TOURIST INFORMATION SYSTEM

By

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ABSTRACT

The objective of WXES 3181 is to make a report and proposal of the thesis project. This is part of the thesis whereas the second half will be focusing on the implementation of my project done in WXES 3182. This report will therefore, provides an evaluation of the thesis topic, its literature review as well as the system analysis and system design of this entire project.

According to this thesis title – Tourist Information System is whereby a web based information system about tourism in Malaysia is developed. This on-line information system will be used by tourists to help them gain a deeper understanding towards the interest place in Malaysia. Potential tourists, especially from overseas will be able to know more about the characteristics of Malaysia in order to make preparation for their visit here.

This system will includes all the convenient ways for users to browse for information regarding the places of interest in Malaysia, cultural and foods of Malaysian, their lifestyles and their main ways of making living. Besides, this system will also includes most of the travel agencies in Malaysia; this will act as a mediator in helping the tourists to search for the packages that provided.

The V model has been chosen as the software life-cycle model to develop the system. The development technologies and tools are Hypertext Markup Language (HTML), Active Server Pages (ASP), VBScript, Microsoft Front Page 2000, Macromedia Dream weaver and others related tools.

ACKNOWLEDGEMENT

The development of this proposal has been affected by the effort and contributions of many individuals. The project will not be success without the help and cooperation from many parties.

Firstly, I would like to express my gratitude to Mr. Chiew Thiam Kian, my advisor for this thesis project, for his unselfishness in sharing knowledge with me and helping me to overcome most of my problems in my work. He has given a lot of advice, comments and guideline throughout the completion of the project proposal.

Furthermore, I would like to extend my thanks to my moderator Cik. Norazlina Khamis, kindly to become my moderator and giving me a lot of suggestions and comments. Her opinion is one of my important guideline to develop this project.

Last but not least, I would like to express my appreciation to my family and all my friends to given me a lot of support and advice. Especially, I want to thank my friend Mr. Khoo Yeow Keong. He has giving me a lot of help in guiding to design an attractive user interface of the project.

Wong Chi Kee

28 August 2001

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CHAPTER 1
INTRODUCTION

1.1 PROJECT OVERVIEW

This project is to develop web-based on-line information about tourism in Malaysia. This on-line information system will be used by tourist to help them gain a deeper understanding towards the interest place in this country as well as help them to plain for vacation in Malaysia. This system will includes all the convenient ways for users to browse for information regarding the places of interest in Malaysia, cultural and foods of Malaysian, their lifestyles and their main ways of making living.

The system wills links to other informative sites such as air ticket reservation and hotel rooms booking. Besides, this system will also includes most of the travel agencies in Malaysia; this will act as a mediator in helping the tourists to search for the packages that provided. The system is able to include the travel agencies and let the participated agencies to post up their packages and promotion that they offered. Potential tourists, especially from overseas will be able to know more about the characteristics of Malaysia in order to make preparation for their visit here. This will help government to promote tourism in Malaysia.

Time is usually wasted in browsing for the relevant information; making decision as well as taking action is being done separately. This project aim to help the users to deal with these entire steps in just by visiting one information kiosk that had it all. Users are able to gain knowledge regarding the places and events happening in Malaysia, making comparison and deciding on which place to visit, what kind of transport to take, preferred activities that are offered at certain place. Then start planning by making reservation on accommodation and booking of air tickets.

1.2 OBJECTIVES OF THE PROJECT

This project is developed with these objectives in mind:

i. To have the possibility to access information from any location at any time. Maximum benefits are only become reality when the primary creators and customers of information interact directly with a system.

ii. To guarantee high availability of the system, which the reliability and confidentiality of the system is high and the respond time is fast.

iii. To investigate into the techniques and skills to publish and disseminate information on the web-based environment and produce a research document on web design techniques.

iv. To study and investigate into the current web information system, developing tools, implementations, and the road ahead.

v. To achieve this via a simple, user-friendly system, that will be carefully implemented in order to draw all level of users to easily use the web site.

1.3 PROJECT SCOPE

1.3.1 Project Contents

This project will encompass the usage of the GUI concept by having a map of Malaysia and the states in Malaysia. Users can click on the particular states to know more information related to the place. Each place will be introduced with great details and captivating photos.

Beside, this system will also act as a station for the participated travel agencies to post up their current packages or promotion that they can offer.

1.3.2 Project Features

The following will display a detail of the feature that will emphasize:

i. Implementation of an interactive web site with the aid of ASP scripting language to communicate with users simultaneously.

ii. Development of a database system to keep all the records pertaining to the system.

iii. Provided with a database maintenance features for the purpose of housekeeping in the web site by the authorized person.

1.3.3 Project Principles

There are numerous web sites regarding this project title. Thus, the main principle for this system is to keep it moderate and not too crowded with text and orders. External hyperlinks are more emphasized to provide the users with extra information regarding the topic. The interface of this project has to be intuitive, attractive, interactive, and most of all user friendly in order the users to familiar with the environment with ease without feeling boring and loss at certain stage.

1.3.4 Targeted Audience:

The targeted audiences for this project are:

- WWW visitors who interesting in the project title.
- Interested tourist regardless of local or foreign tourists.
- Travel agencies which want to promote their latest packages.

1.4 RESEARCH PLAN AND METHODS

The concept of a V model is used and this V model is a variation of the waterfall model that demonstrates how the testing activities are related to analysis and design (German Ministry of Defense, 1992). The V model suggests that the program design is verified through the usage of unit and integration testing. These show that all the aspects of the program design have been implemented correctly in the code. System integration should also verify the system design to insure that all system design is properly and correctly implemented. Acceptance testing is conducted by the user rather than the developer, validates the requirements by associating a testing step with each element of the specification.

The V model linkage on the left side with the right side of the 'V' can problems are found during verification and validation, then the left side of the 'V' can be re-executed to fix and improve requirements, design and coding before the testing steps on the right side are reenacted. It focused more on the activity and accuracy.

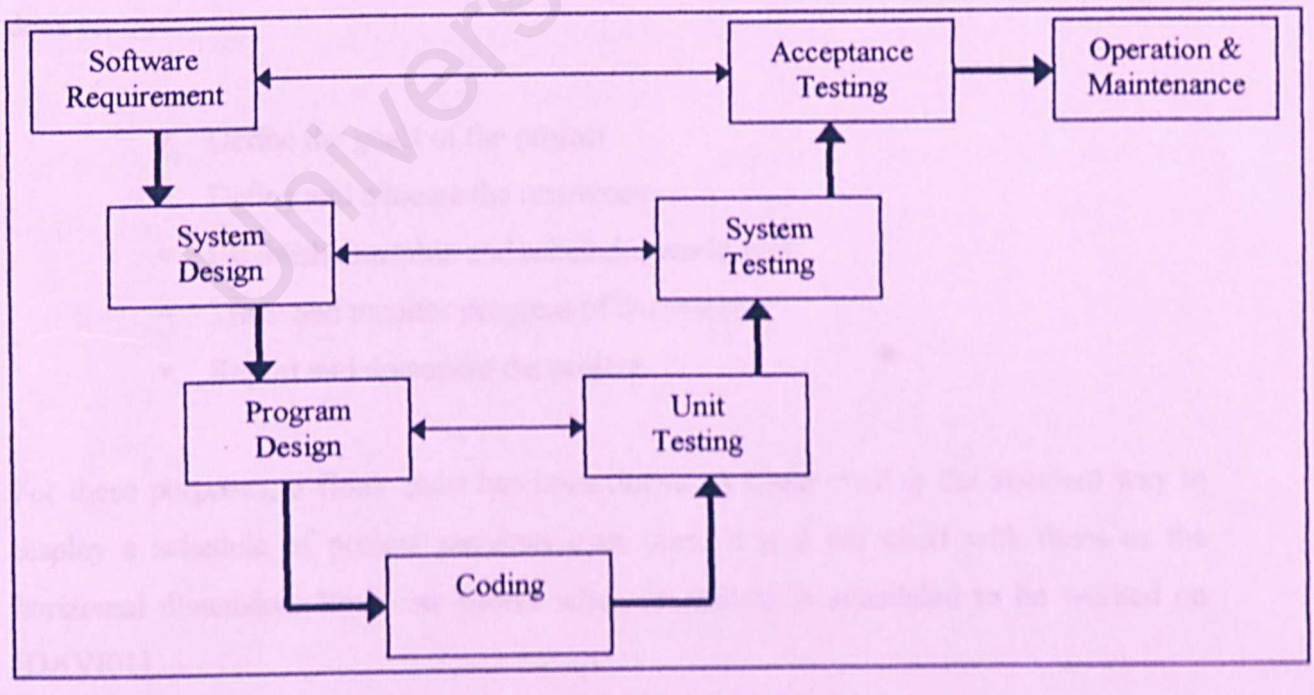


Figure 1.2 The V Model

Below are the research plans:

- Analysis on the database system as well as database management system.
- A study on client/server architecture and web based application.
- Inspection of development tools availability and suitability.
- A study of web based encryption methods.

1.5 PROJECT SCHEDULE

In purpose of achieving the objectives of the system, a milestone of the whole system is drawn. The milestone will arrange the time for each stage of the system development and leads to preparing a guideline in developing the system. A project must be managed properly since it may involve extensive effort. Project management is the coordination of all aspects of a project so that it can be completed under the constraints defined. Because this final project that need to be completed within a short time span, planning need to be done to:

- Define the goals of the project
- Define and allocate the resources
- Establish timetable and schedules workloads
- Trace and monitor progress of the project
- Report and document the project

For these purposes, a Gantt chart has been drawn. A Gantt chart is the standard way to display a schedule of project activities over time. It is a bar chart with times as the horizontal dimension. Each bar shows when as activity is scheduled to be worked on [DAVI01].

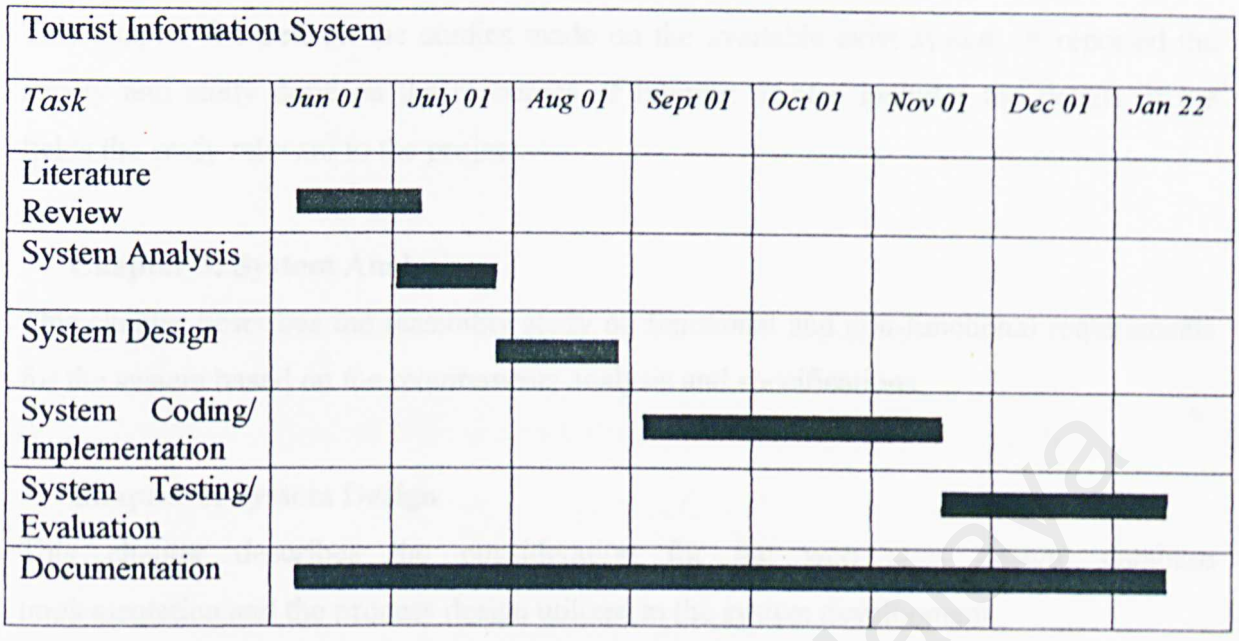


Figure 1.2 Gantt Chart for The Project

1.6 CHAPTER SUMMARY

This written report has the purpose of documenting essential information gathered and implemented throughout the development cycle of the project. It includes the project studies and analysis, the design of the software, development and testing stage and modules of the system. This report is divided into seven chapter, as explain below:

Chapter 1: Introduction

This chapter gives an overview of the project and objectives, scope, project schedule and details of the project planning. A chapter organization section explains how the contents are organized into the different chapters.

Chapter 2: Literature Review

This chapter focused on the studies made on the available exist system. It reported the survey and study done on the resources of Internet. It also includes the details of the fields the study relevant to the project.

Chapter 3: System Analysis

This chapter describes the feasibility study on functional and non-functional requirements for the system based on the requirements analysis and specifications.

Chapter 4: System Design

This chapter describes the consideration for the web sites design, database implementation and the process design utilized in the system development.

Chapter 5: System Implementation and Testing

This chapter explained the development environment and development tools and testing method involved. Web page run many testing and preview under various browsers. The observations used to improve and make correction for rebuild the web page reported here.

Chapter 6: Conclusion

This chapter encapsulates the numerous problems encountered and the solution taken during the project development; strengths, limitations and area of enhancement are explained. Lastly, the overall conclusion regarding the project paper is made in this chapter.

CHAPTER 2
LITERATURE REVIEW

2.1 THE IMPORTANT OF LITERATURE REVIEW

Literature review of a project is important as it places the project in the context of others, which might have similar characteristics. It helps the developer to know existing features offered by some similar systems.

There is no use of reinventing the wheel that has already been invented. The developer can rather focus on learning the existing systems and modify or enhance the systems or parts of the systems into some powerful features for the project.

Another important purpose of literature review is to sufficiently equip the developer with some knowledge of the strengths and limitations of several development tools. This can help the developer to choose the right tool to develop the system.

2.2 THE INTERNET AND WORLD WIDE WEB

2.2.1 An Introduction to Internet

The Internet has revolutionized the computer and communications world like nothing before. The Internet is at once a worldwide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computer without regard for geographic location. Internet is an information and communication service, which has been developing rapidly. Internet is a network of networks with a set of many different computer tools, which allows us to communicate with people around the world, search for information on thousand of publicly accessible computer all over the world.

All computer networks intercommunicate by speaking the same ' language ', which is the TCP/IP (Transmission Control Protocol/ Internet Protocol) protocol suite. The term Internet means 'network of networks ' and it is usually a collection of local networks, linked together by regional networks and attached to a national backbone. Local networks have mostly referred to public agencies such as universities, governmental agencies, military installations as well as private commercial networks. The networks within different country or regions are funded and managed locally according to local policies.

The Internet today is a widespread information infrastructure, the initial prototype of what is often called the National (or Global) information infrastructure. Its history is complex and also involves many aspects, such as technological, organizational, and community. The influence of the Internet reaches not only to the technical fields of computer communications but throughout society as we move toward increasing use of online tools to accomplish electronic commerce, information acquisition, as well as community operations.

2.2.2 Functions of The Internet

The Internet is capable for providing many services and functions to its users all around the world. Below are the lists of some of these functions and services:

- The Internet plays the role as a library of resources from worldwide.
- The Internet is a database of multitudes of information from all areas of interest such as mathematics, science, history, recreation, technology, artistry, sports, music, entertainment and language, just to name a few.
- The Internet provides discussion rooms where people can gather to talk and share ideas with others, for example newsgroups.
- The Internet provides electronic mailboxes to many countries and people all over the world based on the Post Office Protocol (POP).
- The Internet also plays the role as communication tools and it is easy by anyone, for instance electronic mail.

2.2.3 Problems Regarding the Internet

Although the Internet is now one of the essential tools for communication, it has also begun to create concerns regarding privacy and security issues in the digital world. Digital Crimes like electronic break-ins, hacking and widespread of various types of computer viruses take place almost everyday in the Internet community.

The worries raised by the use of the Internet are listed as below:

- Seek to gain the unauthorized access to the resources of the Internet.
- Disrupts the intended use of the Internet and wastes resources (i.e. people, capacity, bandwidth, computer) through such actions.
- Compromises the privacy of users.
- Destroys the integrity of computer-based information.
- Consumes unplanned resources for control and eradication.

2.2.4 The World Wide Web (WWW)

The World Wide Web and the Internet is not the same thing. The World Wide Web refers to a body of information that is an abstract space of knowledge. It is categorized as one of the Internet protocols for searching information. The others Internet protocols are Telnet, File Transfer Protocol (FTP), and Gopher. The World Wide Web is currently the most widely used on the Internet probably due to its interactive and interesting graphical user interface. It encapsulates the other services such as email, news, Gopher, FTP as well as Telnet shown below:

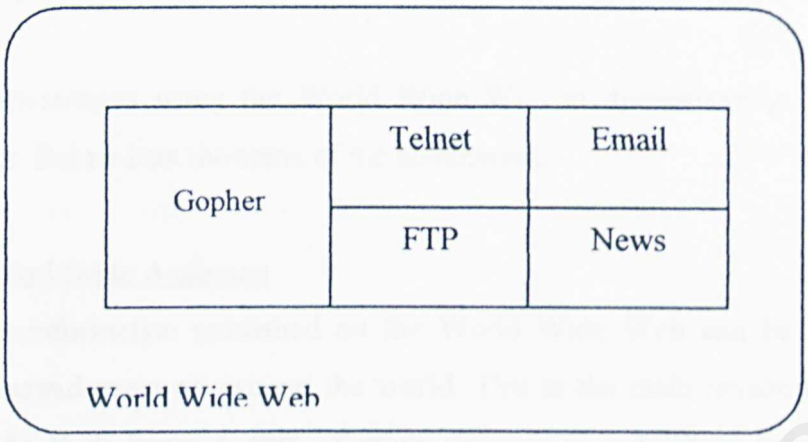


Figure 2.1 The World Wide Web

The World Wide Web users the Internet to transmit hypermedia documents between computer users internationally. Hypermedia documents are documents, which can contain more than just texts, such as graphics, animations, sounds, video clips and other multimedia elements. These documents are connected to each other via the hypertext links to make them look much like "a web of documents" as the term World Wide Web implies. Locations where these hypertext documents (also known as web pages) stored are termed web sites or homepages.

Thanks to the World Wide Web, anyone intending to look for information is finally able to browse various information sources and easily travel from one source to another by following various hyperlinks. Hyperlinks are objects that refer to Uniform Resource Locator (URL) of web pages. When a user clicks on a hyperlink, he or she is transferred to the web page to which the hyperlink is linked. The World Wide Web is perhaps the most influential vehicle of information distribution ever since the invention of the television. The recent boom in the number of web sites on the Internet attests to this fact. As more and more people gain access to the World Wide Web through online services or directly by way of a local Internet Service Provider (ISP), many organizations will be focusing more on using the World Wide Web to keep their customers informed of new products, carry out business transactions, and provide customer services.

2.2.5 The Advantages of World Wide Web

There are many advantages using the World Wide Web in disseminating information across the networks. Below lists the some of the advantages:

i. Global or Worldwide Audience

Web sites with information published on the World Wide Web can be viewed by hundred of thousand users all around the world. This is the main reason that makes the World Wide Web being a cost effective medium in publishing information to large audience at very low cost.

ii. Immediate Distribution of Information

Once any new information is added into a web site, the information can be immediately accessed and viewed by all Internet users. The World Wide Web takes away the time lag associated with publishing content and making it available to users.

iii. Easy to Integrate with Internet Information System

Internet information system deployed on the Internet can be easily integrated with internal information systems that are managed with productivity applications. Internal information repositories can easily be made available for browsing through a web server.

iv. Consists of Multimedia

One of the major advantages of presented in a World Wide Web is the capability to incorporate multimedia functions into web pages to publish information in a more interesting and interactive way. For instance, browsing becomes more interesting with audio and video clips presented to the users.

v. Formatting Capabilities

The major reason for the success of the World Wide Web lies on the capability to publish contents that are richly formatted using the HTML tags and the graphics formats. Besides, various interactive controls can also be added into the web page to allow the web site developers to create more interactive ones.

vi. New Technologies

Various technologies are introduced to the development of the World Wide Web. Examples are the Internet programming language like VB Script, Java, Java Script, and new HTML, which supports the tables and frames in the applications. Web site contents developers use these technologies to build informative web sites that are easy to familiarize with.

2.3 WEB DATABASE

2.3.1 Introduction to Web Database

A web database is a data store or information repository that can be accessed via a query language or programming API. Unlike conventional database system, however, access to web database typically is not achieved by typing instructions at a command line or by using interface that are custom designed for use on a specific computer platform.

Web database are accessed via other web applications, specifically, forms developed using standard HTML tag, ActiveX control and client-side scripts using VB Script and Java Script. Using facilities available in HTML, applications programs on the web server are accessed through a server-side mechanism known as the Common Gateway Interface (CGI). This interface enables developers to create applications that integrate database functionality and provide access to organizational data repositories on behalf of web clients (a user or browser). Before a database connection is opened, the ASP page has to provide the information about the physical location of the database [STEP00].

Besides, the application can incorporate information pulled from a database for use as part of a larger application. The capability to integrate a database into applications that can be accessed by users utilizing a web browser is what makes a database as a web database.

2.3.2 Benefits of Web Database Application

In most web-based application, database server as the basic building blocks for information services. Organizations might want to use this database in their web applications for the following benefits:

i. Consolidation of data

Developer may unlock the potential unused information in organization database. Information from database in various part of an organization (for example finance, human resource, project management and so on) can be consolidated using web-based application and served to the users as though it were for a simple source. Database does not have to physically locate in each department of an organization, either.

ii. Better Management

The evolution from document based information repositories to paperless and efficient data storage in web database has save a lot of energy, time, and cost in managing records.

iii. Extending of Functionality

The functionality of your web server can be extended so that you can make information you maintained available to the general public or internal users. A task currently undertaken by many organization and government agencies whose primary product is information.

2.3.3 Design Consideration Via Web Database Application

Designing a web-based database is very similar to designing a database prior to the advent of the Internet. However, there are several issues that must be considered when designing web-based databases. The following is the brief list of issues related to that:

i. Security

Secure communication and user identity are critically important for protect the data in the web database from loss, corrupt and unauthorized use. Therefore, you must consider various web technologies and develop a security based on some specific scenario.

ii. Performance

Internet users do not want to have to wait for their queries to process. Any queries that take more than a couple of seconds will probably frustrate the user and possibly cause him or her not to user your web site. Therefore, you may need to use a denormalized design to achieve acceptable performance.

iii. Backup

The Internet is available 24 hours a day, 7 days a week. Your web site must be continuously available. This can complicate your backup strategy, which can import your database design. If you choose to denormalize your design, you may increase the physical site of your database, and this can increase the time frame required to back up your database. The longer it takes to back up the system, the longer the database may be unavailable or unresponsive.

iv. Language

The Internet is world wide, which means that your web site may be viewed in foreign countries. Do you need to support multiple languages? If so, this can import your database design because you need to track data in different languages.

2.4 WEB SERVER

2.4.1 Apache

Apache 1.1.3, the most widely implemented Web server on the Internet, offers a powerful and customizable approach for any Unix-based server. But Apache's greatest strength is also its biggest shortcoming. Experienced Unix users will enjoy the control they have over the Web server [HEAT97]. Developer can download Apache and get all the Apache core and module source code, which can be modified to suit the developer needs.

Apache runs on most Unix-based machines. Apache can be managed either from a server console or a web browser. A server console is one that is in the same room as the server and that is directly attached to it. Wizards are available to create new sites and directories, and the server provides for multiple logs that can be automatically cycled or archived. (Cycling a log means replacing the oldest log with the newest, thus recycling the space they occupy. Archiving a log means saving it, perhaps on a large backup storage device.)

Suitability to Task

Apache

	Power	Ease
Documentation	Poor	Fair
Installation/configuration	Good	Poor
Management/administration	Good	Poor
Content and site management	N/A	N/A
Security	Fair	Fair
Web development	Fair	Poor

N/A--Not applicable: The product does not support this feature.

Figure 2.2 Suitability Tasks for Apache Server

Apache's application development tools support CGI and several proprietary APIs. Once the API blocks are built, programmers can invoke the code blocks to perform their duties by using the common API interface. Apache supports Server Side Includes (SSI), a type of HTML comment that directs the web server to dynamically generate data for the web page when it is requested. Apache also supports Active Server Pages (ASP) and Java servlets. Similar to CGI, ASP generate dynamic content using either Jscript code or the Visual Basic programming language.

Both password authentication and digital certificate are found in Apache server. Access can be restricted by domain name, by IP address, or by user and group. Apache can prohibit access by directory or file, and support Secure Sockets Layer (SSL). The public-domain version of Apache provides nothing beyond this basic level of security

2.4.2 Microsoft Internet Information Server (IIS)

Microsoft Internet Information Server (IIS) is the core Windows NT services that provides Internet services. It is also the underpinning that provides information-publishing capabilities in the Internet [ALLE98]. IIS comes bundled (free) with Microsoft' s Windows NT operating system. IIS serves equally well as an intranet web server or a public web server program. IIS uses Windows NT' s User Manager to maintain users and groups, saving the trouble of maintaining multiple sets of network and Web site users.

Microsoft Internet Information Server runs only on the Windows NT operating system. IIS includes an integrated search engine that allows users to create custom search forms with a variety of tools, including ASP. ActiveX Data Objects, and SQL database queries. The IIS web server software also includes Microsoft Front Page HTML development tool. IIS supports FTP, allowing users to download files and data from the IIS server site with the FTP protocol.

Building on Windows NT' s security prowess, IIS provides additional levels of security. Thus, NT basic access control mechanisms (username/password) and Secure Sockets Layer (SSL) software encryption are also provided in IIS. IIS includes a built-in certificate server that allows organizations to issue and manage digital certificates verifying identities. Access control can limit use by groups or by individuals and can be applied to directories and files. Parts of documents can be hidden from users who do not have clearance to access them.

Suitability to Task

Microsoft Internet Information Server

	Power	Ease
Documentation	Excellent	Good
Installation/configuration	Good	Excellent
Management/administration	Excellent	Excellent
Content and site management	Good	Excellent
Security	Good	Excellent
Web development	Excellent	Excellent

N/A—Not applicable: The product does not support this feature.

Figure 2.3 Suitability Tasks for Microsoft Internet Information Server

2.4.3 Netscape Enterprise Server

Building on Netscape FastTrack Server's strong foundation, Netscape Communications Corp. scores with Netscape Enterprise Server (NES). Enterprise adds site and content management tools and incorporates a robust Web development platform [GREG97]. NES provides a powerful development environment that supports development of web-based applications that can be run on the Internet, an intranet, or an extranet.

Netscape Enterprise Server comes with document conversion and indexing utility programs, and these programs bundle a Verity search engine. The Verity search engine is versatile because it can index documents in various formats, including Adobe PDF,

Microsoft Word, and Microsoft PowerPoint. NES also provides a utility program to convert common document file formats to HTML. Besides, NES also supports dynamic application development, including CGI and Netscape's own version of application program interface: Netscape Server API (NSAPI). NES supports the Java Servlet API for server side applications.

Netscape Enterprise Server's security is well through out, with support for password /challenge user authentication and digital certificate authentication. Netscape Directory Server (NDS), bundled into NES, provides basic security through user-name/password-based authentication mechanisms for discretionary access control. Netscape also works with SSL performance enhancement devices, which increase the efficiency of the server while it is performing SSL functions.

Suitability to Task

Netscape Enterprise Server

	Power	Ease
Documentation	Excellent	Good
Installation/configuration	Excellent	Excellent
Management/administration	Excellent	Fair
Content and site management	Excellent	Excellent
Security	Good	Good
Web development	Excellent	Excellent

N/A--Not applicable: The product does not support this feature.

Figure 2.4 Suitability Tasks for Netscape Enterprise Server

2.5 WEB BASED PROTOCOL

2.5.1 Hypertext Transfer Protocol (HTTP)

The Hypertext Transfer Protocol (HTTP) is the Internet protocol responsible for transferring and displaying web pages. It is a set of rules for exchanging files (texts, graphic images, sound, video and other multimedia files) on the World Wide Web. Relative to the TCP/IP suite of protocols (which are the basis for information exchange on the Internet), HTTP is an application protocol.

Web browser is an HTTP client, sending requests to server machines. When the browser user enters file requests by either "opening" a Web file (typing in a Uniform Resource Locator or URL) or clicking on a hypertext link, the browser builds an HTTP request and sends it o the Internet Protocol address indicated by the URL. The HTTP daemon in the destination server machine receives the request, after any necessary processing, the requested file is returned.

If a web page contains objects such as movies, sound, or graphics, a client makes a request for each object. A web page containing a background sound and three graphics thus requires five separate server request messages to retrieve the four objects – the background sound and three graphics and the page in which these objects are referenced. Due to the enormous growth of the number of HTTP users, HTTP has had a tremendous impact on the Internet.

2.5.2 Common Gateway Interface (CGI)

A CGI, which is a protocol, is a common way for web servers to interact dynamically with clients (users). It is a standard way for a Web server to pass a Web user's request to an application program and to receive data back to forward to the user. When a user fills out a form on a Web page and sends it in, it usually needs to be processed by an application program. The Web server typically passes the form information to a small

application program that processes the data and may send back to confirmation message. This method of convention for passing data back and forth between the server and application is called the CGI. It is part of the Web's HTTP protocol. A web site with a CGI application can be created by specifying the name of the application in the URL tag if a form is being created.

The CGI provides a consistent way for data to be passed from the user's request to the application program and back to the user. This means a CGI application is platform independent. Because the interface is consistent, a programmer can write a CGI application in a number of different languages. The most popular languages for CGI applications are C, C++, Java, PHP and Perl. An alternative to a CGI application is Microsoft' s Active Server Pages (ASP), in which a script embedded in a Web page is executed at the server before the page is sent out.

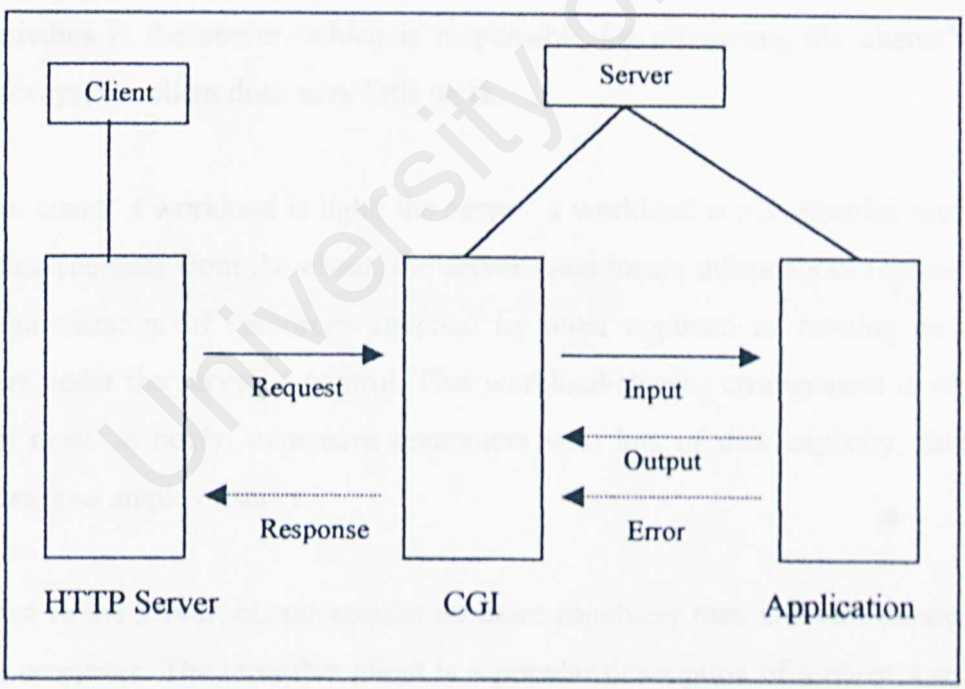


Figure 2.5 Data Flow in Common Gateway Interface

2.6 THE CLIENT/SERVER ARCHITECTURE

A client/server computing defined as the logical extension of modular programming where modular programming has as its fundamental assumption that separation of a large piece of software into its constituent parts creates the possibility for easier development and better maintenance. Client/server computing takes this a step further by recognizing that modules need not all be executed within the same memory space [PATR94].

2.6.1 Web Client/Server Architecture

Client/server architecture may be used in LANs, WANs, and on the web. The main characteristic that these three somewhat diverse uses share is a division of the workload between the client and the server. In each case, the client computers typically request services, including printing, information retrieval, and database access. The partner in these activities is the server, which is responsible for processing the clients' requests. Nearly always, the client does very little work.

While the client' s workload is light, the server' s workload is not. Besides receiving and interpreting requests from the client, the server must locate information, reprocess it, and request initialization of resources supplied by other applications running on dedicated computers under the server' s control. That workload-sharing arrangement is why servers generally must be beefy, expensive computers with lots of disk capacity, fault-tolerant processors, and ample memory.

In contrast to the server, clients require no more capability than is found on any ordinary personal computer. The term thin client is a popular description of a client's relative low workload, compared with that of a server. This will eventually result in putting the processing to the server and the data management as well as data storage.

2.6.2 Two-Tier Client/Server

A two-tier model involved only a client and server. All communication takes place between the client on the Internet and the target server at the other end. Of course, other computers are involved in the process of transporting packets of information across the Internet [GARY00]. The conversation that occurs between a Web browser and a Web server is similar to any conversation between clients and servers generally.

This two-tier architecture is appropriate for simple, routine, relatively homogeneous applications that are not expected to grow. Two-tier applications are simpler, faster, and less expensive to build than their three-tier counterparts. Their need for middleware is minimal, if present at all.

A two-tier architecture is one in which only a client (tier 1) and a server (tier 2) are involved in the requests the responses that flow between them over the Internet. . It is typically used in small environments which less than 50 users. To properly scale to hundreds or thousands of users, it is usually necessary to move to a three-tier architecture.

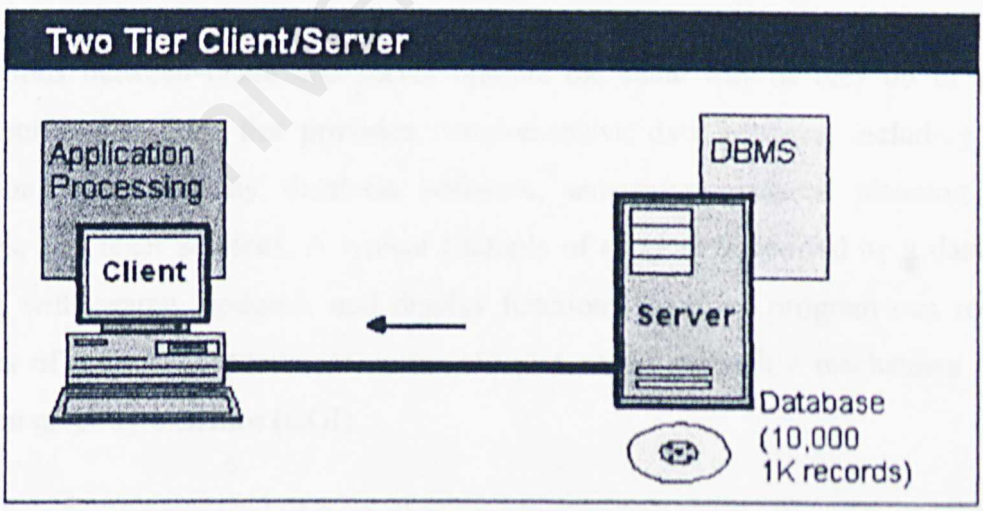


Figure 2.6 Two-Tier Client Server Architecture

2.6.3 Three-Tier Client/Server

A three-tier architecture builds on the traditional two-tier approach. The first tier as the client, the second tier is the Web server, and the third tier consists of applications and their associated databases that supply non-HTML information to the Web server on request. From a software perspective, the three-tier are client processes (tier 1), Web services (tier 2), and data services (tier 3) [Garry, 2000].

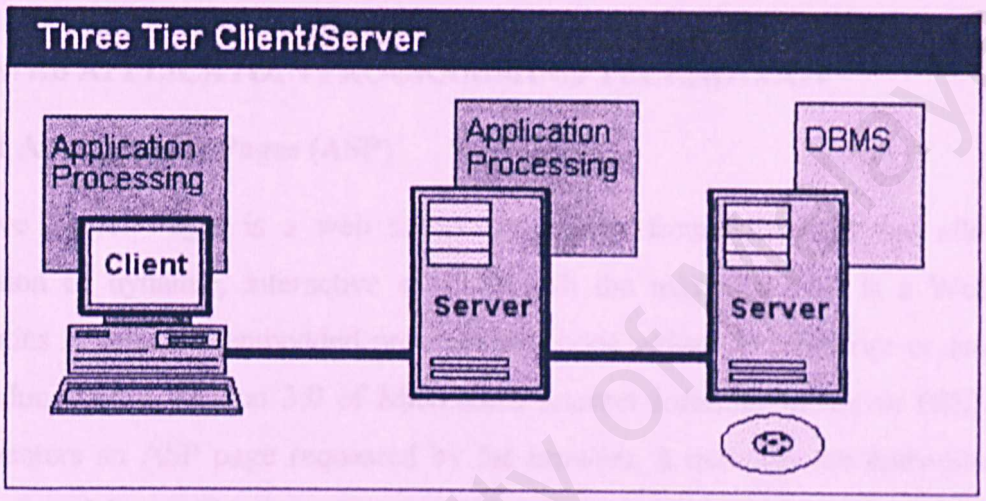


Figure 2.7 Three-Tier Client/Server Architecture

Interactions between client and server operate the same way as they do in a two-tier architecture. The third tier provides comprehensive data services, including database operations supported by database software, enterprise resource planning software services, and other services. A typical example of services supported by a database is a catalog with search, updated, and display functions. A client program can request the services of a backend processor connected to a server through a mechanism called the common gateway interface (CGI).

One of the three-tier architecture' s is each of its major functionality is isolated from one another. Furthermore, its presentation is independent from the behavior of business logic and processing rules where in turn is isolated from the data. Each piece may also running

on different platform. However, when come to the analysis and design, the three-tier requires more efforts, costs and time. Anyway, the advantages of three-tier architecture have outweighed its disadvantages due to above circumstances

A CGI, which is a protocol, is a common way for web servers to interact dynamically with clients (users). CGI is a standard way of interfacing backend applications with web servers. The backend servers provide programs that dynamically transform data into HTML so that web browsers can display the results.

2.7 WEB APPLICATOIN PROGRAMMING TECHNOLOGY

2.7.1 Active Server Pages (ASP)

Active Server Pages is a web server technology from Microsoft that allows for the creation of dynamic, interactive sessions with the user. An ASP is a Web page that contains HTML and embedded programming code written in VBScript or Jscript. It was introduced with Version 3.0 of Microsoft's Internet Information Server (IIS). When IIS encounters an ASP page requested by the browser, it executes the embedded program. ASPs are Microsoft's alternative to CGI scripts and Java Server Pages (Asps), which allow Web pages to interact with databases and other programs. Third party products add ASP capability to non-Microsoft Web servers. The Active Server Pages technology is an ISAPI program and ASP documents use an .ASP extension.

Active Server Pages is based on the ActiveX scripting engine and enable developers to include server side executable script directly into a HTML document. Developers can create Active Server Pages using any of the popular scripting languages, including VBScript, JavaScript, Perl, and so on.

Developers will notice from the diagram that the web clients communicate with the web server through the HTTP protocol. The web server can be on the Internet or within an Intranet. The web server is comprised of Internet Information Server (IIS), which includes the ActiveX Server Scripting engine. An ASP page is any file located on the

web server that has the extension .ASP. This file is simply HTML page that contain scripting code. This scripting code extends basic HTML and provides additional functionality for their application.

2.7.2 Active Server Components

Active Server Components are a signification part of building distributed and powerful application. Active Server Components are programs, DLLs, or executable (EXE) that is built using the Components Object Modes (COM) specification. Visual Basic, Visual C++, and Visual J++ all support the development of COM based components. These programs can be called from ASP to provide robust application processing on the server machine such as database access, permission checker, active messaging, etc.

For example, developers might want to build an Active Server Components that uses the strength of the C++ language to perform financial analysis and return the results to the web browser. Developers can also distribute the application processing load through the use of Distributed COM (DCOM). ASC provide a method for building high transaction processing capability into developers' application.

2.7.3 ASP Compare to Common Gateway Interface (CGI)

ASP provides all of the functionality of CGI applications in an easier-to-use and more robust environment. ASP is an easier way for server to access information in for a not readable by client (such as an SQL database) and then acts as gateway between the two to produce information that the client can view and use [DAVI99].

With CGI, the server creates as many processes as the number of client requests received. The more concurrent requests there are, the more concurrent processed created by the server. However, creating a process for every request is time consuming and requires large amount of server RAM. In addition, this can restrict the resources available for sharing from the server application itself; slowing down performance, and increasing wait time on the web. ASP instead runs in the same process as the web server, more handling

client requests faster and more efficiently. It is much easier to develop dynamic content and web applications with ASP.

2.7.4 Microsoft Front Page 2000

Generally, at the mention of Microsoft FrontPage, HTML purists groan while corporate users raise their eyebrows in anticipation. The former group tends to dislike the code that Microsoft produces and disdains the lack of support for products developed (or acquired). The latter appreciates the integration with the Microsoft Office suite, which is ubiquitous in most enterprise-size companies.

The considerable headway Microsoft FrontPage 2000 makes, however, should please both camps. First, the code has been cleaned up, and users can set preferences for how they want it to appear—nested or flat text, uppercase or lowercase on tags and parameters. In the past users could only count on support for the latest version of Internet Explorer, but now they can design for Netscape-specific features and maintain pages compatible with older browsers.

Among FrontPage's strongest points are its collaborative capabilities. Pages on a file or Web server can be checked in or out, leaving notes about who has done what work to individual pages, and what remains to be done. Users can easily incorporate several features normally requiring CGI-bin access or Perl programming, such as discussion groups, Web counters, or search forms. To use these features, the server that hosts user's Web site must provide support for FrontPage extensions, which is becoming increasingly common among commercial hosts.

2.8 WEB APPLICATION DEVELOPMENT LANGUAGE

2.8.1 Hypertext Markup Language (HTML)

The hypertext markup language (HTML) is the language used to define the content of web pages. In its basic structure, HTML is quite simple, consisting of tags that precede or bracket various types of information [WILL98]. It is a non-proprietary format based upon Standard Generalized Markup Language (SGML) and can be created and processed by a wide range of tools, which are from simple plain text editors to sophisticated WYSIWYG (What You See Is What You Get) authoring tools. HTML files are different from other text files because they included special code called HTML tags. The HTML tags are surrounded by two angle bracket characters (< and >).

HTML allows physical styles from the content markup by relying more on style sheets. FRAME element is now formally defined somewhere other than Netscape or Microsoft. OBJECT element is introduced to address the computing interest between applets, plug-ins and ActiveX controls. The following are the advancements of HTML:

- HTML markup is separated from style through the introduction of style sheets.
- Added flexibility with forms and tables.
- Formal adoption of tags that are crucial to DHTML.
- Incorporation of scripting language capabilities.
- Better printing capabilities.
- Ability to respond too or ignore specific media types.
- Improved sensitivity to different language types.
- Greater accessibility for those who use audio or Braille interfaces to access Web data.
- End users may choose between styles for viewing a document or turn off style sheets altogether.

2.8.2 Scripting Language

A scripting language is special type of programming language used to provide control in another host environment. If is interpreted rather than compiled. Therefore, a program built with a scripting language must be run in the environment that contains the scripting language's interpreter and cannot be run as a stand-alone application.

i. VBScript

Visual Basic Scripting Edition (VBScript) was introduced by Microsoft to allow Web page developers to make use of their existing Visual Basic skills when creating client side script. VBScript inherits its syntax and structure from Visual Basic programming language. VBScript is an alternative to JavaScript in the client side scripting language. However, only Microsoft Internet Explorer supports this language. Netscape Navigator's users need a Netscape Plug-in called Script Active. It can be used to validate form data, displaying status bar messages, ActiveX controls and working with cookies.

VBScript is closely related to the BASIC programming language. It is a scripting language that is easier to use. It can act as a client side and server side programming just like JavaScript. VBScript can be used as the server side programming which means the language is executes on the server that serves a web site's files, rather than on the browser that received those files. The scripts are processed before the pages are sent out across the Internet to browser.

ii. JavaScript

JavaScript is a cross-platform scripting language, which is simple, interpreted and object-oriented. It used to add simple interactive behaviors to an HTML page by means of a script of keywords inserted into a Web page. Its originate from Live Script that developed by Netscape to provide a way to interface with Java. The developer of Java helped Netscape to rework Live Script and produces JavaScript. JavaScript is a full featured and

allows for the creation of dynamic pages; interactive content, forms input checking, and much more.

JavaScript' s syntax is based on Java's syntax, but otherwise remains as a different language with a different role. JavaScript excels in its ability to add client-side processing of forms, create HTML content on the fly, and tightly integrate HTML with Java. JavaScript requires only a text editor for the creating of applications, and because Netscape's Navigator has a built in JavaScript interpreter, JavaScript applications may be run immediately after they have been typed in simply by loading them into the browser window.

2.9 WEB BROWSER

A web browser is a software program that knows how to contact a web server (using the HTTP protocol), requesting a document from that web server, and display that document returned by the server to the client.

There are many different types of browsers; the most popular ones are Netscape Navigator and Microsoft Internet Explorer. The appearance of the document varies from browser to browser dependency on the capability of each browser, system and preference.

2.9.1 Microsoft Internet Explorer

Microsoft's Web browser, also known as "IE." Versions for Windows, Mac and UNIX are available. Internet Explorer was developed after Netscape began to turn the computer world upside down with its Navigator browser, and both companies went head to head on enhancements and features. Although Netscape's browser was a purchased product, Microsoft made Internet Explorer free, forcing Netscape to do the same. Since Microsoft integrated the browser into Window 98, Internet Explorer has become the market leader. Internet Explorer has also been the browser in AOL's online software.

The advantages of Internet Explorer are:

- Available free for everyone
- Integrated with Windows 98

The advantage of Internet Explorer is:

- Available only for specific platforms, e.g. Windows and Macintosh.

2.9.2 Netscape Navigator

A Web browser for Windows, Macintosh and X Windows from Netscape that provides secure transmission over the Internet. Soon after its introduction in 1994, Navigator, or just "Netscape," as it is commonly called, quickly became the leading Web browser on the Web. Initially a purchased product, Netscape was forced to give it away after Microsoft developed Internet Explorer and offered it free of charge. The Navigator Web browser is part of Netscape's Communicator package, which includes a variety of additional Internet utilities.

The advantages of Netscape Navigator are:

- Available for a wide variety of platforms
- Large installed base
- Code released into public domain
- Available free for everyone

The disadvantages of Netscape Navigator are:

- Does not integrate with Windows 98
- Does not have operating system revenue to support development costs.

2.10 STUDY THE CURRENT SYSTEMS

Throughout the literature process, many web sites I have been visited and a few of good sites are selected to go through a through analysis of the related current systems. Web sites that are being discarded or not selected are due to the reason of not being attractive enough. Below are the selected web sites together with their respective URL address.

2.10.1 www.malaysiamydestination.com

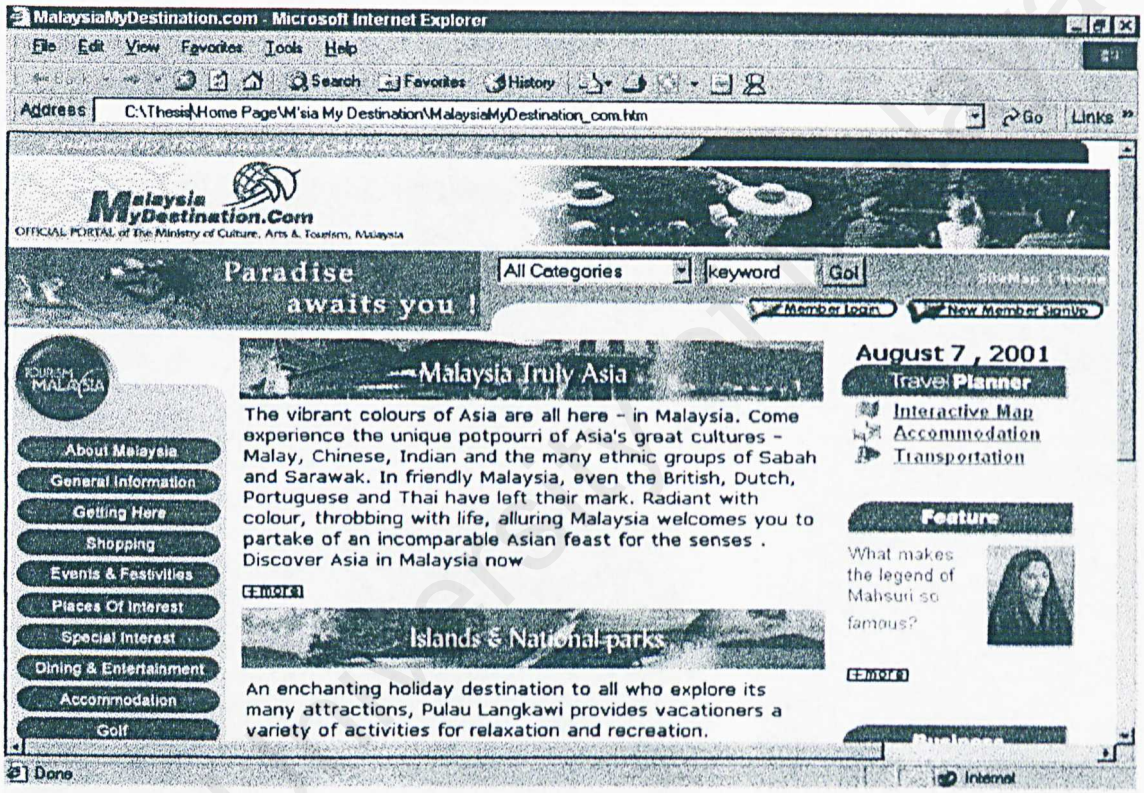


Figure 2.8 Home page of Malaysia My Destination

Malaysia My Destination web sites are developed by Ministry of Culture, Arts and Tourism, Malaysia by a company called MyDestination.com Sdn.Bhd. For the first time I visited to this web sites, I felt it is quite attractive and user friendly. The information is well structured. At the left frame of the web site, the information has gather in different categories such as events and festivities, places of interest, special interest, dining and

entertainment, and others. In the special interest category, there are also some features such as mountain climbing, camping, jungle tracking, scuba diving, and others.

The main information is display at the center frame. In the right frame, there is an interesting feature name *interactive map*. In this interactive map, visitors can look for the map of Malaysia even can zoom in more detail map according to the scalar. At the top of the web site, it also provides a fast search feature for visitors to search by key word according to the categories that they have divided.

2.10.2 www.tourism.gov.my

Figure 2.9 Home page of Tourism Malaysia

These Tourism Malaysia web sites are the official web sites developers and maintains by Malaysia Tourism Promotion Board from Ministry of Culture, Arts and Tourism. These

web sites are more focus on the accuracy of information to visitors as a reliable body as well as other services provided.

Tourism Malaysia web sites provide information such as Malaysia calendar of events, tourism resource center, statistics update, and related contacts for tourism industries. Other additional features in these web sites are bulletin board, which let members get more specific information, send greeting cards, provide national holidays and school holidays. Beside, these web sites also provide Bahasa Malaysia language version and Chinese language version for visitors' convenience.

2.10.3 www.fascinatingmalaysia.com

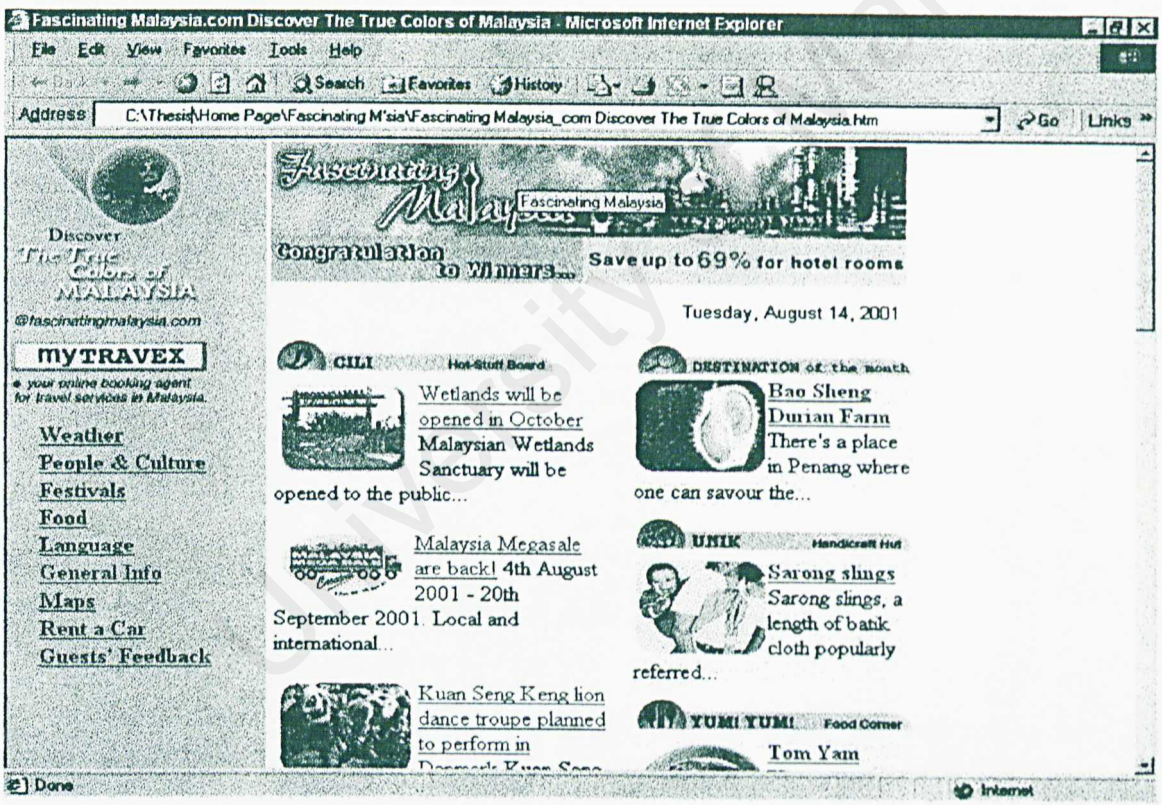


Figure 2.10 Home page of Fascinating Malaysia

Fascinating Malaysia web sites are developed and maintained by personal company. The home page is divided into two sections; there are side frame and main frame. The side

frame (left frame) provides information such as weather, people & culture, festivals, foods, maps and others.

At the main frame, the information has categorized to different types. In the *hot-stuff board*, latest information such as latest events, festival, new places are display here. Other categories such as handicraft hut, food corner, shopping online, events of the year, virtual reality also provided at the main frame. Visitors can get more detail information about particular category by clicking the hypertext link. Besides, visitors also can search interest place regarding the states in Malaysia or type of interest such as highlands, beaches and islands, nature, and adventure.

CHAPTER 3
SYSTEM ANALYSIS

3.1 CURRENT SYSTEMS ANALYSIS

3.1.1 Common Features of The Current Systems

After studied the current web based travel information systems, notices that there have some similarities and common features as listed below:

i. *Information Based*

There provide a lot of information related to the culture and events in Malaysia as well as interest places. The web pages also consist of some pictures related to the places or particular events.

ii. *Map of Malaysia*

Most of the systems have provided the map of Malaysia and maps all the states of Malaysia. User can click on the particular states to get more information related to the place

iii. *Related Link*

Some of the web sites may add certain hyperlink in the web pages such as car rental company, airline, other informative web sites etc.

There are several advantages of the current web based travel information systems as shown below:

i. The design of user interfaces is well and attractive. The web pages are not too crowed with text and there are some related photos inserted in the pages. In other word, the user interface is user-friendly.

ii. The data in the systems is well structured; each of the information has categorized into some groups according to the types of the information. The user is easy to find and search for the needed information.

Beside, there are also several weaknesses and disadvantages of the current systems as shown as below:

i. Current systems do not provide enough tour packages for the user/ tourist. Some tourists prefer come to Malaysia with the help of travel agency, but there are lack of information about travel agencies and the packages provided.

ii. The systems are not interactive enough, user need to always visit the web sites to get the latest information such as new travel places, coming events and festivals, latest packages offered and so on.

3.1.2 Synthesize The Survey Resources

After revised and surveyed all the related resources or literature as well as analysis the current system, finally comes out the synthesis about the revised / surveyed resources. My purpose web-based Tourist Information System should contains features and functions as below:

i. Featuring a web-based Tourist Information System that allow Internet users / tourists to search for information about Malaysia. Information is structured and organized in a way that more attractive and humanize.

ii. Allow travel agency to register as a member in order to post up their packages in the web sites. Travel agency can login to the web sites to add, modify, or delete the package.

iii. The system can allow users to perform currency conversion. Webmaster can login into the system to update the currency rate frequently.

3.2 OVERALL STRUTURE

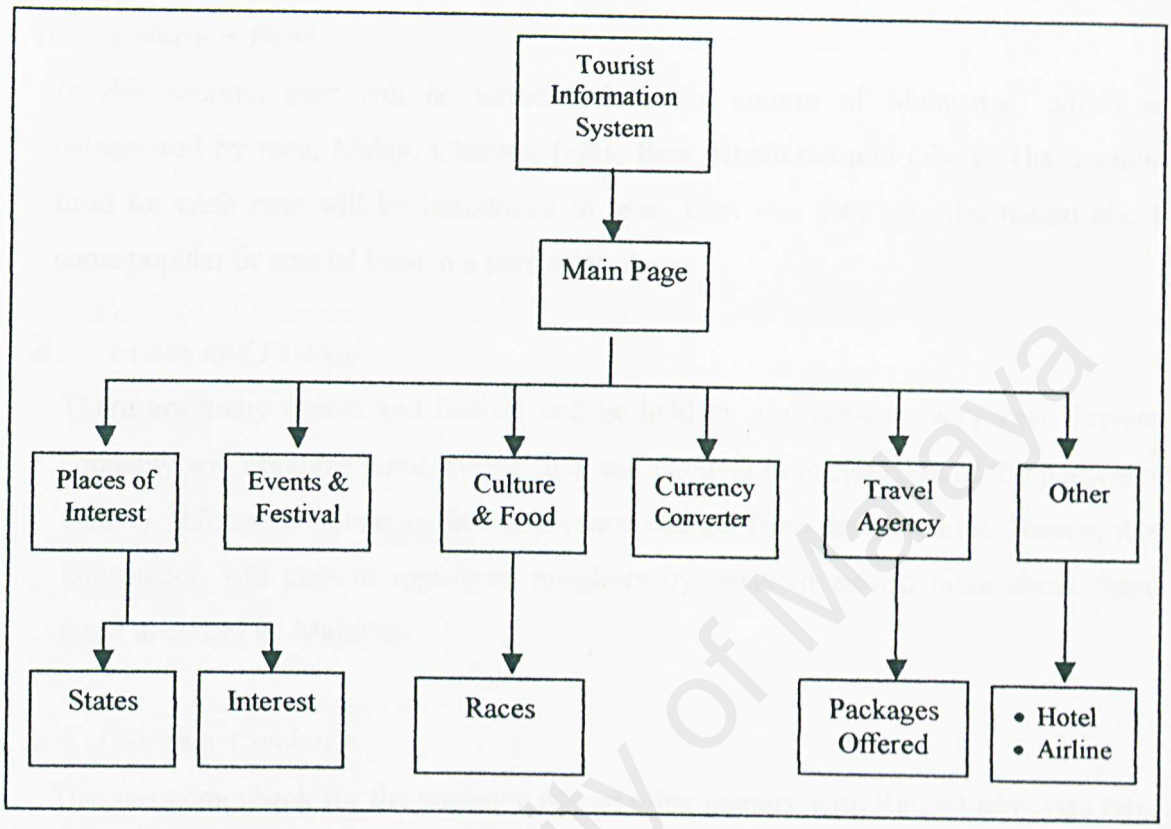


Figure 3.1 Overall Structure of Tourist Information System

The Tourist Information System main page is consist of several modules, the main modules are places of interest, culture & food, events & festival, travel agencies and so on. These modules descript the way to structure and organize the information, the information will display in a humanize way.

i. *Places of Interest*

User who is interest with the places in Malaysia can get to particular places in states of Malaysia via the system. User can get more detail in each state of Malaysia by just select for the particular state, related tourism places and photos will be also inserted in it. Beside, the *interest* section has categorized the places in such a way like

highland, beach, island, adventure, natural and so on, user can search for the places regarding to his/her preference.

ii. *Culture & Food*

In this section, user will be introduced to the culture of Malaysian, which is categorized by race, Malay, Chinese, India, Iban, Khadazan and others. The popular food for each race will be introduced to user. User can also get information about some popular or special food in a particular place.

iii. *Events and Festival*

There are many events and festival will be held by government every year. Private company will organize some events such sell carnival in conjunction of the particular festival. Information such as date and venue can get from the web sites. Beside, this information will post to registered members by email to inform them about these latest activities in Malaysia.

iv. *Currency Converter*

The users can check for the currency rate of other country with Ringgit Malaysia rate. They can insert the amount and select the currency type of other country; the system will calculate and display the amount in Ringgit Malaysia. Webmaster can login into the system online to update the currency rate frequently.

iv. *Travel Agencies*

For the travel agencies which have a significant to promote their tour packages on the Internet, they can do so with this tourist information system. User or tourist can search for the packages from different travel agencies and make comparison. There is a fast search provided for user to search the packages by select the category of the packages or which state to travel, the related packages will display at the list.

v. *Other*

This system will provide other information to user. There is a section that consist most of the famous hotels in Malaysia regarding to the place. There will provide other informative link to other web sites such as air tickets booking.

3.3 ANALYSIS OF REQUIREMENTS

A requirement is a feature of system or a description of something that the system is capable of doing in order to fulfill the system's purpose. It describes not only the flow of the information to and from the system but also the constraints on the system's performance. Requirement elicitation is an especially critical part of the process. Variety of techniques is used to determine user's needs and customer's wants. Requirement identifies the "what" of the system and the design identify the "how" of the system.

Requirement enables to explain the requirement definition of the system. Requirement definition is a complete listing of everything the customer expects the proposed system to do. It represents an understanding between customer and developer of what the customers need or want, it usually written jointly with developer. On the other hand, the requirements specification restates the requirement definition in technical terms appropriate for the development of a system design. It is the technical counterpart to the requirements definition documents and requirement analysts write it.

Requirement analysis covers 2 main categories, which are:

- Functional Requirements
- Non- Functional Requirements

The other requirement would be the run-time requirements for the machine and application to function properly.

3.3.1 Functional Requirements

A functional requirement is a function or feature that must be included in an information system to satisfy the business need and be acceptable to the users [JEFF01]. It describes an interaction between the system and its environment. For the Tourist Information System, the functional requirements have divided to several small modules as shown below:

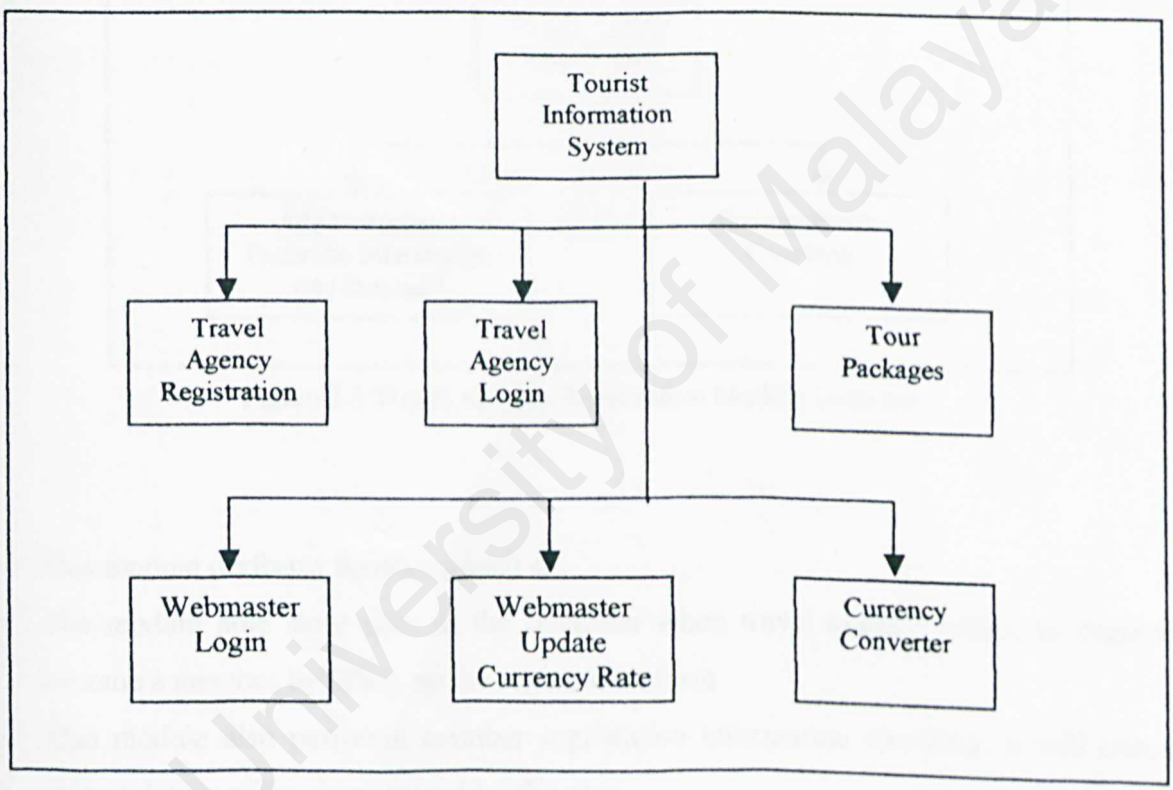


Figure 3.2 Modules of Functional Requirements

As I have mentioned before, the target users are tourist (local and foreign tourist) and travel agency. Therefore, the system has two logins module, which one is for tourist and another is for travel agency. There are several functional requirements in this tourist information system as shown below:

a) Travel Agency Registration Module

This module is responding to the web page electronic registration from. It will handle the travel agency' s registration to become a member. This system required the travel agency to register as a member before they can make any online transaction with the system such as post-up latest packages, modify or delete packages.

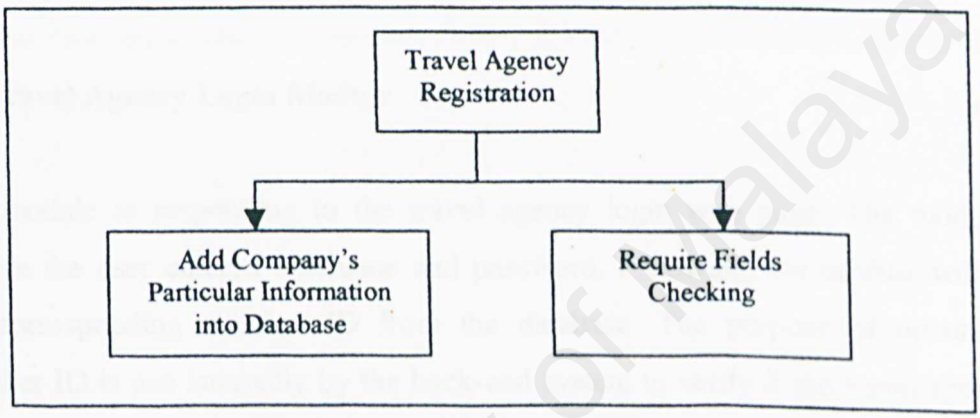


Figure 3.3 Travel Agency Registration Module Diagram

This module performs functions such as:

i. The module able store data in the database when travel agency wishes to register become a member by filling up the registration form.
ii. This module also performs member registration information checking. It will check the validation of the data entered by the user.

The error handling perform in this module are:

i. Checking User Input

The module will make sure the user has entered all the required information in the electronic form such as username, password, company name, and company number. If the user failed to do so, the module will generate an error massage and redirect the electronic form to the user to notify the reasons of error occurred and asks the user to reenter again.

ii. *Input Validation*

The module also able to validate the password and confirm-password that entered by the user. The module will validate this two input by comparing the two inputs. If the inputs do not match, an error massage will generate to notify the user the password had entered differently. If the username entered is same with the other existing username, an error massage will generate to notify the user the username already exist and required the user to choose another username.

b) Travel Agency Login Module

The module is responding to the travel agency login web page. The module will receive the user entered username and password. Following, the module will obtain the corresponding member ID from the database. The purpose of obtaining the member ID is use internally by the back-end system to verify if the travel agency is a registered member before they can make any online transaction.

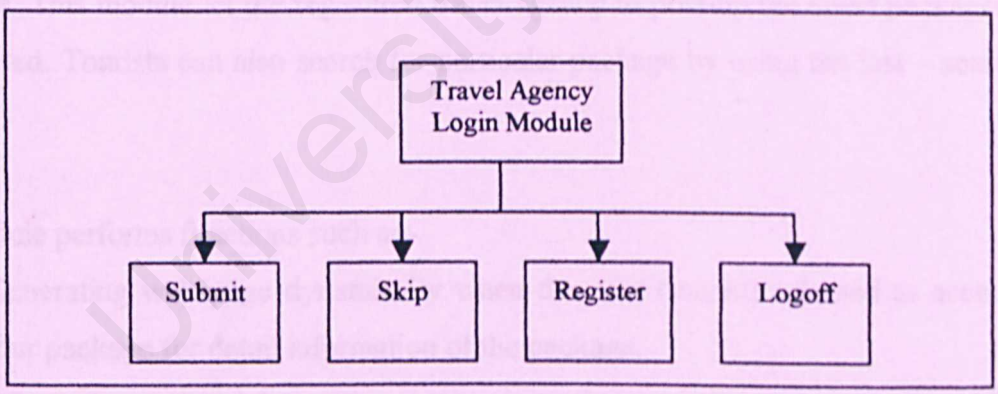


Figure 3.4 Travel Agency Login Module Diagram

This module performs functions such as:

i. Handler the travel agency's login by receiving the username and password to login to the homepage as a registered member.
ii. Allow the travel agency to login to the web site in order to do any changes.
iii. Allow user to logoff from the web site.

The error handling perform in this module are:

i. *Validation of travel agency input.*

Make sure the travel agency has entered the required email address and password by checking the length of the input variable. If the length is 0, this mean one of the input has not entered. An error message will be generated to the user.

ii. *Checking the travel agency's username and password*

Validate the correctness of username and password. When a travel agency had submitted inputs, the module will search in the database, if either the username or password not found, an error message will be generated to notify the user either the username or password had enter incorrectly.

c) Tour Packages Module

This module is responding to the Tourist Information System's tour packages promotion web page. This module let the registered travel agency to post-up the latest packages that they offered. Tourists can also search for particular package by using the fast – search by keyword.

This module performs functions such as:

i. Generating web page dynamically when the user (tourist) selected to access the tour package for detail information of the package.

ii. Allow the registered travel agencies to make an online transaction within the packages that they had offered such as addition, delete, or modify the packages.

d) Webmaster Login Module

The module is responding to the webmaster login web page. The module will receive the webmaster entered username and password.

This module performs functions such as:

i. Handler the webmaster login by receiving the username and password to login to the update currency homepage.
ii. Allow the webmaster to login to the web site in order to do update currency rate.
iii. Allow webmaster to logoff from the web site.

The error handling perform in this module are:

i. Validation of webmaster input.
ii. Checking the webmaster's username and password

e) Webmaster Update Currency Rate Module

This module is responding to the currency update page. Webmaster is allowed to update the currency rate according to the currency type. The new rate will store at the database. Webmaster can update the currency rate frequently in order the user can check for the latest currency rate in the currency converter module.

f) Currency Converter Module

This module provides the user (foreign tourist) to convert their chosen foreign currency to Malaysia currency – Ringgit Malaysia. The user need to enter the amount of foreign currency they wish to convert to Ringgit and select the chosen foreign currency in to select box provided in the web page.

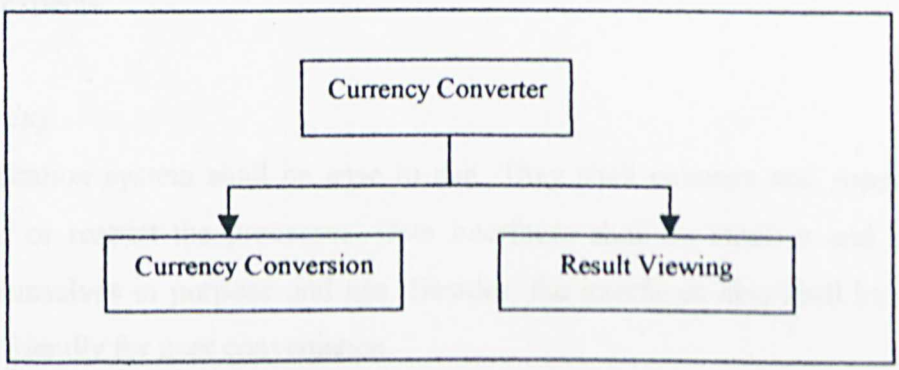


Figure 3.5 Currency Converter Module Diagram

The function performed in this module is:

i. Convert the amount of foreign currency to the correspondent value in Ringgit Malaysia.

3.3.2 Non-Functional Requirements

A non-functional requirement is a description of the features, characteristics, and attributes of the system as well as any constraints that may limit the boundaries of the proposed solution [JEFF01]. Non-functional requirements are defined as constraints under which the system must operate and the standard, which must be met by delivered system. These requirements are very subjective but are as important as the functional requirements. Despite a set of functional requirements, this system also includes some non-functional requirements. The non-functional requirements for this system are listed as below:

- *Reliability*

The application system, software and hardware shall be reliable and shall not cause unnecessary and unplanned downtime of the overall environment. A system is said to have reliability if it does not produce dangerous or costly failures when it is used in a reasonable manner, that is, in a manner that a typical user expects is normal. This definition recognizes that a system may not always be used in the ways that the designer expects.

- *Usability*

The application system shall be ease to use. They shall enhance and support rather than limit or restrict the processes. User interfaces shall be intuitive and consistent within themselves in purpose and use. Besides, the interfaces also shall be attractive and user friendly for user convenience.

- *Security*

User must login with their username and password to prevent unauthorized access into the protected web sites.

- *Timely*

As the system's main objective is to be an information web based, the information published in these web sites shall be updated always as to give the latest and accurate information to the visitors.

- *Scalability*

The scalability is to promise the capability of the system to migrate as a client or server to machines of greater or power, depending upon requirements, with less or no changes to the underlying components. The solution can be using hardware or application configuration or a combination of both of them.

- *Interactive*

The system shall be interactive such as link to other informative web sites for other purpose.

- *Serviceability*

The application system hardware and software shall be highly available all the time.

3.4 RUN-TIME REQUIREMENTS

3.4.1 Server Hardware Requirements

The server computer requirements are:

- A server with at least Pentium 166 MHz processor
- A minimum 64 MB RAM to support the workload of the server.
- Network Interface Card (NIC) and network connection with recommended bandwidth at 10 Mbps or more.
- Other standard computer peripherals.

3.4.2 Server Software Requirements

To host and run the system, the server computer needs to have various supporting software installed:

- Window NT Server 4.0 – Network Operating System
- Microsoft Internet Information Server – web server service
- Active Server Pages – Server Scripting Engine
- Microsoft SQL Sever 7.0 – RDBMS for data warehousing
- Microsoft Internet Explorer – Precondition for ASP installation

3.4.3 Client Hardware Requirements

The client hardware requirements are quite minimal as long as it has a reasonable amount of RAM that is capable of supporting the graphics and animations, and a reasonable quality dial-up connection line. The recommended configurations are:

- A minimum of 150 MB hard disk storage
- Network connection through existing network configuration or modem (recommended at least 14.4 kbps)

3.4.4 Client Software Requirements

The client software requirements fall on the browser used by the users. Recommended browser is Microsoft 4.0 or above because this browser can support VBScript.

3.5 DEVELOPMENT ENVIRONMENT AND TOOLS

3.5.1 Operating System Platform – Microsoft Windows NT

Microsoft Windows NT is a robust system incorporating GUI ease-of-use with the technical power to operate a network across several existing platforms. Because it was designed to evolve modularly and consistently over timer, Windows NT' s portability will facilitate its migration to new hardware platform [BOTT95].

Windows NT provides the pre-emptive multitasking services required for a functional server. It provides excellent support for windows clients and incorporates the necessary storage protection services required for a reliable server operating system. A the moment, a large number of windows applications are available, with increasing number that leverages the 32 – bit of multiprocessing nature of Windows NT. Besides that, Microsoft's BackOffice suite provides good integration of many server applications, including system management and a database.

Windows NT has many advantages that can be taken into considerations:

- Windows NT is a very cost – effective operating system. The cost of hardware for Windows NT is less than that for UNIX.
- Windows NT has strong support from third – party vendors.
- Windows NT is easy to administer, and it has a user-friendly graphical interface.
- Windows NT provides strong security features. Its user/group concept is similar to that of UNIX, and the NT file systems allow file – level security.

3.5.2 Web Database – Microsoft SQL Server 7.0

IBM invented a computer language back in the 1970s designed specifically for database queries called SEQUEL; which stands for Structured English Query Language

[WYNK99]. Over time, the language has been added to so that it is not just a language for queries, but can also build databases and manage the database engine's security.

Microsoft SQL Server 7.0 is a member of the BackOffice's suite. It is a scalable, high performance database management system designed specially for distributed client/ server computing. It provides tight integration with Windows and Windows – based application. Therefore, it can only be installed in Windows NT environment compared to UNIX.

3.5.3 Web Server – Microsoft Internet Information Server (IIS)

Microsoft Internet Information Server (IIS) 4.0 is the only World Wide Web server that is tightly integrated with the Microsoft Windows NT server operating system and is designed to deliver a wide range of Internet and Intranet server capabilities. IIS 4.0 was designed to deliver on the following objectives:

- Integrated with the Windows NT server

Due to the tight integration with Windows NT server, IIS is easy to setup and manage, fast and secure.

- Comprehensive web server solution

IIS includes a built-in search engine, streaming multimedia capabilities, rich log file and analysis tools.

- Easy to develop, Powerful web based application

IIS introduces ASP, which make posting dynamic content and development of web-based applications is an easy tasks.

3.5.4 Web Application Programming Technology – Active Server Pages (ASP)

Active Server Pages (ASP) is a server side scripting language that is used to build database driven web site where the browser may have no scripting at all. Here are some related facts about ASP:

i. ASP is a free for Windows NT or Windows 9X – IIS 4.0 had the first ASP with all its essentials features.
ii. ASP scripts can be tested off line with Personal Web Server (PWS).
iii. ASP code is mixed within HTML on a page – it does not need to be compiled separately or deployed.
iv. ASP code is not biased towards any browsers – its run on the server and can serve up pure HTML to any browser even one that supports no scripting language.
v. ASP can allows browser users to manipulate database (view, edit, and manage) from any browser serving up HTML with ActiveX Data Objects (ADO) and allowing HTML web pages to generate database updates, which the server takes care of.

In conclusion, ASP has a lot of benefits especially in web-based application. It does not only support all types of programming languages but it is compatible with HTML. Beside, all common servers and machines also can support it.

CHAPTER 4
SYSTEM DESIGN

A design specification describes the features of the system, the components or elements of the system and their appearance to users. The design phase builds on the knowledge obtained from the analysis phase, it used the requirements to design a system that will meet the users needs. Design focuses both on the logical and physical or technical aspects of the system [SELL00].

This chapter wills describes details of how this system will meet the requirement identified during the system analysis. In general, a system design is formulated to:

- Incorporates system features that are easy to understand and use
- Identify user error or carelessness
- Functions in a manner that seems natural to the user
- Prevents failures or improper procedures that will cause system failure

4.1 THE ESSENTIALS OF DESIGN

There are few design steps involved throughout the system design. Generally, three essentials design are used to design the system, there are:

i. User Interface Design
ii. Process Design
iii. Database Design

4.2 USER INTERFACE DESIGN

A good user interface allows people who understand the problem domain to work with the application without having to read the manuals or receive training. Interface design is important for several reasons. The more intuitive the user interface, the easier for user to

familiar with the system. The better the interface, the less help people will need to use it as well as increasing the user's satisfaction with the work that the designer had done.

4.2.1 Screen Design

Tourist Information System screen design is presented in the form of a web document on the browser. User's needs, skill level, and preferences are a major consideration here. Data should be displayed in an organized and humanize manner.

The main page of the system is divided by using table. For the first draft design, the links to other informative pages such as about Malaysia, travel packages, foods and culture, event and festival, places of interest and others have put in the left column of the table. User can direct go to the particular pages for greater details. This column is static for other pages in the system.

The main information is display at the middle column. All the information, dynamic data and forms will display at the middle column. For instance, when user clicks on the *places of interest* at the left column, the information will display at middle column.

At the right column has provided the travel agency login and member login. At the top row of the table, user can search for particular packages according to the criteria inserted. The highlighted events or places will also display at this column.

The figure next page is the design of the main page of the tourist information system web based.

Figure 4.1 Main Page of Tourist Information System

4.2.2 Travel Agency Registration Form Design

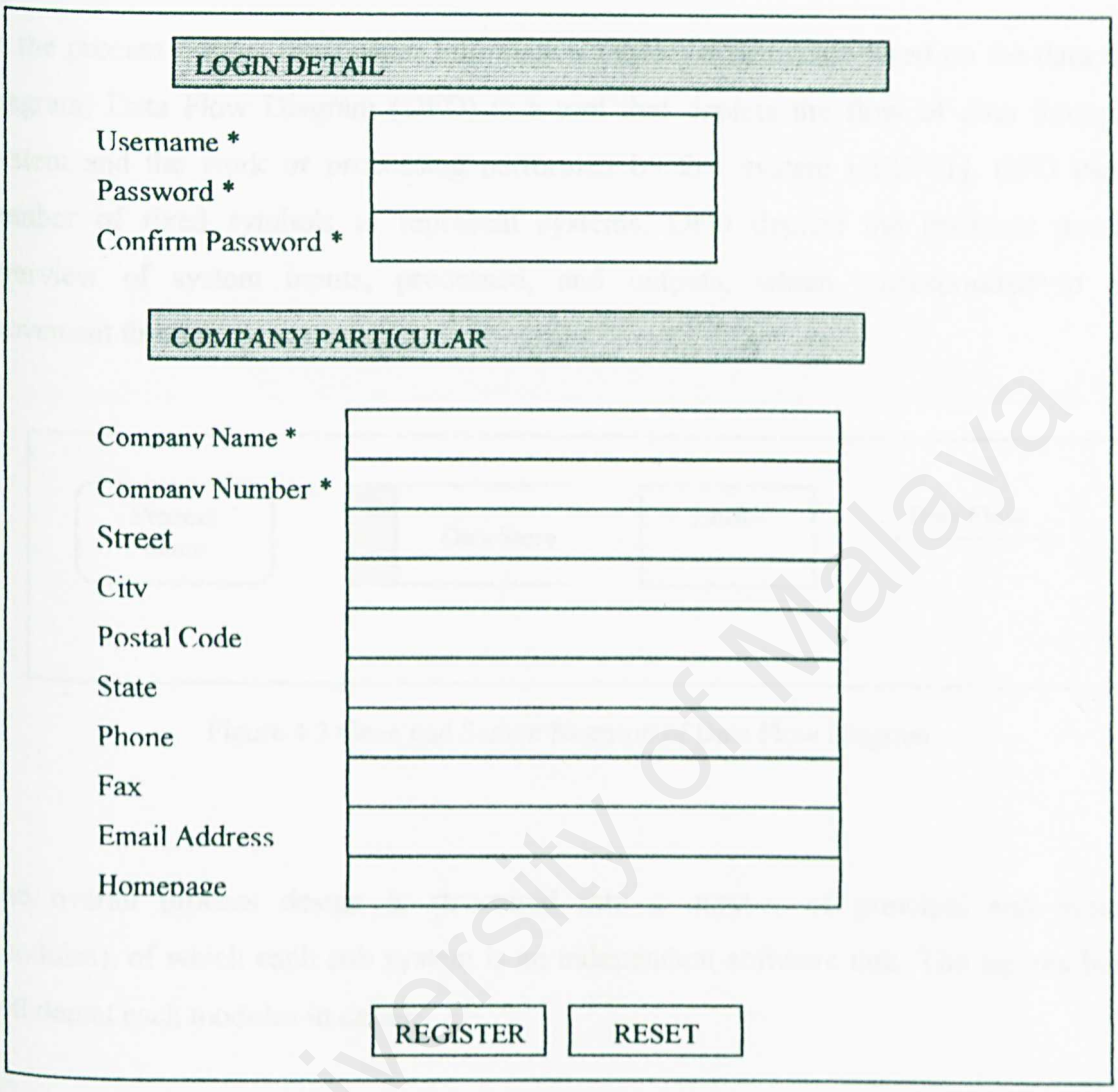


Figure 4.2 User Interface Design of Travel Agency Registration Form

After the travel agency has entered the particulars in the registration form and clicks *register* button, the system will check to make sure whether or not the travel agency has entered all the required fields (mark with *). If either one of the required fields is not entered, a error message will generated to inform the user and requires user to entered the data.

Beside, travel agency can also click the *reset* button, the system will clear all the data that has entered before and the travel agency can fill in again the registration form.

4.3 PROCESS DESIGN

In the process design, the Tourist Information System is designed based on the data flow diagram. Data Flow Diagram (DFD) is a tool that depicts the flow of data through a system and the work or processing performed by that system [JEFF01]. DFD uses a number of fixed symbols to represent systems. DFD depicts the broadest possible overview of system inputs, processed, and outputs, which corresponded to data movement through the system.

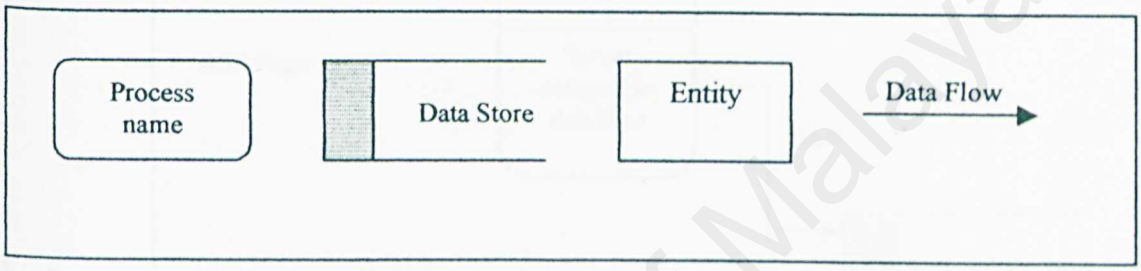


Figure 4.3 Gane and Sarson Notation of Data Flow Diagram

The overall process design is structured into a number of principal sub systems (modules), of which each sub system is an independent software unit. The figures below will depict each modules in detail.

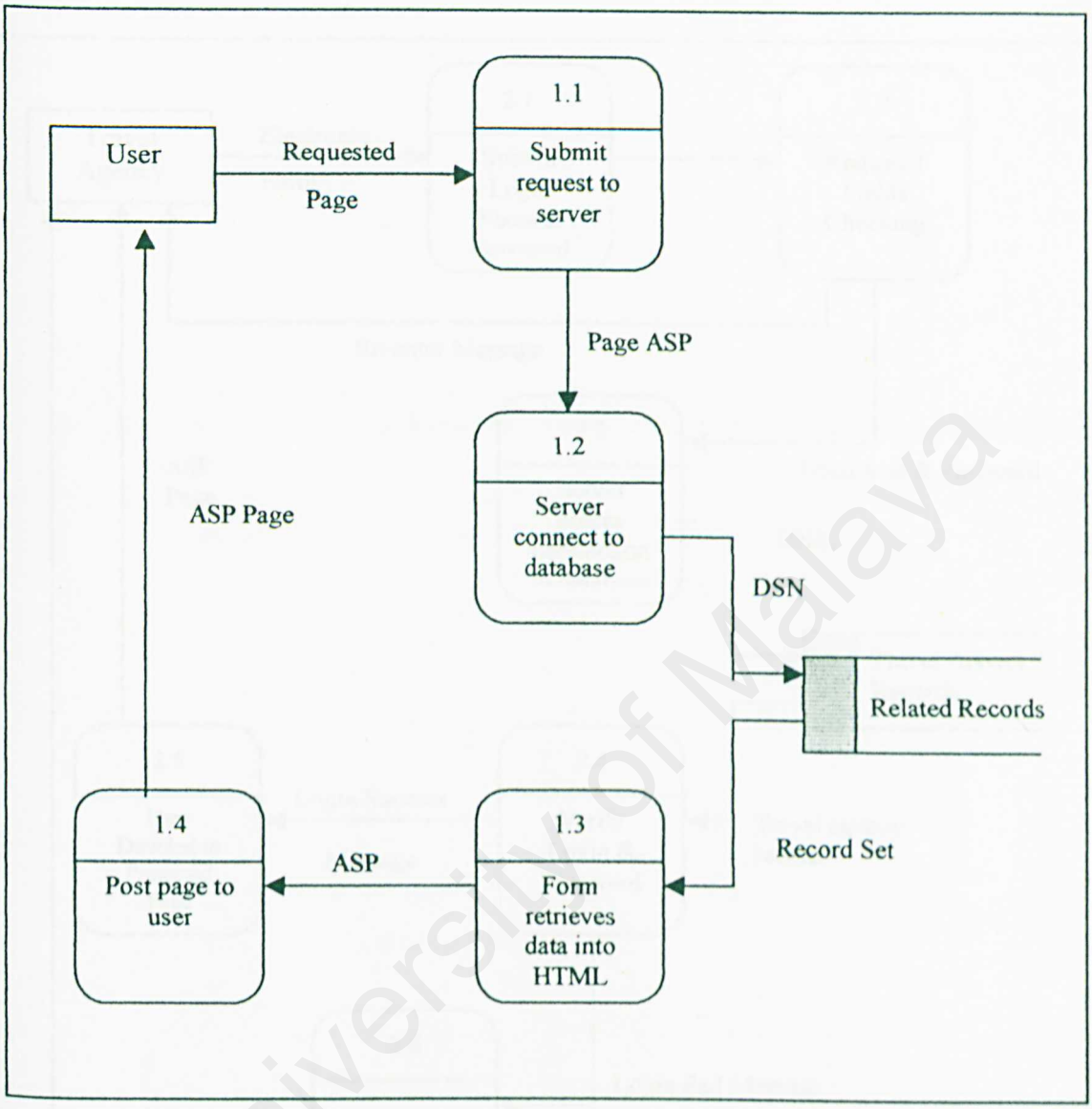


Figure 4.4 Data Flow Diagram Depicts General Data Flow in Tourist Information System

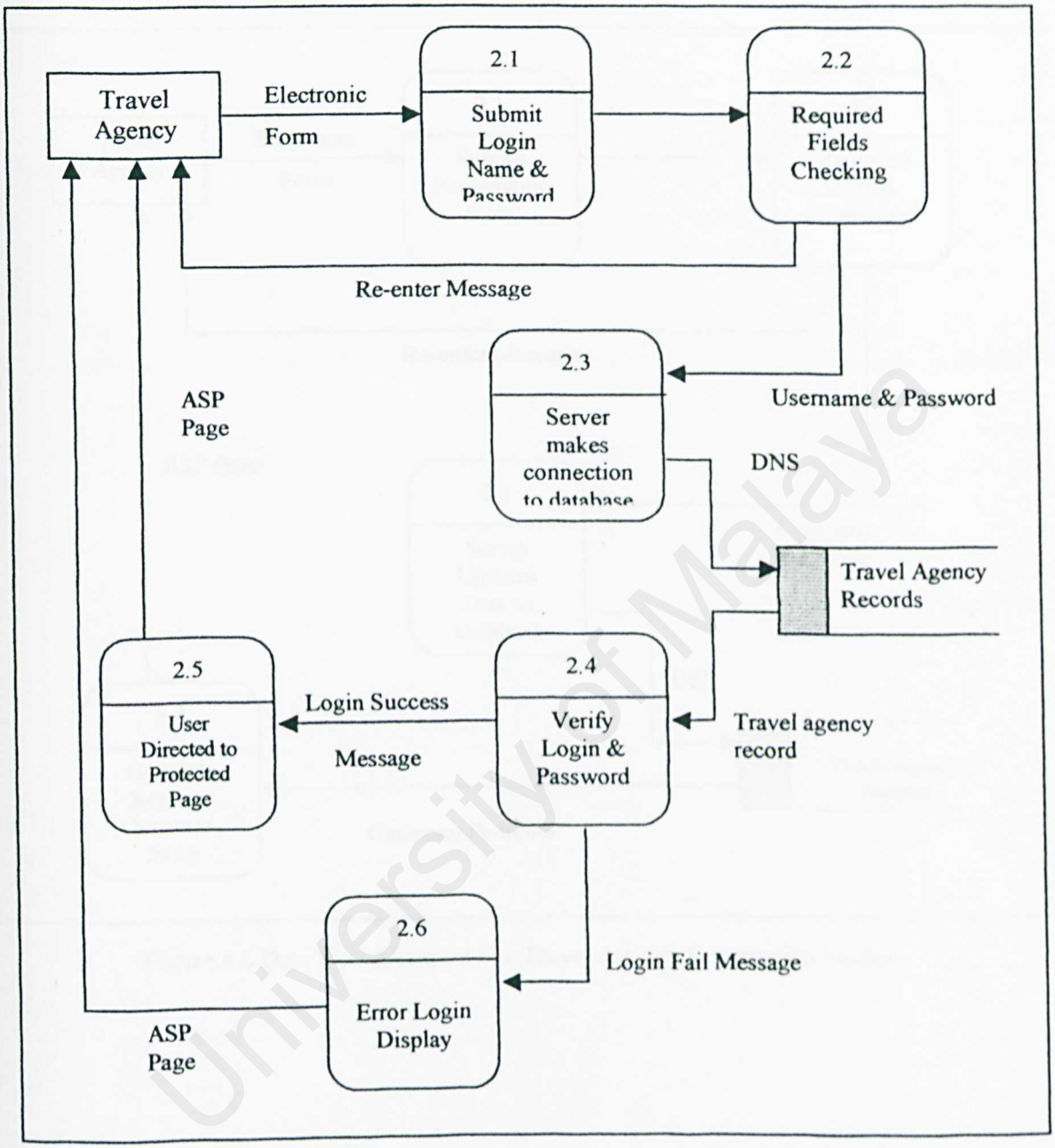


Figure 4.5 Data Flow Diagram For Travel Agency Authentication/Login Module

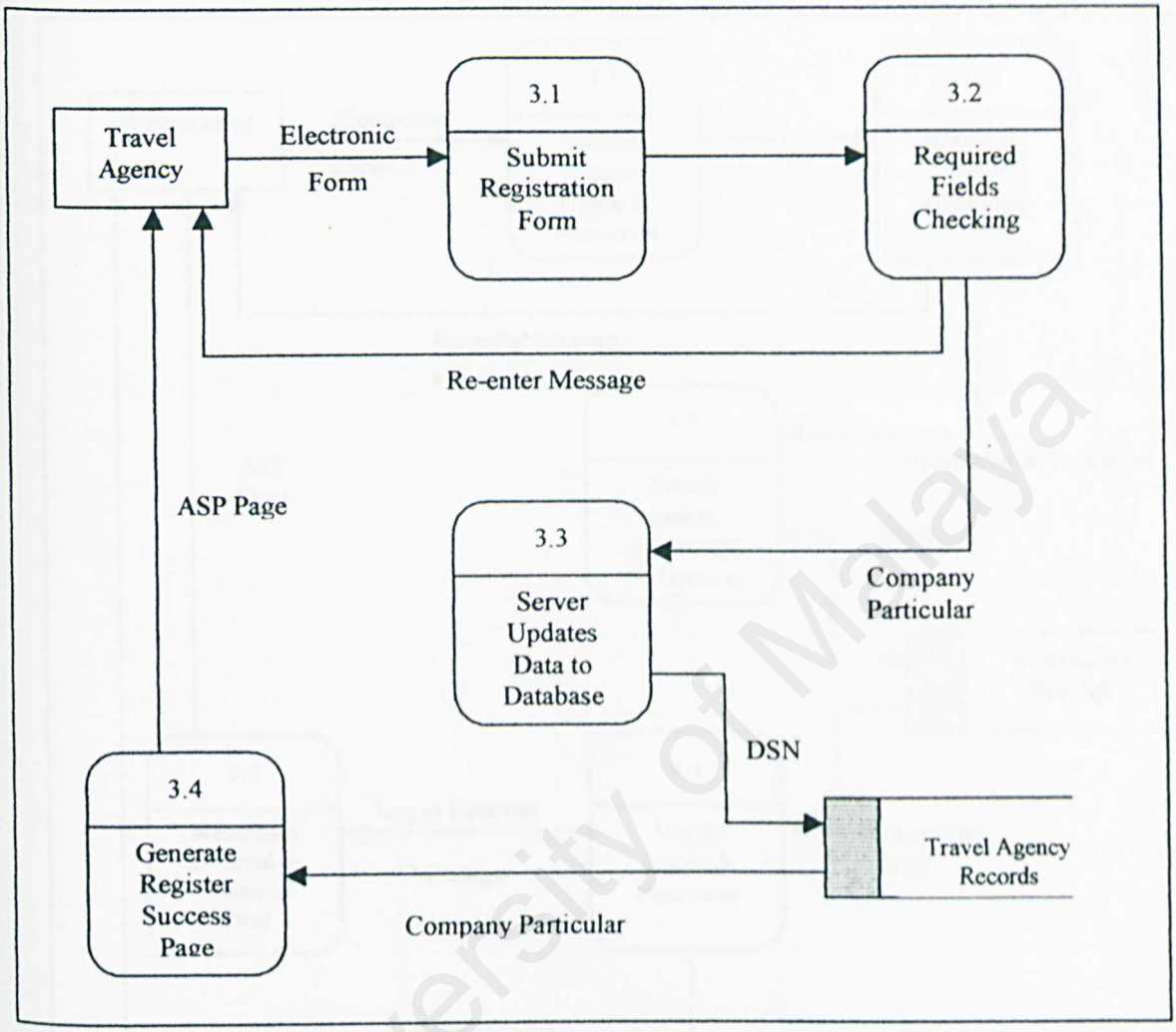


Figure 4.6 Data Flow Diagram For Travel Agency Registration Module

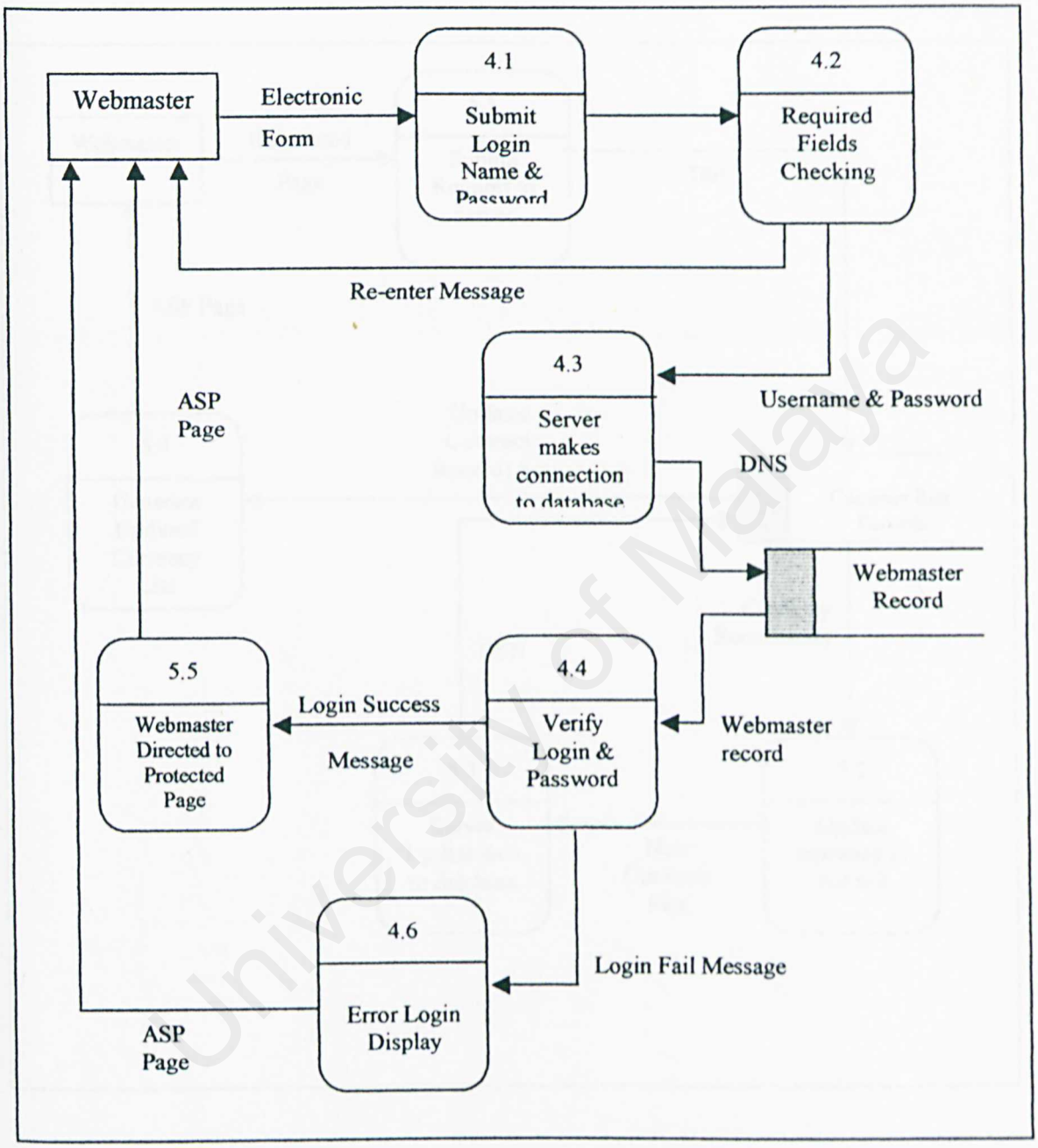


Figure 4.7 Data Flow Diagram For Webmaster Authentication/Login Module

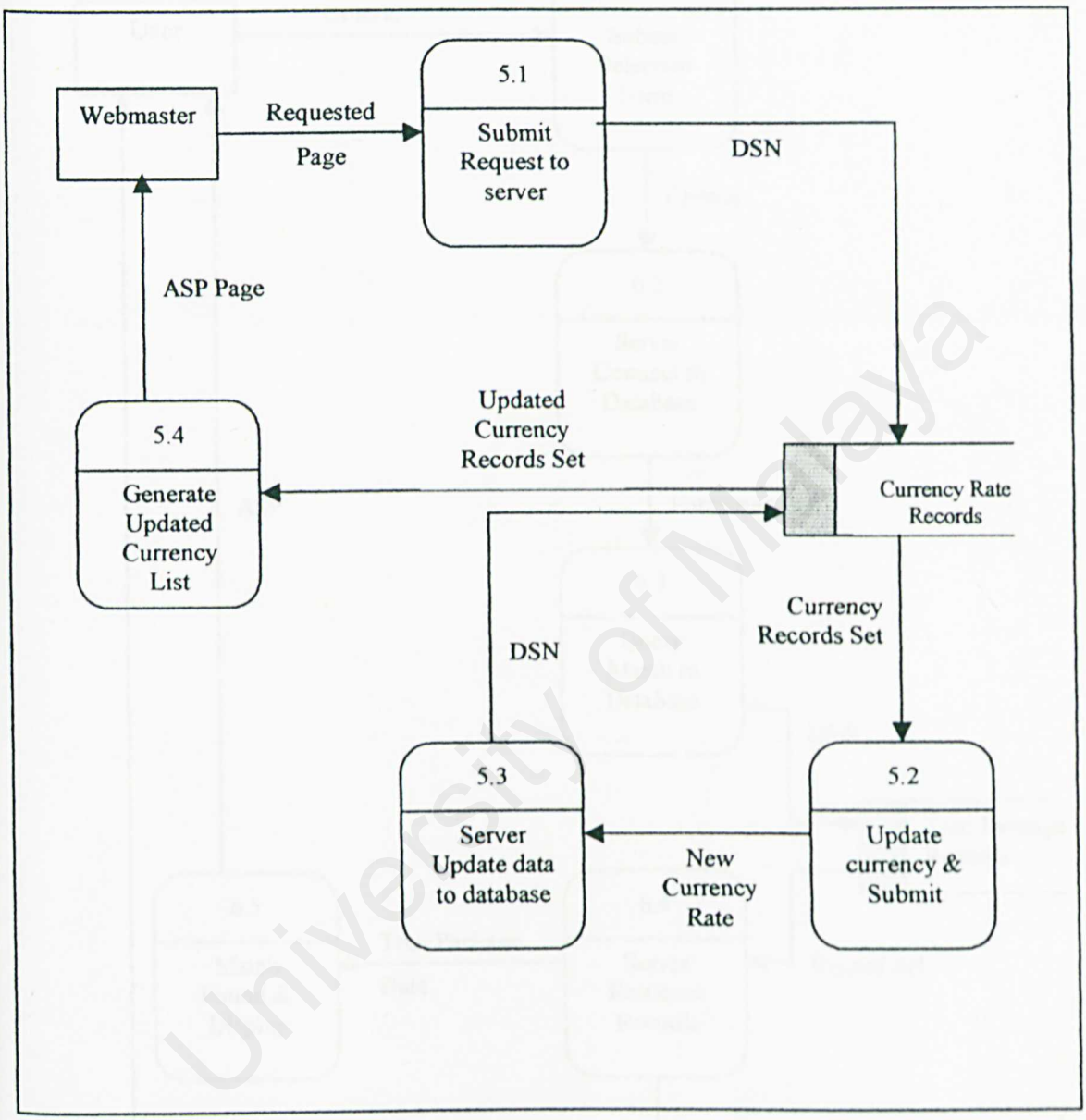


Figure 4.8 Data Flow Diagram For Webmaster Update Currency Rate Module

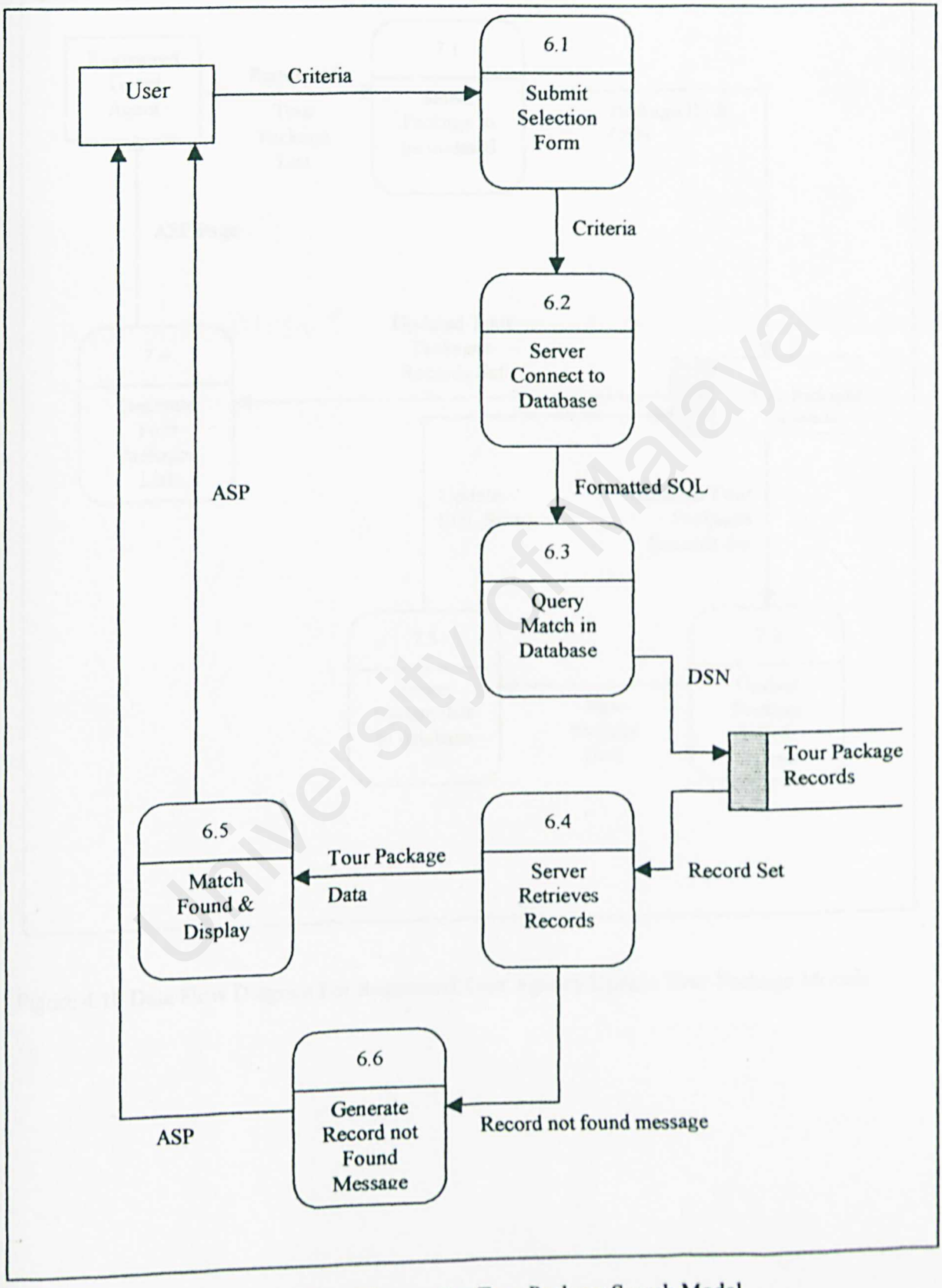


Figure 4.9 Data Flow Diagram For Tour Package Search Model

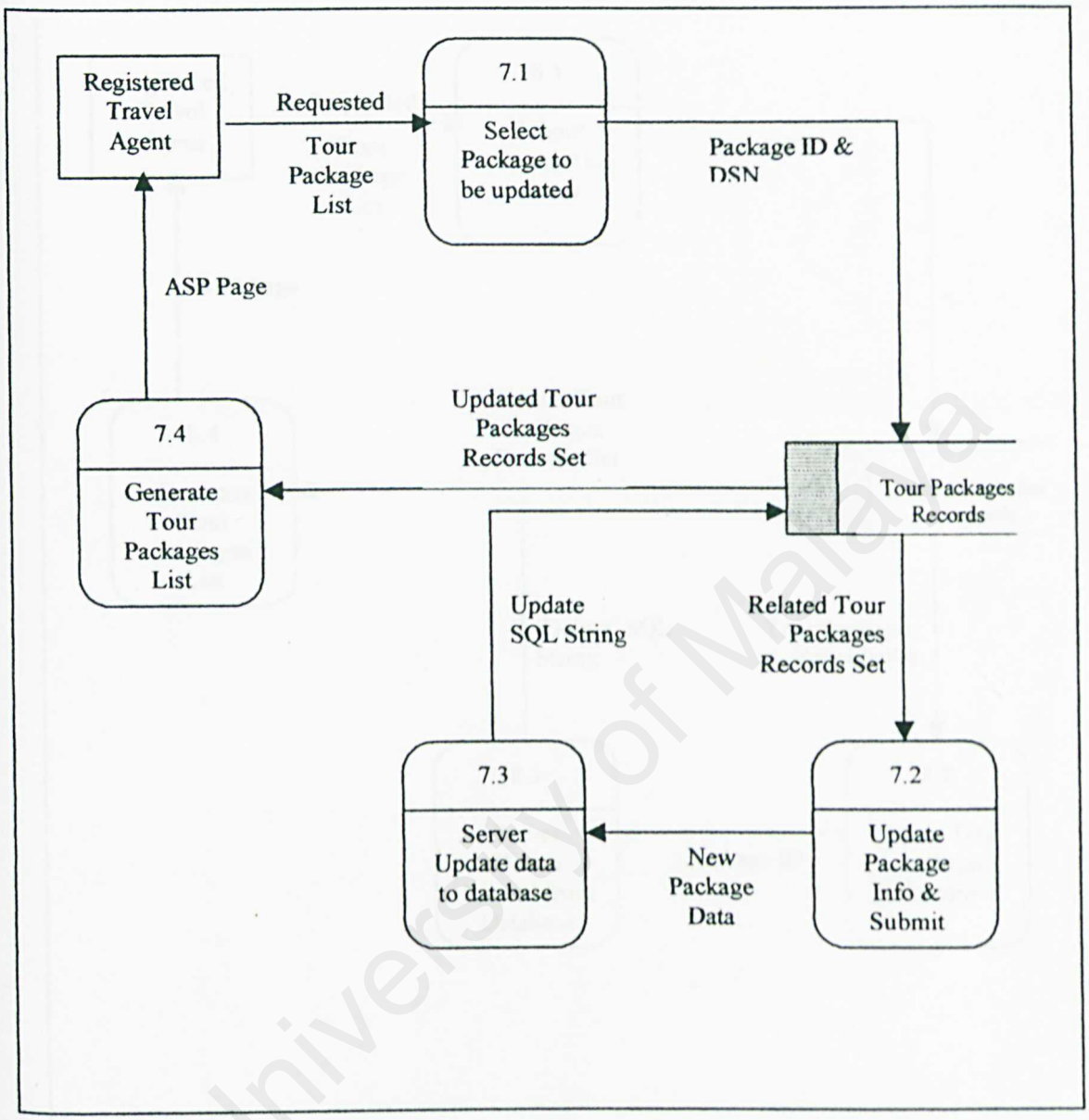


Figure 4.10 Data Flow Diagram For Registered Tour Agency Update Tour Package Module

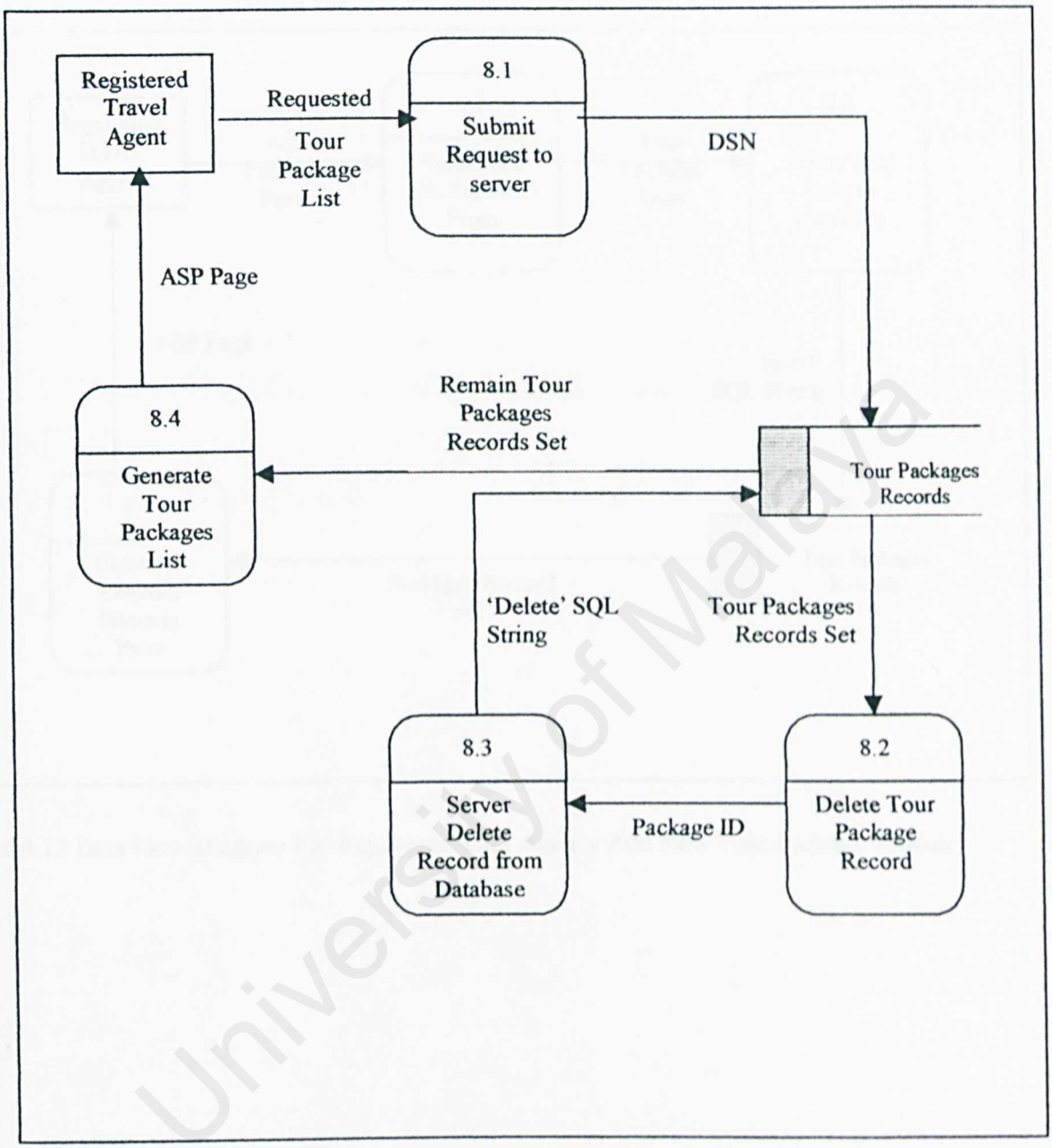


Figure 4.11 Data Flow Diagram For Registered Tour Agency Delete Tour Package Module

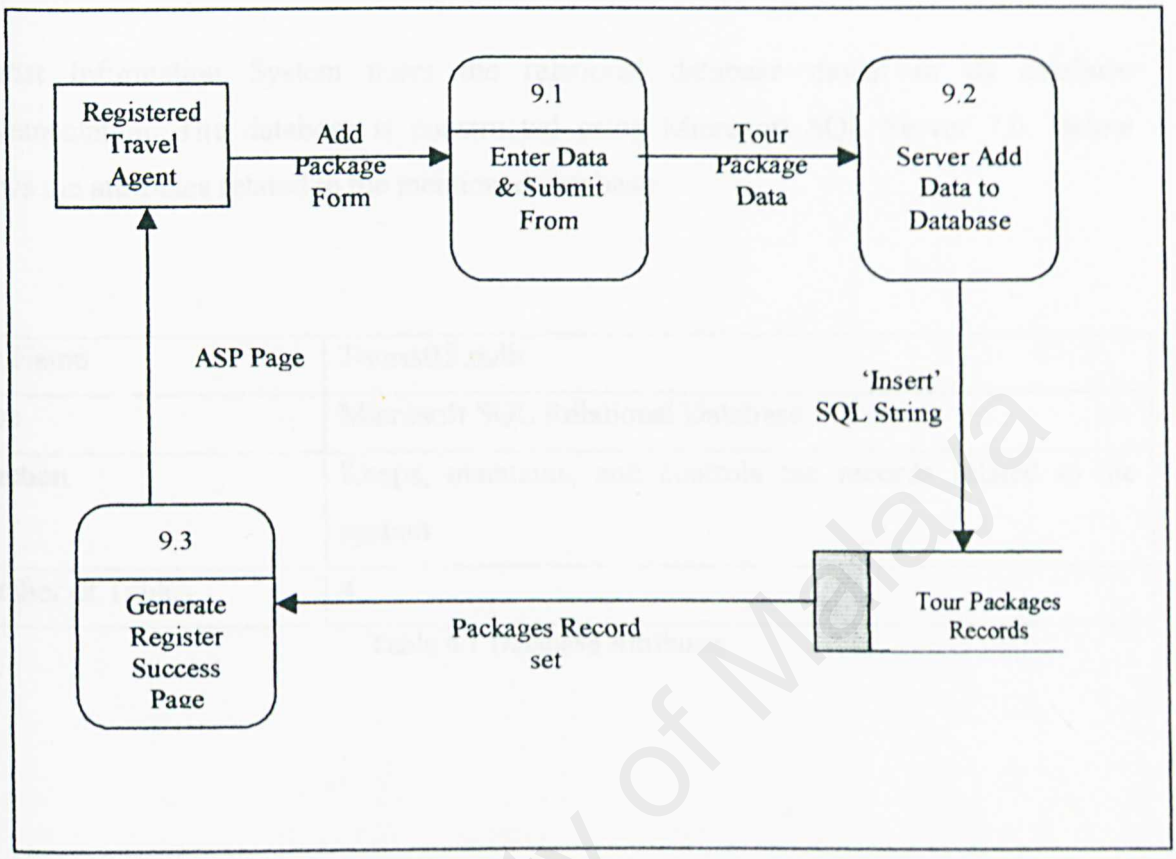


Figure 4.12 Data Flow Diagram For Registered Tour Agency Add New Tour Package Module

4.4 DATABASE DESIGN

Tourist Information System users the relational database model in its database implementation. The database is constructed using Microsoft SQL Server 7.0. Below shows the attributes related to the mentioned database:

File Name	TouristIS.mdb
Type	Microsoft SQL Relational Database
Function	Keeps, maintains, and controls the records related to the system
Number of Tables	4

Table 4.1 Database Attributes

1. Table Name: Travel_Agency

This table keeps the travel agency details.

Attribute	Data Type	Database Name	Descriptions
Primary key	Int(4)	Agency_id	Primary key
Username	Char(50)	Username	Unique login name
Password	Text(16)	Password	User login password
Company name	Text(16)	Com_name	Company name
Street	Text(16)	Street	Company street address
City	Text(16)	City	Company city address
Postcode	Text(16)	Postcode	Postcode
State	Text(16)	State	State
Telephone number	Text(16)	Tel_num	Company telephone number
Fax number	Text(16)	Fax_num	Company fax number

Email	Text(16)	Email	Company email address
Homepage	Text(16)	Homepage	Company homepage
Company number	Text(16)	Com_num	Company number

Table 4.2 Travel_Agency Table

2. Table name: Tour Package

This table keeps the information about the tour package that offered by travel agency.

Attribute	Data Type	Database Name	Descriptions
Package ID	Int(4)	Pack_id	Primary key
Username	Char(50)	User_name	Foreign key
Package name	Text(16)	Pack_name	Package name
Package Description	Text(16)	Pack_desc	Description about the package
Package Duration	Text(16)	Pack_duration	Package duration
Package price	Text(16)	Pack_price	Price of the package
Package category	Char(50)	Pack_category	Package category type
Package state	Char(50)	Pack_state	State to be travel
Package status	Int(4)	Pack_status	Active/Inactive the package

Table 4.3 Tour_Package Table

3. Table name: Currency

This table keeps the information about the currency rate.

Attribute	Data Type	Database Name	Descriptions
Currency ID	Int(4)	Currency_id	Primary key
Currency code	Char(10)	Currency_code	Code for the currency
Currency name	Text(16)	Currency_name	Currency name
Currency rate	Float(8)	Currency_rate	Rate of the currency

Table 4.4 Currency Table

4. Table name: Admin

This table keeps the information about the webmaster login name and password

Attribute	Data Type	Database Name	Descriptions
Admin name	Char(10)	Admin_name	Username for login
Password	Text(16)	Pass_word	Login password

Table 4.5 Admin Table

Among these tables, table *Currency* and table *Admin* are independent tables, which have no any relationship with other tables in the database; while there have relationship between *Travel_Agency* table and *Tour_Package* table.

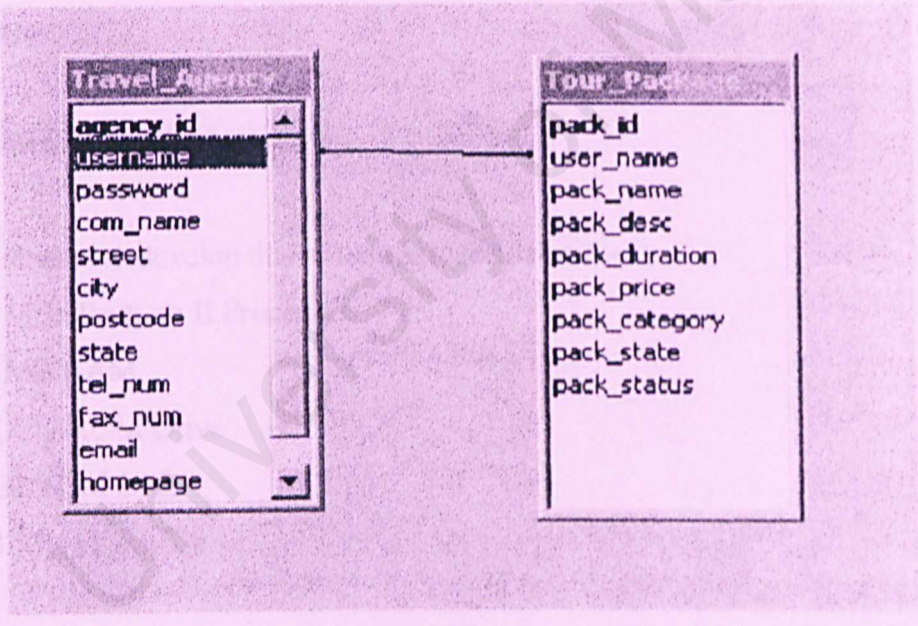


Figure 4.13 Database Relationship

CHAPTER 5
SYSTEM IMPLEMENTATION

System implementation is a process that converts the system requirements and designs into workable program codes. This phase at times involves some modifications to the previous design.

5.1 DEVELOPMENT ENVIRONMENT

Development environment has certain impact on the development of a system. Using the suitable hardware and software will help to speed up the system development timeframe. The hardware and software tools used to develop and document the entire system are shown as below.

5.1.1 Hardware Configurations

The hardware used to develop this system is listed as below.

- 350 MHz Pentium II Processor
- 192 MB RAM
- 48X CD-ROM Drive
- 20 GB Hard Disk
- 1.44 MB Floppy Drive

5.1.2 Software Configurations

The software specifications used in the development of this project are illustrated in table below.

Software	Usage Description
Microsoft Window 2000	Operation System
Microsoft SQL Server 7.0	Database server for storing and manipulating data
Microsoft Visual InterDev 6.0	For coding web pages
Internet Explorer 5.5	For viewing the web pages
Microsoft FrontPage 4	HTML and User interface editing
Macromedia Dreamweaver 4	HTML and User interface editing
Macromedia Fireworks 4	Graphics editor
ACD See 2.41	Viewing the graphics
Microsoft Word	Documentation tool

Table 5.1 Software Configurations

5.2 PROJECT DEVELOPMENT

The design must be translated into the form that can be understood by the machine. The development of the web based information system basically including 3 stages, which is data preparation, database connection, and coding for function.

5.2.1 Data Preparation

Since the tourism information system purpose is mainly providing information to users, thus web pages design could be an important factor that determines the successful of the project. Data such as text and graphics are prepared synchronize with the web page design.

The information about the tourism in Malaysia is taken from the Internet, magazine, booklet, and other resources. The information text is displayed with the related images. Information about the places suck as Pulau Redang will be inserted with some photos to increase the attractive of the web page. The images are edited using graphics editor such

as Adobe Photoshop 6.0 and Macromedia 4.0. Animated graphics are used with the specific intention of drawing attention to the items with which they are related to make the page more attractive.

5.2.2 Database Connection

It is an important step to do before the coding of web pages that involve process of data input by user that involve the database. Figure below show the ASP code that open connection with the database. This code is include in all the ASP file that need to make connection to the database in order to do any transactions with the database.

```
<%
'Open database connection
Set oCon = Server.CreateObject( "ADODB.Connection" )
oCon.Open "Provider=SQLOLEDB; Data Source=10.100.1.195;" & _
"Database=3182TIS; User ID=wek990027; Password=fsktm"
%>
```

Figure 5.1 The open database connection ASP code

5.2.3 Coding

Since this is a web based information system, the scripts are coded using Hypertext Markup Language (HTML), server side script and client side script that should support and enhance the web application.

i) HTML

HTML is mainly coded by using Macromedia Dreamweaver, a great HTML editor that provides many functions and user-friendly interface. Microsoft FrontPage also

has been used for this purpose. Data that has prepared such as text and graphics are inserted into the web page easily by using Dreamweaver.

ii) Active Server Pages (ASP)

ASP is coded using Microsoft Visual InterDev 6.0, in VB Script. The challenge of coding in ASP is of determining and separating the HTML source code from the scripting counterpart. ASP is mainly used for server side scripting. In this project, all the server side scripting is written for transaction that involves the database. The server side scripting used is as below:

- Request object
- Response object
- Session object
- ADO object

iii) Java Script

Since client side script is interpreted by user browser and does not sent to web server for processing, the efficiency of this system is improved and enhanced with the using of client side scripting. Client side script helps to reduce the network traffic problems since it reduce user requests that need to be sent to server and get response from the server.

CHAPTER 6
SYSTEM TESTING

6.1 INTRODUCTION

Testing is critical for newly developed systems, because a new system that is never distributed out is less or no user given a feedback to the system. Therefore system testing is a very important to establish the popularity in the market or user view. No matter how the programs are developed, it is obvious that from variety of errors, which are possible, the modules should be checked to ensure that they have functioned correctly.

System testing is performed to ensure that programs are executed correctly and conforms to the requirement specified that are performed to detect the existence of errors. It provides a method to correct logic error and for testing system reliability.

6.2 TESTING PROCESS

The writer has run out the system testing on the Tourism Information System. System testing is one of the market strategic to promote a reliable, user friendly and bug free system. The frequently failure occurred will reduced the users' confidence in using the system.

System testing also contains some aspects that are orientated on the word "system". This means that those tests should be done in the environment for which the programs was designed, like a multi-user network or whatever. Different form function testing system testing will focus on the whole application and its environment.

Component testing, integration testing and user testing is the sequence of testing activities. As defects are discovered at any stage, the writer has made some modifications to correct them and this may require other stages in the testing process to be repeated.

The process is therefore an interactive with information being feedback from later stages to earlier parts of the process.

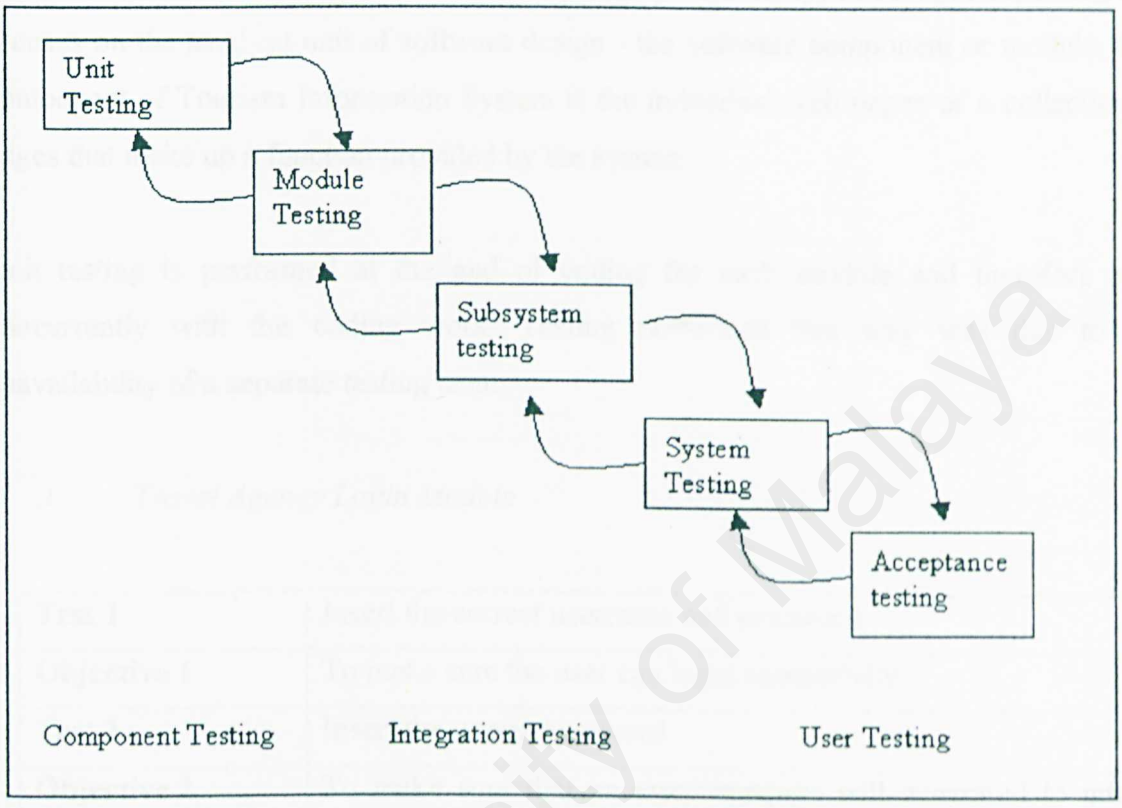


Figure 6.1 The most widely used testing process

In figure 5.2 the arrows form the top of the boxes indicate the normal sequence of testing. The arrows returning to the previous box indicate that previous testing stages may have to be repeated.

A test plan is developed to detect and identify potential problems before the software is distributed. A test plan also offers road map and testing strategy for testing activities.

6.3 TYPES OF TESTING

The testing strategy implemented during testing was unit, integration, validation, and system testing. For each of the strategy listed, a suitable testing technique is employed.

6.3.1 Unit Testing

Unit testing verifies that the code functions properly with the types of input expected, it is focuses on the smallest unit of software design - the software component or module. The component of Tourism Information System is the individual web pages or a collection of pages that make up a function provided by the system.

Unit testing is performed at the end of coding for each module and therefore runs concurrently with the coding work. Testing performed this way was due to the unavailability of a separate testing team.

i) Travel Agency Login Module

Test 1	Insert the correct username and password
Objective 1	To make sure the user can login successfully
Test 2	Insert the wrong password
Objective 2	To make sure that an error message will generated to inform user enter the correct password

Table 6.1 Test Plan for Travel Agency Login Module

ii) Travel Agency Registration Module

Test 1	Enter all the fields correctly
Objective 1	To make sure the user can register successfully
Test 2	Blank the require fields
Objective 2	To make sure an error massage generate to inform user enter the require fields
Test 3	Enter the different password for the *confirm password* field
Objective 3	To make sure both the password are compared and error massage will generated.

Test 4	Enter the same username with the existing username
Objective 4	To make sure the same username can not exist in the database and error message will generated

Table 6.2 Test Plan for Travel Agency Registration Module

iii) Webmaster Update Currency Rate Module

Test 1	Click on the *update currency* button
Objective 1	To make sure all the currency records can retrieve from the database correctly
Test 2	Edit the currency rate and click on *update* button
Objective 2	To make sure the new rate will update to database correctly

Table 6.3 Test Plan for Webmaster Update Currency Rate Module

iv) Travel Agency Editing Tour Package

Test 1	Click on the *Add New Package* button
Objective 1	To make sure the add package form can generate well
Test 2	Enter data and click *Add Package* button
Objective 2	To make sure the new record can add to database correctly
Test 3	Click on *Update Package* button
Objective 3	To make sure the correct package record is retrieved from the database
Test 4	Update the package and click on *update* button
Objective 4	To make sure the updated record is successfully update to database
Test 5	Click on *Delete Package* button
Objective 5	To make sure the correct package record is deleted from the database

Table 6.4 Test Plan for Travel Agency Editing Tour Package

The unit testing process also include the graphics to make sure the graphics can be retrieved and display correctly on the corresponding page. Before the testing is carried out, there are some graphics can not display correctly on the related page because the path name and file name are incorrect. These mistakes have been fix after the graphics testing have been taken.

6.3.2 Integration Testing

When the individual components are working correctly and meet the objectives, these components are combined into a working system. In other words, integration testing is the process of verifying that the system components work together as describe in the system and program design specification.

For this system, an incremental integration strategy approach is used. The Tourism Information System main system is constructed and tested in small segments, where errors are easier to isolate and correct, interfaces are more likely to be tested completely.

All the buttons and hyperlinks have been tested to make sure that the hyperlinks are correctly link to the corresponding page. The maintenance and testing of the hyperlinks become more difficult and complex because the integrated system has a lot of hyperlink, which allow user to link to other pages easily.

The integrated functional also have been tested to make sure these functional can run correctly as specified at analysis and design phases. For example, the sequence of processes likes travel agency start from register, login, add package, update package, delete package, and logout have been tested to make sure the integrated functional can run correctly.

6.3.3 System Testing

The last testing procedure one is system testing. Testing the system is very different from unit and integration testing. The objective of unit and integration testing is to ensure that the code implemented the design properly. In other words, the code is written to do what the design specifications intended. In system testing, a very different objective is to be achieved, to ensure that the system does what the users want it to do.

The Tourism Information System is tested whether it meets specific performance efficiency objectives in Performance testing. Data Integrity Testing is used to verify that the data is stored in a manner where it is not compromised under updating, restoration or retrieval processing in the system.

CHAPTER 7
SYSTEM EVALUATION

7.1 INTRODUCTION

After finish the project implementation, a report of evaluation of this project will discuss in this chapter. It will cover the system strengths and limitations. A few suggestions will made as enhance of the system in the future.

7.2 SYSTEM STRENGTH

Below are the strengths of the tourism information system which had achieved the objective:

7.2.1 Secured Area Login

A secured application area login equates to secure confidential information viewing and manipulation by registered users of the system. Tourism information system is a password-protected site. By giving authorize user a user ID and password, unauthorized user are prohibited from accessing its records stored in the database. This is to make sure the system is secure.

7.2.2 Simple and User-Friendly Interface

The user interface of the Tourism Information System is designed to be intuitive and attractive. User Interface for the system is easy to understand and user-friendly. In addition, the web pages are designed to suit a wide spectrum of user. The learning curve

is foreseen to be short and a user should be able to use the system with ease within minutes. User manual can help the users to handle this system.

7.2.3 Able to Provide Database Maintenance

Webmaster of the web pages is able to do housekeeping for database maintenance. Webmaster can manage the data stored in side the database. Besides, the registered travel agency can add, delete, and update the tour package records stored in the database.

7.2.4 Reliable System with Effective Error Recovery

This system provides effective error recovery, as users would still be able to navigate other parts of the system in case of failure in one part of the system. The system caters for almost any possible errors encountered. Server side scripting will generate appropriate feedback to user when error occurs. For example, a password validation failure of a user login ID failure is handled by the system and an error message is generated informing the user about the type of error.

7.2.5 Information Based

The Tourism Information System is very much centered on the information provided. It is important to well structure and categorize the information in order the users are easy to get the information. For example, the great detail description about the interest places is categorized according to the states in Malaysia, where it is located. User can look for particular place by explore the *state* category from the web pages. Beside, These places are also categorized according to different category such as Beach and Island category. User can get the same description about the interest places according to their preferences and interests.

7.3 SYSTEM LIMITATION

Due to project boundaries, there are still several limitations in the Tourism Information System that are not resolved yet. The limitations are stated as below:

7.3.1 No Search Engine

This system does not provide online search engine. If the information in web pages becomes plenty, users may get more difficult to look for the information they needed. Thus, it is necessary to let users get the information faster, directly and efficiently.

7.3.2 Limited Functionality

This system provides only a few functions to users. Functions such as online chat room, hotel checking and reservation, feedback and others do not exist in this system. Although above mentioned functions are out of the project scope, it is an advantage to enhance the system in the future.

7.3.3 Limited Information

As mentioned before, this system is an information web based system. Due to time constraint, there are still several interest places in Malaysia have not included in the system. Other information such as weather, sport and games in Malaysia also not included in the system.

7.4 FUTURE ENHANCEMENT

Because of the limitation in development time and lack of experience in developing a system, most advanced features cannot implement in this project. Therefore, some suggestion for the enhancement is discuss below:

7.4.1 Provide Search Engine

A dynamic search engine should be provided for users. This is to prevent time consumed in searching information on a huge information sea. The requirement of the Internet usage nowadays and in the future is efficiency. Thus, providing powerful search engine in a web site is very important.

7.4.2 Provide More Information

Since the information provided in this system in limited, it is recommended that more information such as other interest places in Malaysia, transportation information, games and sport and other are added to the system.

7.4.3 Enhance User Interface

User interface should enhance from time to time. Multimedia elements such as streaming video, graphics especially animated graphics and flash movies should be added to increase the attractiveness, impressive, and interactive of the system.

7.4.4 More Functionality Added

Online chat room, hotel room checking and reservation, feedback and other should be added to provide more interactivity of the system. A web site that has more functionality provides more flexibility and interactivity to users.

7.4.5 Provide Information In Other Language

The web page is designed especially for the worldwide Internet users. Thus, different language should be added so that users can browse for the information using their preferred language.

7.5 PROBLEMS ENCOUNTED AND SOLUTIONS

There are several number of problems encounted during developed the system as shown below:

7.5.1 Inconvenience Functional Requirement

Problem:

For the earlier purposed project, there is functional requirement for the tourist/normal user login module. Later on, the writer find out that this module is not really necessary and inconvenience. The purposed system is a public information web based system, it is inconvenience to require user to login in order to search the information.

Solution:

Therefore, this functional requirement has been discarded from the Tourism Information System.

7.5.2 Additional Functional Requirements

Problem:

The purposed Tourism Information System has a functional module called *currency converter*. The currency rate of the system must be updated frequently so the users can get a more accurate and latest currency rate. But the earlier purposed system has no

functional module to allow webmaster or administrator to login into the system to update the currency rate.

Solution:

Therefore, webmaster login module and webmaster update currency rate module have been added to the system in order the webmaster can login into the web site and update the currency rate frequently.

7.5.3 Lack of Knowledge In Programming Language and Tools

Problem:

Due to the time constraint, learning and developing process were done concurrently. Without a strong knowledge based of the ASP language, a lot of time has been spent in looking for solutions to solve the problem that were occurred during the development of the system.

Without experience with the Dreamweaver and Fireworks, authoring software that has much difference with the software ever used, a lot of time has been taken to learn it from scratch.

Solution:

These problems were tried to be solved through the tutorial note from the software and finding solution by discuss with friends.

7.5.4 Difficulty In Designing User Interface

Problem:

Without much experience in such development, developing an attractive, suitable, standard, and user-friendly user interface became a difficult task. The management of controls and graphics on the web pages eaten up a lot of time to meet the final standard

user interface. A number of different user interfaces have been design during the development process.

Solution:

To gain more information on the layout of Graphic User Interface (GUI), other related web sites are taken as reference for developing a proper and attractive user interface. Macromedia Dreamweaver and Fireworks were used to generate attractive user interface.

7.6 KNOWLEDGE AND EXPERIENCE GAINED

A wealth of knowledge and experience was obtained in the course of the development of the Tourism Information System. It was very much a learning and application of knowledge learned throughout the development effort.

To develop a project, time management is very important. A development phrase and milestone must define very clear. Some knowledge of programming also can be learned form this project, like ASP, VB Script, design pattern and unit testing.

The experience has also exposed the writer to one of the most popular application deployment platform in the world today, the World Wide Web. The writer gained experience in setting up a web server, a database server, as well as a host of web programming languages.

CONCLUSION

In conclusion, this system has fulfilled its objectives and requirements. The aim of this project is to develop information system for providing information on tourism in Malaysia.

This project is very important and beneficial. A lot of knowledge, skills, and experience were gained throughout the development of the system, these includes knowledge in setting up SQL Server 7.0, Internet technologies, concept in coding such as VB Script, Active Server Pages (ASP), and Hypertext Markup Language (HTML).

One of the major knowledge gained throughout this project is the chance to exercise a full software development life cycle in software development and the application of sound software engineering methods and techniques in realizing the quality of the software. Proper documentation of various software engineering activities has also been practiced in the reporting of the thesis. Besides, I have also learned a lot about how to find out the solutions whenever I encountered problems about developing an application.

Finally, all the problems faced and experience gained during the system development would be useful in my future career.

APPENDICES

Appendix A: Part of VB Script Coding for Retrieve Tour Package Records

```
<!-- #INCLUDE FILE="adovbs.inc" -->
<!-- #INCLUDE FILE="OpenConnection.asp" -->

<%
search = TRIM (Request("search"))
PackCat = TRIM (Request("PackCat"))
PackState = TRIM (Request("PackState"))

' Get the Current Page
pg = TRIM( Request( "pg" ) )
IF pg = "" THEN pg = 1

Set oRS = Server.CreateObject("ADODB.Recordset")
oRS.ActiveConnection = oCon
oRS.CursorType = adOpenStatic
oRS.PageSize = 5

IF search = "1" THEN
sqlString = "SELECT  T1.*, "&_
   "T2.com_name AS ComName, "&_
   "T2.tel_num AS TelNum, "&_
   "T2.fax_num AS FaxNum, "&_
   "T2.email AS Email, "&_
   "T2.homepage AS HomePage "&_
   "FROM Tour_Package AS T1 "&_
   "INNER JOIN Travel_Agency AS T2 "&_
   "ON T1.user_name = T2.username "&_
   "WHERE T1.pack_category ='"& PackCat &"' OR "&_
   "T1.pack_state ='"& PackState &"' AND "&_
   "T1.pack_status = 1 "&_
   "ORDER BY T1.pack_category ASC, T1.pack_state ASC"

oRS.Open sqlString

ELSE

sqlString = "SELECT  T1.*, "&_
   "T2.com_name AS ComName, "&_
   "T2.tel_num AS TelNum, "&_
   "T2.fax_num AS FaxNum, "&_
   "T2.email AS Email, "&_
   "T2.homepage AS HomePage "&_
   "FROM Tour_Package AS T1 "&_
   "INNER JOIN Travel_Agency AS T2 "&_
   "ON T1.user_name = T2.username "&_
   "WHERE T1.pack_status = 1 "&_
   "ORDER BY T1.pack_category ASC, T1.pack_state ASC"

oRS.Open sqlString
oRS.AbsolutePage = pg
```

```
END IF
%>
.
.
.
.
<%
WHILE NOT oRS.EOF AND rowCount < oRS.PageSize
rowCount = rowCount + 1

PackName       = TRIM( oRS( "pack_name" ) )
PackDuration   = TRIM( oRS( "pack_duration" ) )
PackPrice      = TRIM( oRS( "pack_price" ) )
PackDesc       = TRIM( oRS( "pack_desc" ) )
PackCat        = TRIM( oRS( "pack_category" ) )
ComName        = TRIM( oRS( "ComName" ) )
TelNum         = TRIM( oRS( "TelNum" ) )
FaxNum         = TRIM( oRS( "FaxNum" ) )
Email          = TRIM( oRS( "Email" ) )
HomePage       = TRIM( oRS( "HomePage" ) )

%>
  <tr>
    <td><br> <font face="Arial, Helvetica, sans-serif" size="3">
      <b><%=PackName%></b></font>
      <br><%=PackDuration%>     <%=PackPrice%><br>
      <font face="Arial, Helvetica, sans-serif"><%=PackDesc%></font><br>
      <font face="Arial, Helvetica, sans-serif" size="3"><font
      size="2">Package Category is <%=PackCat%></font></font><br>
      <font face="Arial, Helvetica, sans-erif"></font><b><%=ComName%></b><br>
      <font face="Arial, Helvetica, sans-serif" size="2">Tel</font><font
      size="2">:</font>
      <%=TelNum%>  <font size="2"> 
      <font face="Arial, Helvetica, sans-serif">Fax:</font></font>
      <%=FaxNum%><br>
      <font face="Arial, Helvetica, sans-serif" size="2">e-mail:</font>
      <%=Email%>  <font size="2">
      <font face="Arial, Helvetica, sans-serif">Home Page:</font></font>
      <%=HomePage%><br><br> </td>
  </tr>
<%
oRS.MoveNext
WEND

IF oRS.PageCount > 1 THEN
%>
</table>
<font color="yellow"> <br>
<b>Go to page: </b>

<%
   For i=1 To oRS.PageCount
   IF i <> cINT( pg ) THEN
%>
```

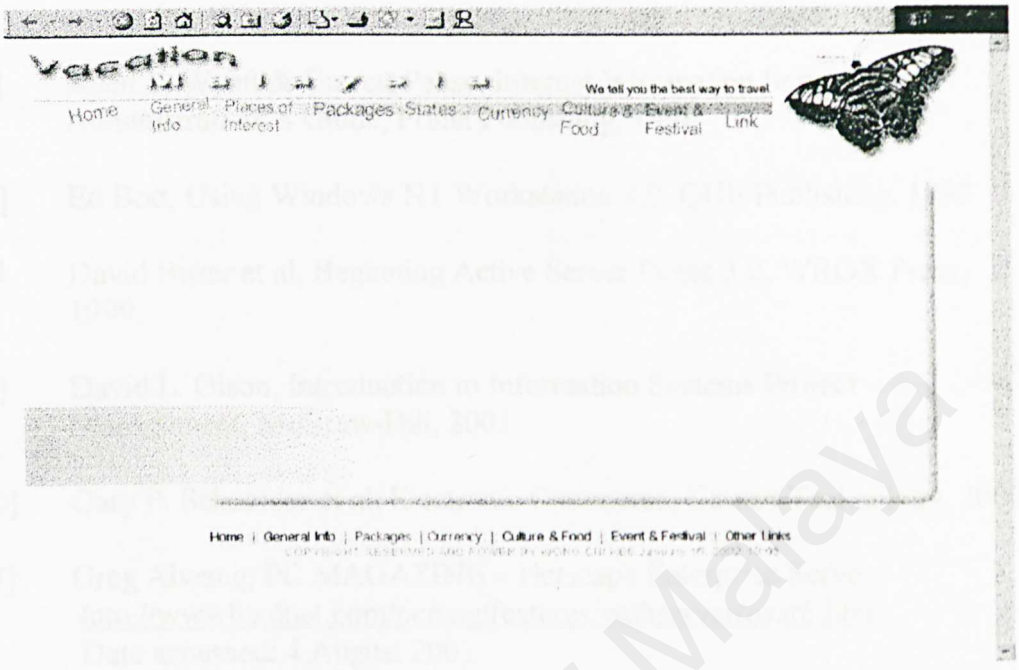
```
<a href="TourPack.asp?pg=<%=i%>"> <%=i%></a> 
<% ELSE %>
<b><%=i%></b> 
<% END IF %>
<%
   NEXT
%>

</font>

<%
END IF
oRS.Close
%>
.
.
.
```

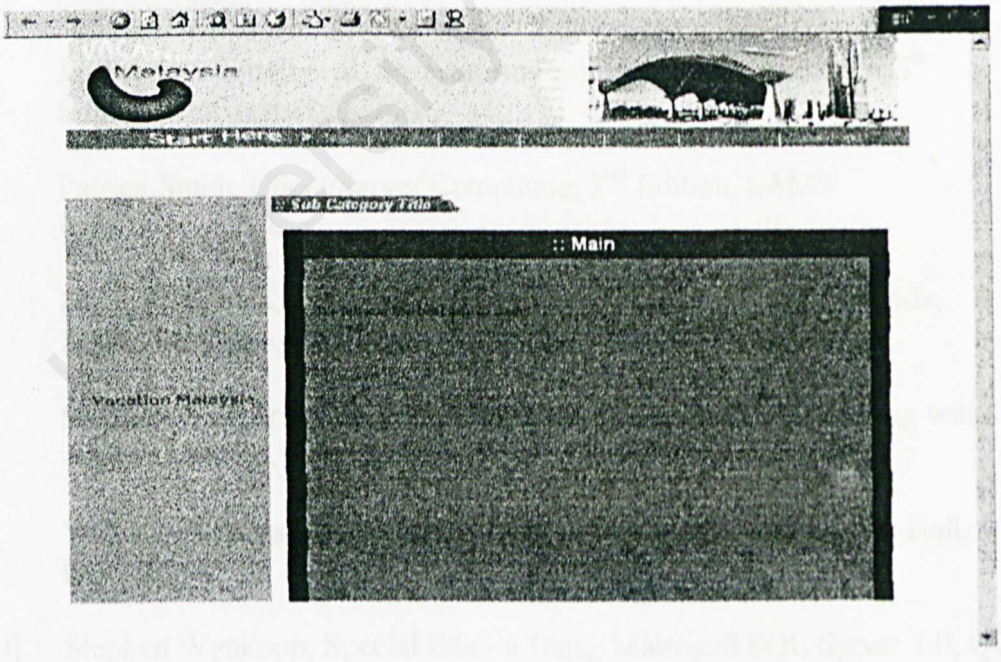
Appendix B: Part of VB Script Coding for Update Package and Add New Package

```
<!-- #INCLUDE FILE="OpenConnection.asp" -->
<%
username = Session("user")

FUNCTION fixQuotes( theString )
  fixQuotes = REPLACE( theString, "'", "''" )
END FUNCTION

' Get the Form Variables
'username          = TRIM( Request( "username" ) )
addPackage      = TRIM( Request( "addPackage" ) )
updatePackage   = TRIM( Request( "updatePackage" ) )
packID          = TRIM( Request( "packID" ) )

packName        = TRIM( Request( "packName" ) )
packDuration    = TRIM( Request( "packDuration" ) )
packPrice       = TRIM( Request( "packPrice" ) )
packDesc        = TRIM( Request( "packDesc" ) )
packCategory    = TRIM( Request( "packCategory" ) )
packState       = TRIM( Request( "packState" ) )
packStatus      = TRIM( Request( "packStatus" ) )



' Add New Product
IF addPackage <> "" THEN

sqlString = "INSERT INTO Tour_Package " &_
  "(user_name, pack_name, pack_duration, pack_price, pack_desc, " &_
  "pack_category, pack_state, pack_status )" &_
  "VALUES ( " &_
  " '" & username & "', " &_
  " '" & packName & "', " &_
  " '" & packDuration & "', " &_
  " '" & packPrice & "', " &_
  " '" & packDesc & "', " &_
  " '" & packCategory & "', " &_
  " '" & packState & "', "&_
  " '" & packStatus & "'  )"

oCon.Execute sqlString


Response.Redirect "AgencyPackage.asp"

END IF
```

```
' Update Package
IF updatePackage <> "" THEN

sqlString = "UPDATE Tour_Package SET " &_
  "pack_name='" & fixQuotes( packName ) & "'," &_
  "pack_duration='" & fixQuotes( packDuration ) & "'," &_
  "pack_price='" & fixQuotes( packPrice ) & "'," &_
  "pack_desc='" & fixQuotes( packDesc ) & "'," &_
  "pack_category='" & fixQuotes( packCategory ) & "'," &_
  "pack_state='" & fixQuotes( packState ) & "'," &_
  "pack_status=" & packStatus & " WHERE " &_
  "pack_id=" & packID

oCon.Execute sqlString

'Session("SuccessUpdate") = packName & " was success updated."
Response.Redirect "AgencyPackage.asp"
END IF

%>
```

Appendix C: Some of the User Interface that have been designed





REFERENCES

[ALLE98] Allen L. Wyatt & Garrett Pease, Internet Information Server 4.0 Administration' s Guide, Prima Publishing, 1998.

[BOTT95] Ed Bott, Using Windows NT Workstation 4.0, QUE Publishing, 1995

[DAVI99] David Buser et al, Beginning Active Server Pages 3.0, WROX Press, 1999.

[DAVI01] David L. Olson, Introduction to Information Systems Project Management, McGraw-Hill, 2001

[GARY00] Gary P. Schneider et al, Electronic Commerce, Course Technology, 2000

[GREG97] Greg Alwang, PC MAGAZINE – Netscape Enterprise Server, http://www8.zdnet.com/pcmag/features/webserver/iwsr6.htm, Date accessed: 4 August 2001

[HEAT97] Heath H. Herel, PC MAGEZINE – Apache, http://www8.zdnet.com/pcmag/features/webserver/iwsr1.htm, Date accessed: 4 August 2001

[JEFF01] Jeffrey L. Whitten et al, Systems Analysis and Design Methods, 5th Edition, McGraw-Hill, 2001

[PATR94] Patrick Smith, Client/Server Computing, 2nd Edition, SAMS Publishing, 1994.

[SELL00] Dr. P. Sellappan, Software Engineering: Management and Methods, Sejana Publishing, 2000.

[STEP00] Stephen Walther et al, Teach Yourself e-Commerce Programming with ASP in 21 Days, SAMS, 2000

[WILL98] William Stallings et al, Business Data Communications, Prentice Hall, Inc., 1998

[WYNK99] Stephen Wynkoop, Special Edition Using Microsoft SQL Server 7.0, QUE Publishing, 1999

USER MANUAL

1.1 NORMAL USER

The information is structured and categorized into different main categories and sub-categories. User can search for information in the system according to these categories.

Figure above is the main page for the Tourist Information System.

The contents of each different category are listed below:

- *Home* → Main home page
- Places of Interest → Places are categorized into different categories:
  - Beach and Island
  - Natural and Recreational
  - Cave and Hills
  - Fun and Entertainment
  - Museum and Culture Center
  - Mosque and Temple
  - Highland and Mountain
  - Historical Place
- States → 13 states in Malaysia and Kuala Lumpur
- General Information → Introduction about Malaysia
- Tour Package → List all the tour packages provided by travel agency
- Culture and Food → categorized with different races
  - Malay
  - Chinese
  - India
  - Orang Asli
- Events and Festival → events and festival in 12 months
- Currency → Perform currency conversion
- Other → Hotel and Malaysia airline link

1.2 Travel Agency Section

1.2.1 Travel Agency Registration and Login

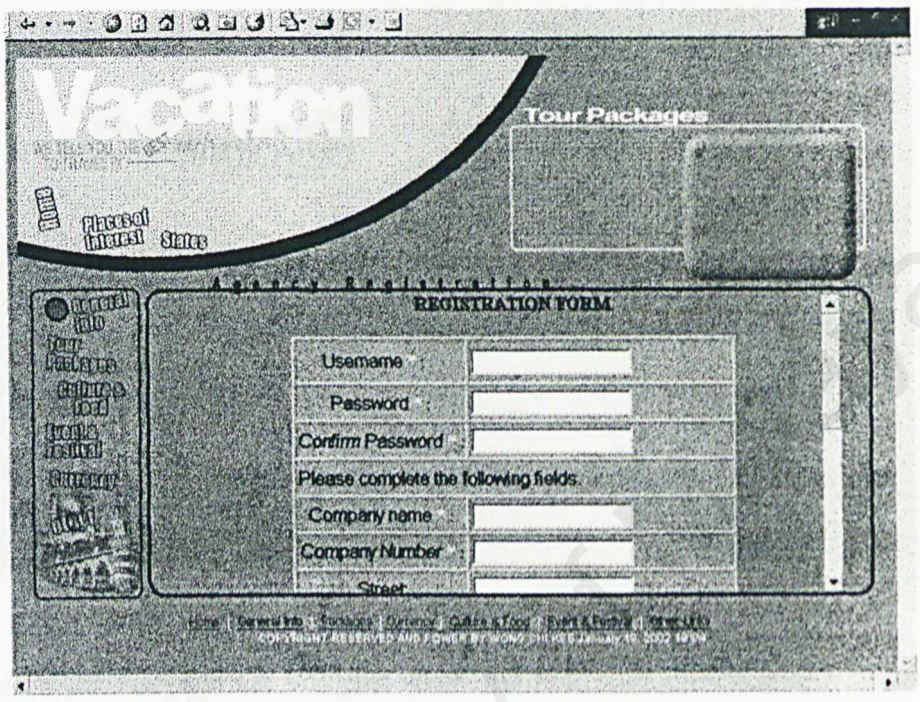
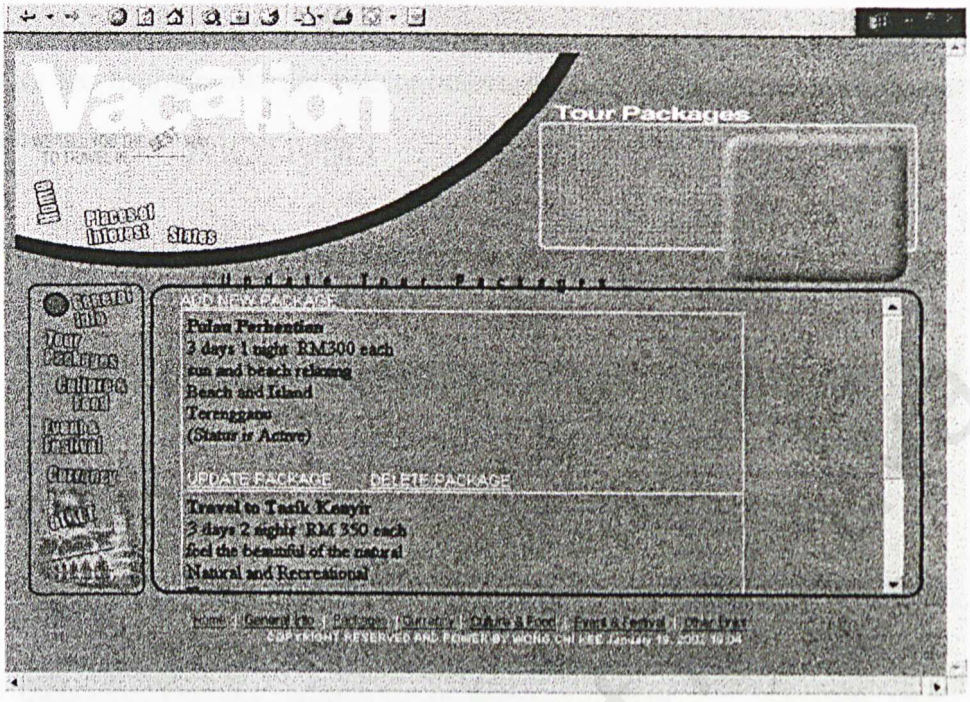


Figure above is the travel agency registration form. There are five require fields:

- Username
- Password
- Confirm password
- Company name
- Company number

1.2.2 Travel Agency Add, Update, and Delete Packages



The Update Tour Package list will just show the tour packages that relevant to the login agency. Travel agency can add new package to the tour packages list, or delete the particular package record from the list. Travel agency also allows to update the tour package information.

In the add package form and update package form, there is a field called *Package Status*. There two selections for this field, there are:

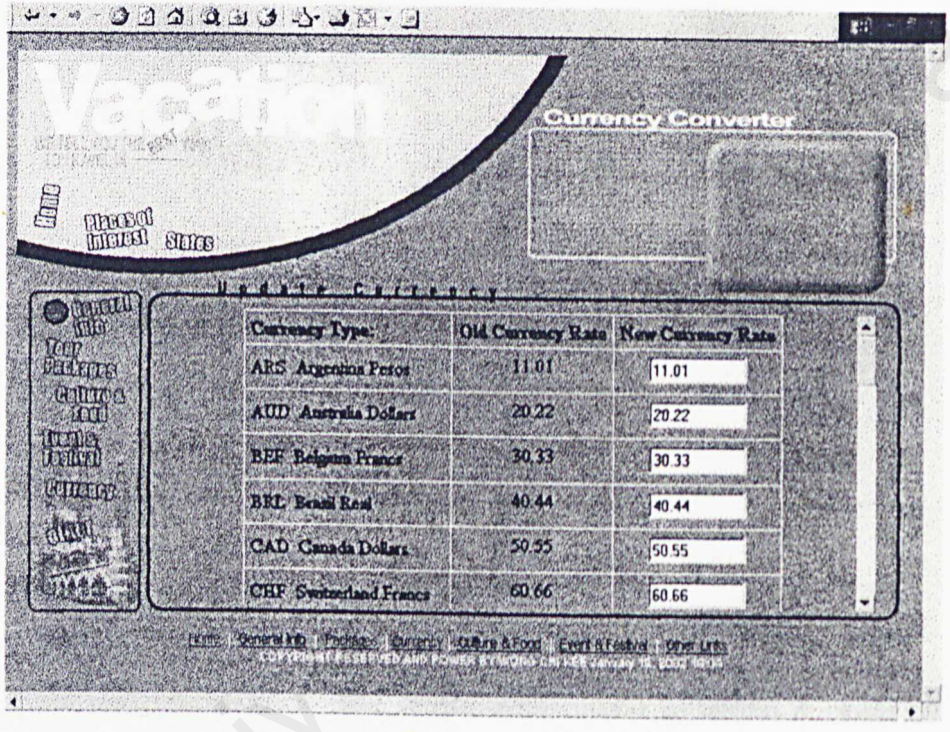
- Active → This package will show at the *Tour Package* list to view by all users.
- Inactive → This package will not show at the *Tour Package* list, but the correspondent login travel agency still can view this record.

1.3 WEBMASTER SECTION

1.3.1 Webmaster Login

Webmaster has to login into the system before the webmaster can do any transaction with the currency rate.

1.3.2 Webmaster Update Currency Rate



Webmaster enters the new currency rate in the text field according to the particular currency type. After all the new rates have been entered, webmaster click on the *update* button and the records will store into the database. Webmaster has to logout after all the transactions have done.

3.3.1 Functional Requirements

A functional requirement is a function or feature that must be included in an information system to satisfy the business need and be acceptable to the users [JEFF01]. It describes an interaction between the system and its environment. For the Tourist Information System, the functional requirements have divided to several small modules as shown below:

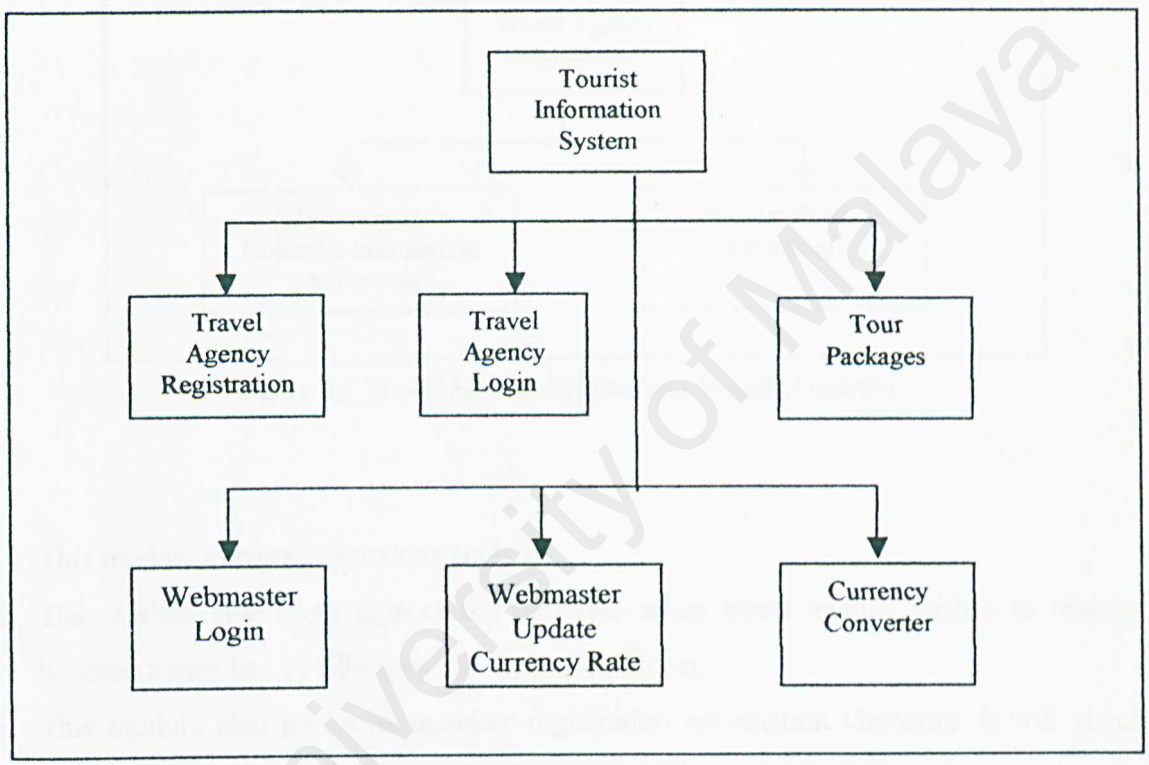


Figure 3.2 Modules of Functional Requirements

As I have mentioned before, the target users are tourist (local and foreign tourist) and travel agency. Therefore, the system has two logins module, which one is for tourist and another is for travel agency. There are several functional requirements in this tourist information system as shown below: