



UNIVERSITY OF MALAYA

ONLINE RESERVATION SYSTEM

BY

CHEE KIM SHIH
WEK990078

UNDER SUPERVISION OF
PM RAJA NOOR AINON

MODERATOR
PM DR. LEE SAI PECK

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ABSTRACT

Online Reservation System (ORS) is a system that use by travel agency to meet the need for the tourists. This system main function is provided reservation in ticket for transportation, such as bus, cruise, flight and hotel. Besides, this system also promotes the places of interest in Malaysia to tourists. This system will be separate into 2 module, which I will do the reservation in ticket for transportation and my partner will complete the module of hotel reservation.

ORS allows two types of user login, the normal user (tourists) and administrator. Tourists will login as a normal user and they can make reservation for ticket and hotel. The administrator will login to manage the database and update the latest data. At the end of project, ORS will expect to have a security checking for authorized user, develop database to keep all the records, create database maintenance, feedback maintenance and creation of interactive homepages to deploy the reservation to tourists.

ORS is developed using prototyping software developing model. It will be built by using Active Server Pages technologies and run on Windows 2000 Server function as Network Operating System. The Internet Information Services (IIS) 5.0 will also be using and will function as Web Server Service. For the database, the Microsoft SQL Server 7.0 will be using to create and store the relevant data.

At last, I believe that this ORS will become an essential to everyone in the future and can provide lot of benefit especially to the tourists.

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CHAPTER 1: INTRODUCTION

1.1 Project Definition

Traveling actually mean for going from one places to another places or making a journey along or through a country, while reservation is an arrangement to secure accommodations at a restaurant or hotel, on a boat or plane, etc.

Due to the fast development of Internet, the Internet has becoming a major influence in tourism industry. Traveling agencies can feel the impact and the important of the Internet technology in order to promote the tourism industry has started to change their manually reservation to online web-based reservation system.

So this online reservation system for travel agency will be built to enable worldwide enthusiasts travelers to access the information provided and make online reservation of accommodation and transportation. This proposed project will a project to create an interactive and attractive web for online reservation. Besides, this project will also to promote the Malaysia tourism industry.

1.2 Project Overview

The **Online Reservation System (ORS)** is an online Internet based application that provides reservation services in ticket and accommodation to tourists. It also provides the useful and detail information about places of interest in Malaysia. It is a user-friendly system that provided by travel agency to the tourists, and let them gather information about various hot spots in Malaysia.

1.2.1 Tourist's View

In this system, it allows two-type of system login, the administrator and the normal user (tourist). The tourists can view the entire web page, through a simple information board that introduce some of the hot spot in Malaysia and also view the reservation services provided for certain places. If they satisfy with the service provided, they can login as a member and get the more information about the tourism hotspot in Malaysia. If the user is not a number, that user has to sign up first before can become a

member. After they login as a member, they can enjoy the discount in booking ticket or accommodation.

1.2.2 Administrator's View

The administrator can login as travel agent and they can get the full information about the reservation and made modification to the price especially for the discount. Usually the user will be invite to become a member so they can enjoy the benefit when they want to purchase ticket for transportation and hotel reservation. Because of this, the administrator has an important task to update the database currently. This includes update the prices for transportation travel, accommodation or provide discounts. The administrators have the ability to check the current reservation and let the user know the result of reservation for ticket or accommodation, by sending e-mail to them. The administrator also has the responsibility to send the feedback to users. This can enhance the relationship between the user and the administrators.

Besides, an information board has provided by travel agency. The tourists can get the information by refer to a map that provided by the travel agency. For their convenience, the travel agency provides various ways for tourists to travel, such by car, cruises or flight. The tourist can also easy get the information for accommodation after they make decision for a visit. A user can give their suggestion to the travel agency by sending feedback through e-mail. This can improve the services provided by travel agency. The system also provided a result section for user after they login as a member. So they can check for their reservation result, that has been send by administrator and also the feedback by the administrator.

1.3 Objectives of ORS System

Keeping in mind that this reservation system provides an easy way to facilitate variations in making decision on reservation for accommodation and transportation. The system is aimed at the following:

- Developing interactive and secure web pages as the interface for transportation and hotel reservation besides providing useful information for a tourism hotspot.
- Providing timely and useful tip to aid traveler decisions.
- Avoidance of shortage problem for transportation and hotel room and to ensure that traveler maintains an enjoyable trip.
- Cost and time optimizing for traveler, as this system will also provide information about tourism hotspot besides facilitate ticket reservation and hotel accommodation.
- Enable traveler to gain useful information on various tourism hotspot in Malaysia besides making ticket and hotel accommodation reservation.
- To upgrade the conventional method of ticket reservation and hotel accommodation.
- To reduce processing error due to lower of human intervention.
- To develop a modular-oriented system that allows any automated processes or activities to be added or deleted easily
- To create an integrated system to manage ticket reservation and hotel accommodation.
- To increase the number of visitor, due to increase the flow of foreign currencies into our country.
- Expand reservation functionality to the Internet and provide reservation management capability.

1.4 Project Scope

The scope of this project is like below:

- The travel just limited in Malaysia, not outside the country.
- The tourist destination are like Langkawi Island, Tioman Island, Penang Island, Malacca, Kuala Lumpur, Genting Highland, Taman Negara, Gunung Kinabalu and others.
- To Implements a password-protected website.
- This program also facilitates ticket and hotel accommodation reservation around Malaysia.
- Provide mailing system that will be send to the traveler through e-mail to confirm for the reservation.
- Special promotion offer to members such as discount during some promotion session.

1.5 Research Plans

There will be some research planed to use during this project:

- i. Research will be carrying out for the current online ticket and hotel reservation in Travel Agency Company and hotel. This is tent to provide a better understanding for the system that will design.
- ii. Gather the extra information form the website. This is due to create an attractive and relevant web page.
- iii. Gather the information form reading journals and books related.
- iv. Writing the research proposal for the outline of the project.
- v. A good understanding for the client/server architecture is important. This also important for the deep survey for the available web base software and the tools.
- vi. After identify the requirement and overall objective for the system, a quick system design that consists of the features of the system will be develop.

1.6 Strength and Limitation of the Project

The strength for the project are list as below:

1) **Reservation through Internet**

User will be able to make reservation from anywhere via Internet as long as they have Internet access. They do not have to present personally to the travel agency office to make reservation by filling the reservation form manually.

2) **Security Control**

ORS provides more security features. It's only allowed the users who are given the necessary access authority to login the system. Unauthorized users are prohibited from accessing its records stored in the database. The authorize user are given UserID and Password to enter the system.

3) **Improve Service**

ORS offers a much simpler, easier, integrated and more attractive way for user to make reservation for accommodation and transportation. Besides, it is also much more easy for administrator (usually a travel agent) to respond to user request and reply feedback besides confirming a user reservation.

4) **Promoting Malaysia**

This system on the web is one of the best telecommunication media to promote Malaysia tourism industry and will definitely give a boost to the Malaysia Tourism Industry.

5) **User Friendly and Convenient**

This reservation on the web is user friendly and caters for all age users. Besides it is also convenient and easily accessible by anyone around the world.

The limitation for the project are list as below:

- 1) The main limitation for this project is depending on the availability of Internet services. Without the Internet services, nobody can make the online reservation.
- 2) The reservation result on the web maybe unreliable if the administrator does not update the latest information currently.

1.7 Project Expectation

In any project, certain expectations of the outcome will be define before the work started. Some of the factors must be consider for making these expectations. One of the most important factors for the outcome is time available to complete the whole project and also the technique, methodology and resource available. Below is some of the expectation of the project:

- i) System can perform some basic function and meet some criteria such as stable, consistency, user friendly and also reliability.
- ii) The systems will be able to fulfill the requirement of a travel agency and can perform the required functions such add, update, delete reservation efficiently and effectively.
- iii) The proposed system is quite a complete solution. However, it needs to enhance so that more functionality can be added.
- iv) The final implementation should allow for future enhancement as well as additional module to add functionality to the reservation system as business environment change rapidly.

1.8 Project Schedule

Key activity	JUN 01	JULY 01	AUG 01	SEPT 01	OCT 01	NOV 01	DEC 01	JAN 02	FEB 02
<i>Semester I</i>									
Introduction	<div></div>								
Literature Review	<div></div>								
System Analysis		<div></div>							
System Design		<div></div>							
<i>Semester II</i>									
System Coding				<div></div>					
System Testing					<div></div>				
System Documentation						<div></div>			

Table 1.1: Online Reservation System (ORS) Project Schedule

1.9 Report Overview

Mostly, the purpose of this report is to gathering the essential document information during this system development and implementation stage. The main idea of this report is divided into six respective chapters.

Chapter 1: Introduction

This chapter gives an overview of the project, scope, objective, problems facing, project schedule and requirements for the project.

Chapter 2: Literature Review

For this chapter, it discusses the researches that are carried out during the analysis and design phase at this project. This includes studies on the client-server architecture, online reservation and registration and comparisons between various scripting languages, the VBScript and the JavaScript.

Chapter 3: System Analysis

This chapter discusses the functional and non-functional requirement of the system based on the requirement analysis. It also makes details comparisons of the various software and web technologies. The software and hardware required also that required to run this system will be analysis.

Chapter 4: System Design

This chapter discusses the various aspects of user interface design, data flow diagram, database design, consistency and redundancy issues etc. It also shows some sample of the interface design and the required for registration database structure. It explains how the requirements for this project were required and the results of analysis.

Chapter 5: System Development and Implementation

This chapter discusses the various techniques to develop the system, and also the implementations for the different module to ensure the system can function properly.

Chapter 6: System Testing

This chapter discusses the various forms of testing needed to ensure that the software developed is of high quality.

Chapter 7: System Evaluation and Conclusion

The problem encountered during the development of the system is given. An evaluation of the system in term of strength and limitations are also given together with suggestions for future enhancements for the system. This chapter ends with conclusion of the project.

User manual

User manual provide the guidelines for the use of the system

CHAPTER 2: LITERATURE REVIEW

The Online Reservation System (ORS) was chosen after a lot of survey and gathering the various information and resources from the literature review before making a decision as a conclusion for this topic. The purpose of this research is to get a better understanding about the topic and gain knowledge for the development tool and methodology that used for develop the project. In the process of research, various new concepts have been gained focusing on the reservation system in ticket booking system. The research also included the comparison for several different homepages and the new and relevant feature will be added into the program later.

2.1 The Concept of Tourism

Tourism can be define as “the sum of the phenomena and relationships arising from the interactive of tourists, business suppliers, host governments, and host communities in the process of attracting and hosting these tourists and other visitors”.

Conceptually there are five main characteristics of tourism:

- a) Because of its complexity tourism is an amalgam of phenomena and relationship, rather than a single one.
 - b) These phenomena and relationships arise from a movement of people to, and their stay in, various destinations and in this there is a dynamic element – the journey- and a static element – the stay.
 - c) The journey and stay are to and in destinations outside the normal place of residence and work, so that tourism gives rise to activities which are distinct from those of the resident and working population of the places through which tourists travel and in which they stay.
 - d) The movement to destinations is of a temporary, short-term character with intention to return within a few days, weeks or months.
 - e) Destinations are visited for purposes not connected with paid, work, that is not to take up employment and not for business or vocational reasons.
- [Markres]

2.2 The Definition of Visitor

A “visitor” is defined as those persons who travel to a country other than that in which they have their usual residence but outside their usual environment for a period not exceeding of an activity remunerated from within the place visited. The visitors can class into two classes, the tourists and excursionists.

The tourists is a temporary visitor and stay at least 24 hours for their purpose of leisure, business, family, mission or meeting. The excursionists is a temporary visitors, they stay less than 24 hours, include cruise travelers but excluding transit passengers. [Toursys]

2.3 The Role of Travel Agents

The travel agent's role is dissimilar to that of most other retailers, in that agents do not purchase product for resale to their customers. Only when a customer has decided on a travel purchase do agents approach their principal on their customer's behalf to make a purchase. This has two important implications for the business of travel distribution, first is cost of setting up in business and second is agents are not seeking to dispose of products they have already purchased. [Markres]

2.4 What is Reservation System?

Reservation system mean by keeping or holding something that in mind or document form, such as a travel arrangement, booking for the seat in train, aircraft, passage on a ship or reserve a room in a hotel. An online reservation system means a system that allows the user get or processes the information for reservation through the Internet. The user can gain information directly from the homepages and choose the services that provided.

2.4.1 The Advantages of Online Reservation System

Users not need to travel different places for the purpose to purchase ticket or booking hotel. The entire event will do by a special travel agency. What the tourists have to do is key in the relevant data for the place their wish to visit, press the submit button and waiting for the reply from the travel agent. This will save a lot of time and money. They can also get the full data showing the information for the hotspot that they want to have a visit.

2.4.2 The Disadvantages of Online Reservation System

Sometime the unexpected down line happen in the Internet. This will cause a lot of inconvenient to the users. The security for the online reservation system must be strong to prevent unauthorized user to exist and change the database. Sometime, the data in the web pages may be not updated; this may cause the inconvenient situation for the user especially for the price or discount rate and it make the data not reliable.

2.5 Type of Reservation System

The staff, space, equipment and procedures that are used to handle the process of receiving, documenting and analyzing reservation requests make up a reservation system. Generally, the reservation system can categorize into two major type, the manual reservation systems and the computerized reservation system. [Front]. Nowadays, the most common reservation system is the computerized reservation system that use a lot in the hotel, shipment and airline industry. The type of reservation that is focusing in this project is the online computerized reservation through the Internet.

2.5.1 Manual Reservation System

The other name of manual reservation is traditional reservation system. This system manual and manage by human, which information are save in the ledger book or book, function as a calendar or diary. The name of each person that request for the reservation will be written down on the pages according to the date. [Manage] This type of reservation is seldom use now because it takes time to accomplish the task and the system is also not very reliable. It may cause a lot of delay or crash for the reservation due to cause the losing of the customers.

2.5.2 Computerized Reservation System

The computerized reservation system is the modern type of reservation that using the computer to manage the flow of reservation. The network connection has link the reservation from the different side. It makes the efficiency for the reservation such in the hotel or airline industry. The travel agency can quickly update their database using this kind of method. [Holid]

2.6 List of the Resources Surveyed

2.6.1 Electronic Resources/Internet

There have a lot of resources that can be gathering regarding for the reservation system in Malaysia. The first method that was done is by browsing through the Internet and make research for the local tour or travel agency online web pages to get the main idea and the relevant data for the reservation system. The few pages that has been focus during my research are list as below:

1) Homepage of a travel agency name as Triways Logistic Agency. [Triways]

(URL --<http://www.triways.com>)

This travel agency is base in Malaysia since September 1992. The service that has provided is the full range of transportation, freight forwarding, custom brokerage and logistics services. The homepages that their create have a very nice interface. It contain several form that give me a very useful information for review, they forms related are track for shipment, online quotation proposal, mail to contact, and others.

2) Hotel in Malaysia [Hotel]

(URL—<http://www.Malaysia-hotels.com>)

This homepage lists the accommodation according to the town in every state in Malaysia. This idea is brilliant because it convenient the tourist for making their choice for the accommodation during their visit, especially for the tourism that unfamiliar with the location of accommodation in Malaysia.

3) InfoHub Specialty Travel Guide [InfoHub]

(URL—<http://www.infohub.com>)

This homepage let the visitor select 3 destinations around the world and compare against sites offering similar service. It usually has at least twice as many selections than other sites. User can get a lot of information about the agency like tour operator program, travel agent advantages, travel forum and others.

4) Tourism in Malaysia [Tourism]

(URL—<http://www.tourism.gov.my>)

This homepage contains the useful and relevant data for introduce the hotspot in Malaysia to the tourists. It contains the images, picture, FAQ and also list down the program of activity that provide and the particular activity take place to the tourists during their visit. It also provided various linking that easy the user to get the relevant information.

5) Travel Guide [Guide]

(URL--<http://all-malaysia-hotels.com>)

This homepage is a very simple because it lists all the place of interest by using a map. This method is very useful for the tourists to choose the place to visit because some of the tourists may not know actually the location hot spot that they want to visit, but it is easy with the guide of a map that has been provided.

6) MySwitzerland.com [MySwit]

(URL—http://MySwitzerland_com4.com)

This homepage provides the entire feature need in the reservation system. It contains the reservation for ticket, hotel, shipment, rent for car or cruise. The others feature that have interesting me is it create a member area and the media room for the member to login and get the extra information. It also provided a map, shopping, forum, quick tour, check for the weather and multimedia gallery. This is very good features that make the tourist more enjoyable for their tour.

7) Travelweb [Traweb]

(URL--<http://Travelweb Hotel Reservation and Flight Reservation.htm>)

This homepage contains the simple hotel and flight reservation for the tourists. The interface for this web page is very nice and full of creative idea. It allows the tourists search for the flight, hotel, deal with the travel agent, shopping and others.

8) Asia Travel [AsiaT]

(URL—<http://Malaysia Hotels & Malaysia Resorts Reservation Service - Asia Travel.htm>)

Besides listing down all the place of interesting in Malaysia, it also provide various type of hotel for the tourists to choose. Tourists can choose for the type of hotel provided by comparing the price that has list by the homepages.

9) Travel and Tour Agencies [TravelT]

(URL--<http://travelagencies.com>)

From this web page, the information gained is the list of travel and tour agencies in Kuala Lumpur. All the travel agency is listed by their name in alphabetical order including the address, fax and the telephone number.

10) Famtravel.com [FamT]

(URL-- <http://famtravel.com>)

From this website, I get some of the idea in online ticket reservation. The idea of the authorization for the user is very important. When a user click on the "Online Reservation Button" the user will request to enter ID number and password before their can make further process. This purpose is for security that let the right person to log in.

2.6.2 Survey on Existing System by Interview

i) Interview Webpage Developer for Travel Agency.

The second method I done to get information was referring to the program build by the senior programmer. The program was related to an online ticket reservation system for travel agency, Triways Travel Network (M) Sdn. Bhd. Mr Eng Choon Siang and his team from Micro-Labs Asia had build the system. The program gives a lot of information about the real online ticket reservation that have been use for the actual business activity.

During the interview, my partner and I were given the opportunity to examine the program that was still under construction. For the system, they use the Active Server Page (ASP) to code the program. This method was chosen because ASP can make dynamic web pages if compare to HTML file, which just can create the static web pages. I also gain the knowledge for the program flow and run in the correct and sequence. It also gives me a new dimension of idea on how my programs are to be done in a correct sequence.

The online reservation system that they have created include the ticket reservation for the flight, rent for car and shipment, reserve a hotel and shopping list. For the system, they have been creating two types of user login, the normal user and the administrator. For a normal login there will be restricted to access fewer module of the program such as to gain discount while administrator login can gained access to update the database and others.

One of the important knowledge we gain was the respond time needed of their system to respond to user reservation. Mr. Eng explain that this reservation system will give the user answer on weather their reservation was successful or not normally in two day after the user make the reservation. Besides, Mr. Eng also shared his experience on how to counter the problem faced during the development of their project, how to develop a better system and others valuable opinions.

As for my conclusion, the main idea I gained by examined this web page is enormous and will be applied to my ORS.

ii) Telephone Interview with Chan Chee Kheong & Brothers Travel Sdn Bhd

From this interview with Ms Chan Siew Hah, I gained depth knowledge on how the travel agency responds to users when they make a reservation. Ms Chan told me that the respond time depends on the particular hotel or transportation company. For example, if a transportation company has a fast respond time, then the travel agent can confirm the reservation on the spot. But if not the travel agent will had to wait for the transportation company to reply before confirming the reservation, so normally they set a two days limit before deciding on weather the user successfully make that reservation. Usually their travel agency only had e-mail address of a transportation agency and do not link to that transportation company database. Besides, for any reservation that is not confirmed immediately, the confirmation will be sending to the user e-mail or through telephone.

2.6.3 Articles And Relevant Material Read

For the articles I get from ABACUS Distribution Systems Malaysia Sdn. Bhd., the Abacus System is know as a standard system for the flight reservation. Below is some of the brief information that I gained.

Abacus System

ABACUS Distribution Systems Malaysia Sdn. Bhd. (ABACUS Malaysia) was incorporated on 4 April 1989 as joint venture National Marketing Company (NMC) with Malaysia Airlines, Telekom Malaysia, Malaysia Association of Travel & Tours Agent (MATTA) and Abacus International Pte. Ltd, as its shareholders.

They commitment:

1. Developing and supplying our customers with innovative products that meet their business and technological needs
2. Providing superlative service and support programmers that are benchmarks in our industry
3. Bringing a global perspective to our customers' business while retaining our Asian heritage

ABACUS Malaysia now employs over 160 employees located in 5 offices with its head office in Kuala Lumpur. The other regional offices are located in Penang, Johor Bahru, Kota Kinabalu and Kuching. To date, ABACUS Malaysia has over 860 travel agents throughout Malaysia using its products and services, on over 3,000 terminals or computers.

ABACUS National Marketing Companies (NMCs), it provides services to travel agencies and airlines in Malaysia via highly secure and reliable data communications network, operates 24-hours-a-day seven days a week. ABACUS system is also connected on Internet to allow online booking capability worldwide. The ABACUS core GDS functions provide complete travel-related information about schedules, availability, fares and related services, which can be quickly retrieved through a series of keystrokes. Seat reservations are made, airline tickets are issued and an entire

spectrum of passenger information is recorded in just a few minutes. Beyond this, services from many different types of travel suppliers such as hotels, car-rentals, railways, can also be provided and booked. Travel agencies use the information provided by ABACUS to advise customers about the entire spectrum of travel options: air, hotel, car rentals, cruises, tours etc.

These systems calculate fares, display availability status, issuance of tickets and provide a range of travel information like visa requirements, customs and health regulations, facilities for credit card validation, currency conversion and weather information.

ABACUS provides comprehensive GDS services that include global travel-related information and efficient reservations functions as well as agency front, mid-office and back-office systems inclusive of valuable management reports for travel managers

2.6.4 Statistical Survey Conducted

From the statistical survey of the data get from Tourism in Malaysia (URL—<http://www.tourism.gov.my>), I have found a statistic regarding to tourists arrival to Malaysia Year 2000. From this statistic, I found that tourists come for visit Malaysia and also ASEAN country has dramatically increased in the year 2000 if compare to year 1999. If compare the amount of tourist that has come for visit by month, it is really clear that visitors is depend for certain month. For example, the amount of visitor in December is 1,042,572 this is the maximal amount for the whole year.

This give me an idea that some efforts should done by travel agency to attract the visitors, such as having some session promotion in certain month to attract more visitors. This feature may be useful and can implemented in ORS system. Some others information that I realize important to the online reservation is the type of accommodation, shopping, organized tours, local transportation, entertainments and other activity that the visitor may be fell interesting with it. This kind of features may present in the ORS to make the homepages more attractive to the visitors.

MALAYSIA TOURIST ARRIVALS 2000

region	jan	feb	mar	apr	may	june	july	aug	sep	oct**	nov	dec
GRAND TOTAL	731,509	786,040	737,678	916,382	894,350	960,782	811,876	764,500	778,587	990,658	806,648	1,042,572
ASIA	585,815	645,240	571,693	795,687	768,982	843,289	689,060	658,611	683,894	840,099	698,747	901,072
ASEAN	446,052	486,298	423,884	643,564	611,896	715,717	548,113	551,194	593,059	736,283	628,177	810,728

Note:

*- Less Than 0.1%

** - October figures have been revised

Source :immigration department of malaysia(KL)

File: Tourism 2000(19/7/2000)

Figure 2.1 Tourists Arrival in Malaysia Year 2000

region	2000 jan-dec no.	1999 jan-dec no.	00/99 change %	2000 share %
GRAND TOTAL	10,221,582	7,931,149	28.9	100
ASIA	8,682,189	6,763,480	28.4	84.9
ASEAN	7,194,965	5,947,009	21	70.4

Figure 2.2 Tourists Arrival in Malaysia, Year 1999 and 2000

2.7 Further Reading for Methodology

Before getting involved to the online reservation system, some basic network concept must be clear. The research is regarding to the World Wide Web, Internet, TCP/IP, database in the net, web server, client server architecture and other web application.

2.7.1 World Wide Web (WWW)

The World Wide Web (WWW) is an internet-based hypertext system initially developed in 1989 by Tim Berners Lee at the European Laboratory for Particle Physics, CERN, in Switzerland. The release in 1993 of Mosaic, the first graphical user interface to the Web, marked the beginning of a sustained exponential growth in the number of the Web sites and the amount of Web traffic. This explosive growth is the prime cause for the widespread use of the Internet and the intense business interest in exploiting the Internet. [Datacom]

The web is, in essence, architecture for sharing information. The information is in the form of linked pages that reside at various sites around the Internet. An individual page can contain text, graphics images and even link to voice and video. A page may be passive, simply providing static collection information on demand.

A user accesses the web by means of a web browser program, such as Netscape and Mosaic, running the user system. The browser can connect to a server across the Internet. The server maintains a database of information in the form of linked pages.

On the server side, there is a collection pages with links between them plus links to pages on other server. Each page contains information that is defined using the hypertext markup language (HTML). Each page is identified by an address known as Uniform Resource Locator (URL), which unique across all the pages on all the servers connected to the Internet. Some of the information on a server pages may reflect information maintained at the site in a database or file system.

Communication between a browser and a server is in the form of one or more transactions. A transaction occurs over a TCP connection and consists of a request from the server and response from the server. The request or response uses the Hypertext Transfer Protocol (HTTP). [Datacom]

2.7.2 Internet

The internet can be definite as a corporate internet work that provide the key internet applications, especially the World Wide Web, an internet operates within the organizations for internal purposes and can exists as an isolated, self-contained internet work, or may have link to the internet. . [Datacom]

In facts, the world “Internet” was coined from the word “interconnection” and “network”. What this means is that, many connecting networks, usually made up of differing kinds of computers and different technologies, are interfaced together so smoothly that the individual parts appear to be one network.[Faqlhelp] When someone dials in, the user can go to any connection computer, research any type of topic and browser through any information that already exit in the net. The Internet has a very rapid growth rate in the form of electronic communication and distribution information.

The Advanced Research Project Agency (ARPA) of the U.S. Department of Defense evolves the Internet from the ARPANET that developed in 1969. It was the first operational packet-switched network. The ARPANET was designed to support military research and in particular, research how to build the computer network that could withstand partial outages, meaning it would continue to function if one or more computers on the system were eliminated due to a bomb attack, backhoes cutting cable and others. [Datacom]

There is no central authority, no governing body nor any overall organizational scheme to the vast amounts of information available. The Internet transfers or accesses data in five different ways: gophers, telnet, FTP (File Transfer Protocol), HTTP (World Wide Web) and e-mail. Each computer that is connected to the Internet is provided a unique address or URL (Uniform Resource Locator). [Datacom]

The main uses of Internet are doing the research, download software, education, business, Telemedicine, entertainment, send mail, IRC (Internet Relay Chat), news group, get information and etc. There are also a few type of the internet activity, such as sending and receive the information include the e-mail, reading the message form the newsgroup, browsing the World Wide Web, online chatting and other. This kind of service give a lot of benefit and convenience to the user because that information can be send to different distance in a very short time. [Datacom]

2.7.3 TCP/IP

TCP and IP were developed by a Department of Defense (DOD) research project to connect a number different networks designed by different vendors into a network of networks (the "Internet"). It was initially successful because it delivered a few basic services that everyone needs (file transfer, electronic mail, remote logon) across a very large number of client and server systems. Several computers in a small department can use TCP/IP (along with other protocols) on a single LAN. [Datacom]

The IP component provides routing from the department to the enterprise network, then to regional networks, and finally to the global Internet. On the battlefield a communications network will sustain damage, so the DOD designed TCP/IP to be robust and automatically recover from any node or phone line failure. This design allows the construction of very large networks with less central management. However, because of the automatic recovery, network problems can go undiagnosed and uncorrected for long periods of time.

As with all other communications protocol, TCP/IP is composed of layers:

- **IP** - is responsible for moving packet of data from node to node. IP forwards each packet based on a four-byte destination address (the IP number). The Internet authorities assign ranges of numbers to different organizations. The organizations assign groups of their numbers to departments. IP operates on gateway machines that move data from department to organization to region and then around the world.
- **TCP** - is responsible for verifying the correct delivery of data from client to server. Data can be lost in the intermediate network. TCP adds support to detect errors or lost data and to trigger retransmission until the data is correctly and completely received. [Datacom]

2.8 Web-based Application Component

Web-based application relies on many network and application components, working together to send the requesting information to the users.

2.8.1 Web Browser

A browser is a software program that acts as an interface between the user and the inner workings of the Internet, like the World Wide Web. A browser is also referred to a web client that acts in conjunction with a web server. The browser acts on behalf of the user by connecting a web server and requesting information, receiving information and then displaying it on a screen. [InfoLi]

The web browser provides a graphical, text-based terminal interface to the web server. This terminal approach provides an interface between the user and the web server. The web browser is responsible for translating HTML sent by the web server into a graphical user interface within the browser. [Uasp]

The choice of web browser is often directly related to the needs of the targeted user. For example, if one design goal of your web application is to reach the largest user group, your application should rely only on HTML standards, which can be used to deliver information to all browsers. The web browser also use client-side scripting to perform task and operations within the browser. Scripting language such as JavaScript, Jscript and VBScript are used to reduce server processing and network bandwidth by performing action such as field validation calculations within the requesting browser. [Uasp]

2.8.2 Web Server

A web server is a software program running on a computer connected to the Internet. The term 'web server' is also used sometimes to refer to the computer on which the software is running. More often, the computer is called a server and is running more software than just web server software. [What15]

The web server has several responsibilities that all center on delivering HTML to the requesting client browser. The traditional billboard or information-sharing approach, which initially created the need for the World Wide Web, quickly demanded more functionality from the user community. The web server was soon able to process executable scripts that gave needed functionality and connectivity to other systems. [Uasp]

The server side scripts, either acting as stand-alone application or embedded in Active Server Pages, can be used to transform the web server into a gateway that exposes information stored in other server. The Internet Information Server can access information from database servers, mail and news servers, or any other COM-based server, such as Lotus Notes or Microsoft Exchanges. [Uasp]

2.8.3 Database Server

The database server plays a vital role in Internet application development. The database server can be used to store, search and retrieve information that is stored in database. This same database that distributes information to web users can also be accessed and maintained from within corporate walls. . Web server – not a web browser, can act as the client to the Database Server. [Uasp]

2.9 Database In The Net

Database usually is a collection of tables that constitute "relational" database (relationships between tables). Database "server" can communicate with many "client" applications (2 layer Client-Server).

For database server, the client passes SQL requests as message to the database server. The results of each SQL command are returned to over the network. The code that processes the SQL request and the data resides on the same machine. The server uses its own processing power to find the requested data, instead of passing all the records back to a client and allowing it to find its own data. Database server provides the foundation for decision support system that requires ad hoc queries and flexible reports.

There can be also some middle layer(s) - very common is a 3-tier architecture. In distributed environment of today's large financial institutions, people often use a messaging system (like MQSeries from IBM) and code messages in XML. Many claim that messaging is much more convenient to use than CORBA or Orbix. [Uasp]

To communicate with the database from your application, you need drivers. Each database has each own driver for different languages. It is good idea to use standard drivers:

- 1 **ODBC** (Open Database Connectivity) - standard and open API for database Access (Windows).
- 2 **JDBC** (Java Database Connectivity) - API for database access from Java.

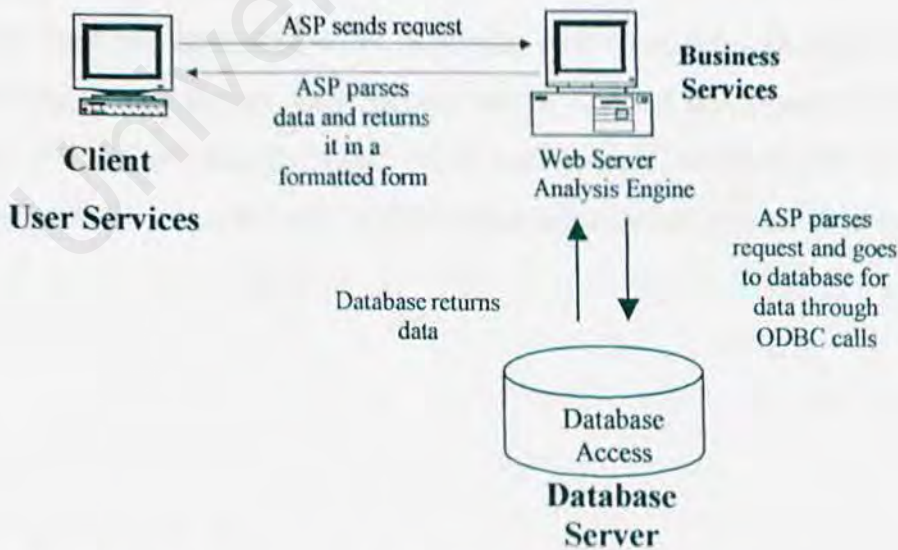


Figure 2.3: Relationship between Client Servers, Web Server and Database Server

2.9.1 Database—ODBC

Open Database Connectivity (ODBC) is an Application Programming Interface (API) that allows a programmer to abstract a program from a database. When writing code to interact with a database, user usually has to add code that talks to a particular database using a proprietary language. If user want program to talk to an Access, Fox and Oracle databases they have to code their program with three different database languages. This can be quite the daunting task causing much grief.

When programming to interact with ODBC user only need to talk the ODBC language (a combination of ODBC API function calls and the SQL language). The ODBC Manager will figure out how to contend with the type of database are targeting. Regardless of the database type are using, all of the user calls will be to the ODBC API. All that needed to do is have installed an ODBC driver that is specific to the type of database that will be using. [Uasp]

2.9.2 Microsoft SQL Server 7.0

Microsoft SQL server is a scalable, high performance database management system designed specially for distributed client/server computing. Microsoft SQL Server has a unique advantage over its competitors like IBM's DB2 Universal database, Informix Dynamix Server and Sybase SQL Server as it provides tight integration with windows and window-based applications helping reduce the cost and complexity of deploying sophisticated applications.

It is an ideal database engine for powering web sites, through tight integration with Internet Information Server, SQL Server can be queried and updated via popular Web browser. SQL server's native ODBC lets it inter-operate smoothly with the Internet Database Connector Interface included with Internet Information Server. [Seum]

2.10 Client-Server Computing

Client/server computing is the logical extension of modular programming. Modular programming has as its fundamental assumption that separation of a large piece of software into its constituent parts ("modules") creates the possibility for easier development and better maintainability. Client/server computing takes this a step farther by recognizing that those modules need not all be executed within the same memory space. With this architecture, the calling module becomes the "client" (that which requests a service), and the called module becomes the "server" (that which provides the service). [Usenet]

The logical extension of this is to have clients and servers running on the appropriate hardware and software platforms for their functions. For example, database management system servers running on platforms specially designed and configured to perform queries, or file servers running on platforms with special elements for managing files.

2.10.1 Client Process

The client is a process (program) that sends a message to a server process (program), requesting that the server perform a task (service). Client programs usually manage the user-interface portion of the application, validate data entered by the user, dispatch requests to server programs, and sometimes execute business logic. The client-based process is the front-end of the application that the user sees and interacts with. The client process contains solution-specific logic and provides the interface between the user and the rest of the application system.

The client process also manages the local resources that the user interacts with such as the monitor, keyboard, workstation CPU and peripherals. One of the key elements of a client workstation is the graphical user interface (GUI). Normally a part of operating system i.e. the window manager detects user actions, manages the windows on the display and displays the data in the windows. [Usenet]

2.10.2 Server Process

A server process (program) fulfills the client request by performing the task requested. Server programs generally receive requests from client programs, execute database retrieval and updates, manage data integrity and dispatch responses to client requests. Sometimes server programs execute common or complex business logic.

The server-based process "may" run on another machine on the network. This server could be the host operating system or network file server; the server is then provided both file system services and application services. Or in some cases, another desktop machine provides the application services. The server process acts as a software engine that manages shared resources such as databases, printers, communication links, or high powered-processors. The server process performs the back-end tasks that are common to similar applications. [Usenet]

2.11 Client/Server Architecture

2.11.1 Two-Tier Architecture

A two-tier architecture is where a client talks directly to a server, with no intervening server. It is typically used in small environments (less than 50 users). A common error in client/server development is to prototype an application in a small, two-tier environment, and then scale up by simply adding more users to the server. This approach will usually result in an ineffective system, as the server becomes overwhelmed. To properly scale to hundreds or thousands of users, it is usually necessary to move to a three-tier architecture. [Usenet]

2.11.2 Three-Tier Architecture

A three-tier architecture introduces a server (or an "agent") between the client and the server. It can provide translation services (as in adapting a legacy application on a mainframe to a client/server environment), metering services (as in acting as a transaction monitor to limit the number of simultaneous requests to a given server), or intelligent agent services (as in mapping a request to a number of different servers), collating the results, and returning a single response to the client. [Usenet]

2.11.3 Middleware

One of the key differences between traditional, two-tier client/server models and second generation, three-tier (also known as n-tier, where n is any number greater than two) client/server architectures is in the use of what is known as middleware. Some of the most popular kinds of middleware are transaction monitor and object request brokers (ORB). Microsoft's Transaction Server is a combination of these two technologies, providing you with a flexible and powerful middleware component that can be used to build very large-scale distributed-processing applications with minimal coding and configuration. [Uasp]

2.12 Web Applications

A web application is like any other application, except it resides on a web-server. A web-application uses the internet/intranet and browser to present data and retrieve input. One of the advantages of a web application has over a typical application is that it does not require the user to install any files on their computer. This enables users to access the application from any location at any time. Also this type of feature allows the developers to modify the application without having to distribute updates to all of the users.

The emergence of web application also spurs another round of programming technology and technique revolution. There is variety of technologies available such as Common Gateway Interface (CGI), Java, Dynamic Hypertext Markup Language (DHTML), scripting language, such as VBScript, JavaScript, and Active Server Pages (ASP).

2.12.1 Active Server Pages (ASP)

Active Server Pages (ASP) is a new technology from Microsoft that provided the capability for the web server to process application logic and then delivers standard HTML to the client browser. The result then can be delivered to a variety of client-side web technologies, such as standard HTML, ActiveX, Java, Browser Plug-in and DHTML. [Uasp]

ASP is considerably enhanced with the release of Internet Information Server 4.0 and Personal Web Server 4.0. It offers the model for managing communication between the client browser and the web server. It allow to create dynamic forms which can return feedback to user, allow access databases and return the sorted results on your web site, allow update content on a web site without changing one jot of HTML and also allow customization on a per-user basis, making the sites more useful for the user.

Two common scripting languages that support ASP are VBScript and Jscript. The extension .asp enables the Microsoft Internet Information Server (IIS) to parse and execute the scripts language in the pages. Most of the feature of the IIS can be integrated into any ASP pages, such as Microsoft Transaction Server (MTS), due to safety commit or abort the transaction that span multiple computers.

The best feature of Active Server Pages is being considered for this system because of its main features especially in the web server technology.

The reasons are:

- It is suitable for publishing and collecting data on the web
- It provides a way for building secure transactions, server-based application and web sites
- It works together with Windows NT and IIS to provide a comprehensive set of key software technologies which enable secure exchange of information over public networks, access control to server resources and confident identification of server and client
- It provides Active Database Object, one of the Active Server Components allows easy but powerful connections to be made to almost any database system for which as open Database Connectivity (ODBC) driver is available

- It has pre-build Active Server Component which provide plug-in objects that will perform specific tasks
- It can interact with almost any existing dynamic Web page technology such as CGI (Common Gateway Interface), ISAPI (Internet Server Application Programming Interface) and script written in PERL, Python and Awk.
- It is suitable for building multi-tier internet and intranet applications
- It supports client-server programming. Furthermore, the combination of ASP, client-side scripting and objects can be used to create client/server application
- It is able to create client side code dynamically on the server.
- Active Server Pages are browser independent .An Active Server Page is executed on a Web server and not within a browser. This means that an Active Server Page is not dependent on the capabilities of a browser. Unlike JavaScript, Active Server Pages can be written so they work with any browser.[Uasp]

2.12.2 Hypertext Markup Language (HTML)

HTML is a layout language. It contains commands that, like a word processor, tell the computer in very loose sense what the content of the documents is. HTML contain only 2 kinds of information:

- 1) Markup, which consists of all the text contained between angle bracket (<>),
- 2) Content, which is all the text not contained between angle brackets.

The difference is that the browser doesn't display markup; instead, markup contains the information that tells the browser how to display the content. Html lets user create structured documents. The heading commands separate and categorize sections of user documents. The useful purpose of html is that it provides a way for non-programmers to create attractive sites full of useful information in conjunction with the Internet, it make that information globally available. [Masp3]

2.12.3 Dynamic HTML

Dynamic HTML is a collective term for a combination of new Hypertext Markup Language (HTML) tags and options, it let user create Web pages more animated and more responsive to user interaction than previous versions of HTML.

Much of dynamic HTML is specified in HTML 4.0. Simple examples of dynamic HTML pages would include having the color of a text heading change when a user passes a mouse over it or allowing a user to "drag and drop" an image to another place on a Web page. Dynamic HTML can allow Web documents to look and act like desktop applications or multimedia productions.

The features that constitute dynamic HTML are included in Netscape Communications' latest Web browser, Navigator 4.0 (part of Netscape's Communicator suite), and by Microsoft's browser, Internet Explorer 4.0. While both Netscape and Microsoft browsers support HTML 4.0, some additional capabilities are supported by only one of the browsers. The biggest obstacle to the use of dynamic HTML is that, since many users are still using older browsers, a Web site must create two versions of each site and serve the pages appropriate to each user's browser version.

2.12.4 VBScript

VBScript was initially created by Microsoft to be a lightweight scripting language to interpret user events triggered within the Internet Explorer browser. It actually created from Visual Basic for Application (VBA), a pure subset of Visual Basic. VBScript can used to create references to control HTML intrinsic object, ActiveX automation objects, ActiveX controls and Java applets. [Uasp]

2.12.5 JavaScript

JavaScript is also a lightweight, interpreted scripting languages that provided the same functionality as its VBScript counterpart. The syntax of the JavaScript language is similar to C. [Uasp] JavaScript was originally to have been named LiveScript. It was the first client-side scripting language

2.12.6 JScript

JScript is Microsoft's ECMAScript compatible version of JavaScript. It is a powerful scripting language. Developers commonly use JScript to write client-side script because it is the common standard for browser scripting, and not all browser can run VBScript. [Masp3]

JScript is Microsoft version of JavaScript, and it was designed to lend OLE-based functionality found within VBScript to the JavaScript programming structure. The JScript and the JavaScript object models are similar, but variations between the models exist. As a result, the slight varieties can generate runtime error when executing JavaScript. [Uasp]

2.12.7 ECMA Script

ECMAScript is an object-oriented programming language for performing computations and manipulating computational objects within a host environment. ECMAScript as defined here is not intended to be computationally self-sufficient; indeed, there are no provisions in this specification for input of external data or output of computed results. Instead, it is expected that the computational environment of an ECMAScript program will provide not only the objects and other facilities described in this specification but also certain environment-specific *host* objects, whose description and behavior are beyond the scope of this specification except to indicate that they may provide certain properties that can be accessed and certain functions that can be called from an ECMAScript program. [Ecma]

2.12.8 Common Gateway Interface (CGI)

Common Gateway Interface is a method used to create dynamic HTML. CGI enable direct communication between the HTTP server and executable scripts. Programming in CGI provided a standard communication and processing mechanism between the requesting client browser, the gateway program, and the HTTP server. The CGI program help create a standard interface with the HTTP server to eliminate having to learn the specifics of Hypertext Transfer Protocol. [Uasp]

CGI has some severe shortcomings. The major one is that adds an extra level to browser-server model of interaction. It is necessary to run a CGI program to create the

dynamic page, which is sent back to the server. The code that CGI received and transmits is not easily manipulated by many programming language, user have to use a programming language that has good facilities for manipulating text and communicating with other software.

CGI programs are usually written in the scripting language such as Practical Extraction and Report Language (PERL). The early PERL scripts were created to run UNIX because the early HTTP servers only existed in the UNIX platform. However with the emergence of HTTP servers for NT, the Internet Information Server support PERL5.0 scripts. To initiate a CGI executable simply reference the name of the executable scripts and passes any required parameter.

2.13 Web Application Development Tools

2.13.1 Microsoft Visual InterDev

Microsoft Visual Interdev is a development environment in which user can create, edit, deploy and manage Active Server Pages. Visual InterDev combines a rich set of database connectivity tools; wizards and design- time control to increase the functionality and it decrease the development time to built the Active Server Applications. [Uasp]

There are four main functionality of the Visual InterDev:

1. File and source code management
2. Database connectivity and live design-time access
3. Active Server Page functionality
4. Client-side functionality

A typical Web application created with Visual InterDev consists of server-side scripts, written in VBScript or another language that supports ActiveX scripting, that are executed in response to HTTP requests from a client-side Web browser. These scripts may do complex processing, but more often than not the scripts use server-side runtime ActiveX components to provide system services or implement business rules

2.13.2 Visual Basic 6.0

Visual Basic is a fourth-generation language for designing and building the application with the graphical user interface (GUI). It is a Microsoft Windows programming language. VB is a distinctly different language providing powerful feature such as graphical user interface, event handling, access to the Win32 API, object-oriented features, error handling, structured programming and other. [VisualB]

VB provide very popular tool for prototyping and constructing GUI and it is easy to learn. Visual basic programs are created in an Integrated Development Environment (IDE). The IDE allow the programmer to create, run and debug visual basic programs conveniently. The programmer has the ability to create graphical user interface by pointing and clicking with the mouse. The programmer creates the GUI and writes code to describe what happen when the user interacts with the GUI. All the components of the development environment are integrated. This feature let the user easy to create program with VB.

3.13.3 Lotus Notes/Domino

Lotus Note and Domino server work together to meet the challenge of managing and distributing timely information across a confusing landscape of incompatible platforms, varying network protocols and different clients. Lotus Notes and Domino server have a number of powerful capability that can drastically streamline the development strengths of Notes Web-sensitivity features have quickly made Notes into one of the most prolific Web development environments. [Lotus]

Domino is an integrated HTTP/Notes server developed by Lotus that allow any Web client to request and receive information form Notes databases. Domino can interface with HTTP, parse URLs and perform a number of other Internet-related functions. Notes constructs such as documents, links, views, navigators and formulas are used by Domino to dynamically generate HTML files and provide advance Web functionality to users. All this occurs in split second timing at the moment a request is made. Domino takes the right combination of constructs, generates the HTML file and sends it out to the requesting web browser.

2.14 Problem Facing During Literature Review

There are some problems that I faced for the surveying purpose. The problem face is as below:

- i. Hard to conduct a real interview with the travel agency.
- ii. Many of the travel agency still uses the manual system for selling ticket. I unable to identified the current requirement for the system.
- iii. Limited exposure and knowledge about the interface for the system. Some of the travel agency unwilling to show their system interface to other people.

2.15 Analysis on Surveyed Resources

After gained various data for different resources, the analysis has been done to make the data more reliable.

2.15.1 Analyzing Resources Getting From Internet:

From the different website that I survey, the idea I gained form it are:

- i. The webpage should be attractive and user-friendly. The user can get the information easily form the webpage. These means the webpage must be contain the information about certain destinations and tour packages. This will include the transportation travel and accommodation.
- ii. The website should be protected with password. This idea is getting from the Famtravel.com. When a user decided to make a reservation for a flight, the user has to type in the user ID and password before further task/ can be proceed.
- iii. The webpage should be including a help function or a FAQ section. This idea is getting from Tourism in Malaysia Homepage. This idea can be implemented in the ORS to solve the problem from tourists.

2.15.2 Analyzing Resources From Interview:

From both interview, I get the main idea that the response time for the system must be quick. This means that the user can view the result for the reservation in a very short time. Usually the travel agency will let the user to wait a least two day before can give a confirmation to the user. It is hard to make a system that can let the users know about their reservation on the spot. Besides, both travel agencies that I interview have made the reservation for the user by call or e-mail to the transportation agency or the hotel. This system although has the weaknesses, but it can save a lot of cost. The has other better system like Abacus system that can let the user know the result for the reservation on the spot, but the system has to pay before can use it.

2.15.3 Analyzing Resources From Articles Read:

The material is regarding to the Abacus system. Usually this system will be use in the flight and help to control the selling for the ticket. Normally this system is hard to implemented in the ORS because user has to pay before can be use. Besides, the staff for the Abacus will come directly to travel company to make sure the company achieves the minimal requirement before they can provide this service to travel company.

2.16 Synthesis on The Surveyed Resources

Lastly, after the surveying and analyzing on the various resources, the final stage is the synthesis on the surveyed resources. Based on the analysis, my proposed for the ORS will contains the features as below:

- i. Provided the transportation services and accommodation detail to the tourist according to the desire to visit the hot spot in Malaysia.
- ii. Some feature like Map or calendar can be implemented in the web pages. The map can let the tourists easily get the information for some different tourism hot spots. Meanwhile, the calendar provided the information of the various events in Malaysia and all the activity throughout the years.
- iii. Provided services like feedback maintenances to the tourists, due to improve the services of travel agency and good relationship between the travel agency and tourists.
- iv. The system administrator will change and update the latest information for the ticket and hotel reservation. They also given the main task to manage the reservation for the tourists, by send the confirmation letter to the users.

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- [Usenet] = Usenet FAQs, <http://www.cis.ohio-state.edu/hypertext/faq/usenet/client-server-faq/faq.html>, OSU Department of Computer and Information Science
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Deitel T.R.Nieto
- [What15] = 15-minutes series- what is the World Wide Web,
<http://telcom.coos.k12.or.us/WhatIsTheWWW/server.htm>. InterNIC
(Internet Network Information Center)

CHAPTER 3: SYSTEM ANALYSIS

3.0 Methodology

3.1 Prototyping Model

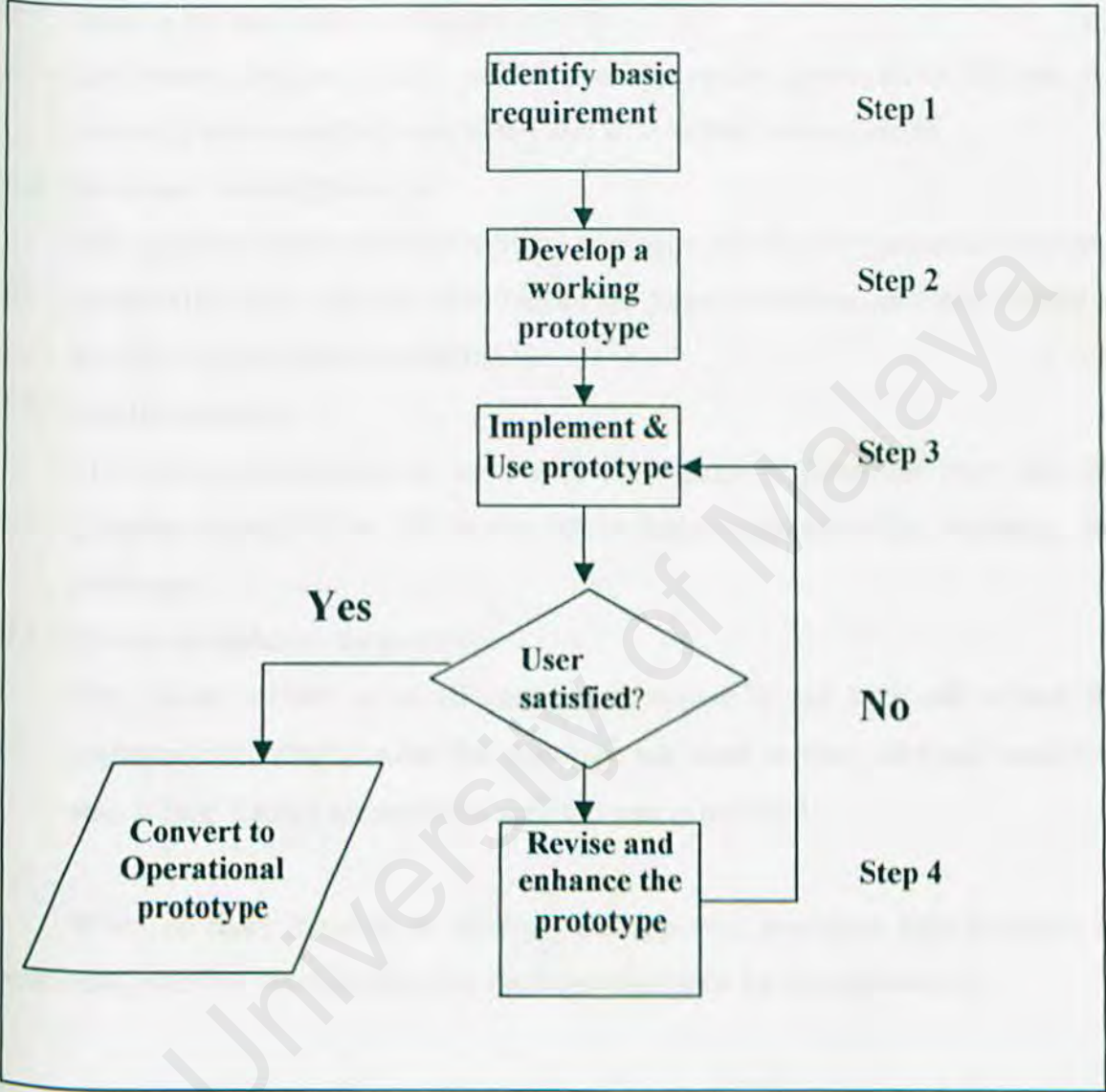


Figure 3.1: Prototyping Methodology (Source: [SAD])

3.1.1 Steps on Prototyping

Figure 3.1 shows a four-step model of the prototyping process. The steps consist of the following:

1. Identify the user's basic requirements.

The system designer (usually an information systems specialist) works with the user only long enough to capture the user's basic information needs.

2. Develop a working prototype

The system designer creates a working prototype quickly. The prototype may only perform the most important functions of the proposed system, or it may consist of the entire system with a restricted file.

3. Use the prototype

The user is encouraged to work with the system to determine how well the prototype meets his or her needs and to make suggestions for improving the prototype.

4. Revise and enhance the prototype

The system builder notes all changes requested by the user and refines the prototype accordingly. After the prototype has been revised, the cycle returns to step 3. Step 3 and 4 are repeated until the user is satisfied.

When no more iteration is required, the approved prototype then becomes an operational prototype that furnishes the final specifications for the application.

The prototype model is used because:

- a) Change can be made early in development.
- b) System developed can meet users' needs more easily.
- c) It provides a common baseline and frame. Developers and users can communicate better.
- d) The developer can understand the system much better.

3.1.2 Advantage of Prototyping

i) Changing the early in its development

Successful prototyping depends on early and frequent user feedback to help modify the system and make it more responsive to actual needs. As with any systems effort, early changes are less expensive than changes made late in the project's development.

ii) Scrapping undesirable systems

A second advantage of using prototyping is the possibility of scrapping a system that is just not what users and analysis had hoped. Once again, the issue of time and money spent arises. A prototype represents much less of an investment than a completely developed system.

iii) Designing a system for users' needs and expectations

A third advantage of prototyping is that the system being developed should be a better fit with users' needs and expectations. Many studies of failed information systems indict the long interval between requirements determination and the presentation of the finished systems while sequestered away from users during this critical period.

3.1.3 Disadvantage of Prototyping

i) Managing the project

Although several iterations of the prototype may be necessary, extending the prototype indefinitely also creates problems. It is important that the systems analysis team devises and then carries out a plan regarding how feedback on the prototype will be collected, analyzed, and interpreted. Set up specific time periods during which you and management decision makers will use feedback to evaluate how well the prototype is performing.

ii) Adopting an incomplete system as complete

A second major disadvantage of prototyping is that if a system is needed badly and welcomed readily, the prototype may be accepted in its unfinished state, and pressed into service without necessary refinement. While superficially this may seem an appealing way to short circuit a lot of development effort, it works to the business and team's disadvantage.

3.2 Questionnaire

3.2.1 Reason to Use Questionnaire

- 1) The people need to be questioned are widely dispersed
- 2) Can get the overall opinion for various kinds of people before the system project is given any specific direction.
- 3) Problem sensing is done so that any problems with the current reservation process are identified.

3.2.2 Questionnaire Design

The questionnaire is the combination of open-ended and closed questions. The open-ended question is used to get all possible responses to the question from the opinion of respondents. A closed question is chosen to limit the response option available for the respondent to answer the questions. The design of the questionnaire is attached in Appendix.

3.2.3 The Respondents

All the students in FSKTM and people outside the campus are potential for using this system

3.2.4 Questionnaires Results

100 questionnaires has distributed to the student and people outside the campus. Response that gained through the open-ended and closed questions has been analyzed and interprets like the tables below:

Table 3.1: Statistical result on what attract users most when their visit a web page dedicated for online reservation

	Total (x/100)	Percentage (%)
Information provided	11	11
Fast respond time	13	13
Interactivity	10	10
Special Offer	11	11
Easy to Use	19	19
Responsive	12	12
Attractive	15	15
Others (like fast loading, interesting link)	9	9

The statistical reveal that most of the users demand a very user-friendly interface and easy to use. Some of the others factory like attractive and fast response time also consider a factory that attract user to surf our website. This gives me an idea that the interface of ORS must be user-friendly, attractive, and can response fast to the users.

Table 3.2: Statistical result on what kind of information users wish to have if they surf a web page that provide reservation

	Total (x/100)	Percentage(%)
Information about place of interest in Malaysia	25	25
Information about the reservation for ticket	31	31
Information about the reservation for hotel	35	35
Others (like events happening)	9	9

The statistical result above reveals that a user would love to be provided information on accommodation and transportation before their makes any decision to make a reservation. Besides some user about 34 % of them wanted information on places of interest and others information such as events happening so they can know better about the place that they going to visit.

Table 3.3: Statistical result on provided feedback or comment to/from a travel agency is a good way to communicate

	Total (x/100)	Percentage(%)
Very good	25	25
Good	39	39
Not good	13	13
Not idea	23	23

Majority of the respondents say that having feedback maintenances from travel agency is a brilliant idea. 64 % of the respondents are agreeing with that. This give me an idea that this services should be included in ORS because it can improve the relationship between the travel agents and users besides solving the problem that face by the users.

3.3 Data Gathering

The most important part of the system analysis is the standard procedure to gather data for the system. It is a process to define and understand type of the system, defining the problem, compare the different method and technology for the system development and selecting the best method for the system design as well as establishing the system requirements. This process has been done from the literature review.

3.4 Development Strategies

They are plenty of the development method and technology that can be use to design the system. A wide range of system analysis has been done to choose the most suitable technology for implement the system. Each programming method has their specification feature and each of it will be analysis and choose the most suitable one for the system.

3.5 Conclusion of The Development Strategies

3.5.1 Programming Technology & Languages

After the wide range of system analysis, the ASP technology has been chooses. It method is idea for the reservation system because is simple to implement and no additional software is required, it just need the Internet Information Services IIS 5.0 function as a server. The VBScript will be use as the main scripting language using together with the ASP technology as an added script to web pages.

Although the JavaScript is more widely support, but VBScript is chosen because the script embedded in the web pages is server script interpreted by the IIS5.0. Beside this, the VBScript is also more easy to learn if compare to the JavaScript. This is due to reduce the burden of learning the more difficult programming language. The JavaScript will be used when some certain specification that unable build by VBScript but can but using JavaScript.

The tool for develop the ORS is using the Microsoft Visual InterDev. This method is chosen because it has the ability to create, generate and edit the content, and the content is automatically uploaded to the web server. The function that provided by it is also well integrated in the software and this convenient user to create the layouts. Microsoft FrontPage 2000 and Macromedia Dreamweaver 3 also consider as an alternative tools to create interesting layouts.

3.5.2 Database Implementation

For the database repository, Microsoft SQL Server 7.0 is chosen. The Microsoft Access is not been choose because the limitations and constraints on hardware and software of the development environment. The Microsoft SQL Server 7.0 can handle more users and large amount of data if compare to Microsoft Access. The access of the database is using ActiveX Data Objects (ADO).

3.6 Identifying Requirements

To develop a good system, we need to identify the system requirements first. So in order to identify the system requirement, a lot of information is needed. As for this project, information were gathered from various source and discuss in detail in chapter 2. From the result, it showed that most users would like to have the following features in web sites:

- Attractive interface
- Informative
- Interesting links
- User friendly
- Easy to use
- Responsive
- Fast loading
- Confidentiality

After going through the phase of information gathering and analyzing, the requirement for this project was outlined. Basically they are divided into functional requirement and non-functional requirements and will be discuss in details in section below.

3.7 Functional Requirements

Functional requirement are set of functions or subsystems that are must integrated into the system. It describes the interaction between the system and its environment. The absent of functional requirement will make the entire system incomplete. These functional requirements are discussed in depth in next section and can be divided into two separate sections, mainly the hotel reservation and the ticket reservation section. This two section will be divided into 2 modules, that is the user module and the administrator module.

3.7.1 Entire System

3.7.1.1 Authentication and Authorization Module

Some of the documents in the ORS required user identify and password to access. An authentication and authorized process is vital to the system in order to protect its web pages and database form any non-authorized user. Users are required to enter their user identity and password to access the system. This will increase the security of the system and protect form the unauthorized people to login.

3.7.1.2 Account Initiation Module

This module should enable the users to change their password for the security reasons. Any old password must be key in before any changes are made to ensure that the valid is making the changes. Confirmation upon the new password is needed too.

3.7.2 User Module

3.7.2.1 Main Page

This main page gives a brief introduction of the ORS to the user. User has the choice of choosing his own preferences to view other pages or to do the online booking of hotel and ticket. The user much login to get the more information about the ORS.

3.7.2.2 Personal Data Management

This module is provided for a user to update certain personal information if there are any changes. There are certain fields, which are editable such as permanent and current address, contact telephone number and others.

3.7.2.3 User Information

After the user login, there will be pages that greeting the user and show the user information to make sure that the real and right person that has sign in.

3.7.2.4 Preview Reservation

This module allows the user preview their latest reservation status both for the hotel and ticket reservation.

3.7.2.5 Add New Reservation

This module is function as add a new reservation to the database. Any reservation shall have a confirmation number associated with it. This module will be able to check the availability of the ticket or room for the reservation. A message will be giving to the user regarding the results of the reservation that the user has made.

3.7.2.6 Retrieval and Updating

This module will be able to retrieve any valid reservation using conformation number. Update to the existing reservation shall be possible to make the system more reliable.

3.7.2.7 Conformation and Cancellation

This module mainly gives the conformation to the user for the reservation that has make. It shows the information of the reservation to the user to get the conformation. If the user did not satisfied regarding or show mistake occur regarding to the reservation, the user has the authority to cancel the valid reservation or send request to change the reservation.

3.7.2.8 User Authentication and Authorization

This module enables the user to change their password frequently so as protect some user form misusing the access password, which they coincidentally found.

3.7.2.9 General Information

This module shows the Malaysia map and the other details. The map is very important to show the user the detail information of some hot place.

3.7.2.10 Help File

This system should provide an online help file to guide the user using the system. It is very important when the users are facing some error or information that they do not understand. This help file will guide they through a complete help contents and context sensitive link to the related pages to easy the user.

3.7.3 Administration

3.7.3.1 Database Maintenance

This module allows an administrator to manipulate all the records in the ORS database system. The administrator has the full right to create, delete and update any data in the database. To avoid editing a large amount of data at once time, user may select data based on the criteria options provided. Records that will be available for editing in this module are tourist records, all the record of the reservation for the ticket and booking hotel.

3.7.3.2 Reservation Result

This module let the administrator to check the reservation of some user so their can give the notice to the user.

3.7.3.3 Password

This module allows the administrators to change their own password for the security reason.

3.7.3.4 Searching

This module enables the administrator to search the user name to enable them to find the record of some user in a short time.

3.7.3.5 Feedback Maintenance

This Module enables the administrators read the mail from the user and their try to give the idea back to the users.

3.8 Non-Functional Requirements

Non-functional requirement are as important as functional requirement. Non-functional requirement describe restrictions on the system that limits the choices for constructing a solution to the problem.

3.8.1 User-friendly and Usability

This system can be considered as attractive and easy-to-use application because user only have to click on the task or image by using the mouse. The user of suitable and meaningful icons will be help the user to user the system with more confidence. The use of menu should give the user sufficient information to use the system.

Confirmation message for any non-trial process such as updating or deleting a record should be displayed. Confirmation messages should be displayed after adding, updating and deleting a record. User should be allowed to cancel an editing process.

3.8.2 Browser

This web-based reservation application system requires a Microsoft Explorer browser that can support VBScript scripting languages.

3.8.3 Reliability

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 manner that a typical user expects in normal. This definition recognizes that a system may not be used in the ways that the designer expects. ORS is also required to be reliable, so as to produce accurate results and information.

3.8.4 Accuracy

The system must be able to perform accurately as requested by the user so that the user is convinced in using the system.

3.8.5 Efficiency

This is the important requirement between the other. It should provide a good response time to all user requests. This system should not cause any delay in processing the user request or even in the midst of retrieving information..

3.8.6 Modularity

Modularity involves breaking the programming into logical, manageable portions or modules. Ideally, each individual module should be functionally cohesive, so that it is charged with accomplishing only one function.

Advantages:

- Modules are easier to write and debug because they are virtually self-contained. Tracing an error in a module is less complicated, since a problem in one module should not cause problems in others.
- Modules are easier to maintain. Modifications usually will be limited to a few modules and will not spread over an entire program.
- Modules are easier to grasp, because they are all self-contained subsystems. Therefore, anyone can actually understand its function by looking at module code listing.

3.8.7 Maintainability and Expandability

This system is also required to have the ability to maintained and expanded for future enhancements. Therefore, this system is to be developed using common languages like VBScript where users can get to learn the language easily or even get some reference point from other people who can provide them with relevant information.

3.8.8 Security

This system should be equipped with sufficient security. Users must login with their correct user ID and password to prevent unauthorized access into the user and administrative section. The password should be encrypted.

3.8.9 Flexibility

The system should have the capability to take advantage of new technologies and resources. The system should be able to implemented in the changing environment.

3.9 Software and Hardware Requirements

3.9.1 Server Hardware Requirements

The requirement for the server is:

- A server that with the processor power no less than 133 MHz
- At least 32 MB RAM of memory
- 2.0 GB of free hard disk apace
- Network interface card (NIC) and network connection with recommended bandwidth at 10 Mbps or more

3.9.2 Server Software Requirements

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

- Windows NT or Windows 2000 server function as Network Operating System
- Internet Information Services (IIS) 5.0 function as Web Server Service
- Active Server Page (ASP) 3.0 function as Server Scripting Engine
- Microsoft SQL Server 7.0 function as database Server
- Microsoft Internet Explorer 5.0 function as Precondition for ASP Installation

3.9.3 Client Hardware Requirements

The client hardware requirements are quite minimal as long as it has a reasonable amount of RAM and a reasonable quality dial-up connection line. The recommended configurations are:

- Computer that the processor power not less than 300 MHz
- At least 16 MB memory
- Network connection through existing network configuration or modem (recommended at least 28.8 Kbps.)

3.9.4 Client Software Requirements

The client software requirements fall on the browser used by users. It requires Microsoft Windows family operating system that can run Microsoft Internet Explorer 4.0 and above or any other browsers that support ActiveX and VBScript. Besides, Microsoft Outlook should also present for mail application.

Reference:

[SAD] = Kenneth E. Kendall & Julie E. Kendall, 1999, System Analysis & Design 4th Edition, Prentice Hall International, Inc.

CHAPTER 4: SYSTEM DESIGN

System design can define as those task that focus on the specification of a detailed computer-based solution. It also calls as physical design. [SADM].

This mean that system design is a process of convert conceptual idea in the requirement specification in system analysis into the real design that contain the feature, components and element of the system. The ORS design issues that will be discussed are system architecture design, system functionality design, database design and user interface design.

4.1 Overview of ORS Architecture Design

The ORS is divided into 2 major components: Ticket Reservation and Hotel Reservation. I will do the ticket reservation module and my partner will do the hotel reservation module. Each component is further divided into 2 main modules that is the user module and the administrator module. The 2 module will be separate into the several small to perform several task for the ORS.

The main section can be access thought a login page for the system. In this login page, users are needed to select a login category. For the normal user are allowed to select the user categories and enter their user ID and password. For the administrator, they need to input in the administrator ID and password.

4.1.1 User Module

This section let the user login as a normal member. They can view their personal data and information after they login as a member. The function that provided in this section is that user can make a reservation for ticket or hotel, and this is include for preview the reservation that had make, add new reservation, retrieval, updating, conformation or cancellation for reservation. Beside this, this section also provide the general information to the user.

4.1.2 Administrator Module

This section allows the administrator to manipulate the records in the database. This includes the right to create, delete and update the data in the database. The administrator also has the right to view the result of the reservation, change the password and searching for the user data.

4.1.3 Database Module

At the database module, the Microsoft SQL server is use to stored the relevant data. Server database is available to support the work performed by the analysis engine.

4.2 System Functional Design

System functionality design is based on the system stated in chapter system analysis. The entire system requirement is translate into the system functionality. The design is focuses on the system structure design and data flow design.

4.2.1 System Structure Chart

The system structure is used to depict high level of a specified system. The use of the system chart is to describe the interaction between independent modules of s system. Major functions from the initial component part of the structure chart, that broken into several subcomponents.

In ORS, the Hotel reservation module and the Ticket module has the 2 same sub modules, which are the user module and the administrator module. Each of the two components has been dividing into subcomponent, that is show structure chart below:

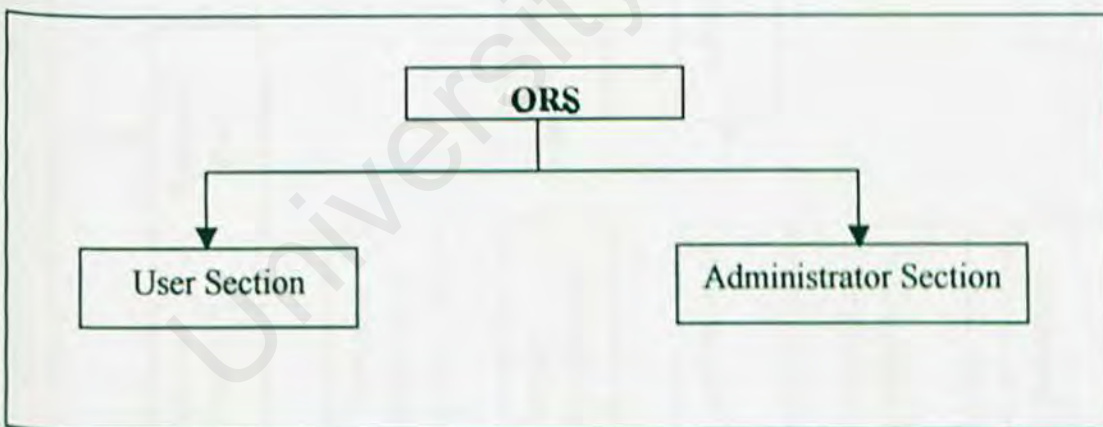


Figure 4.1: Structure Chart For ORS--Main System

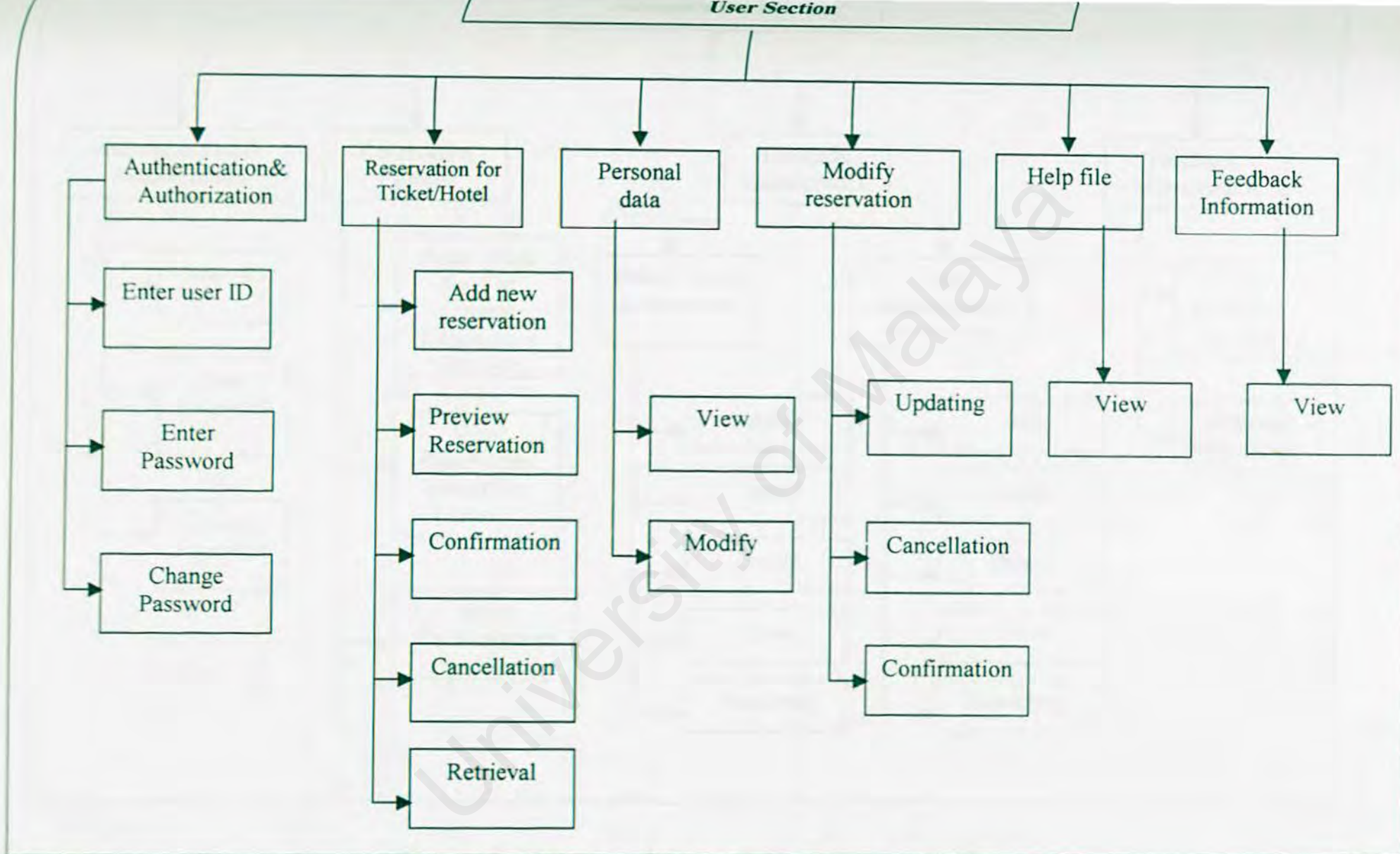


Figure 4.2: Structure Chart For ORS --Users Section

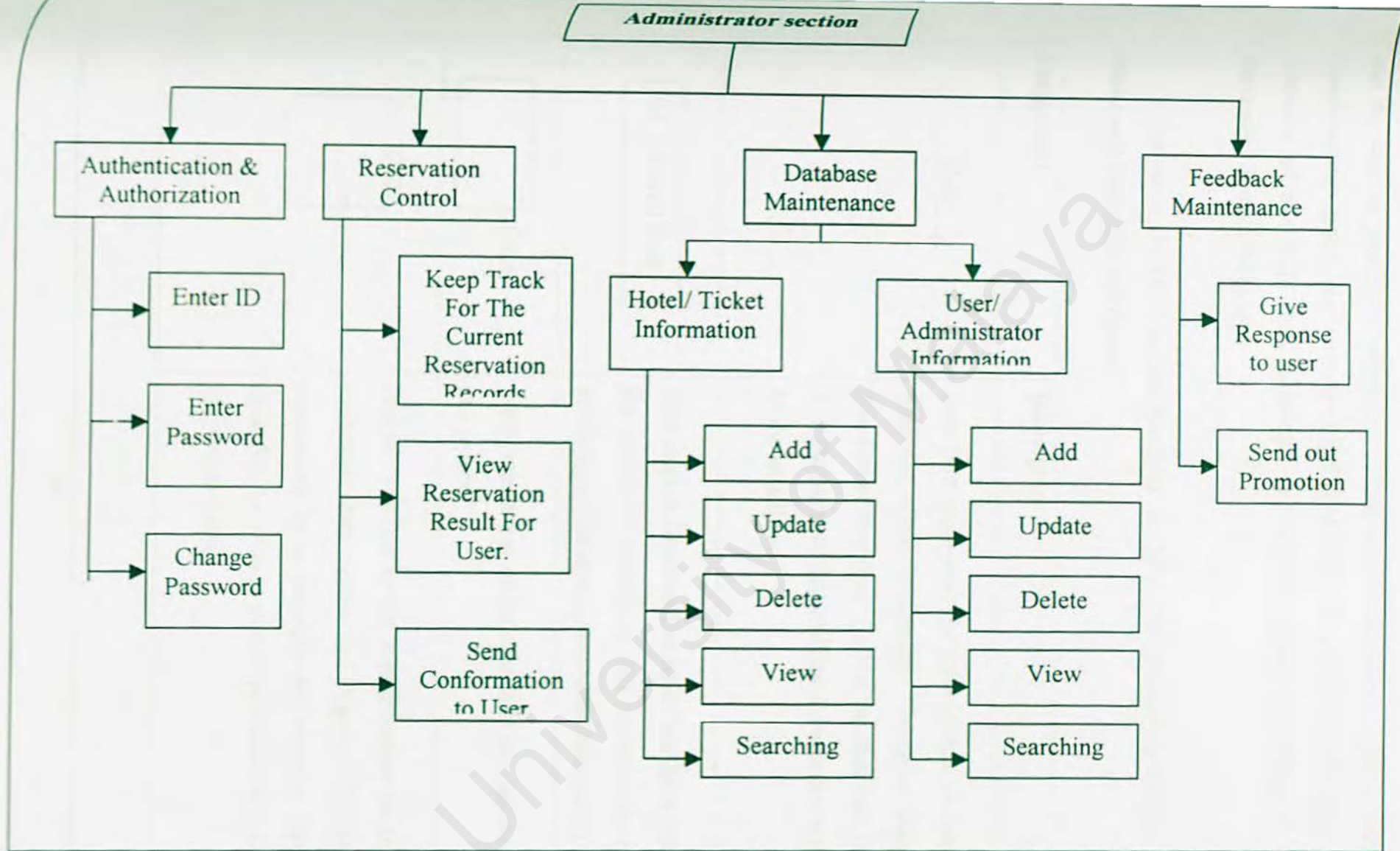


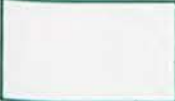



Figure 4.3: Structure Chart For ORS –Administrator Section

4.2.2 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. Synonyms include bubble chart, transformation graph and process model. [SADM] It depicts the broadest possible overview of a system input, processes and outputs, which correspond to the data movement through the system.

Below is the DFD for the functions in ORS. The component for the graphics model will explained like below:

Component	Description
	Data flow represents the flow of data or information from one object to another. The arrow denoted the direction of data flow. Each of the data flow is labeled with the name or details of the information represented by the data flow.
	Data store is functional as hold Data for a time within the system. It contain of two sections, the identifier information and description of the data stored.
 Entity	Entity means any of the objects in the real world, such as a person.
	Process is define as the transformation the input data to output data within the system. The process is represented by a rectangle that contains three parts: identifier, location or person performs the process and the process name.

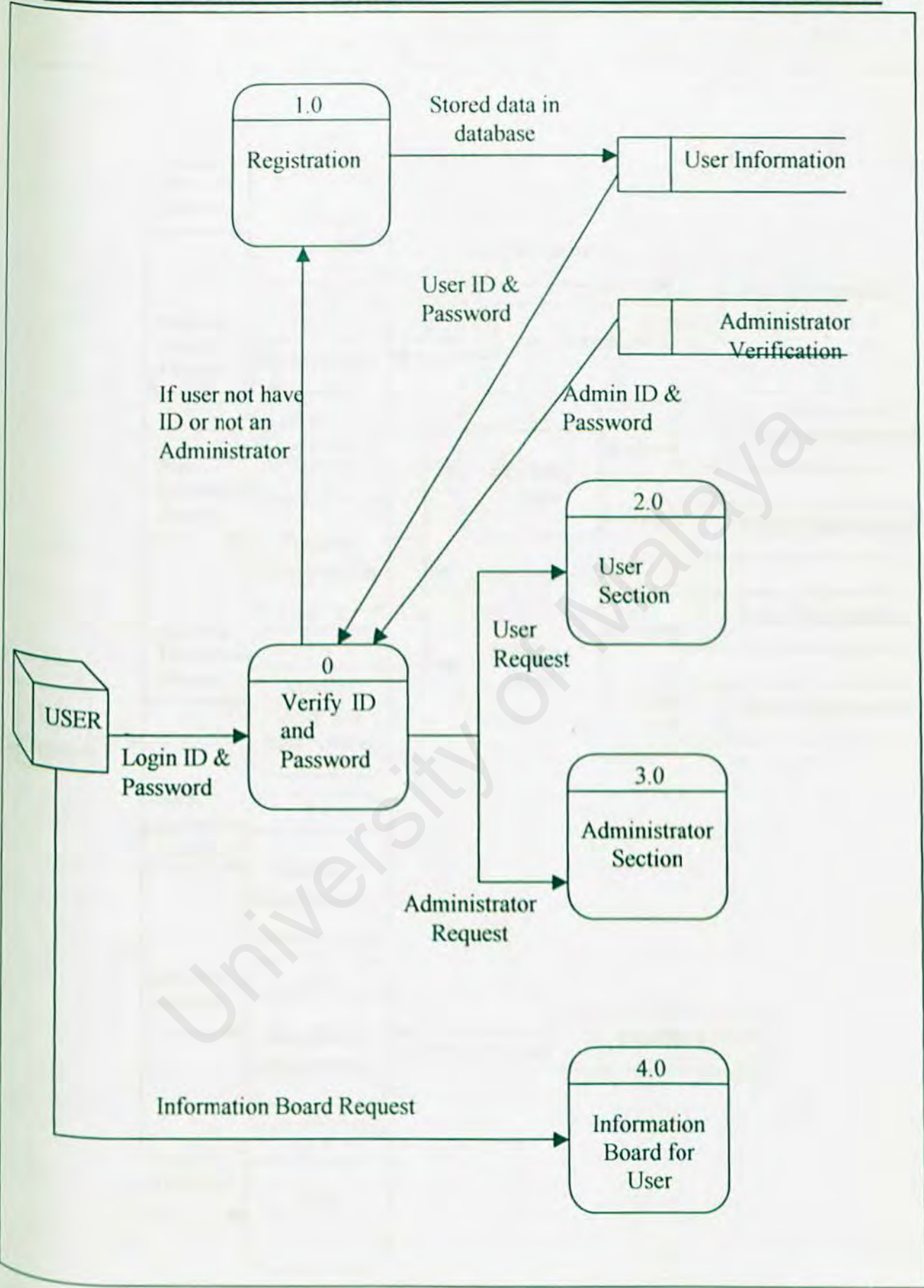


Figure 4.4: Data Flow Diagram for ORS System Overview

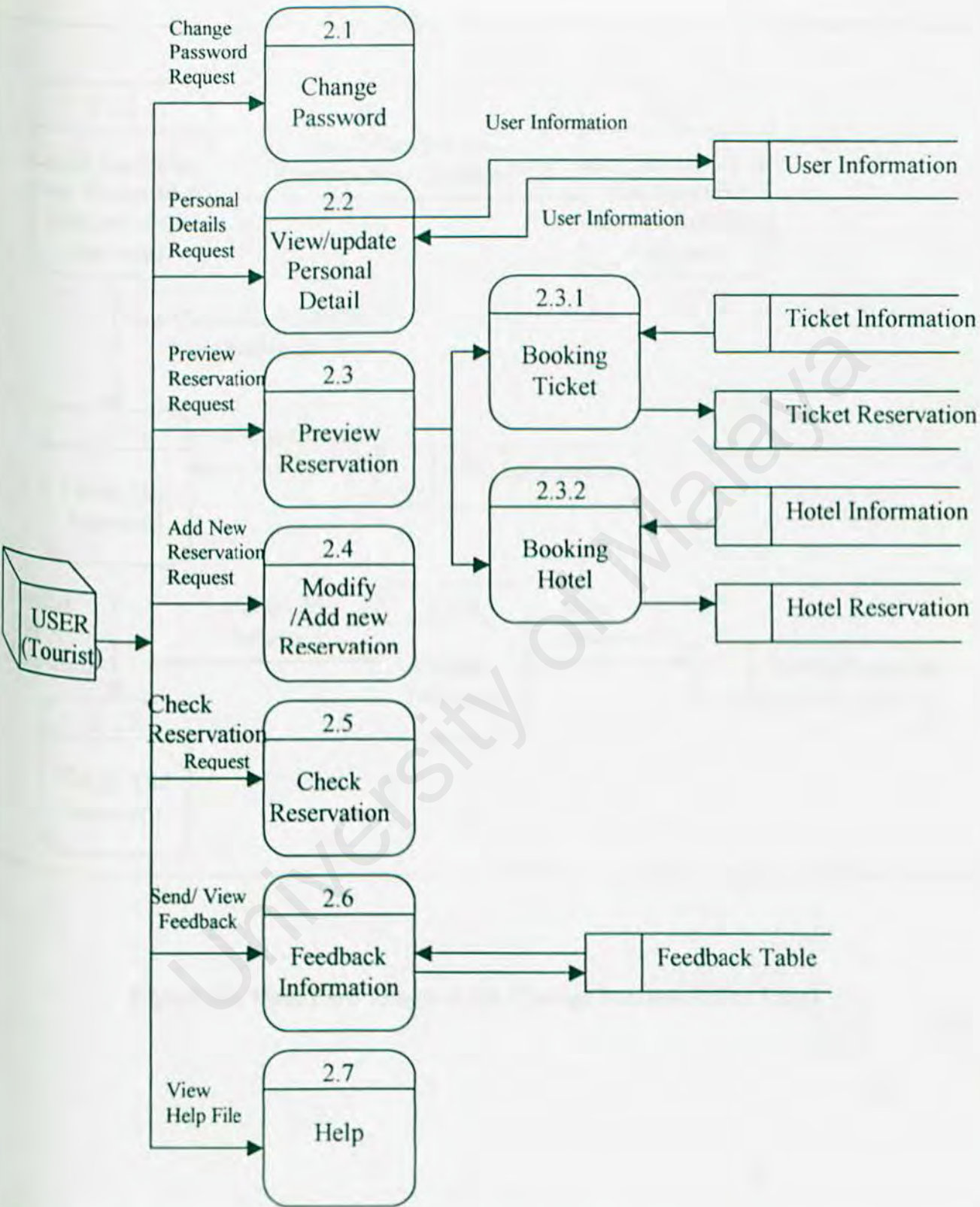


Figure 4.5: Data Flow Diagram for User (Tourists) Section

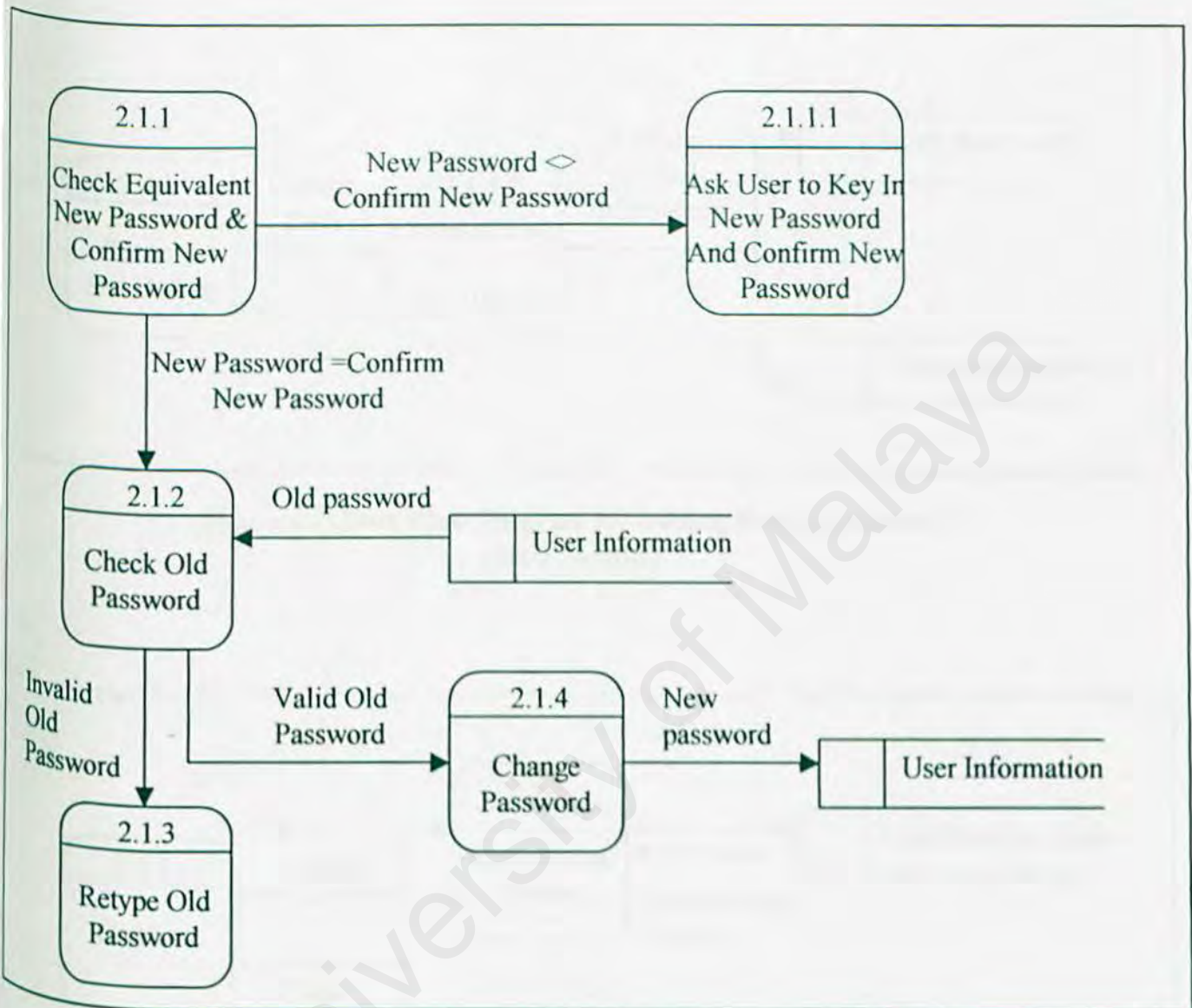


Figure 4.6: Data Flow Diagram for Change Password (For User)

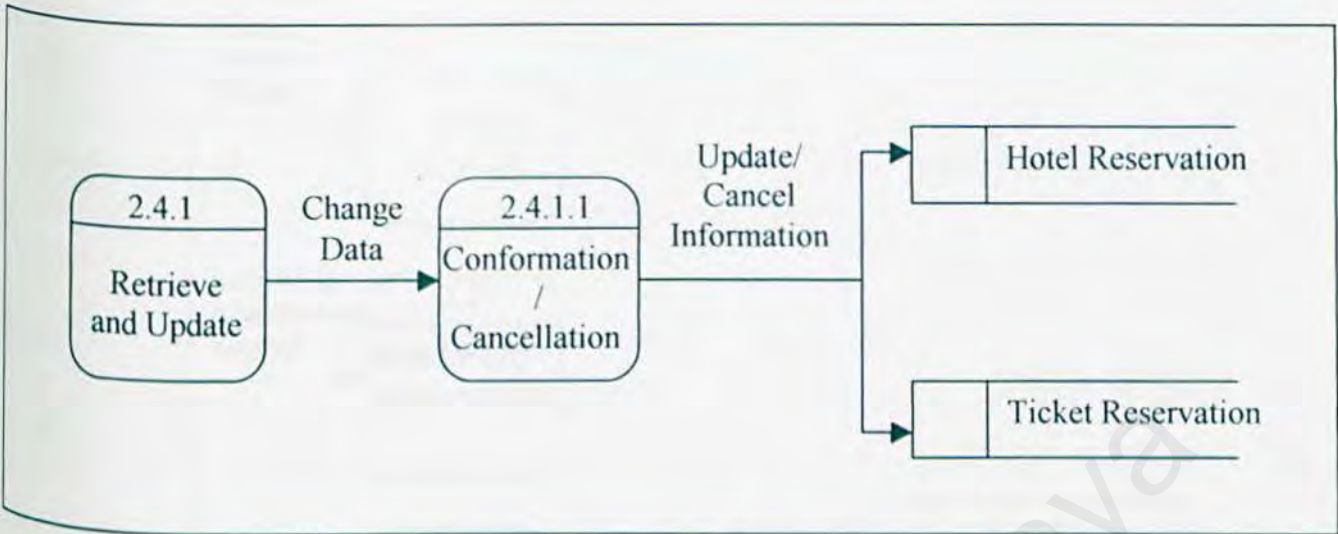


Figure 4.7: Data Flow Diagram for Adding New Reservation (User Section)

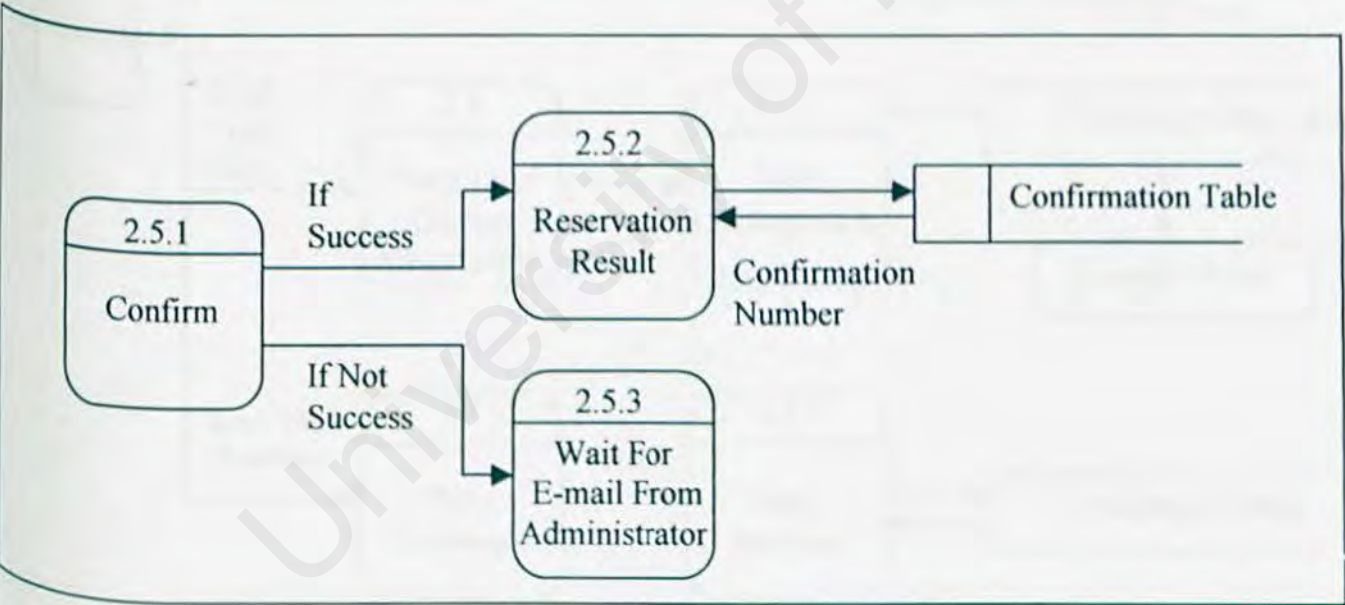


Figure 4.8: Data Flow Diagram for Corfirmation (User Section)

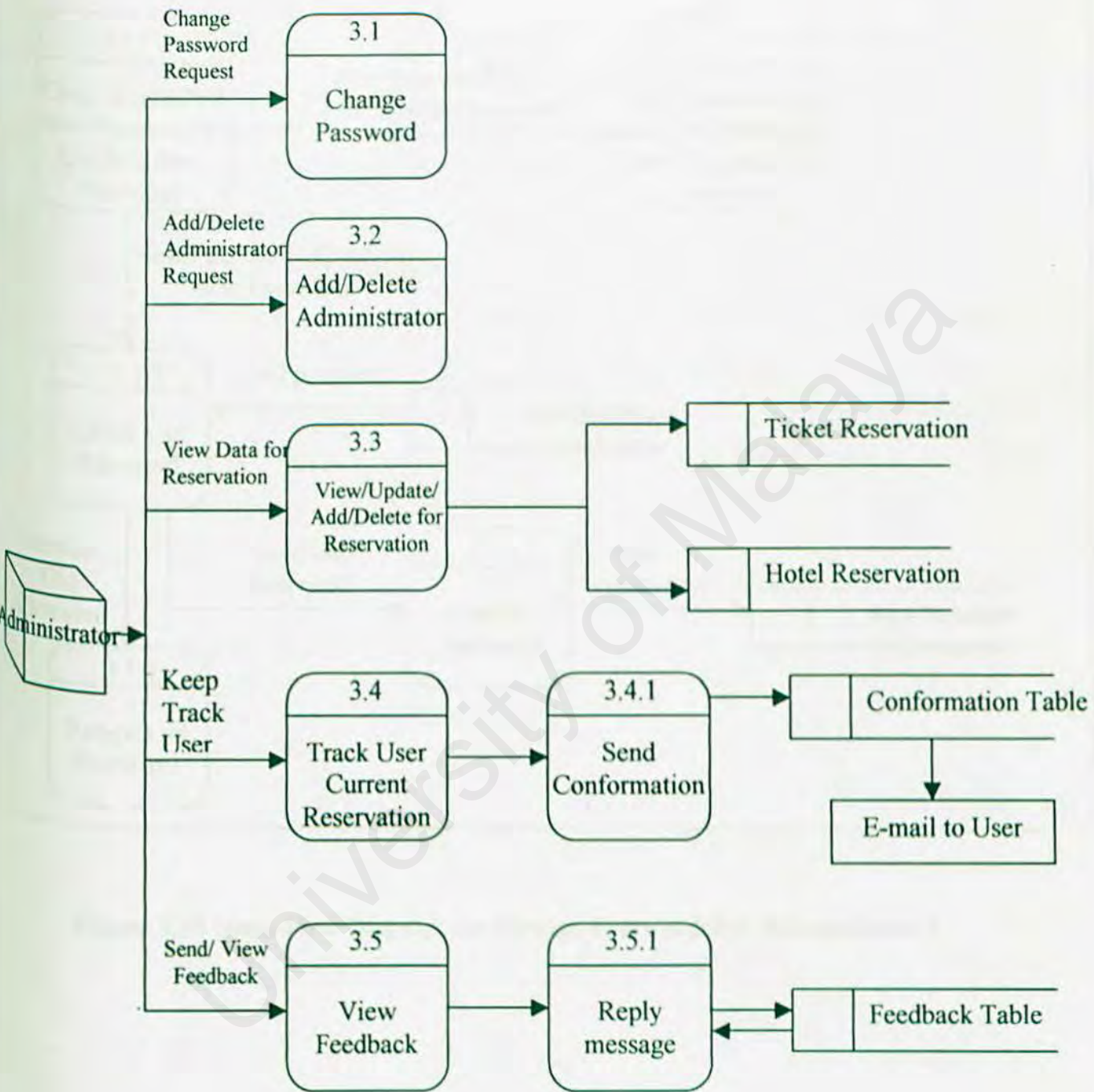


Figure 4.9 :Data Flow Diagram for Administrator Section

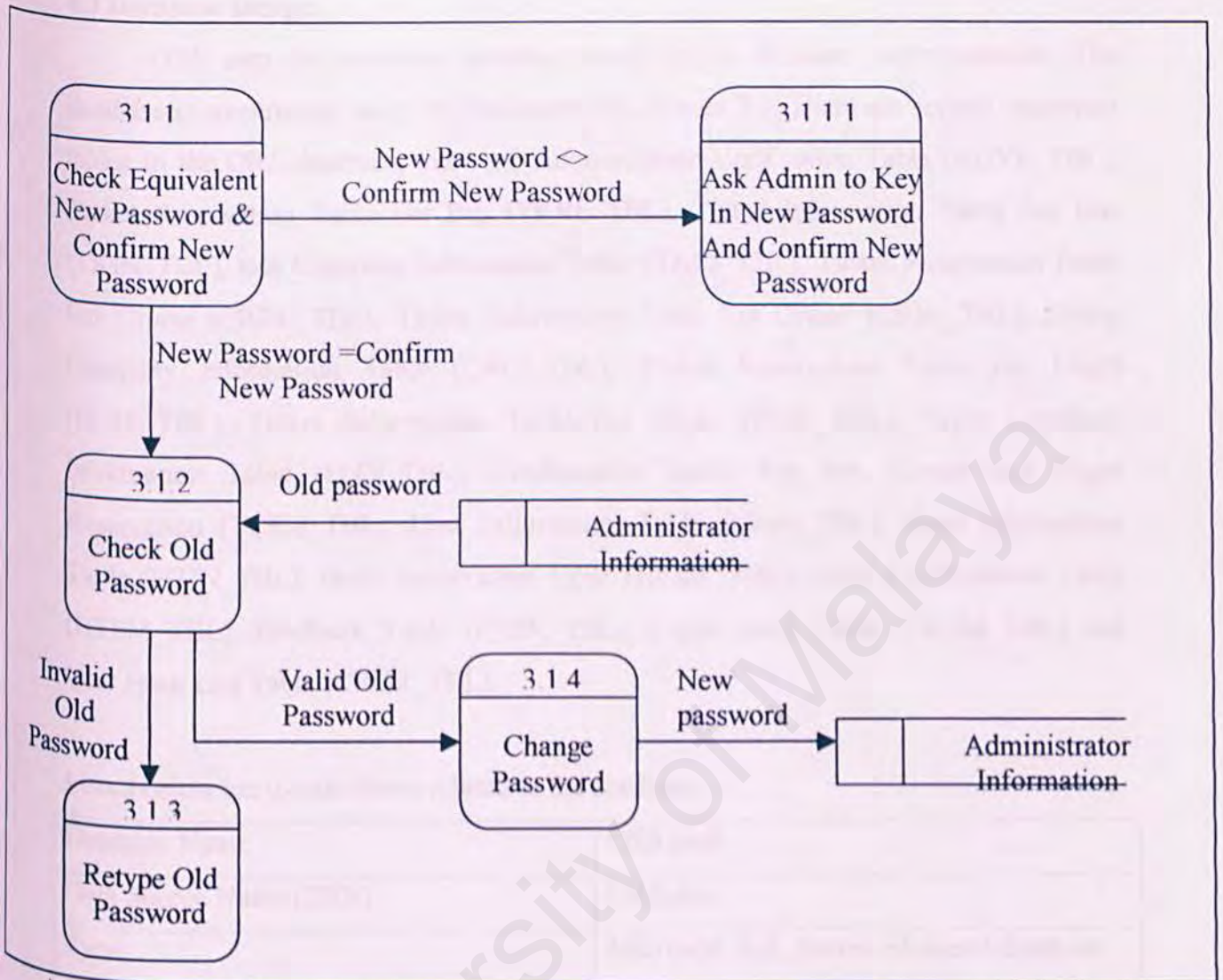


Figure 4.10 :Data Flow Diagram for Change Password(For Administrator)

4.3 Database Design

ORS uses the relational database model in its database implementation. The database is constructed using the Microsoft SQL Server 7.0. There are several important tables in the ORS database, there are Administrator Verification Table (ADVE_TBL), Ticket Reservation Table For Bus (TKRE_TBL), Ticket Information Table For Bus (TKIN_TBL), Bus Company Information Table (TKCI_TBL), Ticket Reservation Table For Cruise (CRRE_TBL), Ticket Information Table For Cruise (CRIN_TBL), Cruise Company Information Table (CRCI_TBL), Ticket Reservation Table For Flight (FLRE_TBL), Ticket Information Table For Flight (FLIN_TBL), Flight Company Information Table (FLCI_TBL), Confirmation Table For Bus, Cruise and Flight Reservation (TCFM_TBL), User Information Table (URIN_TBL), Hotel Information Table (HTIN_TBL), Hotel Reservation Table (HTRE_TBL), Hotel Confirmation Table (HTFM_TBL), Feedback Table (FEBK_TBL), Credit Card Table (CRCM_TBL) and User Error Log Table (URER_TBL).

Listed below are the attributes related to the database.

Database Name	OSR.mdf
Data Source Name (DSN)	ORS.dsn
Type	Microsoft SQL Server relational database
Usage	Keeps the records of the system
Number of Tables	18

Table 4.1: ORS Database General Profile

4.3.1 Data Dictionary

The tables used in ORS database are:

4.3.1.1 Administrator Verification (ADVE_TBL)

Table 4.2 stores the personal detail for the administrator. The primary key is ADVE_USRID.

Field name	Data Type	Length	Description
ADVE_USRID	Nvarchar	20	Administrator Identification
ADVE_PWORD	Nvarchar	20	Administrator Password
ADVE_USRNM	Nvarchar	50	Administrator Name
ADVE_LUPDT	Smalldatetime	4	Last Update Time
ADVE_QUEST	Nvarchar	50	Question to Ask When Admin Forget Password
ADVE_ANSW	Nvarchar	50	Answer to Admin When Forget Password
ADVE_ICNB	Nvarchar	20	Administrator IC Number
ADVE_POSTI	Nvarchar	50	Administrator Position in Company
ADVE_HADDR	Nvarchar	100	Home Address
ADVE_CITY	Nvarchar	35	City Live In
ADVE_STATE	Nvarchar	35	State For City
ADVE_PCODE	Nvarchar	20	Postcode For City
ADVE_PHONE	Nvarchar	10	Home Phone Number
ADVE_MPHONE	Nvarchar	10	Admin Hand Phone Number
ADVE_EMAIL	Nvarchar	50	Admin Email Address

Table 4.2 Administrator Verification Table

4.3.1.2 Ticket Reservation Table For Bus (TKRE_TBL)

Table 4.3 stores the information of bus ticket booking by the user. The primary key for this table is TKRE_AUTO.

Field name	Data Type	Length	Description
TKRE_AUTO	Nvarchar	10	Bus Ticket Reservation Temporary Confirmation Number
TKRE_USER	Nvarchar	50	User Name
TKRE_USRID	Nvarchar	20	User ID
TKRE_COMPID	Nvarchar	20	Bus Company ID
TKRE_COMP	Nvarchar	50	Bus Company Name
TKRE_DEPT	Nvarchar	35	Departure Place
TKRE_ARRIV	Nvarchar	35	Arrival Place
TKRE_DDATE	Nvarchar	30	Departure Date
TKRE_DTIME	Nvarchar	30	Departure Time
TKRE_BDATE	Nvarchar	30	Date for Booking Reservation
TKRE_PAYM	Float	8	Payment for The Ticket
TKRE_TRANS	Ntext	16	Transportation Type
TKRE_SITCL	Ntext	16	Passenger Sitting Class
TKRE_PCHILD	Int	4	Children Passenger
TKRE_PADULT	Int	4	Adult Passenger
TKRE_PSENIOR	Int	4	Senior Passenger
TKRE_TPSSENG	Int	4	Total Amount of Passengers
TKRE_TPAYM	Float	8	Total Payment

Table 4.3: Ticket Reservation Table For Bus

4.3.1.3 Ticket Information Table For Bus (TKIN_TBL)

Table 4.4 stores the information for the bus ticket reservation that available.

Field name	Data Type	Length	Description
TKIN_IDEN	Nvarchar	10	Bus Agency Identification
TKIN_COMP	Nvarchar	50	Bus Agency Name
TKIN_DEPT	Nvarchar	35	Departure Place
TKIN_ARRIV	Nvarchar	35	Arrival Place
TKIN_PRICEE	Float	8	Price For Ticket In Economy Class
TKIN_PRICEB	Float	8	Price For Ticket In Business Class
TKIN_DTIME	Nvarchar	30	Departure Time
TKIN_ETIME	Nvarchar	30	Arrival Time

Table 4.4: Ticket Information Table For Bus

4.3.1.4 Bus Company Information Table (TKCI_TBL)

Table 4.5 stores the information of the bus agency. The primary key for this table is TKCI_IDEN.

Field name	Data Type	Length	Description
TKCI_IDEN	Char	10	Bus Agency Identification
TKCI_COMP	Nvarchar	50	Bus Agency Name
TKCI_ADDR	Nvarchar	50	Bus Agency Address
TKCI_EMIL	Char	30	Bus Agency Email Address
TKCI_TEL1	Char	15	Main Telephone number of Bus Agency
TKCI_TEL2	Char	15	Other Telephone number of Bus Agency
TKCI_FAX	Char	15	Fax Number of Bus Agency

Table 4.5: Bus Company Information Table

4.3.1.5 Ticket Reservation Table For Cruise (CRRE_TBL)

Table 4.6 stores the information of cruise ticket booking by the user. The primary key for this table is CRRE_AUTO.

Field name	Data Type	Length	Description
CRRE_AUTO	Nvarchar	10	Cruise Ticket Reservation Temporary Confirmation Number
CRRE_USER	Nvarchar	50	User Name
CRRE_USRID	Nvarchar	20	User ID
CRRE_COMPID	Nvarchar	20	Cruise Company ID
CRRE_COMP	Nvarchar	50	Cruise Company Name
CRRE_DEPT	Nvarchar	35	Departure Place
CRRE_ARRIV	Nvarchar	35	Arrival Place
CRRE_DDATE	Nvarchar	30	Departure Date
CRRE_DTIME	Nvarchar	30	Departure Time
CRRE_BDATE	Nvarchar	30	Date for Booking Reservation
CRRE_PAYM	Float	8	Payment for The Ticket
CRRE_TRANS	Ntext	16	Transportation Type
CRRE_SITCL	Ntext	16	Passenger Sitting Class
CRRE_PCHILD	Int	4	Children Passenger
CRRE_PADULT	Int	4	Adult Passenger
CRRE_PSENIOR	Int	4	Senior Passenger
CRRE_TPSSENG	Int	4	Total Amount of Passengers
CRRE_TPAYM	Float	8	Total Payment

Table 4.6: Ticket Reservation Table For Cruise

4.3.1.6 Ticket Information Table For Cruise (CRIN_TBL)

Table 4.7 stores the information for the cruise ticket reservation that available.

Field name	Data Type	Length	Description
CRIN_IDEN	Nvarchar	10	Cruise Agency Identification
CRIN_COMP	Nvarchar	50	Cruise Agency Name
CRIN_DEPT	Nvarchar	35	Departure Place
CRIN_ARRIV	Nvarchar	35	Arrival Place
CRIN_PRICEE	Float	8	Price For Ticket In Economy Class
CRIN_PRICEB	Float	8	Price For Ticket In Business Class
CRIN_DTIME	Nvarchar	30	Departure Time
CRIN_ETIME	Nvarchar	30	Arrival Time

Table 4.7: Ticket Information Table For Cruise

4.3.1.7 Cruise Company Information Table (CRCI_TBL)

Table 4.8 stores the information of the cruise agency. The primary key for this table is CRCI_IDEN.

Field name	Data Type	Length	Description
CRCI_IDEN	Char	10	Cruise Agency Identification
CRCI_COMP	Nvarchar	50	Cruise Agency Name
CRCI_ADDR	Nvarchar	50	Cruise Agency Address
CRCI_EMIL	Char	30	Cruise Agency Email Address
CRCI_TEL1	Char	15	Main Telephone number of Cruise Agency
CRCI_TEL2	Char	15	Other Telephone number of Cruise Agency
CRCI_FAX	Char	15	Fax Number of Cruise Agency

Table 4.8: Cruise Company Information Table

4.3.1.8 Ticket Reservation Table For Flight (FLRE_TBL)

Table 4.9 stores the information of flight ticket booking by the user. The primary key for this table is FLRE_AUTO.

Field name	Data Type	Length	Description
FLRE_AUTO	Nvarchar	10	Flight Ticket Reservation Temporary Confirmation Number
FLRE_USER	Nvarchar	50	User Name
FLRE_USRID	Nvarchar	20	User ID
FLRE_COMPID	Nvarchar	20	Flight Company ID
FLRE_COMP	Nvarchar	50	Flight Company Name
FLRE_DEPT	Nvarchar	35	Departure Place
FLRE_ARRIV	Nvarchar	35	Arrival Place
FLRE_DDATE	Nvarchar	30	Departure Date
FLRE_DTIME	Nvarchar	30	Departure Time
FLRE_BDATE	Nvarchar	30	Date for Booking Reservation
FLRE_PAYM	Float	8	Payment for The Ticket
FLRE_TRANS	Ntext	16	Transportation Type
FLRE_SITCL	Ntext	16	Passenger Sitting Class
FLRE_PCHILD	Int	4	Children Passenger
FLRE_PADULT	Int	4	Adult Passenger
FLRE_PSENIOR	Int	4	Senior Passenger
FLRE_TPSSENG	Int	4	Total Amount of Passengers
FLRE_TPAYM	Float	8	Total Payment

Table 4.9: Ticket Reservation Table For Flight

4.3.1.9 Ticket Information Table For Flight (FLIN_TBL)

Table 4.10 stores the information for the flight ticket reservation that available.

Field name	Data Type	Length	Description
FLIN_IDEN	Nvarchar	10	Flight Agency Identification
FLIN_COMP	Nvarchar	50	Flight Agency Name
FLIN_DEPT	Nvarchar	35	Departure Place
FLIN_ARRIV	Nvarchar	35	Arrival Place
FLIN_PRICEE	Float	8	Price For Ticket In Economy Class
FLIN_PRICEB	Float	8	Price For Ticket In Business Class
FLIN_PRICEF	Float	8	Price For Ticket In First Class
FLIN_TYPE	Char	20	Type of Airplane
FLIN_DTIME	Nvarchar	30	Departure Time
FLIN_ETIME	Nvarchar	30	Arrival Time

Table 4.10: Ticket Information Table For Flight

4.3.1.10 Flight Company Information Table (FLCI_TBL)

Table 4.11 stores the information of the flight agency. The primary key for this table is FLCI_IDEN.

Field name	Data Type	Length	Description
FLCI_IDEN	Char	10	Flight Agency Identification
FLCI_COMP	Nvarchar	50	Flight Agency Name
FLCI_ADDR	Nvarchar	50	Flight Agency Address
FLCI_EMIL	Char	30	Flight Agency Email Address
FLCI_TEL1	Char	15	Main Telephone number of Flight Agency
FLCI_TEL2	Char	15	Other Telephone number of Flight Agency
FLCI_FAX	Char	15	Fax Number of Flight Agency

Table 4.11: Flight Company Information Table

4.3.1.11 Confirmation Table for Bus, Cruise and Flight Reservation (TCFM_TBL)

Table 4.12 stores the reservation of bus, cruise and flight ticket that has been confirmed by the administrator. The primary key is TCFM_AUTO.

Field name	Data Type	Length	Description
TCFM_AUTO	Nvarchar	10	Ticket Reservation Confirmation Number
TCFM_USER	Nvarchar	50	User Name
TCFM_USRID	Nvarchar	20	User ID
TCFM_COMPID	Nvarchar	20	Travel Agency ID
TCFM_COMP	Nvarchar	50	Travel Agency Name
TCFM_DEPT	Nvarchar	35	Place of Depart
TCFM_ARRIV	Nvarchar	35	Place of Arrive
TCFM_DDATE	Nvarchar	30	Departure Date
TCFM_DTIME	Nvarchar	30	Departure Time
TCFM_BDATE	Nvarchar	30	Date for Booking Reservation
TCFM_PAYM	Float	8	Payment for The Ticket
TCFM_TRANS	Ntext	16	Transportation Type
TCFM_SITCL	Ntext	16	Passenger Sitting Class
TCFM_PCHILD	Int	4	Children Passenger
TCFM_PADULT	Int	4	Adult Passenger
TCFM_PSENIOR	Int	4	Senior Passenger
TCFM_TPSSENG	Int	4	Total Amount of Passengers
TCFM_TPAYM	Float	8	Total Payment
TCFM_STINO	Nvarchar	10	Seat Number
TCFM_CRFNM	Nvarchar	20	Ticket Number That Will Be Verify By Travel Agency.
TCFM_TYPE	Nvarchar	20	Type Of Travel Such as Bus Travel, Cruise Travel or Flight Travel.

**Table 4.12: Confirmation Table Table for
Bus, Cruise and Flight Reservation**

4.3.1.12 User Information Table (URIN_TBL)

The user personal profile is stored in this relation. The primary key for this relation is field URIN_USRID

Field Name	Data Type	Length	Description
URIN_USRID	Nvarchar	20	USER IDENTIFICATION
URIN_PWORD	Nvarchar	20	UESR PASSWORD
URIN_NAME	Nvarchar	50	USER NAME
URIN_NEWIC	Nvarchar	15	NEW IC NUMBER
URIN_CADD	Nvarchar	100	CURRENT ADDRESS
URIN_CPCD	Nvarchar	16	CURRENT POST CODE
URIN_CCITY	Nvarchar	35	CURRENT CITY
URIN_CSTE	Nvarchar	35	CURRENT STATE
URIN_CTELN	Nvarchar	10	CURRENT TELEPHONE NUMBER
URIN_MTELN	Nvarchar	10	CURRENT TELEPHONE NUMBER
URIN_CNTRY	Nvarchar	30	COUNTRY
URIN_GENDR	Nvarchar	6	SEX
URIN_EMAIL	Nvarchar	65	EMAIL ADDRESS
URIN_JOIN	smalldatetime	4	DATE OF SIGNING UP
URIN_LUPDT	smalldatetime	4	LAST UPDATE DATE
URIN_SQUES	Nvarchar	65	USE TO RETRIVE PASSWORD
URIN_SANSW	Nvarchar	65	ANSWER TO RETRIVE PASSWORD

Table 4.13: User Information Table

4.3.1.13 Hotel Information Table (HTIN_TBL)

This relation stores the information about a hotel. The primary key for this relation is HTIN_IDEN.

Field Name	Data Type	Length	Description
HTIN_IDEN	Nvarchar	50	HOTEL IDENTIFICATION
HTIN_NAME	Nvarchar	50	HOTEL NAME
HTIN_ADDR	Nvarchar	500	HOTEL ADDRESS
HTIN_DESC	Nvarchar	500	HOTEL DESCRIPTION
HTIN_STAR	Int	4	HOTEL STAR RATING
HTIN_LOCAT	Nvarchar	50	HOTEL LOCATION
HTIN_DEPRC	Float	8	DELUXE ROOM PRICE
HTIN_STPRC	Float	8	STANDARD ROOM PRICE
HTIN_SUPRC	Float	8	SUITE ROOM PRICE
HTIN_HLINK	Nvarchar	65	HOTEL LINK

Table 4.14: Hotel Information Table

4.3.1.14 Hotel Reservation Table (HTRE_TBL)

This relation stores the unconfirmed reservation make by the user. The primary key for this relation is HTRE_CONN.

Field Name	Data Type	Length	Description
HTRE_CONN	Nvarchar	10	HOTEL RESERVATION TEMPORARY CONFIRMATION NUMBER
HTRE_USRID	Nvarchar	20	USER ID
HTRE_CIDT	Datetime	8	CHECK IN DATE
HTRE_CODT	Datetime	8	CHECK OUT DATE
HTRE_REDT	Nvarchar	8	RESERVATION DATE
HTRE_IDEN	Nvarchar	50	HOTEL ID
HTRE_DEROM	Nvarchar	30	DELUXE ROOM PRICE

HTRE_TROOM	Smallint	2	TOTAL ROOM
HTRE_TGUES	Smallint	2	TOTAL QUEST
HTRE_PAYMT	Float	8	TOTAL PAYMENT
HTRE_SUROM	Nvarchar	30	SUITE ROOM PRICE
HTRE_STROM	Nvarchar	30	STANDARD ROOM PRICE
HTRE_LCANT	Nvarchar	30	LAST CANCEL TIME
HTRE_RPREF	Nvarchar	30	ROOM PREFERENCES
HTRE_BDTYP	Nvarchar	30	BED TYPE
HTRE_SMOKE	Nvarchar	30	SMOKING AREA
HTRE_ACCES	Nvarchar	30	ACCESIBLE
HTRE_CRIB	Nvarchar	30	CRIB
HTRE_EARLY	Nvarchar	30	EARLY CHECK IN
HTRE_FOAMP	Nvarchar	30	FOAM PILLOW
HTRE_ROAWY	Nvarchar	30	ROLLAWAY BED
HTRE_ROLOC	Nvarchar	30	ROOM LOCATION
HTRE_REUPD	Datetime	8	RESERVATION UPDATED DATE
HTRE_ADCHK	Int	4	ADMINISTRATOR CHECK FLAG

Table 4.15: Hotel Reservation Table

4.3.1.15 Hotel Confirmation Table (HTFM_TBL)

This relation stores the confirmation number for any reservation. The primary key for this relation is HCFM_CONN field.

Field Name	Data Type	Length	Description
HCFM_CONN	Nvarchar	10	HOTEL CONFIRMATION NUMBER
HCFM_USRID	Nvarchar	20	USER ID
HCFM_CIDT	smalldatetime	4	CHECK IN DATE

HCFM_CODT	smalldatetime	4	CHECK OUT DATE
HCFM_IDEN	Nvarchar	50	HOTEL ID
HCFM_DEROM	Nvarchar	30	NUMBER OF DELUXE ROOM
HCFM_SUROM	Nvarchar	30	NUMBER OF SUITE ROOM
HCFM_STROM	Nvarchar	30	NUMBER OF STANDARD ROOM
HCFM_TROOM	Int	4	TOTAL ROOM
HCFM_TGUES	Int	4	TOTAL GUEST
HCFM_RPREF	Nvarchar	30	ROOM PREFERENCES
HCFM_BDTYP	Nvarchar	30	BED TYPE
HCFM_SMOKE	Nvarchar	30	SMOKING AREA
HCFM_ACCES	Nvarchar	30	ACCESSIBLE
HCFM_CRIB	Nvarchar	30	CRIB
HCFM_EARLY	Nvarchar	30	EARLY CHECK IN
HCFM_FOAMP	Nvarchar	30	FOAM PILLOW
HCFM_ROAWY	Nvarchar	30	ROLLAWAY BED
HCFM_ROLOC	Nvarchar	30	ROOM LOCATION
HCFM_CONDT	smalldatetime	4	CONFIRMATION DATE
HCFM_ROOMNM	Nvarchar	50	ROOM NUMBER
HCFM_PAYMT	Float	8	TOTAL PAYMENT

Table 4.16: Hotel Confirmation Table

4.3.1.16 Feedback Table (FEBK_TBL)

This relation stores information about feedback/respond provided by the user/administrator. The primary key for this relation is FEBK_USRID.

Field Name	Data Type	Length	Description
FEBK_USRID	Nvarchar	20	USER IDENTIFICATION
FEBK_USCOM	Ntext	16	USER COMMENT
FEBK_CDATE	smalldatetime	4	COMMENT DATE
FEBK_AREPY	Ntext	16	ADMIN REPLY
FEBK_AREDA	smalldatetime	4	ADMIN REPLY DATE
FEBK_ADMID	Nvarchar	50	ADMIN ID
FEBK_RWEB	Nvarchar	10	COMMENT ON WEB
FEBK_RFACI	Nvarchar	50	COMMENT ON FACILITY
FEBK_RSERV	Nvarchar	50	COMMENT ON RESERVATION FUNCTION
FEBK_UPDCO	Int	4	ADMIN CHECK FLAG

Table 4.17: Feedback Table

4.3.1.17 Credit Card Table (CRCM_TBL)

This relation stores information about credit card detail provided by the user.

Field Name	Data Type	Length	Description
CRCM_COMNM	Nvarchar	50	CREDIT CARD COMPANY NAME
CRCM_CRNUM	Nvarchar	10	CREDIT CARD COMPANY RETURN NUMBER
CRCM_USRID	Nvarchar	20	USER ID
CRCM_DATE	Datetime	8	LAST UPDATE TIME
CRCM_PAYMT	Nvarchar	50	TOTAL PAYMENT

CRCM_CONN	Nvarchar	10	HOTEL/TICKET CONFIRMATION NUMBER
CRCM_JDATE	Datetime	8	DEPARTURE/CHECK IN DATE
CRCM_CRNM	Nvarchar	50	NAME ON CREDIT CARD
CRCM_RTYPE	Nvarchar	10	RESERVATION TYPE

Table 4.18: Credit Card Table**4.3.1.18 User Error Log Table (URER_TBL)**

This relation stores problem face by ORS user when they use ORS.

Field Name	Data Type	Length	Description
URER_USRID	Nvarchar	20	USER ID
URER_CONN	Nvarchar	10	CONFIRMATION NUMBER
URER_PRODS	Ntext	16	PROBLEM DESCRIPTION
URER_ERRDT	Datetime	8	ERROR LOG SUBMIT DATE
URER_ADRPL	Int	4	ADMINISTRATOR REPLY FLAG
URER_ADANS	Ntext	16	ADMINISTRATOR ANSWER
URER_AREDA	Datetime	8	ADMINISTRATOR REPLY DATE
URER_ADMID	Nvarchar	50	ADMINISTRATOR ID

Table 4.19: User Error Log Table

4.3.2 Relationship

A relationship is an association between entities (tables) in the database. There are three type of relationship:

- One : One
- One : Many
- Many : Many

The relationship of ORS database is as below:

4.3.2.1 User Information – Hotel / Ticket Reservation

- 1 : Many
- One user can make many reservations for tickets or hotels room.
- One ticket /hotel reservation can be given to one user.

4.3.2.2 Administrator Verification – Hotel / Ticket Information

- 1 : Many
- One administrator can get/manage many reservations information for tickets or hotels.
- Only one reservation information can manage by one administrator at once time.

4.3.2.3 User Information – Feedback Table

- 1 : Many
- One user can send many feedbacks
- One feedback just can send by one user.

4.3.2.4 Administrator Verification – Feedback Table

- Many: Many
- One administrator can reply many feedbacks to user.
- Many feedbacks from different administrator can receive by one user.

4.3.2.5 User Information – Confirmation Table

- 1 : 1
- One user can receive one confirmation result.
- One confirmation for reservation can send to one user.

4.3.2.6 Administrator Verification – Confirmation Table

- 1 : 1
- One administrator can confirm for one reservation result.
- One reservation result will confirm by one administrator.

4.4 User Interface Design

The quality of the system input determines the quality of the system output. Due to this, a good user interface design is a very important part for created an application that is user friendly and easy to use. A good interface should be intuition, interactive, interesting and user friendly. This friend approach is adopted by using mouse, buttons and simple language that is easy to understand. This will make the user more interesting and convenience when access to the web pages.

To design a good interface is not an easy task. The first step is to define the overall look with interesting icon and picture. Then some of the flow of data that the user will see or just see by the administrator will be determine. The navigator link also needed to provided on all of the pages to easy the user move between the different pages.

4.4.1 User Interface for ORS Web Page

When a user enters the ORS web page, the user will go into the main pages. The user will be asking to login before can make the further progress. If the user is not a member, the user will ask to register first. After he fills in a form and the record has been success keep in database, the user can login into as a member. The user will go to the user section and now they can view the reservation for the ticket and if they satisfy with the

time and price, they can book for the ticket. After the do the process, the will be inform to wait for two days for the administrator to make a confirmation for they reservation.

For the administrator, they can login as a administrator agent. They jobs is manage the database, give feedback maintenance and manage the reservation process.

Below is some of the simple interface for ORS:



Figure 4.11: Main Pages of ORS

BEING RELIABLE, TRUSTWORTHY, COMMITTED & CARING!

Welcome to Online Reservation (ORS)

Existing ORS Users, Please enter your ORS ID and Password to sign in

ORS User ID :

Password :

Login

[Why Use ORS?](#) [Tell Me More](#)

[Sign Me Up?](#) [Forgot Your Password?](#)

[About Us](#) · [Help/FAQS](#)

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Figure 4.12: User Login in ORS

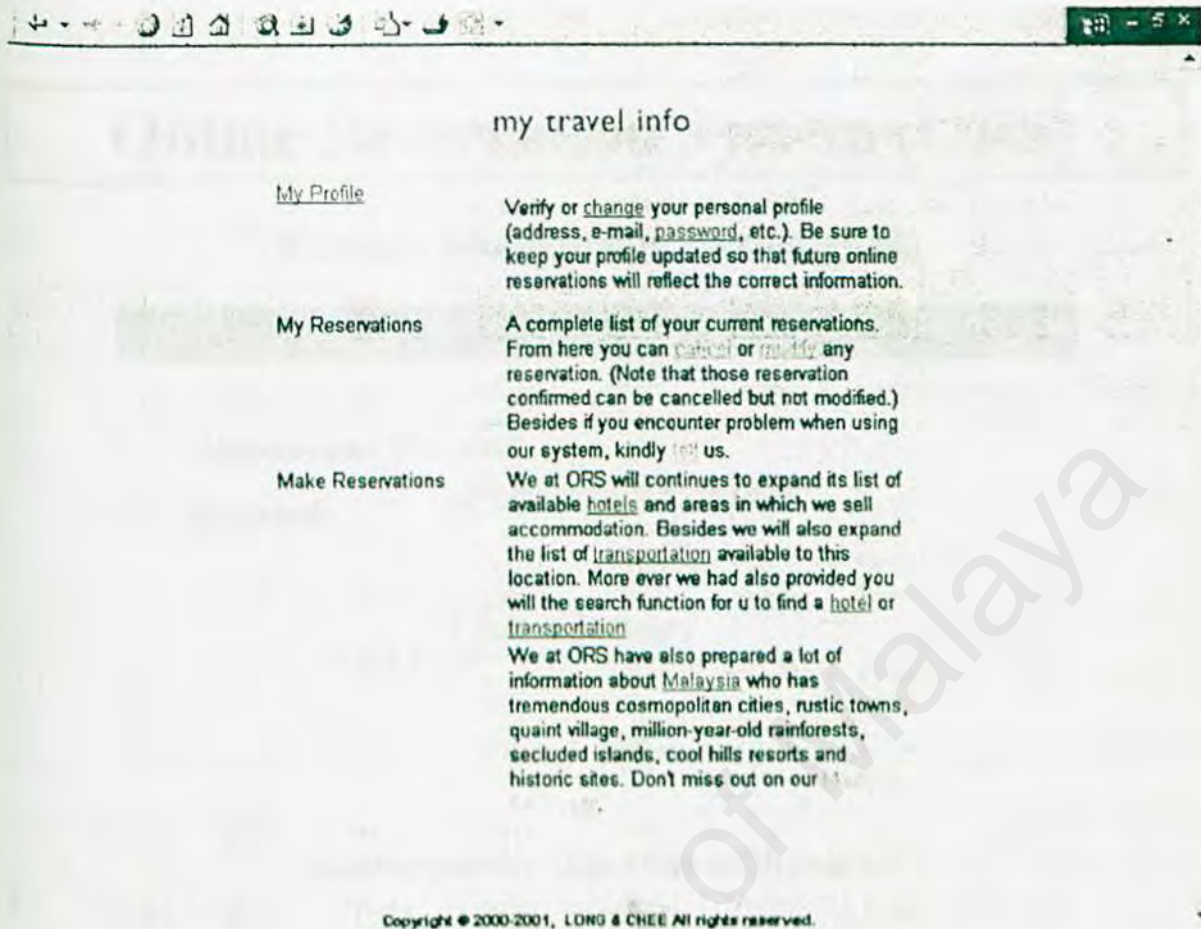


Figure 4.13: User Section in ORS

Online Reservation System (ORS)

Welcome Administrator, Please Log In!

Login to ORS

Administrator ID:
Password:

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Figure 4.14: Administrator Login in ORS

Reference:

[SADM] = 5th Edition, System analysis and design methods, Jeffrey L. Whitten Lonnie D. Bentley Kevin C. Dittman

CHAPTER 5: SYSTEM DEVELOPMENT & IMPLEMENTATION

5.1 Introduction to System Development and Implementation

System development and implementation is a process that converts the system requirements and designs into program codes. The process of coding is started in this phase where it took most of the time in development this system. In order to achieve the requirements for the system, the appropriate tools and language are needed to code the program. This section will describes briefly about the processes and technique of transfers the system design into workable modules and programming codes, and finally setting up the system in the same environment where it will be used.

5.2 Development Environment

The development environment has certain impact on the development of the system. Using the suitable tools will not only help to speed up the system development, but it also determines the success of the project. This is an important phase and developer must be very careful. Any error or mistake in this phase will affect the performance of whole system. There are three essential configuration in the to reduce the mistakes and increase the quality and performance, the following steps must be considered when develop a system:

1. Development strategy
2. Development platform configuration
3. Development technique

5.2.1 Development Strategy

In consider the development strategies, a few methods have been studied. Finally, the module approach has been chosen to apply into this system development phase. In this system, each module such as ticket reservation module or hotel reservation module does a different and separate function and the relationship between modules are looser compare to the components in the module. Therefore, the module approach is suitable to be use during the development phase. ORS was developed modularly using the top-down

approach that involves building the high-level software modules that are refined into functions and procedures

The development steps used to develop this system are:

1. A Home or Main page of the system will be developed first where all the services are called through it;
2. Develop an independent module on its own, such in bus, cruise and also flight reservation. Each sub module or internal level in the module will be develop first and then slowly move to the outer level of the module;
3. Testing each the module following the sequence as describe in the data flow diagram;
4. Repeat step 2 and step 3 for another modules until all modules have been created.
5. Integrate all of the modules and carry out the integration testing;
6. System level implementation;
7. System testing;
8. System evaluation.

5.2.2 Development Platform Configuration

Procuring suitable hardware and software will help to speed up the development. There are two essential configurations in the development process as below:

5.2.2.1 Hardware Requirement and Configuration

The hardware used to development the system are as listed below:

- 500MHz Pentium Processor
- 128MB RAM
- 10.0GB HardDisk
- 512K Pipeline Burst Cache
- Other standard desktop PC components

5.2.2.2 Software Requirement and Configuration

During the development of ORS, a vast array of software tools was used. Table 5.1 below depicts the software used to develop the system.

Software	Purpose	Description
Microsoft Windows 2000 Professional	System Requirement	Operating System (OS)
Internet Information Server 5.0	System Requirement	Web Server Host
Microsoft Visual Interdev	System Development	Method for Coding the web pages
Microsoft FrontPage	System Development	Web page design
Internet Explorer 5.0	System Development	Viewing the web pages
Active Server Pages	System Development	Coding the web pages
Hyper Text Markup Language (HTML)	System Development	Coding the web pages
Microsoft SQL Server 7.0	Database	Build and store the database and manipulate the data
Dream weaver 3.0	User Interface Design	Image design and creation
Adobe Photoshop 6.0	User Interface Design	Image design and creation
Xara3D4	User Interface Design	Image design and creation

Table 5.1 Development Software Requirements /Software Tools Used

5.2.3 Development Technique

This section explains the technique and strategy that are applied in the actual developments. It consists of four aspects:

- Application and Web page Development
- Database Design
- Prototyping
- Debugging

5.2.3.1 Application & WebPages Development

5.2.3.1.1 Web Pages Coding

The programming language chosen to do the application system in ORS is using ASP programming. Active Server Page is primarily a scripting environment. Language used to develop an ASP is HTML, VBScript and also Jscript. The Microsoft Front Pages, Macromedia Dreamviewer and Microsoft Visual Interdev are chosen to design the interface and also use to write the coding for the applications for ORS system.

There is a bit different when develop the on-line part. As mention in the early chapter, the main tools chosen for the web development are; Microsoft Visual Interdev, Microsoft FrontPage and the Internet Explorer5.0. The application is designed with platform-independence in mind. The page interface is first design using the Microsoft FrontPage. Then, coding or scripts are added to the page by using the Visual Interdev. When the coding is done, the page is view by browse it through the Internet Explorer. If any mistake or error is detected, changes are immediately made and the document will be test again and again until no mistake is detected. Beside that, other supporting tools such as Adobe Photoshop are used in order to make the interface more attractive.

Normally, the scripting language used by the ASP application is specified by using the statement `<%@ LANGUAGE = "VBSCRIPT"%>`. Usually this statement is placed at the beginning of the ASP application. The LANGUAGE keyword can be set equal to any supported scripting language, such as Jscript. For client-side scripting, they must be delimited by the `<SCRIPT LANGUAGE = "VBSCRIPT"> ...</SCRIPT>` tags. On the other hand, server-side scripting requires the RUNAT attribute set to Server so that the script should be executed on the server rather than the client (browser).

ASP subroutines can be also be placed directly in the server-side code between the `<%` and `%>` delimiters. Preparation of a HTML and ASP document involves endless cycle of testing and modifying of the ASP source codes, loading the file in the browser for viewing and validating and then going back to make further changes where necessary.

5.2.3.1.2 Database Design

Database design is the most critical and important part in a system. It plays an important role during the development and also for future enhancement and customization. A proper design database will ease the development and customization process.

The database for this system is using the Microsoft SQL 7.0. The referential integrity option is enabled to allow cascading update and delete for the database. This can prevent the database accuracy and integrity. The ActiveX Data Object (ADO) is used to store and retrieve the data. ADO is a group of objects designed to provide a simple programming interface to databases. In order to connect to the database, a connection string has been created with the file name call 'connection.asp'. All communication with a database takes place through an open connection. Before any information can be inserted into or retrieved from a database, a connection with the database must be opened. The ADO Connection object serves the purpose. Below are a few steps to follow in order to open a database connection.

- 1) Create an instance of the Connection object to open a connection with the database
- 2) Call the open method of the Connection object to actually open the connection

Below is an example:

```
<%
```

```
Dim strConn
```

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

```
strConn.Open "provider=SQLOLEDB;" & "Initial Catalog= ORS;" & "user ID=sa;" &  
_ "password=;"
```

```
...
```

```
...
```

```
objConn.Close
```

```
%>
```

5.2.3.1.3 Debugging

Debugging is an activity to finding and fixing the bugs in the system. If a program doesn't have any error, it didn't mean that it is free of bugs. Therefore, programmer needs to carry out this debugging or trouble shooting process to eliminate these bugs. Debugging is considered as the most boring process during the development phase.

There are various types of errors that exist in the system; compile error, run-time error and logic error. When handling logical error, it is important to insert temporary debugging codes at certain intervals to track movement of the program and return values of key variables in strategic location inside the program.

CHAPTER 6: SYSTEM TESTING

6.1 Introduction to System Testing

Testing is a critical step in assuring the quality of the developed system and is representing the ultimate review of specification, design and coding. Testing is performed to ensure that the programs are executed correctly and conforms to the requirement specified. It also provides a method to correct logic error and testing the system reliability.

Testing of a system does not actually come at the end of the system development, but should be carried out during the development phase. The main purpose of the testing include the objective as below:

1. Testing is a process of executing a program with the intent of finding an error.
2. Tent to reveal different types of error with a minimum amount of time and efforts.
3. To checks that the system perform its functions as specified in the requirement.
4. To assure the customers that the system they requested is the system that was built for them.
5. To allow users to exercise system functions and document additional problems that result from being at the actual site.

After study the objectives of the testing process, the conclusion is that a successful testing will result a system with no errors and bugs and also can fulfill the requirement of the users and customers. The system as a working whole must also be tested. This includes testing the interfaces between subsystems, the correctness of the output, and the usefulness and understandability of system documentation and output.

Four types of testing are being used for the ORS system, it include unit testing, integration testing and system testing.

6.2 Unit Testing

Unit testing is focuses on verification effort on the smallest components of the system design. Each component is treated as a stand-alone entity and is tested individually to ensure that they operate correctly. This means in unit testing, the most basic units of the system – the individual modules are tested. The sub functions and input forms are verified and the flow from form to form is tested first. It is following by the testing of the relation between pages and shared-data integrity. The main objective of unit testing is to ensure program accuracy, data integrity, usability and efficiency at the module level.

The unit testing carried out involved:

- Testing the interface to ensure that information flows properly into and out of each program unit.
- Testing boundary conditions to ensure each component is operating correctly at the boundary values
- Make sure that all independent paths in a control structure are tested at least once.
- Testing of all error handling paths.

The test cases, which will be built, are used to test some important aspects of the system such as the interface, local data structure, output of the program, boundary conditions and also the error handling paths.

6.2.1 Conclusion of Unit Testing

Unit testing is a continuous process, which has been done during the coding and development phase. To ensure that the output and the logic and process flow make the unit or module satisfy the user requirement, it must be carried along this phase. After carried out the unit testing, a lot of logic errors, data structure faults, input validation and unexpected output have been found in ORS. These errors and faults need to be solve before proceed to the integration testing process.

As the conclusion, some modification has been carried out in order to fix these errors and upgrade the functionality of this system, such as new control functions had

been inserted into the program in order to control the input and output value of the program, for example the error checking function has been done for every form to prevent the unsuitable data type store in database and so on.

6.3 Integration Testing

After the all the modules were satisfied the requirements, the integration testing will be carry on. Integration testing is a systematic technique for constructing the program structure while at the same time conducting test to uncover errors associated with interfacing.

The objective of integration testing is to take unit-tested modules to build a program structure that has been dictated by design. This testing will ensure that the interface such as the module calling sequence in ORS are systematized and link to the correct document. In ORS, an increment integration strategy approach is used. ORS main system is constructed and tested in small segments, where errors are easier to isolate and correct.

When satisfied that individual components or modules are working correctly and meet the system objective during the unit testing, these modules then combined into a working system. While several independent modules combined into a single system, it will cause some unpredicted and unexpected errors that related to the integration of these modules. So, integration testing is a systematic approach for constructing the application while conducting tests to uncover errors associated with interfacing of different components or modules.

There are many approaches that can be used to do the integration testing. Such as Bottom-Up Integration, Top-Down Integration, Big-Bang Integration, and Sandwich Integration. For this system, the bottom-up approach has been used. When this method is used, each component or module at the lowest level of the system hierarchy is tested individual first. Then, the next components to be tested are those that call the previously tested ones. This approach is followed repeatedly until all components or modules are included in the testing.

The objective is to ensure that the different unit-tested modules in ORS System can function smoothly together to the exaction of the system requirements. The major concerns here are the shared data, user privilege and security.

After finished the integration test, those errors and faults discovered should be corrected as soon as possible in development in order to proceed to the system-testing phase.

6.4 System Testing

After complete all the modules, the entire system must now be validated. This validation is done by carry out the system testing process. System testing is actually a series of different test which primary purpose is to fully exercise the computer-based system. This will ensure that the system is functioning well under a larger system and all the elements have been integrated and perform the functions required without any error. Testing the whole system is very different from unit and integration testing. When doing the system testing process, the major different compare to unit and integration testing is that we need to work with the entire environment of the system such as the hardware, software, databases and computer systems.

The objective of system testing is to verify and validate the functional and non-functional requirements of the system. The functional and non-functional requirements of ORS are as defined in chapter 3. Several types of system testing that can be used to test a software system, but in this system several types of system testing are carrying out:

6.4.1 Function Testing

Function testing focus on the functionality of the system. It is based on the system functional requirement and it checks that the integrated system perform it functions as specified in the requirement.

6.4.2 Security Testing

This test is to ensure that the security requirements are fulfill. This includes testing the system characteristic related to availability, integrity and

confidentially of data and services and protect the system from improper penetration.

6.4.3 Performance Testing

This testing usually involved the hardware as well as software perform in the system. When the system performs the function required by the requirements, the testing process then turn to test the way in which those functions are performed. Thus, the performance testing addresses the non-functional requirements. The purpose of this testing is to test the run time performance of this software within the context of an integrated system.

6.4.4 Acceptance Testing

This is one of the stages in the testing process before the system is accepted for operational use. The system is tested with data supplied by the system producer rather than simulated test data. Sometime, this testing is called as alpha testing and this testing process continue until the system developer and client agree that the delivered ORS system is an acceptance implementation of the system requirements.

6.4.5 Summary Of User Testing

The purpose of the testing activity is to find out unexpected errors and bugs in the system. By performed this testing, developer can get some useful advices and suggestions from the end user to upgrade the performance of the system. After perform this system testing, a lot of useful information has been gained. This information is very useful and helpful when performing the system upgrade process and mistake or bugs checking process. Bellow is a brief summary by the given end user during the system testing process.

1. A nice and interactive user interface must be use to attract the user and they won't feel bored using this system. Some colorful icon and picture can be insert to make the interface look nicely.
2. A help file must be creating to help the user when using this system. It will reduce the mistake or error cause by the unskillful user.
3. Try to avoid lot of fields need to key in when issue some document because this can increase the user workload. More selection features such as drop down list, lookup form need to provide in order to ease the data entry process.

CHAPTER 7: SYSTEM EVALUATION

7.1 Introduction To System Evaluation

This is the final phase in the project life cycle. During the early period of unit testing and system implementation testing, various problems were encountered. This chapter will highlight some of the problems faced throughout the project duration and solution to solve the problems. Besides that, this chapter also will include the evaluation of the system to identify its strengths and limitations. As suggestion to further improvement of this system, the possibility to enhance the system also explored.

7.2 Project Problems and Solutions

7.2.1 Problems and Solutions during Project Studies and Analysis

Before starting to develop ORS, a lot of system analyses need to be done on technologies and programming concepts. The basic knowledge needed as a foundation in building an application of this nature involves studies in fields such as the Internet, Information systems and some basic registration procedures. The following are some of the major problem encountered from beginning to the completion of the system development.

7.2.1.1 Difficulties in Choosing a Development Technology, Programming Language and Tools

In the software development cycle, choosing the suitable development tools and method is the most important and critical part. There are many software tools available to develop a web based database system currently as stated in the earlier chapters. Each of the different technology and tool has their strengths and weaknesses. In addition, the availability of the required tool for development was also a major consideration. A tough decision was needed to choose from Active Server Page technology, Lotus Notes, CGI or Java. In order to solve this problem, seeking advises and views from project supervisor, course mates and even seniors engaging in similar project were carried out. Furthermore, surfing the Internet and visiting the library to get the extra information will help a lot to clarify some doubts.

7.2.1.2 Lack of knowledge and experience in the web development

One of the very common problems that face by each developer is the lack of experience or knowledge in developing web application. This lack of experience and knowledge has proved to be an obstacle in the beginning. The developer has struggled to understand the concepts of web programming and application and differentiate them from the conventional programming concepts to which he is more accustomed.

Putting a lot of hard work and asking advice from course mate who are using the same tools can solve this problem. There are also have abundant reference materials available for the developer on the subject. This is especially true for the ASP (which currently using in this project). Therefore, this problem only proved to be slight delay in the schedule with several weeks with little progress. After the knowledge and skills has been familiarized, everything went on rather smoothly.

7.2.1.3 Handling New Operating System

Choosing the Windows 2000 Professional for the operating system is a brilliant choice, because this operating system is capable of doing web base programming especially the features of Internet Information Services 5.0.

7.2.1.4 Determining Scope of the System

It is impossible to build a full-scale complete system within the time given frame. ORS include normal user and administrator section. It is a huge program. Inexperience with the current reservation system available was another hindrance to implement true workable reservation system. Many discussions were held with project supervisor to outline the scope of project to be built during the initial stages of the project. After the scope has been defined, analysis of current reservation system was as reported in chapter two.

7.2.1.5 Inexperience in the Chosen Programming Language

Since there was no prior knowledge in ASP and HTML, there was an uncertainty on how to organize the codes in the web page. These programming languages and

concepts were never taught before and to implement such an application requires a fair grasp of the language. Although it took time to learn the new technology, but choosing to program in ASP proved to be wise move. Most of the problems faced were manageable through surfing the Internet for related materials and referring to the reference book available in the market. Discussion with friends using the same technology was a great help. A more efficient was through trial and error during the coding phase.

7.3 System Strength

During the analysis and development of this project, several strengths that achieve the objective were identified, there are:

7.3.1 Security for User ID and Password

ORS is password-protected by the session-based authentication. By giving authorize user a username and password, unauthorized user are prohibited from accessing its records stored in the database. This is to make sure the system is secure for unauthorized users. Beside, some encryption function that has been done to make sure the user and admin password which store in the database won't be know by others.

7.3.2 Simple and User-friendly Interface

User Interface design in ORS is easy to understand and user friendly. The web pages are designed to suit a wide spectrum of user and also administrators to manage the system. The learning curve is foreseen to be short and the user should be able to use the system with ease within minutes. Beside, the user manual can help the user to handle this system.

7.3.3 Reliable System with Effective Error Recovery

This system provides the reliability to user because it caters for almost any possible errors encountered. Server side scripting is use tend to generate appropriate feedback to user when error occurs. For example, a password validation failure or a user username is handled by the system and a user-friendly message is generated informing the user about the type of error.

7.3.4 Able to provide database maintenance

Administrators are able to do housekeeping for database maintenance. They can add, delete, update, the records. Besides that, they also can keep track the records and view the reports. This feature allows administrators to views reservation make by the user and also make approval or reject the reservation.

7.3.5 Report Generating

ORS is able to generate report. Administrator can view their reports based on reservation make and result.

7.3.6 Provide easy to use functions and tools

ORS is user-friendly system seems it provides appropriate message to guide the users whenever they make mistakes. This will make sure that the datatype that store in the database is the valid value.

7.3.7 Easy Accessibility

This system is web-based application that using Internet Explorer 5.0 and can be accessed easily using the web browser.

7.3.8 Fast response time

Each web page is designed as simple as possible to allow fast loading. Large size graphical images are avoided. This consideration has also been taken into the scripting part where overhead of calling script are kept to a minimum. The data validations are also carried out at the client site to enhance fast response time.

7.3.9 Reliable processing

The programming logic applied in the program is well tested to ensure it accuracy and correctness. Data entry was verified and validated first before any updating carried out into the database to preserve the database integrity.

7.3.10 Integrate With Mailing Capabilities

The current system completed with a mail server services. With this mailing capability, the administrators can easily sending out confirmation email or to reply the user feedback or error log and others to user. It also helps the administrator to have a well communication with the user.

7.4 System Limitations

There are some limitations in ORS stated as below:

7.4.1 Browser Limitations

ORS can only run in Internet Explorer 4.0 and above. ORS requires a browser that can understand VBScript, the default supporting language for ASP. If the user uses browsers that do not support these features will not able to use the available function in this system.

7.4.2 Functional Limitations

Due to the time constraints, ORS does not reflect a real reservation scenario. At this stage only sufficient rules and procedures are implemented in the system. Some of the procedures such as automatic approving the user reservation, credit card authorization and other still need to be done manually. Administrators still need to keep track the problems with reservation approval and reservation rejection.

7.4.3 User Customized report

The customize functions provided by the system are not powerful enough. User has the limitation in choosing the type and style of report they preferred.

7.4.4 Limitation in Administration Tasks

The administration tasks provided by the system are very limit. Administrators still need to perform a lot of tasks manually such as database backup.

7.4.5 Payment Method for User

The payment procedure in ORS just can be manages by Credit card. This system will ask the user to input the valid credit card number before can proceed further. This causes a lot of inconvenient to the user if they don't have credit card.

7.5 Future Enhancement

Future enhancement can be done to make the system more advance and ease to use. A system development knows no boundaries as new requirements and better implementation method continue to arise and evolve. There are several enchantments that could extend the usability of the developed system.

7.5.1 Extent the ability of Browser

As stated, ORS requires IE4.0 and above for execution. In future, ORS can be turned to fulfill other browser requirements such as Netscape Navigator for execution. This is because Netscape has a sizeable share in the browser market besides Internet Explorer and it has a lot of users in the world.

7.5.2 More Administration Task

Administration task can be further enhanced to include more features to ease maintenance process. Among the features may be included are multiple user grouping according to access right, analytical tools, data mining and database backup.

7.5.3 Online Demonstration Help System

A complete ORS system is not complete without an online demonstration help file. Demonstration basis help system may also be incorporated to reduce the system learning curve to enhance usability among its users.

7.5.4 Attractive Homepage

ORS will become better publicized if its homepage is enhanced to be more attractive and interactive by adding more meaningful and user-friendly images, 3D images, animation images and sounds.

7.5.5 Other Language Support

A successful system is the system that can support more than one communication language. This system can be enhancing to include more than one language such as Chinese, Malay and so on to broaden the usage of the system. By having this multiple language function, it can be used by others countries with different national languages.

7.5.6 Enhancement for the Existing Reporting Module

The existing reporting module needed to enhance to provide more powerful function. It should have the function, which allows the user to customize the type and style of report they needed. This is include generate a full monthly report. Besides that, the users must be provided with the function, which enable them to save the reports in certain format or type of document file they want for further study or analysis.

CONCLUSION

Throughout the development of the ORS system, a lot of valuable knowledge and programming skill has been learned. This include the skill in develop the WebPages using Active Server Pages, programming in scripting language such as VBscript and Javascript, and also the knowledge to manage the database using the Micorsoft SQL Server 7.0. This experience of web development proved to be valuable since the era now is moving towards Internet Technology that requires decent knowledge in Internet programming and the knowledge in deploying network systems and functionality.

This project has achieved the goal and fulfills the requirements for a travel company to manage the selling for ticket in bus, cruise or flight travel and also provide the benefit in manage the accommodation to the user especially for the tourists.

Finally, this project has created wide opportunity for individual who is creative and innovative to further modify and tailor the system to individual need. The development tools and languages used have potential to grow further in the future as well.