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Perpustakaan SKTM

## **Online Home Finder System**

**TANG PING PING  
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## **Abstract**

The aim of proposed project is to develop a web-based system called Online Home Finder System. Day by day the burden of house for sale or rent advertisement under classified section in newspaper keeps on increasing and is quite hard and also quite wasting time for house seekers to find their house.

In this new era, internet grow rapidly and becoming an attractive advertising media for various sectors. HousingLane.com.my is among the successful online advertising locally from those four existing systems that I studied and analyzed. Quite similar to HousingLane.com.my concept in the sense to allow advertiser to place advertisement at website and the website would provide searchable database for targeted viewers.

This project draft which covered specifications for developing OHFS. Chapter 1 present introduction defines project overview, objectives, scope limitations, expected come project and the targeted users. The next chapter, Chapter 2 is discuss about the finding of literature review has been carried out earlier which include judgments and opinions on existing system that being studied and analyzed. Discuss various supporting tools and technologies that related to develop project also done in this chapter.

Chapter 3 is focusing in the discussion about the methodology will be implemented in system development process. It also discusses the reasons of selecting proposed methodology to a next deeper step.

For Chapter 4, it discuss about the various requirements analysis have been carried out in. Functional and non-functional requirements are completely documented in this

chapter. It also included the summary of tools and technologies chosen to develop system.

Chapter 5 are presents system design using various techniques such as context diagram, data flow diagram and flow diagram. It also include with database design and user interface design.

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### ACKNOWLEDGEMENTS

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# Chapter 1: Introduction

## 1.1 Project Overview

The motivation for me to choose this project is because I got two housemates were on the plan to buy a house and they need to consider many thing before buy the house. Few months ago, I joined them to have a look the house advertise at newspaper which located in Shah Alam. We visited two new housing area but both is not their choice. There is many thing need to be done during finding period and the most wasted time is following the location map and drive to that place just to have a look only. Thus, it did attract me to choose this project. I hope that I can built a system which multiple search functions, send alerts and let the communication among all the system user as convince and fast way for letting house seekers to find their ideal house.

According to Janice Reynolds (2004), there are eight basic website which is Brochureware Site, Online Store, Subscription Site, Advertising Site, Online or Cyber Mall, Business-to-Business Site, Auction Site, Weblog and Peer-to-Peer Site with its own unique characteristic. The basic website model that will be implemented on Online Home Finder System (OHFS) is an advertising site.

OHFS is a web based system which is developed to provide house for sale/rental advertising through the internet for better efficient, reliable and fast home seeking services to users. The conventional advertising process is not efficient, house sale or house rental need to put the advertisement on the newspaper. The processes involved for old kind of advertising method is started by submit the advertisement. Manually

advertisement submission is not quite convenient because home owner or home rental need to go to the newspaper office. After trap at traffic jam, he/she need to queue up at office waiting to go in advertising department of newspaper publisher. Then, request a form and fill in the content of advertisement. When payment for the advertisement has done then the advertisement procedure at property owner side has been finished. The following process is the manually editing and organized all the advertisement before send to printing department.

A burden of steps needs to do just to advertise an advertisement. So, why don't we utilize internet technology which can develop a website that the ability to handle advertisement submission and on-line fee payment transaction. It is a symbiosis beneficial for property owner and advertiser people. Owner can stay at home to submit their advertisement to website anywhere and anytime as long as internet access. Meanwhile, 24 hours services and broadly access by world will increase advertiser clients and their profits.

The aim for this system is easy, fast and paperless advertisement process. Just click on submit button on online form owner can advertise their property. Advertisement that submitted to websites form a huge database which provides valuable and useful information to help home seekers to find the most suitable and affordable property. Fully equipped browse search engine with variety search method will save a lot of time for browsing through site page by page. Allowing home seeker to join sale/rental alerts, users can specify their own criteria of their dream home they are seeking for such as location, type of house, price type house, number of rooms, facilities provided

and etc. Thus, when there is a house suit seekers requirements available in advertisements database, e-mail will be send to house seeker to notice them. This system has feature that can remind house seekers that the house they are looking for is available currently. So, that they do not need to spend time to keep track the required house continuously by their own.

The system allows website administrator to monitor and manage advertisement database and online fee transaction in a systematic manner. Highly secure site that only allow authenticated administrator access administrator modules. These modules enable administrator to edit advertisement's content and carry out transaction before activating and store advertisement in database. It is totally different with traditional advertising through newspaper; the system has a kind of automated process make the administrator job easier and faster. Besides that, professional editor did not need to re-type and re-edit advertisement before sending them to printing department. Advertisement dissemination through internet saves a lot of costs if compare with paper based advertisement through newspaper. Despite of lower operation cost, lower charges of advertising fee can be offered. There was no fear to have audience because potential readers are still as many as newspaper readers with advertisement that published online definitely can reach by public without geographical boundaries. Besides that, feedback, poll and forum provided indirectly will enable communication between user and system administrator.

As conclusion, this website plays a significant role for those who are dream to have their own home or rental home. Their dreams still can come true even if their future live location is far way from place they currently stay, particular other states. Provide

a safe way to make sure that they own a comfortable house to stay when arrival at new place.

## **1.2 Project Objective**

The objectives for develop the web based system to find a home electronically with following features:

1. Adopt traditional paper-based house advertising to online medium and promote it.
2. Act as an intermediary for providing house advertising services and searchable database enhanced with fast and efficient searching methods for house seekers.
3. Replace manually operated submission to fee payment transaction and advertisement dissemination to automated processes.
4. To reduce paper works and human error working.
5. To reduce time and effort needed for house owner to advertise house.
6. Minimize advertisement processing efforts by administrator support required in advertisement publication and dissemination.
7. Achieve competitive advantages from competitors by providing house advertising services in lower cost but more efficient way through online medium.
8. Utilize advancement of ICT to provide large scale online house advertising services.
9. To create an effective and user friendly interface that is easy to use.

### **1.3 Project Scope**

Online Home Finder System is divided into 3 sections. The first and second section considers users' scope that copes with services shall provide to end-users of the website. The third covered the system functionalities used by support staff or system administrator to process advertising submission, registration, credit card verifying, monitoring forum and etc.

#### **a) Universal User Scope (Include Authorized User)**

1. Allow house seekers to browse home finder websites.
2. Allow house seekers house for sales/rent.
3. Provide efficient searching method to facilitate house search and comparison to short listed house.
4. Allow users to calculate the loan.
5. Allow users to give feedback.
6. Allow house owner to register as member.

#### **b) Authorized User Scope**

1. Allow house owners or real estate companies to register themselves before they can place house sale/rental advertisement.
2. Allow house owners or real estate companies advertise house properties by filling up a form that gives description of the house being advertised. They can also attach house photo for preliminary viewing.
3. Allow house owners or real estate companies to pay their advertisement fee using

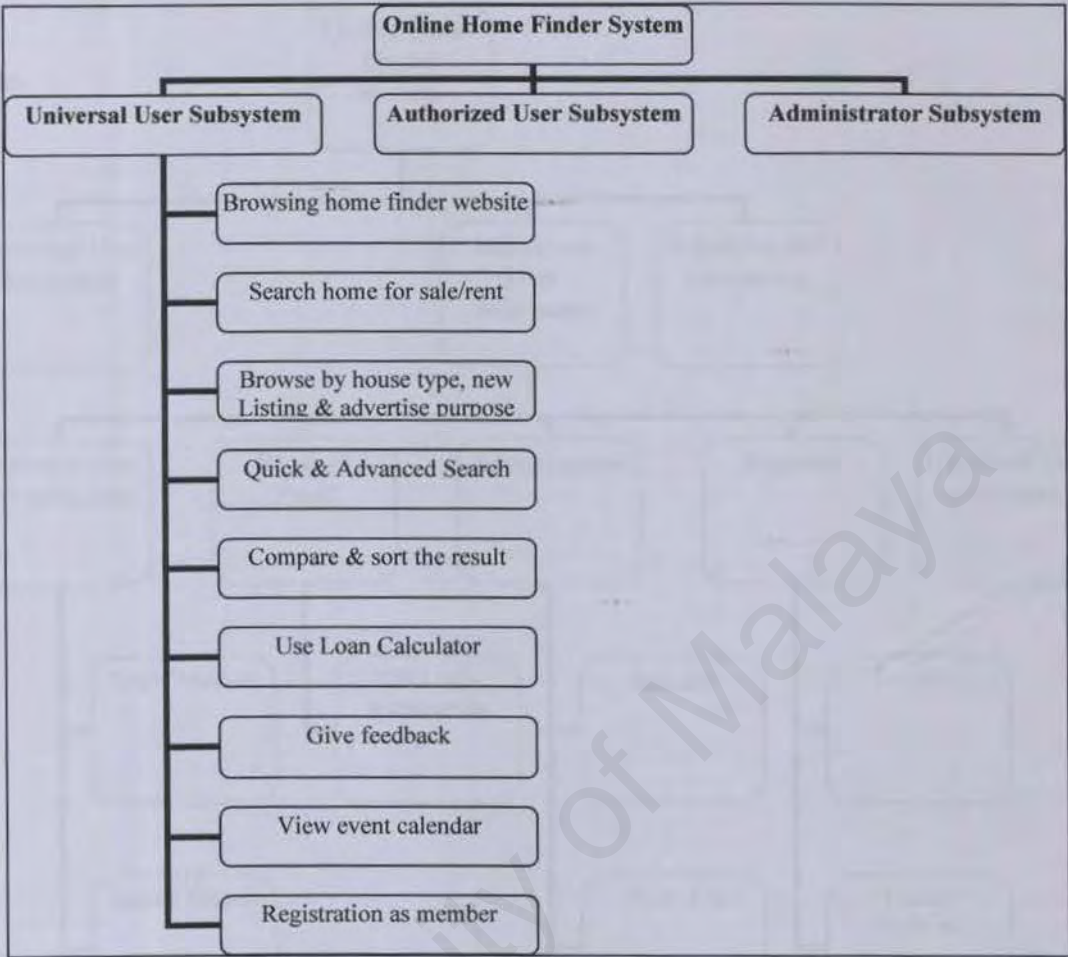
credit card via online transaction

4. Allow house owners or real estate companies to fully use Universal User functions.

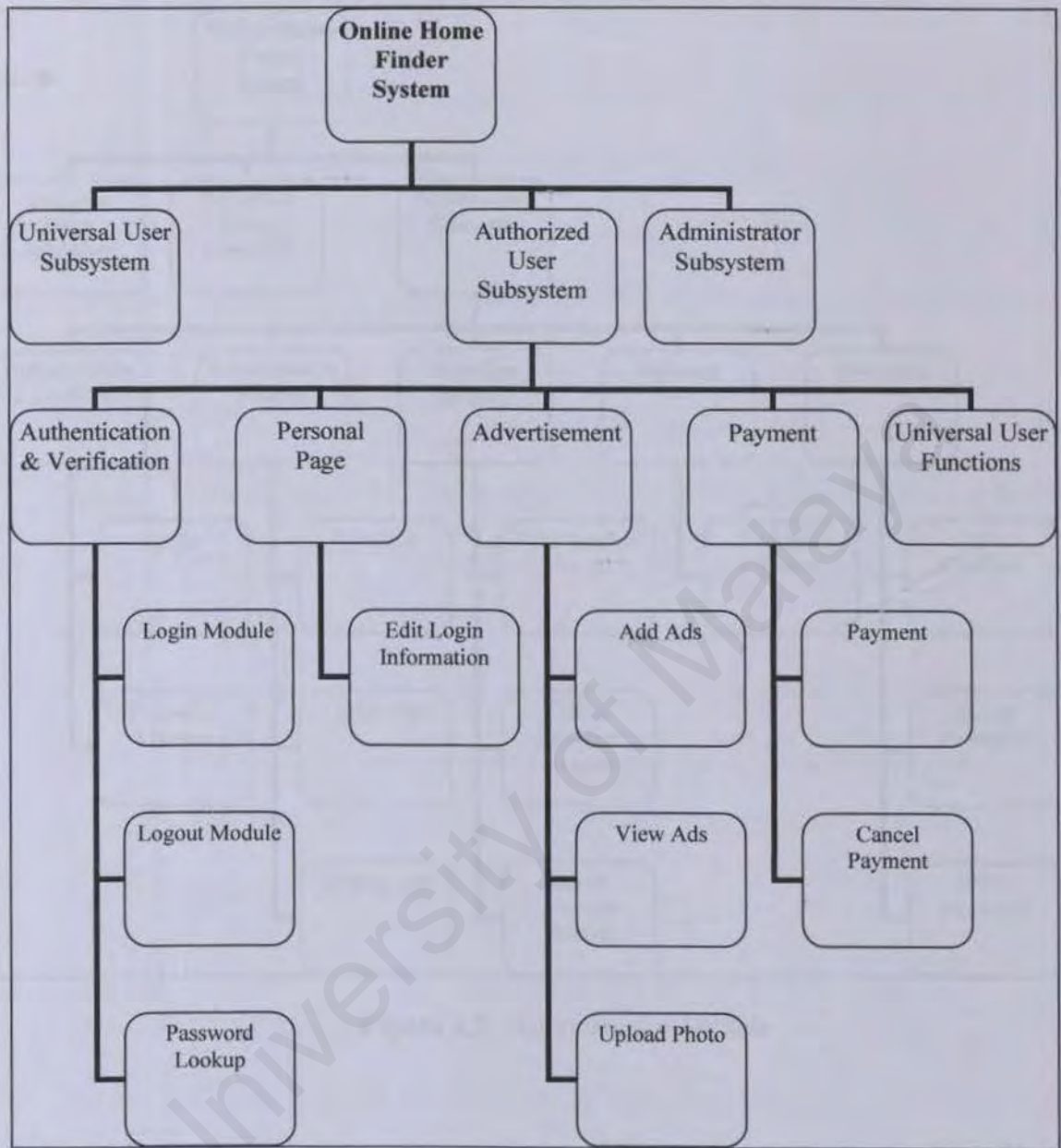
**c) Administrators Scope**

1. Allow administrator to validate members' records and password lookup.
2. Allow administrator to carry out advertisement fee transaction and then activate advertisement in database.
3. Allow administrator to edit and validate advertisements to ensure advertisement content do not contain harmful or unsolicited information.
4. Allow administrator to clean up those expired advertisement records form database to prevent server response time being slow down.
5. Allow administrator to edit and validate feedback.
6. Allow administrator to edit and validate event calendar.

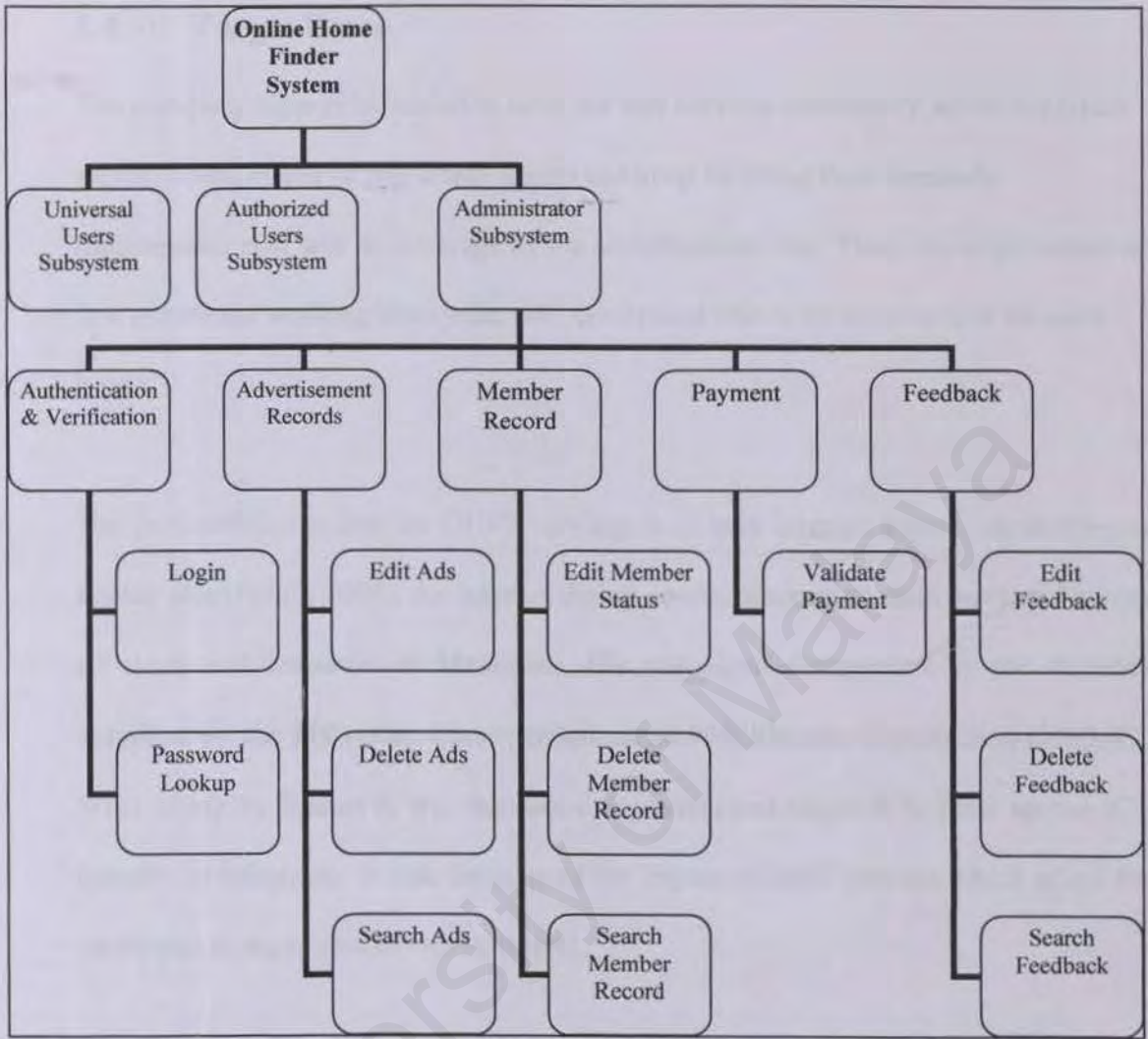




**Figure 1.1:** Universal User Module



**Figure 1.2:** Authorized User Module (Registered Member)



**Figure 1.3: Administrator Module**

## **1.4 Target Users**

The monetary support is needed to keep the free services continually serves for house seeker, house owner or real estate agents and keep fulfilling their demands.

Maintenance cost will be coverage by the advertisement fee. Thus, the target users for this system are working Malaysian with credit card who is trying to sale or ret out a house.

The pre-condition to use the OHFS services is to have internet access. According to Roslan Sharif (July 2004), the internet dialup access penetration rates increased across all states and territories in Malaysia. His statement is supported by the statistics compiled by the Malaysian Communications and Multimedia Commission (MCMC). What is say by Roslan is true because our government target is to burst up the ICT industry in Malaysia. It also because of the impact of MSC process which adopt the traditional management to e-government.

## **1.5 Expected Outcome**

The On-line Home Finder system supposed has following outcome:

- a) The result is a dynamic web content generation is based on user's searching criteria and respond to user depends on its availability in database.
- b) Has acceptable response time when performing database searching and retrieving.
- c) It should be endowed with various kind of searching methods that help users to search their idea house easily and fast.
- d) The administrator modules should be able to embrace the entire management jobs

in automatic environment.

- e) Resulted a reliable web-based system and with minimum errors during the system running period.
- f) System able to provide authentication module it will enhance system security.
- g) The database is scaleable to support the increasing of demands and needs that may arise in the future.
- h) System able to fulfill some important criteria such as user friendly, reliability, stability, and consistency

## **1.6 Project Limitations**

- a) Focuses only for Malaysian which provides services to home seekers and advertise services to home owners within Malaysia area only.
- b) Only citizen have credit card can place their advertisement.
- c) Support only English language as communication language.
- d) Rural area citizen might miss the opportunity because the usage of internet access in Malaysia is in middle level.
- e) System did not advertise other property such as shops, offices and land.

## 1.7 Project Schedule

ID	Task/Verre	Start	Finish	Duration	Gantt Chart											
					Jul 2004				Aug 2004				Sep 2004			
					7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22	8/29	9/5	9/12	9/19
1	Project Initialization and Planning	7/1/2004	7/12/2004	8d												
2	Literature Review	7/13/2004	7/22/2004	8d												
3	Current System Analysis	7/22/2004	7/29/2004	6d												
4	Methodology Research	8/2/2004	8/17/2004	11d												
5	System Analysis and Design	8/17/2004	9/10/2004	19d												
6	Final Draft Preparation	9/13/2004	10/1/2004	15d												

Table 1.1: Project Schedule

## Chapter 2 Literature review

### 2.1 Introduction

A literature review actually is an account of what has been published on a topic by accredited scholars and researchers. It is important because it places the project in context of others, which might have similarity in characteristic aspect. Developer can experience the existing features offered by similar systems. Thus, identification for the strengths and limitations of the existing systems can be done in order to build a good system by enhance the existing systems. For this project, literature reviewing serves the purpose of gathering information related to development of web-based house finer advertising system. At the end, the result of reviewing will serve to better equip the developer with knowledge relevant or essential in the design and planning of system.

#### 2.1.1 Techniques on conducting literature review

Literature review lets developer to gain and demonstrate skills in two areas:

- § *Information seeking* is the ability to scan the literature efficiently, using manual or computerized methods, to identify a set of useful articles and books.
- § *Critical appraisal* is the ability to apply principles of analysis to identify unbiased and valid studies.

The techniques been taken to seek and gather information are:

1. Search information from the internet

Internet is the domain information source to get the web-based systems.

Extraction is done to take out relevant information on web application, client-server and other related information. Thus, current existing similar system can be review and compared.

## 2. Newspaper and magazines

References on latest newspaper and magazines such as In-Tech (The Star), Computimes (News Straits Times) and pc magazines are most suitable technique to gather information about latest web development technologies.

## 2.2 Analysis Existing System

### 2.2.1 Why Analyze Existing System?

For this chapter studies on several existing systems have to be done by analyze and evaluate each of them. Developer need to explore the features and services that should be provided in proposed project. It helps a lot in requirements discovery and find the requirements which are truly need to fulfill the purpose of the system. Moreover, analysis on existing system also helps in discovery improvement opportunities in those systems to provide a better system. Finding of research can be tailored and incorporated into proposed system according to system's needs and objective.

Among those existing web-based home finder system, four of those existing system has been selected for the analyze purpose which consist of overseas and local existing with two each of them. it will be useful to analyze those system in



term of different culture. Local existing systems need to be studied to know the consideration for Malaysian seeking culture.

#### **2.2.1.1 HomeFinder**

a) URL : <http://www.homefinder.org>

##### **b) Introduction**

This website provided the services for finding the house within America only. Its finding services coverage the residential types, land/lot, commercial, multifamily investment and auction property. For this project I only consist at residential type. This website consists of four main pages which is *Buy, Sell, Find A Realtor, Login Page for My Homefinder* and *Realtor Page*. It is free service.

##### **c) Strength**

Registered member have benefit like free service for *Detailed searches, Expanded views, Property comparisons, Saved searches, New listing alerts, Price change alerts and Emailing of listings*. Provide password lookup by send email to user registered e-mail address. It also provides the comparison features for buy and rent the house based on the affordability aspect. It also suggested the loan payment and shows the future payment list. User can plan their budget more easily.

Beside, house seekers can search realtor from the alphabets sorted office categories or by key-in realtor first and last name. This search is good because it is not case sensitive. Among those existing system I have analyze, it is the only website can let house seeker to click the company name. And the result will make the house

seekers confident and trusted the company because it shows the company information and realtor information, company logo and realtor photos.

Separate out the listing for new property which can sort the result based on address. Provide open house calendar which easier for user to check the date and location for the open house. Its search options more flexible because user can input the range for price, bedroom and bathroom they wish to have, and the range of year it being built can be enter manually. Have the features to modify search by narrow the search result in term of price range, number of bedrooms and bathrooms aspects. Thus, the result is more accurate and more match to user criteria.

It also the only site provides the *Print Selection*. It let user must select at least one of properties. It enable user to print out a list of choice of the properties which include property and realtor photos. The advantages of this feature are user doesn't need to save or copy and paste the information, the printout is exactly with the preview and it saves user time to gather the information.

#### **d) Weakness**

All the process involves the appearance of realtor. Member must register based on their realtor first on the realtor list from *Find A Realtor* page. Member cannot direct put house advertisement on this site only can be done by registered realtor. This will make the realtor gain the commission from their properties.

The map did display cities in each state but cannot narrow the search till the cities. *Price Range* not function as expected. It is proven by the testing I done on

15/8/2004. Enter amount for maximum range is \$100 the will change to 100. Meanwhile, when \$100,000 entered it show 100. After testing for a while with different amount, I can conclude that the comma cause such problem. When detected comma at input integer field the problem will occurs and there is no problem to full stop sign. I think the site owner should state beside the price fields about the condition for entered the money.

Search function to find realtor is not accurate. This is proven by the testing I done on 15/8/04. Below table prove the testing that I have done.

Real name	Last Name	First Name	Expected Result(s)	Result(s)
Jan Deckard (ABACUS Realty & Management)	Deckard	Jan	Match	Expected result
	deckard	jan	Match	Not as expected
	Jan	Deckard	Not match	Expected result
	jan	deckard	Not match	Expected result
Linda Quillen (Action Property Mgmt. & Realty)	Quillen	Linda	Match	Not as expected
	quillen	linda	Match	Not as expected
	Linda	Quillen	Not match	Expected result
	linda	quillen	Not match	Expected result
Jacques Maynard (Appraisal Associates of Indiana)	Maynard	Jacques	Match	Expected result
	maynard	jacques	Match	Expected result
	Jacques	Maynard	Not Match	Expected result
	jacques	maynard	Not Match	Expected result

**Table 2.1:** Testing outcome for search by realtor function

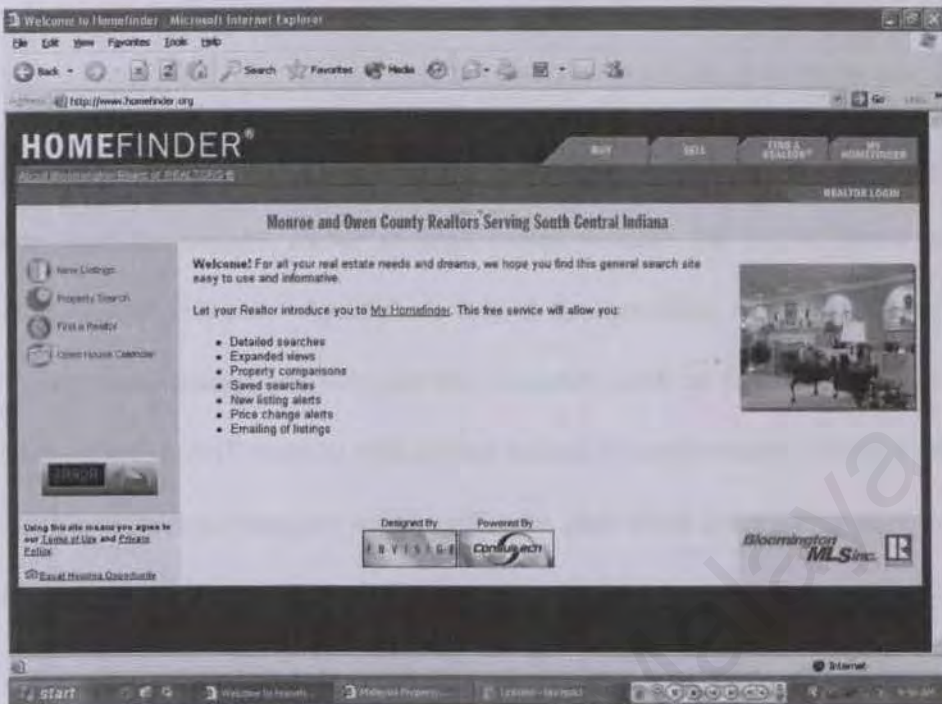


Figure 2.1: Screenshot for HomeFinder

### 2.2.1.2 Florida's Home Finder Service

a) URL : <http://www.floridaguide.com/services/bl-form.html>

#### b) Introduction

The search limited to the location within Florida. Firstly, user needs to click on the location he/she want to search at provided map. Then, user will direct to a page, actually is a form which need user to fill in all the information such as criteria of the house the house seeker want to search and personal information. The section about the criteria to search the house is house type, price, number of bedroom/bathroom and other criteria. After submitted the form, he/she need to wait e-mail about the house which is matched with his/her requirement from the site owner.

**c) Strength**

House seekers did not have to spend time at the website to search house. They just need to wait the website owner to send e-mail contain the list of house which match to his/her criteria. Apart from that, it also provides features such as find new home communities and receives free materials such as brochures and videos, and even schedule VIP tours to visit model centers through e-mail. Besides that, it has *MyHomeShopperPassport* which will save user from completing registration forms every time he/she visits a builder's sales office.

**d) Weakness**

This site is not flexible because did not let user to browse the site. It does not let user to search their own the property available in its database. Registration only for an agent and only them can use the features provided by the site. No real-time interaction among the user and the site owner.

The worse mistake is all the function provided need the users to registered their e-mail address first. To see the floor map, appointment schedule and receive the brochures. The registration is repeated every time the user wants to use the ~~features~~. It should have the member page.

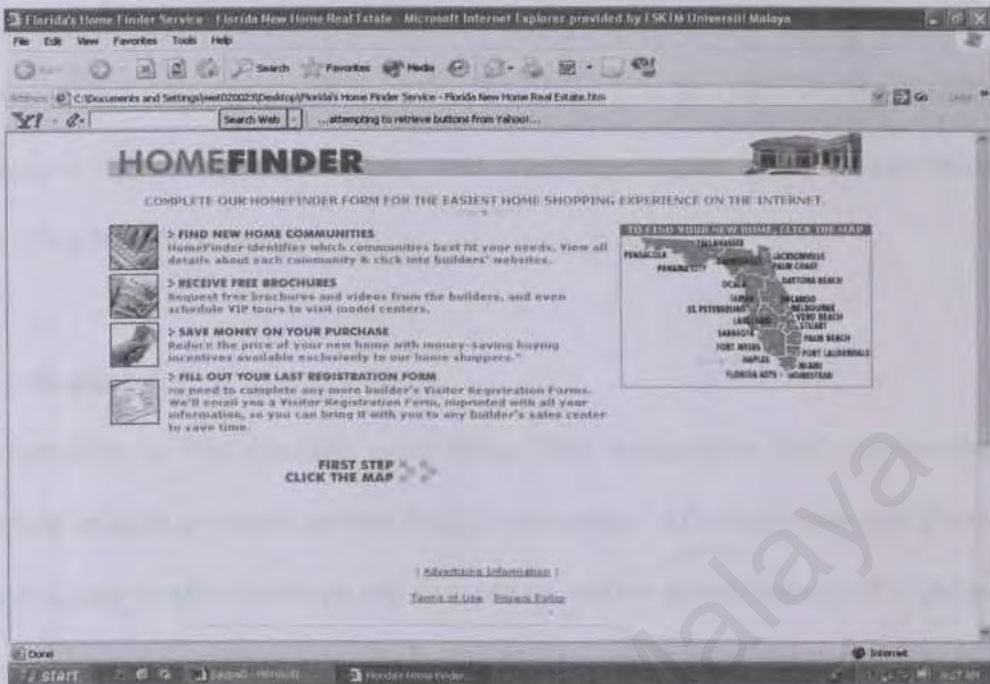


Figure 2.2: Screenshot for Florida's Home Finder Services

### 2.2.1.3 Rumah.com.my

- a) URL : <http://www.rumah.com.my>
- b) Introduction

It is the site provides the services for Malaysian real estate owner or agents to advertise their property to sell such as apartments, house, land and others. The coverage is within Malaysia only. The interface is simple but did not miss the user-friendly design in it. This site is focusing in real estate.

- c) Strength

Separation for rent and sell properties let users more easy to find house. It is the only website provides the *Near* function for the location such as school, park, LRT station, lake and others in the search. It also direct use to *mapquest*, the URL is

<http://www.mapquest.com/maps/main.adp?countrycode=my> for the convenience use by house seekers to search the house location. It is the only website provides the logout function for the member. And it informs the user about the expiration date of his/her advertisement.

#### **d) Weakness**

The security is low because even using fault information and non-existing information such as e-mail address during registration. After registration, it directs user to a page to select package and then can upload the advertisement. It is shown that using agent moniker at the agent name at the posted by agent fields. Display the moniker at the formal fields is the mistake which cause the lack of confident and trustless to users.

The type of house did not arrange properly. This is because in the drop-down menu it consists of apartment and apartments. Both of the types are same but the search results are not the same. In drown-down menu for the state also has problem which is stated all the state in Malaysia. When click down, is does not show all the state in Malaysia which just have a few of the state name. Same mistake also occur in the city/town drop down menu which only consist the famous city/town. In my opinion, it should provide a function to display a proper city/town when the user selects the town, automatically sort and display the city/town for that state only. There is not difference of the search and advanced search function.



Figure 2.3: Screenshot for Rumah.com.my

#### 2.2.1.4 HousingLane.com.my

a) URL : <http://www.housinglane.com.my>

#### b) Introduction

Housing Lane coverage is only within Malaysia. Among those existing systems that I have analysis, it is the most rich in providing services to Malaysian. This existing system included Malaysia seeking culture in it. It provides two version of website which is English and Chinese. It just not serves as provide services to search and advertise house but it also play the role as the information provider for users. It is providing currently and up-dated information for users such as the BIZ directory, the biggest Malaysia property exhibition calendar, still undergoing house development phases, house alerts subscription and others. Briefly, I stated here it



is “live and active” site because the community among all the users for sharing the knowledge about the interior design of the house, buying house tips and others with the occurrence of property discussion and feedback. I also can see that, it did build a “communication bridge” among the users and administrator by the feedback. It also create a outside communication by allowing users to invite friend about the site.

### **c) Strength**

Among those existing system that I had analyzed, briefly I can say that this site not just only have good user interface but also provide various type services which can fulfill the need of different users. It included Chinese mystics such as Feng Shui and lucky day for different users with different meaning. For house seekers would like to buy a house with good Feng Shui for better life and lucky. For the real estate or developer, their would like to know when is the best day for the to hold “crack land” ceremony and which location is good in Feng Shui so that housing project will sell of easily and fast. From my analyses, I found that this site is build base on Malaysia seeking culture and adopt what the users need and want while searching the house.

Many consideration need to think of before can have a house such as type of house, location, monetary support t for buy it on cash or with loan payment, the safety, traffic and others. This is problem did solve by the Housing Lane provided services for the it provided the loan calculator for monetary support aspect, type of

house and location with the photos and map even the still in development house phase as a picture.

It provides various kind of searching method with the goal to fulfill different user attitude and searching style which is the express search, map and hot search for novice and in rush users. The advanced search is for the intermediate and high level users who have a lot of time to find their ideal house. The purpose of it is just to enable user can search their ideal house easily and quickly based on their favourite such as express search, advanced search, search by map and hot search. It enhanced with add to house cart features which allows users to add their choices in a location for future view or let them to printout it later.

It does not forget the security aspects while busy providing services and information to users. It did implement high security level in the registration and login for users. It also has it own style for user or developer login method. Apart from, users will not lost in the system because the systematic and useful design of it.

#### **d) Weakness**

Not all advertisement has photos. Actually, it should restrict the users to place photo at advertisement for house seekers convince. Apart form that, it should inform the users' current advertisement available in the database and the amount for each state has the advertisement. It also needs to have the feature to let users

know few days ago advertisement because the will be user who like to know the house advertisement based on the date.



Figure 2.4: Screenshot for HousingLane.com.my

### 2.2.2 Comparison

a) Comparison among selected existing system with proposed system.

Features		Floridaguide .com	Homefinder .org	Rumah .com.my	Housinglane .com.my	Proposed Project
Login	User	N	Y	N	Y	Y
	Developer	N	Y	Y	Y	Y
	Password Lookup	N	Y	Y	Y	Y
	Logout	N	N	Y	N	Y
Search Function	Quick	Y	Y	N	Y	Y
	Advanced	N	N	Y	Y	Y
	Map	Y	N	N	Y	N
	Case sensitive	Y	N	Y	N	N
Browse		N	Y	Y	Y	Y

Advertisement Service	N	Y	Y	Y	Y
Upload Photo	N	Y	Y	Y	Y
Direction Map	N	Y	N	Y	Y
Loan Calculator	N	Y	N	Y	Y
Event Calendar	N	Y	N	Y	Y
Useful Link	N	Y	N	Y	Y
Feedback	Y	Y	Y	Y	Y
Advertisement Fee	N	N	Y	Y	Y

**Table 2.2:** Comparison existing system and proposed project

**b) Comparison local existing system**

System		Rumah.com.my	Housinglane.com.my
Features			
Member Registration		Registration only for agent to place the advertisement.	Registration is free. Open to user, developer and real estate agency.
Registration Procedure		Fill in form then direct member page after submit	<ol style="list-style-type: none"> <li>1) Users choose type of user.</li> <li>2) Fill up the form.</li> <li>3) After submit form, activation e-mail will send to the e-mail address key-in by user during registration.</li> <li>4) Click the link in the e-mail to activate the account.</li> </ol>
Login	Type	Registered agents only	Developer / user
	password lookup	No	Yes
Search facilities		User can use freely use provided search method	User can use freely use provided search method.
		Search and advanced search but both are same.	Search and express search, by map and property categories.
		For rent and property search criteria are same.	Differentiate the search criteria for rent and sell property.
		Specify near to building/facilities	Specify near to building/facilities (New Property only)
Security in Member registration		Low Direct to member page	High. Activation by click at the link sent to the e-mail address

		during registration.
New Listing property	No	Yes. Display at the main page
Upload Photo	Can	Can
Floor map	No	Yes
Event Calendar	No	Yes
Invited Friend	Yes	Yes
Forum	No	Yes
Poll	No	Yes
Useful tips, design	No	Yes
Loan Calculator	No	No

**Table 2.3:** Comparison local existing system

Those comparison for among those four existing system that I analyzed with the purpose enhanced and included the requirement to my proposed project. During the analyses period, I found some features in those systems are functioning well and some is not function properly. There need some improvement in those features. Thus, I proposed those requirements in my project as to enhance it. Apart from that, I include also some of the useful requirements which do not included at those existing system that I analyzed.

My proposed project should optimize the requirement which needed in searching and placing advertisement. It also provide up-date information for users in the way to give some ideal and the consideration need to take in mind when buy/rent house. It also enrich users knowledge about particular area such as current the property exhibition event, EPF benefit for users to buy house, the loan payment estimation an. It provides sharing opinion and tips at forum discussion and poll.

The comparison and analyzed also done for those two selected existing systems will give me some idea about the Malaysian seeking culture and their attitude. From those two website, I found that the other useful information such links to trusted and well known organization or company is needed. For example the links EPF website is to let the house seeker who has monetary problem while need to buy a house for references. He/she can know the organization provide services for those who want to buy a house but not afford for it. If there has that particular services, how and what is the procedure to apply it. Malaysian is kind in sharing useful information to their relatives or friends when they found that there are new and suitable house available at the site.

As conclusion, I did learn new things and enrich my information during this requirement and analysis period. A good system is enhancement of those existing systems that has been analyzed. Briefly stated here, that new version of those existing system being analyzed which has been enhanced and new features at the optimum level will get higher place in user's mind than the old verion.

## **2.3 System Development Technologies**

### **2.3.1 Development Platform Consideration**

An operating system (OS) controls all of a computer's operations, such as allocating memory, accessing disk drives and calling applications. The software applications that provide the bulk of an OS's services run on top of the OS.

#### **a) Unix**

UNIX is an interactive time-sharing OS that comes in many variations or 'flavors.' UNIX is not a single operating system; it is a family of operating systems with each vendor providing its own version of UNIX. It is a multitasking, multi-user operating system.

Every UNIX system has a hostname assigned to it. This hostname is used to identify individual machines on a network, but even if the machine isn't networked, it should have a hostname. Besides that, log in is for identification user on UNIX system which involves two steps: Entering user's login name and password. Nobody can log in into the system using his/her username without knowing the password.

#### **b) Linux**

Linux, a variant of UNIX is a free operating system. Thus, it can be copied and redistributed without paying a fee or royalty. It is a multi-user, multi-tasking operating system that runs on many platforms, including Intel processors. Linux

interoperates well with other operating systems, including those from Apple, Microsoft and Novell.

Linux has the following features:

- § A program cannot crash the entire system because of memory protection between processes.
- § Has support for Netware clients and servers.
- § Includes a LAN manager/Windows Native (SMB) client and server.
- § It is multi-platform, it can run on any processor.
- § Can support many networking protocols.

**c) Microsoft Windows XP Professional**

Microsoft Windows XP Professional built on Windows NT technology and an easy-to-use, familiar Windows 98 user interface. Microsoft Windows XP Professional makes business users more productive because it is added with additional business features such as:

- § Capable To Support Peer-To-Peer Networking For 10 Simultaneously Users
- § Access Control is monitoring file and folder accessibility
- § Remote Desktop (RD) allow to work from virtually anywhere and access files, applications and network services from almost any computer
- § Encrypted File System (EFS) to protect personal and sensitive data from unauthorized users
- § Enhanced software restriction policy where only administrator is entitled to identify software and controls its ability to execute.



§ Group Policies allow administrators to organize user into logical group and assign settings (security, appearance, managements option)

The advantages of Microsoft Windows XP Professional are:

- § New user interface make users easy to find what they need when they need it
- § Windows File Protection is for protects core system files from being overwritten by application installs. In the event a file is overwritten, it will replace that file with the correct version.
- § Internet Connection Firewall automatically shields the PC from unauthorized access when the user connects to the Internet.
- § Driver certification is provides safeguards to assure that device drivers have not been tampered with and reducing the risk of installing non-certified drivers.
- § Full 32-bit operating system means that it minimizes the chance of application failures and unplanned reboots.
- § System Restore is important when something goes wrong with user's computer, user can revert the system to a previous state.
- § Dramatically Reduced Reboot Scenarios which eliminates most scenarios that forced user to reboot in Windows NT 4.0 and Windows 98. Many software installations also will not require reboots.

### **2.3.2 Database Consideration**

Commonly, a database used to gather, handle and process information in an organizational structure to facilitate storage and retrieval of information. For Database Management Systems

(DBMS) is a software program designed to store and to access information used to support the workings of a website. Once information is entered into a database, a DBMS can manipulate the information so that administrator can analyze it easily.

Relational Database Management System (RDBMS) is a type of Database Management System (DBMS). RDBMS is a program that enables developer to create, to update, and to administer a relational database. An RDBMS typically takes statements written in the extremely popular Structured Query Language (SQL) and creates, updates, or provides access to the relational database. SQL is a 'declarative' query language, which means that the user specifies what he or she wants and then the RDBMS query planner figures out how to get it. The RDBMS stores the data in whatever manner it 'wishes.'

#### a) **MYSQL**

MySQL is the most popular Open Source SQL database. It is Relational Database Management System (RDBMS) that can stores data in separate tables rather than putting all the data in one big storeroom. Thus, the speed and flexibility is increases.

It has endowed with enterprise requirement features and innovations which are:

§ Full text indexing and searching enables rapid searching of text fields for words and phrases which includes relevance rankings, exact phrase matching and Boolean search operators.

- § Multiple storage engines including full transaction support with commit rollback, crash recovery and low-level locking capabilities.
- § A robust security system with advanced permissions and support for SSL transport-layer encryption provides robust application security.

#### **b) Microsoft SQL Server 2000**

Microsoft SQL Server 2000 is the record-holder of important benchmark awards for scalability speed and performance. SQL Server 2000 is a fully Web-enabled database product, providing core support for Extensible Markup Language (XML) and the ability to query across the Internet and beyond the firewall. The unique of SQL Server 2000 is it includes a superset the ANSI standard SQL language elements and it make it outperformed than MS Access and Informix SQL.

The advantages of Microsoft SQL Server 2000 are:

- i. Fully web-enabled by provides extensive database programming capabilities built on web standards. Rich XML and Internet standard support make the ability to store and retrieve data in XML format easily with built-in stored procedures. Besides, user can also use XML update programs to insert, update and delete data easily.

#### **§ Easy Access To Data Through The Web**

It enables HTTP used to send queries to the database, perform full-text search on documents stored in database, and run queries over the web with natural language.

### § Powerful And Flexible Web-Based Analysis

SQL Server 2000 Analysis Services capabilities are extended to the Internet.

Thus, user can access and manipulate cube data by means of a web browser.

- ii. Highly scalable and reliable, SQL Server meets the needs of demanding e-commerce and enterprise applications.

### § Integrated And Extensible Services

With SQL Server 2000, developer can build end-to-end analysis solutions with integrated tools to create value from data. Apart from that, developer also can automatically drive business processes based on analysis results and flexibly retrieve custom result sets from the most complex calculations.

### § Scale Up And Scale Out

For scale up, it takes advantage of Symmetrical Multiprocessor (SMP) systems. SQL Server Enterprise Edition can use up to 32 processors and 64 GB of RAM. Meanwhile in scale out aspect, it distributes the database and data load across server.

### § Availability

It achieves maximum availability through enhanced fail over clustering, of shipping and new backup strategies.

### § Fastest Time-To-Market

Act as data management and analysis backbone of the Microsoft .NET Enterprise Servers. It also includes tools to speed development from concept to final delivery.

### § Quick Development, Debugging And Data Transformation

Endowed with features of ability to interactively tune and debug queries, quickly move and transform data from any source, and define and use functions as if they were built in to Transact-SQL.

### 2.3.3 Web Server Consideration

Basically the web server software's main functions is to takes a file name passed through a command, gets the file and sends it across the Internet so it can be viewed on the requesting computer's browser software. It also tracks hits to the site, records and reports error messages, etc. The following is the major web servers which are:

#### a) Microsoft Internet Information Server (IIS)

IIS receives high marks for superior installation, performance and maintenance. IIS especially earns kudos for its ease of installation and the quality of its management interface, which is provided separately from other interfaces. Another good feature is that IIS can be managed remotely via a web browser. However, IIS can operate only within a Windows environment.

### The .Net Framework

Microsoft .NET is software that connects information, people, systems, and devices. It spans clients, servers, and developer tools. The .NET Framework is Microsoft's new programming model for developing, deploying, and running XML web services and all types of applications-desktop, mobile, or web-based. It is the

infrastructure for the overall .NET Platform. The common language runtime and class libraries (including Windows Forms, ADO.NET, and ASP.NET) combine to provide services and solutions that can be easily integrated within and across a variety of systems. The .NET Framework provides a fully managed, protected, and feature-rich application execution environment, simplified development and deployment, and seamless integration with a wide variety of languages.

#### **b) Apache**

Apache is the most widely used web server and is probably the most stable and fastest of the web servers available. Apache was a largely Unix product that used a number of tricks in order to execute within other operating systems. Apache 2.0 is easily supported under a wide variety of operating systems: UNIX (of course), Windows (all versions), Linux, Mac OS X, BeOS, and more.

#### **c) Netscape Enterprise Server (NES)**

Even though it is on third ranking in the web server market, but it still offers a 'complete' web server package for any website. It also comes with a built-in search engine, log analysis tools, advanced content publishing, server clustering and administrative rights delegation. It supports most Windows operating systems and most of the UNIX family including Digital UNIX, SGI IRIX, Sun Solaris, and IBM AIX.

NES is a good web server for a traffic intensive website since it has features such as SSL 3.0 support with client-side certificate authentication, SNMP and SMTP

support and centralized server management. But its technical support is free for the first 90 days only and then it gets a little pricey. However, Netscape offers decent free support on its website

### **2.3.4 Web-Based Development Technologies Consideration**

#### **a) PHP**

PHP, originally known as *Personal Home Page* can be used on all major operating systems, such as Microsoft Windows, Mac OS X, Linux and etc. It has also support for most of the web servers today which includes Apache, Microsoft Internet Information Server, Netscape and others.

It is mainly focused on server-side scripting which enables developer to do much more than commonly CGI program can do (collect form data, generate dynamic page content, or send and receive cookies). Apart from that, it is an alternative to Microsoft's Active Server Page (ASP) technology. As with ASP, the PHP script is embedded within web pages along with the HTML. Before the page is sent to a requesting user, the web server calls PHP to interpret and perform the operations called for in the PHP script.

#### **b) ASP.NET**

ASP.NET is a technology for creating dynamic Web applications. It is part of the .NET Framework; developer can author ASP.NET applications in any .NET compatible language, including Visual Basic .NET, C#, and JScript .NET. ASP.NET pages (Web Forms) are compiled, providing better performance than

with scripting languages. Web Forms allow developer to build powerful forms-based Web pages. When building these pages, developer can use ASP.NET server controls to create common UI elements, and program them for common tasks. These controls allow developer to rapidly build a Web Form out of reusable built-in or custom components, simplifying the code of a page. ASP.NET provides a programming model, and infrastructure, to make creating scalable, secure and stable applications faster, and easier than with previous Web technologies.

Type	Advantage(s)	Disadvantage(s)
PHP	<ul style="list-style-type: none"> <li>§ Able to support cross-platform such as Unix, Linux and Microsoft Windows.</li> </ul>	<ul style="list-style-type: none"> <li>§ Have some features do not supported by Microsoft Windows</li> <li>§ Lacks of session handling.</li> </ul>
ASP.NET	<ul style="list-style-type: none"> <li>§ Easier and faster to develop.</li> <li>§ Can use VB script as server-side scripting</li> <li>§ Works well with Microsoft SQL Server 2000.</li> </ul>	<ul style="list-style-type: none"> <li>§ Required IIS Web-Server which must run on Windows-Based (NT and above) system with .NET framework installed.</li> </ul>

**Table 2.4:** Comparison of web-based development technologies consideration

### 2.3.5 Scripting Language Consideration



### **a) JavaScript**

JavaScript is a new scripting language for web-pages. Some effects that are now possible with JavaScript were some time ago only possible with CGI. Thus, developer can create really sophisticated pages with the help of JavaScript. Developer does not need any special tools, programs, or compilers to write JavaScript; whatever, we are currently using to write HTML should work just fine.

Java Script can be used to make web pages interactive and dynamic. A static HTML page without any JavaScript just sits there is dull because when the visitor returns to following week, it still looks exactly the same as it did today. With JavaScript, we can display different images, give feedback on forms, control the user's browser (for instance, displaying different pages based on the user's plug-ins), and manage framed sites. Overall, we use JavaScript to give the user feedback: the feeling that our site is responsive to their actions.

### **b) Visual Basic.NET (VB.NET)**

VB.NET evolved from BASIC (Beginner's All-Purpose Symbolic Instruction Code) developed in mid-1960s by Professor John Kemeny and Thomas Kurtz, Dartmouth College. VB.NET strategy was announced in 2000. VB.NET is the newest implementation of the very popular Visual Basic language and is part of the emerging Microsoft .NET platform. VB.NET includes full object-oriented language features, a new shared IDE, and many data type changes. VB.NET is the language that provides the easiest transition to the .NET framework for current Visual Basic developers. According to Pattison (2003), .NET Framework

introduced by Microsoft which included the re-designs Visual Basic using it.

### **2.3.6 Development Data Access Technology**

Getting data from a data source (database) isn't a direct way and it requires the use of a data access interface. There are many type of database connection are:

#### **a) ADO.NET**

ADO.NET is an integral part of the .NET Framework. ADO.NET provides an extensive set of .NET classes that facilitate efficient access to data from a large variety of sources. ADO.NET enables sophisticated manipulation and storing of data and forum an important framework within which to implement inter-application communication and XML Web Services.

#### **b) Open Database Connectivity (ODBC)**

ODBC is a standard database access method developed by Microsoft Corporation. The goal of ODBC is to make it possible to access any data from any application, regardless of which database management system (DBMS) is handling the data.

When programming to interact with ODBC users 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 user are targeting.

### **2.3.7 Consideration of Image Authoring Tool**

### a) Ulead Photoshop 7

Ulead PhotoImpact 7 is also among the popular images editing software in the market now. Generally, PhotoImpact needs less technical if compared to the Adobe Photoshop. Listed below are some of the features for this software:

- § Embedded with GIF Animator 5 which is an application that can starts with wizard. It able supports multiplayer animations and frame manipulations
- § It can support up to 38 file formats which included JPG, GIF, MBP, TIF and JPG 2000 formats.
- § It also comes with built-in Web Publishing capabilities such as button, component and background designer. The creation can be converted to HTML.
- § The effect gallery to edit the images, such as blur, shadow, scratch removal, red eye removal, natural painting, noise, and others.
- § The PhotoImpact Album can create personal album of pictures by choosing one of the twelve templates. Hence, the compiled album can be exported to a web page. There are also 18 effects to be chosen to view the web pages. In addition, users can also add music to the slide show of the images.
- § It also has imperfect because has following limitations:
- § Its interface looked confusingly, especially for the beginner users.
- § It just able to convert to HTML format which is the basic web pages.
- § Some of the effect gallery in PhotoImpact makes images become slightly not natural.

## b) Adobe Photoshop 7.0

It is the latest version of Adobe product. It is a professional image editing tool software.

Following is the features and advantages for this image editing tool:

- § XMP (Extensible Metadata Platform) which ensure some information travel with file such as caption, credits, owner URL, copyright and author details.
- § PDF security- Support for Adobe Acrobat Reader 5.0 security setting.
- § Web Photo Gallery is a new security option which enables to enter text or embed the filename, caption or copyright information on the image as a watermark.
- § Spelling checker will make the work more efficiently with Adobe's products.
- § Preview and save the images for web in WBMP format (standard format for optimizing images for mobile devices, supports 1-bit colour, images only contain black and white pixels), especially for displaying images on PDAs and wireless devices.
- § File Browser which enable user to search for image visually and intuitively. The image metadata such as date created, date modified, and Exchanged Image File (EXIF) information from digital camera also can be displayed.
- § Rollover Palette used by user to create, view and set rollover to a Web page using Java scripting.
- § Pattern Maker is useful the when want to generate abstract patterns or realistic textures.

**c) Adobe Illustrator 10**

Adobe Illustrator is a variation product from Adobe. It is industry-standard vector graphics software.

Listed below are the some of the features and the advantages of the software:

- § It can integrate with other Adobe products such as layer mask, transparency, and compound shapes preserved in Adobe Photoshop.
- § It automate complex task such as the Image Map and can create the URL linking easily
- § It can get an accurate on-screen review before going further.
- § Enable color effects using tool such as: natural-looking transparency, clipping mask and opacity mask, solid patterns, and gradient tools.
- § The drawing tools such as layout tools, eyedropper tool, and swatches.
- § Other tools or functions such as selection tools, layer effects and nesting layer.

The imperfectness is consisting following limitations:

- § The non-Adobe products applications cannot access certain fonts that have been installed in the Adobe Folder.
- § The latest version Illustrator 10 is not compatible with plug-ins design to work in Photoshop 6.
- § File saved from Photoshop 6 as PDF may has result of losing text objects in Illustrator.

## **Chapter 3: System Methodology**

### **3.1 Introduction**

A methodology is a systematic way of accomplishing a certain task and maybe defines as a collection of procedures, techniques, tools and documentation aids which can help the software developer to speed up and simplify the software development process. By the way, it serves as the guideline for developer to develop a well standardizes software.

### **3.2 Information Gathering**

In order to build a system, I have done analysis to gain a better view of the system domain which includes the requirements of the system and the underpinning for the system design. Among the fact-finding techniques that have been practiced to collect information are:

#### **3.2.1 Documentation and printed materials**

The main reference resource for this proposal is the past years student's reports in the documentation room at FSCIT. This is because the previous year's thesis reports are the most suitable and fastest way to figure out the whole system development layout.

Apart from that, reading printed materials such as newspaper, books, magazines and other printed materials are also important to get deeper understanding of the some particular topics and to get the latest technology's information such as web technologies, online payment methods and other

#### **3.2.2 Internet surfing**

Internet surfing is the main source to find information especially to find the existing similar project or software. Non-limited access to various kind of information really useful for developer the ideas and features needed to build a system.

Apart from that, information of current available technologies for website development, database technologies, web authoring tools, security and other related to ICT are easily be search via search engine such as Google and Ask.

### **3.2.3 Observation and Current System Analysis**

Observation and analysis current existing system is essential for developer to have better understanding about the current existing criteria and how the functions can work together to provide services to users. Thus, four existing system being selected to undergo this analyzing and observation phase. During this phase, the strength and weakness of those systems is being identified and analyzed.

The most important things that need to be considering during the analyzing process is the functionalities of those system such as different search capabilities and the user interface design. The functionalities are the synergy to attract the users to continuously visit the site. Besides that, give the users chance to make comments or suggestions and vote the poll indirectly will make the website "live" because the interactions with users and among the users did exists. Meanwhile, the website owner can evaluated

### **3.2.4 Guidance by lecturers**

Project supervisor, had spent his time in guiding and assisting the project directly and

indirectly of the way to develop a system and report. Apart from that, content of project also enriched with project moderator's comments during the viva section.

### **3.3 Software Process Model**

During the past decade, most of the website is intermediate for display the content and information in static form. Thus, the steps involve in creating such website does not required a great deal of planning, development and designing the interface.

Nowadays, most of the website is dynamic website which also incorporating with web applications such as search engines, e-commerce, e-banking, online transactions and so on. These data-driven applications that needs to connect to the database for data storing and retrieving. The content of the dynamic website is generated personalized to user request. Dynamic website is an active website because the creations and execution of the programs are a fully-dependent to users request and their environment. Technology-push impact also infected to Online Home Finder System which required it to act as dynamic website. It is essential to choose suitable project development methodology as the "backbone" for system design and development efforts.

Every development process has its own problem. Nowadays, the unsolved software crisis still exists while developing software. Web development also needs to face the same tragic like software development. Web development wouldn't escape from facing the web crisis because the web development is still fresh and there is no single recognized methodology to do it. Thus, web developer has no choice other than refer to traditional



software model as the guideline to develop a website. This included the waterfall model, prototyping model, incremental development, spiral development, and others. Based on the process model, it will direct developer to a way to address the complexity of the website, minimize the project risk in term of project failure and deal with near certainty of change during the project process. Thus, a process model should be adopted to describe various phases involved in web-based home finder system.

Each process model has its own strength and weakness. So, desired process model will be the modification of waterfall model that utilizes prototyping approach in several stages of the model. Each stage in the model proceeds one after another waterfall model is the use of prototyping in requirements specifications stage and system design stage. The name of modified waterfall model is known as "waterfall model with prototyping". Reasons for choosing the waterfall with prototyping model for this project are:

- § It is systematic.
- § It is easy to implement.
- § The scope of project well understood.
- § Project risk have been assessed and considered to be low.

### **3.3.1 Review of waterfall model**

The most contrast advantages for this model is it represents basic engineering practice, that specification should precede design and design should precede construction, etc. By the way, the project can divided into manageable stages which will produce deliverable at the end of each stage. It is not such perfect because of its disadvantages which are the system is not available for testing or trial until end of project, there is an implicit

assumption that all will go well throughout the project and it is quite difficult to change software requirements or rectify any problem in the preceding stage.

In order to overcome the drawbacks of waterfall model, developer can compliment it other software process approach. For this project, prototyping approach has been combined with waterfall model to produce an ideal software process model as a guide to the system development.

### **3.3.2 Review of prototyping**

Prototyping model can be view as a 'process' which is either well-defined phase within software development life-cycle or is an approach that influences the whole of it. This model has efficiency in development of applications because it break complex and often ill-defined problem into several comprehensive, smaller and simpler parts. Apart from that, its' development approach can help in building and refining a product to meet end-user or market expectations.

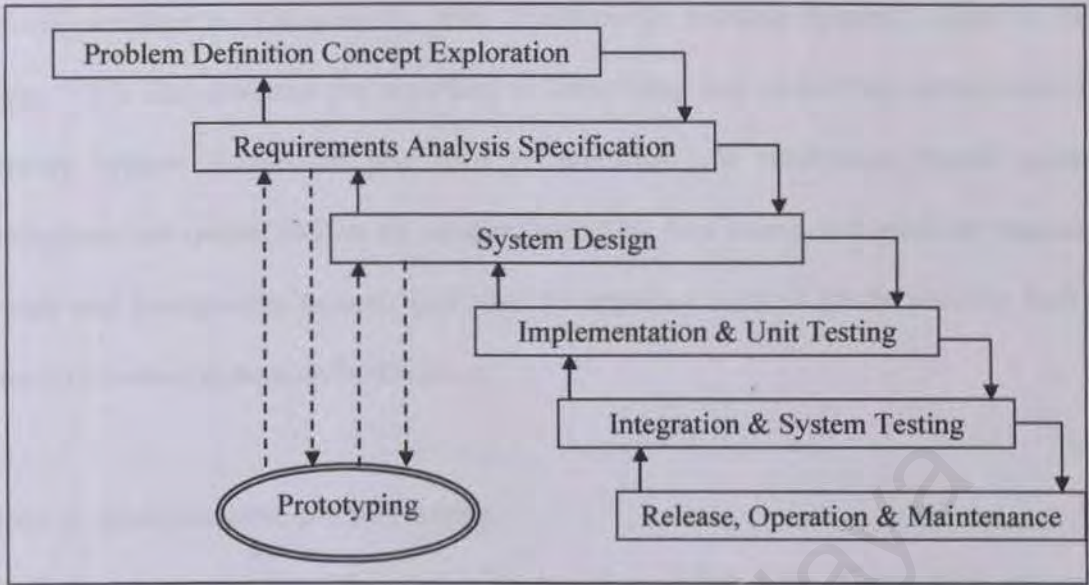
### **3.3.3 Waterfall model with prototyping**

The modification must need done so that it can eliminate the weakness of waterfall model and maintain its strengths. Waterfall approach makes developers plan everything upfront, and each step is supposed to distinct. Waterfall model is used only when requirements are well understood and it is difficult to respond to changing requirements. Web-based project must deals with the changes because it often has great deals of uncertainly to accomplish a project.

Prototyping techniques are used in requirements specification and system design stages with the main objective to reduce risk of waterfall model. The impact of building the prototype in requirements specification phase is helping developer to clarify the critical requirements. Meanwhile, the relevant problems are revealed by experimentation during prototyping. Contradict with the original model; the software developer only can reveal problems during coding and implementation phases. This is because targeted system is not ready for testing until the end of project. The process costs and effort to fix the problems is much higher when the problem remains unrevealed until later phases in the process.

There are many benefits by build out a working prototyping during requirement specification. This benefit includes the high probability to produce a tangible description of those requirements and help system engineer and user in requirements elicitation and analysis. Besides that, some minor requirements will not expand or changed drastically in coming stages.

During the system design stage, system developers are encouraged to use prototype to help visualize web based system. The system design prototyped might probably in the figure of navigational physical structure in web-based system. Links between each module are connected according to flow charts of various user scenarios that have been designed in this stage. Organization of various section of this site is important and should be refined using working prototype. At system design stage, the user interface should be prototyped to ensure they meet visual requirement such as section on a screen is for content, which section is for graphic and which section is clickable.



**Figure 3.1:** Waterfall with Prototyping Model

### 3.3.3.1 Principles phases of waterfall model with prototyping

#### *Phase 1: Problem definition and concept exploration*

In this first phase of system development life-cycle, needs for a system is identified and problem is sufficiently defined to assemble a team to begin problem evolution such as project objective, scope and purpose.

#### *Phase 2: Requirements analysis and specifications*

This phase started with the activity of understanding and determination of user needs by undergoing the brainstorming or using the prototype to communicate and eliciting user requirements with users. Following activity is doing the examination of user needs and constraints before the production of initial set of user requirements. The consideration of requirements must be assessed for priority, cost and schedule impact as well as risk. Finally, user requirements are validated by customer and software engineers.

#### *Phase 3: System design*

Process partitions requirements to either hardware or software system is done in this phase. This also involves the activities to identifying and describing fundamental of software system abstractions and their relationships. It establishes overall system architecture and creates models of solution, including flow charts and dataflow diagrams module and functionality layouts, and other descriptions required by the solution logical system of product is develop in this phase

#### *Phase 4: Implementation and unit testing*

The blueprints created in system design are transformed into a set of executable program (application) units. The type of testing used in this phase is the unit testing which involve debugging and verifying each unit (module) meets it specification. Focusing to web application development, each web page should be tested for browser comparability since end-users might use different browser to view web pages.

#### *Phase 5: Integration and system testing*

The individual program units or module are integrated and tested as complete system to ensure the user requirements have been met. For the web development, user acceptance testing should be performed after the site have been integrated and appears to work correctly. In software development term, this form of testing often called beta testing. Among all the testing involved, the user testing is the most important because it simulates real use. If problem discovers are not significant issues are uncovered, it is wise to delay release until they be corrected

#### *Phase 6: Release, operation and maintenance*

This phase is the longest life cycles phases. Started with the installation of system and put into practice use. Maintenance involves the correcting errors which were not discovered in earlier stages of life cycles, improving implementation of system units and enhancing system's services new requirements are discovered.

### 3.4 Conclusion

Variations of models are intended to illustrate different points which are just serving as the guideline only. It depends on how deep the software developer understands processes are represented in order to benefit and without being misled. Besides, developer also need to understand development of the business, the process which a model represents and what they are doing, and cannot just simply follow a model.

## Chapter 4: System Analysis

System analysis is a term that collectively describes the early phases of systems development. It also ranked as important phases in system development which can helps the developer has better understanding on the system's domain and system requirement. This technique helps developer to analysis system into its' component pieces and analysis the effectiveness of the components.

### 4.1 Functional Requirement

Functional requirements are statement of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations. The functional requirement for OHFS consists of three sections: Administrator Section, Authorized User Section and Universal User Section. The core of this system is administrator section. The most important is authentication module that controls the access of those two levels of user.

#### 4.1.1 Authorized member subsystem

##### 4.1.1.1 *Login module*

Users login to system with their login username and password.

##### 4.1.1.2 *Password lookup module*

Used by user when he/she forget the login name or password. An e-mail contains their login username and password

##### 4.1.1.3 *House advertisement module*

It enable member enter their information about their house into system through

advertising form and also upload the photo(s). This module contains the selection of the package for advertisement period.

#### *4.1.1.4 House Information module*

Enable user view the complete information of house which is advertised for sale/rent information such as photo, details and others.

#### *4.1.1.5 Payment module*

This module allows the advertiser (member) to pay the advertisement fee to system administrator. It also can show the status of payment and the list of all.

#### *4.1.1.6 Event Calendar module*

Directly enable member to share about particular topics and communicate among each other by posting it to forum board.

#### *4.1.1.7 Search module*

It enables users to search all the information about the house using various kinds of methods. It enable user to sort the results based on the date and price.

#### *4.1.1.8 Loan Calculator Module*

This module enable instant calculation of loan when user wants to the payment for loan monthly / yearly when user need the monetary support to buy the house .

#### *4.1.1.9 Feedback Module*

This module enable member to send comments, suggestion and report the error to administrator.

### **4.1.2 Universal User subsystem**

#### *4.1.2.1 Registration module*

This module enable then to register as member, so can use all functions provided by



system like other member.

#### *4.1.2.2 Search module*

It enables users to search all the information about the house using various kinds of methods. It enable user to sort the results based on the date, price and location.

#### *4.1.2.3 Loan Calculator module*

This module enable instant calculation of loan when user wants to the payment for loan monthly or yearly when user need the monetary support when buy the house.

#### *4.1.2.4 Event Calendar module*

Enable non-member to register as member to post event schedule.

#### *4.1.2.5. Feedback Module*

This module enable member to send comments, suggestion and report the error to administrator.

#### *4.1.2.6. Error check*

Error check data fields must carried out when user submit form to be inserted into database which includes all forms in user sections such as member registration forms, add event and feedback.

### **4.1.3 Administrator modules**

#### *4.1.3.1 Authorized member account maintenance*

This module used by administrator of system to view and monitor user information.

#### *4.1.3.2 House record maintenance module*

Enable administrator to customize and monitor house information. This included the approval or declination of house advertising by administrator.

#### *4.1.3.3 House categories maintenance module*

Give administrator privilege for viewing and monitor house categories.

#### 4.1.3.4 *Add administrator module*

This module allow administrator add new administrator system.

#### 4.1.3.5 *View administrator module*

This module allows administrator view all administrator system.

#### 4.1.3.6 *Feedback module*

This module enable administrator to view and reply to those feedback post by users. It gives the administrator some ideas to improve existing functions

#### 4.1.3.7 *Event Calendar module*

Giving the administrator privileged to customize and monitor event being added. This included the approval or declination of the posted event.

#### 4.1.3.8 *Authorized member password lookup*

This module allows administrator to send the login information to member through e-mail when user request for it.

## 4.2 **Non-Functional Requirement**

Non-functional specification are the constraints under which a system must operate and the standards and must be met by delivered system. Act as description of other features, characteristics and constraints that define a satisfactory system.

### 4.2.1 **User Friendliness**

User interfaces is the only way to let the communication medium between a human and a computer occur. Thus the OHFS design should be simple but attractive in the way to

reduce learning curve and trouble to user.

#### **4.2.2 Flexibility**

Basically, all the implementation of the system based on the web technologies must foreseeable to continually changing technologies environment which will see the appearance of the new technologies. It has ability to work with existing technologies and will not facing any problem when integrated into website.

#### **4.2.3 Speed / response time**

The server should be fast while searching a large amount of house ads from database and response to house seekers that using provided search engine to search house. Thus, the server must be powerful to handle simultaneous search request from multiple users.

#### **4.2.4 Reliability**

Reliability means the level of services to the user is consistent. This system will be test by technical user and non-technical users to avoid errors caused by the unfamiliarity of the limitations of the system by different background users.

#### **4.2.5 Security Features**

OHFS should ensure that only authorized administrator can has access to administrator subsystem and only registered member prohibited login to use certain services and perform certain tasks.

#### **4.2.6 Maintainability**

Maintainability for OHFS should be ease in term a program can be corrected when error is encountered, adapted if its environment changes or enhanced if the customer desires a change in requirement. There is not big manner for OHFS to fulfill this aspect because it is build using Microsoft .NET Platform in ASP.NET which is Visual Basic.Net-based programming. It is because it enhances code-behind concept which can strongly believed that bugs or systems faults can be detected and fixed in the shortest time.

### **4.3 System Development Tools Requirements**

#### **4.3.1 Chosen Development Platform**

As a web-base client server application, it provides a graphical user interfaces for users as administrator to perform administrative tasks over the internet. OHFS choose Microsoft Window XP Professional as development platform. This platform is built to associate with series of microprocessor from Intel Corporation that share the same or similar sets of instruction.

The main reason of choose Microsoft Window XP as development operating system because the familiarity to use it and mostly the computers in FCSIT are installed in Window XP version. Therefore the implementation of the new system can be done easily and effectively. Apart from that, Window XP offers high system uptime, dynamic system configuration and resilience to application failures. Following is the consideration that has been encounter while choosing it:

#### *a) Reliable*

Endowed with Windows File Protection contribute helps in term to protect core system files from being overwritten by application installations. When a file was overwritten, Window File Protection will restore the correct version. This operating system mitigates many of the most common system failures encounters in earlier version of Window to safeguarding system files.

*b) Internet enables user business*

It is designed to make to make organizations to be more ease to embrace the Internet. The built-in Internet Explorer (IE), a tightly integrated browser, provides user with a faster and richer Internet experience. Supported Dynamic HTML (DHTML) and Extensible Markup Language (XML) and offers a powerful platform for developers to create highly scalable end-to-end e-commerce applications.

*c) Manageable and easy to use*

Window XP offer a set of built-in tool which makes it easier to deploy and manage. It also offers an intelligent user interfaces with adapts to the way users work. Directly it is efficiency to users.

*d) Troubleshooters*

Window XP is designed to help users and administrators configure, optimize, and troubleshoot numerous Window XP Professional functions. This feature let users to be more self-sufficient, increase productivities; decrease the calls to help desk and better customer services.

### **4.3.2 Chosen Database Management System**

Microsoft SQL Server 2000 is a client or server-based relational database management system. It uses Transact-SQL as its dialect of the SQL language. It did offer a solution that's aimed at rapid development and low-cost implementation. Even though Microsoft SQL Server 2000 only run on Windows based platform but the usage level of Windows based operating systems in Malaysia is high. Microsoft SQL Server 2000 includes the Full-Text Search Services.

Apart from that, it also embedded with the built-in Internet integration which allows users to conduct business on the Internet and build intranet sites. Decreasing the administrative overhead and lowering total cost of ownership with design problems has been geared toward dynamic configuration. SQL Server 2000 leads in price-performance which involves the automation of most of manual tasks of the database administrator.

It also offers features such as dynamic for locking and memory allocation, auto-grow for log files, temped and database files, automatic for creation of the database upon a restore, index creation across an entire database and many other new features which tries to eliminate administrative tasks.

### **4.3.3 Chosen Development Data Access Technology**

The Data Access Technology that chosen is ADO.NET. It is an integral part of the .NET Framework. ADO.NET provides an extensive set of .NET classes that facilitate efficient access to data from a large variety of sources. ADO.NET enables sophisticated

manipulation and storing of data and form an important framework within which to implement inter-application communication and XML Web Services.

Essentially it is a collection of classes that expose techniques and feature used to manage communication between an application and a data store. As a basic part of the .NET Framework, ADO.NET simplifies integration of data sharing in distributed ASP.NET application. It also can be used in any consumer application that needs to connect to, and communicate with data sources such as Microsoft SQL server, as well as data sources exposed via OLE DB and XML.

#### **4.3.4 Chosen Development Web Server**

Microsoft Internet Information Server 5.0 (IIS) has been as web server. IIS is a web server and collection of software program. It is designed to services requests for information and other resources from client on the internet, World Wide Web or organizational Intranets. In a broader sense, IIS provide a comprehensive web server and web publishing system designed specially for Microsoft Window server operating system. Apart from that, it also let security features to be implemented on specific virtual directories to control access.

#### **4.3.5 Chosen Web Development Tool**

ASP.NET has been selected as the web development tool for develop this proposed project.

Below are reasons to choose it:

*a) Manageability*

The configuration information is stored as plain text, new setting may be applied configuration system which simplifies applying settings to server environment and web application. An ASP.NET framework application is deployed to a server simply by copying the necessary files to the server. To deploy or replace running compiled code, server restart is not required.

*b) Enhances Performance*

ASP.NET is compiled command language runtime code running on the server. ASP.NET is different from its interpret predecessor. ASP.NET can take advantage of early binding, just-in-time compilation, native optimization, and caching services right out of the box. These features are taken into consideration for better performance.

*c) Flexibility*

ASP.NET is based on the common language runtime, so the flexibility of the whole platform is available to web developers. ASP.NET can support multi language for code in web application file. It also integrated support to create and edit SQL. The .NET framework class library, messaging and data access solution are seamlessly accessible from the web.

*d) Scalability and Availability*

ASP.NET has been designed with scalability in mind with special features to improve performance in clustered and multiprocessor environment. Additionally, processes are closely monitored and managed by the ASP.NET runtime. If one misbehaves, a new



process can be created in its place, which helps to keep application constantly available to handle request.

*e) Simplicity*

ASP.NET makes it easy to perform common task from simple form submission and client authentication to deployment and site configuration. The ASP.NET page framework allow to build user interfaces that clearly separate application logic from presentation code and to handle events in a simple visual basic which forms processing model. Furthermore, common language runtime simplifiers development with manage code services such as automatic reference counting and garbage collection.

*f) ASP.NET Tool Support*

The ASP.NET is creating by using the rich WYSIWYG designer. Drag and drop ASP.NET server controls from the toolbox or user controls from the workspace and have a near-realistic preview rendering. It is easy to use because just a simple double click a server control to get automatic event wire up of server event handlers.

#### **4.3.6 Chosen Scripting Language**

VB.NET is chosen as the scripting language because of its component creation is using .NET framework. It also provides high quality application in shortest time. Apart from that, it equipped with drag and drop function which easier for the application developer to build interface when compared to Java.

It need to be chosen because the usage of SQL Server 2000 as the DBMS application.

This language will provides higher integration with SQL Server 2000 because both of them are Microsoft solutions. Apart from that, the VB.NET byte codes are faster than Java bytes codes because Java bytes codes need to be interpreted before execution.

#### **4.3.7 Chosen Image Authoring Tool**

Adobe Photoshop 7 has been selected because of it outstanding technology capabilities over Paint Shop Pro and Unlead Photo Impact. Adobe Photoshop software, is the professional image-editing standard, helps developer to work more efficiently, explore new creative options and produce the highest quality images for website, printing and others. It has capabilities to create exceptional imagery with easier access to file data, streamlined web design, faster and professional-quality.

### **4.4 Hardware Requirement**

Hardware requirement for OHFS should not be taken as an insignificant subject as it affects the development of the system tremendously.

#### **4.4.1 Development Hardware**

OHFS is a web based application, so it does not request client to have high spec machines. However, the machines that acts as the server will need very high performance hardware to handle many requests and processes simultaneously at high speed without encountering bottlenecks or system crashes.

#### **4.4.2 Server Hardware Requirement**

- a) Intel Pentium IV Processor 1.8 GHz
- b) 512 MB RAM memory
- c) 20 GB hard disk drive

**4.4.3 Client Hardware Requirement**

- a) Intel Pentium IV Processor 1.8 GHz
- b) 256 MB RAM memory
- c) 20 GB hard disk drive



Figure 3.13: Three Tier Architecture (Logical View)



Figure 3.14: Three Tier Architecture (Physical View)

## Chapter 5: System Design

System design is defined as those tasks focus on the specification of a detailed computer based solution. It is called as physical design which based on system requirement which stated in the functional requirement. The process involved in this step is to translate the requirement into system functionality

### 5.1 Three-tier Architecture

According to Tony Marston (2002), three-tier architecture can be hardware oriented (physical) as shown at Figure 5.1 or software oriented (logical) as shown at Figure 5.2. Briefly to conclude that the hardware oriented is mean how we arrange the position of the hardware components in the architecture which the application server must placed in between the client and database server. Meanwhile the software oriented is means that how is the software work and what its responsibilities for the whole architecture are.

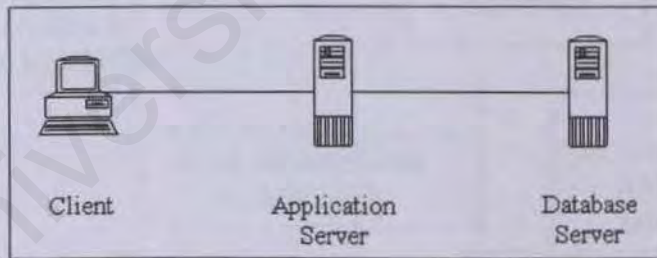


Figure 5.1: Three Tier Architecture (physical view)

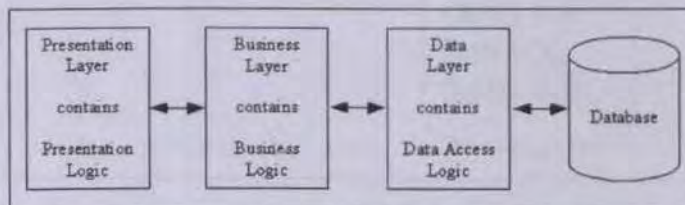
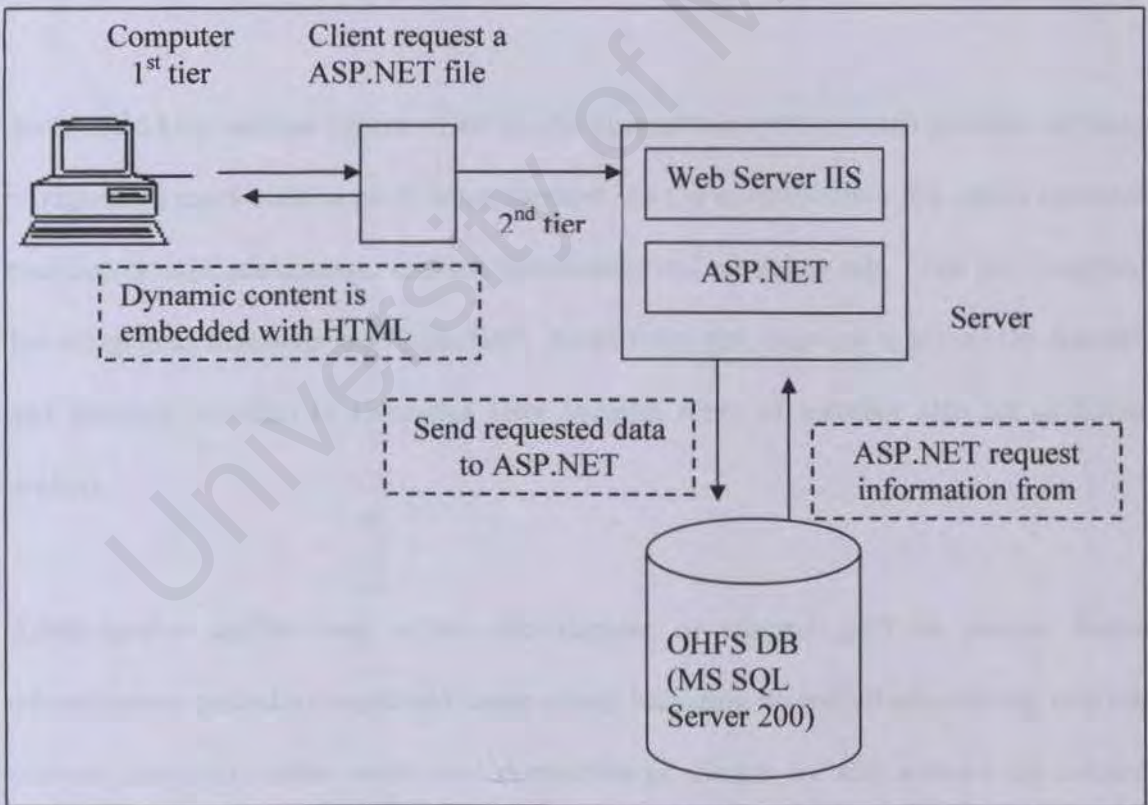


Figure 5.2: Three Tier Architecture (logical view)

The OHFS application infrastructure will be based on three-tier architecture. The three tier architecture is consisting of the application tier, service tier and data repository. Application tier is the user interface, which runs on the user computer. Service tier is the functional module that process data. This middle protect tier protect the data from direct access by the user. Data repository is a database management system (DBMS) that store the data required by the middle tier.

In reality, the three tier web application consist of a web browser for user interface, web server connected to middle tier application, and a persistent store that is normally a relational database.



**Figure 5.3:** Three Tier Architecture

## 5.2 OHFS Architecture Design

OHFS consist of 3 components which is Universal User, Authorized User and administrator which produce into many modules.

For Universal User section which also consist the Authorized User is provide services to house seekers. They can browse and use all the services freely such as search by map, advanced search, use Target House Cart for printing purpose, use loan calculator, vote poll, alerts subscription and sort the result except for the forum which need them to register first. After that, register as forum member their status automatically changes to member.

Authorized User section consist of all the member of this system which provides services to registered users such as place advertisement, do the advertisement fee online payment transaction, edit ads content, contact information and terminate ads. The pre-condition for using these functions is to login first. Apart from that, they can enjoy all the features and function provides to Universal User because some of member also act as house seekers.

Administrator section only allow administrator or support staff to process house advertisement posted by registered house owner including review all ads content, edit ads content, carry out online credit card transaction as charges for ads, activate ads content for public viewing. It also allow administrator to perform other tasks such as send house

alerts e-mail, clearing expired rental ads, monitor and post topic to forum, provide poll topic and review and reply all feedback.

### 5.3 System Structure Chart

This type of chart is used to depict high level of specified system. The system is structured into several different principle subsystems where a subsystem is an independent unit. Each identifies subsystem is decomposed into modules. A module normally provides one or more services to other modules. The purpose of having this kind of chart is to describe the interaction between independent modules of system. The structure charts for OHFS is shown at next page:

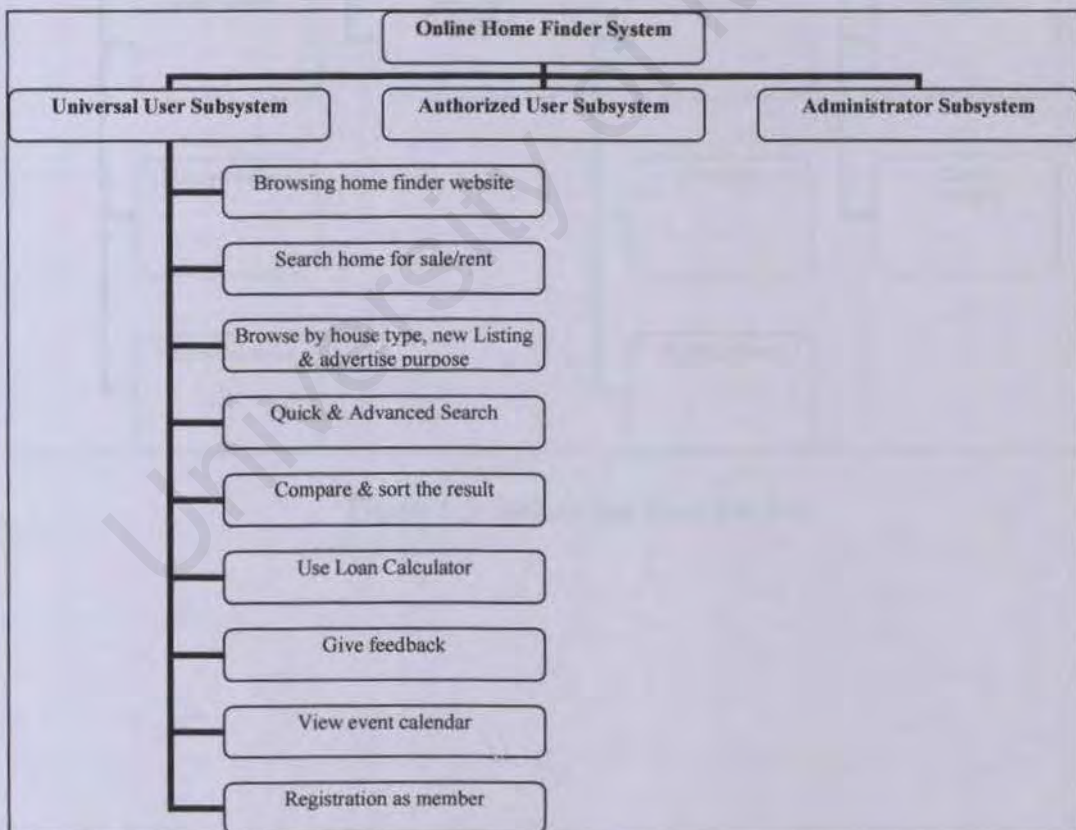


Figure5.4 Universal User Module

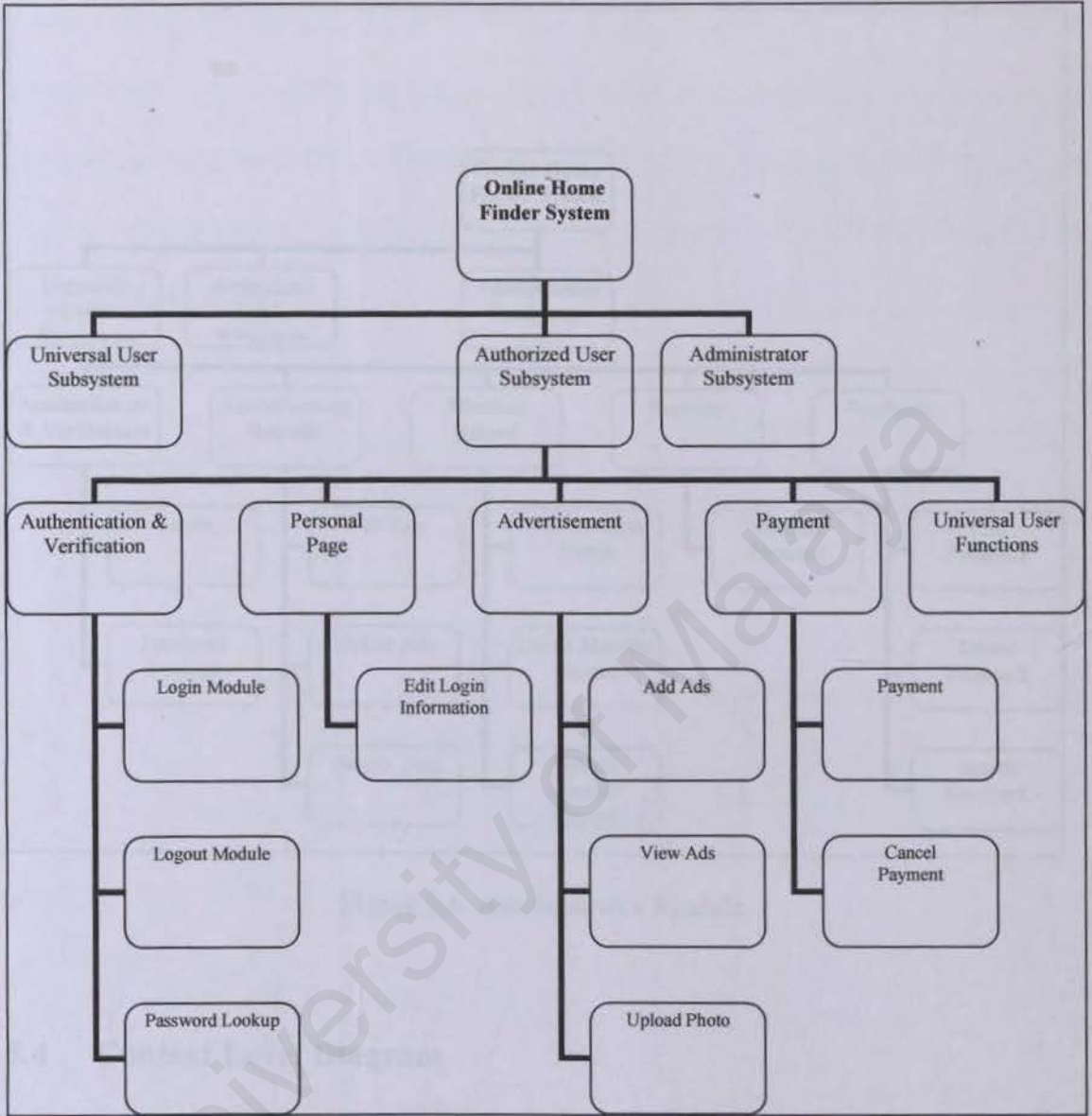


Figure 5.5 Authorized User Module



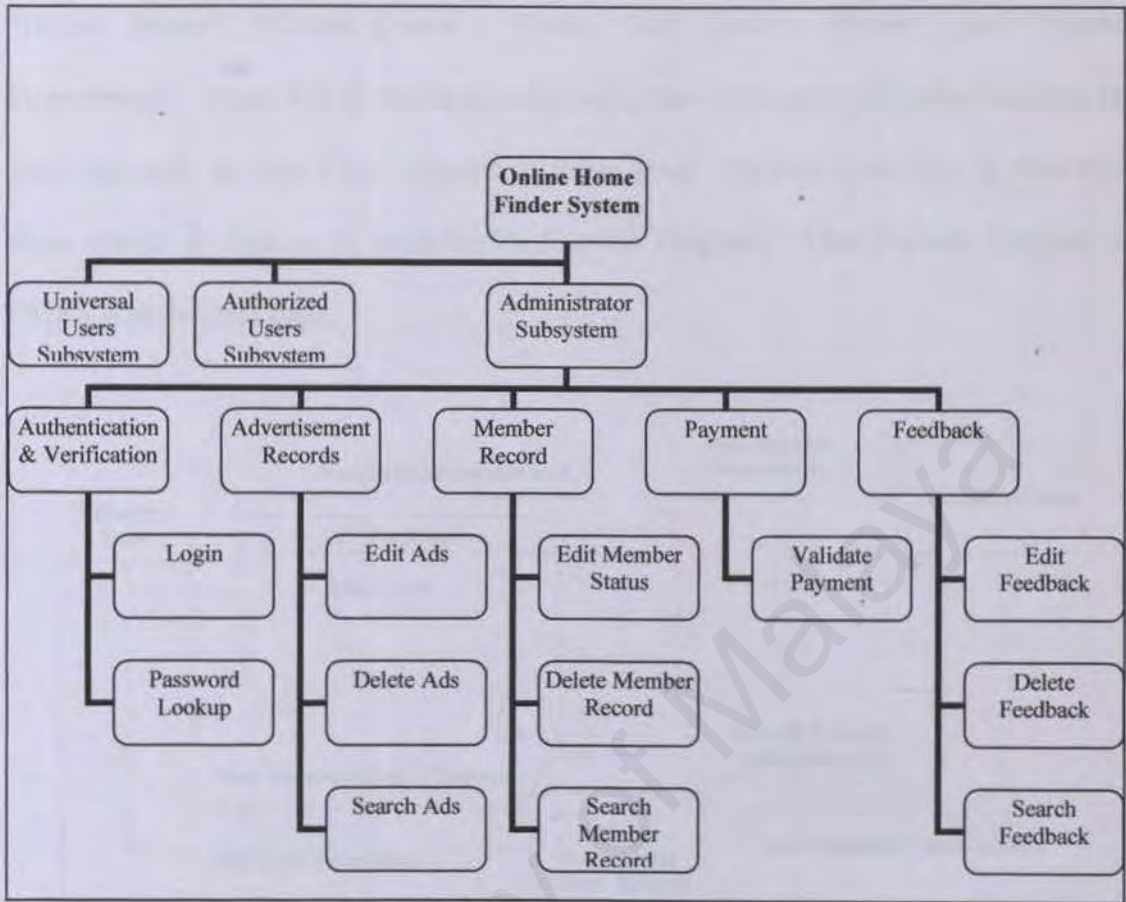


Figure 5.6 Administrator Module

#### 5.4 Context Level Diagram

It is the highest level for data flow diagram which presents scope and boundaries of system. It also a very first diagram had to be drawn in process of preparing the data flow diagram for system.

Only single process will be placed in the middle of whole diagram. This process labeled with the name of system being developed. Context diagram for this project consists of a single process called "Online Home Finder System". Four entities on this diagram is

“House Seeker”, “House Owner”, “Credit Card Clearing House”, and “Account Department”. There will be no data stores will show in Context Diagram because data store will store in Data Flow Diagram of lower level. Arrows show flow of data either from entities to system or from OHFS Context Diagram. This Context Diagram for OHRS is at the next page.

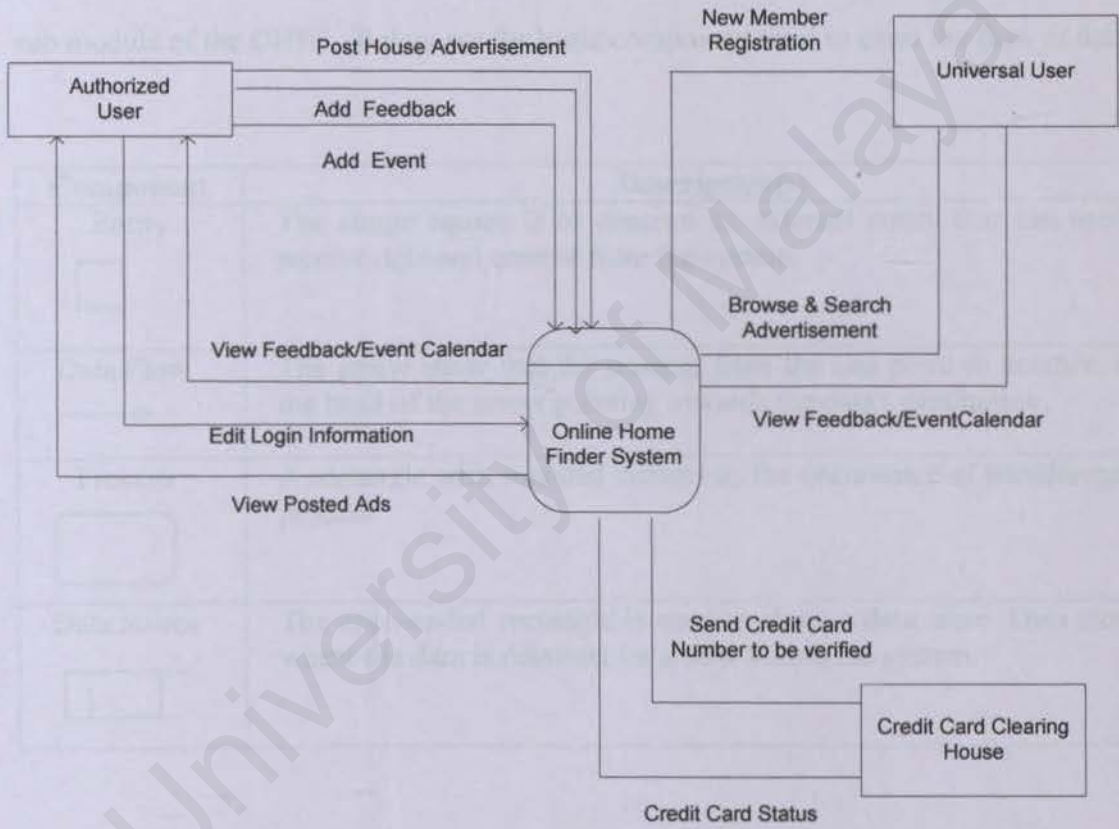


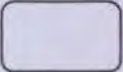
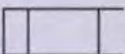
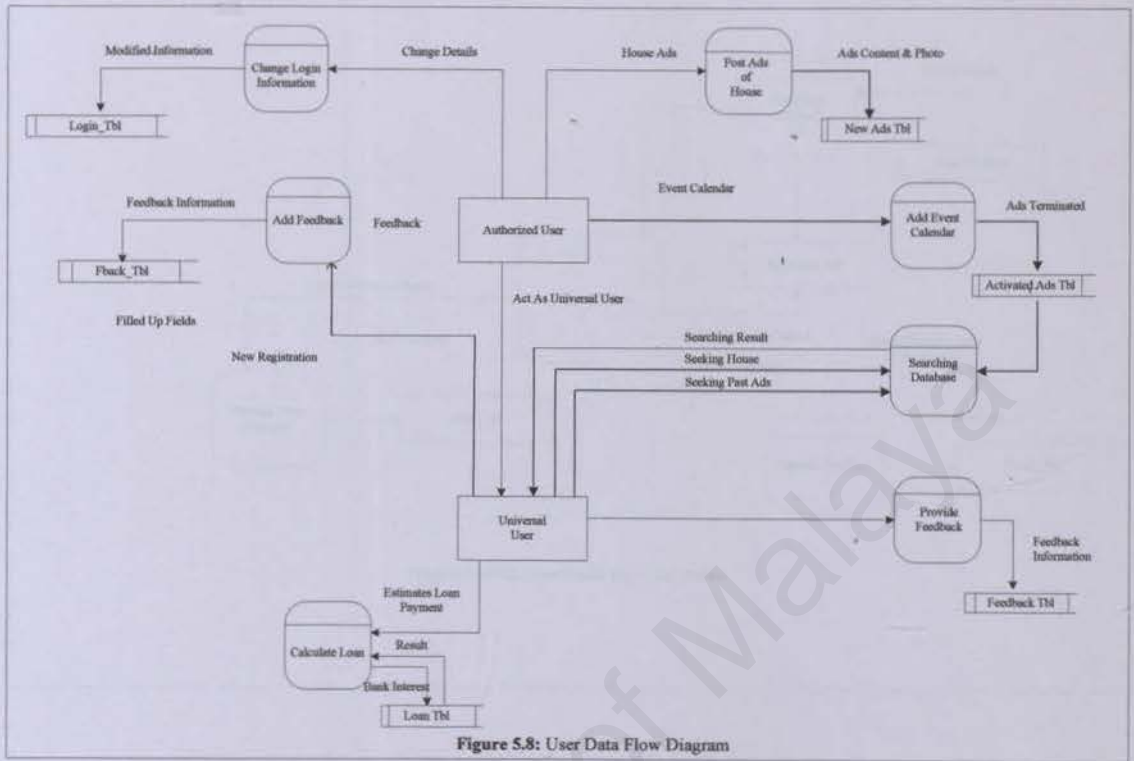


Figure 5.7 Context Diagram for OHFS

## 5.5 Data Flow Diagram

Data Flow Diagram depicts the data flow through a system and the work processing performed by that system. A data flow represents an input or output of data to a process. The basic component of a data flow diagram is: Entity, Data Flow, Process and Data Stores. These component is use to create a graphical of process. The advantages of the data flow, it helps easy to read, further understand of the interrelatedness of modules and sub module of the OHFS. Below are the basic component used to chart the flow of data.

Component	Description(s)
Entity 	The single square is to descript an external entity that can send or receive data and control from the system.
Data Flow 	The arrow show that the process from the one point to another, with the head of the arrow pointing towards the data's destination.
Process 	A rectangle with rounded corners as the occurrence of transformation process
Data Stores 	The open-ended rectangle is used to show a data store. Data store is where the data is detained for a time within the system.



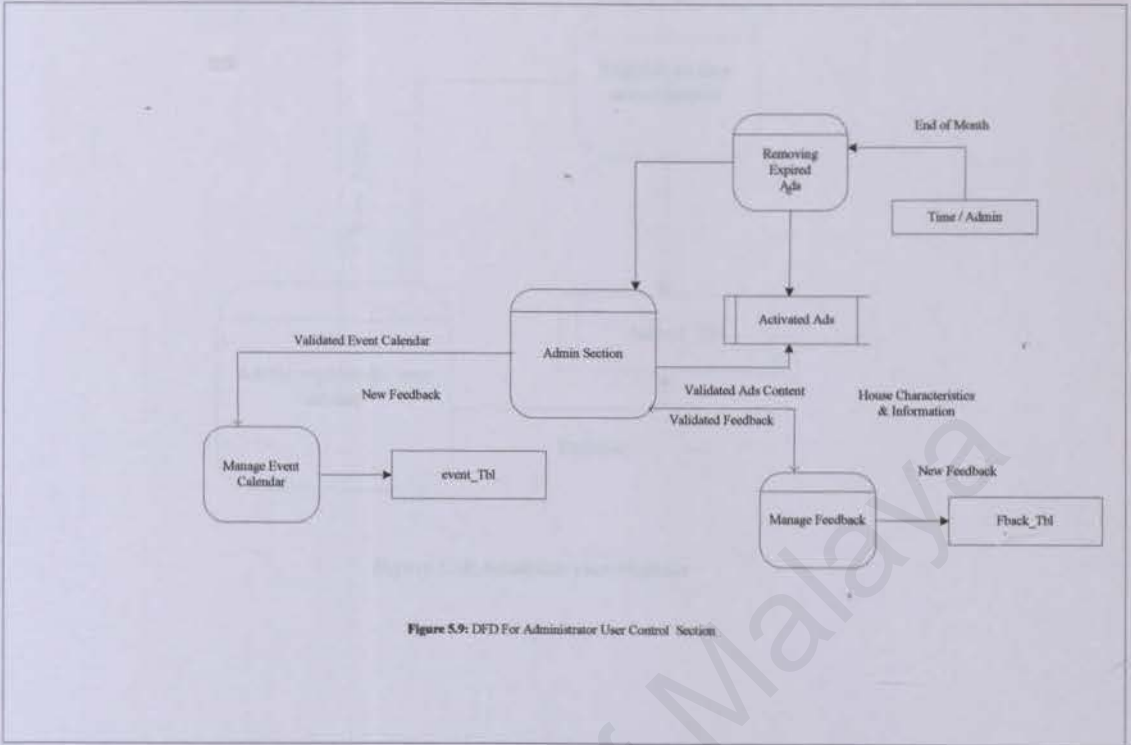


Figure 5.9: DFD For Administrator User Control Section

University of Malaysia

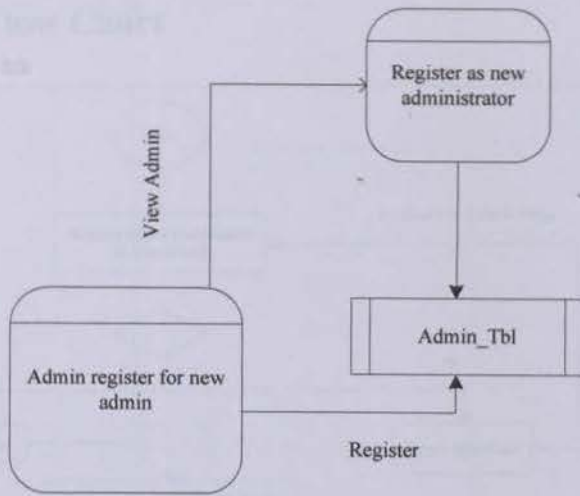


Figure 5.10 Administrator Moduke

University of Malaya

## 5.6 Flow Chart

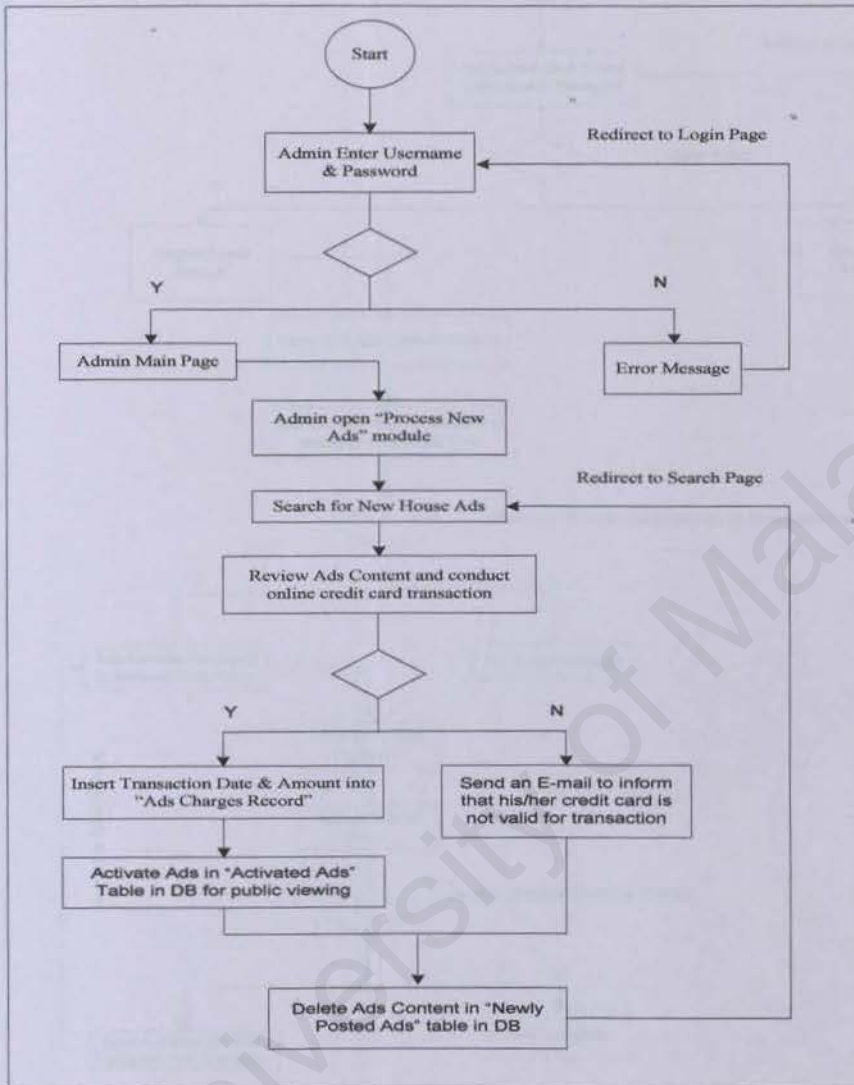


Figure 5.11: Procedure to Delete ads by Administrator

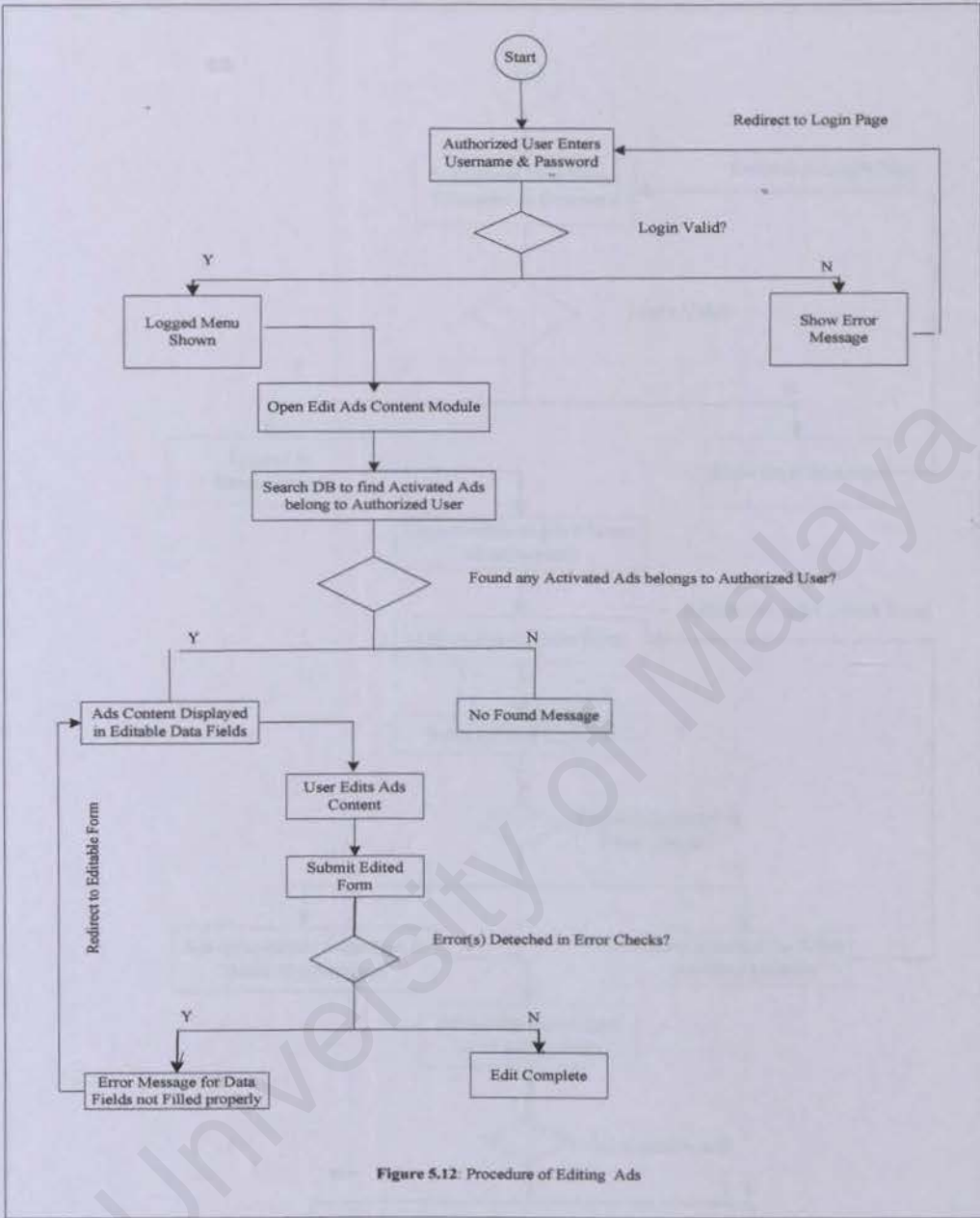


Figure 5.12: Procedure of Editing Ads



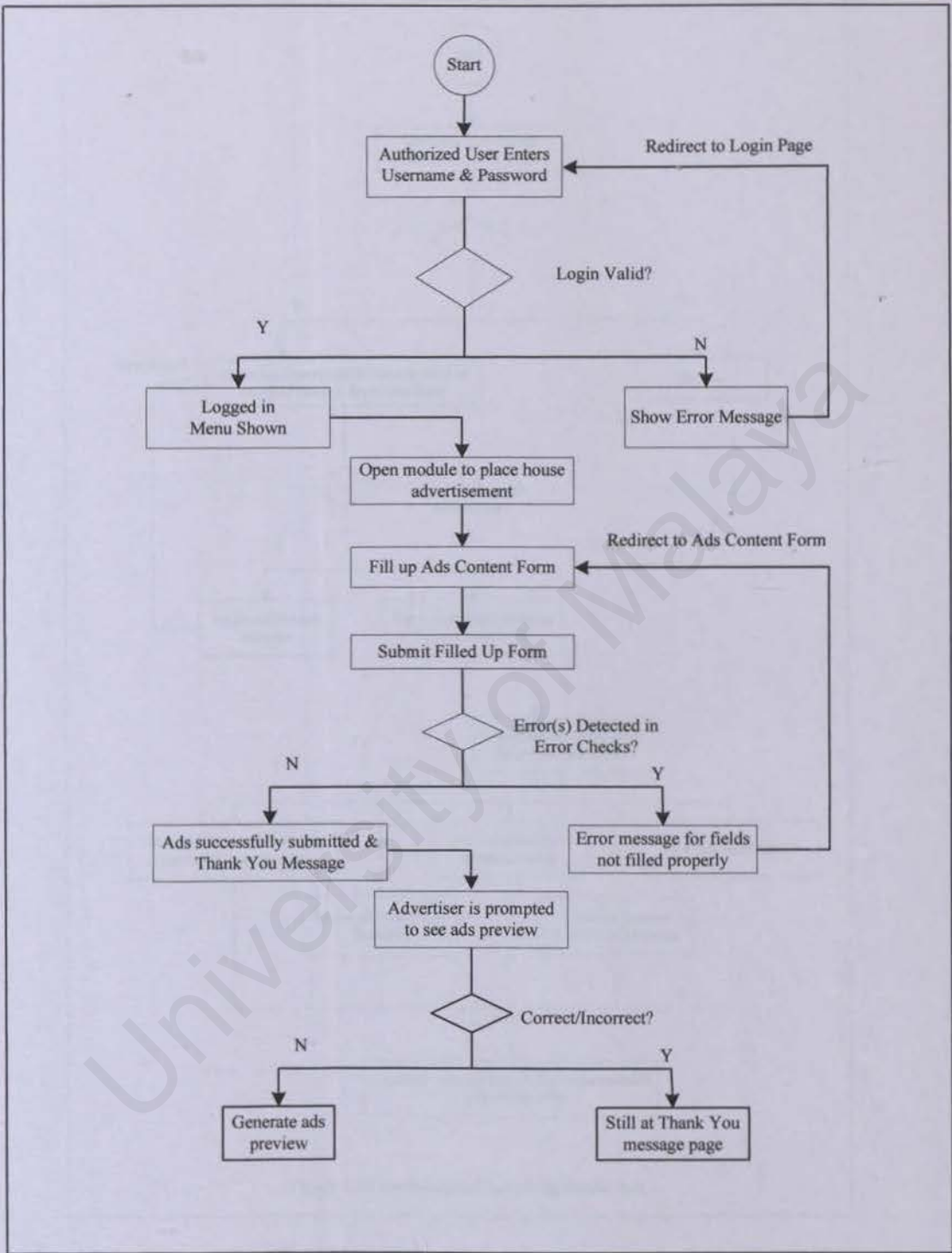


Figure 5.13: Procedures of Placing an Ads

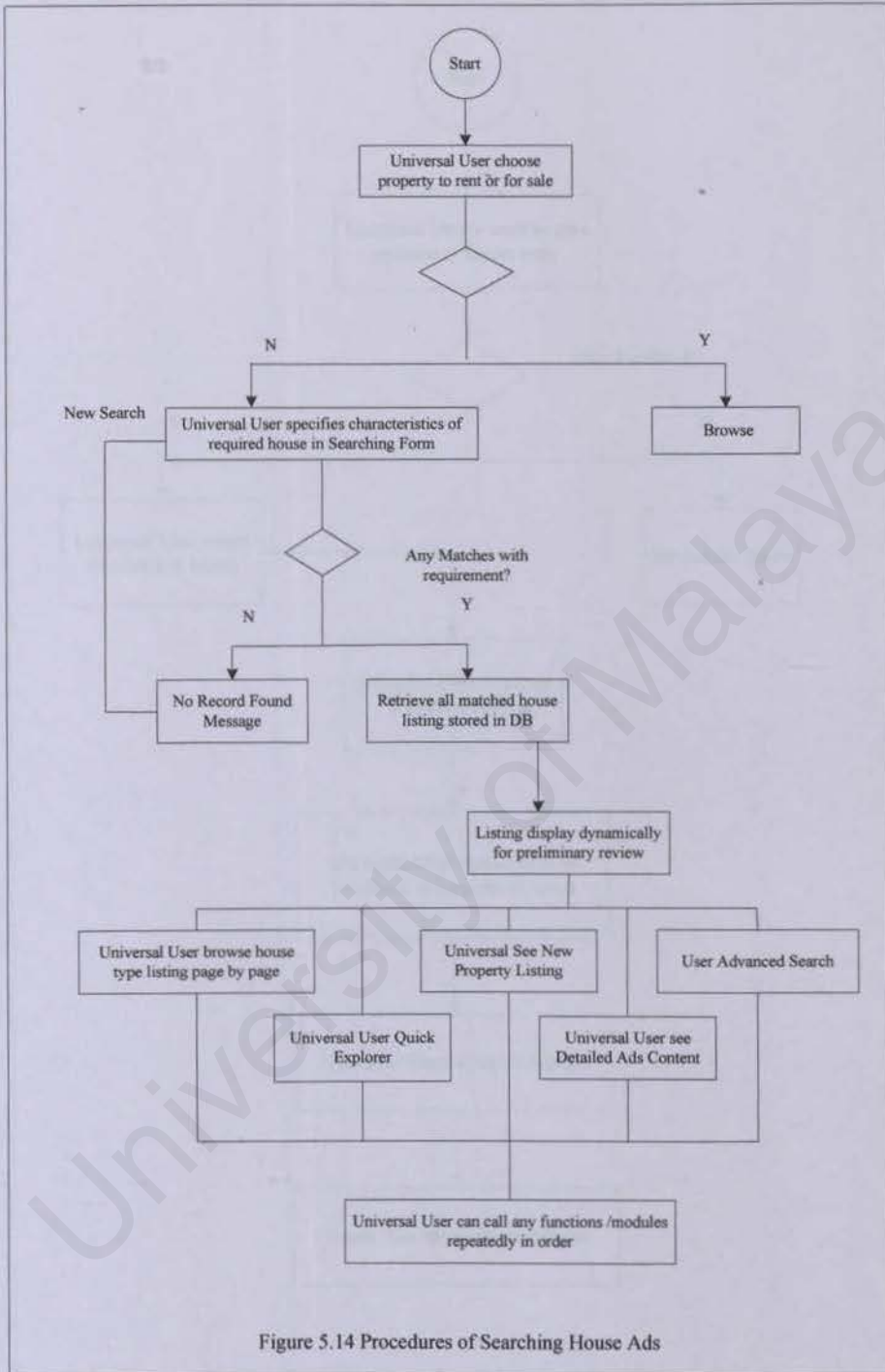
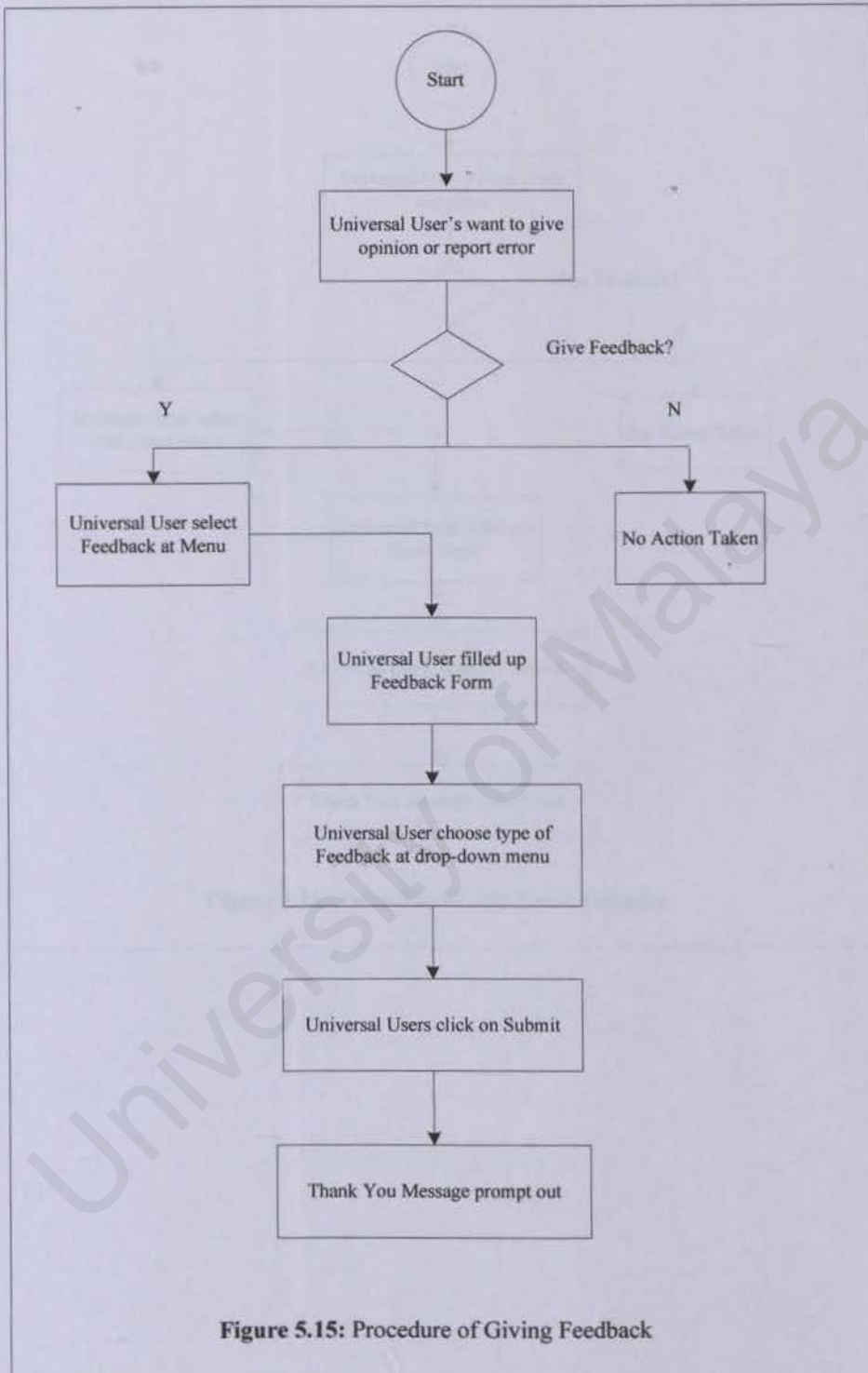
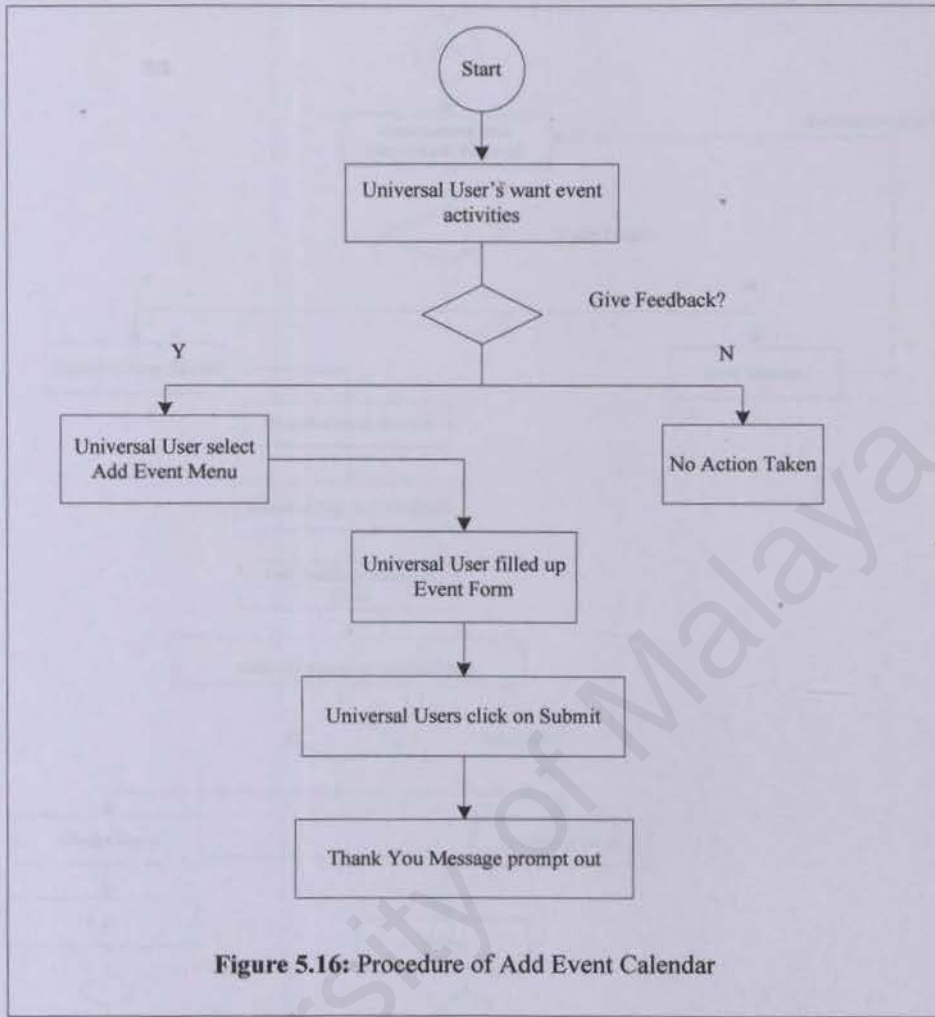


Figure 5.14 Procedures of Searching House Ads



**Figure 5.15:** Procedure of Giving Feedback



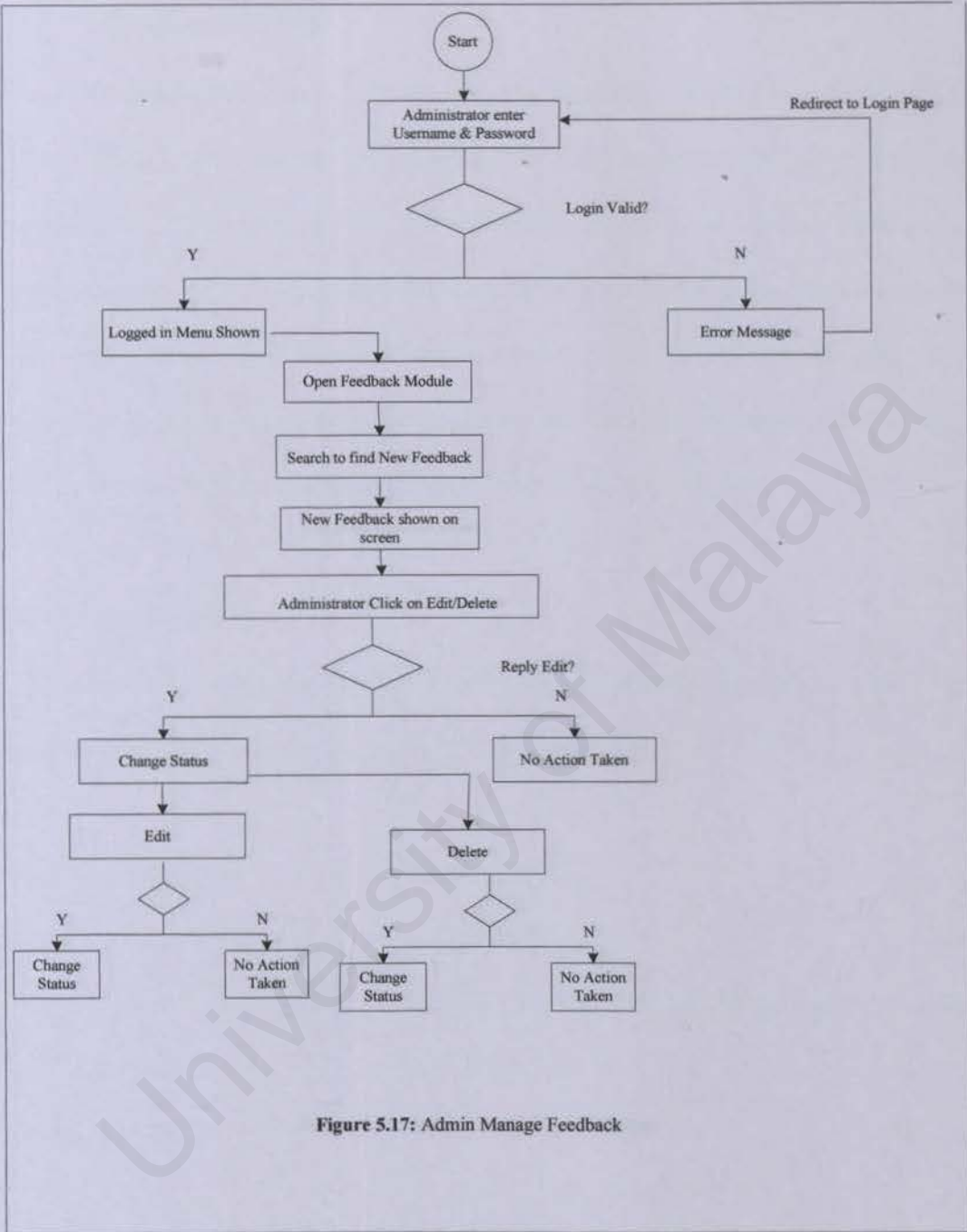


Figure 5.17: Admin Manage Feedback

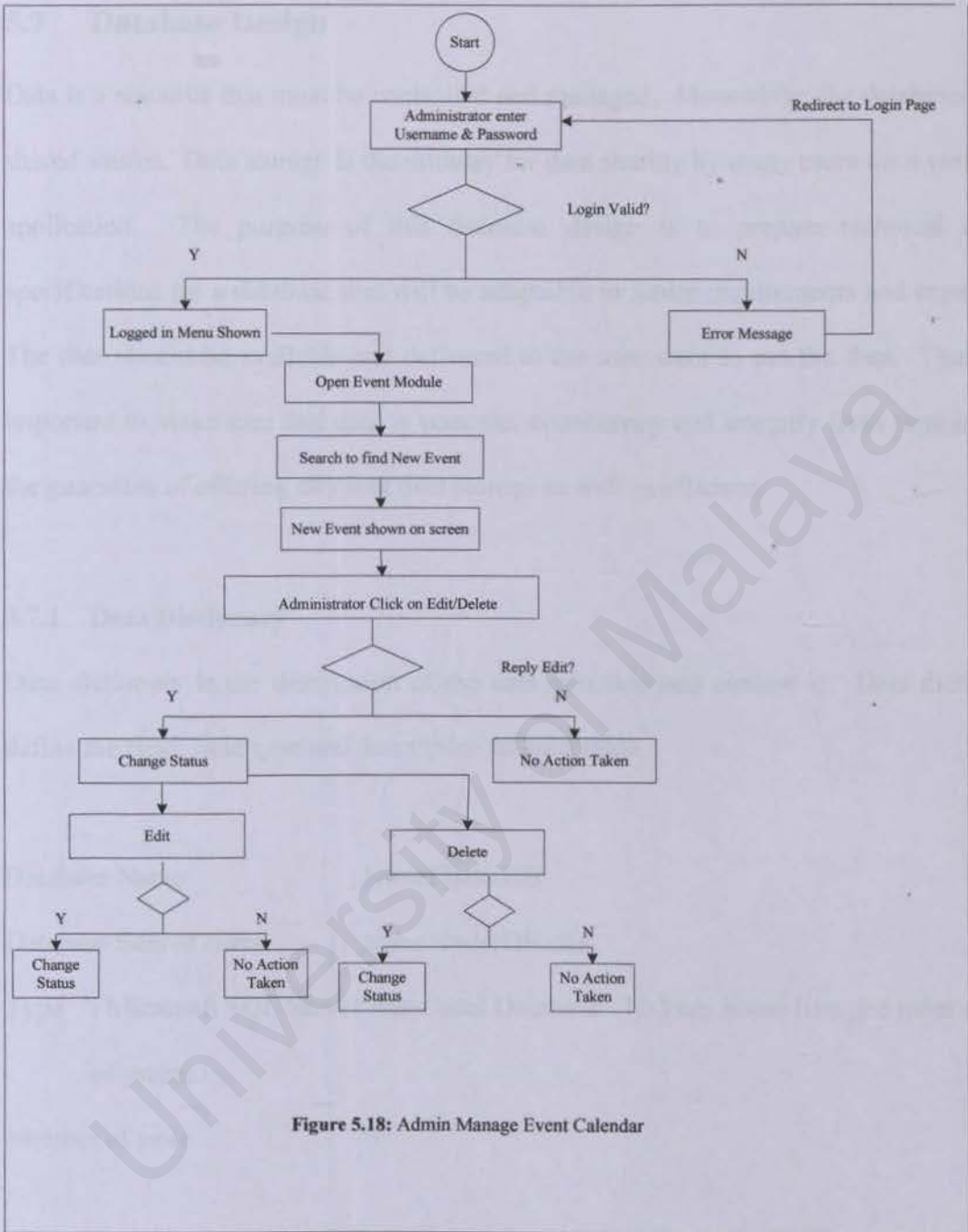


Figure 5.18: Admin Manage Event Calendar

## 5.7 Database Design

Data is a resource that must be controlled and managed. Meanwhile, the databases are a shared source. Data storage is the midway for data sharing by many users for a variety of application. The purpose of this database design is to prepare technical design specifications for a database that will be adaptable to future requirements and expansion. The data should be available and delivered to the user want to use the data. Thus, it is important to make sure that data is accurate, consistency and integrity from time include the guarantee of offering efficient data storage as well as efficient.

### 5.7.1 Data Dictionary

Data dictionary is the description of the data structure and content is. Data dictionary define the field, field type and description of each table.

Database Name : homeFinderDB

Database Source Name : homeFinderDB.dns

Type : Microsoft SQL Server Relational Database. To keep house lists and other record of system.

Number of table : 5

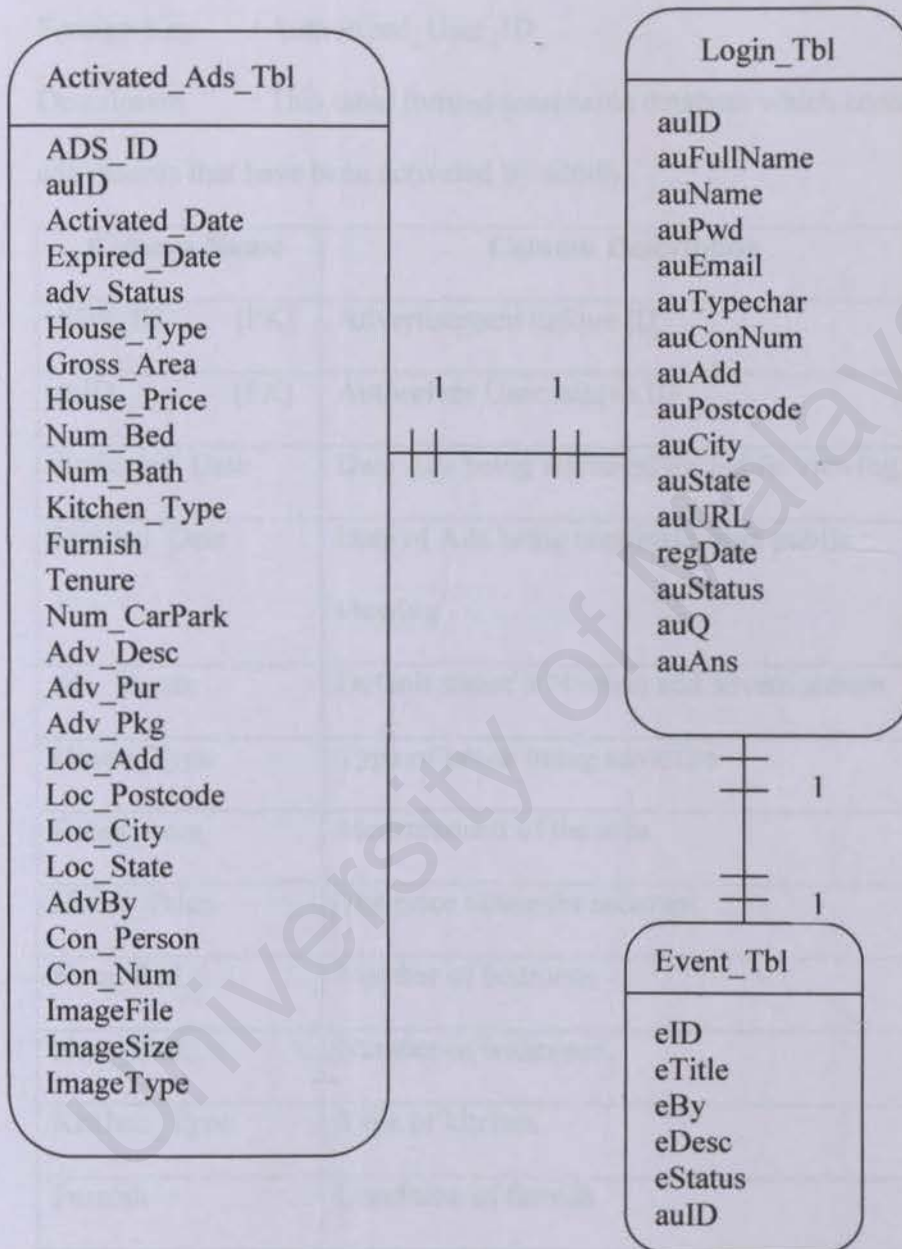


Figure 5.19 Logical Data Model For OHFS



Table Name : Activated\_Ads\_Tbl

Primary Key : Ads\_ID

Foreign Key : Authorized\_User\_ID

Description : This table formed searchable database which contain all house ads records that have been activated by admin.

Column Name	Column Description	Data Type
ADS_ID [PK]	Advertisement unique ID	Bigint(8)
auID [FK]	Authorizes User unique ID	Bigint(8)
Activated_Date	Data Ads being activated for public viewing	Datetime
Expired_Date	Date of Ads being terminate from public viewing	Datetime
adv_Status	Default status is N when add advertisement	Char(1)
House_Type	Type of house being advertise	Varchar(50)
Gross_Area	Measurement of the area	Integer(10)
House_Price	The price house for sale/rent	Integer(10)
Num_Bed	Number of bedroom	Integer(10)
Num_Bath	Number of bathroom	Integer(10)
Kitchen_Type	Type of kitchen	Varchar(25)
Furnish	Condition of furnish	Varchar(25)
Tenure	Type of tenure	Varchar(25)
Num_CarPark	Number of car park	Integer(10)
Loc_Add	Location address	Varchar(100)
Loc_Postcode	Location address postcode	Varchar(30)

Loc_City	Location address city	Varchar(30)
Loc_State	Location address state	Varchar(30)
Adv_Desc	Description advertisement	Varchar(500)
Adv_Pur	Advertise purpose	Varchar(10)
Adv_Pkg	Package for advertising period	Varchar(50)
Con_Person	Person to contact	Varchar(50)
Con_Num	Contact person phone number	Varchar(25)
ImageFile	Image file	Image(16)
ImageSize	Image Size	Varchar(50)
ImageType	Type of image	nvarchar(50)

Table 5.1: Activated Ads Table

Table Name : event\_Tbl

Primary key : eID

Description : Table subtype of Authorized\_User have inherited attributes from Authorized\_User. This table store event details add by user.

Column Name	Column Description	Data Type
eID [PK]	Event unique ID	Integer(4)
auID [FK]	User ID add the event	Bigint(8)
eTitle	Title of the event	Varchar(50)
eBy	Add by which user	Varchar(50)
eDesc	Event description	Varchar(500)
eStatus	Status for event.	Varchar(1)

eDate	Date event added	Datetime
-------	------------------	----------

Table 5.2: Event Calendar Table

### Stand alone table

Table Name : Fback\_Tbl

Primary key : Fback\_ID

Description : This table store feedback has added by universal user.

Column Name	Column Description	Data Type
Fback_ID [PK]	Feedback unique ID	Integer(4)
Fback_Name	Name of the sender	Varchar(50)
Fback_Email	Email address of the sender	Varchar(1)
Fback_TypeR	Type of feedback chosen	Varchar(1)
Fback_Comment	Feedback comment	Varchar(500)
Fback_Status	Status for feedback	Varchar(1)
Fback_Date	Date event added	Datetime

Table 5.3: Feedback Table

Table Name : admin\_Tbl

Primary key : adminID

Description : This table store information about administrators.

Column Name	Column Description	Data Type
adminID [PK]	Administrator unique ID	Bigint(8)
adminName	Administrator full name	Varchar(50)

adminUsername	Administrator login name	Varchar(50)
adminPwd	Administrator login password	Varchar(1)
adminQ	Administrator password hint	Varchar(50)
adminAns	Administrator password hint's answer	Varchar(50)

**Table 5.4:** Administrator Table



Figure 5.24: Main Page Screenshot

## 5.8 User Interface Design

User interface design is very important to provide a user-friendly, intuitive, minimize the need for users to memorize the process and events, and at the same time give a good impression to the users. The user interface must consider some factors as terminal familiarity, possible errors and misunderstandings that end-user may have or may encounter, the need for additional instruction or help at certain points, and screen content and layout.

### Main Page

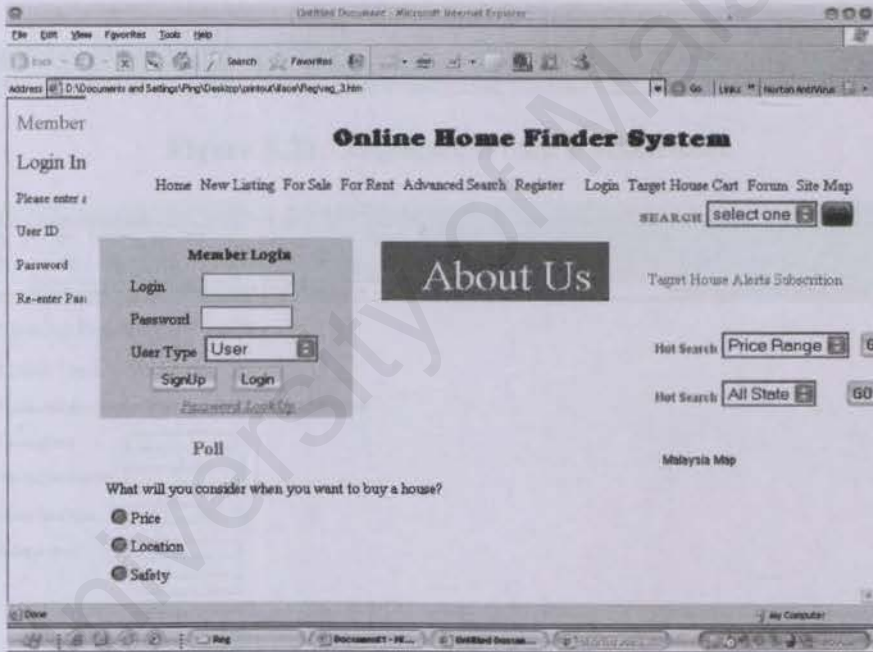


Figure 5.20: Main Page Screenshot

Member Registration (Step 1)

Contact Information

Please enter all required contact information and click the 'Send Form' button below.

Full Name

Address

City

State & Post Code: State

Phone Prefix & Number:  -

Mobile Prefix & Number:  -

E-mail address:  Please provide a valid email address.

Figure 5.21: Registration Step 1 Screenshot

Member Registration (Step 2)

Credit Card Information

Please enter all the requested information below, then click 'Continue'.

Owner Name

Credit Card Number:

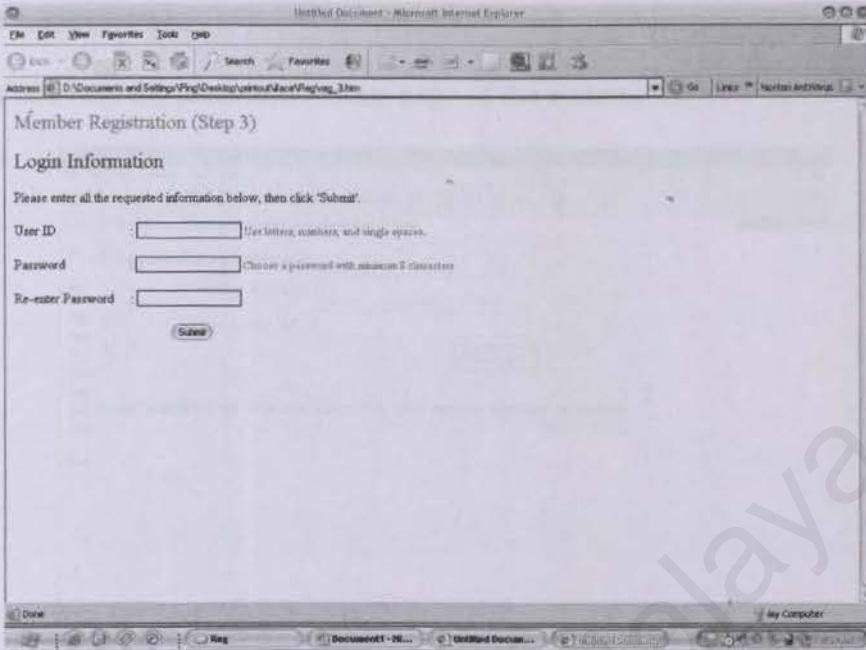
Credit Card Type:

Billing Address

City

State & Post Code: State

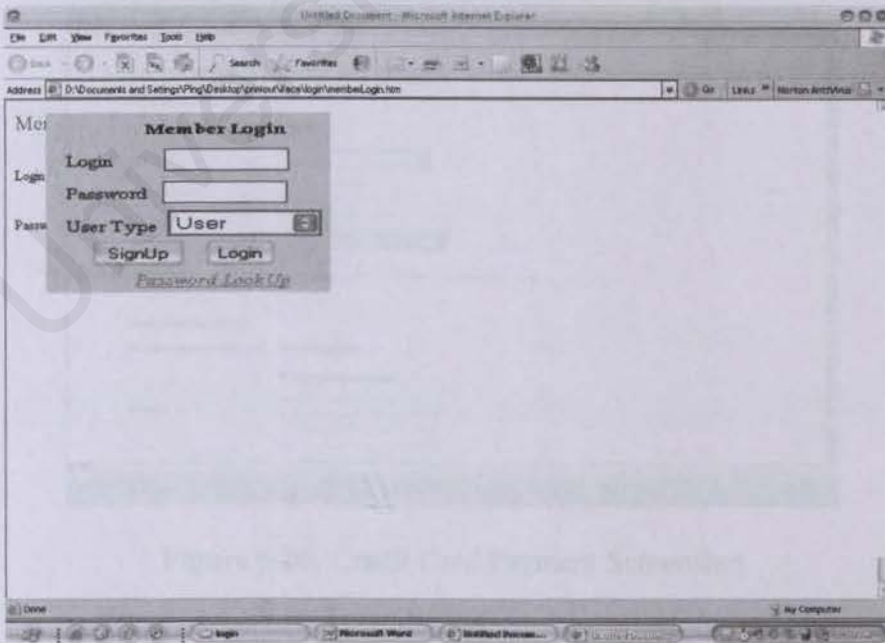
Figure 5.22: Registration Step 2 Screenshot



**Figure 5.23: Registration Step 3 Screenshot**

## Login Page

The figure above is the login page of the system. Content Controller needs to login to system before start using the system.



**Figure 5.24: Member Login Screenshot**

## Password Lookup Page

The figure above is the password lookup page of the system.

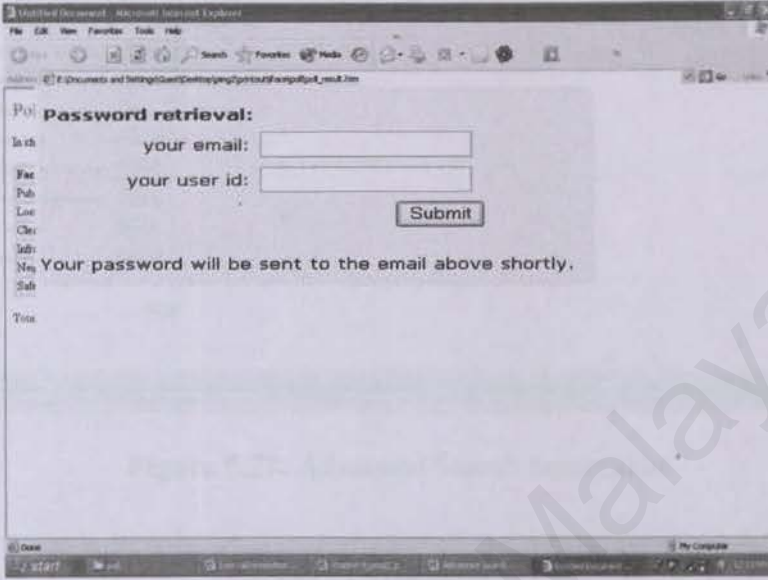


Figure 5.25: Password Lookup Screenshot

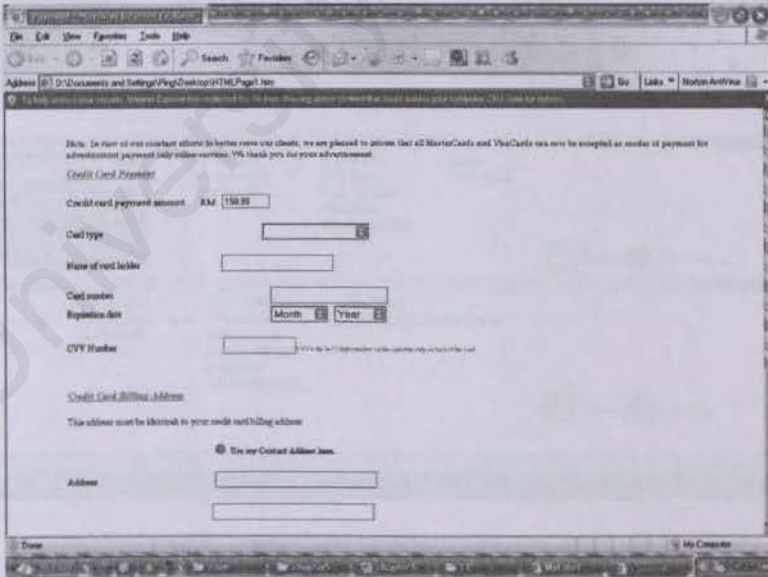


Figure 5.26: Credit Card Payment Screenshot



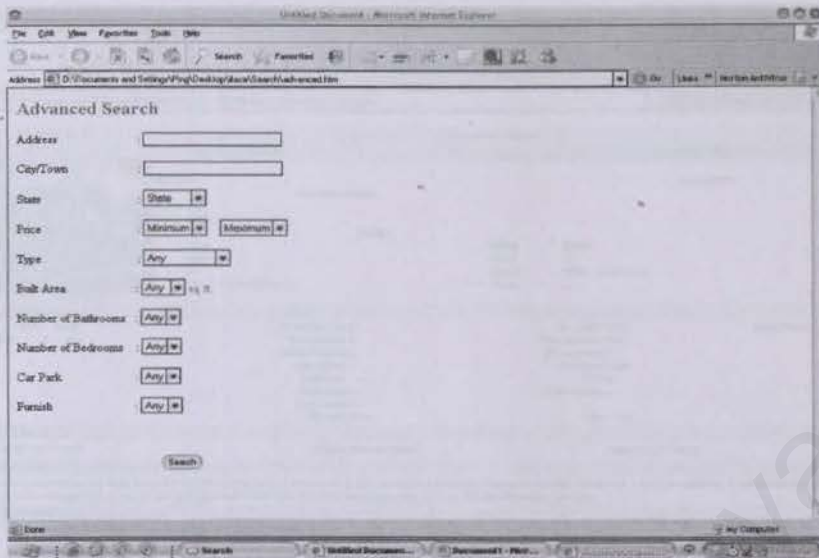


Figure 5.27: Advanced Search Screenshot

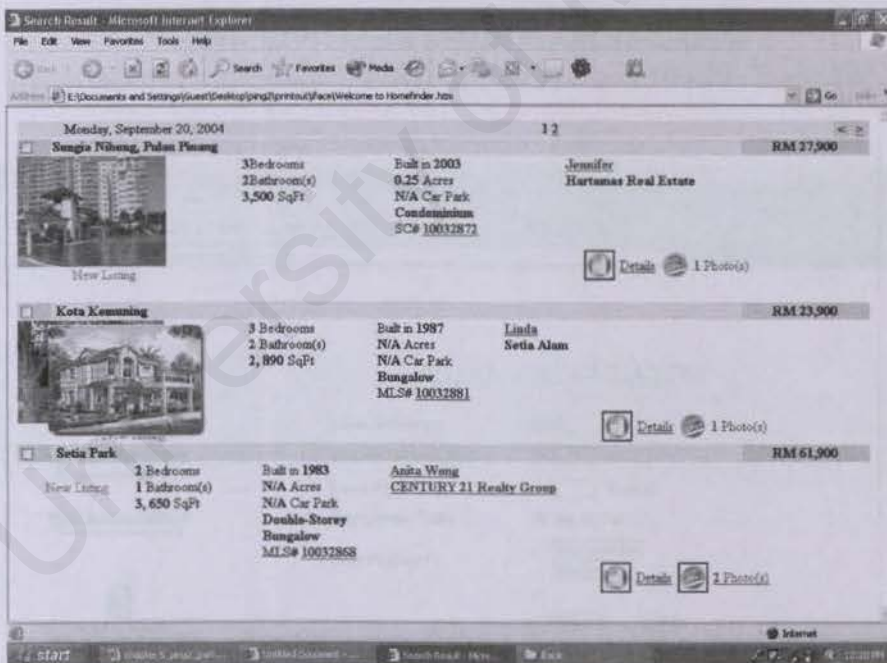


Figure 5.28: Search Result Screenshot

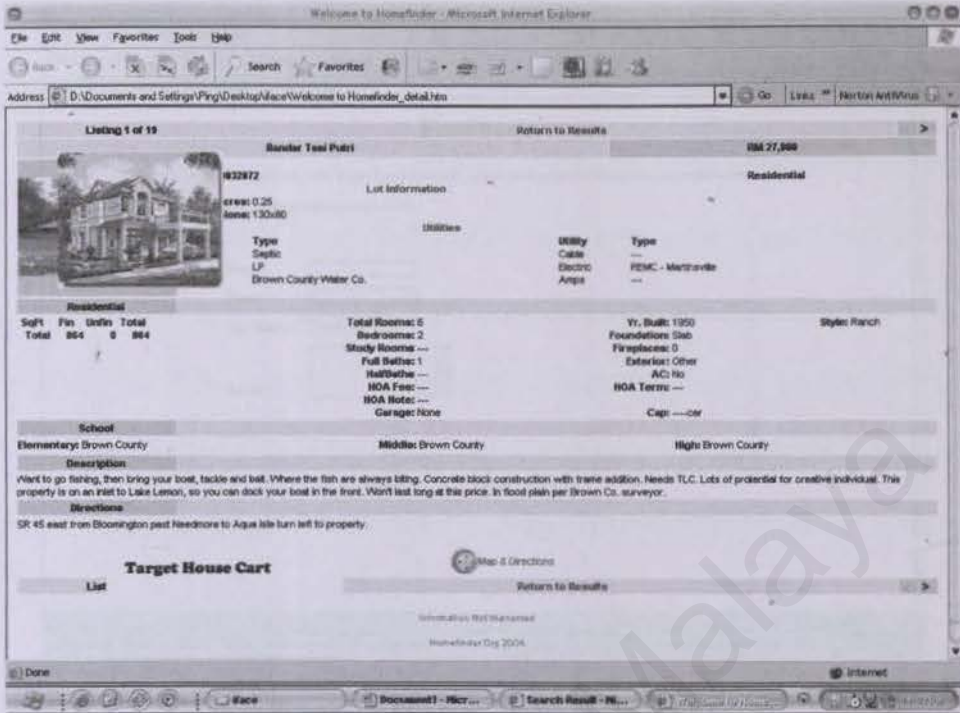


Figure 5.29: Details Search Result Screenshot

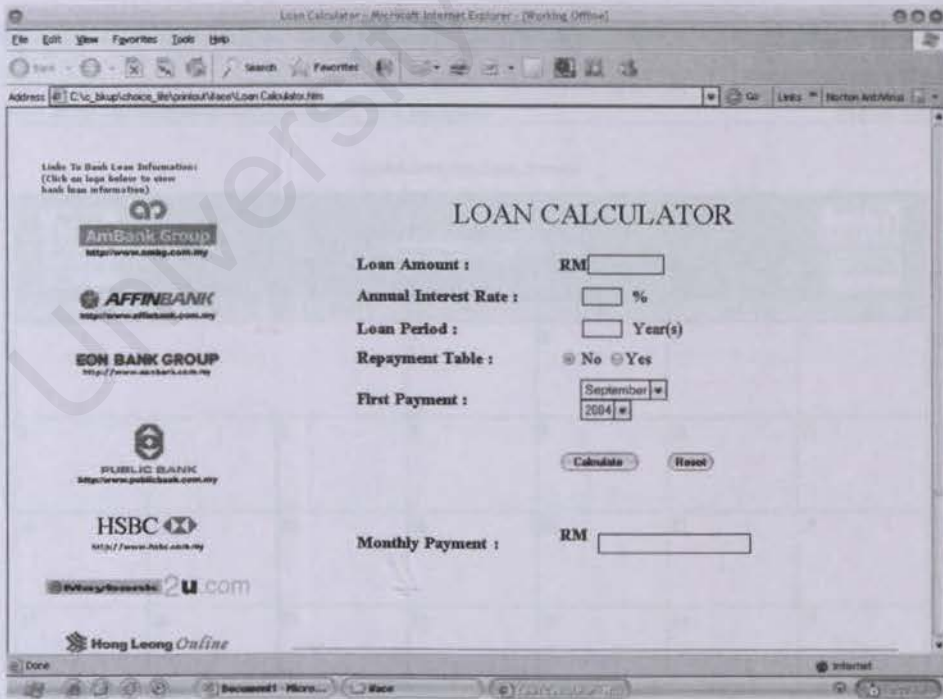


Figure 5.30: Screenshot for loan calculator

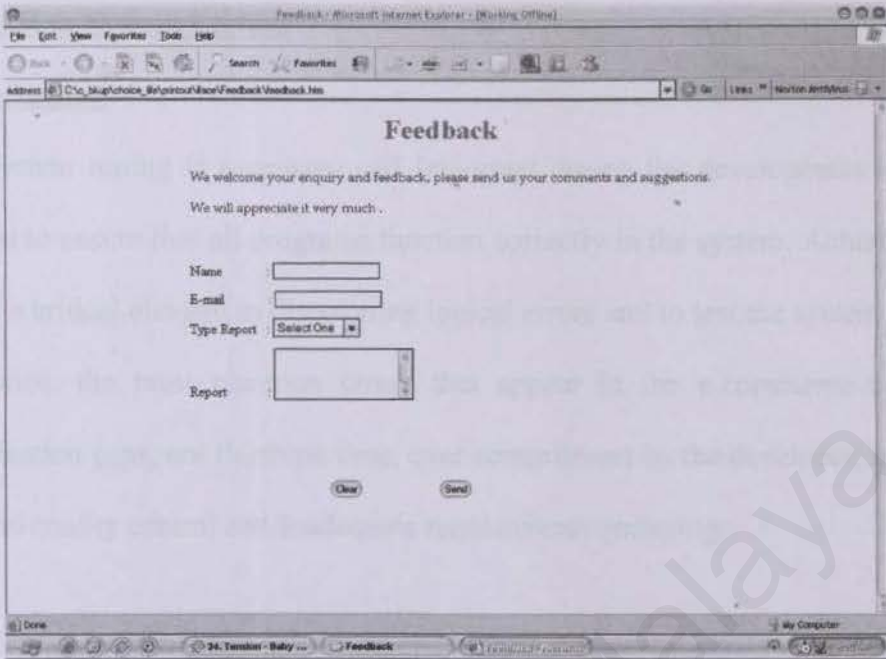


Figure 5.31: Feedback Screenshot

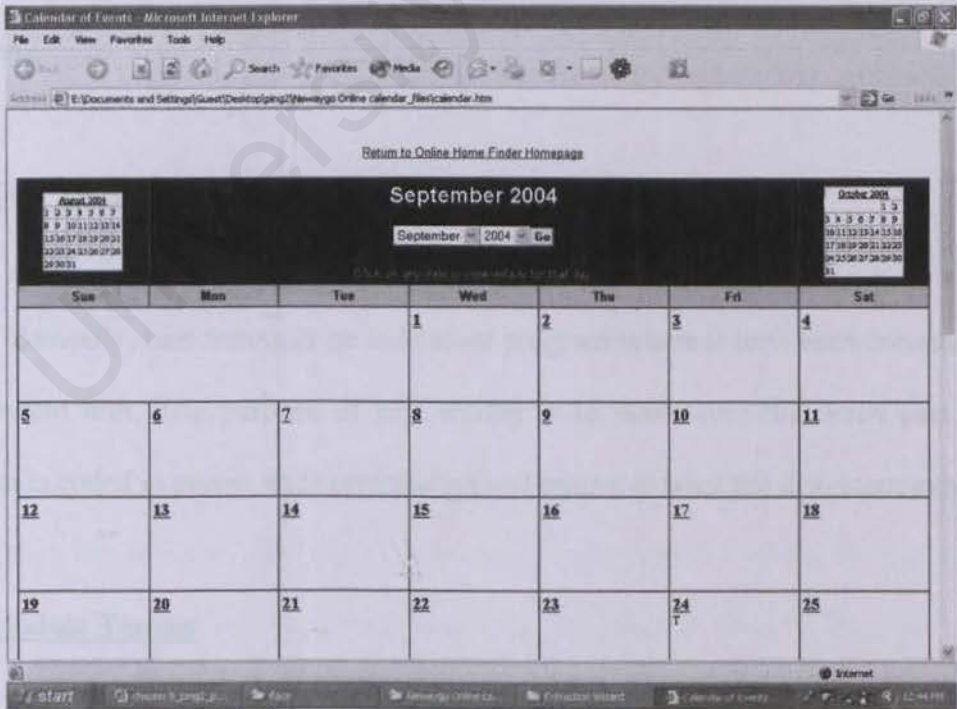


Figure 5.32: Event Calendar Screenshot

## **CHAPTER 6: System Testing**

### **6.1 Introduction**

System testing is necessary and important during the development system. Its purpose is to ensure that all programs function correctly in the system. Actually, system testing is a critical element in discovering logical errors and to test the system liabilities. For instance, the most common errors that appear in the e-commerce system are communication gaps, not finish on time, over commitment by the developer, insufficient testing and quality control and Inadequate requirements gathering.

### **6.2 Testing Process**

Generally, I have used five types of testing process when develop my online shopping system. There are unit testing, module testing, integration testing, system testing and user acceptance testing. All these testing will be explained in detail as following:

#### **6.2.1 Unit Testing**

Basically, unit testing is an individual program where it tests each component as independent unit. The purpose of unit testing is to make sure that each part of the function is coded in proper and correct input and output as what the developer expected.

#### **6.2.2 Module Testing**

A module is a collection of dependent components where it encapsulates related components. I have used different test cases when I first develop my online shopping

module. This is to make sure that I won't get confused with the error appeared when debugging my submodules. In directly, it helps to save my time in getting desired output without error.

### **6.2.3 Integration Testing**

Integration testing involves integration among the single module that I have got during my unit and module testing. This must be done to ensure that the components can be integrated, free from mismatch problems and work together as described in the system and program design specification.

### **6.2.4 System Testing**

System testing is a final test of all programs where it refers to a series of different tests designed to fully exercise the system to uncover its limitations, to measure system's capabilities and to verify that all system components work correctly. The main purpose of system testing is to verify the system so that it meets its specified requirements.

During system testing, I have done the following testing:

#### **i. User interface testing**

User Interface is basically the part of the system which the user interacts with, thus it should be placed with the utmost importance as the other critical operations such as correctness of database transactions. During this stage, tester have to make sure that the information that provide in the system are free from any mistake such as spelling mistake, grammar mistake, facts mistake and figures mistake. Besides that, tester has to make sure that the font's size, style and color are suitable in use and standardize. This is to ensure that the interface is easy and comfortable to read.

## ii. Transaction operation testing

Transaction operation testing involves testing on the correctness of the business logic, business rule and the performance of the system. There are two testing involve in transaction operation testing which are performance testing and stress testing.

### a. Performance Testing

This testing is taken to ensure that the software performs well with good response time, save processing costs and save storage used.

During this testing, all interfaces are fully tested. The tester have to test in detail and carefully to make sure that the communication lines are performing satisfactorily and ensure that the system capture correct data. There are two techniques used in software performance testing which is black box testing and white box testing.

### b. Stress Testing

Besides that, stress testing should be taking part in order to support multiple users. In this case, system should able to handle high volume of data. Hence, I have taken a series of testing in order to achieve this mission.

## iii. Data operation testing

Data operations testing should be carried out because it contains the most sensitive operations of the entire system. Basically, data operations testing is a testing which include on the query response time, data integrity and data validity. Table 6.1 show the summary of the data operation testing:

*Table 6.1 Data Operations Testing*

<i>What to Test</i>	<i>Environment</i>	<i>Tools/Technique</i>
Query response time	System test environment	Syntax Testing /Functional Testing
Data integrity	Development environment	White Box Testing
Data validity	Development environment	White Box Testing

### **6.2.5 User Acceptance Testing**

User Acceptance Testing is the final stage in the testing process before the system is accepted for operational use. Basically, Acceptance testing is performed on a collection of business functions in a production environment. Besides that, integrated modules will compare with non-functional system requirement (e.g. security, interoperability, flexibility and reliability) using performance test.

## **CHAPTER 7: System Evaluation**

### **7.1 Introduction**

System evaluation is the process of accessing the usability of a system and checking that it meets end-users' requirements. It discuss on the evaluation that was conducted against a usability specification Therefore, it is part of the normal verification and validation process for software systems.

### **7.2 Problems Encounted And Solution**

Generally, the development of the system is not free from any problems. There are several problems and difficulties faced during the development process of the system.

- **Difficulty in Choosing the Suitable Development Tools**

Even though .NET technology provided unimaginable possibilities with its cross-language feature, managed code concept and powerful language, it also has many limitations. For instance, we have no freedom in choosing the development tools that we like once we have decided to use this software. However, we are only allowed to choose other tools that compatible with .NET such as Microsoft SQL Server. Due to these problems, I tried to work around and do further research and evaluation on Visual Studio.NET. However, due to the limited time, I have sought advice from my supervisor and seniors who are familiar with the development of web site especially on e-commerce. Besides that, I also refer to the similar projects from thesis room in FSKTM, other resources like surfing the internet and reference books.

- **Lack of Knowledge and Experience**



The lack of knowledge and experience in developing an Online Home Finder System web site is a major problem even though it has been taught in faculty courses. This is because most of the courses are taught in theory knowledge only. In this case, I have to take initiative such as browsing to internet for related materials, study and refer to the VB.NET books, apply trial and error method in coding phase and finally step is discuss with friends in using a new function or seek advice/ guidance from supervisor.

- Install and configure web development tools

Before I started develop my online home finder system, I have to install Visual Studio.net software. However, I have to spend quite a long time to installation and configure web development tools. To reduce these problems, I try to get more information and understand the process of configuration so that this process could be simplified.

- Determining system scope

During the early stage of developing system, I have found the difficulty of define the scope of the system. This is due to my problems of less experience in web based development. In this case, I have to take more initiative by doing research in Internet, seek for others advice and discuss with my partner. During the discussion, we have drawn out the baseline of our system and list out all the related function. By using this baseline, system scope of the Online Home Finder System is determined.

### 7.3 System Strengths

There are a few strengths on the Online Home Finder System that I have developed:

- Graphical user interface simplicity

Online Home Finder site is designed with consistent and attractive user interface. Links and buttons are named with simple and easy to understand words. Besides that, the background colour is convenient to the eyes of user as colourful background will spoil the standard and professionalism of a web site.

- Instant error messaging

The instant error messaging will prompt out the message once the user has input wrong information. In directly, it helps to enable the user to identify his/her mistakes and make the appropriate corrections to it.

- System Security

A valid user id and password are required for enter into the main application of the home finder tasks. The login function is to make sure that only the authenticated administrators are allowed to go into system for doing changes on the information.

- Retrieve Forget Password

For those who forget their password, system will send their password to their email address only if they have inserted correct user id and favour answer.

- Immediate Response to User Query

By utilizing the "Auto Post Back" function of the ASP.NET controls, any selection done on the controls is posted back to the server for immediate action without having to press a submit button. This ensures minimized response time to the user request and higher satisfaction for the user.

- Reusability

Interface codes are separated from the logic processing clearly. This advocates for easy reuse of the different components of the system or while adding future enhancements to the source codes.

- Upload and View Image

The Online Home Finder system that I have developed enable user to upload or view image.

- Flexible status

Admin can change their status flexible.

- Advance Search

Online Home Finder System provide advance search to the user.

- View Calendar and Feedback

User can view calendar and feedback flexible.

#### 7.4 System Limitations

In general, there are some limitation appear in my online shopping system. There are describing as below:

- All transactions only in one currency

All the payment must be using credit card. In another words, in all transactions only can done for those user with internet access and have credit card.

- Limited Number of House Items Choices

In the online home finder system, there are only five categories of houses are included for the demonstration purpose.

- Limited Interaction Between Customers, Supplier/ Vendors and Companies

Inventory system in the online shopping system might not be able to talk to

vendors or suppliers.

- Image file limitation

The limitation for upload image or file is 4Megabytes.

### **7.5 Future Enhancement**

Further development and a lot of new ideas have come about while the system being implemented. Owing to time constraint and other related factors, not all of the ideas could be incorporated into the system. Therefore, it is hoped that the following suggestions could be considered in future for system enhancements.

- Give rate to the houses type

Rating can be done by counted the how frequently the houses is bought by the customer. Rating function is a must in order to maintain the business of the company.

- View Company business account

Account is an important documentation where it shows the profit and expenses of the company in daily, monthly or yearly.

- Auto detect unauthorized user

In future, I hope that administrator tasks will be able to detect those unauthorized user and block those who try to spoil company image automatically.

- Limited access time

This function is ensuring that administrator can only make changes of the information during the access period (usually office hour). This is to avoid from any unauthorized users.

- Auto renew password

System will ask administrator to change their password every month. In another words, administrator account will automatic expired if they do not renew their password.

## **7.6 Knowledge And Experience Gained**

After going though the three months development process of Online Home Finder System, I had gained a lot of the knowledge and experience, which bring benefits to me especially in my future career.

### **Knowledge:**

- I learned new programming language, ASP.NET and I improve my programming skills by developing the system. I can write better codes now if compared to last time before building the system. Besides that, I understand better of the database using MSSQL in building database and tables. I also get to know which software development tools are suitable for a system through further researches and studies.
- In additional, I do learn a lot on how to use others software during my interface design and documentation such as Macromedia Dreamweaver and Macromedia flash, Microsoft Office Visio 2003, Microsoft Word and Microsoft PowerPoint.

### **Experience:**

- From the development of Online Home Finder System, I gained experience in conducting a software development project. From the stages in starting the project, I personally discovered that system planning and requirements analysis are the most critical stages where they determine the success or failure of a

system delivery. Without a proper planning, a system may not be delivered on time and it is a waste from the development cost perspective. However, without a proper understanding of system's requirements analysis, the system built may not be able to meet with the end-users' requirements and system specifications.

In conclusion, there are a lot of the benefits can be gained in building the system although a lot of time and efforts have to be contributed into the successful of the system.

### **7.7 Conclusion**

Last but not least, the development of the system is completed. Although I face many problems during development of the system; from determining the user needs, target users, design and implementation, I do gain a lot of valuable knowledge and experience. All these experience and knowledge will bring benefit to me especially in my future career.

## References

### a) E-book

- 1) Janice Reynolds (2004), *The Complete E-Commerce Book: Design, Build, & Maintain a Successful Web-based Business, Second Edition*, CMP Books.
- 2) Joel Spolsky(2001), *User Interface Design for Programmers*, Apress.
- 3) Redmond-Pyle & Moore (1995), *Graphical User Interface Design and*
- 4) *Evaluation : A practical process*, Prentice Hall.
- 5) Robert Nobles & Kerri-Leigh Grady (2001), *Web Site Analysis and Reporting*, Premier Press

### b) Book

- 1) Jefferey L. Whitten, Lonnie D. Bentley & Kevin C. Dittman(2003), *System Analysis & Design Method*, McGraw-Hill 6<sup>th</sup> edition
- 2) Martin, Joe., Tomson, Brett. (2002) Teach Yourself ASP.NET in 24 Hours. United States, Sams Publishing.
- 3) Anderson R., Francis B., Homer A., Howard R., Sussman D., Watson K., (2002) Professional ASP.NET 1.0. United States, Wrox Press Ltd

### c) Internet

- 1) [http://www.sei.cmu.edu/str/descriptions/threetier\\_body.html](http://www.sei.cmu.edu/str/descriptions/threetier_body.html)  
[Accessed July 20, 2004]
- 2) Microsoft Corporation (2004).  
<http://msdn.microsoft.com/library/default.asp?url=/library/en-us/vbcon/html/vbconBenefitsOfADO.asp> [Accessed August 18, 2004]
- 3) Internet Software Marketing Ltd. (2004).

<http://www.serverfiles.com/Internet-server-software/Web-servers/Internet-Information-Server/Vote/> [Accessed August 6, 2004]

4) Code Project

<http://codeproject.com> [Accessed January 4, 2004- February 7, 2004]

d) Newspaper

- 1) Raslan Sharif. 2004. *Malaysian Rush To Dialup In Q1*. The Star (In. Tech). 15, June:3.
- 2) Raslan Sharif. 2004. Budget 2005: Less Could Mean Just As Much For ICT. The Star (In. Tech). 24, September:4.

e) Thesis

- 1) Chin Lee Kian(2003). *Event Management System*. Degree Thesis. University of Malaya.
- 2) Hew Siew Hoon (2003). *Restaurant Online Menu System*. Degree Thesis. University of Malaya.
- 3) Liew Hoi Ming (2003). *Component-Based E-Manufacturing*. Degree Thesis. University of Malaya.
- 4) Norreen Natasya bt Aziz Al-Rahim (2003). *Online Graduate Job Vacancies System*. Degree Thesis. University of Malaya.



## Appendix: User Manual

### Part 1: Introduction

Online Home Finder System is system is a web-based application that offers convenient ways to house renter and seller to advertise their house at anytime and anywhere. This system is handling all the advertisement and payment transaction and also the searching. This system enable user to view all the colourful images for house directly via electronic without search from the newspaper. This system have higher change in future to replace the house advertisement activities which done through newspaper currently because this system provide fast, better and save cost.

### Part 2: System Requirement

#### *Hardware Requirement*

The hardware required for the entire implementation phase was shown at the Table 2.1 below.

Category	Description
Processor	Intel Pentium 4 CPU 1.80GHz
Hard Disk Size	20 GB
RAM Size	2512 MB

**Table 2.1 Hardware Requirement for the Implementation Process**

## Software Requirement

Software that required for this system during the system's implementation was shown in the Table 2.2.

**Table 2.2 Software Requirement for the Implementation Process**

Category	Description
Operating System	Windows XP
Web Server	Microsoft Internet Information Services 6.0
Special Requirements	Microsoft .NET Framework 1.1

## Part 3: Getting Started

### Administrator Section

Online Home Finder System for the administrator part can be accessed from this URL: <http://localhost/ping2/Admin/adminLogin.aspx>. The login page is shown below.

#### A. Login Page for administrator

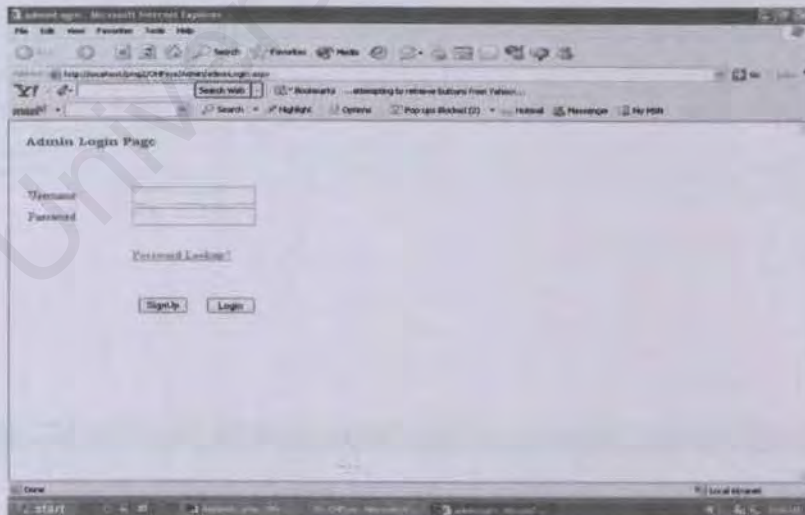


Figure 3.1 adminLogin Page

1. User enters correct Username and Password.

2. Click “Login” button to enter into the system or “Sign Up” to register as member. If account validation is successful, system will redirect user to admin main page which is “adminMenu.aspx” like shown at Figure 3.2.

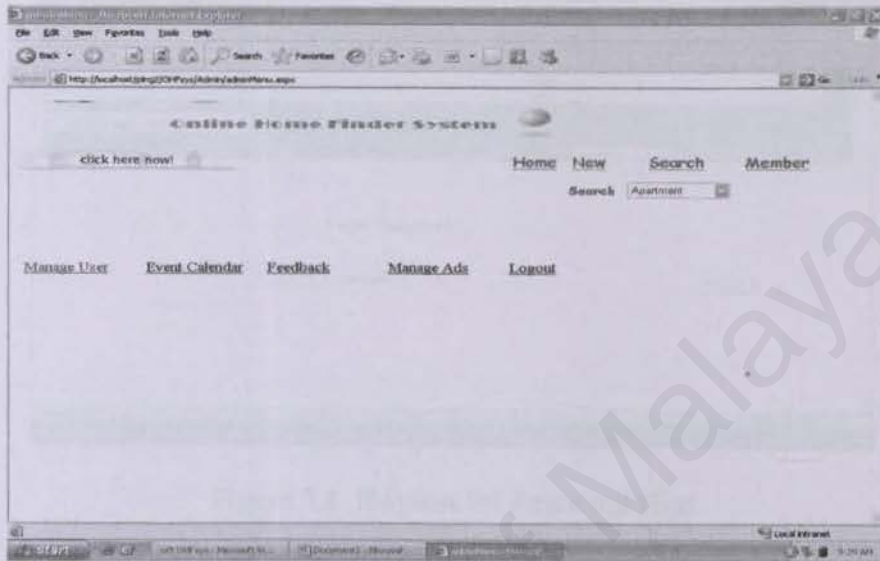


Figure 3.2 adminMenu page

3. In case the invalid username or password entered, the error message will appear like shown at Figure 3.3 below.

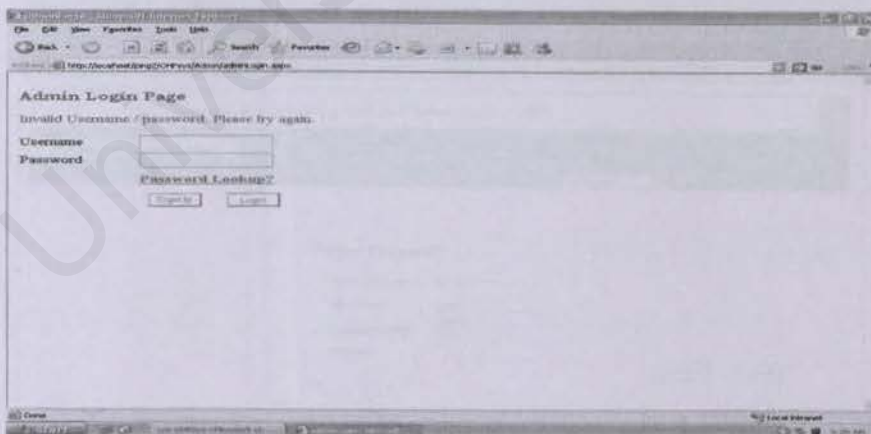


Figure 3.3 Invalid Username or Password entered.

4. If user forget password, user can click at “Password Lookup?” hyperlink which redirect user to a page call retrievePwd as shown at Figure 3.4 shown below.

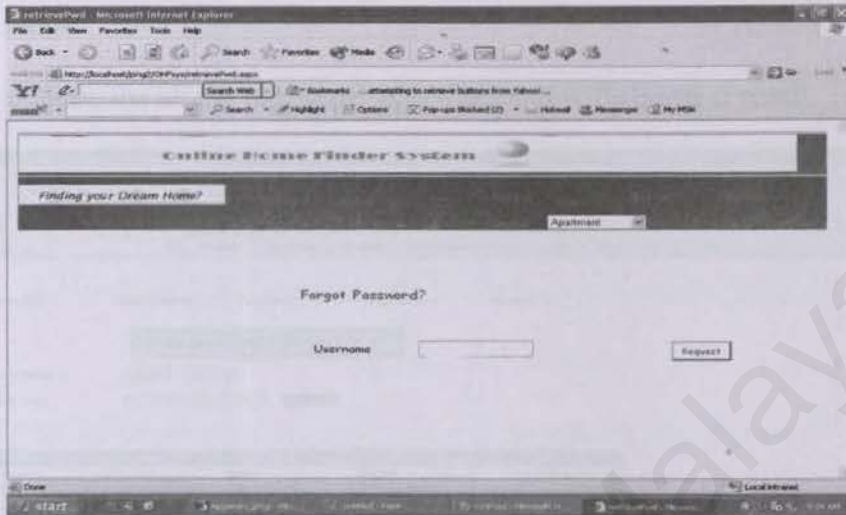


Figure 3.4 Request for Password Hint

5. User need to enter Username and click “Request” button. Then, need to fill in answer for password hint. If the answer is valid, then it will direct user to adminMenu page.

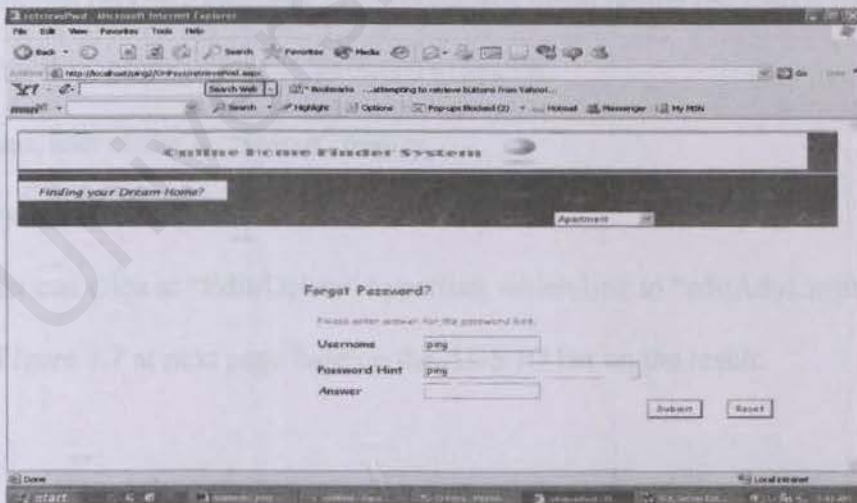


Figure 3.5 Password Hint and answer

## B. Manage Advertisement

1. User click at “Manage Ads” which direct user manage advertisement page like Figure 3.6 below.
2. By default, the all the registered advertisement will shown at result.

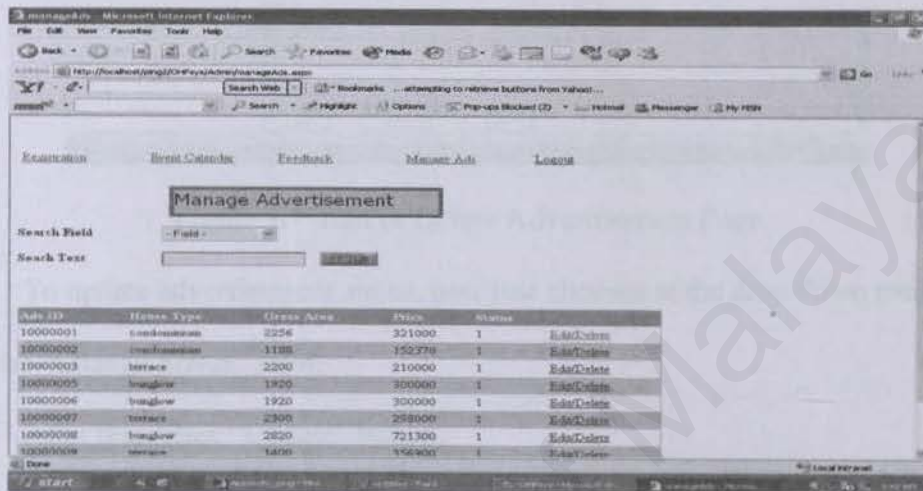


Figure 3.6 Manage Ads Page

3. User can narrow the search by categories.
4. User can choose a category from dropdown menu beside the search field.
5. After that, user can type in keyword to search.
6. Then, user clicks at “Search” button.
7. Result will be return.
8. User can click at “Edit/Delete” hyperlink which link to “editAds1.aspx” as shown at Figure 3.7 at next page base on the ADS ID list on the result.

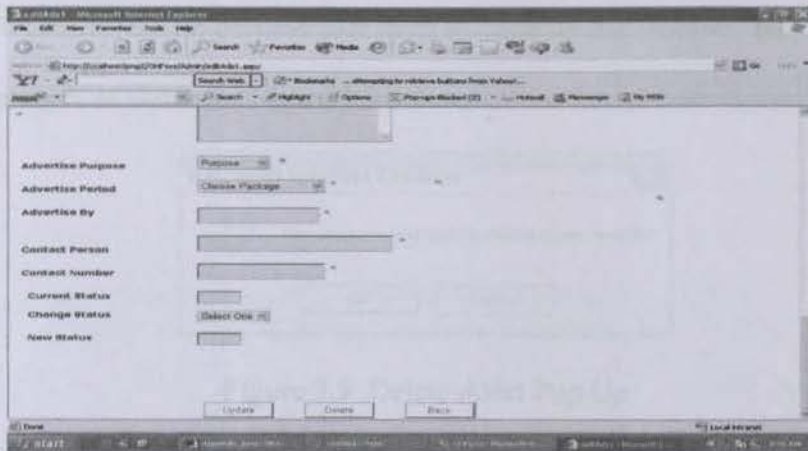


Figure 3.7 Edit or Delete Advertisement Page

9. To update advertisement status, user just chooses at the drop down menu beside the “Change Status” field.
10. After that, click “Update” button.
11. Then, user will see success update message and the “New Status” field also will be filled automatically by system base on choice chosen by user just now like Figure 3.8.

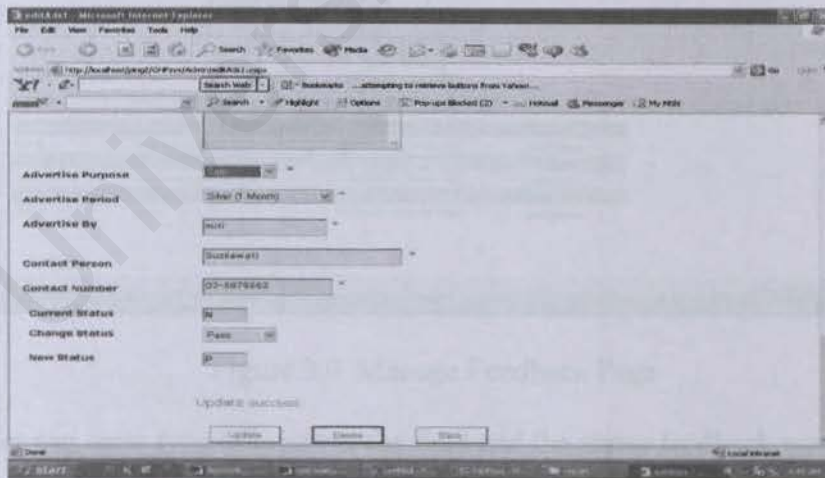


Figure 3.8 Advertisement Status Update Success

12. When user need to delete the advertisement, then user need click at “Delete” button.

13. To confirm delete process user need to click on the “Delete” button on the pop up alert messages as shown at Figure 3.9 below.

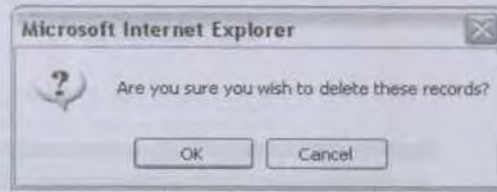


Figure 3.9 Delete Alert Pop Up

14. User can click “Cancel” to return to admin main page.

### C. Manage Feedback

1. User click “Feedback” at adminMenu page to manage feedback which shown like Figure 3.9 below. By default all the feedback will return as result at beginning.

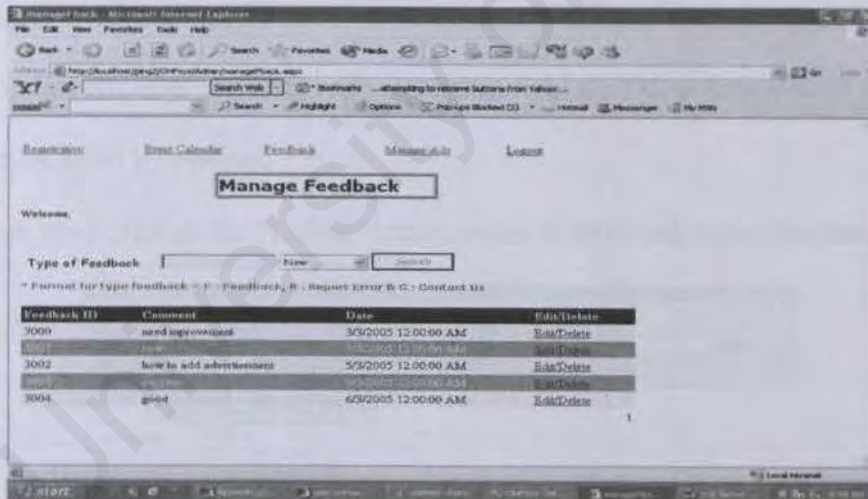


Figure 3.9 Manage Feedback Page

2. User can enter type of report at the field and the status feedback want to searchor.
3. Then, user need to click at “Search” button.
4. Return result is narrowed to feedback status type like shown as Figure 3.10.

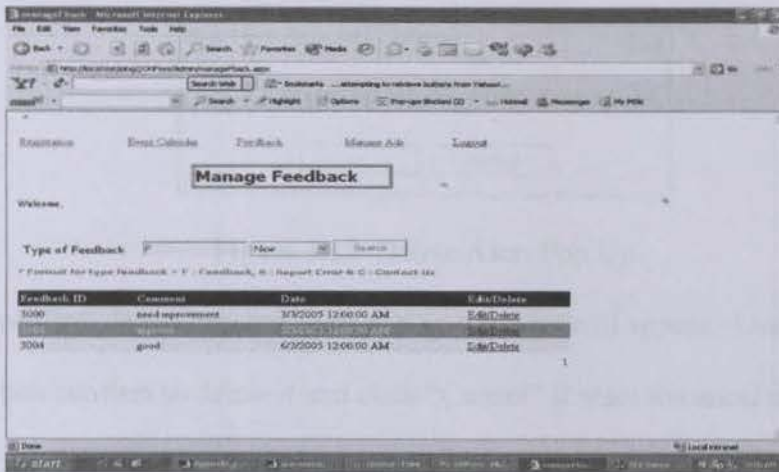


Figure 3.10 Return Result for New Feedback Type

5. User can click at the “Edit/Delete” link at the result return base on the ADS ID user wish to edit or delete.
6. User will redirect to “editDelFback.aspx” page as shown like Figure 3.11 below.
7. If user choose to update the feedback status, user need click at “Update” button.
8. “Update Success” message will show and field for “New Status” will be automatically filled by system.
9. User need click at the “Delete” button when wish to delete the feedback.

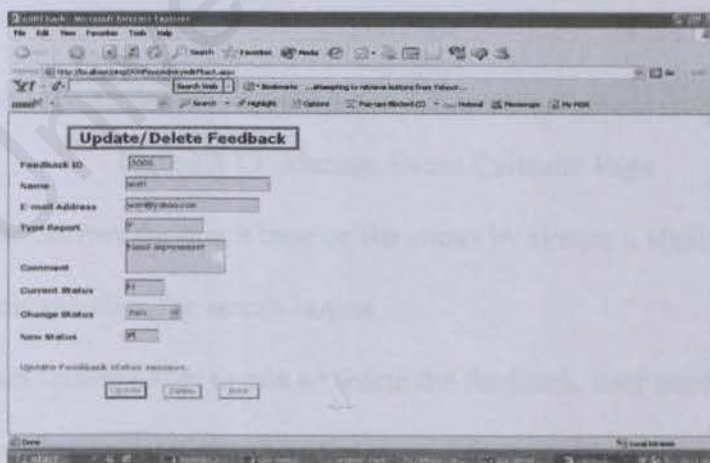


Figure 3.11 Edit/Delete Feedback Page

6. When click on the “Delete” button, alert messages in Figure 3.12 will pop out.



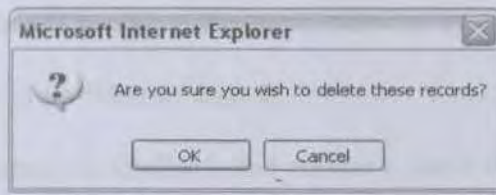


Figure 3.12 Delete Alert Pop Up

7. To confirm delete process, alert pop up window will appear. User need click "Delete" when confirm to delete it and click "Cancel" if want to cancel delete process which will redirect user back to admin main page.

#### D. Event Calendar

1. User click at "Event Calendar" when user needs to monitor the event calendar.
2. After click the hyperlink, user will be directed to a page call manageEventCal as shown as Figure 3.13 at next page.

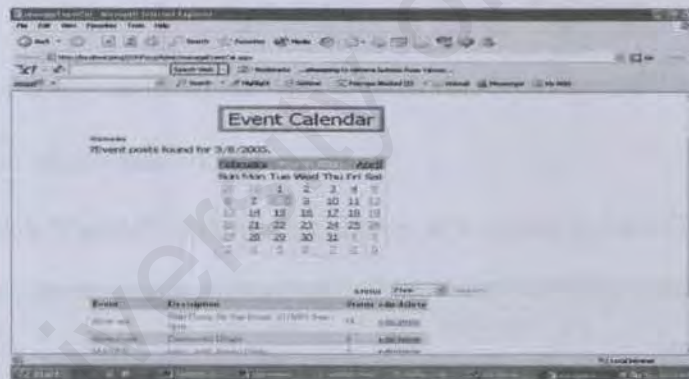


Figure 3.13 Manage Event Calendar Page

3. User can narrow the result base on the status by choose a status type at the dropdown menu and click the search button.
4. User can choose either to edit or delete the feedback, user need click at he hyperlink called "edit/delete" based on the event title user want.
5. User will be redirect to "delEventCal.aspx" page.

6. User can either choose to update the event calendar by click at “Update” button or delete the feedback by click “Delete” button.
7. If user want to update the feedback and choose a status for the feedback. Then, user will see below figure which is Figure 3.14.

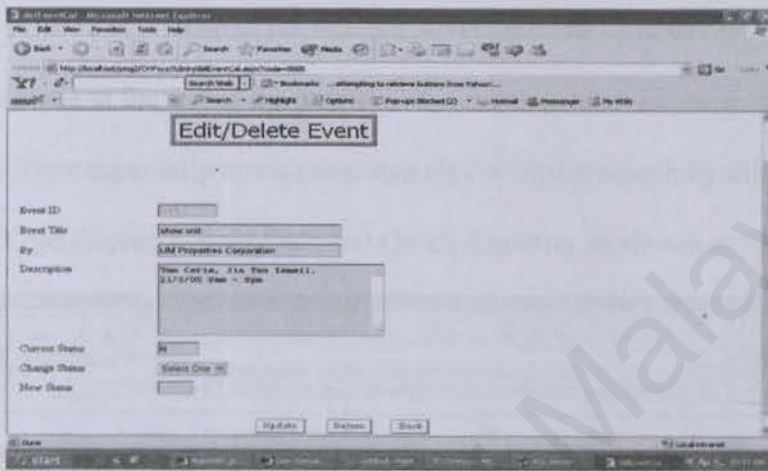


Figure 3.14 Update Success For the Feedback

8. Neither of above actions user want to perform, then user need to choose “Back” button to return to admin main page.
9. If user click “Delete” button, alert pop up will appear as like Figure 3.15 below.

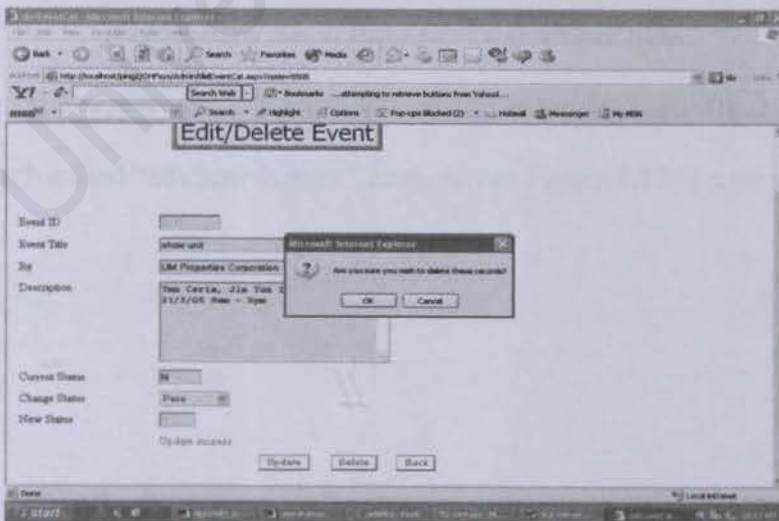


Figure 3.15 Confirm Delete Pop Up

## **Universal User Section**

Online Home Finder System for the user include non-member user can be accessed from this URL: <http://localhost/ping2/index2.aspx>

### **A. Main Page**

1. User can choose to browse the advertisement by house type by click on the dropdown menu at the top of the page.
2. User especially novice user can choose faster search by click a choice under House Type Explorer, Rent/Sale and Quick Explorer as shown at Figure 3.16.

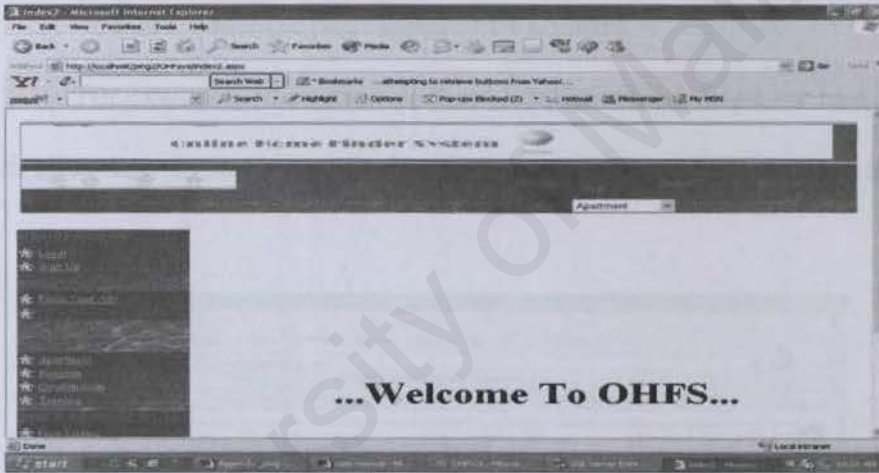


Figure 3.16 Main Page For OHFS User Side

3. For expert user, can click at “Search” at top of menu which will direct to advanced search called “advSearch.aspx” as shown as Figure 3.17 at next page.

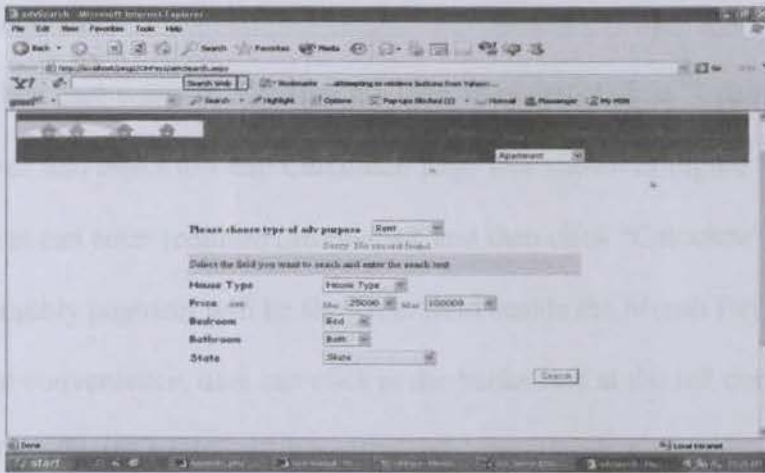


Figure 3.17 Advanced Search Page

4. The entire browse page using same concept.
5. For example, when user click at “Rent” at Quick Explorer-like Figure 3.18 which allow user to sort base on price or state at the drop down menu at top each page.

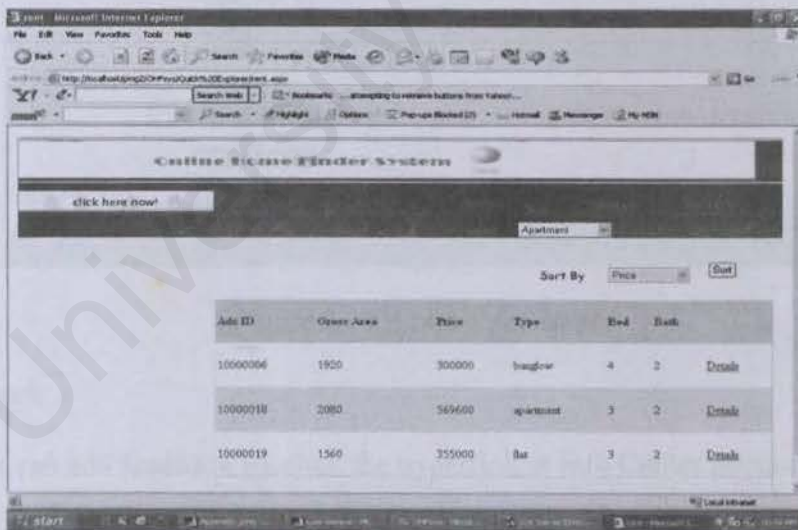


Figure 3.18 Browse By Rent Type From Quick Explorer Section

## B. Loan Calculator

1. When user wants to calculate the loan, they can click at "Loan Calculator".
2. User will direct to Loan Calculator page like shown at Figure 3.19 below.
3. User can enter required information and then click "Calculate" button.
4. Monthly payment will be shown at field beside the Month Pay field
5. For convenience, user can click at the banks link at the left corner to check loan interest for selected bank.
6. After know the amount interest for particular bank, user can repeat step "2".

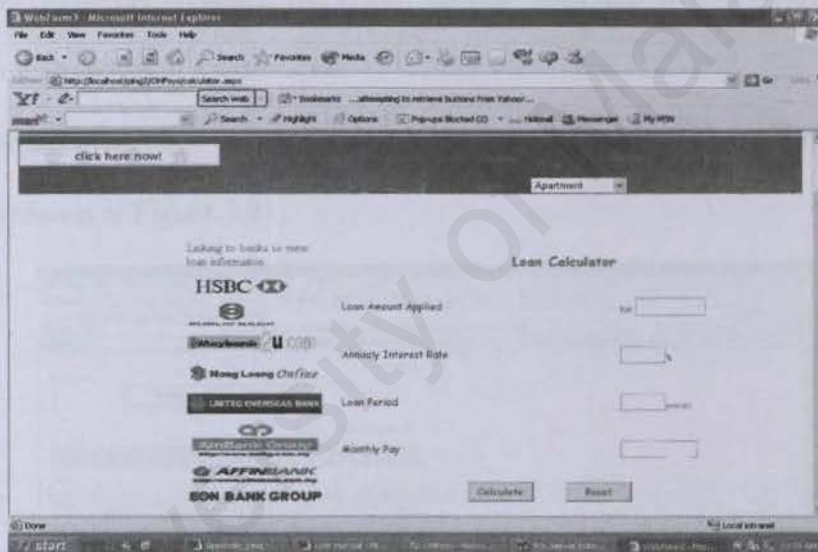


Figure 3.19 Loan Calculator

## C. Feedback

1. User can add feedback by click the hyperlink at Info Center Section.
2. User will redirected to the page like Figure 3.20 at next page.

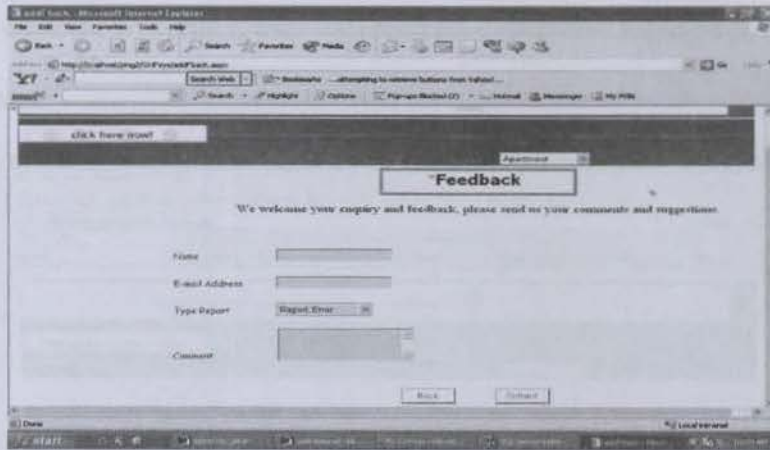


Figure 3.20 Add Feedback Page

3. After fill up the feedback and click “Submit” then user will be redirect to main page which was shown at Figure 3.16.
4. Then user can click “View Feedback” at the main page. User will redirected to the page as shown at Figure 3.21.

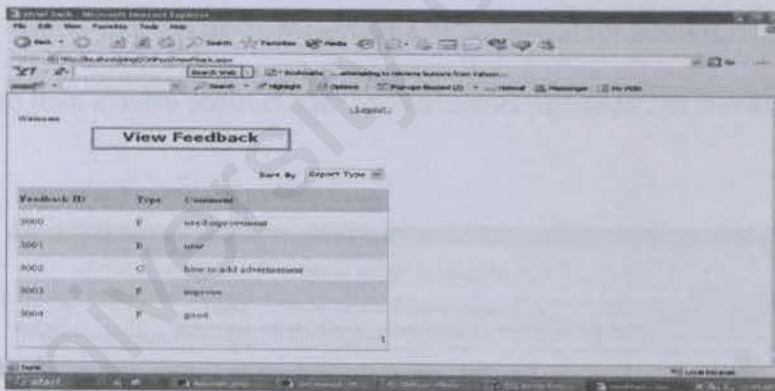
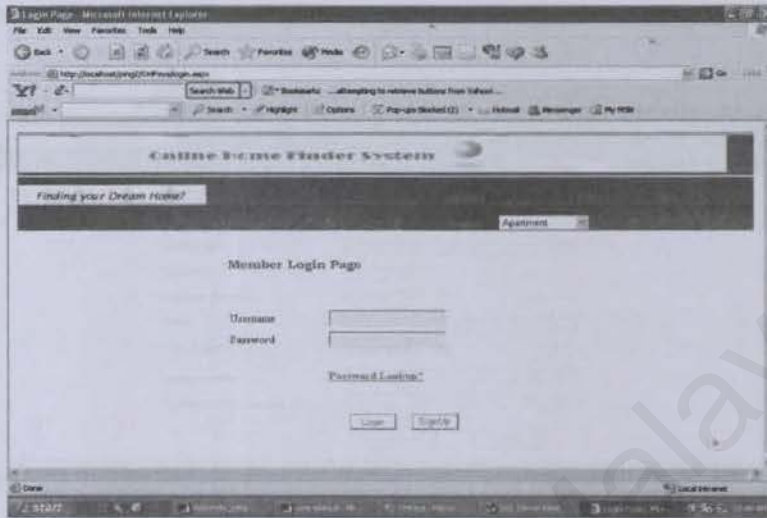


Figure 3.21 View Feedback

### **Authorized User Section**

1. Beside can use all common functions, user need to click “Member” at the top menu or “Login” at Member Login section at the left corner to enjoy the member benefit.

2. After click the hyperlink, user will redirect to member login page like Figure 3.22 at next page.



3.22 Member Login Page

3. User need to enter valid username and password then click “Login” or else error message will appear like the invalid username or password for adminLogin page.
4. If valid then system redirect user to “welcomePage.aspx” as shown at Figure 3.23.

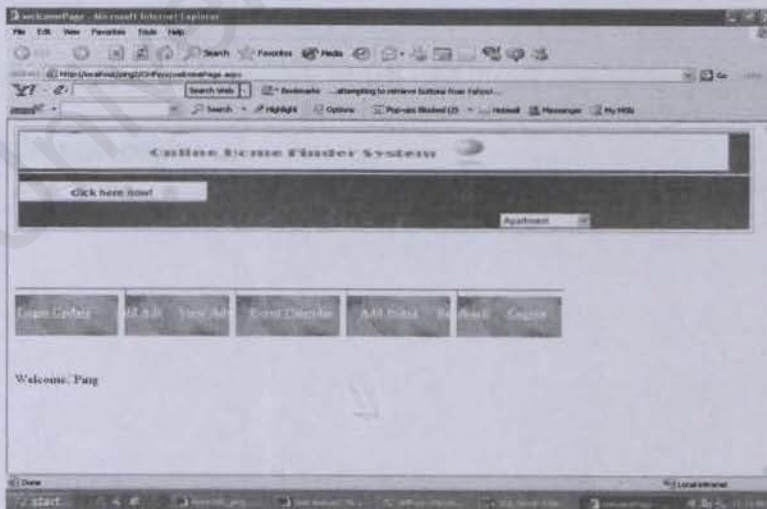


Figure 3.23 Welcome Page For Member

5. For user want to register as member, user need click at “Sign Up” button which will direct user to registration page call “regUser.aspx” as shown at Figure 3.24.

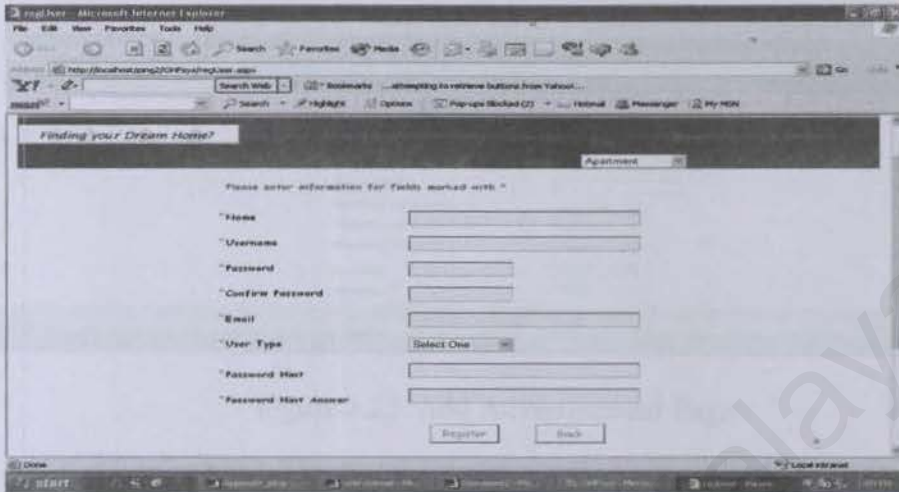


Figure 3.24 Member Registration Page

6. After complete fill up all required fields marked with “\*”, user able to click “Register” button and will redirect to member login page as shown at Figure 3.22.
7. Error message will be appear beside blank field(s) until the field being filled up.

#### D. Advertisement

1. User clicks “Add Ads” hyperlink which will direct user to the page as shown as Figure 3.25 at the next page.



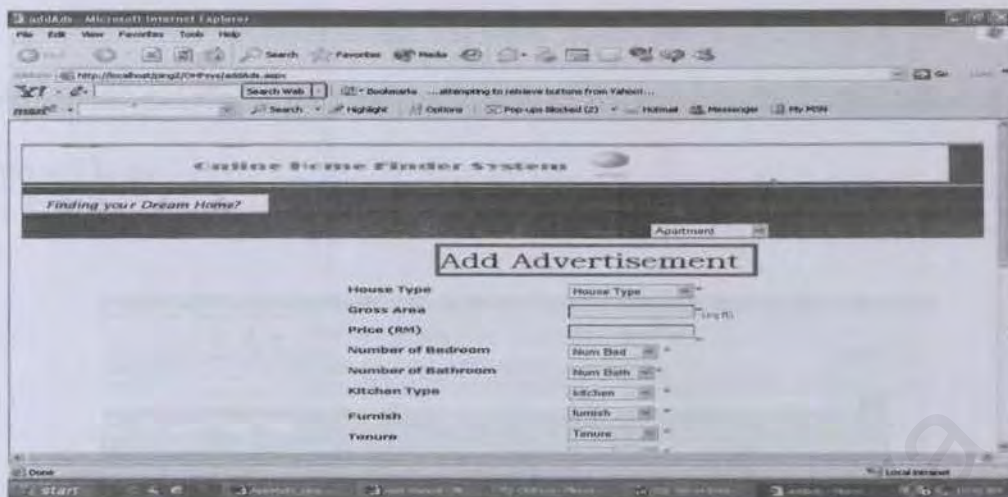


Figure 3.25 Add Advertisement Page

- After complete fill up all required fields, user need click at “Add” button which will direct user to “Payment” page like shown at Figure 3.26 below.

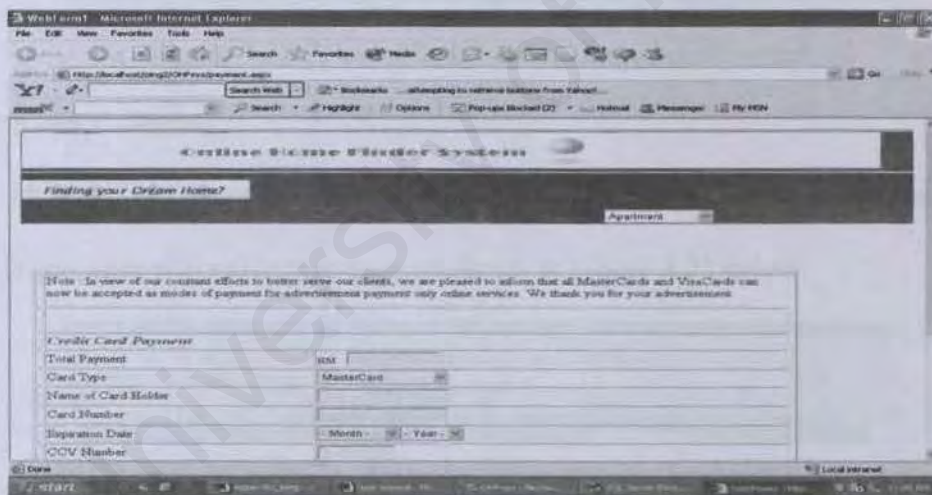


Figure 3.26 Credit card Payment Page

- After click “Pay” button, system will validate the credit card information. If validation success. Transaction considers success and need to wait a while for administrator approve the advertisement.

4. User redirect to Welcome Page and click “View Ads” if user want to view advertisement include the user add just now in case it approved by administrator as shown at Figure

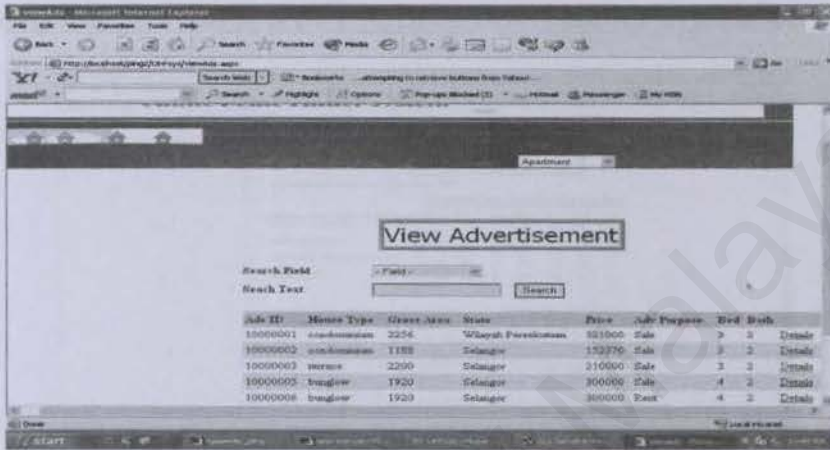


Figure 3.27 View Advertisement Page For Member

E. Event Calendar

1. User can add event to event calendar by click “Add Event” the Welcome Page.
2. Then, user will redirect to page as shown at Figure 3.28 below.



Figure 3.29 Add Event Main Page

3. After fill in all the fields then user need click “submit” button.
4. Success message will be appear. User cannot view the event until administrator approves it.
5. User will redirect to view page automatically to see all added event. In case, event added by user just now approved, then user can view the event also.

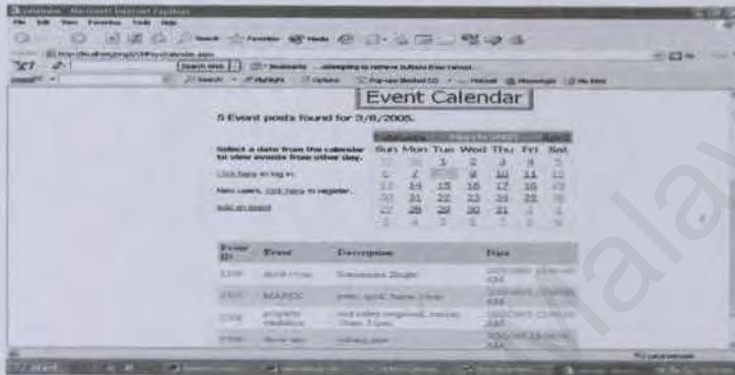


Figure 3.29 View Event Calendar Page

#### F. Update Login

1. User can update login information by click “Update Login” at menu at top of Welcome Page.
2. User redirect to page as show as Figure 3.40 and user change login information.
3. After user click “Update” then user will redirected to Welcome Page again.

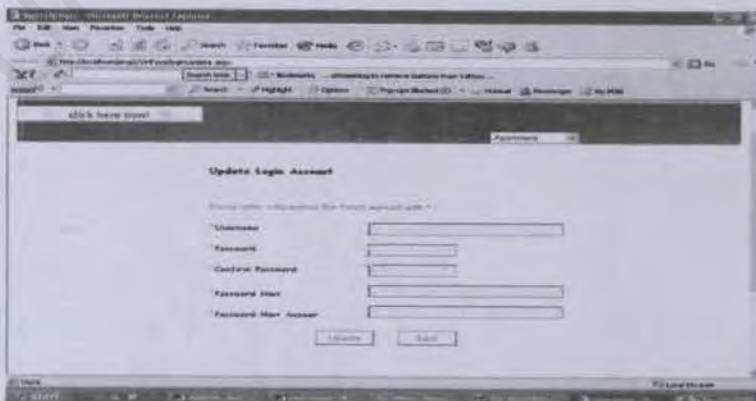


Figure 3.40 Update Login Information