor	Moderate	Good
Yes	51	2	4	16
No	23			

Question 25	Y/N	Poor	Moderate	Good
Yes	51	2	4	16
No	23			

APPENDIX III

REFERENCE

1. http://infotrain.unisa.edu.au/students/neoch001/Ass1/assignments/Ass1.htm-
2. http://www.bhphotovideo.com/bnh/controller/home
3. http://www.adobe.com/products/photoshop/main.html
4. http://www.macromedia.com/software/studio/
5. http://www.macromedia.com/software/authorware/
6. http://images.google.com.my/images?q=picture+navigation&ie=UTF-8&oe=UTF-8&hl=en&btnG=Google+Search
7. http://www.macromedia.com

8. Interactive Multimedia Learning Package " Terokailah IT" submitted by Sasikala Rajagopal year 2000/2001
9. CD Based Multimedia package "Introduction to Law Library" submitted by Chan Yuet Lai year 2000/01
10. Smart Home Simulation System submitted by Ahmad Jazzri Bin Jamaludin Wek990290
11. UMTS Care Network Simulator submitted by Too Sea Chen – WET000285

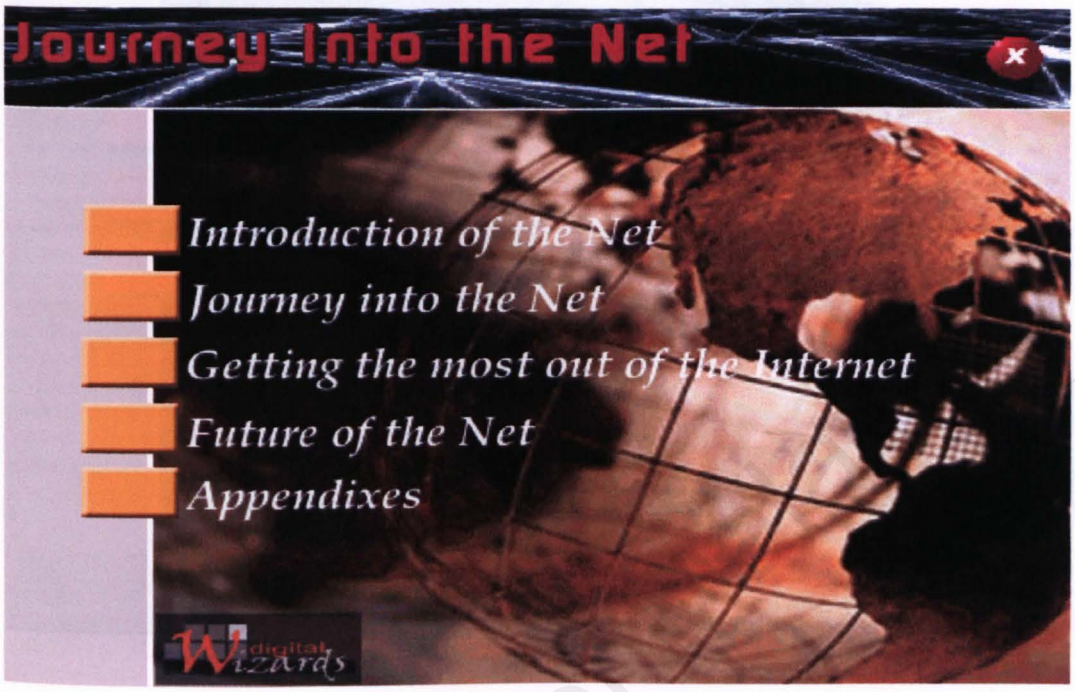
12. Somemerville, I 2001, Software Engineering Six Edition Addison – Wesley

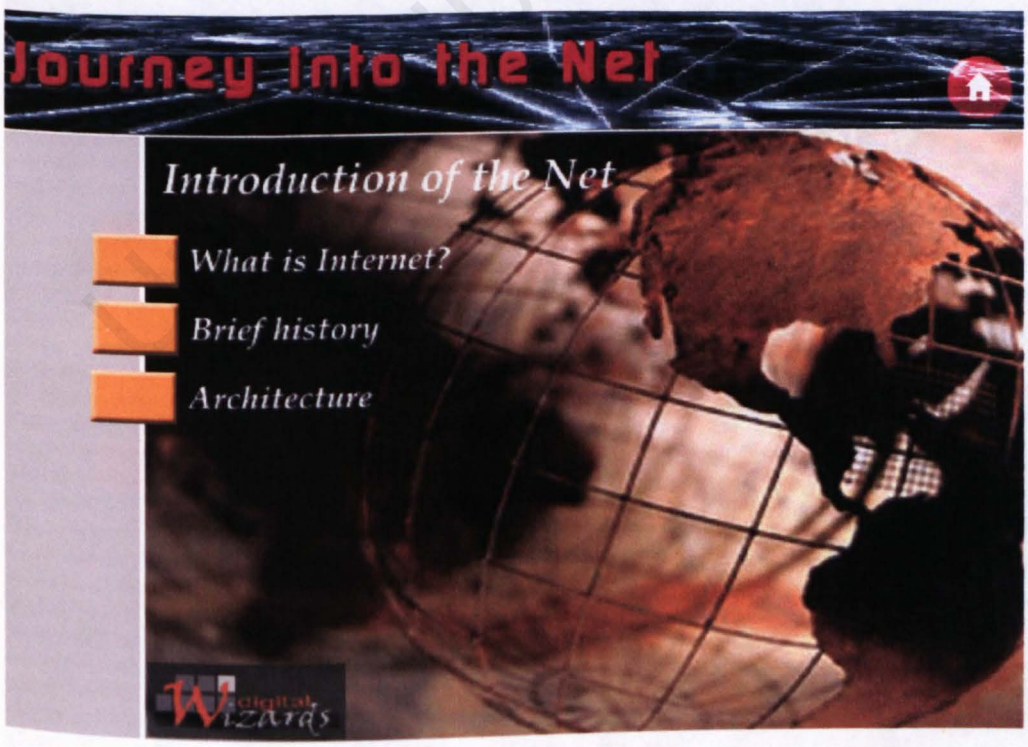
13. Pfleeger, S.L 2001, Software Engineering Theory and Practice Second Edition.Prentice Itall.

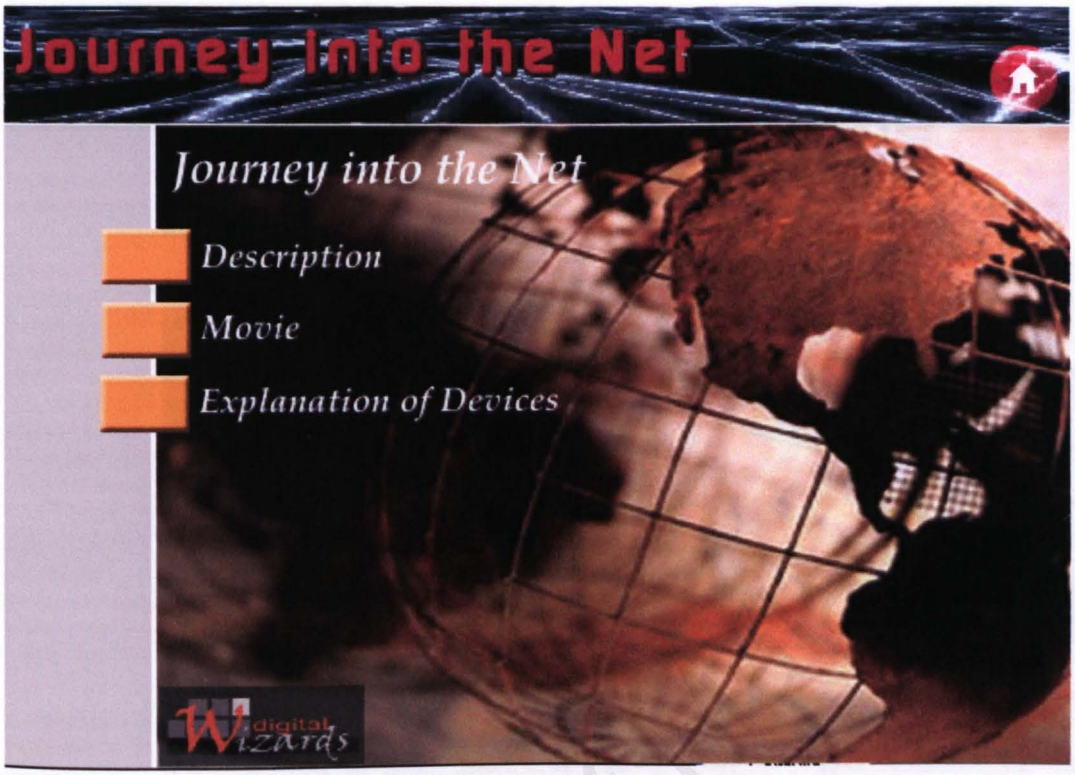
APPENDIX IV

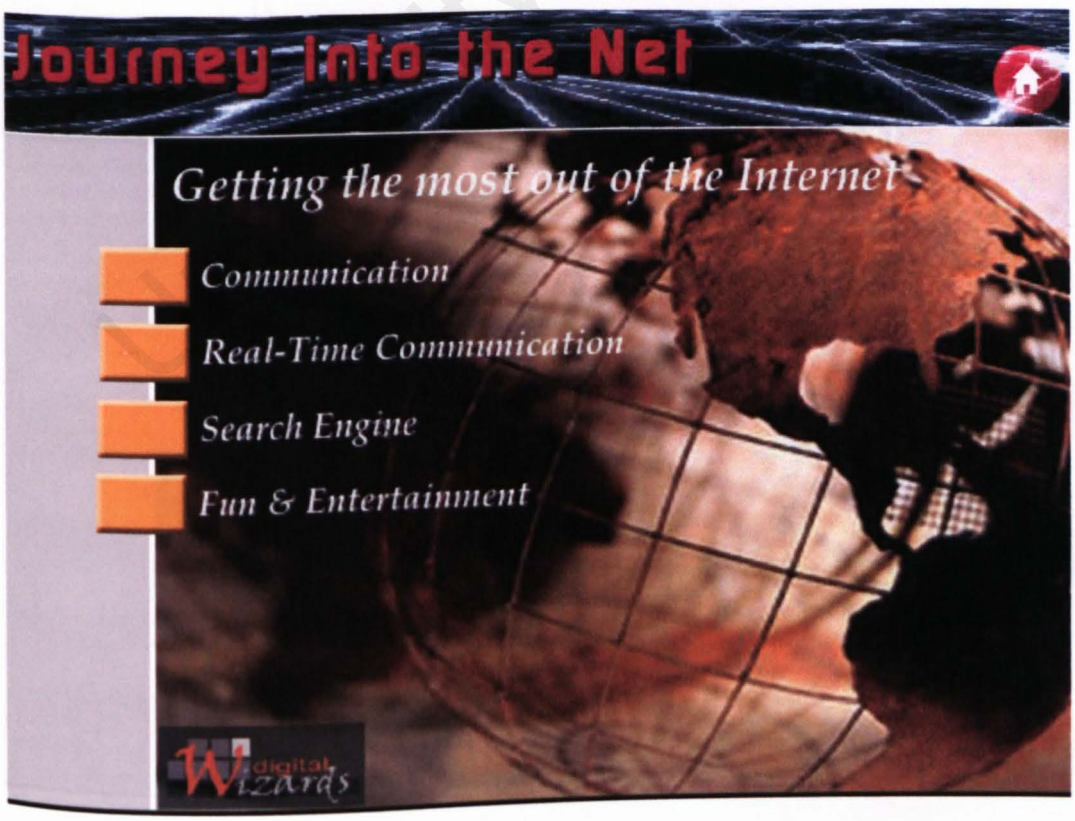
APPENDIX IV

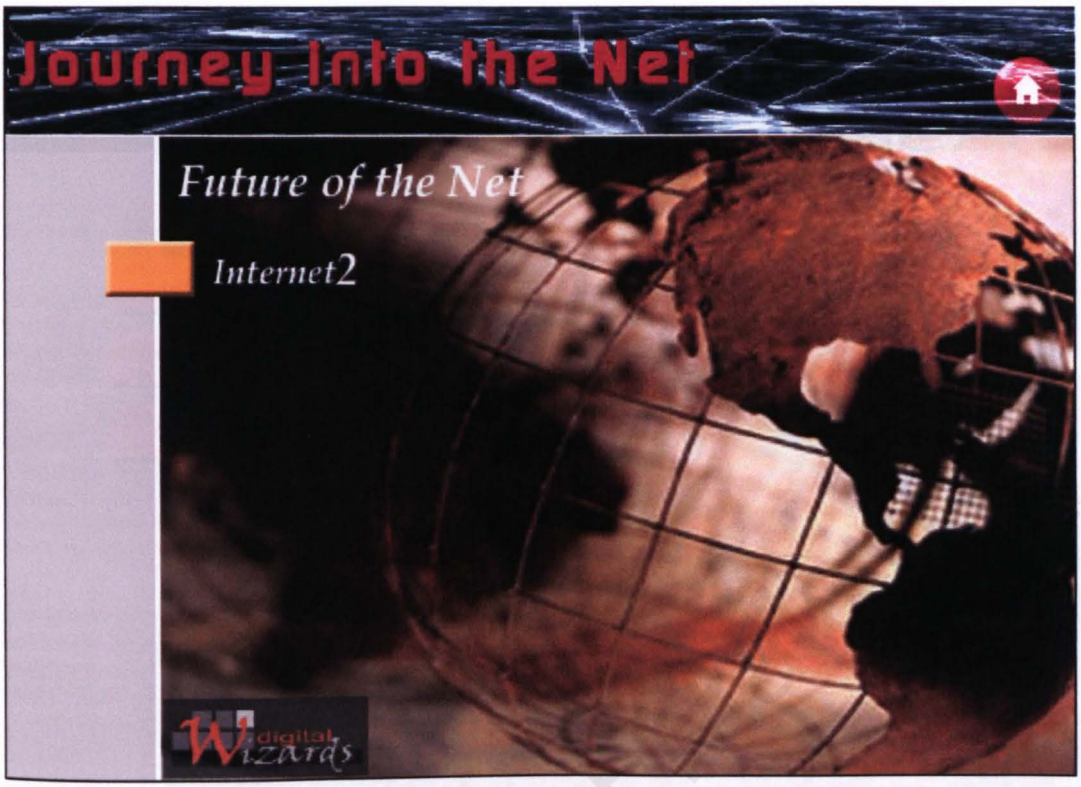
Samples of Journey into the Net user interfaces

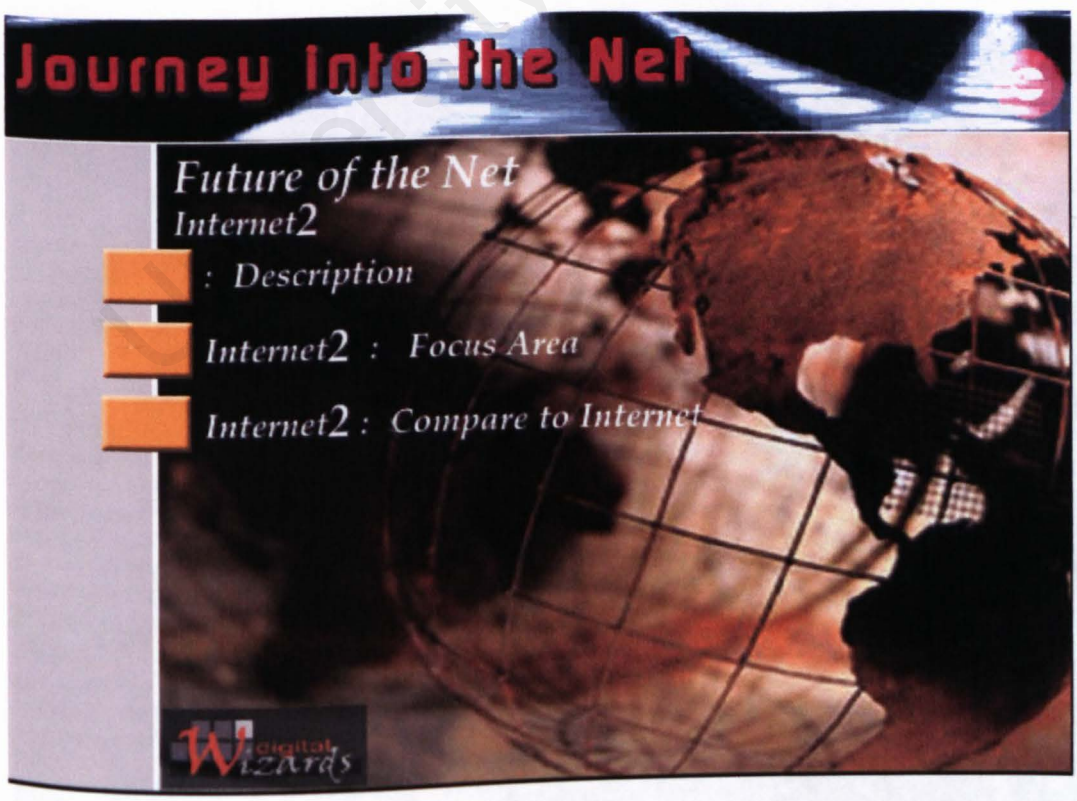





Journey Into the Net
Journey into the Net
Description
Movie
Explanation of Devices
digital Wizards


Journey Into the Net
Getting the most out of the Internet
Communication
Real-Time Communication
Search Engine
Fun & Entertainment
digital Wizards


Journey Into the Net
Future of the Net
Internet2
digital Wizards


Journey Into the Net
Future of the Net
Internet2
: Description
Internet2 : Focus Area
Internet2 : Compare to Internet
digital Wizards

Journey Into the Net

Appendixes

- Terms / Glossary
- Useful Site
- Freeware / Shareware

digital Wizards

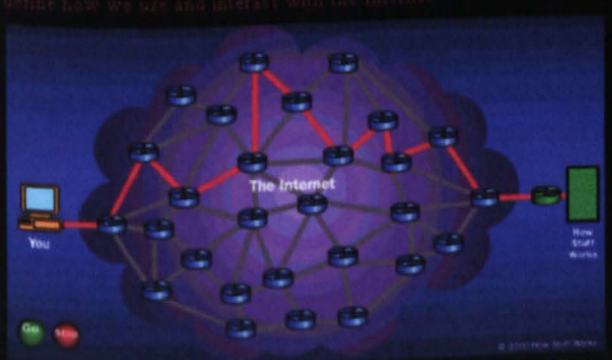
Introduction of the Net

Architecture

How Internet Infrastructure Works

One of the greatest things about the Internet is that nobody really owns it. It is a global collection of networks, both big and small. These networks connect together in many different ways to form the single entity that we know as the **Internet**. In fact, the very name comes from this idea of interconnected networks.

Since its beginning in 1969, the Internet has grown from four host computer systems to tens of millions. However, just because nobody owns the Internet, it doesn't mean it is not monitored and maintained in different ways. The Internet Society, a non-profit group established in 1992, oversees the formation of the policies and protocols that define how we use and interact with the Internet.



The Architecture of the Internet

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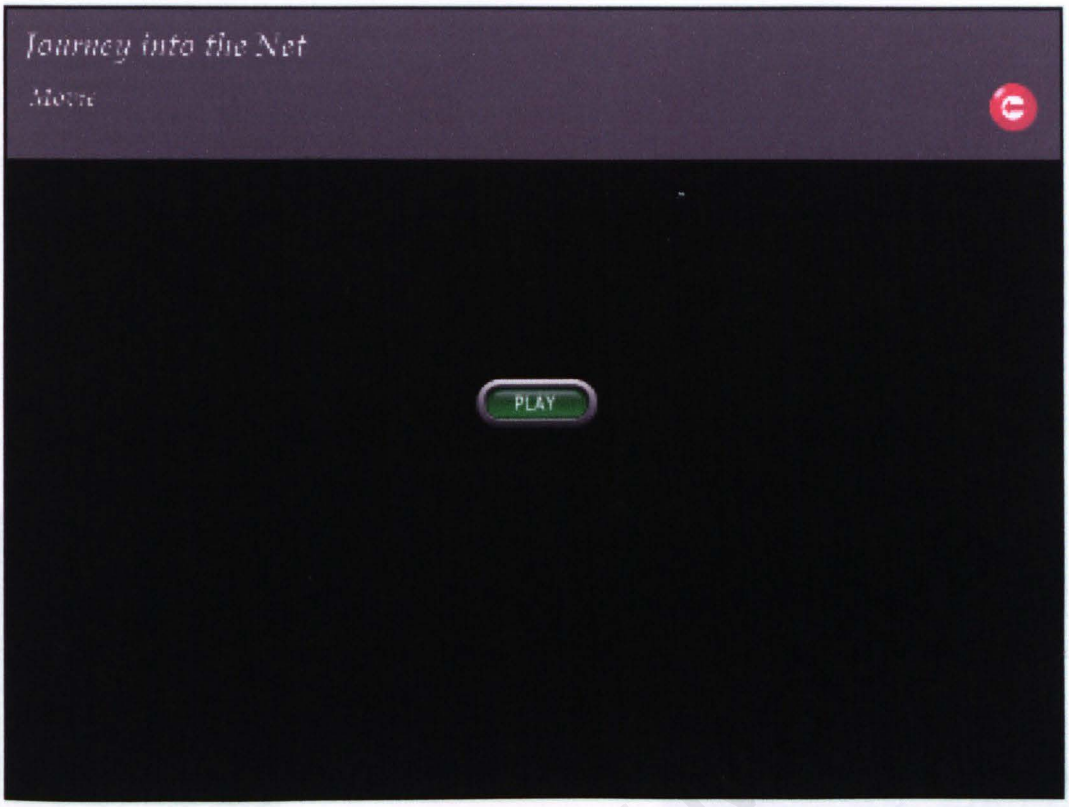
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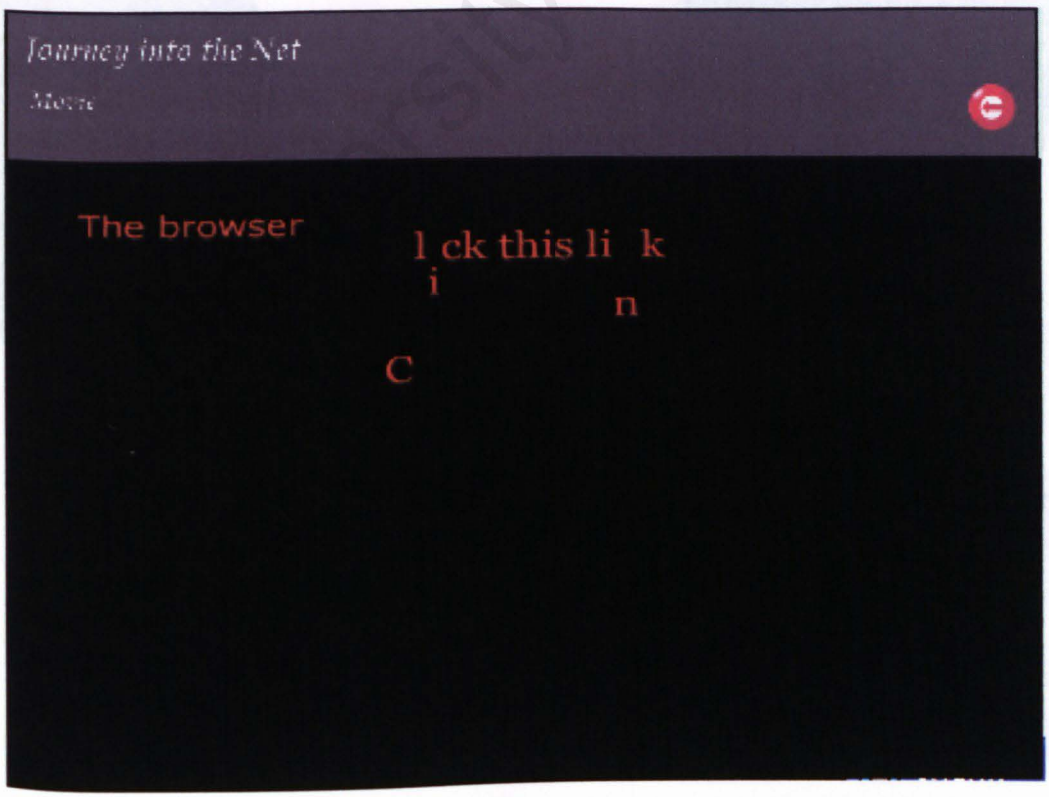
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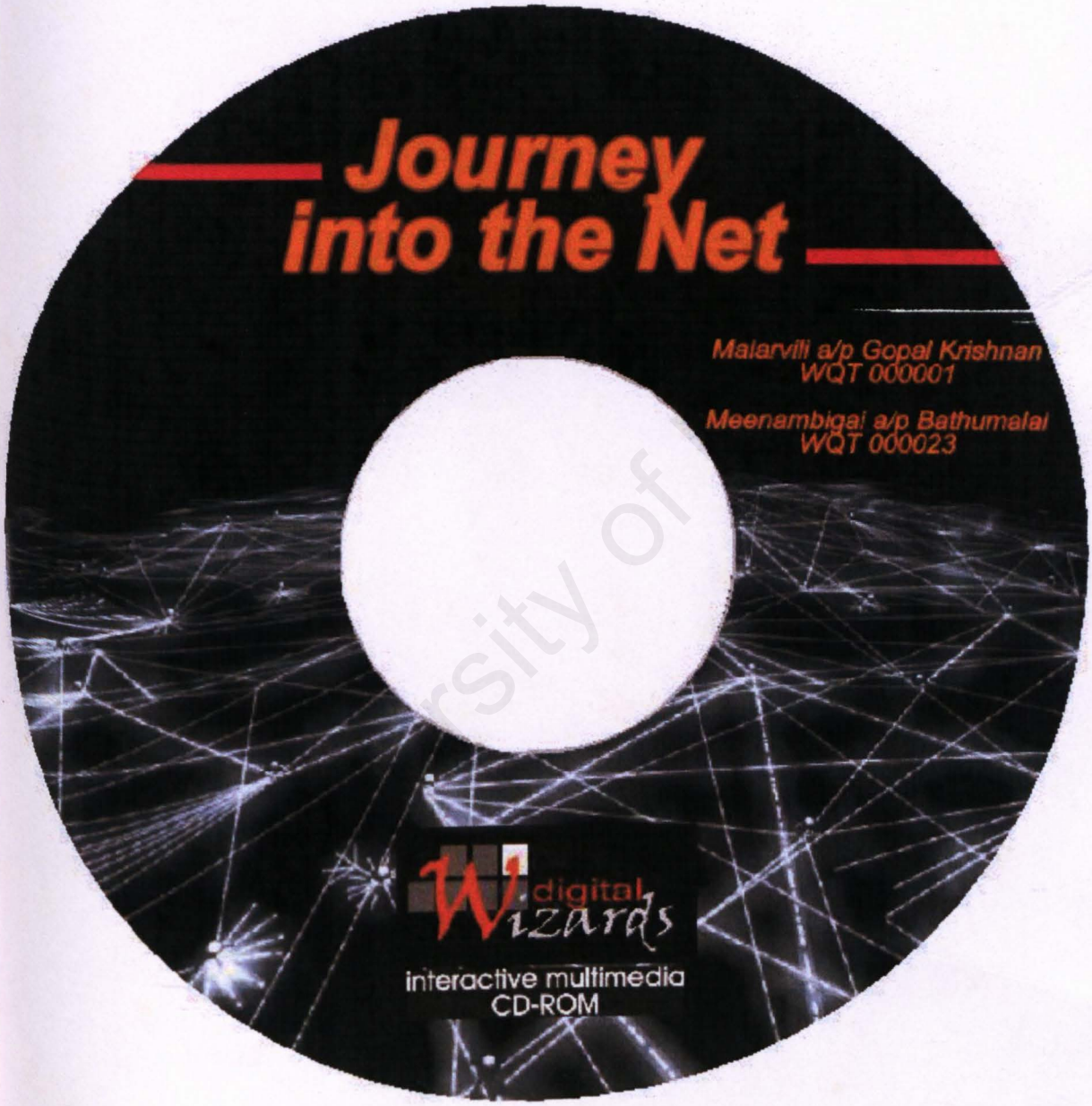
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