

BACHELOR COMPUTER SCIENCE

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**INTELLIGENT MAP GUIDER
(IMG)**

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Abstract

The Intelligent Map Guider is an Internet based system which has a concept of multimedia in presenting the information in an interactive way through the website. This system concentrates on the PUTRA LRT system. It guides the user to the destination and displays information regarding the PUTRA stations and services provided by them. There are 25 PUTRA stations and each station has its own unique destination which is either a tourist attraction or a public attraction.

Intelligent Map Guider is developed to exploit the unique and the speciality of the tourist and public destination surrounding the PUTRA station for the tourist and public through an interactive virtual tour.

Waterfall model with prototyping approach is selected for the development of this Intelligent Map Guider. This method is adopted because it is easy to understand, secondly it is easily described and finally it is easy to be implemented. In addition, management of each phase in waterfall mode with prototyping is divided clearly.

Intelligent Map Guider is fully developed using Macromedia tools and 3D studio Max to enhance the graphics for the virtual tour. The Dreamweaver is used for the Internet browser and finally the system is equipped with high-end Microsoft 2000 database using Microsoft Access 2000 for the ticketing database. Finally, the database is linked to the web page using Active Service Provider (ASP).

Soft system methodology is adopted through the system development life cycle to understand the current problem situation. The system requirements are identified, translated into design and finally implemented into coding. The completed system is evaluated to meet the system requirement specification.

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1.0 Chapter 1

1.1 Introduction

It is a known fact that our country Malaysia has developed a good transport system. It has both excellent and integrated transport grid. The transport have developed tremendously that we have been compared with the other developing nations. The transport developments have helped to the growth of the tourism in the country. It also helps the citizen to travel from one destination to another destination without hassle. One of the most pleasing transports in the city of Kuala Lumpur is the Light Railway Transit, which is also known as LRT. Currently there are two types of LRT system in the country, which are the STAR LRT and PUTRA LRT.

Virtual reality is a known fact that information could be absorbed and have a good chance to be understood by the person who uses it. It guides the user in a detailed manner that even the language barrier can be overcome. In the near future, virtual reality will have a strong influence towards mankind.

Intelligent Map Guider is a system aimed to have a more user oriented and easily understandable. It helps any person from any walkway of the society to travel with ease. It will be guide and as a customer service and even describes the destination with a more virtual and entertaining way.

1.1.1 Introduction to PUTRA LRT

Projek Usahasama Transit Ringan Automatik (PUTRA Line) was incorporated on 15th February, 1994 to design, construct, operate and maintain the LRT System 2 for Kuala Lumpur and is a wholly-owned subsidiary of the Renong Berhad.

The LRT System 2 known as PUTRA Line covers a total distance of 29 km linking the eastern and western suburbs of Kuala Lumpur servicing some of Kuala Lumpur's most affluent and heavily populated areas.

It is using the Advanced Rapid Transit Mark II technology which has been successfully tested and proven in North America and Europe with a very high performance specification specially designed to meet the needs of Kuala Lumpur.

The total alignment which starts from the Depot in Subang and ends at Terminal PUTRA in Gombak is 29km in length. The construction was divided into two (2) sections: Section 1, which is from Subang Depot to Pasar Seni Station, commenced operation on 1st September 1998 and Section 2, which is from Pasar Seni Station to Terminal PUTRA, commenced operation in June 1999.

Featuring the state-of-the-art transport system, The PUTRA Line operates with 35 two-car units traveling at an average of 40 km per hour. Its initial capacity of 10,000 passengers per hour per direction is expected to increase to 30,000 in the near future.

All trains are fully air-conditioned and provide a service level of 90 seconds during peak hours and between five (5) to ten (10) minutes during off-peak hours. The service is provided from 6.00 a.m. until 12.00 midnight, on Monday - Saturday, and 7.30 a.m. to 11.00 p.m. on Sunday and Public Holidays.

For the convenience of commuters, PUTRA Line provides dedicated feeder bus service within 3-km radius from each station. Bus schedules are posted at major bus stops. The operational hours coincides with the LRT operation hours.

As a caring organization, PUTRA Line considers in the development of the LRT System 2 the needs and requirements of the disabled. Facilities for the disabled are provide both at the stations and on trains.

Currently, PUTRA Line is the world's second longest, fully automated driverless rail system.

1.2 Objective

The main objective of Intelligent Map Guider is to act as tourism tool and to make the user know where and how to reach the destination which is serviced by PUTRA LRT. The user would be able to trade all relevant information about the places they will be visiting from just a click from the system. This will remove a lot of obstacles, which faced by the commuters especially tourists and in a way will give a great boost to the tourist industry in Malaysia.

The other objectives of Intelligent Map Guider are:

- ✓ **To help plan their journey.**

The system will help the user to plan their journey from one destination to another destination of their interest.

- ✓ **Ease the queue at the customer service counter.**

Help to reduce the workload of the officers in the customer service and also gives the user the comfort of getting the information via website.

- ✓ **To let the user gain information of the destination even before going to the destination.**

Gives the user first hand information of the destination they are going to visit. This helps the tourist to know the tourist attractions along the stations in an interactive way.

✓ **Alternate route for their destination.**

The system also acts as an alternate route provider for the places which are prone to traffic congestions in the city. Meaning PUTRA LRT also accesses offices and other public amenities in the city.

1.3 Project scope

1.3.1 System Scope

The system is designed as web-based customer service for the user with enhancement use of the interactive approach. The administrator of the system will be in charge to make any alteration needed to the improvement of the system from time to time. The support group will be the person in charge in updating the current information and the changes to the current information regarding the service provided by PUTRA LRT. The system will have the capability to help the user to get the correct information with less hassle. There are three modules to this system, the modules are as follows:

- I. 2-D modules
- II. 3-D modules
- III. Info module

I. 2-D module

2-D module is the main page of the system where it acts as the main interface of the system. It has all the information needed by the user on how to go about the system. The module also specifies the type of user and on what category they fall. The module will divide the user to categories such as public and the tourist. The modules will then redirect the category user to their respective selection. This

module will display the information in flash and also includes a subsystem which is the database.

II. 3-D module

3-D module is where the intelligent guide is concluded. The module will bring to the page where user will choose their destination from their departure station. The system then will guide the user to the selected destination in a virtual tour. The information and places of interest related to the station will also be flashed to the user. The user can choose the place and the information regarding the route will be displayed.

III. Info module

Info module is designed to show the happenings and events that will be held in the near future. The info module will also display any announcement that is done by the Putra LRT. The system also will guide to the STAR LRT stations and KTM commuter stations, which are linked to the Putra LRT stations. It will also include general information's.

Main softwares and tools that will be used to build this system are Macromedia studio, which will be used to create the virtual environment and the 3D studio max to enhance the designs. Both the Macromedia studio and 3Dstudio max will be used to develop the 3-D module. The Macromedia tools will also be used to enhance the 2-D module to be more interactive and user friendly.

1.4 Targeted user

The system is targeted to two types of user. The two types of user categories are as follows public and tourist. There are two modes in the system, which follow suit to its categories. The two modes are designed so the systems can identify intelligently on the needs of the user. For example if the user chooses the tourist mode the stations with the tourist attraction will be highlighted and shaded in an interactive way and the same thing applies for the public mode.

2.0 Chapter 2

2.1 Literature Review

Review of literature is done as a background study about knowledge and information, which gathered and gained to develop the Intelligent Map Guider. The main focus of this review of literature is to get a better understanding and view on the development tools that is going to be used to develop this system. This study also provides a better knowledge on the development of strategies that is going to be used during the development of the system. Apart from that, the literature review stage also enables the developer to do a comparison of the past-developed systems and study the strength and weakness of it. From this study it will give an overview on how to improve the weakness and fulfill the requirements needed by the newly developed system to out stand the previous systems.

2.2 System Definition

System is a group of program that runs an assigned task with accuracy and persistent or in other words a system consist of components-components that interacts with each other to form a specific function. In a whole a system can be defined as a set which contains one or more factors which is inter related and functions to accomplish a targeted objective.

2.3 System Specification

There are few system specifications which are needed to be considered. They are as follows:

a) Function availability

The function in this system is to help the user to learn and to know more about their destination in a virtual approach. Uninterrupted Accessibility towards the information's.

b) Dependable system structure

The system is designed so that the components can interact with each other without any interruptions and produce a good user interface. Example when a user surfs the website and press the mouse at the choosen station the interface then will display the needed information and also the virtual tour of the station.

c) Subsystem availability

The system consists of few small systems with independent functions.

2.4 Interface

Interface is the essential part of this system. It lets the user to communicate with the system in easier ways possible. User interface includes:

a) Computer hardware parts which enables the user to interact with the system.

The computer hardware's are such as screen, keyboard, mouse, switch and etc.

- b) Image which is visible on the screen such as the windows, menu bar, message and help.

Without the interface the user will not have the access right to browse to other parts of the computer system. The diagram below shows the relationship between the user and the inner system of the computer.

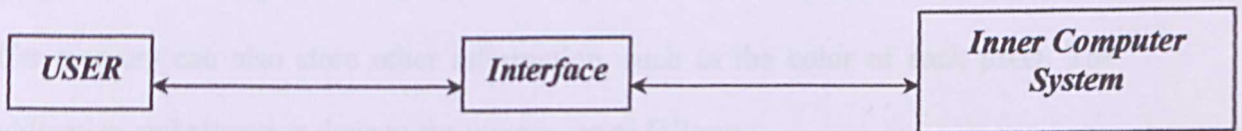


Diagram 2.1: Interface

2.5 Database

The database system that was created in this system is basically a subsystem. This subsystem is used to store the information regarding the price of the tickets. This database can operate independently without collaboration with the main system. This database basically can be used to store the ticket value and the admin of the database is responsible to insert modify or delete the data.

2.6 Computer Graphics

Computer Graphics, two and three dimensional images created by computers that are used for scientific research, artistic pursuits, and in industries to design, test, and market products. Computer graphics have made computers easier to use. Graphical user interfaces (GUIs) and multimedia systems such as the World Wide Web, the system of interconnected worldwide computer resources, enable computer users to select pictures to execute orders, eliminating the need to memorize complex commands.

2.6.1 How Computer Graphics Work

Before an image can be displayed on the screen it must be created by a computer program in a special part of the computer's memory, called a frame buffer. One method of producing an image in the frame buffer is to use a block of memory called a bitmap to store small, detailed figures such as a text character or an icon. Dividing the computer's display screen into a grid of tiny dots called pixels creates a graphical image. Frame buffer memory can also store other information, such as the color of each pixel. The modification and alteration done to the images are as follows:

a) Image Processing

Image processing is among the most powerful and important tools in computer graphics. Its underlying techniques are used for many applications, such as detecting the edge of objects; enhancing images and removing noise in medical imaging; and blurring, sharpening, and brightening images in feature films and commercials.

b) Creating Three-Dimensional Computer Graphics

Many uses of computer graphics, such as computer animation, computer-aided design and manufacturing (CAD/CAM), video games, and scientific visualization of data such as magnetic resonance images of internal organs, require drawing three-dimensional (3D) objects on the computer screen. This graphics pipeline is implemented either with special-purpose 3D graphics microprocessors (hardware) or with computer programs (software). Hardware rendering can be expensive, but it enables the user to draw up to 60 images

per second and to make immediate changes to the image. Software renderers are very slow, requiring from a few hours to a full day to render a single image. However, computer animation almost always uses software renderers because they provide greater control of the images and potentially photo-realistic quality.

c) Modeling

The first step in a rendering pipeline is the creation of 3D objects. The surface of an object, such as a sphere, is represented either as a series of curved surfaces or as polygons, usually triangles. Another technique used to create smooth surfaces relies on a parametric surface, a two-dimensional (2D) surface existing in three dimensions. For example, a world globe can be considered a 2D surface with latitude and longitude coordinates representing it in three dimensions. More complex surfaces, such as knots, can be specified in a similar manner [1].

2.7 Computer Animation

Computer Animation, creation of the illusion and motion by viewing a succession of computer-generated still images. Prior to the advent of computers, animation was accomplished by filming hand-drawn or painted sequences on plastic or paper, called cells, one frame at a time. Computers were first used to control the movements of the artwork and the camera. Now computers create the artwork and simulate the camera.

Computer animation can be used to create special effects and to simulate images that would be impossible to show with non-animation techniques, such as a spacecraft flying by the planet Saturn. Computer animation can also produce images from scientific data, and it has been used to visualize large quantities of data in the study of interactions in complex systems, such as fluid dynamics, particle collisions, and the development of severe storms. These mathematically based models use animation to help researchers see relationships that might otherwise be overlooked. Computer animation has also been used in legal cases to reconstruct accidents.

2.7.1 How Computer Animation Works

In traditional frame-by-frame animation, filming a sequence of hand-painted cells creates the illusion of motion and then playing the images back at high speeds, typically 14 to 30 frames per second. In computer animation, the art is created using computer programs, frame by frame, and then recorded, edited, and played back.

Another computer animation technique is real-time animation, in which the frames are created using a computer and then immediately displayed on a computer monitor. This technique eliminates the interim step of digitally recording the images; however, real-time animation currently does not produce high quality or richly detailed results. It is best suited for creating simple animations for video games. The animation, which will be done both in the 2-D and 3-D module, will have the effects such as below:

a) Computer-Assisted Animation

In the traditional process of animation, a *storyboard* (a scene-by-scene illustration of the plot) is drawn first, the soundtrack is completed, and a

senior animator creates key animation frames. Other animators then draw the frames in between the key scenes, color is added, and each frame is then filmed. Computers can be used to assist or replace every phase of this animation process.

b) In-Betweening

The process of creating the intermediate frames to fill in the action from key scene to key scene is called in-betweening. Techniques have been developed that allow the computer to create the in-between frames by estimating common points from key frame to key frame. In the simplest case, the computer draws the in-between movement of two corresponding points by calculating the mid-point distance. Repeated calculation of midpoints can provide the illusion of smooth and continuous motion.

c) Painting Systems

When a large number of cells are stacked, the transparent layers become slightly opaque. The cell painter must then compensate for this effect by varying the image colors; this process often introduces errors. Computers can eliminate these errors and increase production by consistently coloring the most complex areas of frames. Computer painting uses a coloring, or filling, process in which the artist specifies a color and then selects a pixel, the smallest individual picture element on the computer screen. The computer

then changes all adjacent pixels that have the same color (or nearly the same color) to the newly specified color.

d) Computer-Modeled Animation

Computer-modeled animation is the process of creating three-dimensional models of animated objects. Typically, this is achieved by representing the objects using the following methods: wire-frame, surface, and solid. *Wire-frame representations* are specified by a set of line segments, typically the object's edges and a set of points on the surface called vertices. While a wire-frame representation often does not produce very realistic images, it is good for quick studies, such as how the object will move and fit in a particular scene. *Surface representations* are specified by a set of primitive features, such as a collection of polygons to produce smooth curves and surfaces. *A set of primitive shapes or portions of primitive shapes specify solid representations.* For example, a sphere for the head and cubes that compose the torso and limbs might represent a human. Solid representations can specify both inner and outer surfaces of an object [2].

2.8 Existing Map Guiders

There are four existing websites, which are similar to the intelligent map guider system that will be developed. All the four websites are done previously and published in the Internet. All the four websites have been studied and the similarities of the systems are discussed below.

2.8.1 SLRT (Singapore Light Railway Transit) Pvt. Ltd. (www.slrt.com.sg)

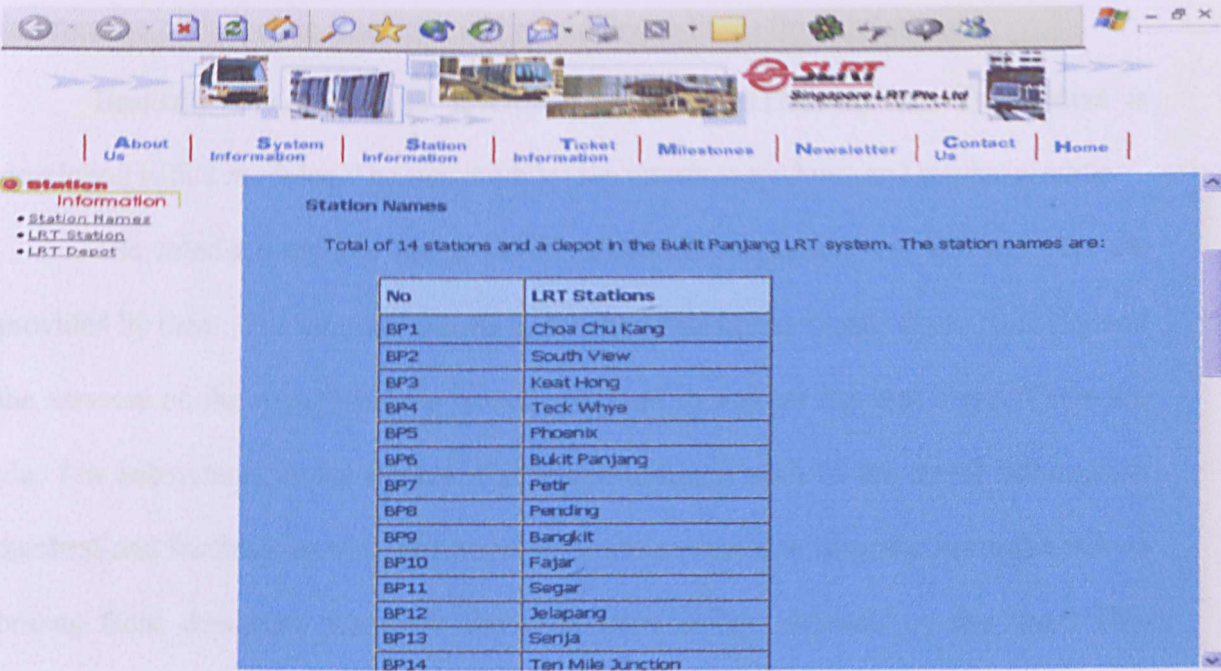


Figure 2.1: SLRT Website

SLRT website is actually a website developed to be a web based information regarding the LRT services in Singapore. It has all the needed information regarding the service provided. The website is maintained with proper changes of the events that are happening surrounding the station environment. It has a good interface with a lot of pictures of the services provided. It also helps to promote the tourism of the country.

The website is integrated with other public transport that is available in the country. The website also provides information on the current happenings in the city and how to get to the venue. It also has the full maps of its stations. It also has the needed details of each station, which includes such as public services, public accommodation, and public transport.

2.3.2 The website also has maps of interesting places and public places. It has the exact information of the public amenities within and few radiuses from the station.

Basically this website is developed using the HTML format. The system is developed with 2 modules. The two modules are interface modules and service module.

The interface module has a lot of information regarding the services that are provided by them. The interface mostly is developed using the simple flash. Each links of the services on the main interface is well designed to capture the user's eye. There are also few subsystems in the system. The subsystems are such as the travel information database and feedback system. The travel information database basically stores the tickets pricing from departure station to the destination station selected by the user. This database is mainly uses ASP codings. The database also has detailed information of ticket pricing according to the types of users.

The feedback system on the other hand is a database oriented where it lets the user to post in any comments regarding the service that is being provided by them. Later the web administrator and the management will view the comments for the improvement of the SLRT.

The disadvantage of the system is clearly seen when the user surfs through each webpage. All the webpage are designed with the similar designs. The background of the webpage is in pale blue. The webpage sometimes have difficulty to be viewed in Netscape browser.

2.8.2 PUTRA (www.putralrt.com.my)

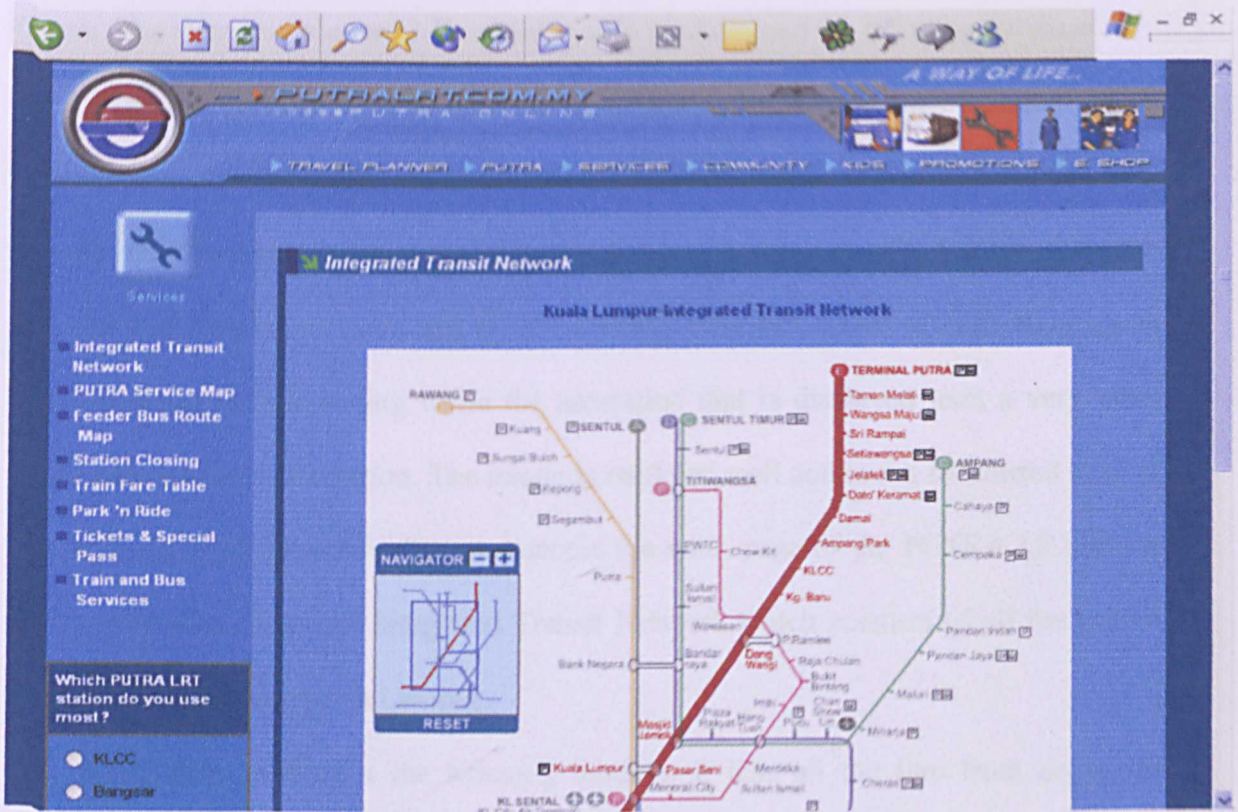


Figure 2.2: PUTRA LRT Website

Putra LRT is the second light transit railway project which have been developed in the Malaysia. In other words it helps the tourism industry in Malaysia. It has all the main attraction such as the Zoo, shopping center, Museum and etc within its rail tracks. It has the pictures of the mentioned places with some background of the tourist attractions.

This website is well developed with a lot of advanced features that helps the user to make a good use of the information gained. The website is mostly developed with macromedia flash and ASP. The website also has features such as zooming into the map to have a clear view of the places. The web developers have enhanced the use of flash

and the director and it gives a very attractive view for the user. It has 3 modules in the system. The three modules are 2-D modules, info modules and the ticketing database.

The 2-D module involves the use of animation software's such as macromedia software and other animation software's. The use of the animation software is done with a proper altitude where it is not crowding the screen. The main interface is blended with both the macromedia products and HTML codings. The side panel of each webpage is done using the HTML coding while the animation that is displayed uses a very clear image and detailed information. The image is rendered well and is not so blurred even if viewed in different browsers. For an example the main page of the PUTRA LRT has a flash of the Kuala Lumpur Integrated Transit Network which consists of all the public transports available in Kuala Lumpur.

The other module is the ticketing module. It lists all the fare from departure station to the destination station. It also has details of each station and provided with feeder bus and list down the route of each bus. It also has listed the fare table of the journey using the PUTRA feeder bus. The database is using ASP as it is more secured and can be maintained in a more secured environment. The purchase of monthly passes also can be done through online purchasing.

The website also has travel planner which is used to plan and learn of the places that they are about to visit. It also has community services listed such as subsidized charges for children and the elderly people.

The disadvantage of the website is that, the website has a lot of information on the tourist places which makes the website is flooded with texts. The website has an

animation at the beginning of the pages which makes the page delays to load on the browser.

2.8.3 SMRT (www.smrtcorp.com)



Figure 2.3: SMRT Website

This website is also similar with the SLRT as both are maintained by the same mother company. But the features of both websites are not similar. The SMRT website has a little information regarding the services provided although the concept of the website is similar to the SLRT

The interface of this website is very simple and less attractive as the SLRT website. The services provided are similar to the SLRT website as the links and buttons

created uses the same arrangements as the SLRT website. The MRT services starts from the north of Singapore. This limits the service provided by the MRT as the rest of the island is covered by the service provided by LRT services. This is another reason why there is not much information stated on the website regarding the services provided by MRT and why the website is inter related with SLRT website.

Another unique feature of this website is that this website acts as a middle person to other websites. The other websites are the transport websites which services the island and to the Malaysia. This transport websites has all the information of buses, taxis, rental cars and courier services from the island to Malaysia and vice versa. It has the schedules included and all the services are across the border. Even the busses are mostly the ones that cross the border. This particular websites also linked to the immigration website where the user can check any details needed for them when traveling to Malaysia.

This website was created with a little effort as it has all the basic requirements of a webpage. The information provided is minimal and confusing as it only has links to other websites. This websites can be said as an integrated transport agent via web. Basically the authoring tool used is HTML. It has a simple table. The links made available using the hyperlinks. There is only one ticketing database used. There are probably only two modules as stated. The possible modules are the main interface module and ticketing database module.

2.8.4 Virtual Denmark (www.virtualdenmark.dk)

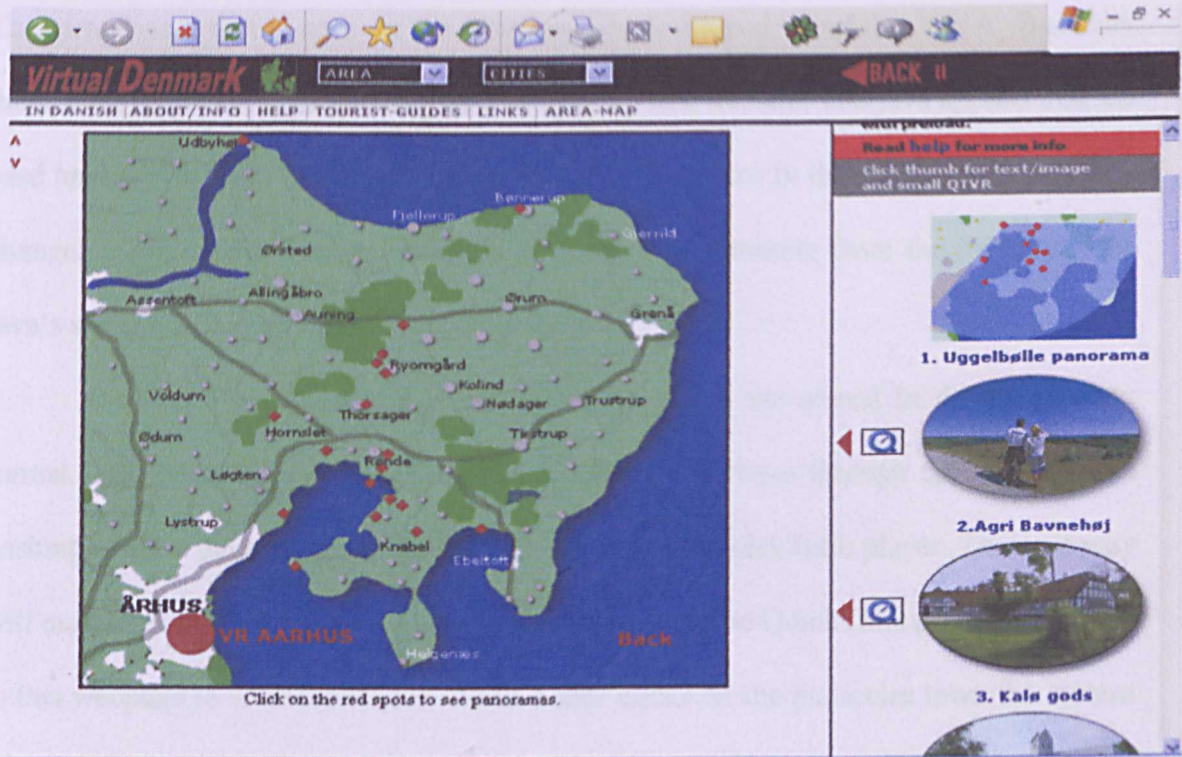


Figure 2.4: Virtual Denmark Website

This website is tourism based. It shows the user of tourist attraction in Denmark. It also has views of places stored in the server in the form of video to show to the user of the tourist attraction in Denmark. This website has links to all the hotels and accommodation provider in Denmark. This webpage is similar to the virtual tour webpage.

The webpage some how only accommodate majority Denmark and European users only. As there is only some functions made available in English. The rest of the webpage is developed in Danish. It will be difficult for a user to get a hotel booking done through the website as it is not equipped with the currency converter.

This webpage is developed using the Dreamweaver and Flash by Macromedia. The virtual map that is seen on the main page is developed using the JAVA. Basically there are a lot JAVA applets being used to develop this website. The java applets that are used basically to show the animation such as the traffic flow in the city of Denmark. The changes of the traffic flow are changed in delay of one minute from the existing. This java's shows the current traffic flow of the city.

As for the recorded videos of the tourist places are stored in the QuickTime format. This becomes a minus point as the user who browses through this website and wishing to view the recorded videos needs to install the QuickTime player. This in a way will make a troublesome for the user to browse or install the QuickTime player and return to this webpage to view the videos. When a user clicks on the particular town the system will then connect it to the QuickTime player and plays the virtual tour of the particular town.

This webpage cannot be viewed in a low end pc as it has heavy graphic utilization. This might take a very long time to load in the browser or in some cases it might stall the system.

2.9 Comparison and Analysis of the WebPages in the Internet

Previously the types of WebPages that are similar to the system that will be developed have been discussed. A lot of information has been gained from all the four websites. Especially the PUTRA LRT and the Virtual Denmark website have given the idea of how the Intelligent Map Guider should look like.

The PUTRA LRT website provided all the details of the PUTRA LRT in the whole. These website have helped to describe and learn of the ways to bring the information to the user.

The Virtual Denmark website has helped in creating a very user friendly approach. This website is choosen as it is a virtual concept in its details presentation. The places of interest and tourist attraction are presented in a virtual tour. The website in a way possible helped in creating a more interactive way to present the information to the user.

The Intelligent Map Guider system will combine the features from both the PUTRA LRT and The Virtual Denmark website. The 2-D module will use the information from the PUTRA LRT website where the interface and the animation will be included. The information will be displayed in 2-D module.

The 3-D module will be similar to the Virtual Denmark. The 3-D module is the intelligent part of the system where the user can view the stations in 3-D view. The user can view the surrounding of the station from the LRT. The extra information will be displayed within the 3-D view which makes the 3-D module different than The Virtual Denmark. Lastly the Intelligent Map Guider system will be informative to all users from all ages and the information can be transferred without the language barrier.

2.10 Development Software and Tools

In this session, few types of software are picked and studied. The functionality and compatibility of the softwares are researched and discussed to. Then the strength and weakness of the softwares are analyzed to decide which software to be choosen to be

used to develop Intelligent Map Guider. The softwares which are needed are divided into two groups which are as:

- a) The tools for the Modules development, which are related to computer graphic and animation design.
- b) The platform.

2.10.1 Tools for the Module Development

Many tools and software supporting computer graphic and computer animation are developed from day to day. They are Macromedia Studio MX and 3D Studio Max.

2.10.1.1 Macromedia Studio MX (www.macromedia.com)



Maximize your ability to get more done with the power of Macromedia Studio MX, a suite of integrated tools that provides all you need to build everything from simple web pages to Rich Internet applications.

Macromedia Studio MX Plus – a special edition for Windows – adds Macromedia Contribute and DevNet resources, to help you make the most of your Macromedia MX technology investment

Macromedia Studio MX is an integrated suite of easy-to-use, powerful, and open development tools that includes Macromedia Flash MX, Macromedia Dreamweaver MX,

Macromedia Fireworks MX, and Macromedia FreeHand MX, and Macromedia ColdFusion MX Developer Edition (Windows only). Macromedia Studio MX streamlines each stage of the web production process—from creating graphics to laying out HTML pages, coding application logic, building rich-user interfaces, and assembling complete solutions.

a) Easy

Get results fast with Macromedia Studio MX. Work in a familiar, customizable environment that's easy to learn, offers a seamless workflow, and provides building blocks for rapid development.

b) Powerful

Studio MX is a professional suite of tools for creating effective user experiences. Find everything you need to create interactive graphics and animation, professional-quality code, rich user interfaces and robust applications.

c) Streamline productivity with the enhanced MX workspace

Consistent user interface elements including colour management, drawing tools, code editing, a common Property Inspector and panel management—make it easy to move between applications.

d) Quickly deliver polished content and applications

Professional-quality, pre-built templates and components make it easy to create everything from web graphics to entire websites and rich Internet applications. Leverage pre-coded HTML objects, Macromedia Flash MX components, and complete templates to create or customize the web solution that best suits your needs.

e) Integrate design and development

Get the maximum advantage from all products in the tool set. Import Macromedia Flash MX files into Dreamweaver MX, and then preview your Macromedia Flash content right in the Dreamweaver authoring environment. Storyboard an entire Macromedia Flash MX site in FreeHand MX and export to Flash with one command. Create, edit, and animate graphics and menus in Fireworks MX, then export them into Dreamweaver-seamlessly and easily. Use single button export to move files from Fireworks to Macromedia Flash, Dreamweaver, and FreeHand.

f) Quickly develop rich Internet applications

With drag-and-drop visual tools and components, code libraries and extensive code-editing support for HTML, XHTML, XML, ColdFusion, ActionScript, ASP, ASP.NET, JSP and PHP.

g) Streamline your workflow

Through seamless launch and edit capabilities shared across the suite. Easily update bitmaps embedded in Macromedia Flash with Roundtrip editing in Fireworks-including layered objects, native text and vector graphics. Edit and update HTML and JavaScript code and graphics from Dreamweaver while maintaining edits.

h) Take advantage of ColdFusion MX integration

The fastest way to develop rich Internet applications is by using Flash MX. Broad-ranging support includes code samples and reference material; common language support between Dreamweaver MX, FlashMX, and ColdFusion; seamless integration with Macromedia Flash MX components; and an integrated tool set for tying back-end logic to Macromedia Flash MX user interfaces.

i) Embrace today's standards and accelerate next-generation development

With support for industry-standard technologies such as XML, web services, XHTML, CSS2, J2EE, Microsoft.NET and ECMAScript.

j) Reach the largest audience possible

The websites provide accessible content and application that leverage Macromedia Flash Player 6. Both Macromedia Flash and Dreamweaver make it easy to develop web-accessible content. Macromedia Flash content is

immediately viewable by over 98% of PCs and also available on a growing number of Internet-connected services.

2.10.1.2 3D Studio MAX 4



3D Studio Max[™] is the world's best selling professional 3D modeling, animation and rendering software, delivering a unified, object-oriented platform for artists creating visual effects, character animation and next generation games. Since its introduction in 1996, 3ds max has been the recipient of more than 65 industry awards and is the 3D tool of choice among more than 140,000 3D artists using Windows[®].

3D Studio Max 4 delivers CG professionals with advanced tools for character animation, next generation game development, and visual effects production. Numerous key new feature additions and architectural enhancements compliment these three major initiatives, making 3D Studio Max 4 an ideal tool for the 3D animation industry. A highly tuned animation system allows artists to bring their ideas to life with the most advanced tools for modeling and animating characters.

Version 4's state of the art interactive graphics, approachable extensibility, next-generation modeling tools and truly open architecture make 3D Studio Max 4 the

premiere 3D content creation tool for next generation game development platforms such as Microsoft® X-Box and Sony Play station® 2.

An interactive and photo-realistic Active Shade render engine, customizable and production proven network rendering system, and tight post-production integration with combustion™ - Discreet's desktop 3D compositing software - makes 3D Studio Max 4 the most efficient and productive tool for film and television visual effects.

3D Studio Max 4 also can utilize other advanced renderers like mental ray® and Render Man for distinct rendering capabilities like global illumination, caustics and distributed rendering.

2.10.2 Systems Requirements

- Windows
- 300+ MHz Intel Pentium II processor or equivalent
- Windows 98 SE, Windows Me, Windows NT 4 (Service Pack 6), Windows 2000, or Windows XP
- Adobe Type Manager Version 4 or later for use with Type 1 fonts
- 96 MB of free available system RAM to open one application (128 MB recommended)
- Additional RAM required to open multiple applications simultaneously
- 510 MB of available disk space to install all applications
- 1024 x 768 resolutions (millions of colors), 16-bit color display or better
- CD-ROM drive
- For Adobe PostScript printing: PostScript Level 2 or PostScript 3

- Netscape Navigator 4.0 or Internet Explorer 4.0 or later

2.11 Platform

2.11.1 Microsoft Windows 2000 Professional



Windows 2000 Professional is the Windows operating system for business desktop and laptop systems. It is used to run software applications, connect to Internet and intranet sites, and access files, printers, and network resources.

Built on Windows NT® technology and the easy-to-use, familiar Windows® 98 user interface, Windows 2000 Professional gives business users increased flexibility. The integrated Web capabilities let them connect to the Internet from anywhere, at anytime—giving the company access to host of flexible, cost-effective communications options. In addition, broad peripheral and mobile computer support make Windows 2000 Professional an ideal operating system for a workforce that increasingly relies on notebook computers. Further, the support and administrative staff will particularly appreciate the reliability and manageability enhancements that make desktop management simpler and more efficient.

Windows 2000 Professional lets you:

- ✓ **Work how and where you want** with new peripheral support and features that extend notebook capabilities.
- ✓ **Rely on your PC** to be up and running with enterprise level quality.
- ✓ **Work the way you did with Windows 98, only much faster.** Combine the ease of Windows 98 with the manageability, reliability, and security of Windows NT, at speeds 30 percent faster than Windows 98 on PCs with 64 MB of RAM or more.
- ✓ **Communicate, share information, and use the Internet quickly and easily.** With integrated support for Internet-enabled applications, business software developers incorporate the new ways to create and share information made possible by the Internet.

3.0 Chapter 3

3.1 Methodology and System Analysis

System development methodology is a collection of techniques for building model-applied across the system lifecycle. A model is process of systems development used by software engineers or system developers to describe their approach in producing a system.

A software life cycle model depicts the significant phase of a system development from conceptions until the product is completed. It specifies the relationship between project phases including transition criteria, feedback mechanism, milestones, baselines, reviews and deliverables. Typically a lifecycle model address the following phases of a software project; requirement phase, design phase, implementation, integration, testing, operation and maintenance. The methodology used in this project is the waterfall model with prototyping.

3.2 Waterfall Model with Prototyping

Waterfall model with prototyping has been chosen as the systems process model. The figure below shows the waterfall model with prototyping. This system process model contains seven phases, which are described as below;

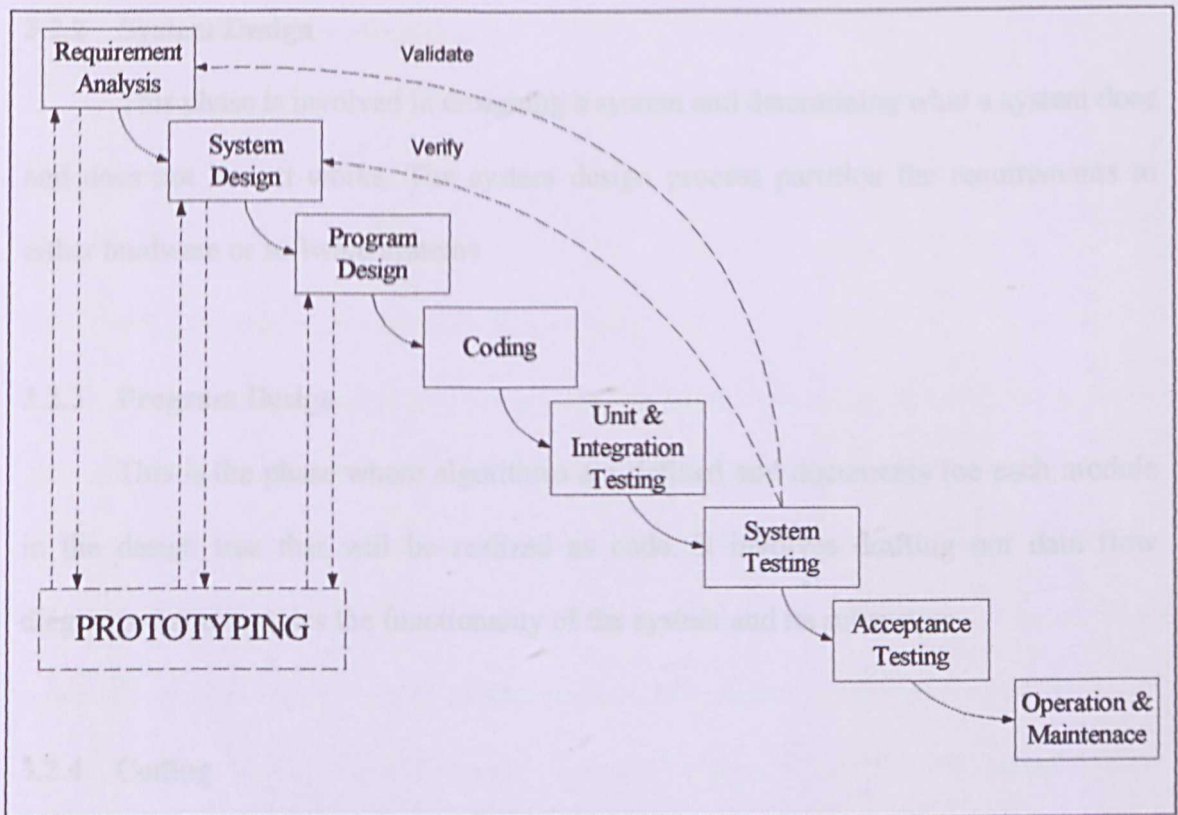


Figure 3.1: The Waterfall Model with Prototyping

3.2.1 Requirements analysis

This phase requires information gathering. It may be in technical aspects or non technical aspect. Information will be gathered through the internet, interviews, and reading materials. The materials may include journals, magazines, books and newspaper. This is the phase where research and survey are done. The system services, constraints and goals are established by consultation with system users. They are then defined in a manner which is understandable by both users and development staff.

3.2.2 System Design

This phase is involved in designing a system and determining what a system does and does not how it works. The system design process partition the requirements to either hardware or software systems

3.2.3 Program Design

This is the phase where algorithms are defined and documents for each module in the design tree that will be realized as code. It involves drafting out data flow diagrams that resembles the functionality of the system and its subsystem.

3.2.4 Coding

This phase involved in transforming the algorithms defined during the previous phase into a computer understandable language. The program will be coded using the selected programming languages and applications development tool following the design specification.

3.2.5 Unit Testing

The purpose of unit testing is to ensure that each module behave accordingly to its specification defined during program design phase. It checks each coded module for the presence of bug.

3.2.6 System Testing

This phase checks the entire system to ensure that the system behaves accordingly to the software requirements specifications.

3.2.7 Operational Maintenance

This phase makes sure that it continues detection and repair of bugs are being carrying out.

3.3 Why Waterfall Model with Prototyping?

The waterfall model with prototyping is chosen because waterfall model can suggest to the developer the sequence of events they should expected to encounter. It can be very useful in helping developer's layout what they need to do. Besides, developer also can estimate how close the project is to completion to give point of time. This model also enables developers to make necessary preparation for the coming phase.

Prototyping is used with waterfall model because it can help the developer to enhance their understanding about the system. In the prototyping section in waterfall model, the user requirement will be identified and documented.

This information will be used to develop user interface and will be taken as prototype. Prototyping enables the users to interact with the system so that they have a better understanding what the new system will be. All the feedback from the users will be used to re-adapt the prototype in order to satisfy the user's needs. The prototype is then used and re-adapt until satisfy by the developers and users. The prototyping is added to waterfall model because the users do not know exactly what they want until they actually have a chance to see and work with systems developer build systems using feedback supplied by the users.

The reason why the prototype is important to be integrated with the waterfall model is shown below:

- ✓ Requirements are often poorly understood.

- ✓ Requirements usually change during the development process.
- ✓ Current requirements remains only partially understood until often users have an actual opportunity to use a system.

3.4 Why not Waterfall Model?

Many problems will arise if only use waterfall model alone. The biggest problem with the waterfall model is that it does not reflect the way code is really developed. Except for very well understood problems, software is usually developed with a great deal of iteration. Often, software is used in a solution to a problem that has never before been solved or whose solution must be upgraded to reflect some change in business climate or operating environment.

The actual software development process, if uncontrolled, developers may thrash from one activity to the next and then back again, as they strive to gather knowledge about the problem and how the proposed solution addresses it.

Waterfall model shows how each major phase of development terminates in the production of some artifact. There is no insight into how each activity transforms on artifact to another, such as requirements to design. Thus the model provides no guidance to managers and developers on how to handle changes to products and activities that are likely to occur during development. For instance when requirements change during coding activities the waterfall model does not address the subsequent changes to design and code.

Curtis, Krasner, Shen and Iscoe (1987) noted that the waterfall model's major short coming is its failure to treat software as a problem-solving process. The waterfall model was derived from the hardware world, presenting a manufacturing view of

software development, but manufacturing produces a particular item and reproduces it many times. Software is not developed like that; rather it evolves as the problem becomes understood and the alternatives are evaluated. Thus software is a creation process, not a manufacturing process. The waterfall model tells us nothing about the typical back and forth activities that lead to creating a final product. In particular creating usually involves trying a little of this or that, developing and evaluating prototypes, assessing the feasibility of requirements, contrasting several designs, learning from failure and eventually settling on a satisfactory solution to the problem at hand.

3.5 Why not Prototyping?

In the competitive world, every manufacturer wants to develop their product as fast as possible and wants to promote that product before their competitors. Therefore most of them use prototyping model. Prototyping is the technique of constructing a partial implementation of a system so that users or developers can learn more about a problem or solution to that problem. It causes the entire system to be constructed quickly.

If a system is needed badly and welcomed readily the prototype may be accepted in its unfinished state and pressed into service without the necessary refinements. While superficially, this may seem to be an appealing way to short cut the development effort; it works to the business's and team's disadvantages.

Besides, the manufacturer also does not consider the long run maintenance. They always produce products that are difficult to maintain. However they argue that when the problem arises in the future, the next release of the software that is more advanced

had been published to solve those problems. From this point of view, the manufacturer is blamed to be not responsible to the users

Users will develop interacting patterns with the prototype system that are not compatible what will actually occur with the complete system. Additionally a prototype will not perform all necessary functions. Eventually when users discover the deficiencies, user mistakenly adopted and integrated into the business as if it were a complete system.

All of the possible problems that project management is subject to are relevant here. It can be quite difficult to manage prototyping as a project within the larger systems effort. Although several iterations of the prototype indefinitely create problems. It is important that the system analysis team devises and then carries out a plan regarding how feedback on the prototype will be collected, analyzed and interpreted.

3.6 Consideration of the Software

3.6.1 Consideration of Advantages of Microsoft Windows 2000 Professional

a) Value

The number one reason to move to Windows 2000 Professional is the overall value it offers. As this list proves, Windows 2000 Professional can help you reduce costs through improved management and increase productivity through improved reliability and ease of use. For example, analysis conducted at Credit Susie First Boston predicted that using Windows® 2000 Professional could reduce the firm's directly related IT costs by 15 percent, as well as improve employee productivity by cutting computer-related

unproductive time by as much as 41 percent. For more about return on investment, see this report from Arthur Andersen.

b) Reliability

An essential requirement for business users is a personal computer they can count on. That's why Windows 2000 Professional includes fundamental improvements—such as modifications to the operating system core to prevent crashes and the ability for the operating system to repair itself—that make it the most reliable desktop operating system Microsoft has ever produced. On comparative reliability tests conducted by ZD Labs, the average system uptime of Windows 2000 Professional was over 50 times that of Windows 98 and 17 times that of Windows NT Workstation 4.0.

c) Mobility

Mobile computing is simpler and more efficient with Windows 2000 Professional. This means users can work anywhere, anytime while also saving time and increasing productivity. As described in these news articles, "Finally, a Notebook OS" and "Mobile Users In Love with Win2K", Windows 2000 Professional offers mobile users' key productivity and time-saving features, including the ability to hibernate and restart the system without a reboot and the ability to easily take files and folders offline.

d) Manageability

Windows 2000 Professional is easier to deploy, manage, and support. Centralized management utilities, troubleshooting tools, and support for self-healing applications all make it simpler for administrators and users to deploy and manage desktop and laptop computers. These improvements pay off in reduced costs, as illustrated by this Eastman Chemical total cost of ownership analysis.

e) Performance

The advancements made throughout Windows 2000 Professional are accentuated by the operating system's speed. As shown in ZD Labs tests running the most popular business applications, with 64 MB of RAM, Windows 2000 was 32 percent faster than Windows 95 and 27 percent faster than Windows 98. It is also significantly faster than Windows NT 4.0 on configurations with 32 MB of RAM.

f) Security

Windows 2000 Professional provides comprehensive security features to protect sensitive business data, both locally on the desktop computer and as it is transmitted over the local area network, phone lines, or the Internet. With its support for Internet-standard security features such as IP Security, Layer 2 Tunneling Protocol, and Virtual Private Networking, Windows 2000 is so secure that banks, such as Credit Suisse First Boston, use it. For some

organizations, such as the law firm Dorsey & Whitney LLP, security is a key reason for moving to Windows 2000.

g) Internet

The familiar user interface of Windows 98 combined with all the capabilities of Internet Explorer 5, makes using the Internet and the local desktop a unified user experience, as described by PC Magazine. This user interface, combined with integrated search capabilities, makes it easier to find and use information locally and on the Web.

h) Usability

As described in this Windows 2000 Magazine review, Windows 2000 Professional combines the power and security of its predecessor, Windows NT Workstation, with the traditional ease of use of Windows 98. It also provides more wizards, a centralized location for common tasks, and menus that adapt to the way you work.

i) Data Access

When you use Windows 2000 Professional in conjunction with Windows 2000 Server, you can take advantage of IntelliMirror technologies. By letting you store your important information and desktop settings on a central computer, IntelliMirror lets you work on any computer attached to your network as if you are at your own desk. The centralized management savings

made possible by Windows 2000 IntelliMirror technologies are one of the reasons WFOF, Inc. is using Windows 2000 Professional.

j) Hardware

Windows 2000 Professional lets you take advantage of new hardware devices, such as those with universal serial bus (USB) and IEEE 1394 (Fire wire) connections. In addition, support for existing hardware makes Windows 2000 ideal for companies, such as Panasonic, that want to standardize on a single operating system across their organizations.

3.7 Consideration of Web Application Language

3.7.1 HTML

Hyper Text Markup Language is chosen as the system's markup language because HTML is the universal language in the Internet. It remains as the default selection for developing web pages. Its high degree of interoperability enables the Intelligent Map Guider to be accessed virtually from anywhere in the world. It is easy to learn and can even be used by the novice.

Although HTML is easy to use, it is rather simple, static and does not support some dynamic features or effects that need to be included in the WebPages. Due to this reason, it alone will not be powerful enough to support a sophisticated and interactive web-based application. Anyway the combination of HTML and ASP will be possible to produce such an interactive application or even a more powerful online application, hence, achieving the Intelligent Map Guider objectives of virtual information and tickets sales dissemination.

Due to its ease of use, HTML is chosen over the DHTML, although DHTML can produce dynamic web pages as well. Another setback of DHTML is that DHTML is impossible to function in both browsers properly while the major browsers support the application produced by the combination of HTML and ASP. Without HTML the World Wide Web would not exist. HTML allows the individual elements on the web to be brought together and presented as a collection. HTML is not the only way to present information on the web but it is not the glue that holds everything together. In addition to being a markup language for developing text, images and multimedia, HTML provides instructions to the web browser in order to control how documents are viewed and how they relate to each other. The users can add many functions inside HTML to make it become a dynamic HTML. Besides displaying information they can also show database record in the Internet and get response from other users.

3.8 Consideration of Web Graphics Technology

3.8.1 Macromedia Studio MX

Macromedia's Studio MX consists of the latest "MX" versions of the company's Dreamweaver web authoring and development package, Fireworks web graphics editor and Flash authoring program, not to mention a copy of the FreeHand 10 illustration package and a developer version of the ColdFusion MX server software. It provides just about everything that is needed to create anything from simple one-page websites to huge, database-driven dynamic portals, in one tightly integrated bundle.

Dreamweaver MX, is used to create web sites in a professional capacity, It is one of the most respected, powerful and flexible editors available including with the UltraDev version that makes the development of dynamic sites with database integration

a breeze. In fact Dreamweaver MX offers better support for server-side scripting and database connectivity than the UltraDev version ever did.

Fireworks MX can be used to create a .PNG file from an HTML page containing tables, edit it, then save the results as HTML or as a .PNG for later use. There's also a data-driven graphics Wizard, which allows to assign variables to elements within a file, such as images, text and slices, and automatically create multiple, differing copies based on data stored in an XML or comma-delimited file. Fireworks MX's button and navigation bar creation facility has also been improved and now create, edit and manage buttons and even complete navigation bars, complete with all the Java required for rollovers, pop-up menus and image swaps, sets Fireworks MX apart from all other web graphic editors.

This entire feature, which has been mentioned above, makes this particular software, dynamic software to create a web page graphics. This software has been chosen as ideal software for this system development. This is the most essential in developing the Intelligent Map Guider.

3.9 Consideration of Web Technology

3.9.1 Active Server Pages (ASP)

Perl' and other scripting language are not robust developments tools by themselves. ASP provides a familiar framework and objects for building complex application that requires data from relational database and legacy sources. ASP supports virtually any scripting language to build these applications. Third parties are currently developing additional scripting engines, such as PERL, which will be announced when they are ready.

3.10 Consideration of Web Browser

3.10.1 Internet Explorer 6.0

Internet Explorer 6.0 has been chosen as the browser due to the following advantages, which can be obtained by using the Internet Explorer 6.0.

- ✓ **Simplicity** – It is easier than ever to find and organize information, including enhancements to search, history and favorite bars.
- ✓ **Automation** – Intelligence technology saves users time by doing the most common web tasks for them, like typing web pages addresses and filling in web forms.
- ✓ **Flexibility** – User have the freedom of choice to use any homepage or portal. Let them use tools they want to use, use the sited they want and access it anywhere.

3.11 Hardware Requirements

The appropriate hardware selection is essential for the Intelligent Map Guider as the developed system will involve server hardware as well as client hardware. It also involves a lot of Graphic utilization so the choice of hardware will determine the efficacy of the system when fully developed and implemented. Below are the recommended hardware requirements for this system.

The server computer hardware requirements are:

1. A server with at least 2.0Ghz Pentium IV processor.
2. At least 256MB RAM.
3. Network interface card and network connection with recommended bandwidth at 100Mbps.
4. External 64 MB Graphic Card.

5. Other standard peripherals.

The client computer hardware requirements are:

1. 1.8Ghz Pentium III Processor.
2. At least 256MB RAM.
3. 64MB Graphic Card.
4. Other standard peripherals.

3.12 System Requirement Statement

3.12.1 Preconditions and Assumptions

- ✓ The objects in the Intelligent Map Guider may not be exactly the same as we see in the real world, they are rather modified, represents the objects in the real world.
- ✓ The Intelligent Map Guider system may be used by as many users at one time.

3.12.2 Functional Requirements

- ✓ System Features for Intelligent Map Guider

Intelligent Map Guider for PUTRA LRT is an internet/intranet based system. In which the system enables the user to view information both informatively and interactively. It provides virtual view of the stations that is selected. It also gives detailed information relating to the station and places around the station. Among the features included in the systems are:

a) 2D Module

- ✓ All users can view the information display in the main interface.
- ✓ This module is also the main page and it has the 2D features of the PUTRA LRT services.
- ✓ The module also specifies the different type of users such as working user, schooling user and the tourist.
- ✓ It is an interactive module where the user can choose the place of departure and destination. Later the interactive system will display the ticket pricing and also the information of place of interest surrounding the destination station.
- ✓ The visualization is only in text and 2-D graphics.
- ✓ Only an administrator can change and update the main interface. When an administrator is performing this task, the system is locked and no other administrator can enter the edit mode of the system.

b) 3D Module

- ✓ This Module can be accessed by all users from the main interface.
- ✓ This Module is the enhanced version of the 2-D Module.
- ✓ This module will give the user the virtual tour like experience. It will show the user the real scenario of the station.
- ✓ This module will also show in detail the places of interest surrounding the station.

- ✓ This module can be considered as the virtual tour as it is the intelligent part of the system.
- ✓ This module is also can only be modified by an administrator. When the administrator is performing this task, the system is locked and no other administrator can enter the edit mode of the system.

c) Info Module

- ✓ This module is present both in 2D and 3D Module.
- ✓ This module will pop up the information regarding the PUTRA LRT and also events which are catered by PUTRA LRT.
- ✓ This module is at the bottom of the web page.
- ✓ It has the interactive flash mode which will flash the information and can also be said as an informative notice board.

3.13 Non-Functional Requirements

Non-functional requirements are the other factors that must be taken into consideration in the system development cycle. These requirements are very subjective but they play an important role to ensure system robustness and successful.

1. **Reliability** - The system should be designed in such a way that process errors are avoided or trapped before the result in output becomes error. It shall not cause any unnecessary actions of the overall environment.
2. **Availability and Manageability** – The system shall be available to the users anywhere and anytime to ensure that the operation and the services are running smoothly. It shall be capable to let user manage and operate the system easily.

3. **Security** – The system should ensure the use of the information is legal. Only authorized user can modify the system. The authenticated users shall have the access right to view or modify the data in the database. The system shall include the login procedure to identify the user. Communication with the system needs to be established with validation control to ensure authenticity of the data transfer.
4. **Usability** – The system must provide documentation or guideline to teach user how to use it. At least, intuitive interface shall present in such a way that makes user feel easy to use.
5. **Flexibility** – The system shall be capable for future expansion. System should allow the integration with other systems and new technologies.
6. **Portability** – The system must enable its application to operate on various platforms regardless of manufacturer or operating system.

4.0 Chapter 4

4.1 System Design

System design is a plan to build a system that meets the requirements needed to deliver the problem solution and helps to achieve the organization goal and objectives. Good design is the key to success project. This is a stage in the system development process where the requirements for the system are translated in to the system characteristics.

In intelligent Map Guider the stages in the design process are as follows:

1. Architecture Design

The subsystems of the system and their relationship are identified and documented.

2. Database Design

The data structures used in the system implementation are designed in detail and specified.

4.2 Architecture Design

The Intelligent Map Guider is divided in to three main modules for development. The three main modules are 2D module, 3D module and General Info module. Each module works as integrated system while some are independent system which capable to run on its own.

i. 2D module

2D module is designed to support the main functions of the system. This is the module is the main interface of the system. This module also has a sub module. The sub module is the ticketing database which will inform the user of the price of tickets according to the destination. This module

takes input from the user and produces the information needed by the user accordingly.

ii. 3D module

3D module is designed to give the virtual view of the information displayed on the 2D module. The 3D modules are entirely developed on the graphics. It is similar to the virtual tour which been practise but it pre recorded and not interactive to the user.

iii. General Info

This module plays a significant role in a single function. It will display any current information which is provided by the PUTRA LRT. This module in other words acts as a virtual messaging system which lists all the services provided by the PUTRA LRT according to the current events. This module also has the customer feedback features for the future improvement of the PUTRA LRT.

4.2.1 Architecture Design for Main Section

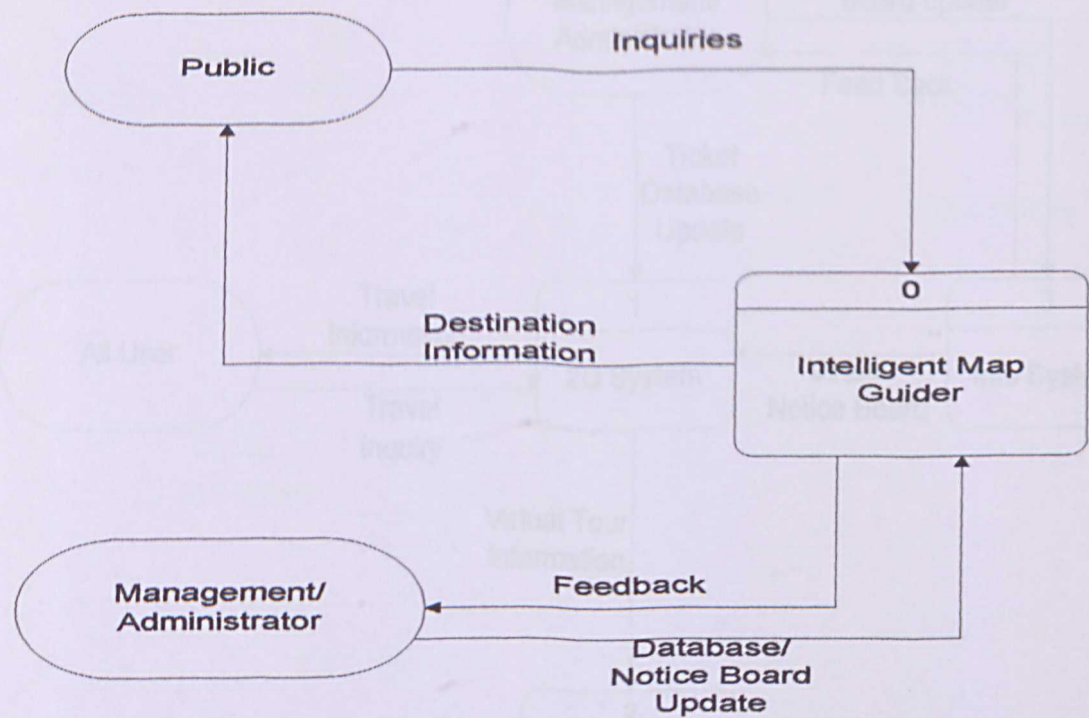


Diagram 4.1: The Context Diagram of Proposed Intelligent Map Guider

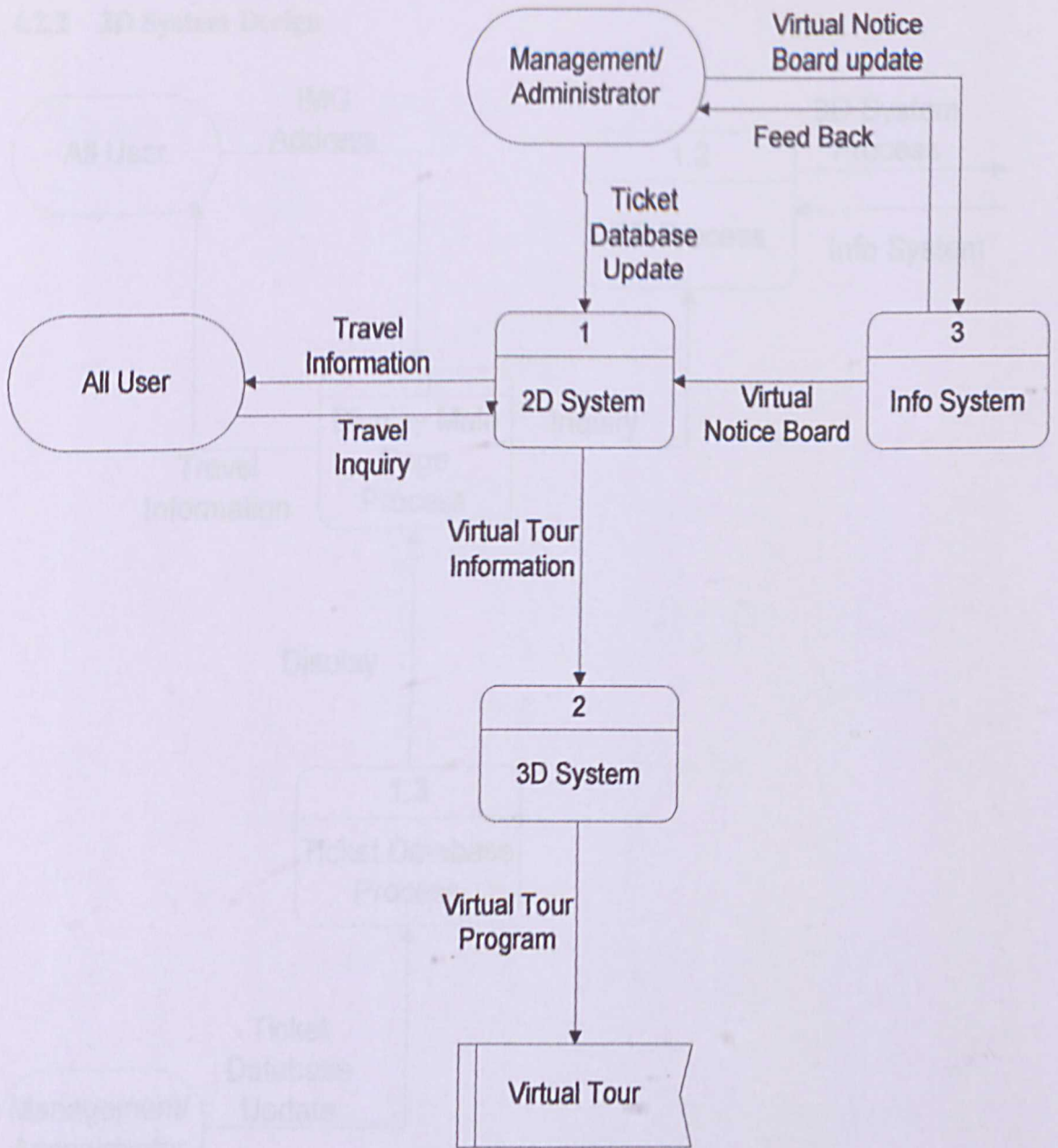


Diagram 4.2: The Zero Diagram of Proposed Intelligent Map Guider

4.2.2 2D System Design

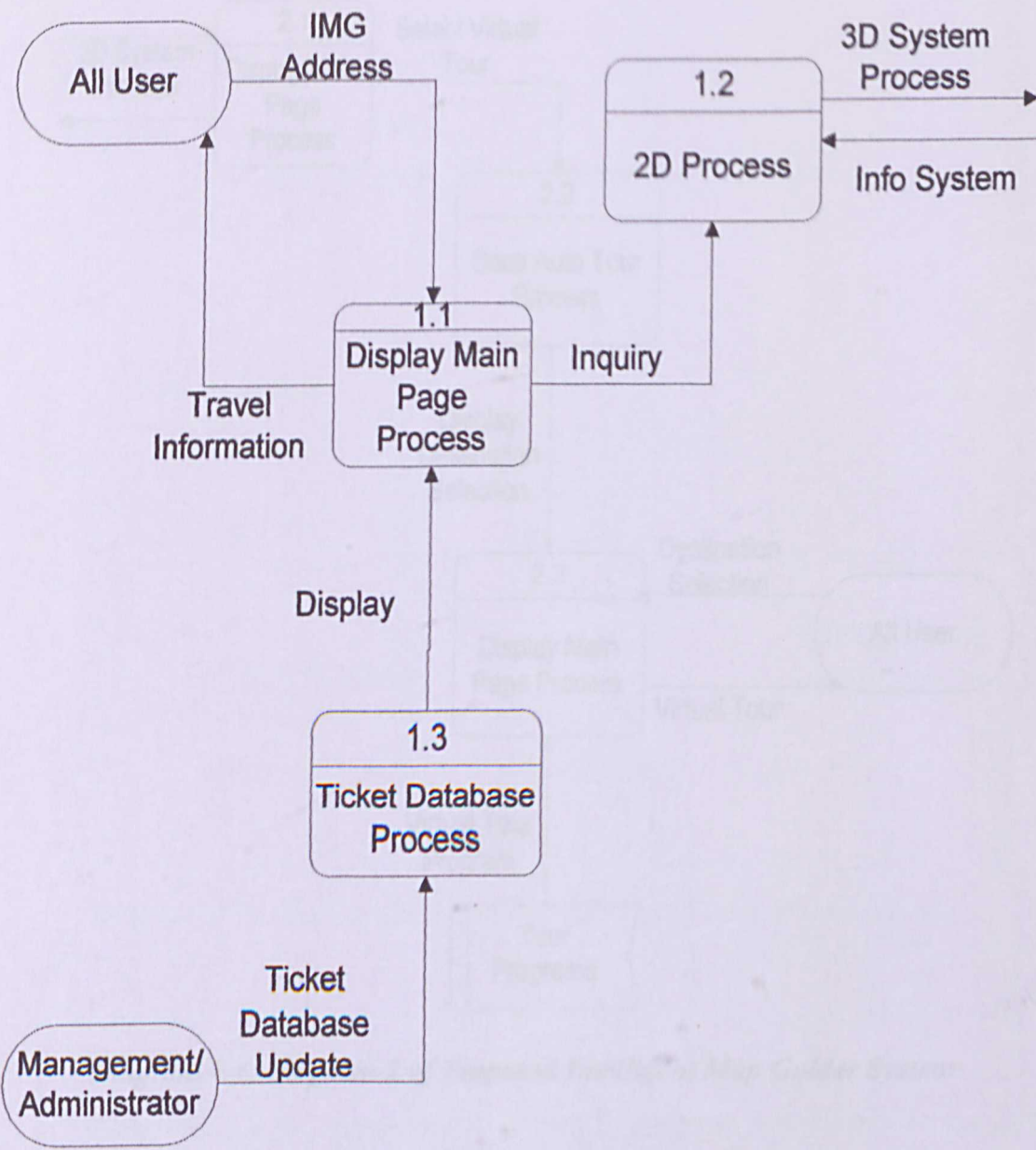


Diagram 4.3: The Diagram 1 of Proposed Intelligent Map Guider System

4.2.3 3D System Design

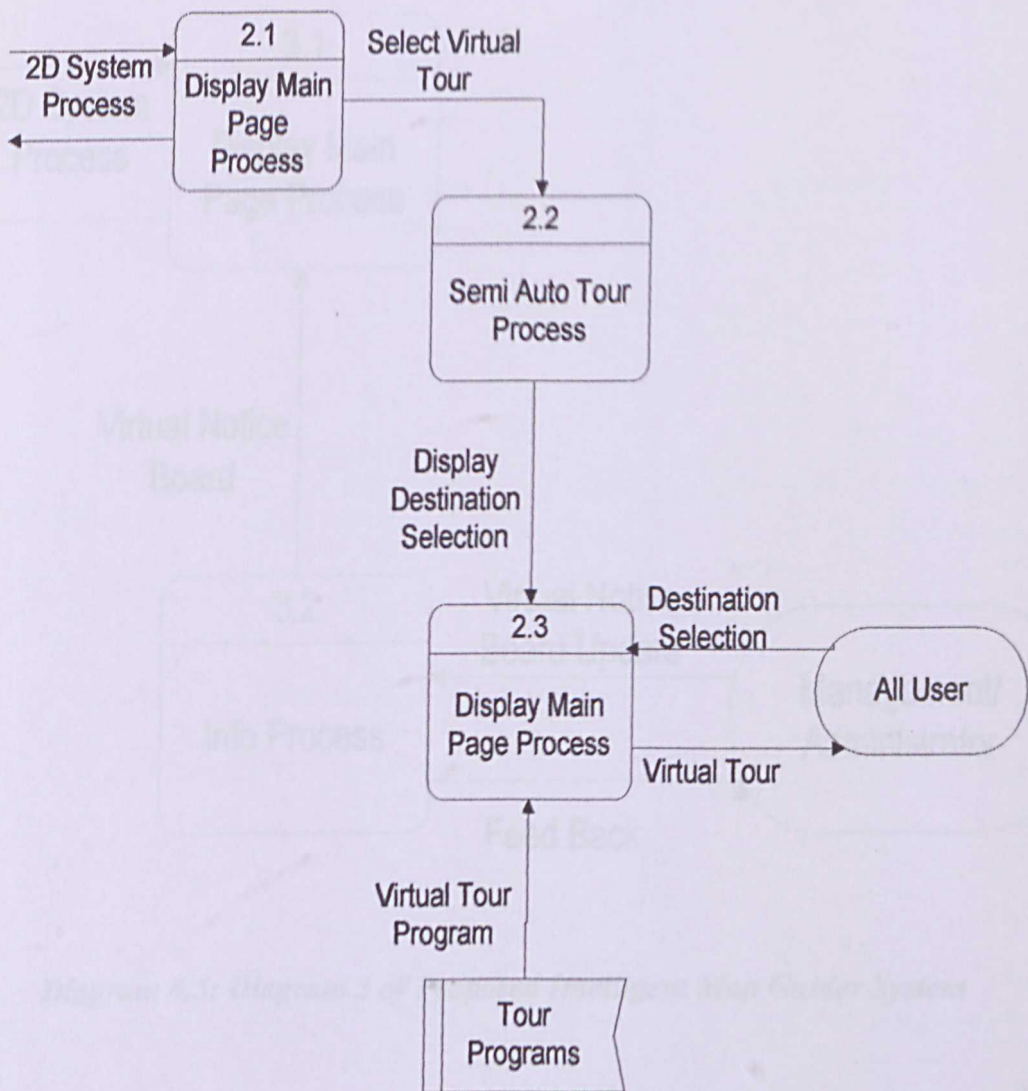


Diagram 4.4: Diagram 2 of Proposed Intelligent Map Guider System

4.2.4 General Info System Design

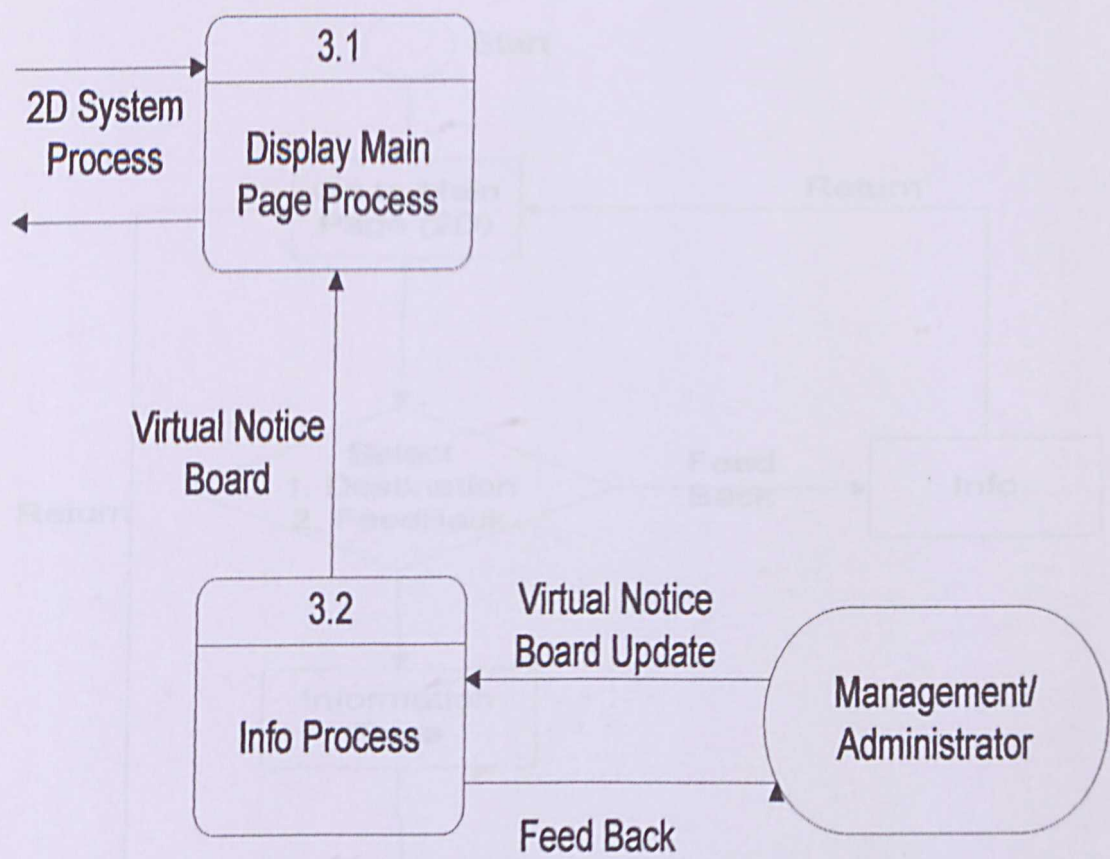


Diagram 4.5: Diagram 3 of Proposed Intelligent Map Guider System

4.3 Program Design

After the system design process is finish, the project continues to the next step that is program design. Program design is very similar to the system design, but this particular process only focus about how the system is running when the user has started using the system. Flow chart is used to design the programs. Flow chart explains step by step what happens to the system as response to the users actions.

4.3.1 Flow chart of Program Design

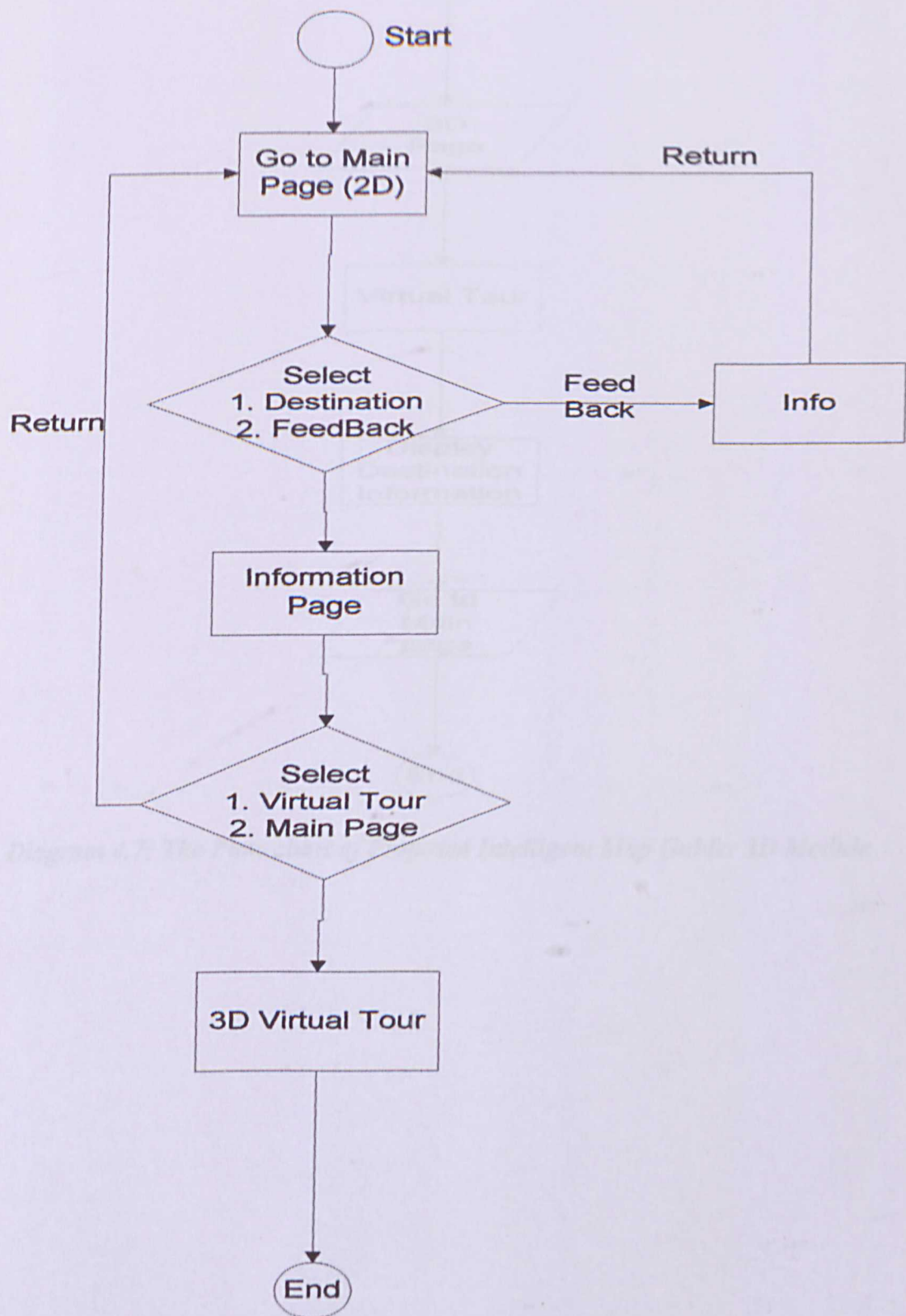


Diagram 4.6: The Flow chart of Proposed Intelligent Map Guider 2D Module

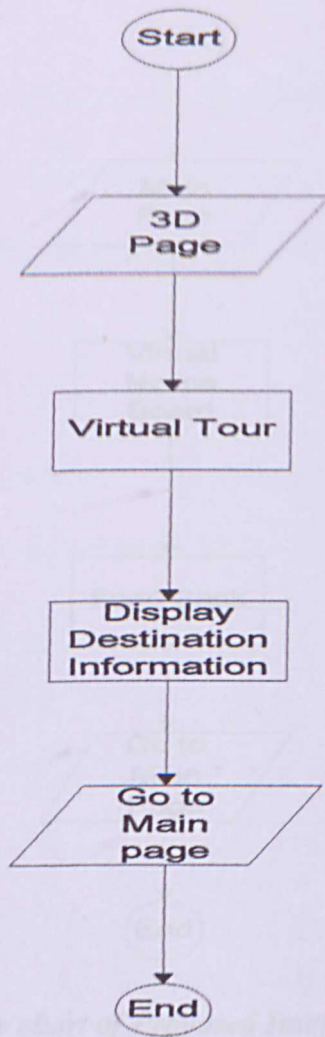


Diagram 4.7: The Flow chart of Proposed Intelligent Map Guider 3D Module

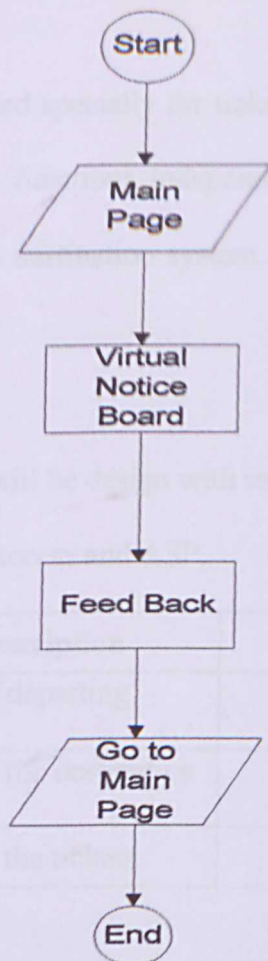


Diagram 4.8: Flow chart of Proposed Intelligent Map Guider

General Info Module

4.4 Database Design

This database is designed specially for ticketing of the PUTRA LRT. IT is a sub system which capable to functions independently. It will show the price of tickets from one station to the destination system. The functionality of the table is described as below.

✓ **Ticketing**

The ticketing database will be design with variables as stated below. It will be designed using the Ms Access and ASP.

Field	Description	Data Type	Field Size
Departure	Name of departing station	Varchar	30
Destination	Name of the destination station	Varchar	30
Price	Value of the tickets	Varchar	6

Table 4.1: Ticketing Database

4.5 User Interface Design

Designing the user interface includes two main aspects, to create and design the display in an informative way. Interface can be defined as the connectivity of two parties, which are the user and the computer. The main concern is the presentation of the desired input and output with the relevant information.

The interface plays and important role to deliver the information and designing the interfaces, as it should offer a user friendly, reliability, intuitive, minimize the need for user to memorize the process and the events. There are few things that must be considered so that the user feels comfortable using the system. To achieve this there are few guidelines, which are provided and followed to enhance Intelligent Map Guider.

The guidelines are as below:

- ✓ Interface must be easy to use and to understand.
- ✓ Objects and elements within the interface must be organized.
- ✓ The use of icons must be consistence and according to the functionality.
- ✓ Interactive animation will give user a good experience of using the system.
- ✓ Consistent format for command input, data display, menu selection, and placing of control objects.
- ✓ Ability of the user to take corrective action once an error has been recognized.
- ✓ Allow user to return to the previous state (before change).
- ✓ Categorize activities by functions and organize screen geography accordingly.

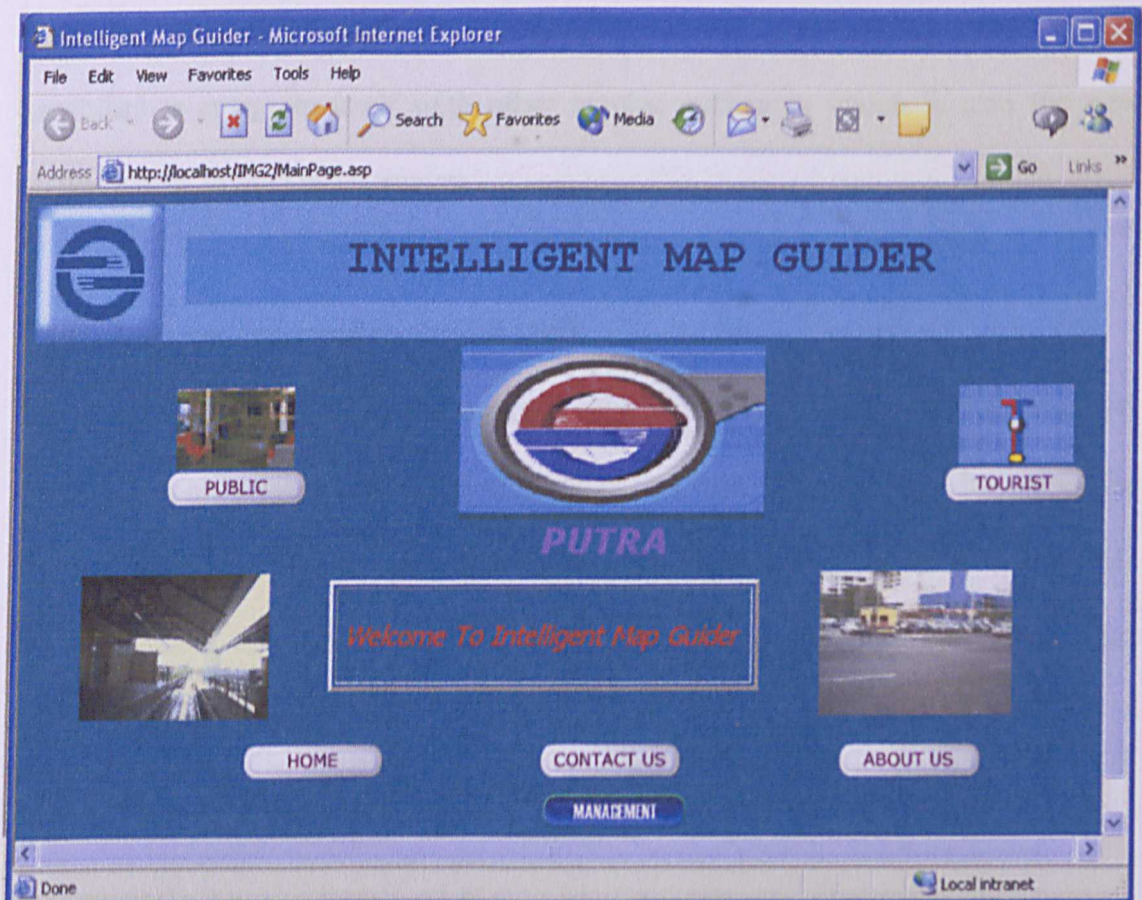


Figure 4.1: Interface Design of Intelligent Map Guider

5.0 Chapter 5

5.1 System Implementation

This implementation phase follows from the design phase. In this phase, the designs of the Intelligent Map Guider are transformed into a workable system. In this chapter the process of implementation will be given in detail. It consists of three main sections, which are implementation requirements, program development, program coding, implementation environment and database connection and the system functions.

5.2 Implementation Tools

5.2.1 Macromedia Studio MX

In order to design the desired user interface, Dreamweaver has been used as it is easy to use and provides a wide range of interface design features. It also has the capability to integrate itself with other graphic softwares which is also the new feature added to the Dreamweaver.

5.2.2 Internet Information Server (IIS)

In this project, IIS is an important tool that serves as a platform for the web tools and applications. The Internet services are run and managed by using the Internet service manager, which the administration feature is provided by the IIS. Properties such as virtual directories, virtual servers and access permissions are configured and tested.

5.2.3 Active Server Pages (ASP)

ASP is a server-generated page that can call other programs to access databases, serve different pages to different browsers. Typically, the script in the web page at the server uses input received as the result of the user's request for the page to access data from a database and builds or customizes the page on the fly before sending it to the requestor. ASP is as efficient as writing code directly to server's application program interface.

5.2.4 JavaScript

JavaScript is used in Intelligent Map Guider development to do such things as:

- ✓ Automatically change a formatted date on a web page Cause a linked-to page to appear in a popup menu window.
- ✓ Cause text or graphic to change during a mouse rollover.
- ✓ To prompt the user with the error message

5.2.5 VBScript

In the development of Intelligent Map Guider, it can put an Internet server to work either by actually storing the data or causing some action to take place on the server based on the information given. VBScript validates data, does the search function for the ticketing database, provides impressive multimedia feedback, and initiating data storage. The VBScript is used to sequence the questions based on responses.

5.2.6 Microsoft Access

MS Access is used to develop the database for the Intelligent Map Guider. It is an easy to use tool where all the important data concerning the Administration and ticketing of the Intelligent Map Guider are stored in a database developed using it.

5.3 Program Development

5.3 Implementation Requirements

5.3.1 Hardware Requirements

The server computer hardware requirements are:

1. A server with at least Pentium III 888MHz processor.
2. At least 256MB SDRAM.
3. 64MB Graphic Card
4. Network Interface Card (NIC) and network connection with recommended bandwidth at 10Mbps.
5. Others standard computer peripherals.

The client computer hardware requirements are:

1. Any compatible PC with recommended at least Pentium II 166MHz processor and 64MB SDRAM.
2. 64MB Graphic Card
3. Compatible Sound Card

5.3.2 Software Requirements

1. Windows NT and above as the client Operating System
2. Internet Explorer 6.0 recommended as the web browser
3. Internet Information Server 4.0 as the web application server host

4. Macromedia Studio MX as the HTML document layout design tool and also the multimedia designing.
5. Java Virtual Machine to support certain function in the web pages.

5.4 Program Development

Program development is the process of creating the programs needed to satisfy the system process requirements. It consists of 5 steps, which are review the program documents, design of the program, code the program, completion of the program documentation. Figure 5.1 shows the steps of the program development.

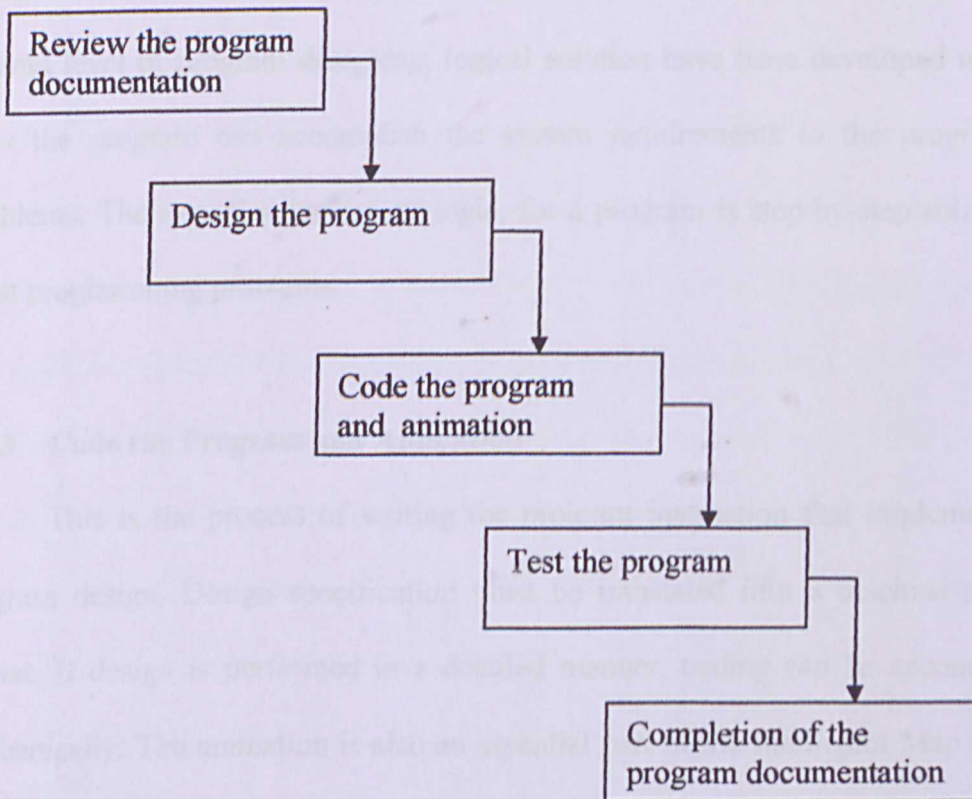


Figure 5.1: Steps of Program Development

5.4.1 Review the Program Documentation

The first step of the program development is to review the previous program documentation. The program documentation of the Intelligent Map Guider system consists of simple system description, system requirements multimedia animation and database design. This documentation helps in the process of understanding better the task that has to be covered during the coding phase.

5.4.2 Design the Program

After the program documentation review, program designing is started, which is the second level of the program design during the system development. For the second level of program designing, logical solution have been developed to rectify how the program can accomplish the system requirements to the programming problems. The logical solutions, or logic, for a program is step-by-step solutions to most programming problems.

5.4.3 Code the Program and Animation

This is the process of writing the program instruction that implements the program design. Design specification must be translated into a machine-readable format. If design is performed in a detailed manner, coding can be accomplished mechanically. The animation is also an essential part of the Intelligent Map Guider. During the development of the code the animation is also created in parallel. The animation also coded to be interpreted in to machine readable format.

5.4.4 Test the Program

This process is to ensure the system functions by testing the program thoroughly. Testing is a must before the program processes actual data and produces information on which users will rely. Several types of test are performed on an individual program, which will be discussed further in the following chapter.

5.5 Program Coding

5.5.1 Coding Principles

Throughout the coding phase for the Intelligent Map Guider, several principles are followed in order to ensure the quality and the structure of the generated code. They are as follows:

1. Readability

Easy to read codes are essential for the future system enhancement by another developer. To cater for this, meaningful variables and label names have been used. Comments are written in most of the coding pages to explain their every functionality. Proper indentations are followed to enhance readability. All the animations created are easily understandable and given similar names to the functions of the animation.

2. Maintainability

Codes should be easily read, corrected and revised. To achieve this, codes should be readable (as explained above), highly cohesive and loosely coupled. Codes that performs functions for one module should be grouped together and try our best as much as possible to achieve high cohesive and loose coupling.

3. Robustness

Codes should be robust in terms of handling errors and responding by displaying appropriate error messages and try to avoid system failure. All animations are thoroughly checked for any fool proof so that there is no any failure during the system test run.

5.5.2 Coding Methodology

In the coding phase, two approaches have been used, which are the top-down and the bottom-up approach. Both of the approaches are used to obtain the benefits from them.

1. Top-Down Approach

This approach starts by looking at the large picture of the system and then exploding to smaller parts or subsystem. Top-Down approach allows the higher-level modules to be coded first before the lower level modules.

This method ensures that the important or core modules of the system to be developed and tested first. Deploying the methods gives a preliminary version of the system sooner. The advantages of using this approach are as follows:

- ✓ Prevents the developer from getting so mixed in the detail that they loose track of what the system is suppose to do.
- ✓ Avoiding the chaos of attempting to code a system all at once
- ✓ This method is compatible with the general system thinking of normal human nature.
- ✓ The method also helps to identify the important animation to be animated and tested then doing the less priority animations so the job does not be delayed.

2. Bottom-Up Approach

In contrast with the top-down approach, the bottom-up approach starts coding at the lower level modules before the higher-level modules. The higher-level module acts as an empty shell that calls these lower level modules. The completed lower level module will then be integrated with the newly completed higher-level module.

5.6 Database Implementation

For Intelligent Map Guider, the database is stored in a PC in which Microsoft Access is installed. Any data creation, updates or data retrieval will be connected directly to the database server through ADOBD connection. The database includes tables to keep details of system users registration, Guestbook which stores the comments of system user, employee details, and profile information.

After the Intelligent Map Guider is completed and tested successfully, all the dumb data were flush from the database. All the unnecessary tables were eliminated from Intelligent Map Guider database to avoid data overlapping and to reduce workload of the entire system when deployed.

```
na=request.form("name")
```

```
pa=request.form("pass")
```

```
Dim objConn
```

```
Set objConn = Server.CreateObject("ADODB.Connection")
```

```
objConn.ConnectionString = "DSN=imgadmin.dsn"
```

```
objConn.Open
```

```
Dim objRS
```

```

set objRS = Server.CreateObject("ADODB.Recordset")

objRS.Open "Administrator", objConn, , , adCmdTable

bolFound = False

do while not (objRS.eof or bolFound)

if (StrComp(objRS("username"), request.Form("name"),
vbTextCompare) = 0) and (StrComp(objRS("password"),
request.Form("pass"), vbTextCompare) = 0) then

bolFound = true

session ("name")=na

session ("pass")=pa

if (StrComp(objRS("status"),"admin",vbTextCompare) = 0) then

Response.Redirect "adminmain.asp"

else

response.Redirect("user.asp")

end if

else

objRS.Movenext

end if

Loop

if Not bolFound then

objRS.Close

```



```

Set objRS = Nothing

objConn.Close

Set objConn = Nothing

Response.Redirect "loginfail.asp"

'Response.Write"<A href = 'login1.asp'>"

'Response.Write" Invalid UserID or Password!"

'Response.Write"</A>"

Response.End

end if

objRS.Close

set objRS = Nothing

objConn.Close

set objConn = Nothing

%>

```

Table 5.1: Full Directory Path ASP Coding For Employee Details

6.0 Chapter 6

6.1 System Testing

The main function of testing is to establish the presence of defect in a program. Meanwhile, testing is used to judge whether or not the program is usable in practice. Nevertheless, testing can only demonstrate the presence of error. It cannot show that there is no error in the program. Therefore, suitable approach must be chosen to reduce the possibility of error in a program. Several rules serve well as program testing objectives.

- a) Testing is a process of program execution with explicit intents to find errors and run-time program bugs.
- b) An effective test case is one that contains unexpected testing record sets with high probability of detecting undiscovered errors during the program design and development phase.
- c) A successful test is also not one that uncovers only few expected error, but it is which constantly provides new challenges to its programmers over time.

The difference between testing modules during the development phase and testing them during software integration is that error can be fixed as they are found and the integration phase must be recorded and the bugged module or animation files must be returned to its development team or programmers for further correction based on its errors logs. Intelligent Map Guider has gone through three stages of testing before it is completed. These three stages are the component testing, integration testing and acceptance testing.

6.2 Testing Process

In general, the testing process of Intelligent Map Guider can be shown in the following figure.

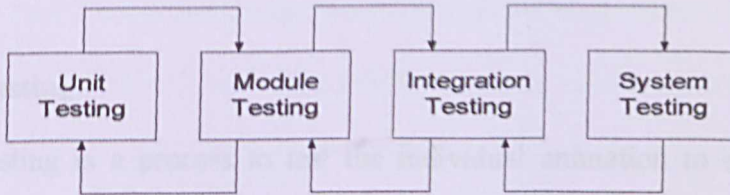


Diagram 6.1: Testing Process

The testing procedure is started from component and animation testing to ensure the codes implemented in the system integrates accordingly with the animation and properly fit the system requirements. This is followed by the integration testing, which is tested for the overall functionality and performance of the animation and modules that are integrated together. Lastly, the testing procedure, user is required to test the system carefully to ensure that the implemented system will function according to their requirements and foolproof. If any mistake or defects are discovered at any stage, the previous stages might need to be repeated for correction and modification.

6.3 Testing Approach

The testing approach adopted in Intelligent Map Guider is the bottom-up approach. Using this approach, each module at the lowest level of the system hierarchy is tested individually with the animation files. Then, the next module to be tested is that module that calls the previously tested module. This approach is followed repeatedly until all modules have been tested.

6.4 Component Testing

The details of how each stage takes place in Intelligent Map Guider are described in the following sections.

6.4.1 Unit Testing

Unit testing is a process to test the individual animation to ensure that they function properly. Each animation is tested independently without the interference from other system component. Unit testing is time-consuming and labour intensive stage of any software development. Several techniques have been used in Intelligent Map Guider to perform unit testing as stated below:

a) Animation Review

Before the animation files are loaded on the browser to be tested on the real time, the animated files are tested and the functions are reviewed during the motion testing to discover the error of the action commands used. If there is any error on the animation files then the animation is corrected and motion testing is done again. This stage is done repeatedly to check the accuracy of the action command used in the animation files.

b) Code Review

Before the rest of the function is run in the browser, codes are reviewed line by line to discover any syntax error as well as semantic error. If errors are discovered, they are corrected immediately.

c) Code Differ In Colour

Macromedia Dreamweaver MX is a very convenient tool to collaborate all the modules. The codes are differentiated in a different colour. For instance, JavaScript will be in red colour, ASP code will be in grey and others. If the code contains errors, it will appear in bright yellow in colour differing the codes is very convenient to trace errors.

d) Other Techniques

In order to watch the value of a server-side script variable, the value is output and updated by using the command:

```
<%  
Dim objConn  
Set objConn = Server.CreateObject("ADODB.Connection")  
objConn.ConnectionString = "DSN=imgadmin.dsn"  
objConn.Open  
  
Dim objRS  
set objRS = Server.CreateObject("ADODB.Recordset")  
objRS.Open "Fare", objConn, , , adCmdTable  
%>
```

Table 6.1: Server-side Script Variable

For example, in Intelligent Map Guider, variable session name is being used to store the value of user's username/userid in almost the entire module. Therefore, its value can be viewed by using the command `<%name = session ("name") pass = %>`.

6.4.2 Module Testing

After the unit-testing phase, module testing will be implemented to uncover error in each unit. A module is a collection of dependent components. During this stage, all

the related units or functions will be integrated and tested in the module level. In performing module test, different test cases are applied to the module and the test results are recorded. If errors occurred in this level, each unit will be retested to figure out the problems. The main reason is, although each sub module performs its task correctly, the end result produced may be incorrect when all the sub modules work together. For example, if the flash animation could not load the proper action function then the user could not view the next module which is the 3D module. This will lead to the testing of the other modules like 2D module and the Info module which is also includes the sub module like view all staff details and edit employee information module will be tested concurrently to find out the possible errors.

6.4.3 Integration Testing (Sub-system Testing)

After the module-testing phase, the entire module will be integrated into sub – system for further integration. Test will be conducted to check the functionality of the integrated modules. The most common problems that arise when modules are integrated together are module interface mismatch. Therefore, the main concern in integration test is to exercise the interface repeated to defect any interface mismatch problem. Several important aspects are checked to reduce the possibility of interface problem as listed below:

- a) Is the user directed to the modules with the use of proper and correct animation
- b) The user have no difficulties viewing and understanding the animations used.
- c) Is it necessary to perform a checking redirect the user to the correct module?
- d) Is the number of parameter received in the receiving module?
- e) Is the type of parameter tally with the type of parameter received?

- f) Is type conversion necessary? Is the value of parameter truncated during type conversion?
- g) Is the information passed sufficient for the receiving module to perform its task?

6.4.4 Functional Testing

After the sub – system testing, all sub systems will be integrated to make up the complete system. Therefore, the main purpose in system test is to find errors that result from unanticipated interactions between subs – system. Besides, it is used to validate whether the system meets its functional and non-functional requirements. Functional test checks that the integrated system performs its function as specified in the requirements, whereas performance test is to compare the integrated component with the non-functional requirements.

Once the functional test is completed, performance is performance to compare the integrated module with the non-functional system requirements. These requirements include reliability, efficiency, maintainability, user friendliness and others to ensure that the system being developed is fully functional and optimized.

6.4.5 Acceptance or User Testing

The final testing procedures in Intelligent Map Guider is the acceptance or user testing whereby users will be actively involved in this stage to test the system to ensure that the system meets their requirements. The main purpose of this testing is to verify whether the system has fulfilled the user's requirements. During this test, besides the functionality of the system is demonstrated to the end users, the users are given the opportunity to experience and explore animation of the system themselves.

6.5 Conclusion

At the end of the testing phase, the system should be able to perform the task required and be foolproof of some errors. The user should use the system. However, there are still some critical problems and errors will occurred only after some time of using the system. Therefore, work of testing should not just end in this phase but have to keep on every now and then, making sure the system is functioning well. Creating the possibility that, this system will last for a longer period.

7.0 Chapter 7

7.1 System Evaluation

Evaluation is the ultimate phase of developing a system and an important phase before delivery the system to the end users. Evaluation was related to user environment, attitudes, information priorities and several other concerns that are to be considered carefully before effectiveness can be concluded. At all phases of the system approaches, evaluation is a process that occurs continuously, drawing on a variety of sources and information.

7.2 Problems Encountered and Solutions

7.2.1 Problems in Tools and Language Selection

Since developing a virtual system is a new technology, it is difficult in selecting the most appropriate tools and software for the development of Intelligent Map Guider at the beginning stage. It is because the process of choosing the suitable technology and tools for the project development is a very critical process as different tools has its strength, weaknesses and understanding.

Hence, researches have been done to learn more the web-based virtual application that will be used in the Intelligent Map Guider. Types of the 3D tools and the programming language used were diagnosed at the earlier stage of the development. The studies and research activities includes Internet surfing, reference books, review of the current virtual systems in the market and others.

7.2.2 Difficulties in Determining System Scope

Without experience in web-based animation development, it is difficult to define the scope of the system in the early stage. Due to the insufficient knowledge and time constraint, it is impossible to build a full-scale complete system within the given time frame.

To solve this problem, reference and analysis on current web sites has been conducted in order to understand the system design of each web site and try to adopt some of the ideas into the system design of Intelligent Map Guider.

7.2.3 Lack of Knowledge In the Language and Tools Chosen

Due to the time constraint, it is very difficult in learning the chosen animation tools and the programming language. Without a strong base of animation, there was more time needed in looking for solution to solve technical and non-technical problems that were encountered during the development of Intelligent Map Guider. It consumed a lot of time in the beginning stage of the development to learn the animation tools and the programming language. All these needed some research on the component before knowing how to use the component and how to apply accordingly in the modules. To solve these problems, Internet was the most vital source. There were lots of free tutorials and source codes in the World Wide Web. In addition, guidance from the forums and supervisor and friends was also another way to help to solve the problems occurred during the Intelligent Map Guider development.

7.2.4 Slow System Response Time

There are some modules in Intelligent Map Guider especially those that were connected to the database need to be able to response in a minimum amount of time.

7.2.5 Evaluation by the End User

As Intelligent Map Guider was proposed to make travelling in the PUTRA LRT easier and more informative for both public and tourist using the public transport, the final stage of system development which is the system testing becomes critical and it needs feedbacks from all respective users in judging the virtual tour of these functionalities, precise flash actions as well as enhanced interface of the system.

The scope of Intelligent Map Guider at first was wide; development was conducted with the objective to reduce the scope to a more achievable time frame. The whole system was developed so quickly to have the overall structure and the potential of the system but the system was not refined to its full efficiency.

The overall feedback from the end users was good and the system is expected to serve the purpose of the targeted group well after refining.

7.3 System Strengths

7.3.1 Simplicity of User Interface

By using the graphical user interface, Intelligent Map Guider can be evaluated as an easy-to-use system. Unlike that text-based environment, Intelligent Map Guider is more user friendly and easy to browse through. Sufficient instruction and guidelines are provided to assist users. Users are required only minimum typing and inputs when they interact with the system.

7.3.2 Efficiency of the System

The system administrator login developed is a user-friendly and efficient program. The administrator can easily add new records, update and delete existing records, while the management login developed is to dedicate the management of the information of the system. These two logins which are created works separately to maintain a proper and efficient system and being transparent to the user using this system.

7.3.3 Error Messaging

In this system, the error messages will be displayed immediately when an error occurs. This allows users to identify their errors effectively. Mostly the error which occurs can be rectified automatic due to the use of scroll menus.

7.4 System Weakness

7.4.1 Platform and Browser Limitations

The obvious limitation to this system is the high requirements of the clients' hardware. Although the total file size has been optimize, loading time is still considered slow even in the LAN. This is because when the files have been downloaded to the client's computer, the files have to be uncompressed first. This would explain the high minimum requirements by the system.

The Intelligent Map Guider's implementation depends heavily on the use of Microsoft and Macromedia Technologies. The current implementation of the Intelligent Map Guider is limited to the Windows Operating System and Internet Explorer 6.0 as client browser. Due to the constraint of time and technical knowledge, the system cannot

be viewed and used properly under other operating systems, such as Linux and Macintosh. The Intelligent Map Guider web pages will not be displayed properly under other browsers such as Netscape Communicator and will show some miss alignment and image loading error.

7.5 Recommendations

7.5.1 Advanced Animation

The recommendations for future enhancement of the 3D Module focus on more optimization of the performance as well as increasing flexibility and functionality for users.

Currently, Intelligent Map Guider was developed using the Macromedia products such Dreamweaver and Flash. This can be made more interactive by using higher level softwares such as the Maya or X3D.

X3D is another language currently under development, which would enhance to current macromedia products to a higher level. X3D will use the flexibility of XML in VRML. Until now no specification project being developed publicly in X3D.

This does not only make the user enhanced but make the user be a participant towards the system. The user might even have a better view and look of the places and information while looking at the images that is being loaded.

7.5.2 More Administration Task

Administration tasks can be further enhanced to include more functions to ease maintenance process. Administrators should take into consideration the safety of the system. The administrator should be able to set a more flexible ground for their

management counter parts to make use of the system in a wider angle. The management should be able to develop the system with user interest in mind.

7.5.3 Report Generating Capability

For future enhancement, both the administrative and the management should be able to generate reports to show their needs and advancement to the higher authority. The printed reports mention is the user details for the administrative and the user's feedback of the system by the public in a statistical manner.

8.0 Chapter 8

8.1 Conclusion

Advancement have been a greater heights achieved in the field of web animation. Web based virtual tours are seem to be a interest with the user of today. Users have the first hand experience of the places that they are planning to visit. The advancements have helped the tourism body to promote the places of interest in a more interactive way. It also guides the publics of the places which is accessible without the city hassle.

A lot of knowledge was gained throughout the literature review, requirements analysis and the initial system development of the project. Information gathered through various sources is an extra knowledge for developing the system that cannot be obtained from the courses taught. Adherence to a development schedule is very important in order to get a job done on time. This experience is definitely proved useful in future system development.

Overall, the Intelligent Map Guider system has achieved and fulfilled the objectives and requirements of a web based virtual kiosk system as stated in the project proposal. The use of web based approach brings along many benefits including the ability to access information anywhere and at anytime of the day. Administrator can perform administering tasks online anywhere at anytime. Furthermore, Intelligent Map Guider provides an attractive and easy to use interface and animation that greatly reduces confusion.

Finally, there are still many rooms for the improvement in the Intelligent Map Guider, in terms of implementing an interactive virtual tour and web based information. With the initial step taken, enhancements could be made by inserting more features when

implementing the system in the time to come. It is hoped that this system will be a success and provides a foundation upon which more innovative and interactive system may be built to perform multiple tasks and fulfill various user requirements.

USER MANUAL

A. INSTALLATION MANUAL

1. System Requirements

In order to use the system, the minimum requirements of your computer are:

- a) Windows 2000 and above
- b) Internet Explorer 6.0 and above
- c) Microsoft Access 2000 and above
- d) Macromedia Studio

2. Installation Guide

These are step-by-step installation guides.

First insert the CD into the CD-Rom. Then browse open CD-Rom drive in windows explorer and right-click on <preview> and click <copy>.

Then paste preview to your c:\inetpub\wwwroot.

Make sure all the files in preview are writeable. To do that, right click preview and click properties. Then uncheck attributes read only. Also make sure the databases are writeable to.

B. HOW TO USE THE INTELLIGENT MAP GUIDER SYSTEM

User Section

Getting Started

1. Begin using the system by viewing the main page at `http://<domain_name_or_ip>/MainPage.asp`. There are two icons on page which is divided into PUBLIC and TOURIST. User can choose according to their preference.

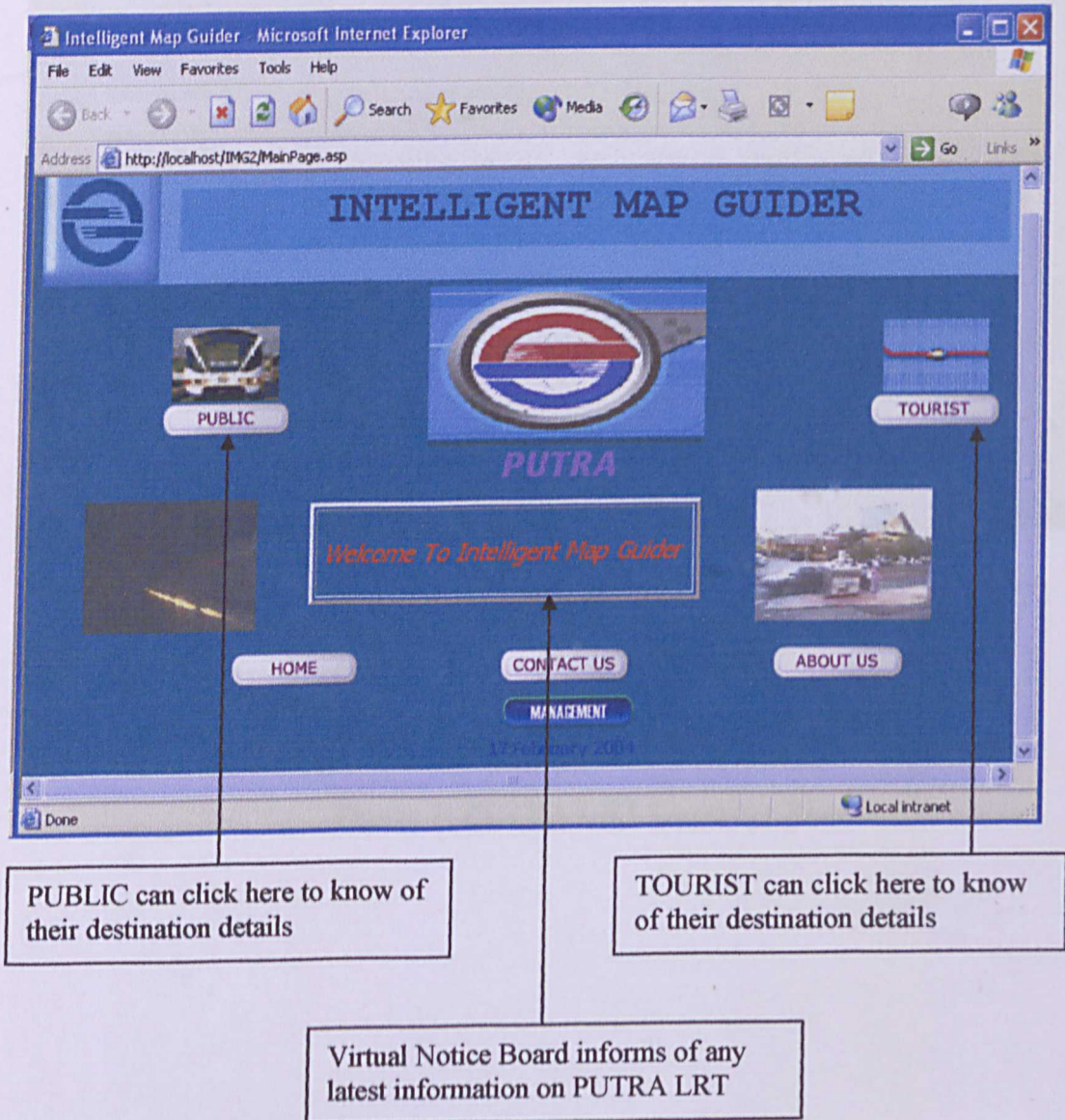


Figure 1: Main Page

2. The system will direct you to the Public/Tourist page where the user will be shown of the PUTRA coverage map where user can click on the preferred station for information. (See figure 2).

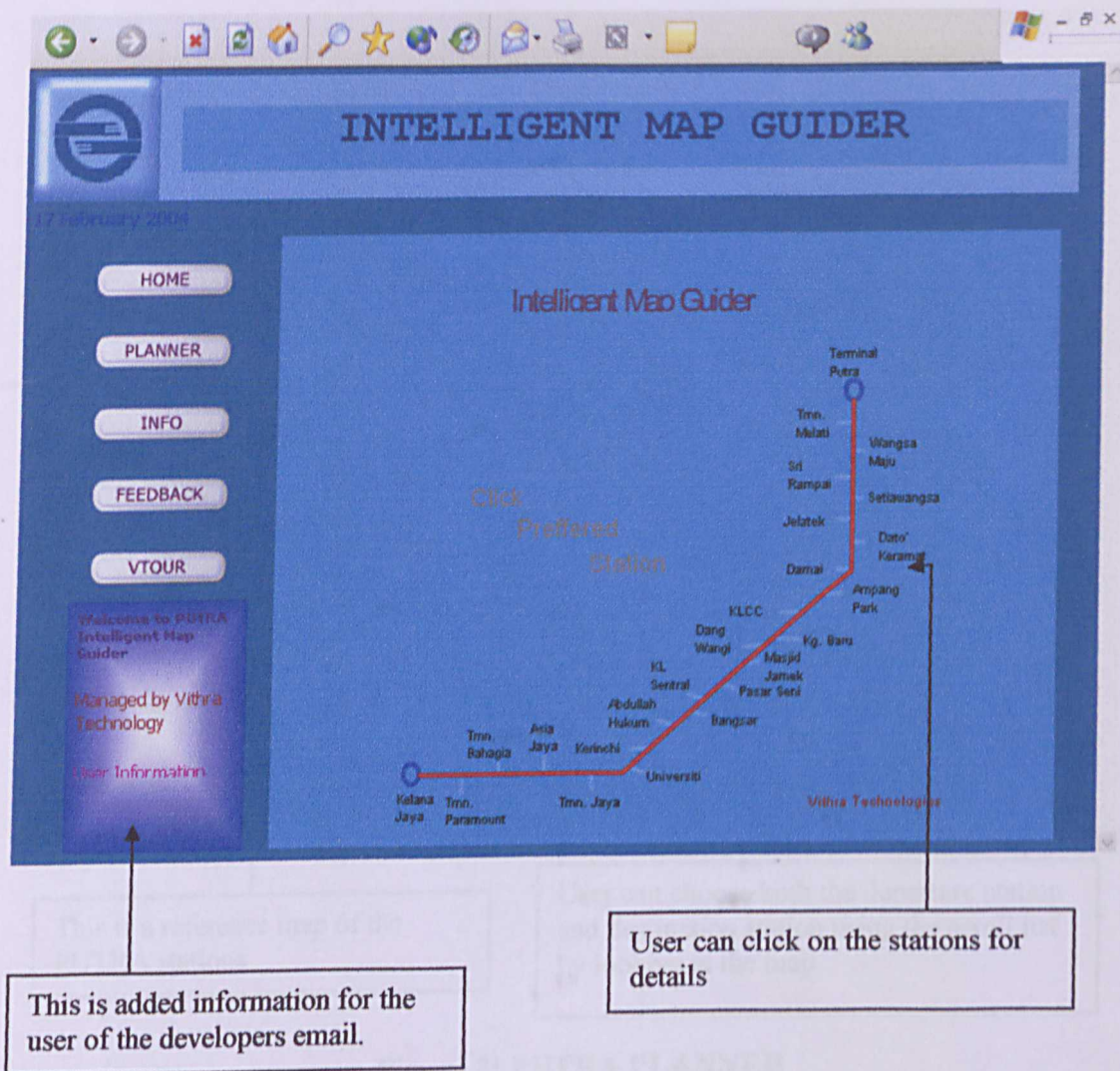


Figure 2: PUTRA LRT Coverage Map

3. This is the PLANNER page where the user can select the departure station and also the destination to know the fare of their journey. The user then click on the submit button to confirm their choice(See figure 3)

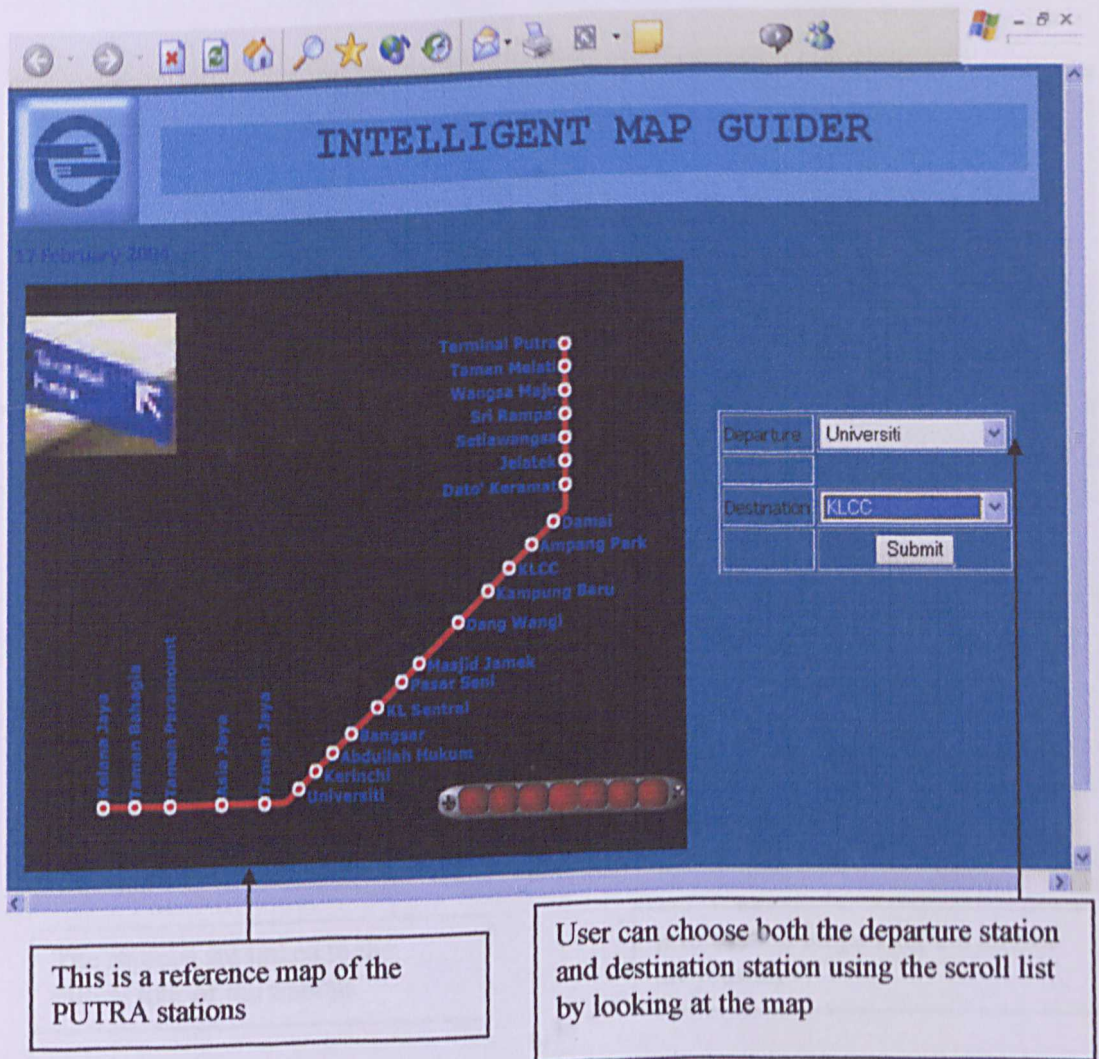


Figure 3: PUTRA PLANNER

4. This page will display the full details of the journey including the departure stations the destination station and the fare. An additional fare for feeder bus is also included. (See figure 4).

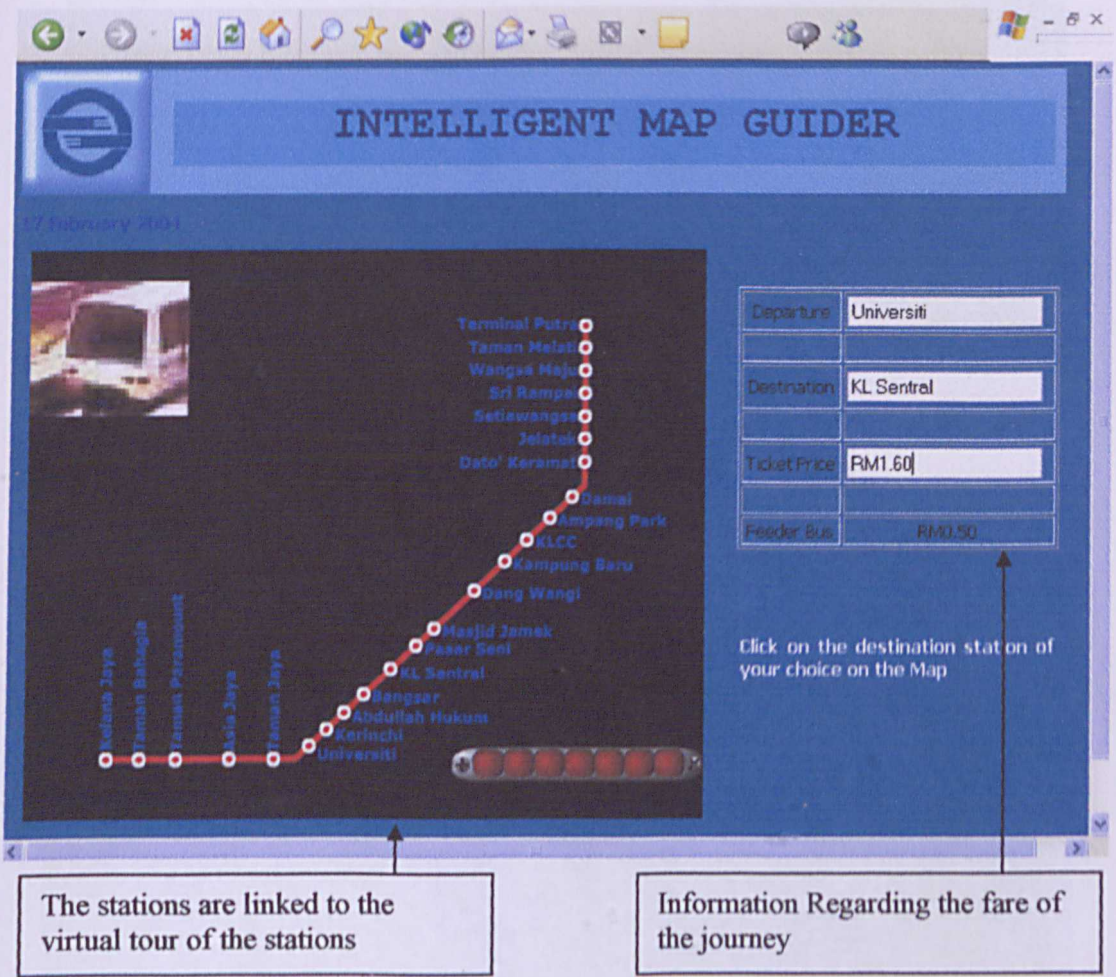
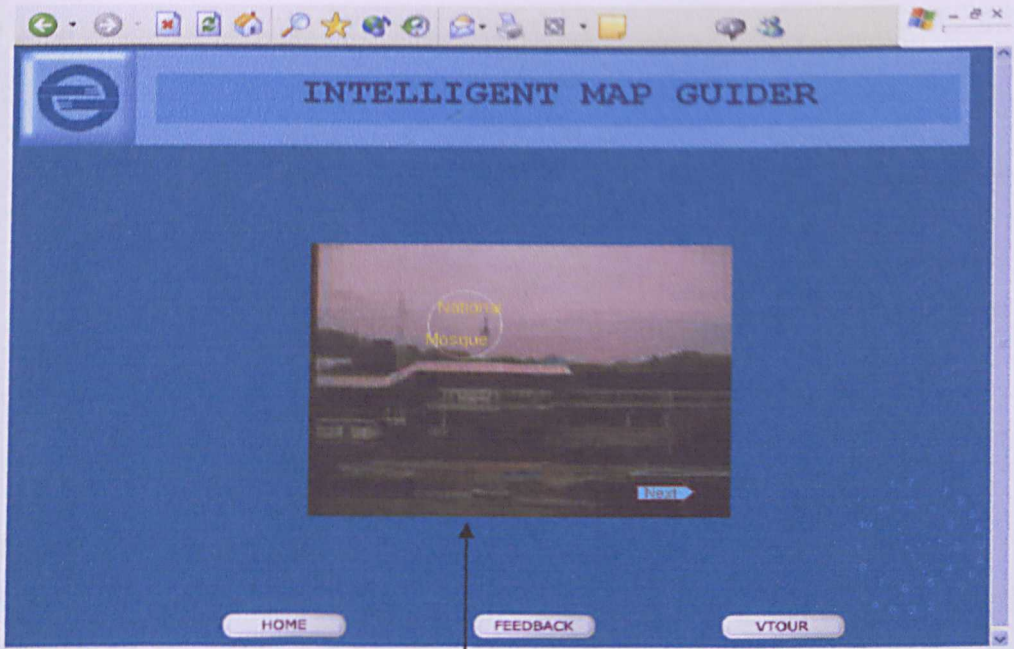


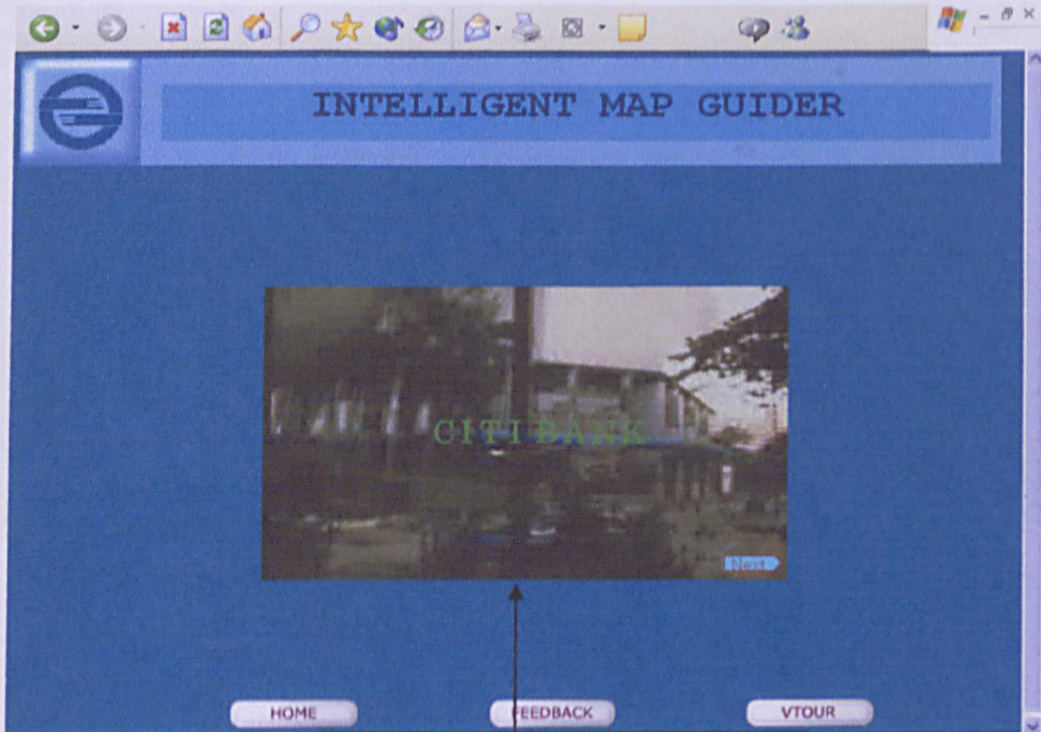
Figure 4: PUTRA FARE

5. In this page the user can click on the stations to view the virtual tour which will show the scenery around the station with the names of the building and places with the tourist and public attractions (See figure 5).



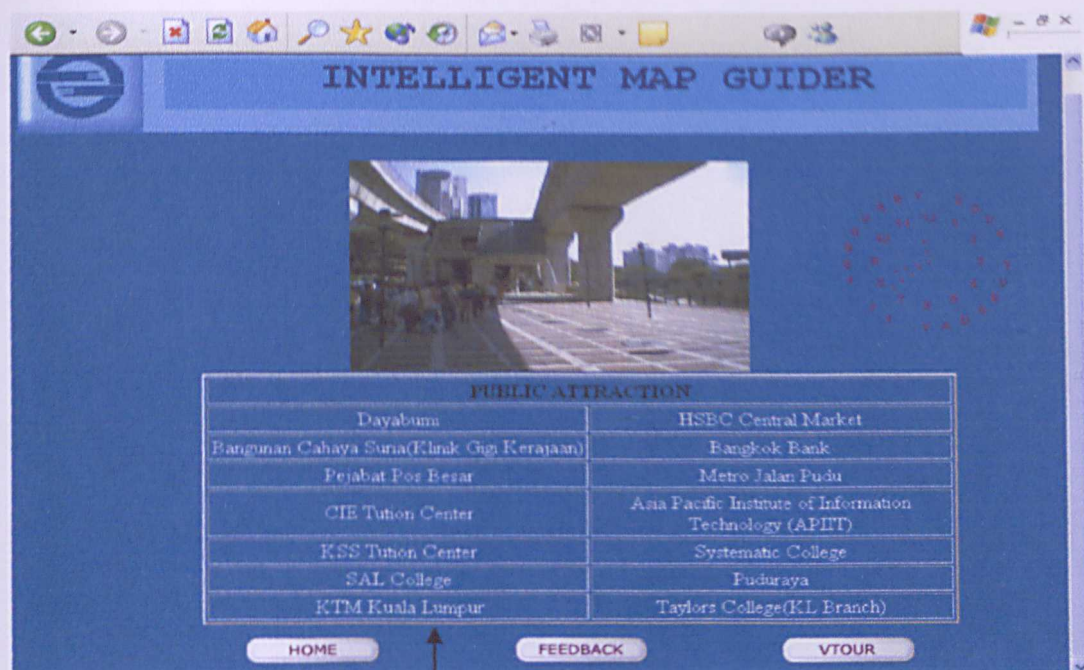
Displays the scenery of the Station including the details of the buildings

Figure 5: Virtual Tour of Station Pasar Seni



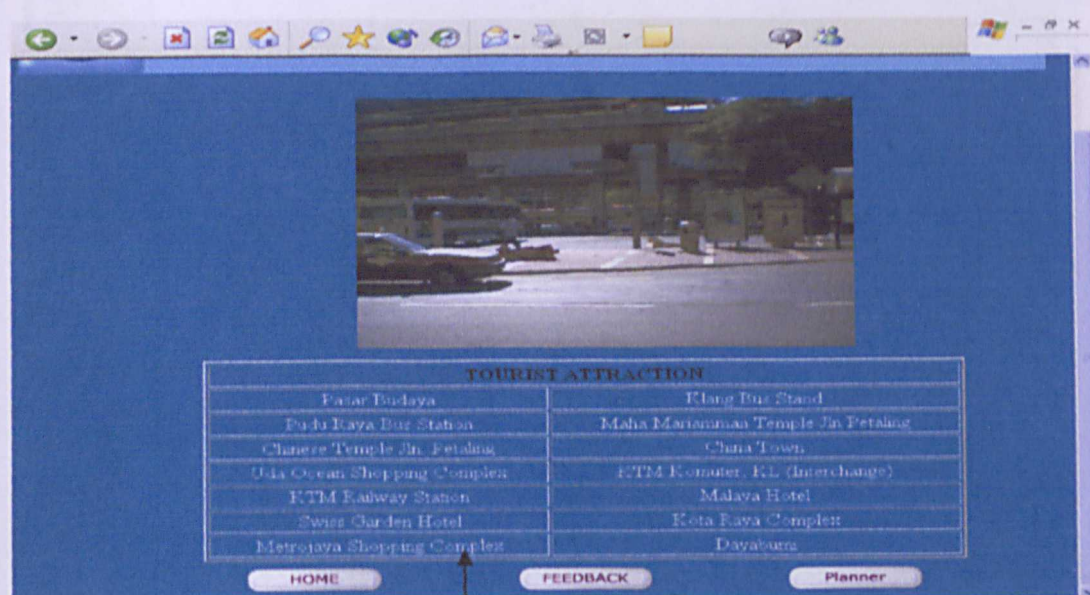
Scenery of the Station click next for the station details

Figure 5.1: Virtual Tour of Station Ampang Park



Shows the Pasar Seni stations Public attraction.

Figure 5.2: Public view of the Pasar Seni Station



Shows the Pasar Seni station Tourist attraction

Figure 5.3: Tourist view of the Pasar Seni Station

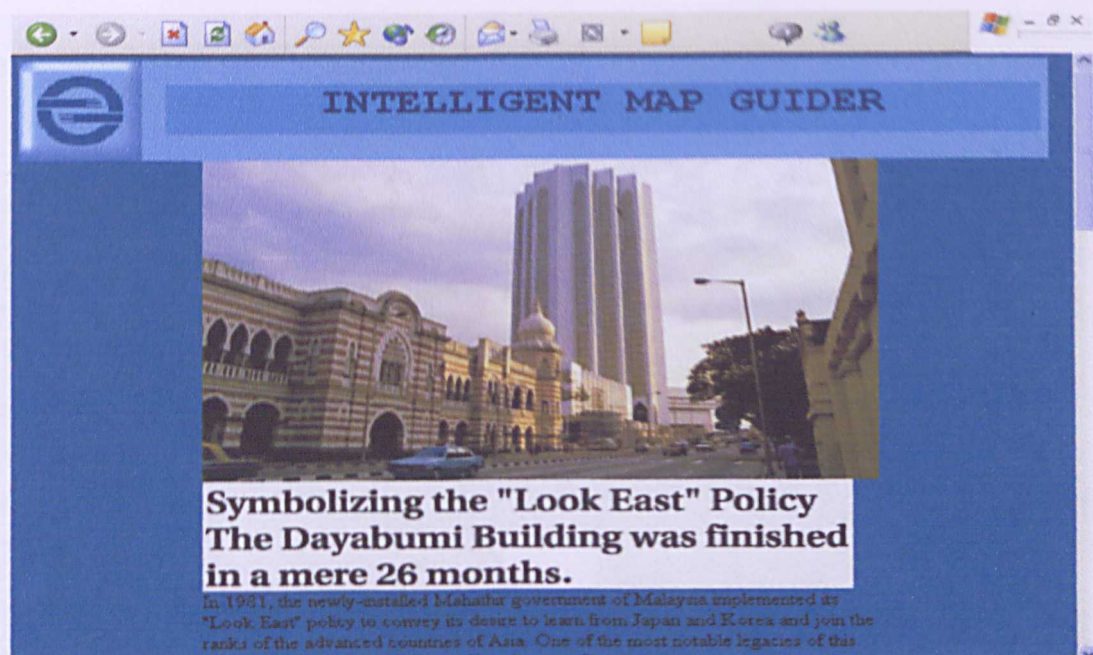


Figure 5.4: Information of the Dayabumi Building

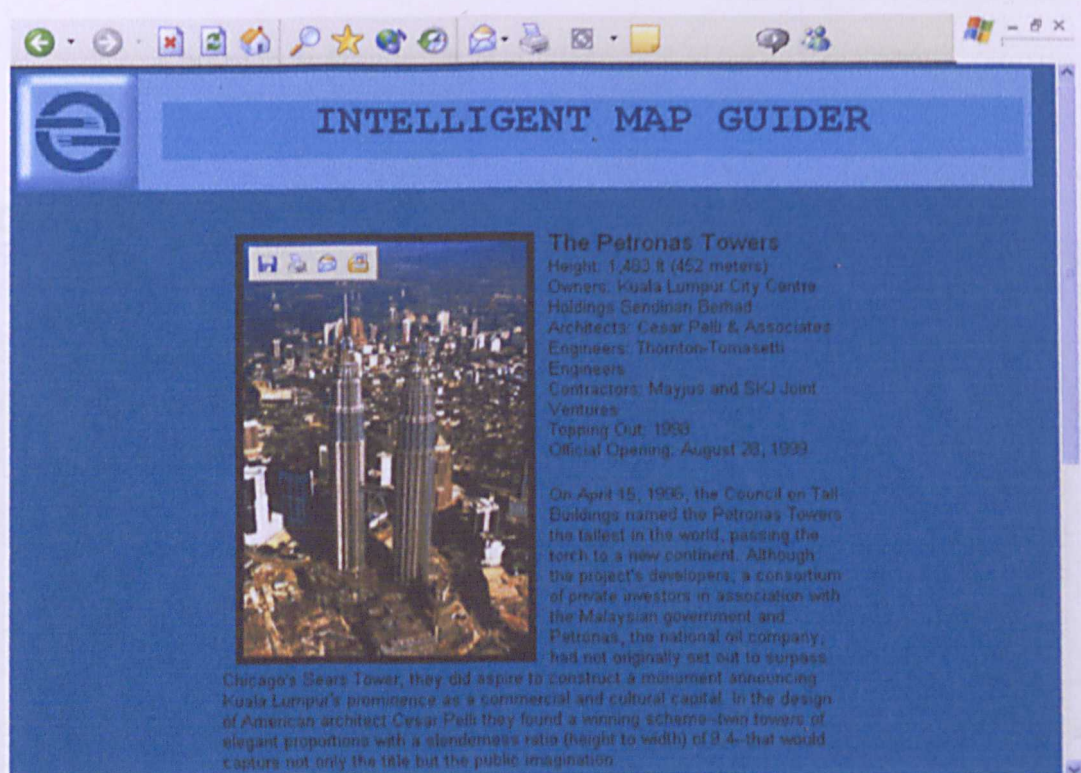


Figure 5.5: Information of the Petronas Twin Tower

6. In this page user can view the details and attraction of the places shown on the virtual tour just by clicking on it.

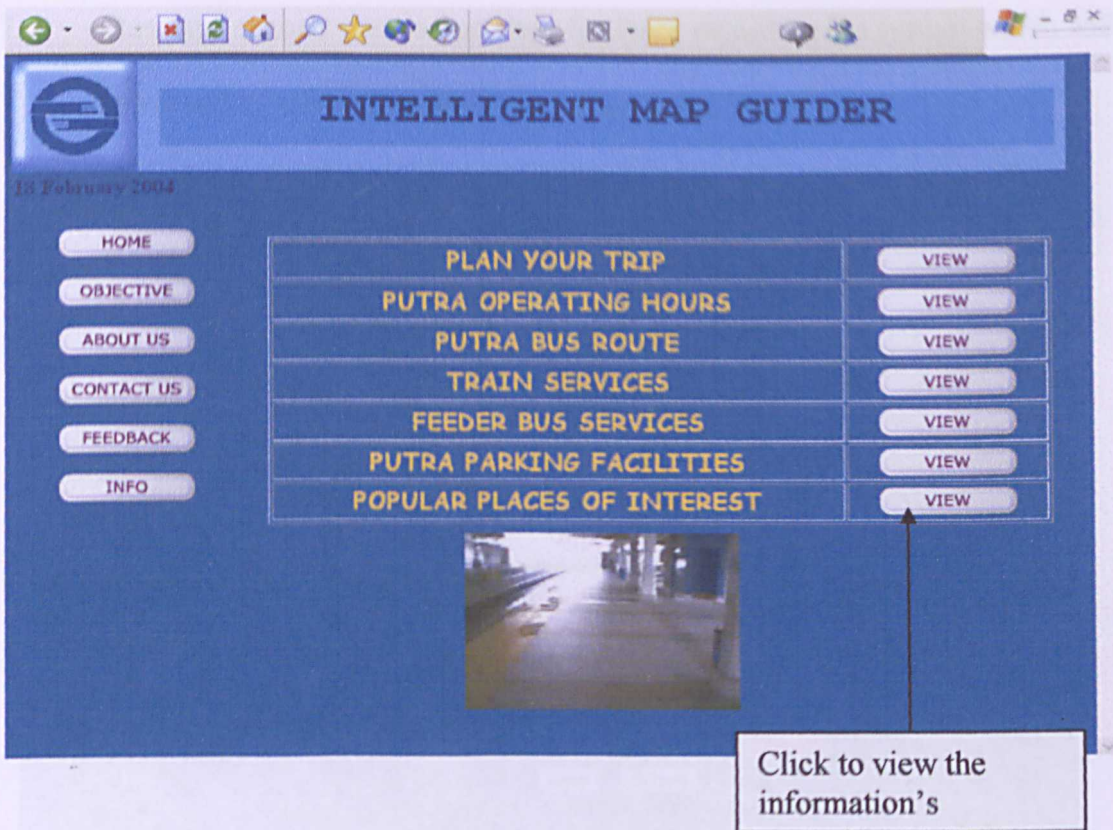


Figure 6: Information regarding PUTRA LRT services

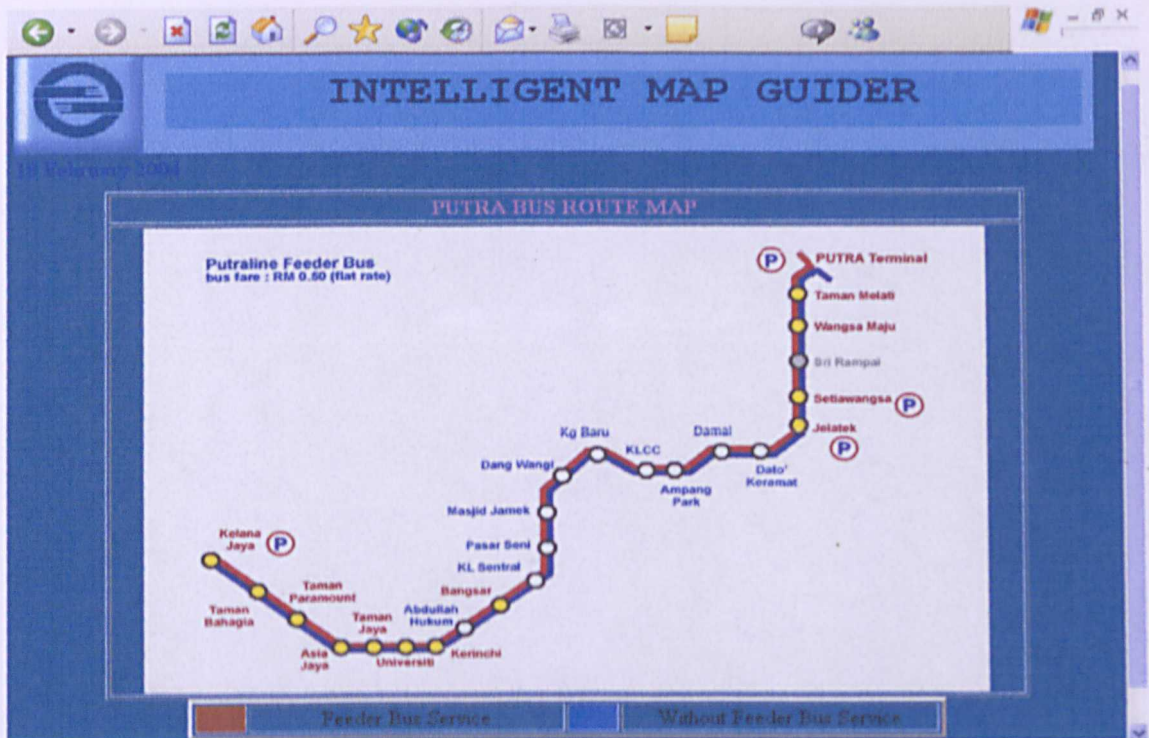




Figure 6.1: PUTRA Feeder Bus Route

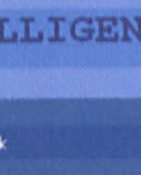
- 



INTELLIGENT MAP GUIDER

18 February 2004


Add To GuestBook



Name :	<input type="text"/>
E-Mail :	<input type="text"/>
Location :	<input type="text"/>
Subject :	<input type="text"/>
Message :	<input type="text"/>
Date :	<input type="text"/> Format
Remark :	<input type="text"/>

HOME

VIEW



The screenshot shows a web browser window with the title "INTELLIGENT MAP GUIDER". The page has a blue header with a logo on the left and the title in the center. Below the header, there is a date "18 February 2004" and a navigation bar with "VIEW GUESTBOOK", "HOME", and "FEEDBACK" buttons. The main content area displays a table with columns: Name, E-Mail, Location, Subject, Message, Date, Remark, and Edit. The table contains three rows of data, with the last row showing a message about a website being tested.

Name	E-Mail	Location	Subject	Message	Date	Remark	Edit
jean	jean.uj2@hotmail.com	chi	hi	bye	02/20/2004	ccp	Edit
							Edit
VP-NEC/val@nec	val@nec.com	chi	testing	the website is being tested		tested	Edit

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INTELLIGENT MAP GUIDER

UPDATE GUESTBOOK

Name :	java
E-Mail :	java_032@hotmail.com
Location :	um
Subject :	Hil
Message :	Eye
Date :	02/02/2004
Remark :	oops

Update

Figure 7.1: Feedback update by user

8. This is the pages that give the details and information regarding the system team (See figure 8).

INTELLIGENT MAP GUIDER

10 February, 2004

HOME
OBJECTIVE
ABOUT US
CONTACT US
FEEDBACK
INFO

About Us
Intelligent Map Guider

Intelligent Map Guider is a system aimed to have a more user oriented and easily understandable. It helps any person from any walkway of the society to travel with ease. It will be guide and as a customer service and even describes the destination with a more virtual and entertaining way.

Objectives of this system

The fundamental objective of this project is to develop a web-based Intelligent Map Guider that

- To create a web base system, which can be accessed by any user in the internet
- To view the station view of the stations within the PUTRA LRT
- To enable the user to view the virtual tour of each stations
- To help plan their journey from one destination to another destination
- Ease the queue at the customer service counter.
- To let the user gain information of the destination before going to the destination.

Figure 8: About Us

Administrator Section

System Administration

- 1. Login page can be accessed through the management button on the main page. When login the login process will divert either the login id belongs to administrator or management accordingly.

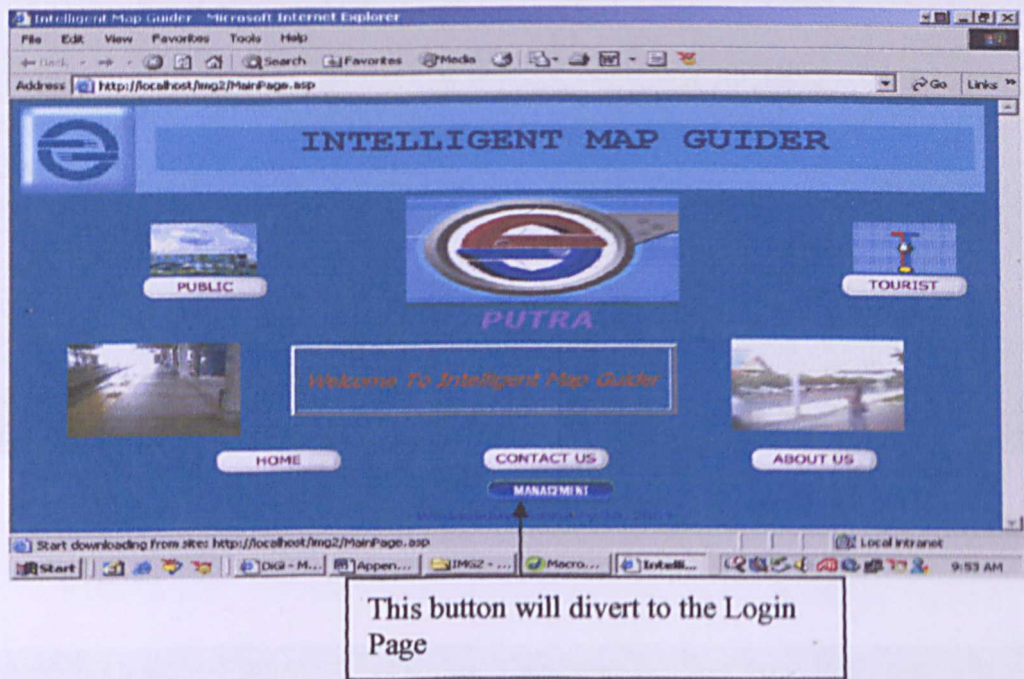


Figure 9: Main Page

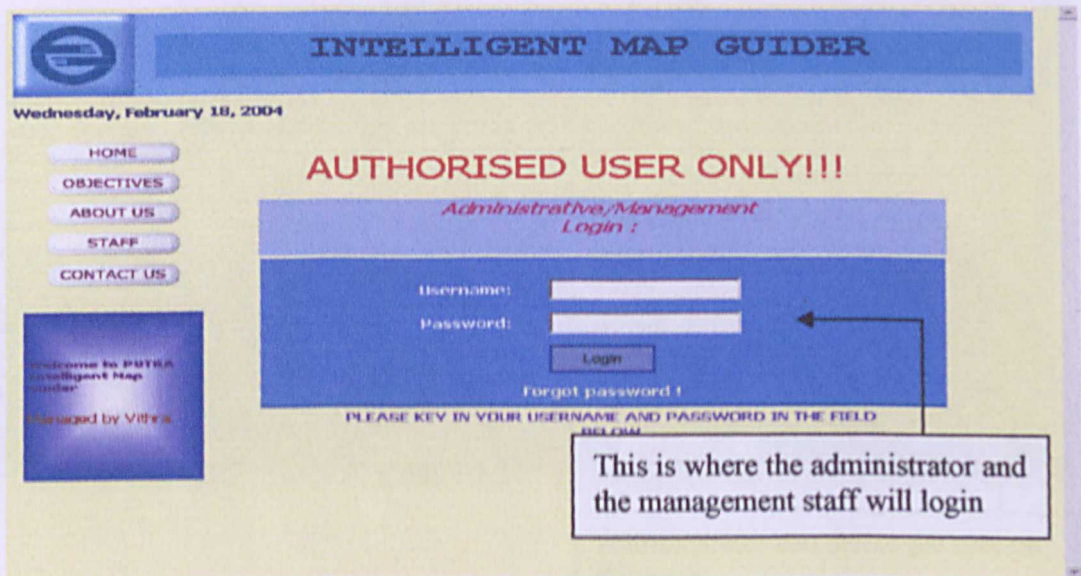


Figure 9: Login Page

2. When entered the administrator page, the administrator can add the new staff either administrator or management staff (see figure 10). Administrator also can delete the user (see figure 10.1).

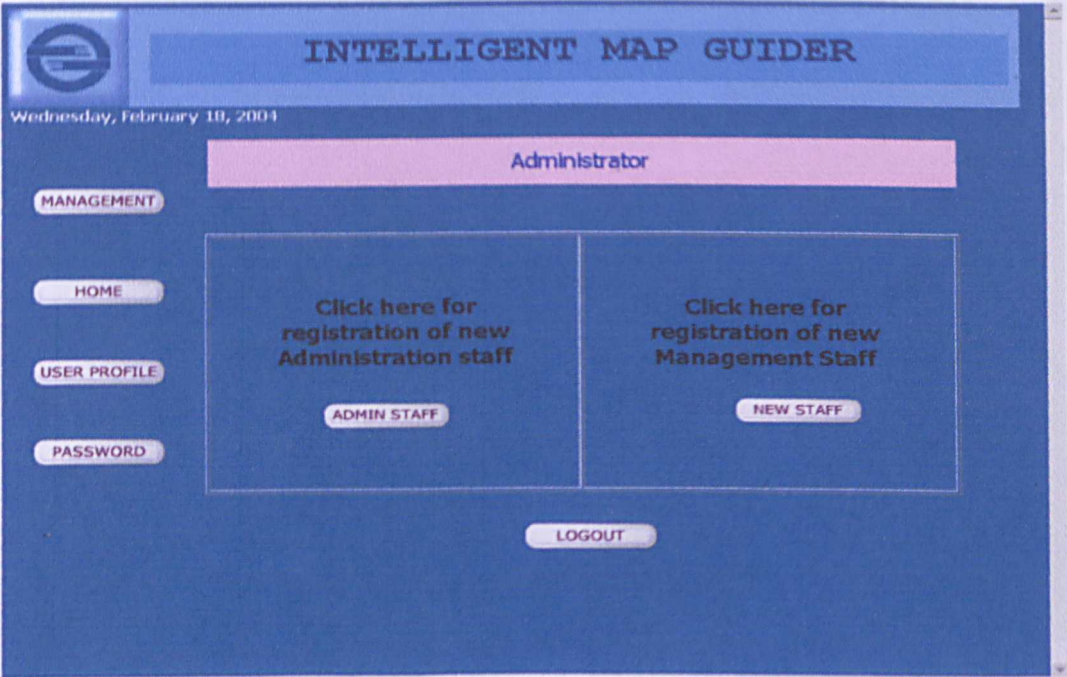
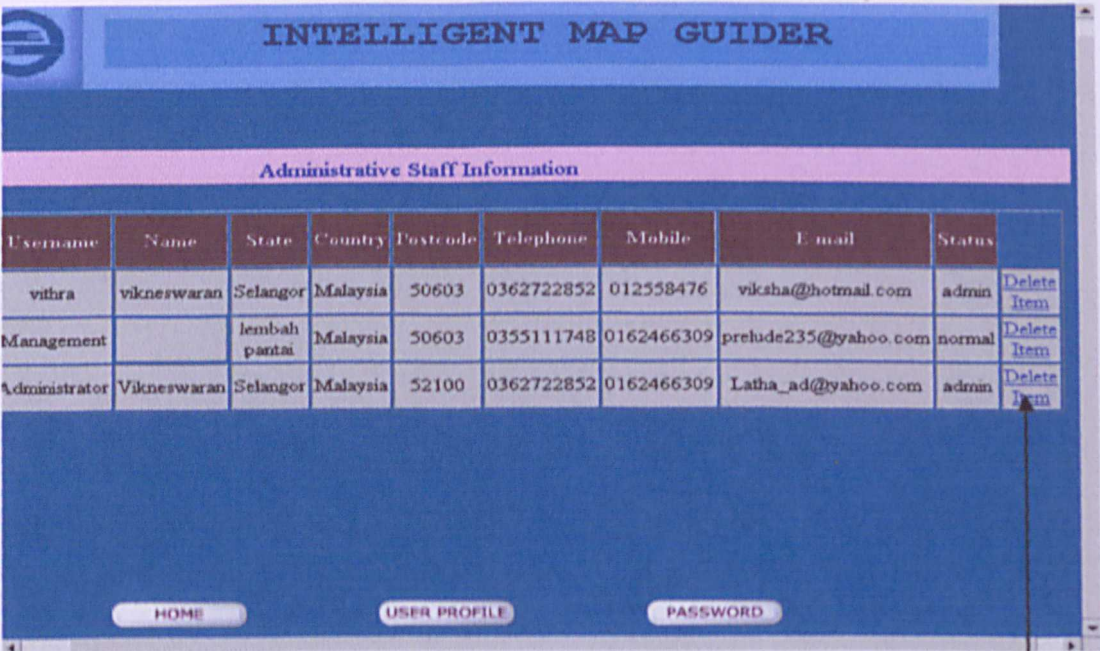


Figure 10: Administrator Page



Administrator can delete the user on this page

Figure 10.1: Staff information page

3. Administrator can create management accounts and also administrator accounts (see figure 10.2)

The screenshot shows a web browser window with the title 'INTELLIGENT MAP GUIDER'. The date 'Wednesday, February 10, 2004' is displayed on the left, and a 'Logout' link is on the right. The main heading is 'NEW ADMIN REGISTRATION'. Below this is a registration form with the following fields:

User ID :	<input type="text"/>	
Password :	<input type="password"/>	(max 12 characters)
Confirm Password :	<input type="password"/>	(max 12 characters)
Name :	<input type="text"/>	
Address 1 :	<input type="text"/>	
Address 2 :	<input type="text"/>	
Postal Code :	<input type="text"/>	
City/State :	<input type="text"/>	
Country :	<input type="text"/>	
Gender :	<input type="radio"/> Male <input type="radio"/> Female	
Tel No :	<input type="text"/>	(Numbers Only)
Mobile No :	<input type="text"/>	(Numbers Only)
E-mail :	<input type="text"/>	

At the bottom of the form are two buttons: 'Clear' and 'Register'.

Figure 10.2: New user registration

4. Administrator can change and edit the profile of the user logged ins shown below (see figure 10.3).

The screenshot shows a web browser window with the title 'INTELLIGENT MAP GUIDER'. The date 'Wednesday, February 10, 2004' is displayed on the left, and a 'Logout' link is on the right. The main heading is 'UPDATE YOUR PROFILE'. On the left side, there is a vertical menu with the following links: 'ADMIN', 'MANAGEMENT', 'HOME', 'USER PROFILE', and 'PASSWORD'. The main content area contains a profile update form with the following fields:

Name :	<input type="text" value="Vikneswaran"/>
Address 1 :	<input type="text" value="11, Jln. 16"/>
Address 2 :	<input type="text" value="Dasa Jaya"/>
Postal Code :	<input type="text" value="50603"/>
City/State :	<input type="text" value="Selangor"/>
Country :	<input type="text" value="Malaysia"/>
Gender :	<input type="text" value="male"/>
Tel No :	<input type="text" value="0362722052"/>
Mobile No :	<input type="text" value="012558476"/>
E-mail :	<input type="text" value="viksha@hotmail.com"/>

At the bottom of the form is an 'Update' button.

Figure 10.3: Administrator Profile

5. Below is the screen where the user logged to the system can change the password (see figure 11).

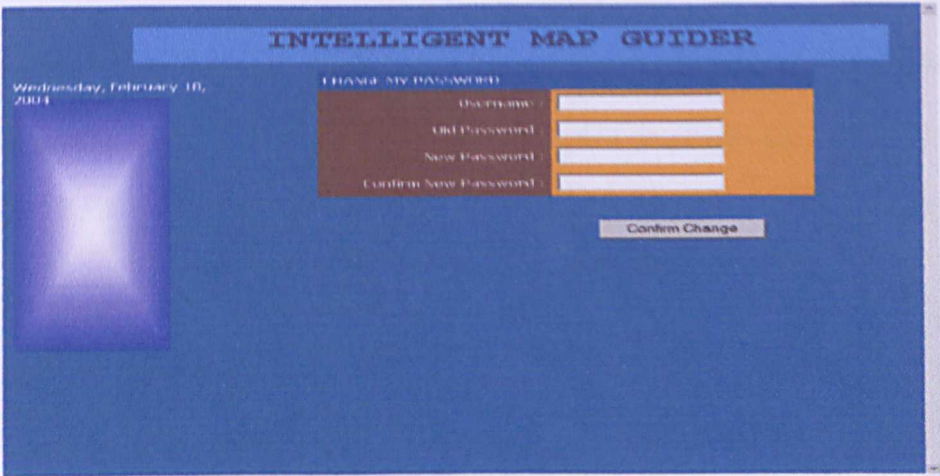


Figure 11: Change password Page

Management Section

Information Management

- 1. This page is the Management staff page where the staff has the rights to alter and modify the system information and related database (see figure 12)

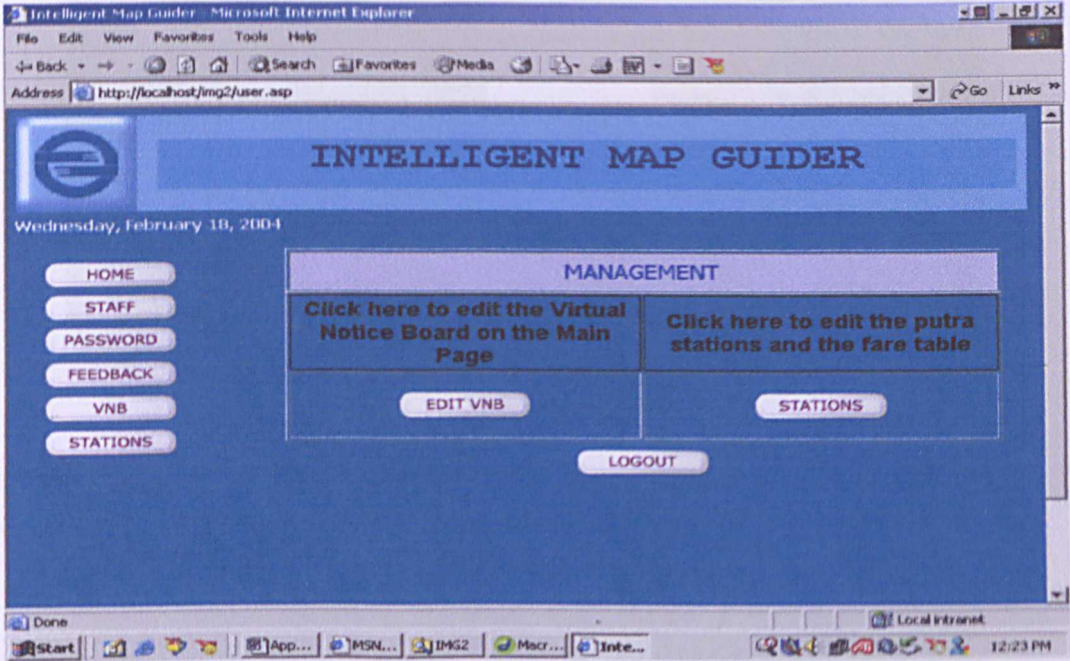


Figure 12: Management staff page

- 2. This page shows how the virtual notice board(VNB) is edited on any latest information for the user on the main page (see figure 13).

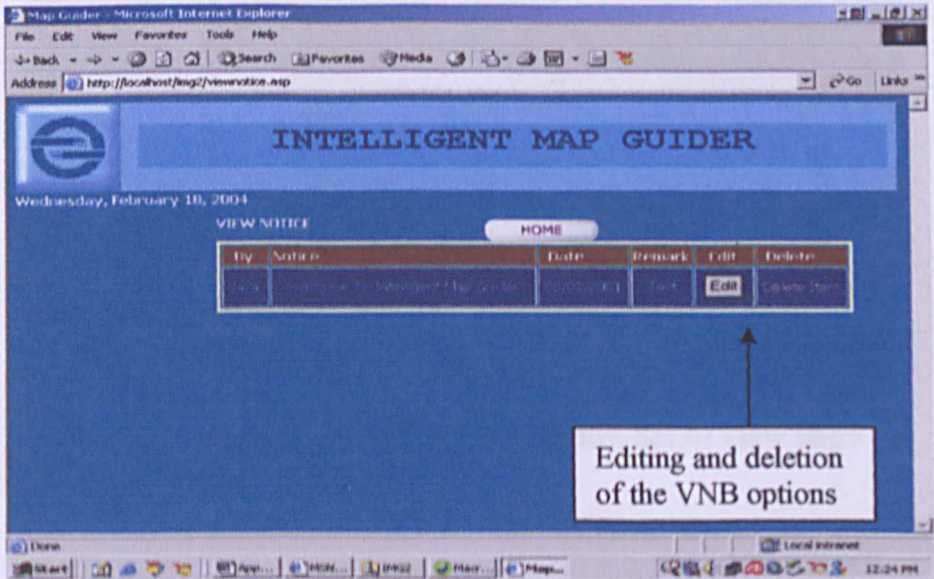


Figure 13: Virtual Notice Board viewing page

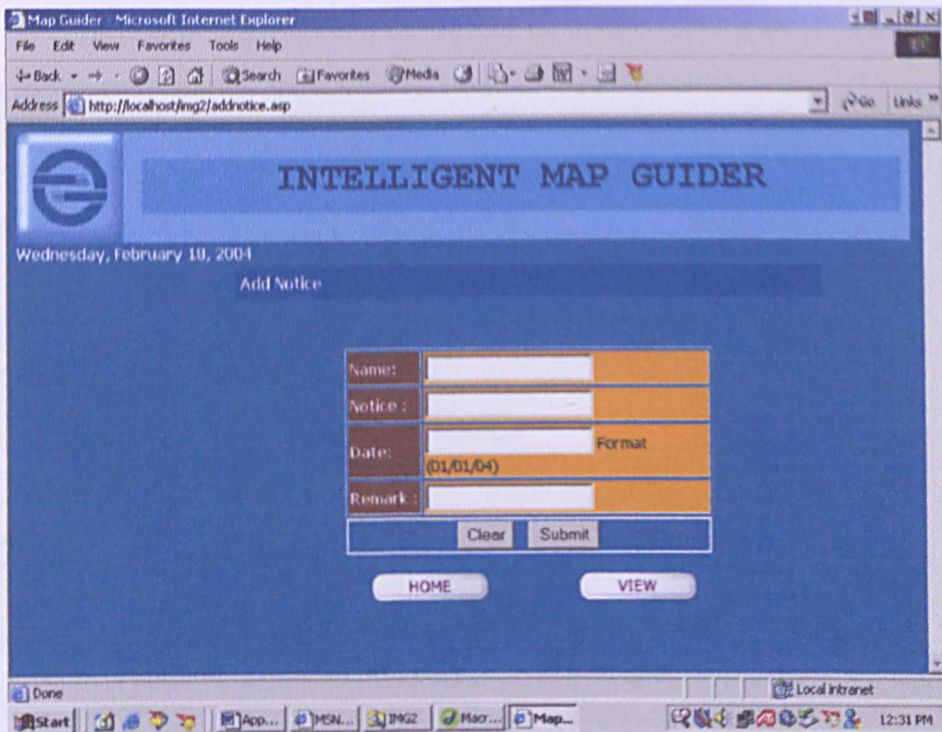


Figure 13.1: VNB Editing Page

3. This is the fare table of the PUTRA LRT stations (see figure 14).

INTELLIGENT MAP GUIDER

Wednesday, February 18, 2004

VIEW STATION DETAILS

HOME NEW STATION

Departure	Destination	Ticket Price	Remark	Edit	Delete Item
Jaya	Widy	RM2.20	test	Edit	Delete Item
Kelana Jaya	Taman Bahagia	RM0.70		Edit	Delete Item
Kelana Jaya	Taman Pelandok	RM1.00		Edit	Delete Item
Kelana Jaya	Ara Jaya	RM1.30		Edit	Delete Item
Kelana Jaya	Taman Jaya	RM1.50		Edit	Delete Item
Kelana Jaya	Universiti	RM1.50		Edit	Delete Item
Kelana Jaya	Kerinci	RM1.40		Edit	Delete Item
Kelana Jaya	Abdullah H. S. M.	RM1.40		Edit	Delete Item
Kelana Jaya	Bangsar	RM1.40		Edit	Delete Item
Kelana Jaya	Universiti	RM1.50		Edit	Delete Item

Figure 14. PUTRA LRT Stations Fare detail view page

3. This page shows the editing of the station details (see figure 14.1).

2004

UPDATE STATION DETAILS

Departure :	Kelana Jaya
Destination :	Taman Bahagia
Ticket Price :	RM0.70
Remark :	
Update	

Departure :	Kelana Jaya
Destination :	Taman Paramount
Ticket Price :	RM1.00
Remark :	
Update	

Departure :	Kelana Jaya
Destination :	Asia Jaya
Ticket Price :	RM1.30
Remark :	
Update	

Departure :	Kelana Jaya
Destination :	Taman Jaya

Figure 14.1: Station details updating page

INTELLIGENT MAP GUIDER

Wednesday, February 18, 2004

Add New Station

Departure :	
Destination :	
Ticket Price :	
Remark :	
Clear Submit	

HOME STATIONS

Figure 14.2: Adding a new station details

4. This is the page to view the feedback that has been posted by the user of the system. The management staff can delete the entry (see figure 15).
5. This Schedule is followed to develop the system with following the

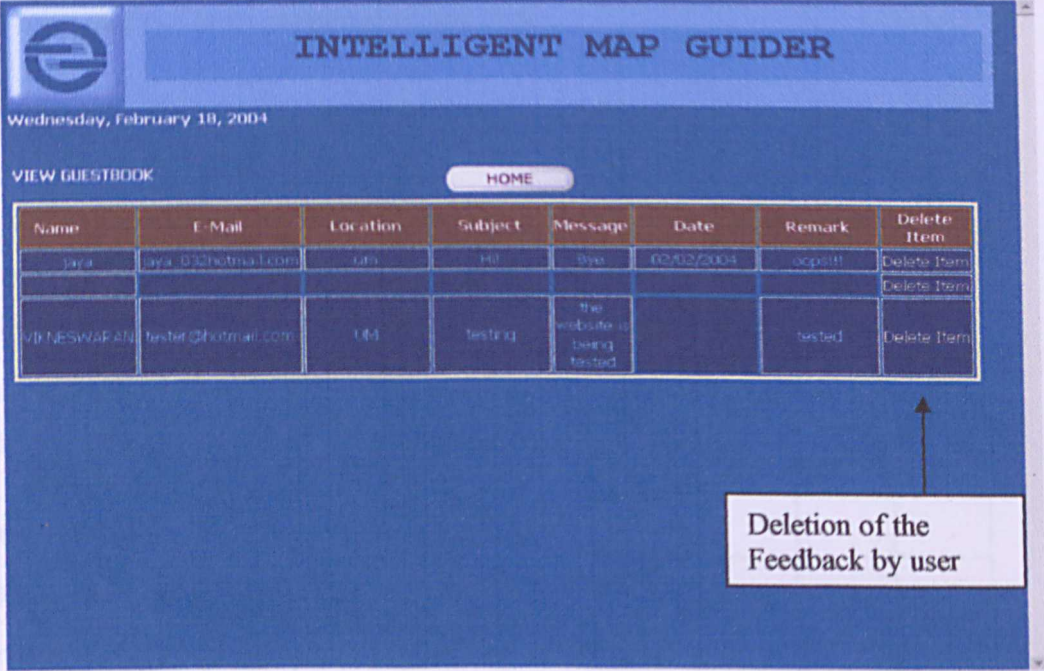


Figure 15: Feedback viewing page

Appendix B

This is the project schedule that will be implemented to develop the Intelligent Map Guider. This Schedule is followed to develop the system with fulfilling the objectives that has been proposed in this thesis.

Intelligent Map Guider								
Project Schedule (June 2003 – January 2004)								
Task Name	JUN	JULY	AUG	SEP	OCT	NOV	DEC	JAN
Introduction	■							
Literature Review		■						
Methodologies			■					
System analysis			■					
System Design			■					
System Implementation					■	■	■	■
System Testing						■	■	■
System Evaluation							■	■
Documentation	■	■	■	■	■	■	■	■

Table A: Gantt chart

Appendix C

1. What do you think of this?

2. Are you satisfied with the Intelligent Map Guide system?

- a. Best ☐
- b. Good ☐
- c. Average ☐
- d. Bad ☐
- e. Worst ☐

3. What do you think of the features in the Intelligent Map Guide?

- a. Best ☐
- b. Good ☐
- c. Average ☐
- d. Bad ☐
- e. Worst ☐

USER FEEDBACK

4. Will you implement the Intelligent Map Guide system for system 2?

- a. Yes ☐
- b. No ☐

5. Besides the current features in this system, would you like to have any additional feature in this system?

6. Finally, do you have any suggestions on how to improve this system?

1. What do you think of this system?

2. Are you satisfied with the Intelligent Map Guider system?

- a. Best ☐
- b. Good ☐
- c. Average ☐
- d. Bad ☐
- e. Worst ☐

3. What do you think of the features in the Intelligent Map Guider?

- a. Best ☐
- b. Good ☐
- c. Average ☐
- d. Bad ☐
- e. Worst ☐

4. Will you implement the Intelligent Map Guider system for virtual tour?

- a. Yes ☐
- b. No ☐

5. Besides the current in features in this system, would you like to have any additional feature in this system?

6. Finally, do you have any suggestions on how to improve this system?

Reference:

- [1] **Contributed By:** Chris Johnson, B.S., M.S., Ph.D. Associate Professor of Computer Science and Director of the Center for Scientific Computing and Imaging, University of Utah.
- [2] **Contributed By:** J. Donald Hubbard, B.A., M.S. User Interface Specialist. Kenneth R. O'Connell, B.S., M.F.A. Professor and Head, Fine and Applied Arts, University of Oregon, Eugene.
- [3] Shari Lawrence Pfleeger. (1998), Software Engineering: Theory and Practice, 2nd Edition, Prentice Hall, Inc.
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Available: www.virtualdenmark.dk
- [11] 3d studio max
Available: <http://www.discreet.com/index-nf.html>
- [12] Windows 2000
Available: <http://www.microsoft.com/windows2000/>
- [13] Macromedia Studio MX
Available: <http://www.macromedia.com/>