

University Malaya

Faculty of Computer Science and Information Technology

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## UM Presentation

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## Abstract

All undergraduates of the Faculty of Computer Science and Information Technology, University of Malaya are required to do the thesis. Thesis is a compulsory subject for all of the final year students in this faculty which has divided into two phases. Each phase is supposed to complete in each semester of final year. Thesis phase 1 (WXES3181) is carried out in the first semester followed by thesis phase 2 (WXES3182) in the second semester. To fulfill the requirement of faculty, UM presentation has been chosen to become the title of my thesis.

To success this thesis, I have implement all the knowledge and skills that I have gained throughout my 3 years study in UM to practical situations. Apart from that, I also have a chance to learn more skills of other multimedia authoring tools according to the requirements of my thesis. I believe that this will help me a lot in my future employment.

UM presentation is a stand alone multimedia package that will focus more on the University Malaya. Due to the reason where there are many people either the university students or other residents like to know more information about it. This presentation will show the user the useful information about the university especially for the first year students. Besides that, campus map will be included in this presentation to let users know how to get there and also navigate it. The system will also let users know about the facilities and services provided by UM.





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## **Chapter 1: Introduction**

### **1.1 Project Overview**

Generally, UM presentation is an introduction of University Malaya. It is a stand-alone multimedia presentation package which involves diversity of useful information about the University Malaya. This project will give a general guidance for the users on exploring the campus of University Malaya in an attractive multimedia environment.

UM presentation can be use as freshman starter pack. Normally after the first year students get to know that they are accepted to further their study at University Malaya, they will receive a reference book to guide them on what to do before and after get into the university. Although this reference book provides lots of useful information about the university and the activities during the orientation week, it is said to be dull and people do not feel interested on read it over and over. This project will assist to attract more attention from the users by providing the information in a different way, which is a multimedia presentation of the University Malaya.

In other word, this UM presentation contains important user's requirement about the university especially information about the orientation for the first year students. It is an alternative way to let them get a better understanding about the rules, activities and things to do before they further their studies in University Malaya. It will also provide brief information about faculties, colleges, facilities, courses and others information



inside the campus of University Malaya.

Multimedia plays an important role to success this project. Multimedia elements such as text, animation, panoramic views, video clip, audio and graphics are integrated in this project to make it more convenient to the users and to ensure its attractiveness. In addition, this project includes an interactive campus map where user can navigate through the map to get information they need.

## 1.2 Project Objectives

The objectives of this project are listed as below:-

- To build an interactive and user friendly multimedia presentation with great interfaces and embedded the multimedia technologies.
- To provide information about the university such as courses, faculties, colleges, and facilities for users to get a better understanding of University Malaya.
- As a freshman starter pack with provided information about the orientation week especially to the first year student.
- To improve the existing map of University Malaya for users to explore the campus of University Malaya.



### 1.3 Project Scope

The scopes of this project are listed as below:-

- Multimedia elements such as graphics, text, video clips, audio and animation are integrated into this presentation. It will make the presentation more attractive for the users.
- To provide useful information for various types of users who wish to know more about the university.
- Map of University Malaya is included into this project for the users to navigate the campus interactively.

### 1.4 Expected Outcome

The expected outcomes for this project are listed as below:-

- This project shall be an attractive multimedia presentation with great interfaces and high interactive to embed the multimedia technologies.
- This project shall give authority to the users to navigate through the map of University Malaya by clicking on the particular places to get more information.
- This project shall include pictures, video clips and 3D effect. Video clips show the environment of university and make this presentation more interesting for the users.



- Student can get offline information more effectively to compare with reference book.

## 1.5 Project Schedule

To achieve the project objectives and the expectancy, a project schedule plays an important role to keep track on the development progress. In order to do so, a detailed schedule is planned in advance to indicate each phase of development. The Gantt chart on the following page shows the schedule of this project.

ID	Task Name	Start	Finish	Duration	2004							2005	
					Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
1	Project Introduction	7/5/2004	7/16/2004	10d	■								
2	Literature Review	7/19/2004	8/9/2004	16d	■	■							
3	Methodology	8/4/2004	8/13/2004	8d		■							
4	System Analysis	8/16/2004	8/27/2004	10d		■							
5	System Design	8/30/2004	9/10/2004	10d			■						
6	System Implementation	9/13/2004	12/17/2004	70d			■	■	■	■	■	■	■
7	System Testing	12/20/2004	12/31/2004	10d						■			
8	System Evaluation	1/3/2005	1/17/2005	11d							■		
9	Documentation	7/5/2004	1/17/2005	141d	■	■	■	■	■	■	■	■	■

Table 1.0: Schedule of the project



## **1.6 Report Layout**

The purpose of this report layout is to give an **overview** of the process involved during the development of this project. The report layouts are listed as below:-

### ***Chapter 1: Introduction***

This chapter gives a brief introduction about this project. The project objectives, project scope, and the expected outcome are written clearly inside it. Besides that, it also shows the project schedule during the project's development.

### ***Chapter 2: Literature Review***

This chapter gives a brief explanation about the literature studies that are related to this project. Literature study approach and information about multimedia are stated inside it. This chapter includes also some analysis on the operating systems, digital imaging tools, multimedia authoring tools and some of the existing or similar systems.

### ***Chapter 3: Methodology***

This chapter gives a brief discussion about the software development life cycle and project development methodology. It will explain the process model that is going to implement in this project. The methods of information gathering are also included inside it.



### ***Chapter 4: System Analysis***

This chapter describes the analysis of functional and non-functional requirements. It discusses about the hardware and software requirements for this project. This chapter also considers about the development tools and technologies that are going to apply in this project.

### ***Chapter 5: System Design***

This chapter discusses about the system functionality design as well as user interface design.

### ***Chapter 6: System Implementation***

This chapter includes a functional project where the system requirement and design model of a system will be covered into it. Implementation comprises of a system design structure to a computer readable system. This system will be evolved from scratch design to executable application.

### ***Chapter 7: System Testing***

This chapter emphasis the system testing where it is one of the important phases to authenticate whether the finished product has meet the predetermine specification and requirement.

### ***Chapter 8: Discussion and Conclusion***

This chapter is a closing for the entire phases. An overall comment about the





developed system will be given which includes the problems encountered during the system development and recommended solution to the particular problems will be given. This discussion will also touch on system strengths, system limitation and future enhancements.

### 1.7 Summary

UM Presentation is a project where it gives brief information about University Malaya to various types of users. This chapter will give some introduction to the project, states the project objectives and scopes. A project schedule for this development process is included inside it. The following chapter is chapter two that will present the literature review to facilitate understanding of the proposed project.



## Chapter 2: Literature Review

### 2.1 Introduction

A literature review is an important part of the project. Study about the knowledge and information related to the proposed project are needed to develop the system. This study allows developers to find information and do some researches regarding to the project title. It indicates findings, analysis of the findings, and summarization of the findings as well as the synthesis of the proposed project. The purpose of doing this is to let the users get to know what knowledge and ideas have been established on the topic and also include their strengths and defects based on the topic. Basically, the literature review performs the following important tasks:-

- It allows the developers to assemble complete and relevant information which are related to the project's development.
- It gives the developers the chance to study more on the subject relevant to the project and see how others have approached the subject area.
- It will give the chance to investigate areas that developers may not have think about before and to read through the subject.
- It will bring the opportunity for the developers to survey on some of the existing similar projects and other relevant works that have been done before.
- It will allow the developers to compare the existing projects to gain the ideas and knowledge. This action can help the developers in order to develop the project.



- The purpose of research, particularly literature reviews, is not simply to collect information. Developers should be able to add any useful values or attractive ideas to the information sources and make the project better.
- It will allow the developers to get better understanding of which software development tools available and are going to be use in developing the project.

Literature study is very important because it helps to make sure that all the relevant information is well collected so that the development can be done efficiently and effectively. Basically, this information can be categorized into two main parts:-

- Factual information – this information will form the contents for the UM freshmen starter pack. In the UM presentation, these information describe how users especially a new student who enter the university, can have details about the university by pictures and video clips, some information about the faculties and facilities, map guidance, information about orientation week and so on.
- Technical information – this information is used to technically develop the multimedia presentation, such as information on particular multimedia software development tools (Swish 2.0, Macromedia Flash MX, Adobe Photoshop 7.0 and so on).

Through the literature study, developers can broaden their point of views to understand more ideas and useful information related to the particular subject area. All of the information should be analyze before implement the information inside the project by the developers.



## 2.2 Literature Study Approach

To gather useful information related to the project, there are various types of available information sources and materials that can be refer from, such as World Wide Web (WWW), the Internet, journals, reference books, digital media like CD-ROM, previous thesis and so on. The approach towards the above subjects is very important to complete this project.

Among the information, WWW and the Internet contribute the most information to the developers. In this technology era, web pages play important role in providing the information needed by the researchers. Search engines that exist in the internet can help the researchers to find information quickly and functionally.

Reference books and journals are very useful in helping to shape a literature review because it normally will highlight the range of perspectives or areas of emphasis researchers have developed and contain comprehensive bibliographies.

Besides, previous theses inside the faculty's document room have provided many useful ideas and knowledge in order to help developers to develop the project. Developers can refer many kinds of information from these theses and get the ideas of how to complete the project.



## 2.3 Multimedia

### 2.3.1 Definition of Multimedia

As the name implies, multimedia is the integration of multiple forms of media that are used to convey an idea, concept or purpose. These media includes text, graphics, audio, video and animation. Any combination of two or more elements can be multimedia. Multimedia is an integrated package for efficient presentation of information. For example, a presentation involving audio and video clips would be considered a "multimedia presentation". As the information is presented in various formats, multimedia enhances user experience and helps grasping information better and faster.

Other than presentation, multimedia provides interactivity. By using interactivity which involving the users, more knowledge is retained, far more than the rate for most other instructional methods. Forms of interactive multimedia include Web sites, CD-ROMs, programs, presentations, tutorials, help sections, and even games.

### 2.3.2 Elements of Multimedia

The elements in an interactive multimedia include text, graphics, video, audio and animation. Below are some explanations of these elements.

#### *Text*

Text is the most basic multimedia element which provides information to users. There are lots of ways to presenting the text. Users can change the styles, sizes, fonts as



well as formats of the justification according to their wish. Different types of styles with different color can emphasis the important part of the information. With multimedia technology, text can be combining with other media in a great and meaningful way. There are four kinds of text, such as printed text, scanned text, electronic text and hypertext. Text needed in this project should be standard to show the well organization of the information and contents.

### ***Graphic***

Graphic or image is one of the essential elements for a particular multimedia. It has a significant impact on the visual impression of the certain project. The graphics also plays an important part to represent the information in a different way. There are many functions of the graphic such as explaining a concept, illustrating a chart, and so on. There are two types of graphic, vector and non-vector graphics. Vector graphic is shape made of lines to create either two or three dimensional objects. A non-vector graphic is image that created or obtained from digital imaging devices such as camera and scanner.

### ***Audio***

Audio or sound is one of the important feature in multimedia. There are two type of sound which is mono and stereo. Sound plays an important role to attract people while presenting the multimedia project. It can use as emphasizing some certain points of the multimedia presentation. Sound also used to notify or alarm user. Without sound, a multimedia presentation will become silent and not dramatic. For example, ambient sound is played from the beginning until the end of presentation as the background



music. The buttons of the multimedia presentation have some audio effects to attract people's attention so that they will continue explore it.

### *Video*

Video is one of the important elements of multimedia. Video is a representation of a numbers of frames sequentially which have slightly different among each frame. When these frames display rapidly in a sequence, it will make the object appear to be moving. Normally video gives impact to the multimedia applications. By using this element, the multimedia presentation will look more reality and being alive.

### *Animation*

Animation is another element of multimedia. Animation can be in two or three dimensional forms. It is a process of displaying a numbers of drawing frames. These frames are slightly different between each other. Displaying the frames sequentially can show the movement of certain object. Generally, animation is measured in frame per second (fps). Animation can improve the presentation because it manipulates the information functionally in order to attract people attention to the presentation.

### **2.3.3 Advantages of Multimedia**

The advantages of multimedia are listed as below:-

- Enhancement of Text Only Presentation: Multimedia enhances text only presentations by adding interesting sounds and compelling visuals.
- Improves over Traditional Audio-Video Presentations: Audiences are more



attentive to multimedia presentation than traditional presentations done with slides or overhead transparencies.

- Gains and Holds Attention: People are more interested in multimedia presentation which combines the elements of text, audio, graphics, video and animation. Communication research has shown that the combination of communication modes (aural and visual) offers greater understanding and retention of information.
- Good and Easy Navigate for "computer-phobic": Those who are intimidated by computer keyboards and complex instructions are more comfortable with pressing buttons with a mouse or on a screen.
- Multimedia is Entertaining as Well as Educational: Multimedia plays an important role and often used in many fields such as entertainment, commercial, education and so on. The usage becomes more and more increasing because of its attractiveness.

Multimedia elements are widely used in the computer based environment because of its user friendliness and interface enhancement features. The inclusion of multimedia elements on the presentation will make it more fascinating and be more appealing to its user.

## 2.4 Operating System

An operating system is a program that acts as an interface between a user of a computer and the computer hardware. The purpose of an operating system is to provide an environment in which a user may execute programs. An operating system controls the way in which the computer system functions. In order to do this, the operating system includes programs that

- initialize the hardware of the computer system
- provide basic routines for device control
- provide for the management, scheduling and interaction of tasks
- maintain system integrity and handle errors

In general, the operating system is the first layer of software loaded into computer memory when it starts up. As the first software layer, all other software that gets loaded after it, depends on this software to provide them with various common core services. These common core services include, but are not limited to: disk access, memory management, task scheduling, and user interfacing.

Since these basic common services are assumed to be provided by the OS, there is no need to re-implement those same functions over and over again in every other piece of software that developer may use. The portion of code that performs these core services is called the “kernel” of the operating system. Operating system kernels evolved from libraries that provided the core services into unending programs that control



system resources because of the early needs of accounting for computer usage and then protecting those records. Here are some examples of operating systems:-

- Linux
- Mac OS (Apple)
- Windows XP

#### 2.4.1 Linux

Linux is an operating system that is totally free for everyone to get. Linux, started by Linus Torvalds is distributed along with its source code so that anyone who receives it is free to make changes and redistribute it. Not only is it ok to make copies of Linux, it's also fine to tweak a few lines of the source code as long as the user also freely provide their modified source code to everyone else. It is because it is state under Linux community.

Since its initial release, the Linux operating system has experienced rapid growth in popularity, overtaking proprietary versions of Unix and even beginning to challenge the dominance of Microsoft Windows. It has been deployed in applications ranging from personal computers to supercomputers to embedded devices such as mobile phones, supporting a remarkable variety of computer hardware.

It mainly supports multiple users, password security, file permissions, disk quotas (to limit a user's disk usage), transparent use of many storage devices, even interconnected in a network by "mounting" them in the same root directory, very



flexible network configuration, servers for telnet, SMB file system, finger, ftp, web, fire walling, packet control, lots of other advanced networking features.

As an operating system, Linux has the following features, great multitasking and process management, very good speed, flexible storage devices configurations, very flexible kernel configuration because the kernel sources are freely available, everyone can compile its own kernel based only on useful drivers for a specific computer, or a full kernel with support for many things, kernel modules inserted on-the-fly depending on the needs, very good stability and protection from the kernel, good support for the most known hardware pieces even if there is no support for some others.

#### 2.4.2 Mac OS (Apple)

Mac OS, which stands for Macintosh Operating System, is Apple Computer's operating system for Apple Macintosh computers. Mac OS was the first commercially successful operating system which used a graphical user interface. The Macintosh team included Bill Atkinson and Jef Raskin and Andy Hertzfeld.

Mac OS combines the power and stability of UNIX. Beneath the easy-to-use interface and rich graphics of Mac OS X is Darwin, an open source UNIX-based foundation built on technologies such as FreeBSD, Mach, Apache, and GCC. Darwin provides a complete UNIX environment, with X11 and POSIX services comparable to Linux or FreeBSD, including familiar kernel, libraries, networking and command-line utilities.





Programs on the Mac are designed to work well together, simplifying the user computing experience while taking on ever more complex tasks. Mac OS includes all the applications that user need to take advantage of their computer immediately. Mac OS uses the digital lifestyle applications to manage cameras, and downloaded music. Mail, QuickTime and Sherlock offer user the best Internet experience. iCal and Address Book help user stay in contact and are even more powerful with a Mac membership. Mac OS includes applications for managing fonts, viewing PDF files and DVD videos, editing text, performing calculations, managing printers, connecting to the Internet, changing system preferences and many more utilities for setting up Mac.

Built using many of the same technologies that power the Internet itself, Mac OS X includes modern networking and support for standard protocols. This makes Mac OS X easy to integrate into any standards-based network, including existing Macintosh networks, Windows networks, and of course the Internet. Since Apple designs both the operating system and laptops, Mac OS X includes exclusive technology that gives user the best mobile platform for them.

### 2.4.3 Windows XP

Windows XP is the latest desktop version of the Windows operating system from the Microsoft Corporation. It was made publicly available on October 25, 2001. Microsoft initially released two versions: Home and Professional. Home is targeted at home users, while Professional has additional features designed for businesses such as network authentication and dual-processor support. The letters "XP" originate from the word Experience.





Windows XP Professional integrates the strengths of Windows 2000 Professional, such as standards-based security, manageability, and reliability, with the best business features of Windows 98 and Windows Millennium Edition, such as Plug and Play, simplified user interface, and innovative support services. This combination creates the best desktop operating system for business. Whether user business deploys Windows XP Professional on a single computer or throughout a worldwide network, this new operating system increases the computing power while lowering cost of ownership for desktop computers.

By safeguarding system files, Windows XP Professional mitigates many of the most common system failures encountered in earlier versions of Windows. A cleaner work environment allows the user to be more efficient. Users can find the crucial data and applications they need quickly and easily. If users experience system failure or another significant problem, they can use System Restore from Safe Mode or Normal Mode to go back to a previous system state, restoring optimal system functionality.

Users will experience increased application compatibility when compared with Windows 2000 Professional, and as more application fixes are rolled out, they will be automatically available. Application compatibility modes will potentially allow thousands of applications to run that do not have applications fixes on Windows XP Professional.



## 2.5 Digital Imaging Tools

### 2.5.1 Adobe Photoshop 7.0



*Figure 2.1: Adobe Photoshop 7.0*

Adobe Photoshop is a state-of-the-art tools with its comprehensive set of retouching, painting, drawing, and web tools. Photoshop complete any image-editing task efficiently. And with features like the History palette and editable layer effects, which allow user to experiment freely without sacrificing efficiency.

Photoshop is a technical tool, for advance user, it can almost create any texture, 2D image and can finely retouch on a photo. As Photoshop become more robust and rich features in every latest released, which makes it the best image editing software in the market.

Mixed-media professionals such as photographers, Web designers, and graphic designers will not be disappointed in Adobe's latest incarnation of Photoshop. In this release, Adobe aims hard at addressing the issues of file management, easy photo retouching, and smarter output for the Web. While Adobe manages to successfully address these issues, it also remains true to its photo editing roots. New and improved features and tools such as a painting option and an enhanced brush palette allow



Photoshop to build on its reputation as the leading tool for image manipulators. New-school designers of wireless applications will smile when they discover that Photoshop 7.0 offers support for WBMP-formatted graphics.

The enhanced brush palette allows users to create custom brushes and save them as presets that can be accessed from the Tools options bar. Users can easily vary different aspects of the brush by changing the hue, opacity, or flow of the brushes for pastels, oils, and charcoal. Photoshop 7.0 also introduces a new Healing Brush and Patch Tool. With these tools, users can easily "heal" their images by removing scratches, blemishes, and other imperfections while preserving shading, lighting, and texture attributes.

While Photoshop 7.0 introduces an impressive array of features that allow photographers, Web designers, and graphic designers to work more effectively with Web and wireless devices, it also remains the leading tool for anyone serious about digital imaging. No other software package provides users with the ability to create such high-quality images.

### 2.5.2 JASC Paint Shop Pro 9



*Figure 2.2: JASC Paint Shop Pro 9*





Paint Shop Pro is another tool for photo editing besides than Adobe Photoshop 7.0. It continues to set the standard for affordable, professional image editing. Version 9 builds on Paint Shop Pro's legacy of creative innovation with a new suite of art media features, professional photo editing tools, and precision graphic design capabilities.

There are lots of features Paint Shop Pro provide for the photo editing. For example, Digital Camera Noise Removal Filter scans photos and removes image noise while intelligently preserving image textures. Besides that, it can customize the noise removal by defining specific regions or color ranges, and then save results to presets for later user with photo from the same camera.

The Symmetric Shape Tool allows users to create polygons and stars then edit them into custom artistic shapes. Users can edit shape properties at any time, not just at creation. The new Displacement Map Filter creates custom two- or three-dimensional surface effects for graphics based on an underlying image.

The History Palette tracks each command applied to an image, making it easy to manage complex editing projects. Powerful Selection Undo functionality allows users to easily undo any individual editing step in a document's history. As for the Resource Categorization, users can now organize their Paint Shop Pro resource files by projects or subjects in flexible resource categories.

## 2.6 Multimedia Authoring Tools

The function of the multimedia authoring tools is used to assist the developers to create interactive multimedia presentation. There are many software have been developed to provide more user friendly development environment for the users, hence, encouraging more developers to incorporate multimedia features onto their projects. Some authoring tools have been analyzed so that the most suitable tools can be chosen to develop the UM presentation.

### 2.6.1 Macromedia Flash MX



*Figure 2.3: Macromedia Flash MX*

Macromedia Flash MX is the professional standard authoring tool for producing high-impact web experiences. This authoring tool is best used in creating animated logos, web site navigation controls, long-form animations, entire flash web sites, or even web applications. New features in Flash MX enhance the approachability, creativity, and





the power of Flash MX. Designers who require a higher level of control and integration with industry-standard design tools now have an unparalleled creative application for creating media-rich content.

Macromedia Flash MX allows designers and developers to integrate video, text, audio, and graphics into immersive, rich experiences that deliver superior results for interactive marketing and presentations, e-learning, and application user interfaces. Flash is the world's most pervasive software platform, used by over one million professionals and reaching more than 97% of Internet-enabled desktops worldwide, as well as a wide range of devices.

New powerful features build on this creativity and giving application where developers access to new capabilities that make Flash MX a robust and exciting application development environment. Developers can work with advanced scripting and debugging tools, built-in code reference, and predefined components to rapidly deploy rich web applications.

Flash MX enhances creativity by providing designers with a higher level of control and expanded integration capabilities with a rich set of design tools. New features help designers quickly create a broad range of content. Instead of focusing on how Flash MX works, they can give more attention to their designs.

### 2.6.2 Swish 2.0



*Figure 2.4: Swish 2.0*

To create wild and groovy Flash™ animations without using Flash™, Swish is the alternative tool that has such abilities to do so. Swish is so easy to use; designers will be able to produce complex animations with text, images, graphics and sound in no time. Swish has over 150 built-in effects like Explode, Vortex, 3D Spin, Snake and many more effects to enhance and replace hard work on creating complex effects. Swish has tools for creating lines, rectangles, ellipses, Bezier curves, motion paths, sprites and rollover buttons, all in an easy-to-use interface.

In terms of price, Swish is quite cheap and furthermore it has nice user friendly interface. Swish exports the SWF file format used by Macromedia Flash™, so the animation will play on any machine that has the Flash™ player installed. Swish animations can be incorporate into any web page or import into Flash™. They can also send in an email, embedded in a Microsoft PowerPoint presentation or include in a Microsoft Word document.



### 2.6.3 Swift 3D



*Figure 2.5: Swift 3D*

Swift 3D created for Flash. But then again, Swift 3D was originally built to serve a demand created when Macromedia Flash began coming on strong as the leader in web animation. But now the horizons have broadened for both Swift 3D and for Flash itself. Designers have found that the Flash authoring tool serves as a great medium for delivering dynamic and interactive content on more than just the web.

Nowadays, there are CDs, presentations, games and even TV programming that use vector graphics as the foundation for brilliant multimedia communication. Wherever vector graphics go, Swift 3D follows. 3D graphics have been used in a long period for television and video production, and now 3D continues to be a great method of creating such thing. So the next logical step is to begin incorporating television quality 3D effects into these other forms of visual communication.

This application is designed for people who are in the business of creating these various forms of multimedia communication, but it is not necessary to have extensive experience designing 3D animations, or have access to a full suite of 3D software applications. Swift 3D brings to the table a powerful set of modeling and animation tools in a super-intuitive user interface so designers can spend time creating great 3D design rather than fighting the typical 3D application learning curve.

#### 2.6.4 Discreet 3ds Max



*Figure 2.6: Discreet 3ds Max*

Discreet 3ds Max, the world's most widely-used professional 3D modeling, animation and rendering software, contains the essential high-productivity tools required for creating eye-catching animation, cutting-edge games, and distinct design visualizations. It raises the bar with some great new features and highly optimized workflows that will enable us to be highly competitive and get the work done on time, within budget.





There has lots of feature of making animation in 3ds Max. Unique, weighted Animation Controller Subsystem allows for multiple algorithms to drive any animation channel, including custom expressions. Curve Editor and Dope Sheet control every animated parameter, with extensive filtering to isolate relevant data. Apart from that, Reactor® 2 allows full interaction of key framed and dynamically simulated objects including new Virtual Stuntman dynamics and improved fracture collection.

As for the modeling, Enhanced Spline/Patch workflow eliminates excess Modifier Stack operations, and includes intuitive cross-section functionality, reset patch tangents, and default filtering of interior edges. Moreover, Editable Poly improvements include the integration of Mesh smooth and a new Isoline Display mode that keeps the artist focused on building good model topology without having to view every resulting polygon in the view port.

3ds Max's legacy as a production workhorse is made even stronger with careful attention to the most commonly used functions to make us faster, more efficient, and able to further stretch the limits of high-volume, high-quality production. The power behind UVW Unwrap has been unleashed to give artists ultimate control over their mapping coordinates, and Polygon Modeling has evolved to make 3ds Max 6 the most comprehensive modeler on the market. Discreet's reliable, extensible, and best of all FREE network rendering and management utility backburner gives us control over both 3ds Max and combustion render farms without the need for costly custom solutions.



## 2.7 Studies on Existing Systems

Study on the available systems is essential before developing any system so that the developer can gain a general knowledge on how to develop the proposed system. The strengths and weaknesses of the existing systems are analyzed so that useful ideas can be embedded into the proposed system. Below are some of the existing systems found in the internet, which are useful as the references to provide the information about the university and the ideas of designing the interactive stand alone multimedia presentation.

### 2.7.1 UM Website

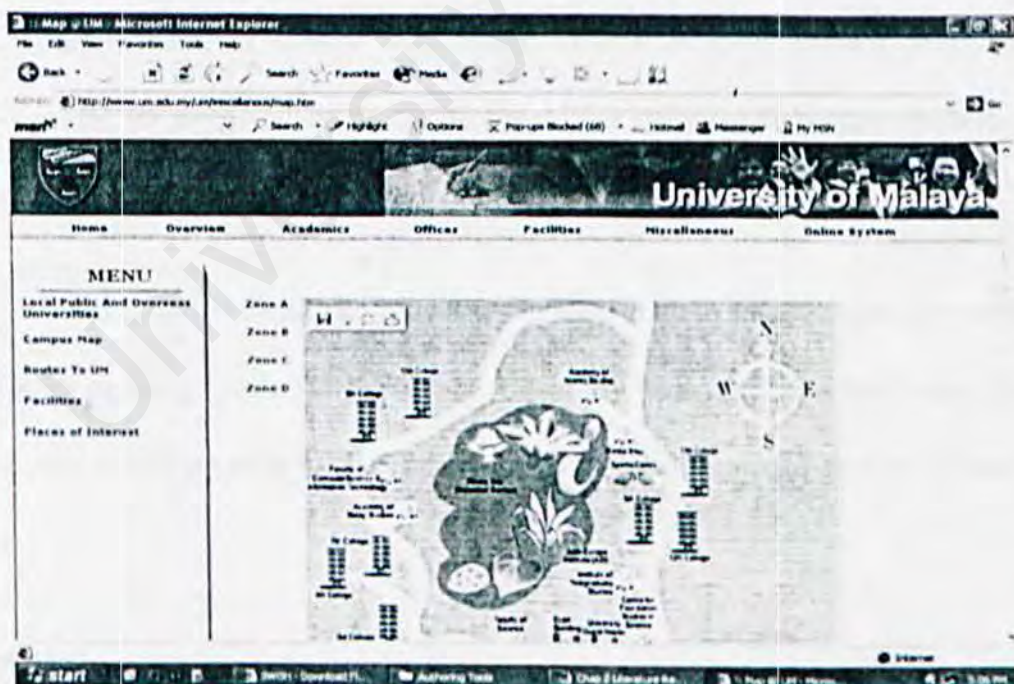


Figure 2.7: UM Official Website



This is the official website of the University of Malaya. The website provides lots of comprehensive information about the university where users can get better understanding about the academics, facilities and other related information. The website interface is simple and straightforward. It is basically divided into five sections:-

- Overview: Mission, the VC, Senior Management, and History of UM.
- Academics: Academies, Faculties, Centre, and Institute.
- Offices: Chancellory, Academics, Development, Student Affairs, Registrar, and Bursary.
- Services: PTM, JPPHB, Library, Security, and Medical Centre.
- Miscellaneous: Links, Campus Map, Routes to UM, Facilities, and Places of Interest

This is mainly a website with details information about the university and tips that is useful for anyone. The design is simple but the most important attribute is the presentation of all the complete information.

Besides, this website also provides a campus map to show people an overview of the routes existing inside the university. Generally, this map is divided into 4 zones. When user clicks on each of these zones, a more details campus map is shown to the users.

### ***Strengths:***

- Lots of information about the university is provided.
- The interface and design is simple and easy to navigate.

- The color is nicely presented.

#### Weaknesses:

- Lack of multimedia content such as audio and animation, it makes the site looks plain and slightly boring.
- There are too many information, it makes the site looks messy.
- The presentation of information is static; it is hard to attract users.
- There is no interactivity because it does not give users the authority to navigate through the campus map.

#### 2.7.2 Clear Advantage Title Inc

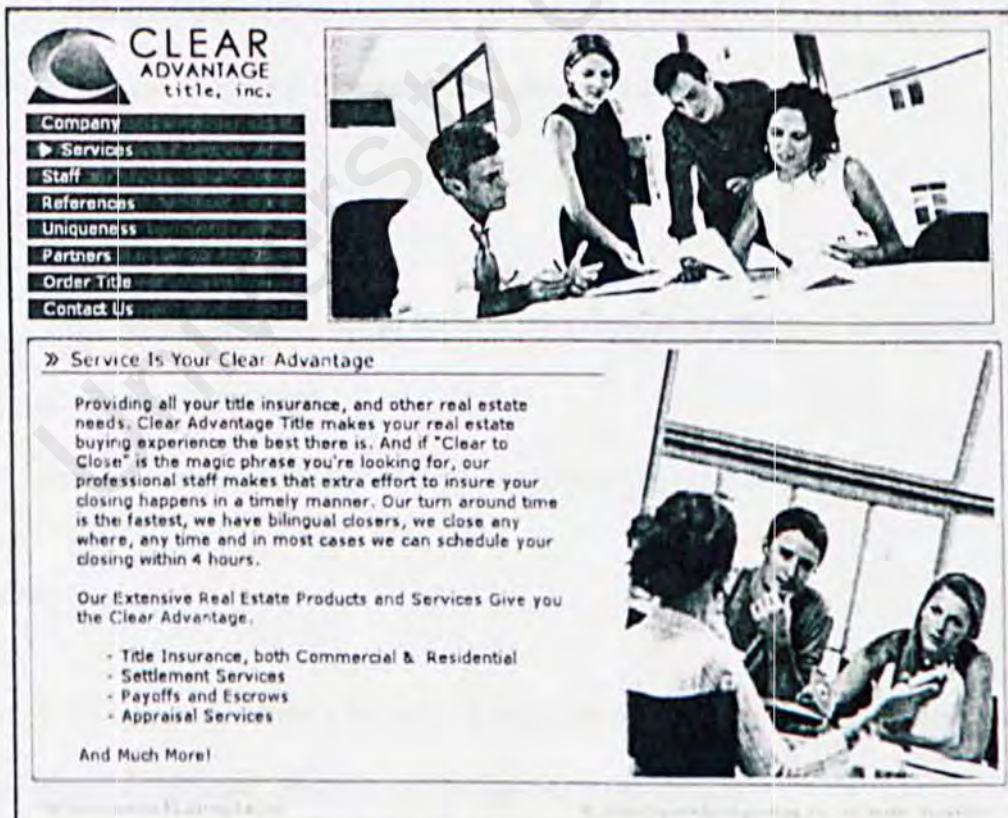


Figure 2.8: Clear Advantage Title, inc. Official Website



This website is analyzed from the aspect of designing the interface as well as the multimedia elements used. From my observation, this website provides several interactivities at its main page.

At the top of the company page, there is a main menu for users to click and look through the website and find their desire information. The menu consists of several buttons for navigation purpose. Each button links to particular page which is loaded at the lower part of the page which is divided into a different frame. When one of the buttons is executed, this will invoke the lower frame and load related page which has short animation to represent the picture.

This is a simple and user friendly web site. Information about the company is nicely separated so that people can easily get the information they want. Besides, picture and animation are integrated together and makes the web sites looks alive.

#### ***Strengths:***

- Well structured menu which leads to easy navigation and user friendliness.
- Good interface design.
- Attractive short animations which can attract people's attention.

#### ***Weaknesses:***

- This web page looks a bit dull. It only invokes the lower part of the page if the button is pressed. There is no change on its main page.
- There is only sound for the button. Lack of background music.

### 2.7.3 Kayfar Design Studios



Figure 2.9: Kayfar Design Studios Official Website

This website brings lots of ideas on designing the multimedia presentation. From the observation towards this company website, this company combines most of the multimedia elements effectively. The buttons are organized properly and clearly.

Furthermore, this website has background music which allows the users to manipulate freely. It means that the users can choose several songs provided by the website. In order for users to do so, there is a control panel situated on the top of the page.

As for the main menu, it is nicely constructed below the banner. Each button is linked to an animated page which is loaded at the main frame whenever the button is pressed.



### Strengths:

- High interactivity because it lets the users the authority to manipulate the background music.
- The interface design is neat and well constructed.

### Weaknesses:

- The space for the main content is small, not many information can put inside it.
- Not much animation included inside the website but only the button of main menu.

#### 2.7.4 SupaLova Club



Figure 2.10: Supalova Club Official Website

From the observation, this website is well constructed into three frames. The main menu is situated at the right frame, while the other two frames are showing the content at the top and bottom of left side.

This website provides high multimedia interactivity to attract and entertain the users when they are navigating through the website. Menu buttons are placed nicely in the page and each time the cursor roll over these buttons, these buttons will highlight with a transparency layer. The main frame is controlled with these buttons.

Color used perfectly and it includes the sound. Below the menu, there is an animation showing for advertisement in the way of sliding.

#### ***Strengths:***

- Buttons on the main menu is animated and sound is provided.
- Interface design is well constructed.
- Animation is provided and the website looks attractive.

#### ***Weaknesses:***

- This website is time consuming. It is slow to be fully loaded by using standard modem.
- There is no banner to show the company name clearly.



### 2.7.5 Dream Dynamics



Figure 2.11: Dream Dynamics Official Website

This website brings lots of creativity and idea on making the multimedia presentation more attractive. Animation is displayed when the website is loaded. Background music is provided so that the user will not feel boring when browse through the web site.

It has high interactivity where it allows the users to customize the catalogue column with the choices below it. Lots of animation are included and make the presentation look attractive.

#### **Strengths:**

- Color used is simple and nice.

- Customization is provided to allow the users customize certain part of the web site.
- 3D animation is included, more reality.

***Weaknesses:***

- Information is few to compare with the other multimedia features.
- Presentation of the information is not well constructed.

## **2.8 Summary**

After review and survey that had been conducted, the strengths and weaknesses of the existing systems have been analyzed. Moreover, some of the operating system, digital imaging tools, and the multimedia authoring tools are also been reviewed so that the most suitable tools can be use for the development phase. As a whole, literature review is very important to the development of this project. Thus, all the relevant information are thoroughly analyzed and reviewed. The next chapter will focus on the methodology used during the development of this multimedia presentation.



## Chapter 3: Methodology

### 3.1 Introduction

A methodology is a systematic way to accomplish certain tasks and it can be defined as a collection of procedures, techniques, tools and documentation aids to help the software developers speed up and simplify the software development process.

The methodology consists of several phases. These phases guide the system developer to select suitable techniques in order to adopt in their development process. A methodology also helps the developer to plan, manage, control and evaluate the project.

Besides, system development methodology is also known as a collection of techniques for building model-applied across the system development life cycle. A model is a process of system development used by system developers to describe their approach in producing a proposed system. The objectives of a methodology are listed as below:-

- Record accurately the requirements for the proposed project.
- Provide a systematic method of development so that progress can be observed.
- Produce a system that is well documented and easy to maintain.
- Provide an indication of needed changes as early as possible in the development process.
- Provide a system that is user-friendly.

### 3.2 Software Development Life Cycle

A software development life cycle model represents the significant phases of a project development from the beginning until the project is finished. Typically a life cycle model addresses the following phases of a software project; that is requirement phase, analysis or specification phase, design phase, implementation phase, integration phase, maintenance phase and retirement. The life cycle model plays an important role to make sure the smoothness and well organized operations of a proposed project. There are several types of software development life cycle models which can be used to develop a software or system. These models are listed as below:-

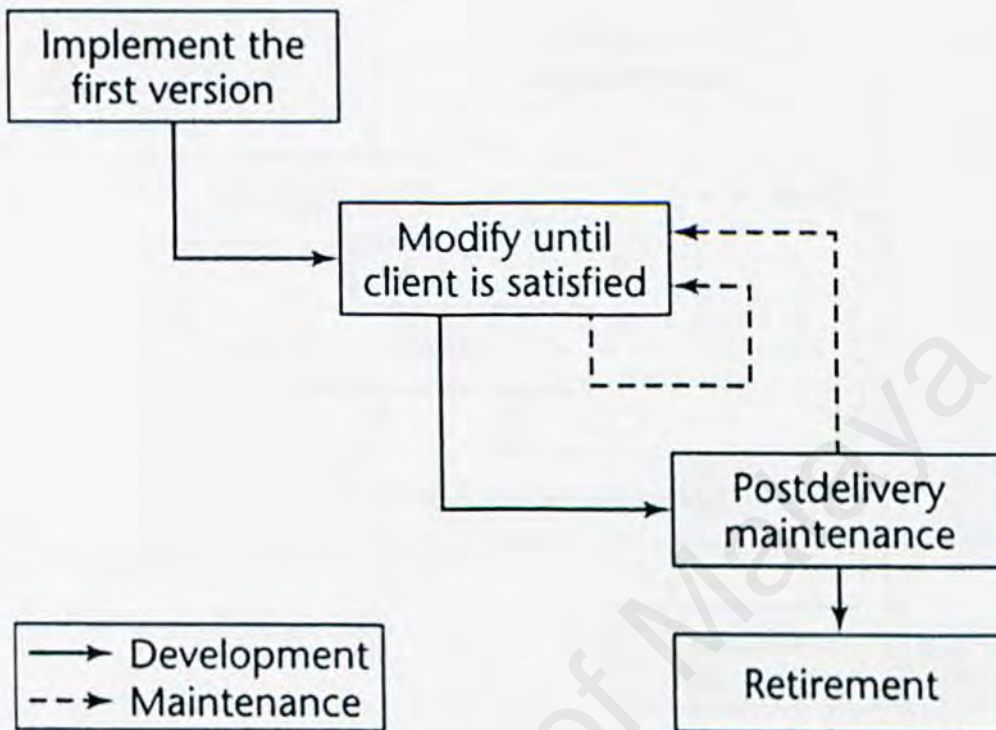
- Code-and-fix life cycle model
- Waterfall life cycle model
- Rapid prototyping life cycle model
- Iteration and incremental life cycle model
- Extreme programming
- Synchronize-and-stabilize life cycle model
- Spiral life cycle model

#### 3.2.1 Code-and-fix life cycle model

This model is implemented without requirements or specifications nor any attempt at design. Instead, the developers can simply apply the coding and rework it as many times as necessary to meet the client's needs. This approach is shown in Figure



3.1, which clearly displays the absence of requirements, specifications, and design.



*Figure 3.1: The Code-and-fix life cycle model*

This model has its disadvantages. This model may work well on small projects, but it is totally unsatisfactory for products of any reasonable size. The cost of the code-and-fix approach is actually far greater than the cost of a properly specified and carefully designed project. Besides, maintenance of a project can be extremely difficult without specification or design documents, and the chances of a regression fault occurring are considerably greater. Although it is the easiest way to develop software, it is the most expensive way to complete the proposed project.

### 3.2.2 Waterfall life cycle model

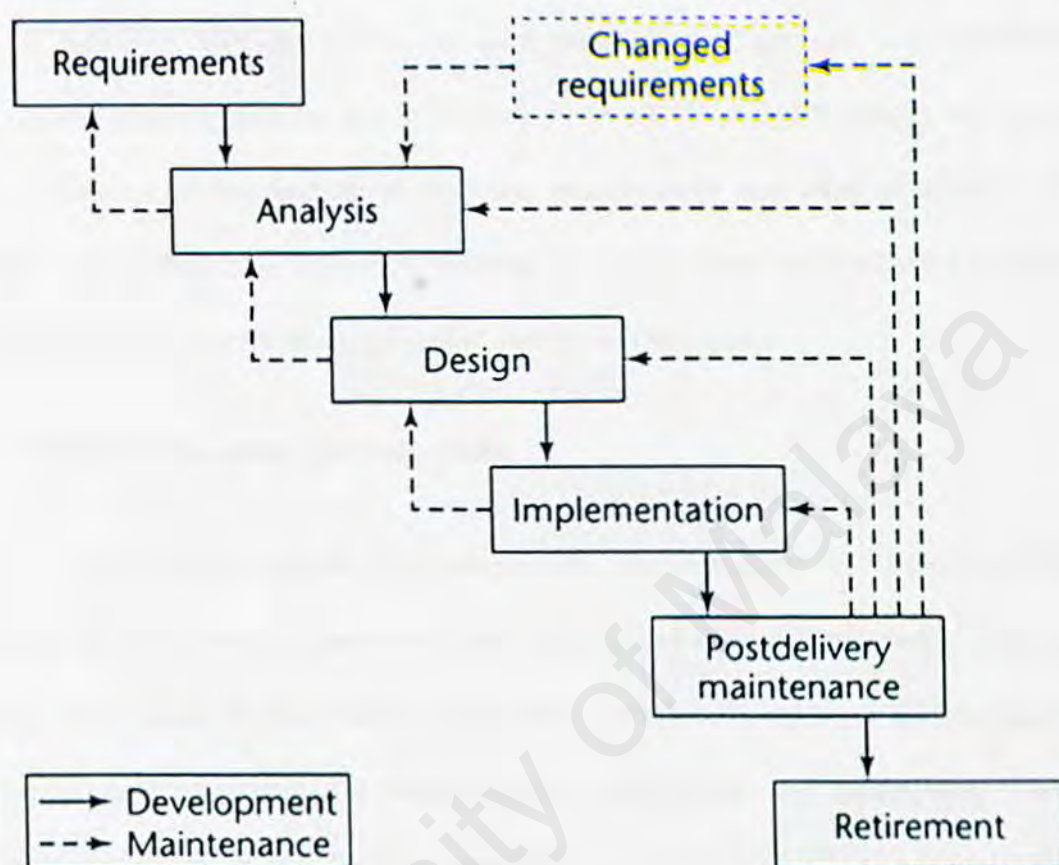


Figure 3.2: The waterfall life cycle model

The waterfall life cycle model was first put forward by Royce [1970]. Figure 3.2 shows the feedback loops for maintenance while the product is being developed. It also shows the feedback loops for post delivery maintenance. A critical point regarding the waterfall model is that no phase is complete until the documentation for that phase has been completed and the products of that phase have been approved by the software quality assurance (SQA) group.

The waterfall model has lots of strengths. It includes the condition that the documentation is provided at each phase and the requirement that all the products of



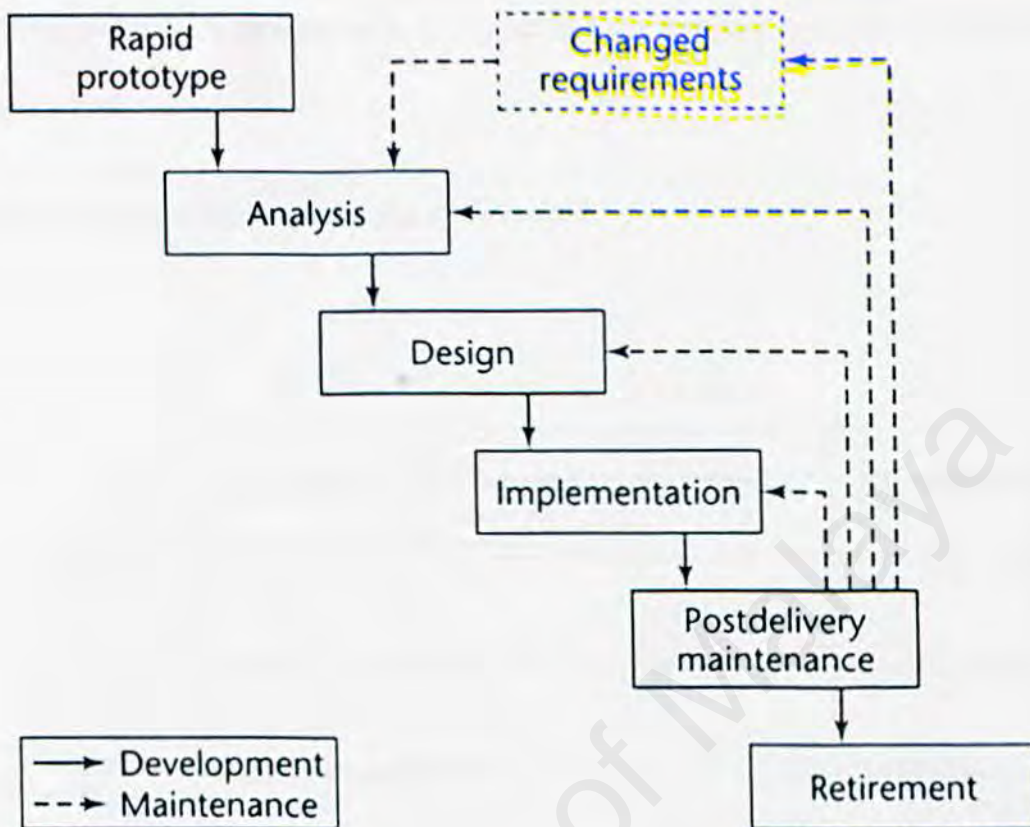
each phase be carefully checked by SQA. Besides, it is known as documentation driven.

However, this model has its own weaknesses. Typically, the specification documents are long, detailed and quite boring to read. The client is usually inexperienced and unfamiliar in the reading of software specifications and often misunderstand it. There is a considerable difference between the way a client understands a product as described by the specification document and the actual product.

### 3.2.3 Rapid prototyping life cycle model

The prototyping model is developed with the assumption that it is often difficult to know all of the requirements from the beginning of a project. Normally, users know many of the objectives that they wish to address, but they do not know all the nuances of the data, nor do they know the details of the system features and capabilities. The rapid prototyping model allows for these conditions. It offers a development approach that produces results without first requiring all information up-front.

When using the prototyping model, the developer builds a simplified version of the proposed system and presents it to the user for consideration as part of the development process. The user in turn provides feedback to the developer who will go back to refine the system requirements to incorporate the additional information.



*Figure 3.3: The rapid prototyping life cycle model*

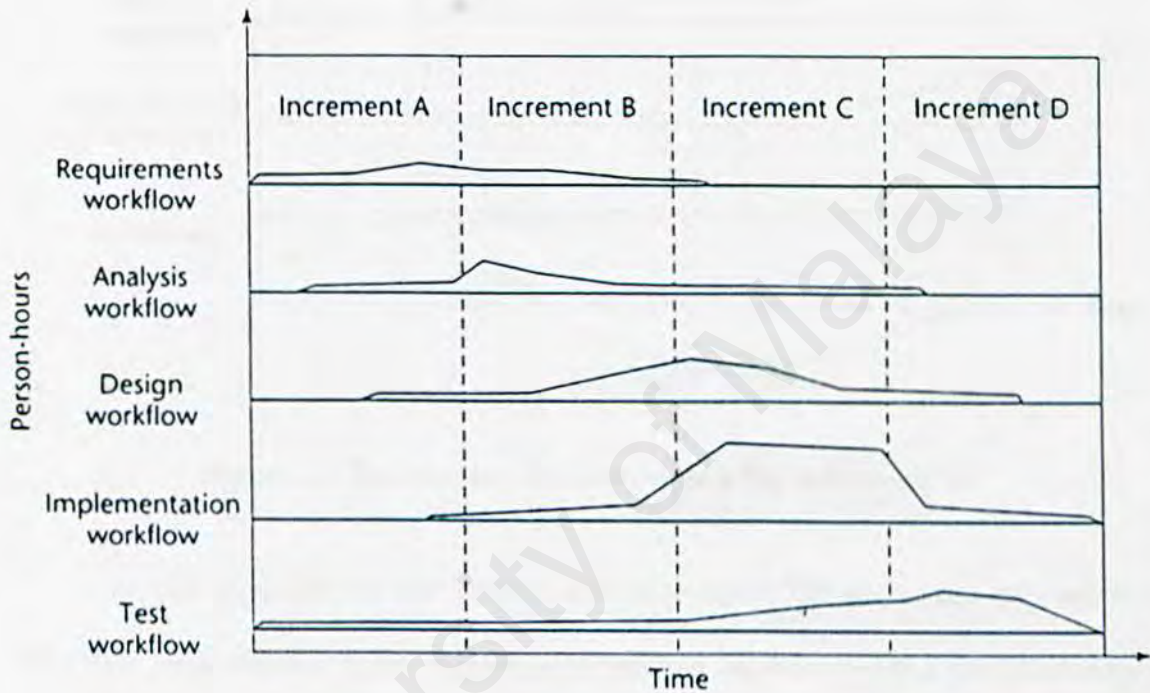
The first step in the rapid prototyping life cycle model depicted in Figure 3.3 is to build a rapid prototype and let the client and future users interact and experiment with the rapid prototype. Once the client is satisfied that the rapid prototype indeed does most of what is required, the developers can draw up the specification document with some assurance that the product meets the clients' real needs.

A major strength of the rapid prototyping model is that the development of the product is essentially linear, proceeding from the rapid prototype to the delivered product. The feedback loops of the waterfall model are less likely to be needed in the rapid prototyping model. It is because the working rapid prototype has been validated by



the client; therefore, it is reasonable to expect that the resulting specification document will be correct.

### 3.2.4 Iteration and Incremental life cycle model



*Figure 3.4: The iterative and incremental life cycle model I*

Figure 3.4 shows the development of a software product in four increments. There are different workflows which performed over the entire life cycle. There are five core workflows, the requirements workflow, analysis workflow, design workflow, implementation workflow, and test workflow.

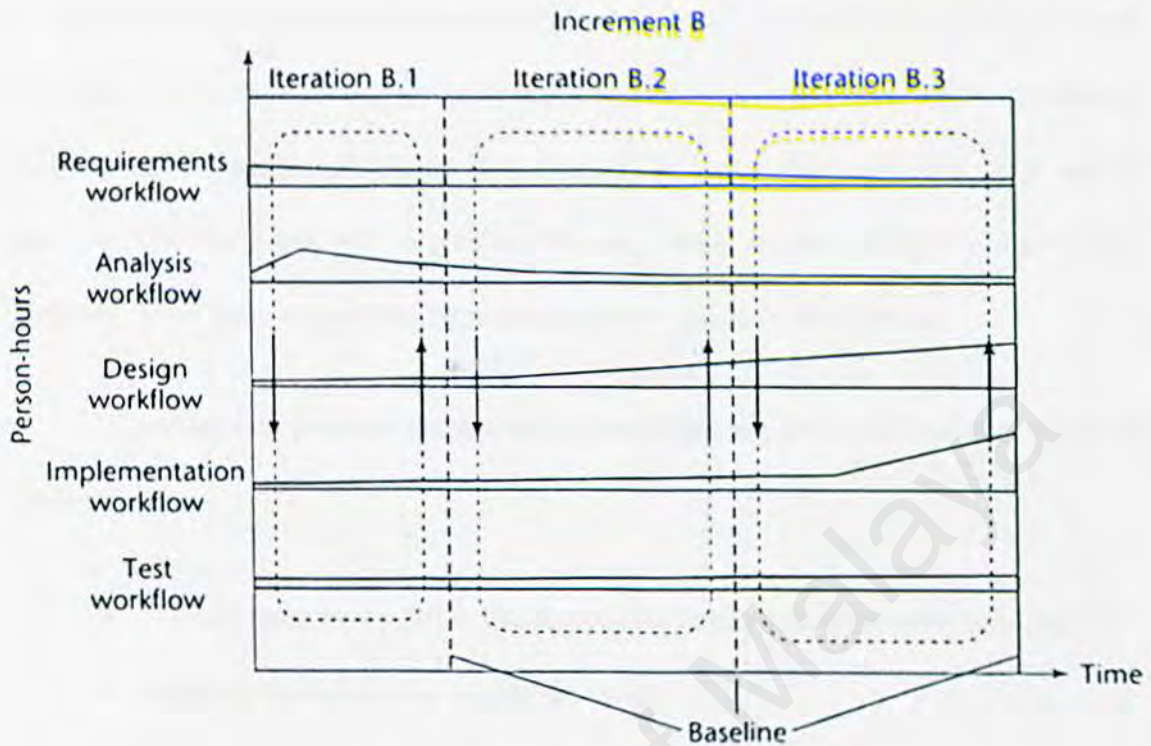


Figure 3.5: The iterative and incremental life cycle model II

At the beginning of the iterative-and-incremental life cycle, the requirements workflow predominates. These requirements artifacts are extended and modified during the remainder of the life cycle. During that time, the other four workflows predominate. Every workflow performed from one increment to another increment. Planning and documentation activities are performed throughout the iterative-and-incremental life cycle. Besides, testing is a major activity at the end of each iteration.

### 3.2.5 Extreme Programming

Extreme programming is somewhat controversial new approach to software development. The first step is that the software developer determines the various features the client would like the product to support. For each feature, the client will be



informed by the developer how long it will take to implement and how much it will cost. The client selects the features to be included in each successive build using cost-benefit analysis. The proposed build is divided into smaller tasks. Test cases for a task will be draw up. The developer will implement the task, ensuring that all the test cases work correctly. Then task is then integrated into current version of the product.

There are few features of extreme programming are somewhat unusual which are listed as below:-

- The computers are put in the center of a large room lined with cubicles.
- A client representative is always present.
- Software professionals cannot work overtime for 2 successive weeks.
- There is no specialization.
- Refactoring or design modification where the design is modified while the product is being built.

Even extreme programming has been successfully used on a number of small-scale projects, however, that does not necessarily that it can be used for medium- or large-scale software products. Extreme programming is one of new paradigms that are collectively referred to as agile process. It is less emphasis on analysis and design and with implementation starting much earlier in the life cycle, because working software is considered more important than detailed documentation. It is responsible to changes and always collaborating with the client.

### 3.2.6 Synchronize-and-stabilize life cycle model

This model is basically used by Microsoft. The requirements analysis phase is conducted by interviewing numerous potential clients for the package and extracting a list of features of highest priority to the clients. A specification will be draw up and the work is divided into three or four builds. Each build is carried out by a number of small teams working in parallel. At the end of each day, all the teams synchronize, where they will combine the components to test and debug the resulting product. At the end of each build, stabilization is performed to detect faults and then freeze the builds.

These steps ensure the various components are always working together. The developers can obtain early insight into the operation of the product and can modify the requirements if necessary.

### 3.2.7 Spiral life cycle model

The spiral model is actually a rapid prototyping life cycle model with each phase preceded by risk analysis, as shown in Figure 3.6. It shows that before commencing each phase, an attempt is made to mitigate the risks. If all the risks cannot be mitigated, the project is immediately terminated.



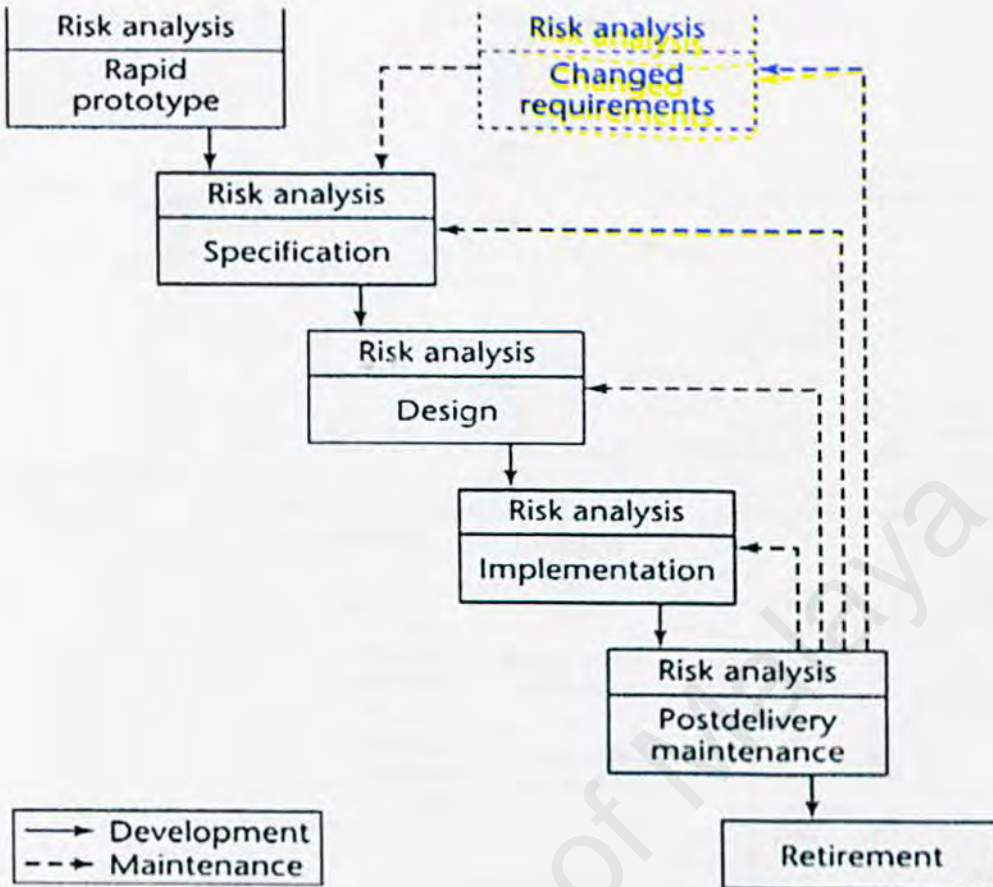


Figure 3.6: A simplified version of the spiral life cycle model

The full spiral model is shown in Figure 3.7. The radial dimension represents cumulative cost to date and the angular dimension represents progress through the model. Each cycle of the spiral corresponds to a phase. A phase begins by determining objectives, alternatives, and constrain of that phase. This process results in a strategy for achieving the objectives. This strategy is then analyzed from the viewpoint of risks. After the risks are successfully mitigated, the next development step is started.

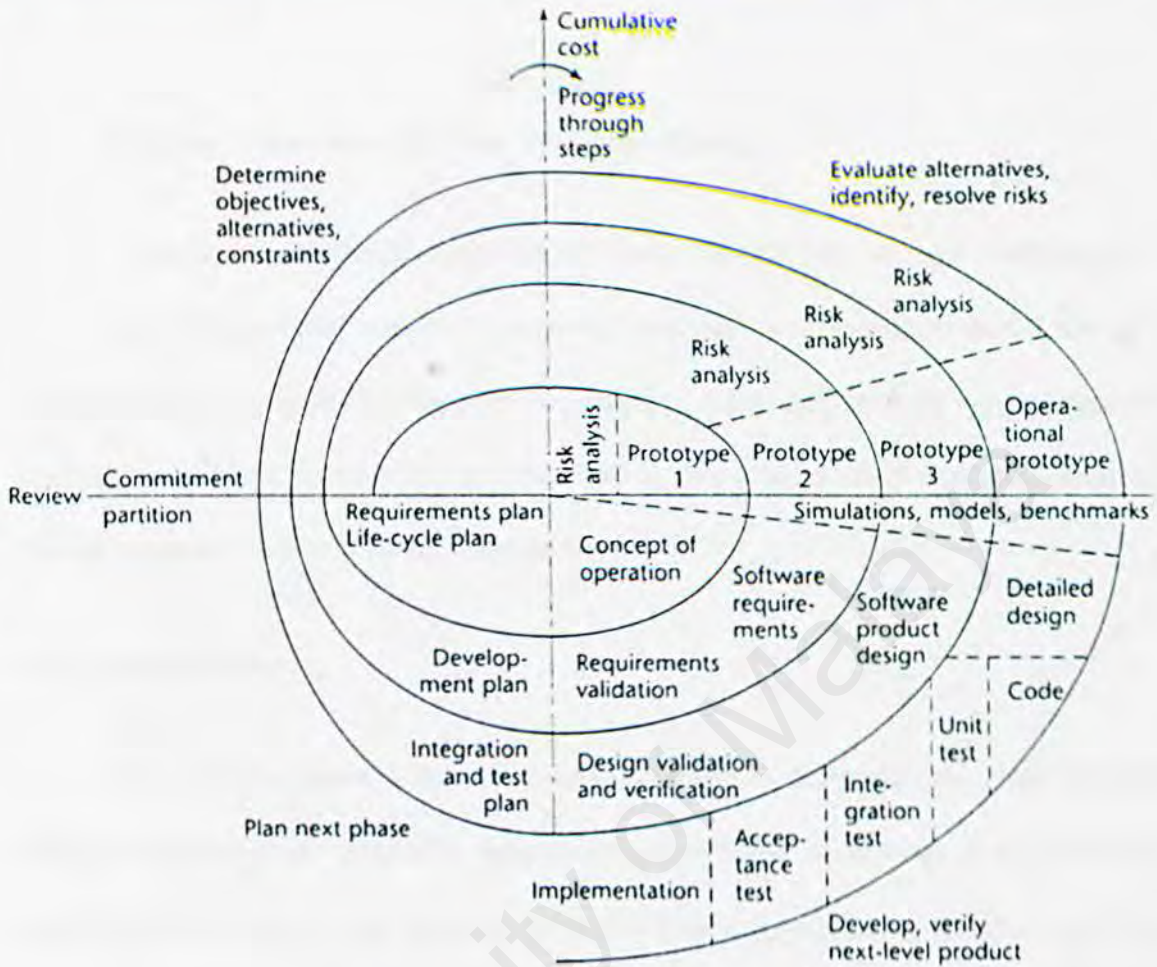


Figure 3.7: Full spiral life cycle model

The spiral model has a number of strengths. The emphasis on alternatives and constraints supports the reuse of existing software and the incorporation of software quality as a specific objective. Besides, it is easy for this model to judge how much to test for certain specific phases.

There are restrictions on the applicability of the spiral model. This model is intended exclusively for internal development of large-scale software. Often it is adopted for internal or in-house software only.



### 3.3 Methodology Consideration (The Waterfall Model)

Typically, each of the suggested life cycle models has its own strengths and weaknesses. Thus, careful selection is required to ensure that the process model selected is the most suitable model for the proposed project. After analyzing these approaches, the waterfall model is chosen to be implemented in this project. This model consists of several important steps which are listed as below.

#### *Requirements Phase*

Requirements phase is the very beginning phase of the project development. All the system requirements needed to develop the project have to be identified. Functional requirements, non-functional requirement and technical requirements are also identified in this phase. This phase plays an important role for developing the project. If the developer does not handle this phase well, the product may not meet the client's needs and there will be a risk where the client refuses the product.

#### *Analysis*

Analysis is the second important phase in order to develop the proposed project. Research and analysis need to be done to some existing systems which have similarity with the proposed project. This helps the developer to get a better understanding and knowledge about the strengths and weaknesses. Besides, the requirements gathered from the previous phase need to be analyzed. Information is gathered by the developer in

order to develop the proposed project successfully.

### ***Design***

The purpose of this phase is to transform the requirements statements and the results of the analysis into design specifications for construction. It addresses how technology will be utilized in the proposed system. Program layout which is designed to build the program is embedded in this phase. System functionality design and user interface design are shown so that the implementation phase can be done smoothly later.

### ***Implementation***

In this phase, the real system is implemented. System designs are transferred to useful and meaningful codes using proposed system tools. Every program built will be tested to ensure that it meets the specifications needed.

### ***Post Delivery Maintenance***

After the proposed project is finished develop by the developer, it will delivered to the client. There is certainly a phase where the developer needs to give commitment to the client for further services or in other word, the post delivery maintenance. The purpose of this phase is to maintain the product if there are any changes required from the client.

Overall, waterfall model is implemented in this project because it is a familiar and common used life cycle model, it follows the process sequentially. Developer can manage the development process effectively and efficiently. Each phase or process is



stable because it has its own unique functionality which provides clearer information to ensure the development process can be done smoothly. Besides, modifications can be done within each phase. It means that if there are any changes for the project in earlier phases, there will be a feedback loop where the developer can maintain the phase until it meets the expected outcome.

The waterfall model is document driven where the documentation is done from the beginning until the end of the project development. Documentation is very important because it makes the post delivery maintenance to be done easily and smoothly where the developer does not need to take time and trace back to find where the problems occurred.

### 3.4 Information Gathering

For this project development process, methodology plays an important part to gather information and resources. Several different methods or techniques have been used to analyze the project, obtain the information needed and related materials regarding to this subject. These methods include brainstorming, internet surfing, consultation with supervisor and book references. These techniques are discussed briefly below.

#### 3.4.1 Brainstorming

Starting from the preliminary stage, a brainstorming session has been held to

gather information about UM presentation based on personal view and knowledge. The purpose of this action is to gain the understanding of the concept behind the project. Brainstorming among friends triggers creative ideas. These ideas have defined the basic functions that this presentation should perform. Gathering among course mates is useful to produce ideas which can be integrated into the project. The identified ideas are then justified so that the functionalities will enhance the idea transformation process.

### **3.4.2 Internet surfing**

The internet is a knowledge and sources repository which plays an important part in the information gathering process. It has become one of the major sources for obtaining the latest information. It is the convenient, economical or cost effective, time efficient and easiest way of accessing and gaining information. Search engines such as Yahoo and Google are used to obtain plenty of information.

### **3.4.3 Consultation with supervisor**

Consultation with supervisor provides the basic understanding of the project and it helps to validate the problems face. Proper solutions can be identified to solve the problems. Besides, the discussion process gives in depth understanding of the project scope and help to identify the system requirements.

### **3.4.4 Book references**

The library is the traditional way to obtain the source of information. It has become one of the options for collecting useful information from various related books.





The traditional reading strategy helps a lot in the development process. There are many theses which have done by senior students are stored in the faculty's document room. These theses provide the general guidelines to help in this project's development.

### 3.5 Summary

It is important to model a software development process because it reflects the goal and objective of the software development. The description of development process forms a common understanding of the activities, resources and constraints involved in software development process. Besides, the process which represented in a form of a model helps to discover inconsistencies, redundancies and omissions in the process and its constituent parts. Every process should be tailored for the special situation in which it will be used. Building a process model helps the development team understand where the tailoring is to occur. The following chapter will discuss about the system analysis in detail.



## Chapter 4: System Analysis

### 4.1 Introduction

System analysis is the learning of a system where its components act as the precondition to the next process, the system design. System analysis is the early phase in system development. Essentially, system analysis is a problem solving technique that decomposes a system into its components for the purpose of studying how well those components work and interact to accomplish their purposes. The aim of system analysis is to obtain a great understanding of the requirement specifications and to describe those specifications that the resulting designs and implementations are easy to maintain.

### 4.2 System Requirement Analysis

System requirement is a feature or description of the function of the proposed system which is capable to be implemented by the developer in order to fulfill the system's purpose. The users' needs of the system are clearly defined. The broad outline and technology used in the system development will also be clarified. After analyzing the gathered information, the requirements for the proposed project are separated into two parts, which are functional requirements and non functional requirements. Analysis on the system requirements is very important because if the developer is failed to do so, the following problems will be appear:-





### ***Home Module***

This module is the main page of this multimedia presentation to give the user general idea of the whole system. It contains a main menu and it allows the users to select which module they wish to enter to get more information about it.

### ***Overview Module***

This module will show an overview of the university. Its content includes some of the important information about the university, such as Mission, The VC, Senior Management and History.

### ***Orientation Module***

This module functions as a collection of all information about orientation week for the university's first year students. Students can get better understanding of the activities and things needed during the orientation week.

### ***Academics Module***

This module will let the users to navigate through the campus map to view information about the existing academics such as academies and faculties. Each academy inside the map is clickable so that user can click on it to get more information about the academics.



### ***Colleges Module***

This module will enable the users to navigate through the campus map which shows the information about it. Users can interact with the map where more information will provide after the users have clicked the button inside the map.

### ***Facilities Module***

This module will let the users to view more information about the university's facilities. Users shall be able to get better understanding about the facilities provided by the university.

### ***Miscellaneous Module***

This module consists of other information about the university. Information such as UM song and Route to UM will be included inside this module. More photos will be provided to let the users getting more information about the university.

## **4.2.2 Non Functional Requirements**

Non functional requirements are not directly concerned with the specific function delivered by the system. Non-functional requirements describe about other features, characteristics as well as constraints that define a satisfactory system. Although the non functional requirements are subjective, they are as important as functional requirements in the system development process. Different types of non functional requirements are listed as below:-





### ***User Interface***

The proposed system is required to have an interface where the interface is specifically intended to allow the users to access the internal components of the system. This interface which is created by the developer is not too complex for the user. With the appropriate combination of colors and graphics, the interface will attract the user to explore the system. The users can just using the keyboard and the mouse as the main input for this system. Graphical User Interface approach should be used for better visual effect.

### ***User Friendliness***

User friendly is an essential criterion for the ease of usage. The user friendly interface is important to help the users to use the system confidently and do not encounter any difficulties. It is easy to understand by all types of users and they can access the system without any conflicts. Therefore, an appropriate menu will be provided to give the users an overall view of this system.

### ***Reliability***

A system is considered reliable if it does not produce dangerous or costly failures when it is accessed by the users. In other words, if the application system, software and hardware do not cause any unnecessary failure and downtime when users use it in a proper way, the system is said to be reliable.



### ***Usability***

The system must be convenient for the users to use. Complex and unnecessary steps when accessing the system should be avoided.

### ***Response Time***

The better response time should fall within interval time for retrieving any data or information. A system should have a shorter response time so that the users will not spend too much time waiting for the information loading. It is to make sure that users will not get bored.

### ***Maintainability and Expandability***

Maintainability is the ease with which a program can be corrected if an error is uncounted, adapted if its environment changes, or enhanced if the customer desires a change in requirements. A product is maintainable as the program is easily modified and tested in the case of updating a process to correct errors or move to a different computer system. The architecture and design can be extended if necessary amendment is required in the future.

### ***Easy Navigation***

The arrangement of the system interface and information has to be well construct so that the users will not face any difficulties when navigate the system. In other words, the navigation design should be clear and simple.



## Interactivity and Manageability

Interactivity is one of the main aspect or feature to attract users of the multimedia system. Appropriate level of interactivity should manage by the developer to let the user to communicate with the system. The system should be able to manage easily without occurs too many problems.

## 4.3 Hardware and Software Requirements

The basic requirement to develop a system is the hardware and software requirements. Hardware and software requirements describe the constraints on computer and development support software to ensure the system development process is able to carry out. Without hardware and software, the system will not be implemented by developers smoothly. This section discusses about the hardware and software that are required for the system development for the developer side and user side. The hardware and software requirements are listed as below:-

### 4.3.1 Developer Side Requirements

Hardware Requirements	Software Requirements
<ul style="list-style-type: none"> <li>Intel Pentium IV Processor 1.7GHz</li> <li>256 MB RAM</li> <li>40 GB Hard Disk Drive</li> <li>Graphic Card</li> </ul>	<ul style="list-style-type: none"> <li>Windows XP Professional (Operating System)</li> <li>Digital Imaging Tool</li> <li>Multimedia Authoring Tools</li> </ul>



<ul style="list-style-type: none"><li>• Stereo Speakers</li><li>• CD-RW Drive</li><li>• 1.44 MB Floppy Disc Drive</li><li>• Mouse</li><li>• Keyboard</li><li>• 17 Inch monitor</li><li>• Digital camera</li><li>• Other standard computer peripherals.</li></ul>	
--	--

*Table 4.1: Developer Side Requirements*

#### 4.3.2 User Side Requirements

Hardware Requirements	Software Requirements
<ul style="list-style-type: none"><li>• Pentium III Processor 800 MHz and higher</li><li>• 64 MB RAM and above (128 MB recommended)</li><li>• 10 GB Hard Disc Drive</li><li>• Graphic Card</li><li>• Stereo Speakers</li><li>• CD-ROM</li></ul>	<ul style="list-style-type: none"><li>• Windows Me / 2000 / XP</li></ul>



<ul style="list-style-type: none"><li>• Mouse</li><li>• Keyboard</li><li>• 15 Inch Monitor</li><li>• Others standard computer peripherals.</li></ul>	
--	--

Table 4.2: User Side Requirements

## 4.4 Chosen Development Tools

### 4.4.1 Microsoft Windows XP Professional

Microsoft Windows XP Professional is the most suitable to be used as the platform to view this multimedia presentation. This latest Microsoft operating system has better functions, fast, lots of compatible software, compared from other OS. It is more reliable and up to date.

#### *Reliability*

The best part of Window XP is its ability to prevent any errors from occurs. Even though error still exists, it will stop the program's process while not to disturb any other running process. It also has the built-in repairing system to return the system back to normal.

### ***Mobility***

Mobile computing is simpler and more efficient with Window XP Professional. It means that users can work anywhere, anytime and much more saving time while increasing productivity. Latest mobile operating system which is currently using Window Palm XP is much more efficient and easy-to-use than other operating system. Even an O2 PDA using Windows XP as its platform.

### ***Manageability***

Windows XP Professional is easier to deploy, manage and support. Centralized management utilities, troubleshooting tools, and support for self-healing applications all make it simpler for all users to manage their computers. Furthermore it is cheaper than other operating system.

### ***Security***

Windows XP Professional provides very tight security features to protect sensitive data. Now it has wireless networking capabilities by adding support for the IEEE 802.1X security protocol. Accessing to the Internet will never be this easier with Windows XP Professional.

### ***Internet***

The familiar user interface of Windows 98 and the capabilities of Internet Explorer 6, makes using the Internet and the local desktop a unified user experience.





This user interface with integrated search capabilities makes information search much easier.

### *Usability*

Windows XP Professional is a combination of Windows 2000 and Windows 98. Using windows 2000's power and security while using the traditional ease of use of Windows 98.

### *Hardware*

Windows XP Professional lets people to take advantage of new hardware devices, such as those with universal serial bus 2.0 (USB), IEEE 1394 (FireWire), IEEE 802.1X, and Bluetooth. It also support for existing hardware makes Windows XP Professional ideal for home-use and large company as well.

#### **4.4.2 Adobe Photoshop 7.0**

Adobe Photoshop 7.0 will be used as a main digital imaging development tool for this multimedia presentation. it is a very advanced and commonly used graphic program that allows all formats of images such as GIF, JPG, PCX, BMP and many other image formats to be imported, edited, customized and changed.

As an overall, Adobe Photoshop 7.0 is the professional image-editing standard, helps the 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



Adobe Photoshop 7.0 enable images to be optimized and decreasing the sizes of the images to dramatically reduced the loading time. It lets users to create rollovers easily allowing images to change when the mouse is placed over the image. Apart from that, Photoshop also offers many other advanced features for the greater enhancement of interactive experience.

#### 4.4.3 Macromedia Flash MX

Macromedia Flash MX is chosen as one of the multimedia authoring tools for making some interesting two-dimensional animation. It is an important tool because of the familiarity this software.

Macromedia Flash format is currently the most widely used vector graphics and animation format on the web today. The recent additions of non-proprietary formats such as SVG may, in time, give web designers a choice of vector graphics and movie formats. Flash movies are distributed as SWF files, a compact binary file format that requires an additional browser plug-in to be available in order for the movie to be viewed.

With Macromedia Flash MX, I can spend less time coding and more time designing forward-thinking new projects. Using the Behaviors Panel and the new data connectivity features, I can easily add interactive elements to this thesis without coding a thing.



#### 4.4.4 Swish 2.0

Besides than Macromedia Flash MX, Swish 2.0 has been chosen for making animation, too. Swish is basically jam packed with features that make producing stunning interactive Flash animations a simple and painless experience. There are many features that make Swish so powerful such as scripting where no coding is required.

Swish is bundled with over 230 built-in effects. These effects can used to make animations with text, images, graphics and sound simple and quick to produce. There are advanced set of drawing tools provided and complex Shape editing option making it easy to modify the shapes.

#### 4.4.5 Discreet 3ds Max

Discreet 3ds Max has been chosen to be an authoring tool to make the three-dimension animation. The reason to choose this software is this is common used software which has many features to built animation easily. Three-dimensional animation is more reality compare with two-dimensional animation.

### 4.5 Summary

This chapter discusses about the system requirement where the functional requirement and non-functional requirement are analyzed. Hardware and software as well as the chosen development tools are also included inside it. The following chapter will discuss about system design.

## Chapter 5: System Design

### 5.1 Introduction

System design is a process to convert the conceptual ideas from requirement specification in system analysis into more technical specification. System design is necessary in order to determine the features of the system components, processes and its appearance to the user.

System requirement defined in the previous chapter is now translated into a system design specification to build a complete and executable system. The objectives of system design are listed as below:-

- Specify logical design element - Detailed design specification with specific logical elements that describe the features of a system.
- Meet user's requirements - Meet user need in term of appropriate procedure and performance, proper presentation, accurate and reliable results and overall reliability.
- Ease of use - Build an easy-to-use with ergonomic design that requires favorable human engineering, physically comfortable and contribute to user effectiveness.

To create a well structured and interesting system, designer has to be creative so that the final outcome will attract users to use the developed system frequently. Besides, designer needs to have more knowledge and experience in the area. To gain more



experience and knowledge, designer should always analyze and review other existing systems.

Besides designing skills, selecting appropriate software tools for the system developing also plays an important role. With the help of convenient multimedia development tools, clear and sharp elements can be created and designed. This chapter will show about the flow of system that is going to develop. System design specification includes the following issues:

- System Functionality Design
- User Interface Design

## 5.2 System Functionality Design

The arrangement of the structure chart shows the relation between modules in this multimedia presentation. It is used to show the activities that existing in the system. The main part of the design is to focus on the system functionality design. Different designers will approach the system functionality design process in different ways.

System functionality design is presented in a form of hierarchy chart. It is used to identify the major modules that act on data at the high levels of the UM Presentation. The components at high level can be broken into sub modules or sub functions if necessary.

Typically, the UM presentation will have the following modules:

- Home Module
- Overview Module
- Orientation Module
- Academics Module
- Colleges Module
- Facilities Module
- Miscellaneous Module

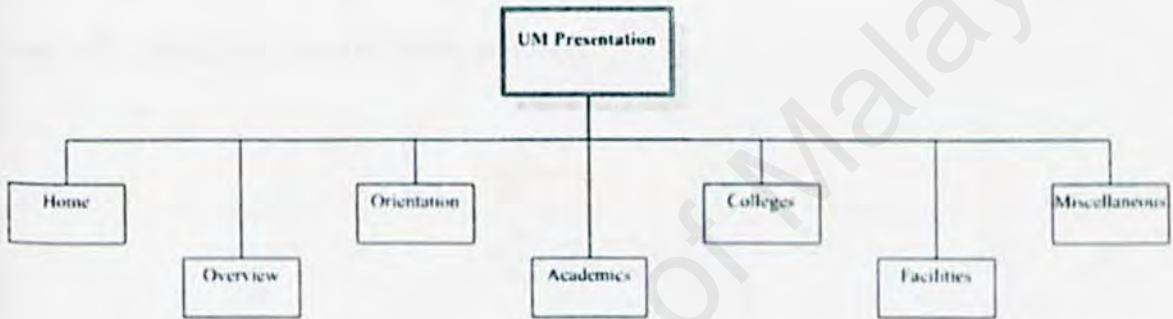


Figure 5.1 Structured Chart of UM Presentation

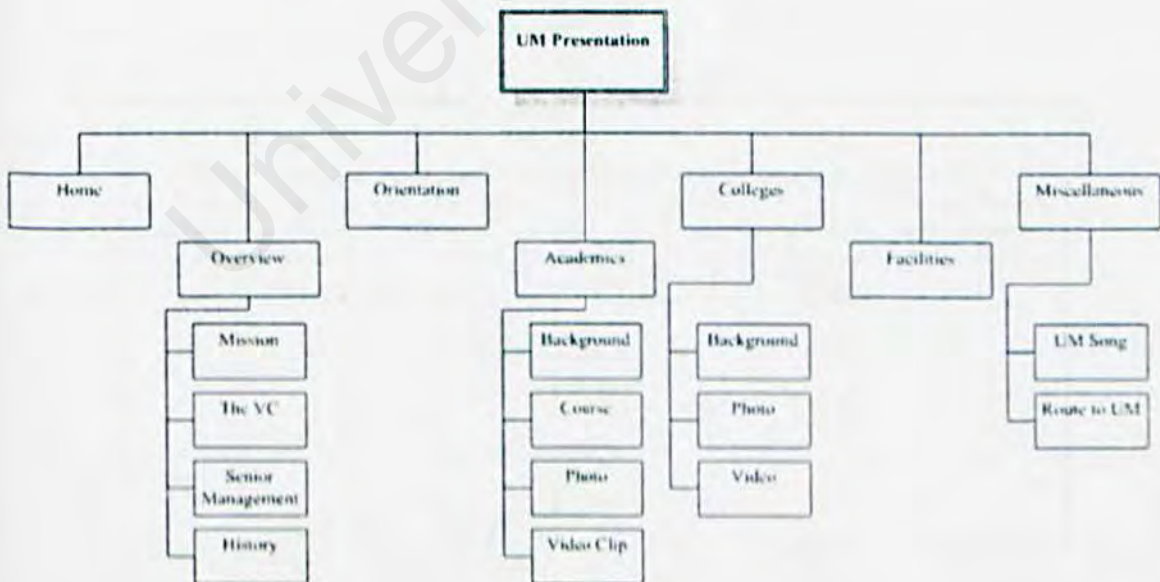


Figure 5.2 Full Structured Chart of UM Presentation



### 5.2.1 Home Module

This module is the main page or main interface of this multimedia presentation. It contains a main menu and it allows the users to select which module they wish to enter to get more information about the module.

To make it more attractive, a flash animation as an introduction for the whole system is added. Anyway, user is allowed to skip the animation by click on the "Skip Intro" button. This flash animation is actually simple and attractive. After the animation, user will directly go into the Home interface.

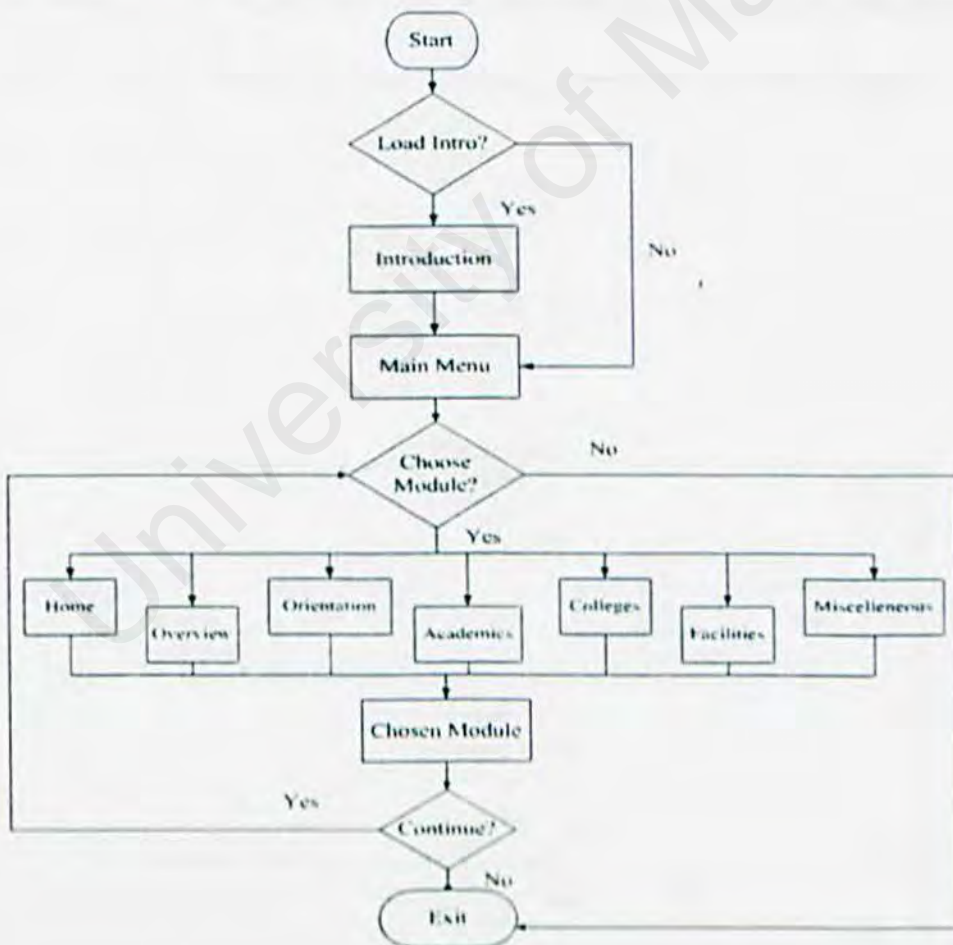


Figure 5.3 Flowchart of accessing the main menu

### 5.2.2 Overview Module

This module will show an overview of the university. It is divided into smaller modules or sub modules which are Mission, The VC, Senior Management and History.

- Mission is a sub module which shows the user or the University Corporate mission and objectives.
- The VC is a sub module which is introducing the Vice Chancellor of the University Malaya.
- Senior Management is one of the sub modules to show the senior management of the university. Photos are included so that users can get to know their faces.
- History is a sub module to show the detail history of University Malaya.

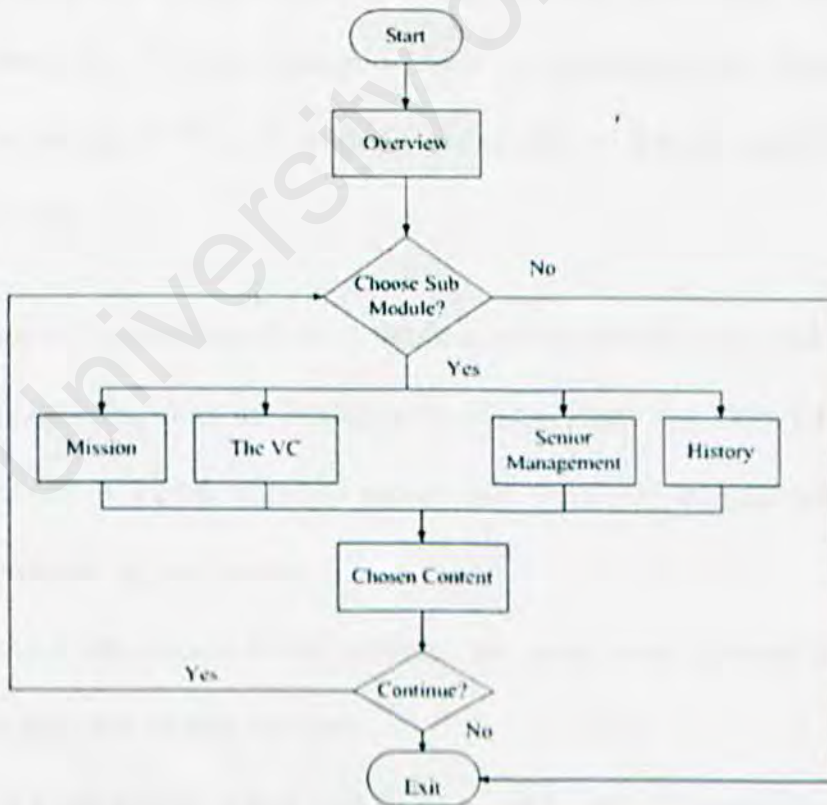


Figure 5.4 Flowchart of accessing the overview module



### 5.2.3 Orientation Module

This module functions as a collection of all information about orientation week for the university's first year students. Students can get better understanding of the activities and things needed during the orientation week.

- It consists of information where the first year students may gain more knowledge related to the orientation week.
- Students shall be able to have better understanding of what is needed and what should prepare for the orientation week in University Malaya.

### 5.2.4 Academics Module

This module will let the users to navigate through the campus map to view information about the existing academics such as academies and faculties. Each academy inside the map is clickable so that user can click on it to get more information about the academics.

- This module lists up links to each faculties and academies. Each link consists of four sub modules which are Background, Course, Photo and Video Clip.
- Background is a sub module which will show an introduction of some background of the academics.
- Course is a sub module which provided the users more information about the courses provided on each academy.
- Photo is a sub module which will let the users to view photos of the academics such as building, surrounding and etc.

- Video clip is another sub module to provide video clips taken by developer for the users to get better viewing of each academic.

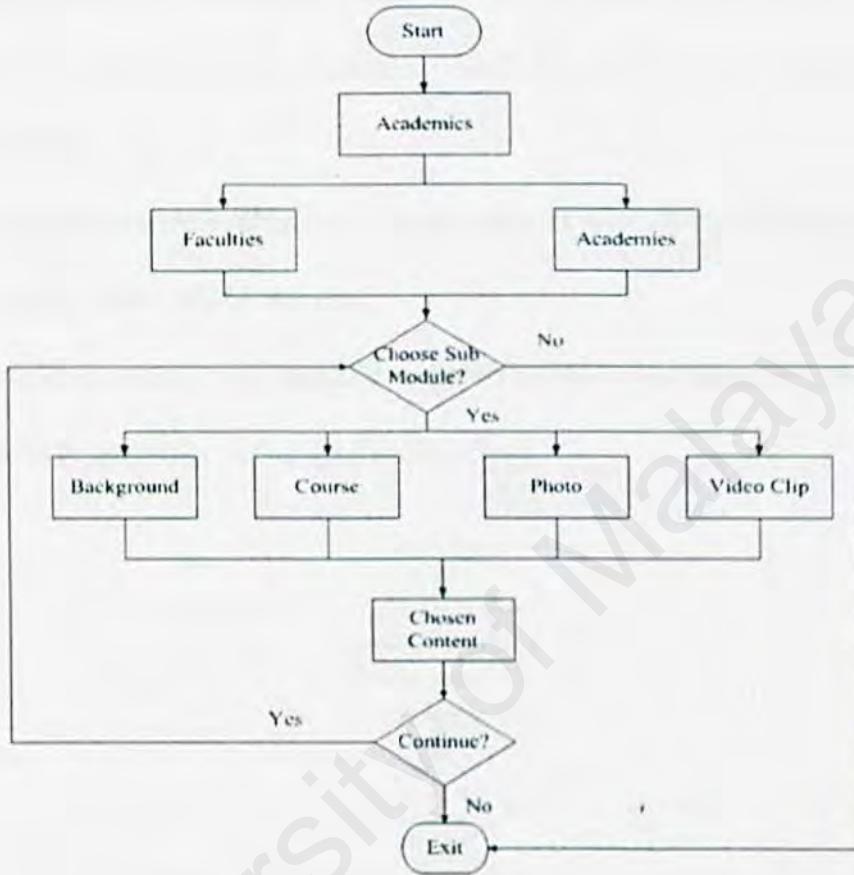


Figure 5.5 Flowchart of accessing the academics module

### 5.2.5 Colleges Module

This module will enable the users to navigate through the campus map which shows the information about it. Users can interact with the map where more information will provide after the users have clicked the button inside the map.

- Users shall be able to get better understanding about each residential college inside University Malaya.



- This module lists up links to each college. Each link consists of three sub modules which are Background, Photo and Video Clip.
- Background is a sub module which will let the users to get more information about the college such as facilities inside the college and also the contact information.
- Photo is a sub module which will let the users to view photos of the college such as building, surrounding and etc.
- Video clip is another sub module to provide video clips taken by developer for the users to get better viewing of each college.

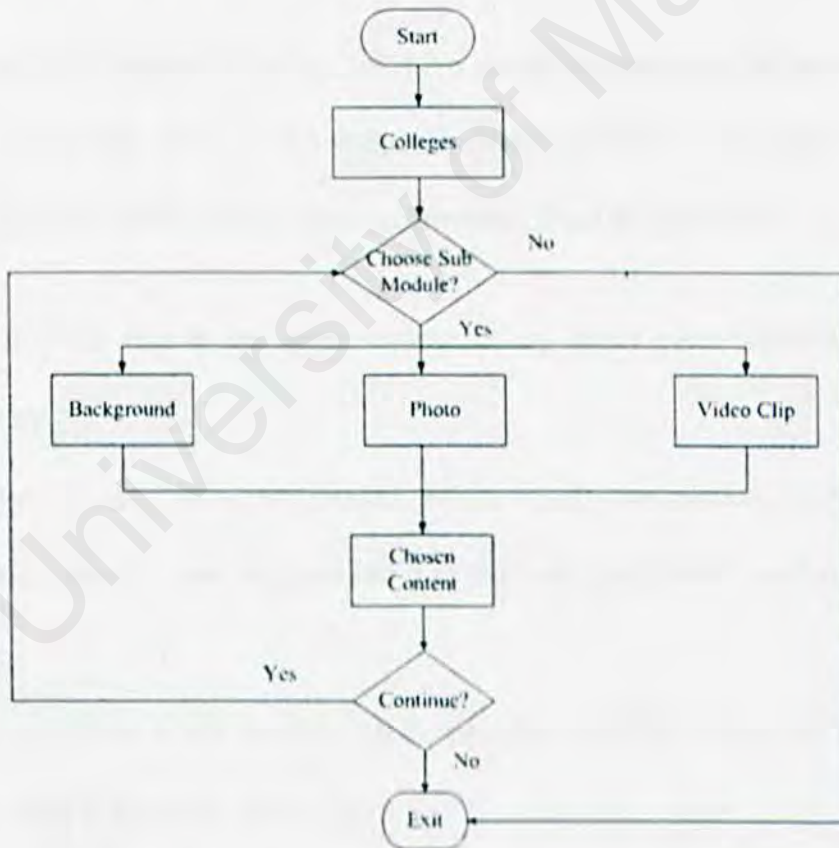


Figure 5.6 Flowchart of accessing the colleges' module

### 5.2.6 Facilities Module

This module will let the users to view more information about the university's facilities. Users shall be able to get better understanding about the facilities provided by the university.

- This module will provide a list of links to each facility.
- Simple information about the facilities as well as photos and video clips will provide for each facility.

### 5.2.7 Miscellaneous Module

This module consists of other information about the university. Information such as university's song and route to UM will be including inside it. More photos will be included also to let the users getting more information about the university.

- Users shall be able to get better understanding about other information of the university.
- University's song is a sub module exists inside the module. Lyric will be provided while the song is played so that users can get to hear the song and learn it faster.
- Route to UM is a sub module which provides different routes to show other people how to go to the university.



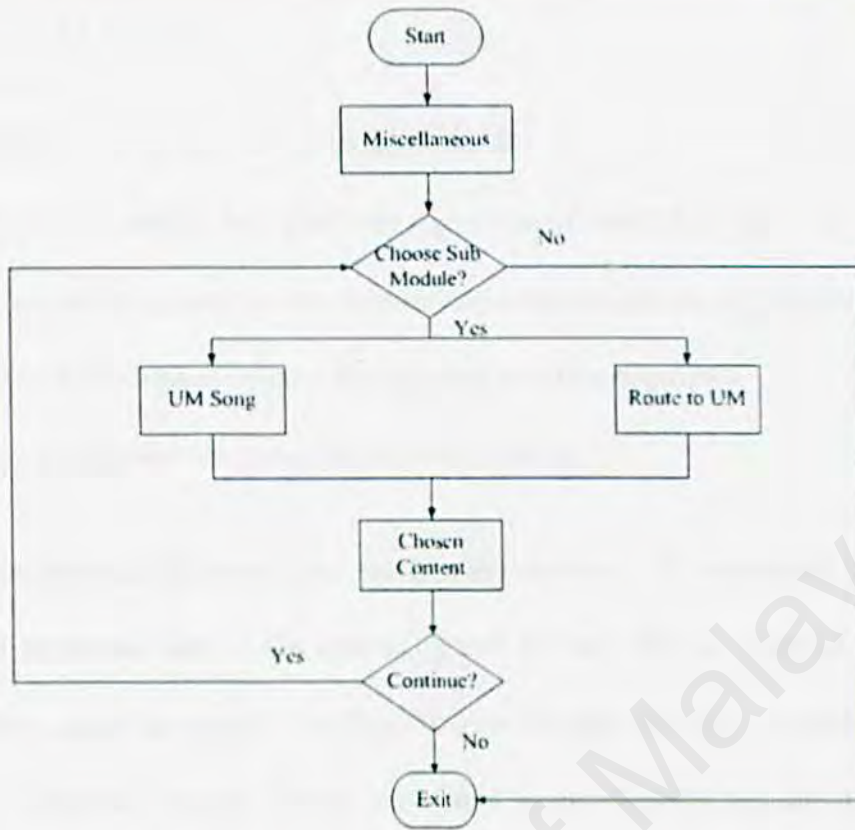


Figure 5.7 Flowchart of accessing the miscellaneous module

### 5.3 User Interface Design

User interface design is the specification of a conversation between the user and the computer. In designing user interface, the most important thing is to create and design the screen or display. Interface are very important because its allow user to interact with computer to run the system.

As we see the importance of interface, we need to come out with a design that is making the user to feel convenient when they are using the system. To do this, there are some guidelines to follow so that the interface will be more attractive and easy to use.

The guidelines are as below:

- Interface must be easy to understand and to use.
- Interactive interface will give user a good experience of using.
- The use of icons must be consistence and according to the functionality.
- Objects and elements within the interface must be organized.
- The use and combination of color must suitable.

The system interface will give the first impression to the user about the system. It is the most important part of the system. It will be easy for the users to navigate the whole system when the system interface is user friendly and easy to understand. Few layouts are designed roughly before the actual system comes out and it is easy for further system implementation.

### **5.3.1 Interface design for Home Module**

This is actually the most important module compare to other modules because it will be the first page when user starts accessing this package. It will give user the first impression for the whole system when user looks at it. In this page, user is allowed to choose which modules they want to proceed.



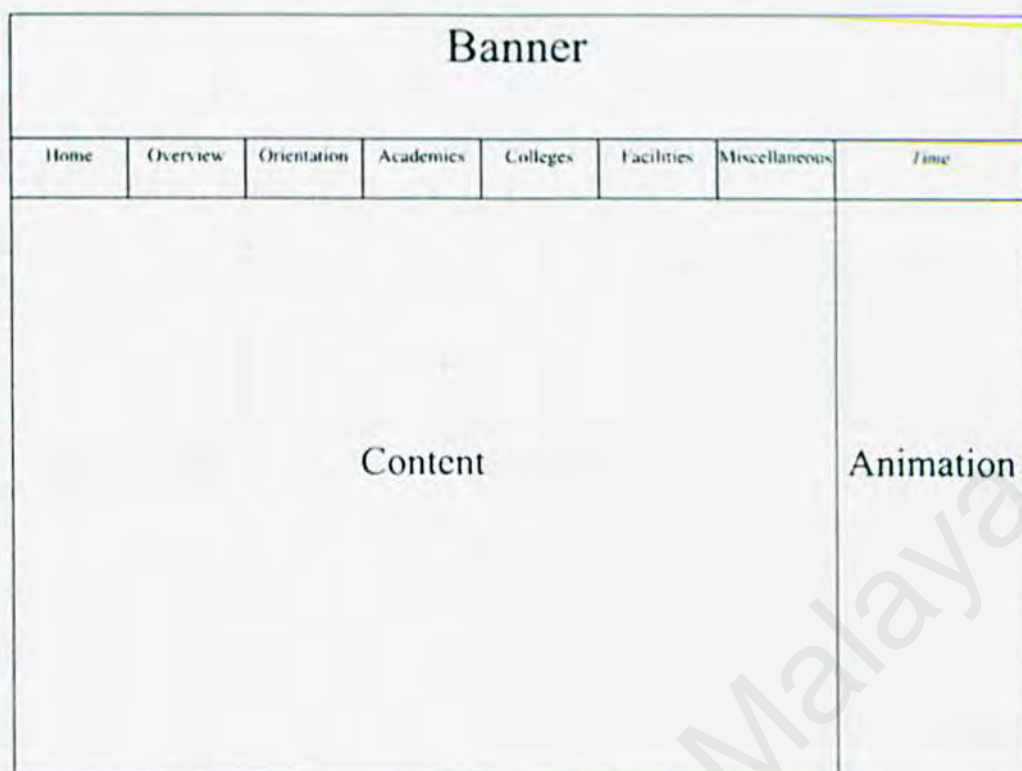


Figure 5.8 Home Module User Interface

### 5.3.2 Interface design for Other Module

Other than Home module, there are six more modules existing in the UM presentation. These modules have a similarity in the user interface because this will help the user to easy navigate and easy to understand the process. Not many changes done to the user interface so that user can get to know the system well and get familiar with it.

To avoid user feel boring when they browse through the presentation, interesting animation will shown on the rite side of the user interface. Sounds are integrated in it also.



Banner							
Home	Overview	Orientation	Academics	Colleges	Facilities	Miscellaneous	Time
Sub module		Content					Animation

*Figure 5.9 Other Module User Interface*

## 5.4 Summary

This chapter discusses about the system design interface generally. Besides that, this chapter also discusses about the features of the modules in UM presentation.





## Chapter 6: System Implementation

### 6.1 Introduction

This chapter will describe the implementation phase of the UM Presentation, in which the major concern is on how the application has been implemented. System implementation is an important phase to change system requirement and system design into workable system. The implementation phase focuses mainly on the architecture of the application, and at the same time, the operation of the prototype to achieve the goals and how the proposed presentation meets the design. In addition, the concepts and techniques used to implement on this presentation will be reviewed in this chapter in order to give a better view of this UM Presentation and its operations.

### 6.2 System Development Tool

System development tool is the main consideration which will give the effect to the program. As a result, choosing correct development tools will make the process of system implementation become more efficient and faster. Furthermore, this will increase the reliability of the program.



### 6.2.1 Hardware Requirement

- Intel Pentium IV Processor 1.7GHz
- 256 MB RAM
- 40 GB Hard Disk Drive
- Graphic Card
- Stereo Speakers
- CD-RW Drive
- Mouse
- Keyboard
- 17 Inch monitor

### 6.2.2 Software Requirement

- Microsoft Window XP Professional
- Adobe Photoshop 7.0
- Macromedia Flash MX 2004
- Swish Max
- Discreet 3ds Max
- Sothink SWF Decompiler
- Swift 3D
- Sound Forge 7.0





### 6.3 System Implementation Technique

This is to describe how the proposed specification can be turned into workable system. Many multimedia authoring tools were used in order to implement the UM presentation. Out of those development tools, Macromedia Flash MX 2004 played very important part and was used as the main development tool. Technique used for the system implementation will be described in details.

#### 6.3.1 Discreet 3ds Max

This software played an important part in designing the complicated 3D objects that are hard to create by macromedia flash. From modeling into animating 3D objects, this software provides such great techniques for it. This section will show how those 3D objects created and what techniques were used to model it. One of the techniques used was designing the 3D map of UM and CellShading technique. A general interface of discreet 3ds Max is shown on the following page.

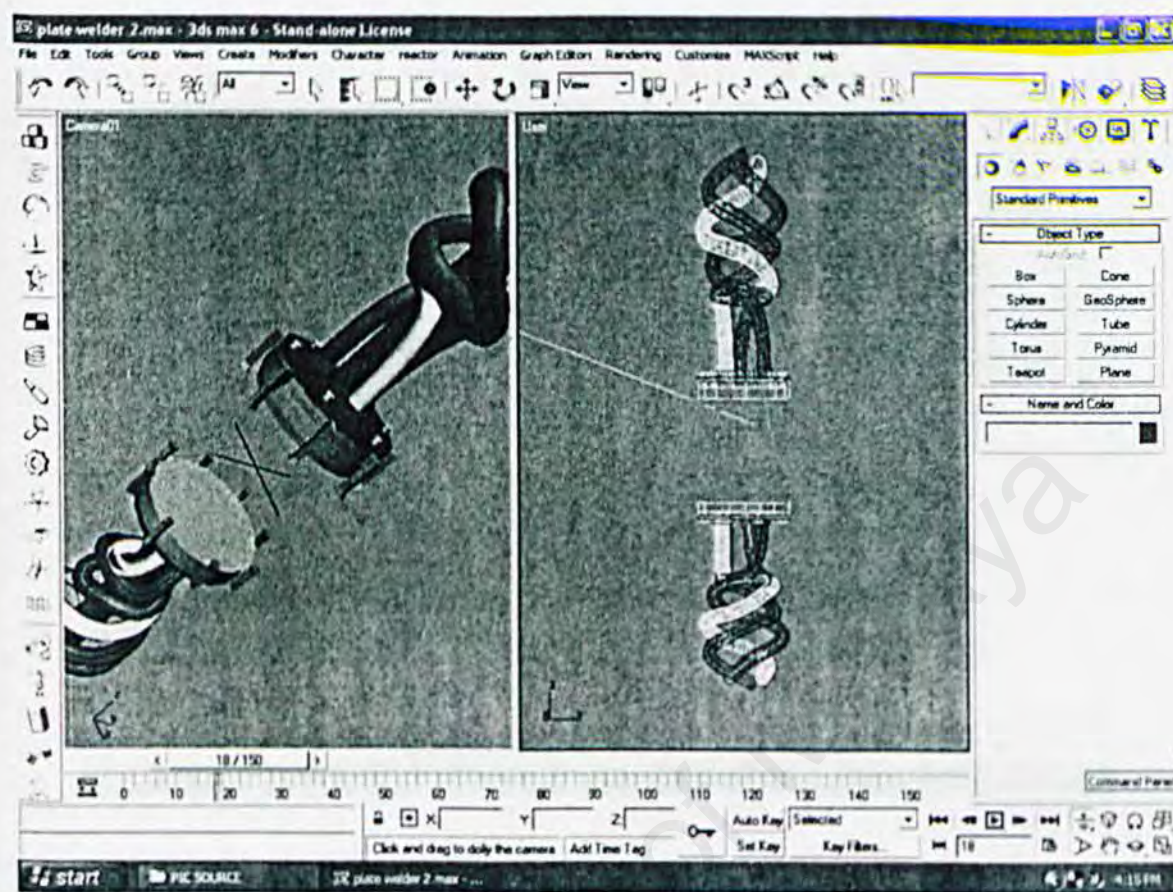


Figure 6.1 General Interface of 3ds Max

### Modeling the UM Plate Stamping Machine

The Stamping Machine was made using standard primitive geometry, cylinder. The head stamping, its screws, and the rod are cylinders. Except for the wires and the stamping hook are used with some special techniques provided within 3ds Max. The model of Stamping Machine is shown on the following page.



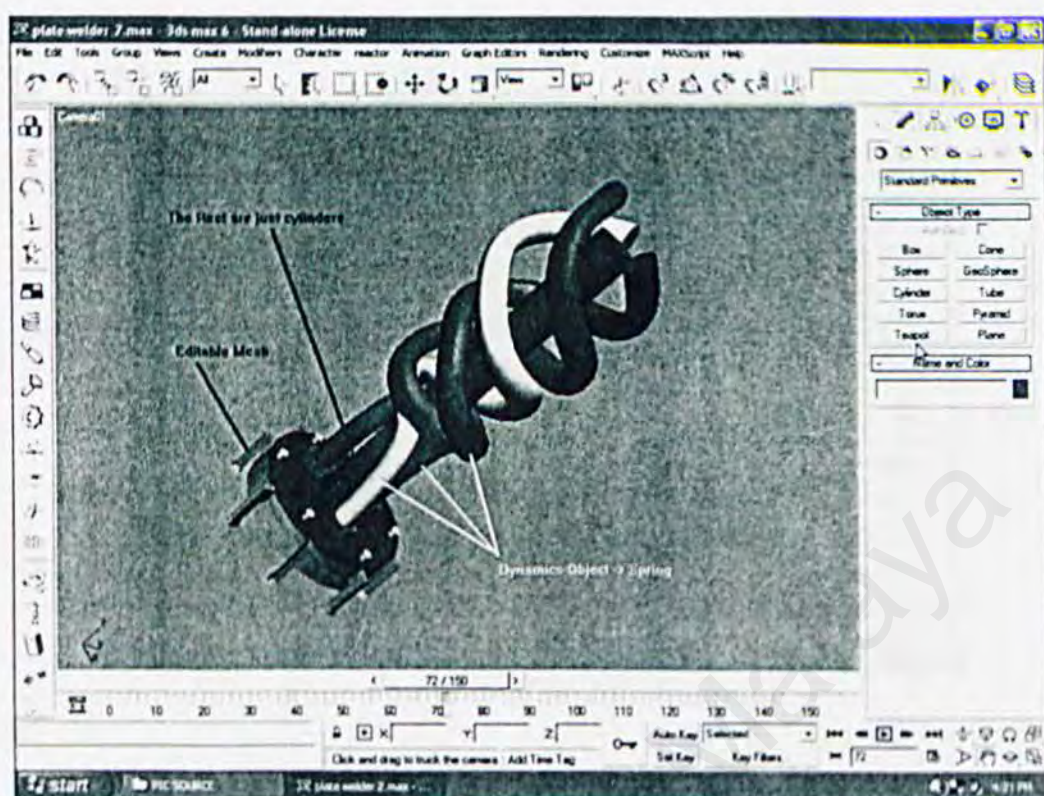


Figure 6.2 The Stamping Machine

### Dynamics Object

For the wires, Dynamic Object was used. There are many ways to create the wires. In this case, a dynamic object, spring was used.

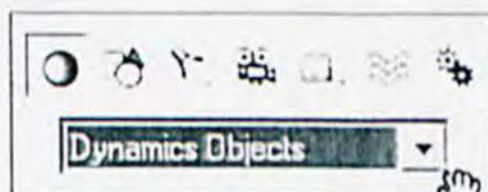


Figure 6.3 Creating the spring

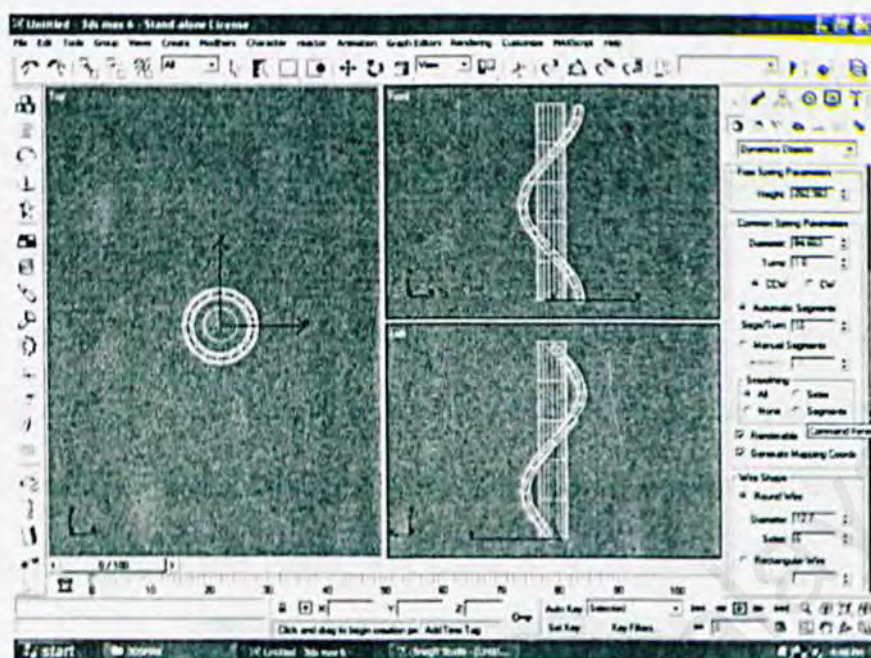


Figure 6.4 View of the earliest spring

At the earliest stage of the creation, the object still does not look like wire surrounding the rod. In order to do so, the Spring parameter has to be altered. The spring parameter was set like below:

- Diameter = 80.0 (how big the curl)
- Turn = 3.0 (how many curly circle created for the spring).

Free Spring Parameters	
Height	282.583
Common Spring Parameters	
Diameter	80.0
Turns	3.0
<input checked="" type="radio"/> CCW <input type="radio"/> CW	
<input checked="" type="radio"/> Automatic Segment	
Segs/Turn	1.0
<input type="radio"/> Manual Segment	
Segments	
Smoothing	
<input checked="" type="radio"/> All <input type="radio"/> Sides	
<input type="radio"/> None <input type="radio"/> Segments	
<input checked="" type="checkbox"/> Flexible	
<input checked="" type="checkbox"/> Generate Mapping Coord	
Wire Shape	
<input checked="" type="radio"/> Round Wire	
Diameter	10.0
Sides	6
<input type="radio"/> Rectangular Wire	
Width	



### Cloning Objects

In modeling, cloning is used to duplicate same object to save time. Like the object wire itself. In the development, three wires are set for the stamping machine. So, the cloning method was used.

On top view of workspace, while holding the shift key, the spring object was rotated around 120 degrees. It is because an equal distance can be made between wires since there are three wires circling to be made around the rod. After the wire was rotated, a popup named clone options will appear to define the new spring.

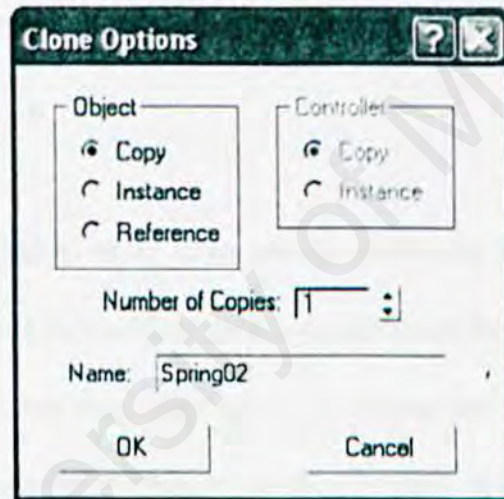


Figure 6.5 Clone Options

The creation proceeds by clicking the ok button. A new spring object will appear. The third spring object was also made using the same techniques.



Figure 6.6 Wires created using Cloning techniques

### Editable Mesh

As stated, an editable mesh is an object which can be edit freely either their vertices, line, or its faces. This method used to create hooks for the stamping machine.

At first, the hook was only a mere box. To change the box into an editable mesh, 3DsMAX provide easy change by choose an editable mesh in the modifier list.



Figure 6.7 Editable Mesh



## Extrude and Bevel

To create the hook, there are two techniques used which are extruded and Bevel.



Figure 6.8 Extrude and Bevel

In the beginning process, there's only a box. By clicking the extrude or bevel button, changes made to the box might change totally its original shape.

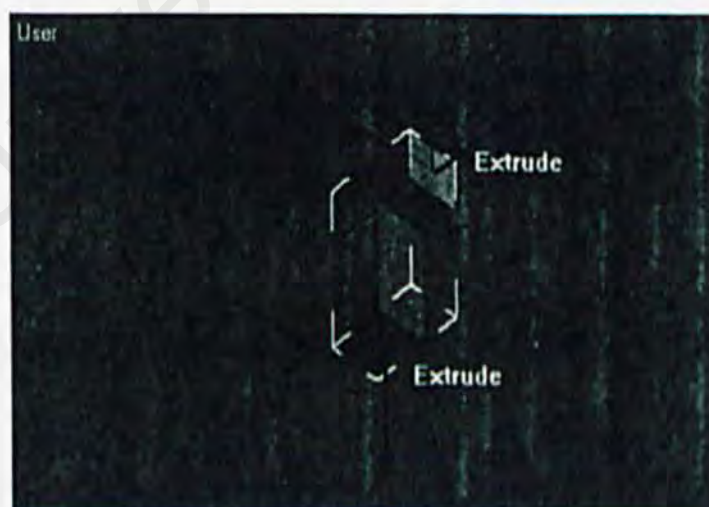


Figure 6.9 Extrude Mode

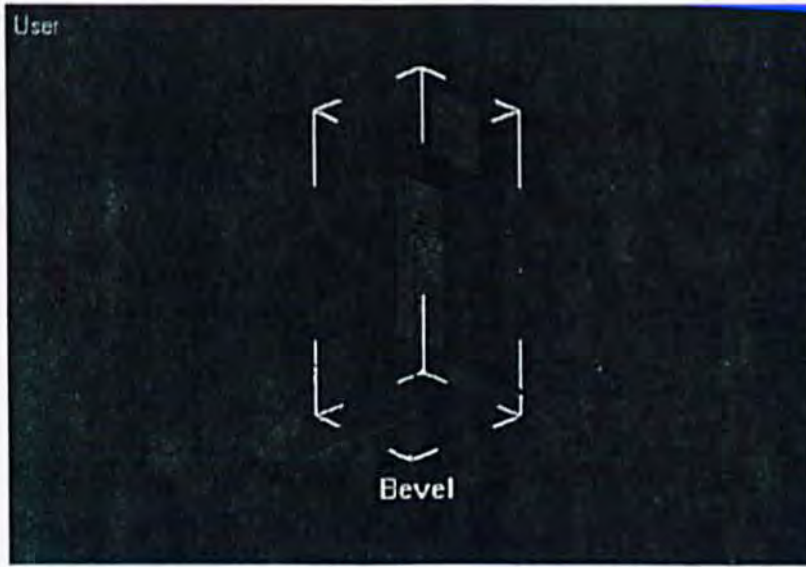


Figure 6.10 Bevel Mode

### ***Modeling the other 3D objects***

There are few 3D objects was created using the same techniques as creating the Stamping Machine. Right after a modeling the object, there file was saved and export into a 3DS file format which later will be used by Swift 3D to be converted into 3D vector graphics.

### **6.3.2 Swift 3D**

This software is also a 3D graphics program like 3ds Max. The reason why it is not used as a modeler and animator because it lacks of functionality compared to 3ds Max. Despite of all that, there is still a benefit of using this software since it can change the 3DS file into a file that can be used by flash without losing its quality, or shall known as vector graphics.



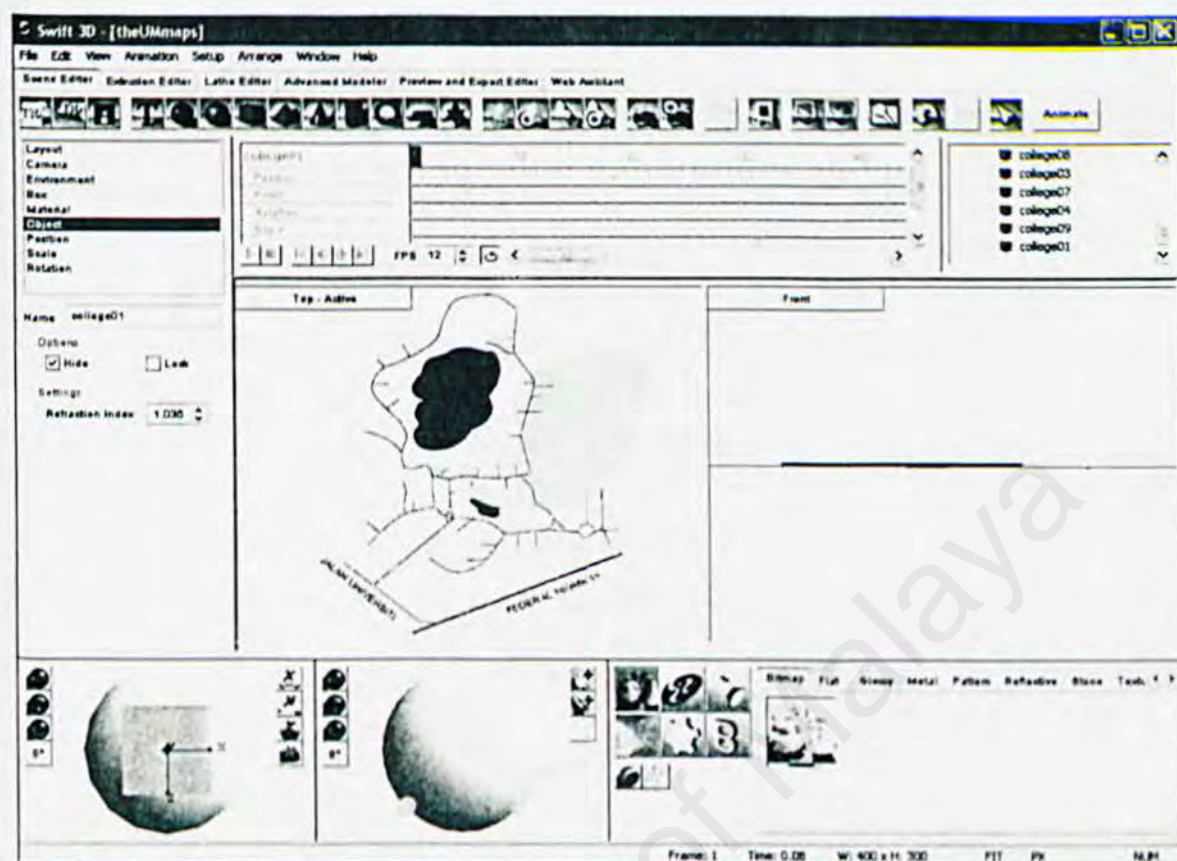


Figure 6.11 Swift 3D interface

For creating building for the map of University of Malaya, there are three primitive object used. There are box, sphere, and pyramid.

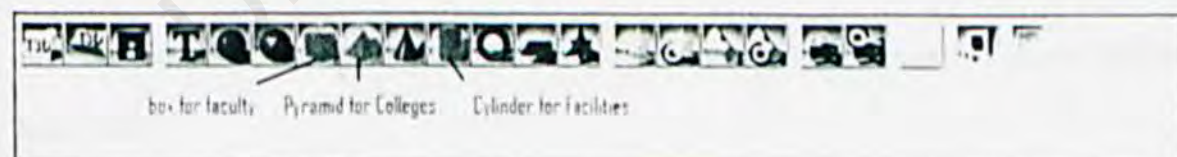


Figure 6.12 Swift 3D primitive objects

The map in the active view port was set to top position and the other one set in side position either left/right or front/back to see the building position and set it parallel with the road.

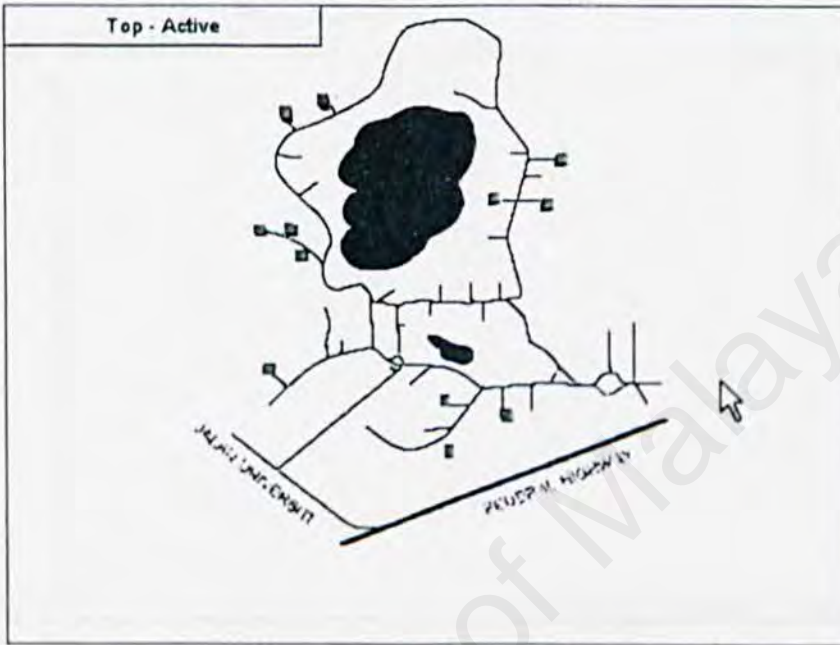


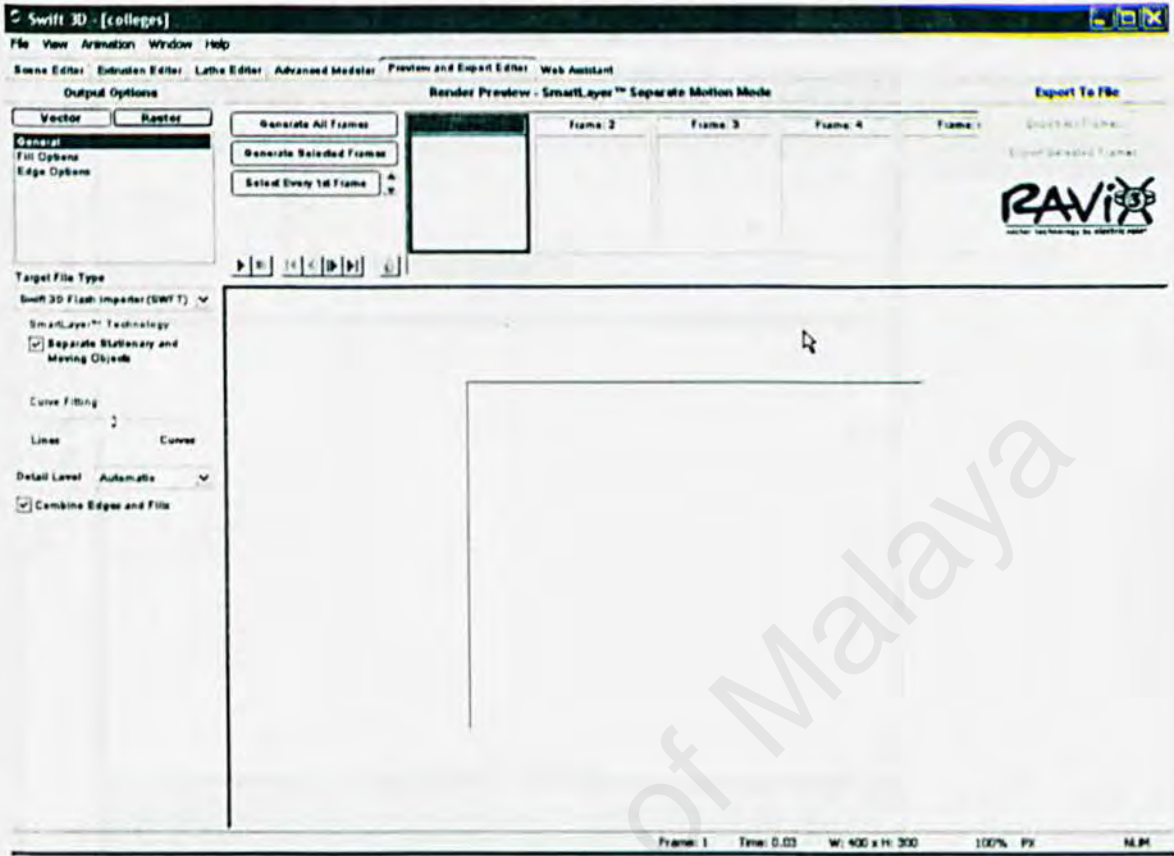
Figure 6.13 Map in the Swift 3D workspace

### ***Exporting into SWFT file format***

When the modeling and animating is done, it'll be exported into SWFT format as vector graphic with CellShading. SWFT format was taken instead of SWF which flash MX familiar with because of size of the file. SWFT generated file nearly 7 times smaller than SWF.

The animated object will be handled by Preview and Export Editor within Swift 3D. This is where CellShading and its complexity can be set here.



*Figure 6.14 Preview and Export Editor*

### 6.3.3 Macromedia Flash MX 2004

Flash is the main application used to create the project. Here not only importing 3D graphics but also interactivity for the program was implemented.

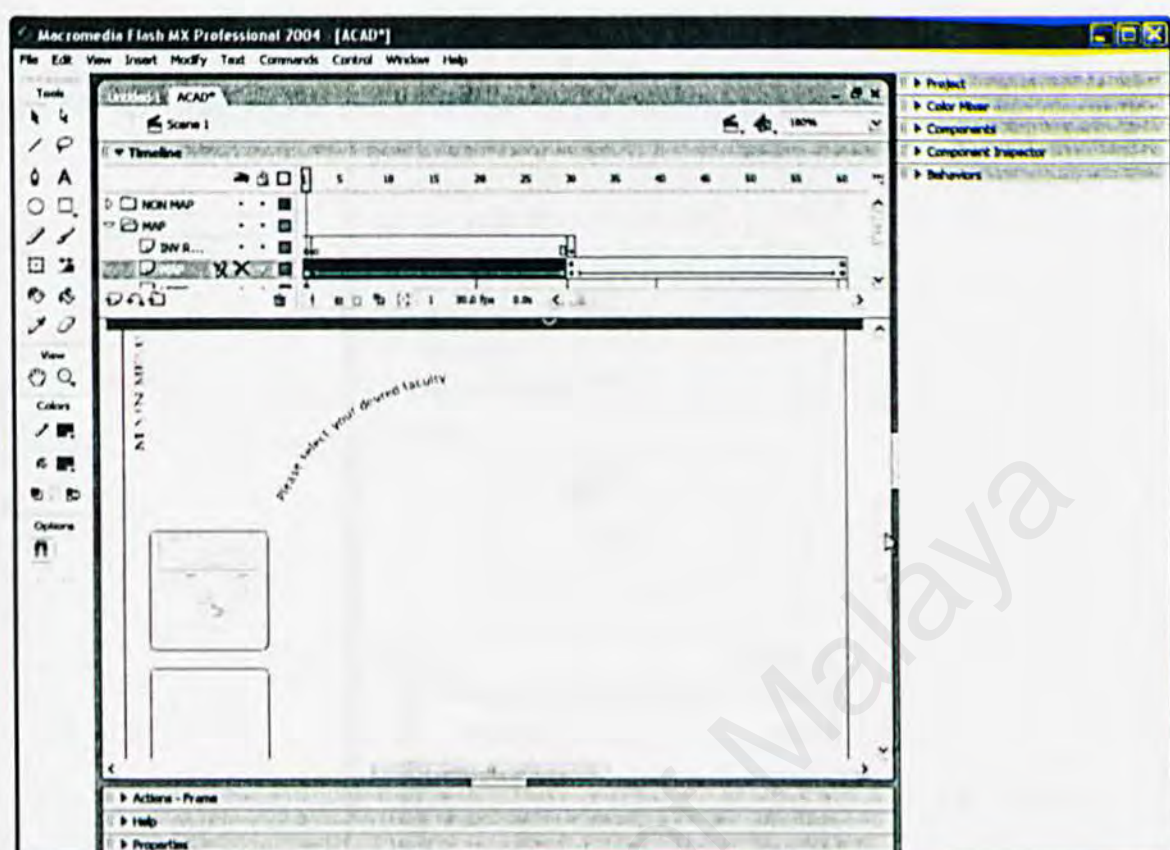


Figure 6.15 Flash Interface

### Import & Export Files

Flash MX cannot import 3D object directly from 3ds Max and create 3D CellShading object. Thus modeling and animation were made under 3ds Max, animation and CellShading under Swift 3D, and imported to Flash.



Figure 6.16 Exporting file



The imported file then automatically stored within flash library. In the library, the file was dragged and placed in appropriate frame or layer.

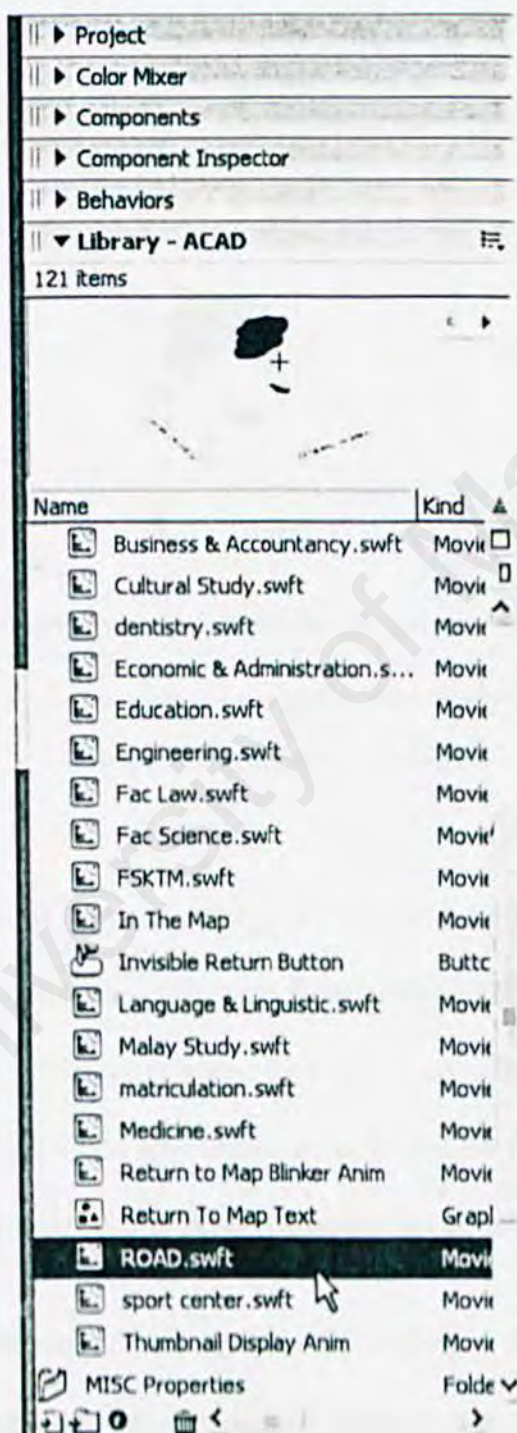


Figure 6.17 Flash Library

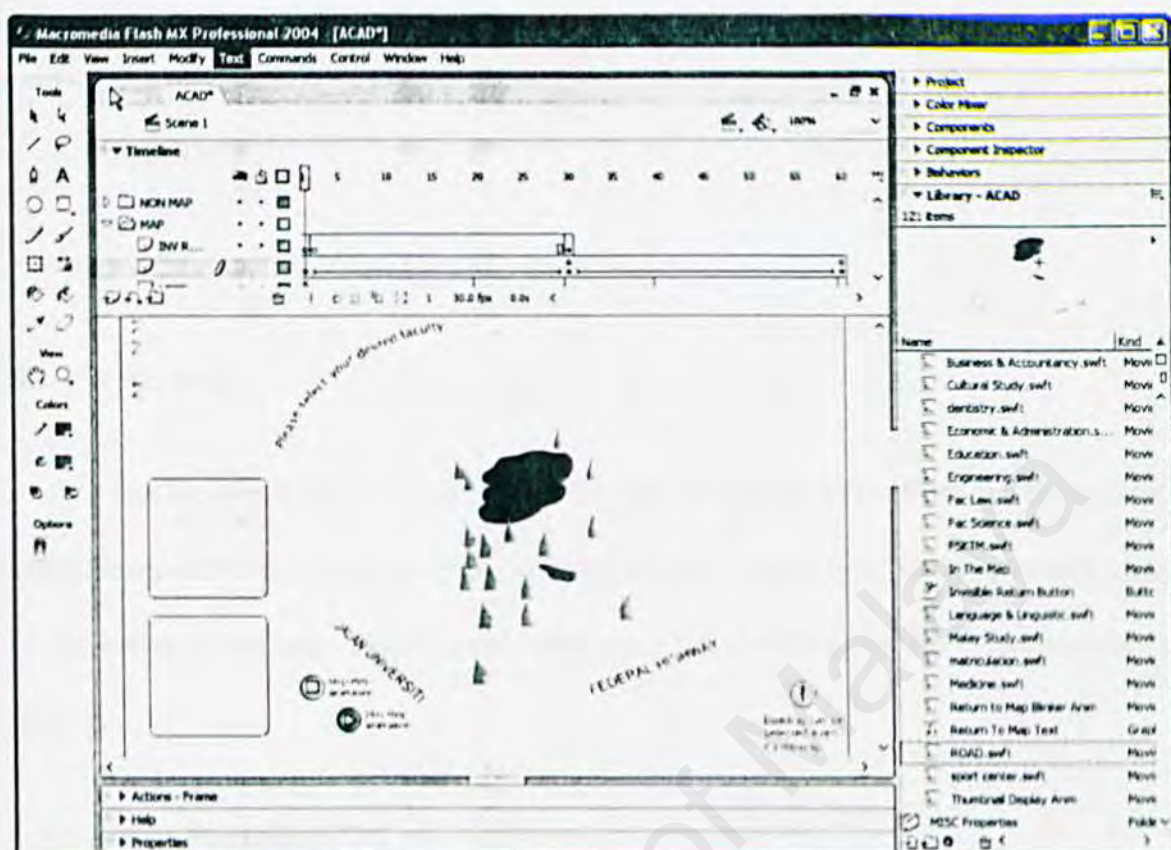


Figure 6.18 Inserted import file

UM Presentation is a large system to build using macromedia flash. To make it easier, there are separated into different flash files. Each file represents different modules and functions. There were some files which contained heavy information like map description, 3D objects and animation, those files were further separated into more detailed files so that each individual flash file would not be too heavy.

Every single file was linked together. For example, by clicking a button inside the home page will then load the other specific page that user want to view. Technique used to apply this action is layering and action scripting. Action script is very important to control the system features and components. Below is an example action script that



existing inside the flash files:-

```
stop();
```

```
loadMovie("NAVIGATE.swf",1);
```

#### **6.3.4 Swish Max**

The technique used from this software was the effect. Text effect can be made so easily because this software has many existing effects. What I need to do is to right click on the above of the text. There would come out a list of effects for me to implement on the text.

#### **6.3.5 Adobe Photoshop 7.0**

Adobe Photoshop is a graphic editor which is used to create static and 2D images for UM Presentation. This software allows all kind of techniques in modifying the images such as scale, rotate, sharpens and etc. Using this software allows system developer to create and design the images more efficiency.

#### **6.3.6 Sothink SWF Decompiler**

It is useful software which it can decompile any existing flash applications and get the data existing inside it. After the technique of decompilation has done, developer can take any of the data existing inside the application such as sounds, images, fonts, texts, buttons and action scripts. Most of the music is taken by using this software and implemented into UM Presentation.



### 6.3.7 Sound Forge 7.0

Sound Force is an audio editing tool to modify any music or sounds. By using this software, audio that was taken from the Sothink SWF decompiler will imported inside it. Any changes or editing can be made such as volume, reverse, mute, invert and etc. The resulting audio can be exported as a MP3 file which will then imports inside flash files.

### 6.4 Summary

This chapter explains the importance and details of the system implementation. Each part of the system implementation process has to be carefully conducted in order to ensure that the finished product can be operated with any errors. Generally, the system implementation phase will take longer time than other phases. This is due to a lot of time has spent to learn the new development tools before the system can be created.



## Chapter 7: System Testing

### 7.1 Introduction

System testing is to make sure the quality of UM Presentation. It is an interactive process to evaluate the effectiveness of a program in executing its functions. The main purpose of this phase is involved the process of validation and confirmation of the system to ensure the system has meet the standard requirements and running without errors. Moreover, testing process will require developer to remove errors and bugs that could cause reliability problem to the system.

System testing is the most important task to make sure that the finished product will conform to the initial requirement of the end user. Through out the testing process, the specification, design and program will be reevaluating to ensure that it is error free and work according to specification. In system testing, there are some principals based on the testing objectives. The principals are listed as below:-

- To find possible errors occurred in the system which have not yet discovered.
- To reveal different classes of errors with using a minimum amount of time and effort.
- To ensure the functions appear to be working according to the proposed specification.
- To demonstrate that behavior and performance appear to have been met.
- To correct all the errors and bugs.

Therefore, a well perform system testing is capable of detecting errors that cannot be traced during system analysis, system design, and system implementation phases.

## 7.2 Types of Faults

Testing process make sure each of every function that implement within the software run smoothly and correctly. It is very important to detect all kinds of possible faults that cause the errors while the program is running. Those errors that might happen are:

### *Documentation Fault*

Documentation fault occurs when the documentation does not match with what the program actually does. The documentation is derived from the program design and provides comprehensible description of what the developer would like the program to do. But in the other hand the implementation of those functions is faulty. Such faults can lead to a creation of other faults later in the program, while people tend to believe the documentation when examining the design to make modification.

### *Algorithmic Fault*

This error occurs when a component's algorithm or logic does not produce the proper output for a given input because something is wrong with the processing steps. These kinds of faults or errors are sometimes easy to detect by just reading through the



program or by submitting input data from different classes of data that the users can expect the program to receive during its regular working.

### ***Compilation Fault***

Compilation fault is due to mistake made during the coding process. This error can be traced during compilation where the bugs caused by syntax error can be identified by the compiler and giving warning. This error can be detected with a straight forward manner and can be repaired instantly.

### ***Logic Fault***

Logic fault will occur when the program produces an output that is out of expectation because the program cannot execute certain function correctly. It can detect when the output turns out to be different from the original design. This kind of error can be detected by the developer or the user but sometimes it is difficult to trace.

### ***Capacity or Boundary Faults***

These faults will occur when the system's performance becomes unacceptable as system activity reached its specified limit.

### ***Timing or Coordination Faults***

In developing real-time program, a critical consideration is the coordination of several processes executing simultaneously or in a carefully defined sequence. Timing faults occur when the code coordinating these events is inadequate.

### *Throughput or Performance Faults*

These faults occur when the system does not perform at the speed prescribed by the requirements. These are timing problems of a different sort. Time constraints are placed on the system's performance by the customer's requirements rather than by the need for coordination.

### *Hardware and Software Faults*

Fault can arise when the supplied hardware and system software do not actually work according to the documented operating conditions and procedures.

## **7.3 Testing Phases**

Generally testing involves several phases. There are three phases of testing, which are unit testing, module testing, and integration testing. After a program is completely implemented, it will be tested under unit testing. Module testing will start when all the programs under a particular module have been completely tested under unit testing. The integration testing is to recover errors associated with interfacing when integrating all the modules.

### **7.3.1 Unit Testing**

Unit testing is to test the program in each module independently. The purpose is to discover the discrepancies between the module interface specification and its actual



behavior. This process enables the developer to detect errors in coding and logical mistakes that are contained within the boundary of the module.

Testing involving interactions between modules are initially avoided. There are many buttons in UM Presentation, especially in the map of UM. Unit testing has been conducted by testing each button on every page to determine whether it works as programmed. Each of these buttons are created with a behavior to react such as sound will be heard when the users click on the button, changes of the appearance and also movements when users roll the mouse over these buttons. This approach is to give them some hints that the buttons are clickable n to lead them to their desire page.

In order to test whether all the buttons in the map of UM and buttons for the main menu are work properly, each of the buttons have to be tested on each page. This is to ensure that these buttons will able to lead the users to the correct page.

### 7.3.2 Module Testing

In UM Presentation, there are 7 modules, which is Home, Overview, Orientation, Academic, Colleges, Facilities and Miscellaneous. Each of these modules has to be tested carefully to avoid any problems during deliverable phase. These modules can be tested from different aspects which are listed as below:-

- Interface

Testing the interface to ensure that information flows properly into and out of the program unit. All the buttons and icons must be well organized, so that they can

work properly.

- All possible independent program paths are executed

It is to make sure that the navigation, propagation and control structures are implemented correctly in the program.

- Boundary value analysis

It ensures that the module operates properly at the boundaries established to limit or restrict its processing.

Module testing helps to correct the errors occur in the entire sub modules. A few errors were identified and corrected after carrying out unit testing.

### 7.3.3 Integration Testing

Once unit testing has been completed, all the individual units are combined into a workable program. The integration is planned and coordinated so that when an error occurs, there are some ideas of where the error could have been occurred. Integration testing is a systematic technique for constructing the program structure while at the same time conducting test to discover the errors associated with the interfacing.

The goal of carrying out the integration testing is to take unit tested components and build a program structure that has been dictated by the design. This testing will ensure that each module is arranged and functioning correctly.

The approach used in integration testing is the bottom up integration. The bottom





up testing is the popular approach used for merging components to test the larger system. The bottom up integration testing begins construction and testing with modules at the lowest levels of the system and later moving upward to the modules at the higher levels of the system. These approaches are repeated until all the components are included in the system.

This approach also has been used to test other sub modules in Overview module, Orientation Module, Miscellaneous modules and etc. Finally all the modules will be integrated to the main menu.

## 7.4 System Testing

System testing focuses on the functionality of the system and to ensure that the system is functioning well under a larger system. It is based on the system functional requirement and it checks that the integration on the system perform it functions as specified on the requirements. There are many types of testing a system.

### *Performance Testing*

This testing verifies that the system application meets the specific performance efficiency objectives. This testing usually involved the hardware as well as the software performs in the system when the system performs the function required by the proposed specification. The testing process will then turn to test the way in which those functions are performed. Thus the performance testing addresses the non functional requirements.



The purpose of the testing is to test the run time performance of this software within the context of an integrated system.

### ***Acceptance Testing***

This is one type in the testing process before the system is accepted for operational use. Its purpose is to ensure that end users are satisfied with the functionality and performance of the program. The system is tested with data supplied by the system producer rather than simulated test data. Sometimes, this testing is called as alpha testing and this testing process continues until the system developer and client agree that the delivered system is an acceptance implementation of the system requirements.

### ***Functional Testing***

System testing begins with function testing, whereas the other previous tests concentrated on components and their interactions. The first step ignores system structure and focuses on functionality. Objectives of this testing is to assess whether the application does what it is supposed to do according to the proposed requirements.

### ***Usability Testing***

This testing is to verify that the system is easy to use and user friendly. Such tests consider the human element in system operation. Test engineer needs to evaluate the application from the perspective of the end user. Test development considerations for usability test include approaches where the user executes a prototype of the actual application that lacks the real functionality.





## 7.5 Summary

This chapter describes the main function of system testing and several types of errors or faults that will cause software failure. Besides, there are three types of testing, which are unit testing, module testing and integration testing. System testing is to ensure that the system is functioning well under a larger system.

University of Malaya

## Chapter 8 System Evaluation

### 8.1 Introduction

System evaluation is the process of identifying problems encountered as well as solutions, system's strengths, system's limitations and the possible enhancements of the system in future. The purpose of system evaluation is to show the effectiveness and efficiency of what has been done on the system. It also enables the developer to evaluate the knowledge gained during the development process.

### 8.2 Problems Encountered and Solutions

There are some problems occurred which is affected the development of UM Presentation. All of these problems involve in every development phase and need a good and suitable solution to solve it and ensure the development process can be continue smoothly.

#### 8.2.1 Limited System Development Time

The time for the system development is not enough. It is quite challenging if we are required to deliver a really good and high performance system that achieves targets and objectives. Moreover, system development was delayed due to unavoidable circumstances such as fatal errors occur in my computer.





### ***Solution***

Management of time is very important to ensure the project can be completed according to the schedule. Works are done according to the stages and systematically to ensure there are no work is left behind.

#### **8.2.2 Problem Choosing the Right Authoring Tools**

There are many ways and tools available to develop a multimedia application. The lack of experience used up a lot of time to learn and study the existing web pages about authoring tools in the early stage of system implementation. This is because the right authoring tools will determine the progress of the project.

### ***Solution***

To determine which approach to use, seek and consult lecturers or experienced individual to gain knowledge before making any decision to choose the authoring tools for system development.

#### **8.2.3 Lack of knowledge in 3D**

3D Studio Max and Swift 3D are 3 dimensional modeling software. This software was new to my knowledge. In order to use this software, I need to have a good skill and understanding of them. Development using 3D requires a lot of time for modeling, animation, and rendering. Due to limited development time, it is difficult to handle with limited skill.

### ***Solution***

In order to solve this problem, help from the internet, reference books and experienced individuals are needed. Besides, by observing the existing system also helps to understand more about this software. Learning the new software also was done through trial and error basis.

#### **8.2.4 Lack of Reference Sources**

There are not many latest reference books and experienced individuals available. Not all of them really understand and experience in the authoring tools that I have already chosen.

### ***Solutions***

During the learning and development process, I had to buy a 3D book as my reference book. Besides, I need to get some guide or help from internet.

#### **8.2.5 Large Size of Multimedia Files**

In UM Presentation, 3D files exported from 3D Studio Max and Swift 3D, animation, sounds, and graphics were integrated into flash files. The files use up a large amount of space capacity and also the RAM. It had been slow down the development of the program.

### ***Solution***

Size images can be reduced by using Adobe Photoshop 7.0, as well as sound can



be edited inside Sound Forge before imports inside the flash files.

### **8.3 System's Strength**

Even though many problems occurred during the development of this project, this project somehow has its own strengths and uniqueness. Some of the strengths of the program are listed as below:-

#### **8.3.1 Easy To Use**

This system is easy to use; it does not require any special skill to handle the system. The entire interface is designed in simple way so that it can suit to all level of users.

#### **8.3.2 Compact and Comprehensive Information**

The system contains a set of compact and comprehensive information about University of Malaya. All the information will help users to know more about the University of Malaya including the information of orientation for the new students. Other than text, pictures of UM are available inside it so that the presentation will not be too dull.

#### **8.3.3 Graphic User Interface (GUI)**

Graphic User Interface was designed to let users feel comfortable when accessing the program. The GUI ensures user friendliness. Designing the interface and



using of different colors are also attracting the users. Users will also familiar with the interfaces as most of the pages have a standard look.

#### **8.3.4 No Keyboard Skill Required**

Users are not required to use the keyboard because all the interactivity will only involves mouse click events. They only have to point or roll the mouse over certain objects and click the mouse to initiate the events.

#### **8.3.5 Easy Storage and Comprehensive Information**

This project is a stand alone application which makes it easier to be stored and retrieved.

### **8.4 System Limitation**

Although most of the major features in the main modules have been successfully accomplished and fulfill all the requirements or specifications agreed upon, there are some limitations due to certain constraints. The limitations are listed as below:-

#### **8.4.1 No Video Clips Available**

Due to the large size of the flash files, I cannot import any video clips inside this program because it will slow down the processing.

#### **8.4.2 Limited Usage of 3D Objects**



3D objects which were created using 3D studio Max and Swift 3D needs high level of RAM for further processing. Adding 3D objects inside flash files also caused large amounts of space. There, applied few 3D objects inside flash files can maintain the computer processing speed.

### 8.4.3 Processing Time

It is really take time of the computer to translate the coding into visible 3D objects and animation. So it is recommended to the user to use at least the minimum hardware requirement system for the purpose of viewing the 3D objects as well as the smooth animations.

## 8.5 Experience and Knowledge Gained

With the successful completion of UM Presentation on time, I have personally gained more knowledge on developing a project from the beginning until the end. The knowledge I gained through this project will be very useful to me in the future. The most important knowledge that I learned is to plan and schedule perfectly for my system development into different phases.

Apart from that, I also learned how to use the implementation tools in the system. I learned a lot from my mistakes in choosing the development tools. Due to lack of knowledge of the development tools that I have been chosen, I had spent a lot of time exploring on these development tools. Trial and error approach was used to solve most

of the implementation.

## 8.6 Future Enhancement

Even though this system has achieved its objectives, its methods are not as effective as the system was created without professional help. Several enhancements can be done to this system to improve its functionalities.

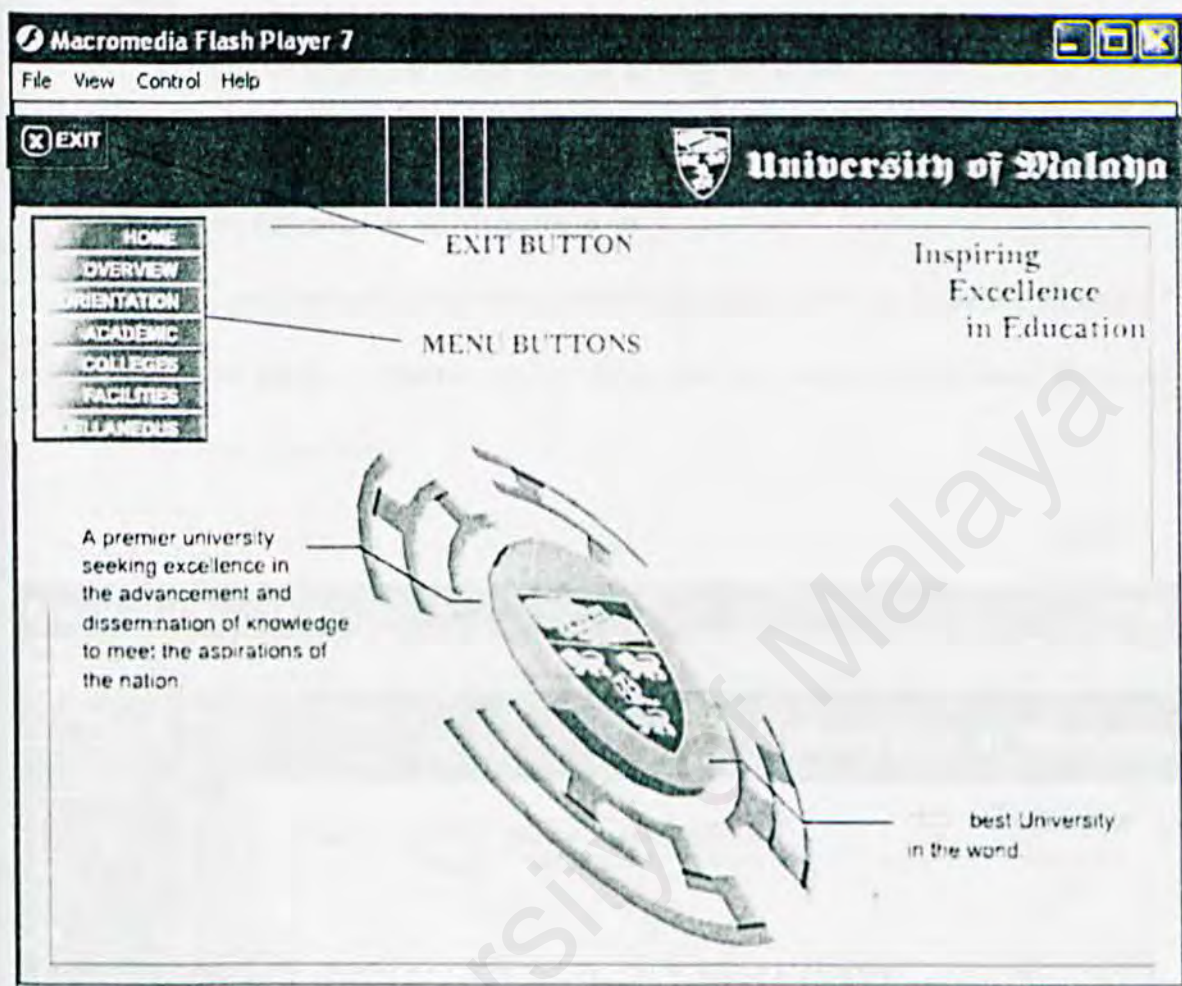
In future, more new information about the UM can be added in the system. Besides, more animation will also need to be added to make it more interesting. Video clips is hopefully can added inside this program so that the users can get a better understanding about the UM environment.

## 8.7 Summary

This chapter is the final chapter that concludes the overall system. Problems faced when developing the system are stated clearly. Even though there are many problems occurred during development, the system has its own strengths and uniqueness as well as the system limitations. Future enhancement is suggested and new ideas are state to improve the system's functionalities. Overall, UM Presentation is a system that gives important information to users by using multimedia elements. It has simple and easy way of displaying information of University of Malaya. Hopefully the system will help users get to know more about UM though this system.



## Appendix A: User Manual



There are buttons which user can interact with here.

- Menu Buttons
- Exit Button

### Menu Buttons

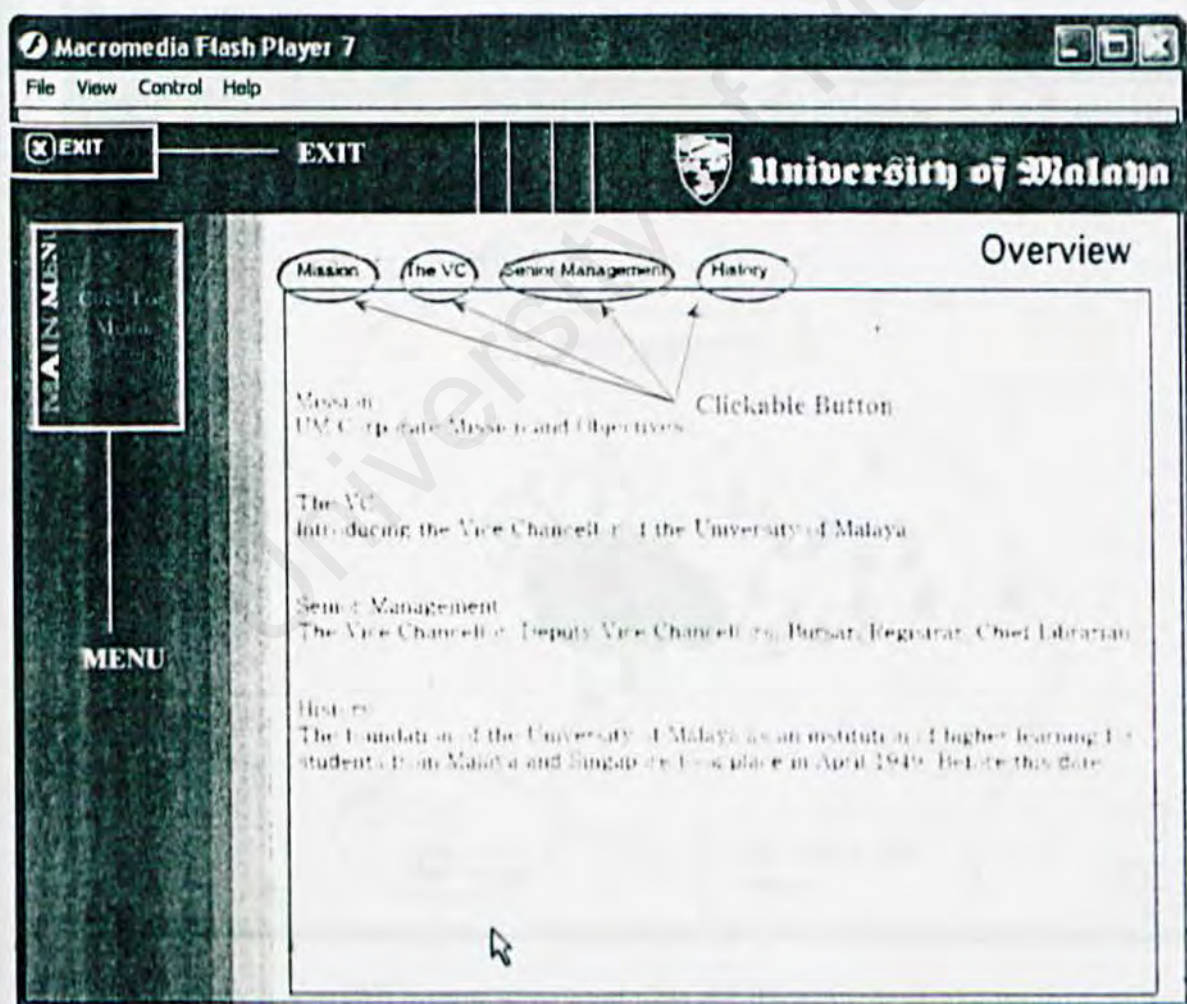
In menu buttons, user can go to other section by clicking one of the buttons given.

➤ Home

- The interface for Home section as graphics above.

➤ Overview, Orientation, & Miscellaneous

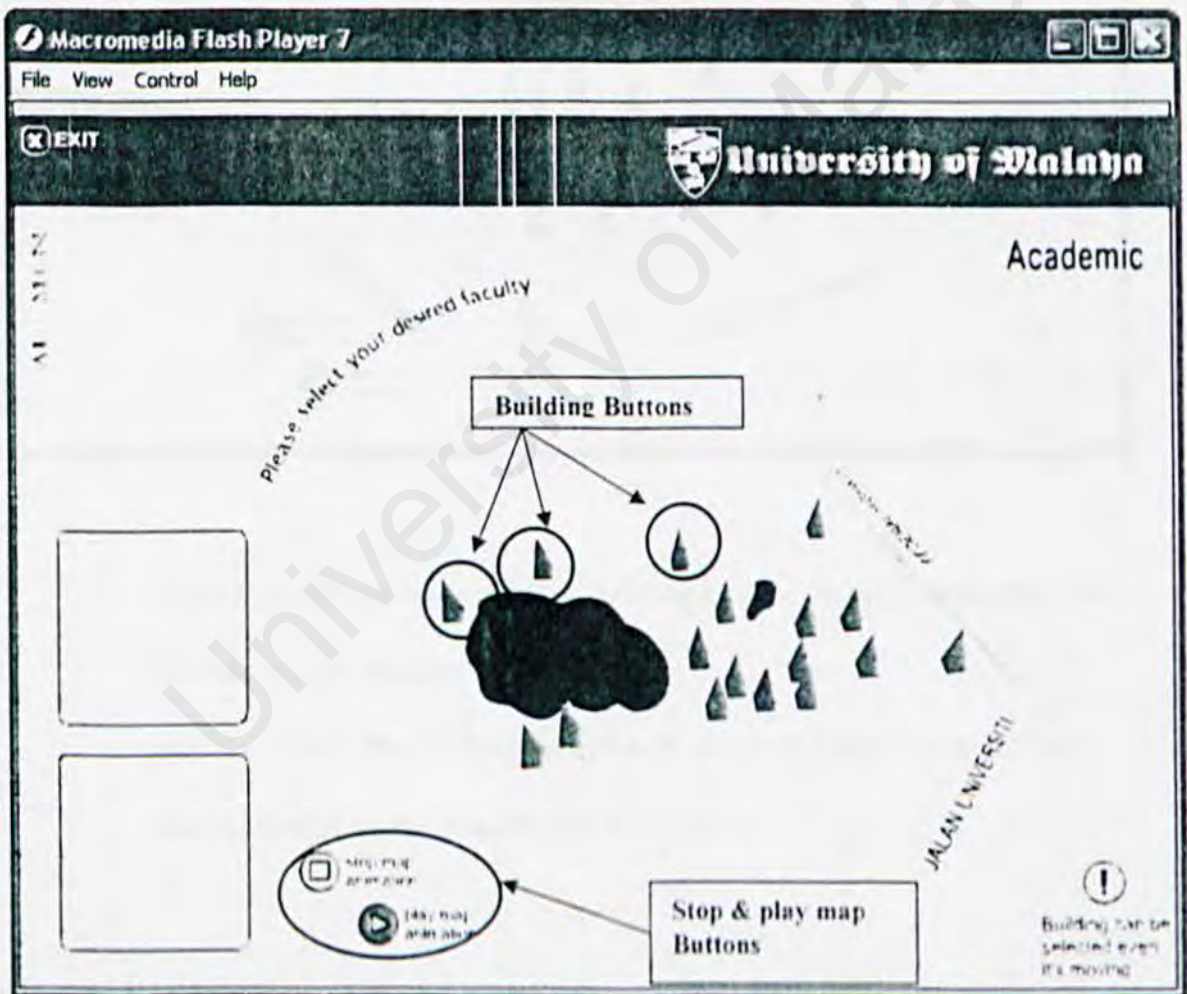
- These three sections have same functionality buttons. Even the contents are different, but the button which user can interact with located the same for these three.



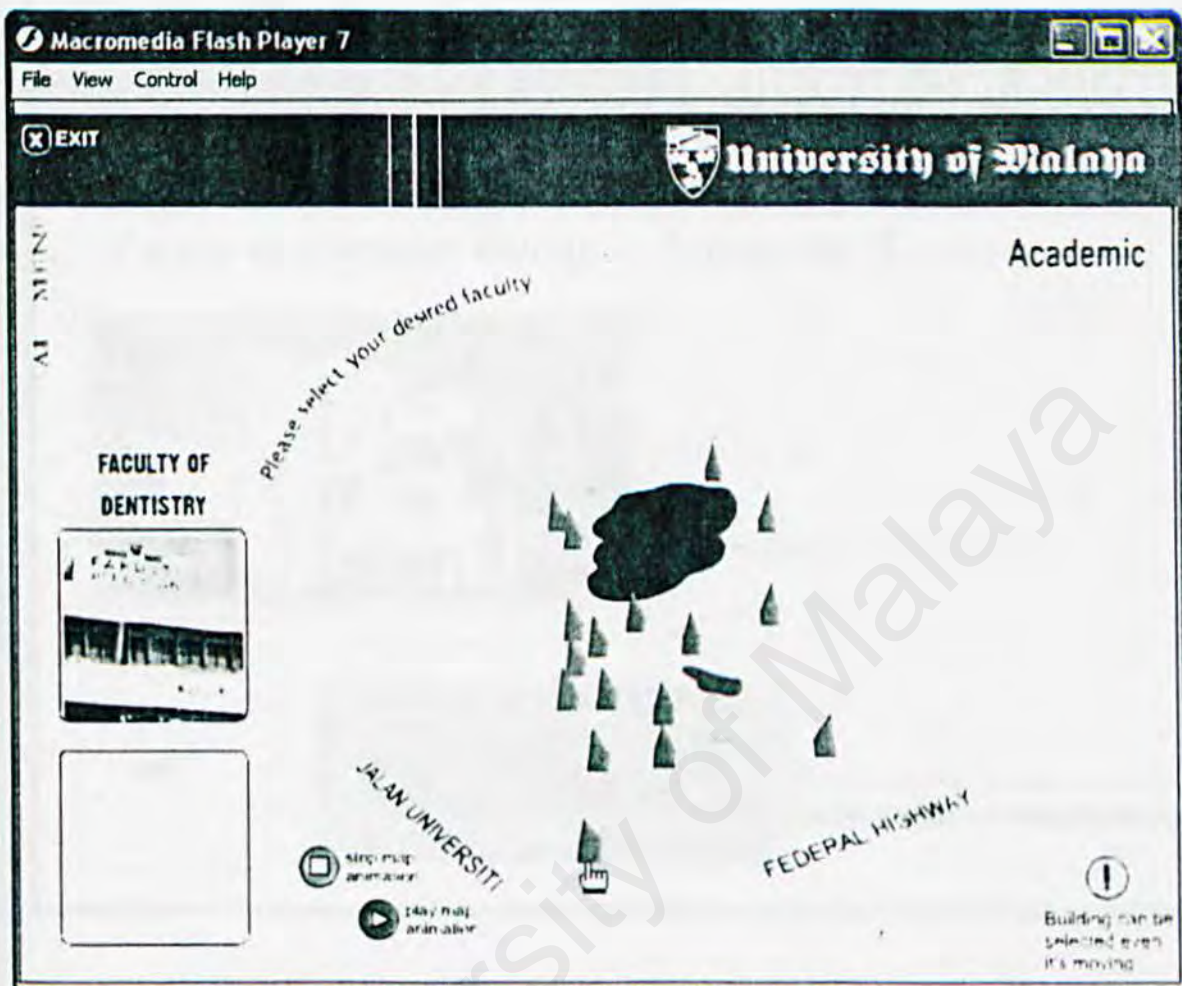


## ➤ Academics, and Facilities

- the different button in these two map are the building icons are **clickable**.  
The Red color icon are buttons actually. User will encounter **different** color for Facilities and colleges section but that's the only differences.
- *Stop map animation* and *play map animation* let the user to stop the map rotation and begin to choose in easier way. User can also play the animation again by clicking on the *play map animation* button.

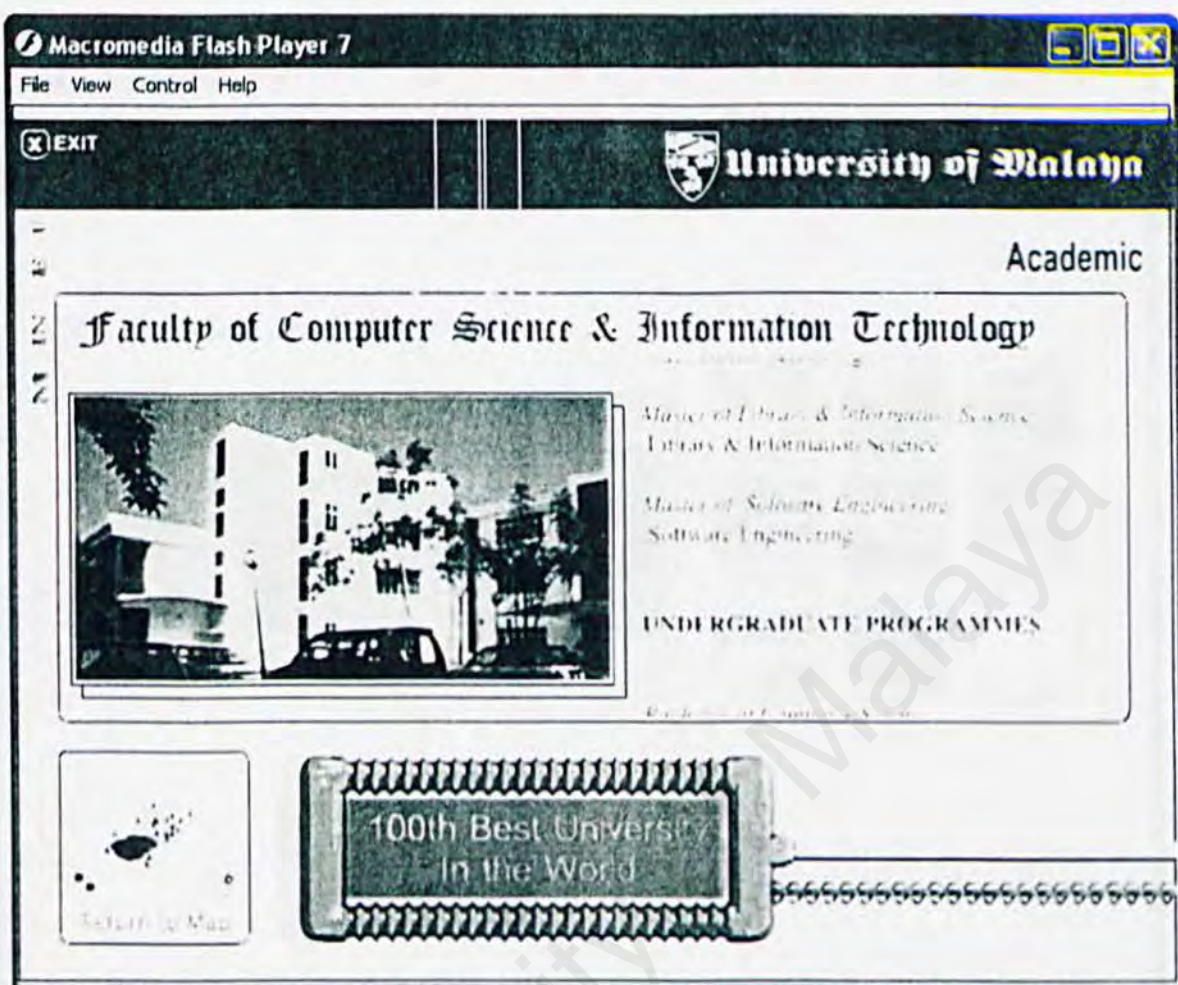


- an image will appear whenever user put their cursor on the top of building icon button.



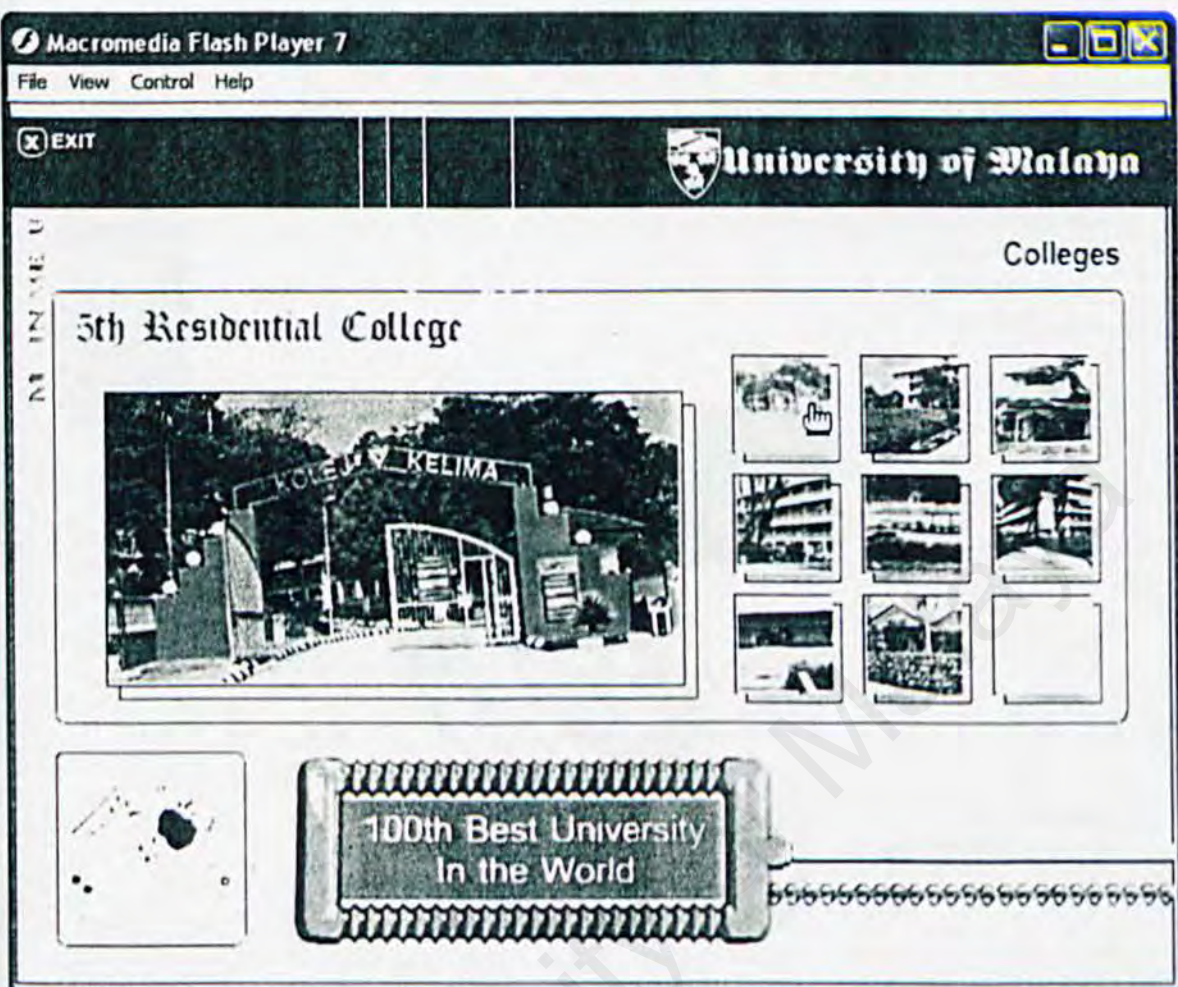
- When user click at any clickable building button, the application will lead the user to its predefined building part.
- User can return back to map selection by clicking return to map button which situated on the bottom left of the screen.





#### ➤ Colleges

- College section is similar like Academics and Colleges Section. The different only when the user redirected to other section which have some extra function than the rest.
- Here user can choose picture to be viewed by clicking the small thumbnail located on the right side of the screen.



#### Exit Button

- Finally, when user wishes to quit the program, they can just click an exit button located on the upper left of the screen.
- A popup will appear and ask the user whether they really want to quit the program. If they do, the program will be terminated and if they don't the program will still be running for them to view.



EXIT



University of Malaya

HOME  
OVERVIEW  
ORIENTATION  
ACADEMIC  
COLLEGES  
FACILITIES  
ELLAMOUS

Inspiring  
Excellence  
in Education

A premier university  
seeking excellence in  
the advancement and  
dissemination of knowledge  
to meet the aspirations of  
the nation



best University  
in the world

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