

House Selection System

By

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Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
(Business Information Systems)

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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
Business Information System Program
Universiti Teknologi PETRONAS
in partial fulfillment of the the requirements for the
BACHELOR OF TECHNOLOGY (Hons)
(BUSINESS INFORMATION SYSTEM)


Approved By,

(Mrs. Savita K.Sugathan)

UNIVERSITI TEKNOLOGI PETRONAS
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CERTIFICATION OF ORIGINALITY

This is certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



SYED AHMAD AZHAN BIN SYED MOHD

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Finally I would like to acknowledge with greatest gratitude to other personnel not mentioned that involves directly or indirectly in the implementation of this project. What I have gained from this project all comes from your support and assistance.

ABSTRACT

As the technology is very rapidly growth in the 21st century world, it has given a big impact to the human lifestyle. Every day, expertise will always find new ways to invent something that can bring a lot of benefits to human. This effort shows that the growth of technology will never stop. Technology totally has made human life become more systematize and easier. In the road of discovering technology, many concepts have been applied. One of the concepts that have become important nowadays is decision support system. Decision support system is used to help people making a better decision. Realizing this, "House Selection System" will be developed with the hope to assist peoples to make a perfect decision before they buy a house. The idea of developing this system is to respond to the unstructured problem faced by human when they wanted to buy a house, as a lot of residential area is being developed nowadays. For the duration of project implementation, waterfall model had been chosen as the framework for the work flow process. The system architecture for the system also had been identified. The perspective of this project will concentrate more on the buyers' point of view, which mean to come out with a system that can meet the important requirement before buying a house. In this report, a system prototype is included to give some preview of how the system will look alike and how it will process the information.

ABBREVIATION

	TRANSLATION
DSS	Decision Support System
FYP	Final Year Project
UML	Unified Modeling Language
HCI	Human Computer Interaction
CIDSS	Consumer Oriented Decision Support System
CDSS	Customer Decision Support System
SQL	Structured Query Language
DBMS	Database Management Systems

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

The growth of technology in the world nowadays is so rapid that make peoples cannot avoid that it is very important in their daily life. Expertises in technology never stop to find ways to make people life become easier and easier. Talking about making life become easier, peoples always want to do their tasks without wasting a lot of time and money. If possible, peoples always want to do every job by just sitting at their home. Thus, author has come out with an idea to develop a system called “House Selection System” which would be a beneficial product after it has been implemented.

The objective of this project is to produce a web-based system that can help peoples to choose a desirable house for them by just sitting in front of the computer. This system will provide the users with a lot of function to let them choosing the specification of the house they desired. The system then will display the list of potential house for the users after they have entered all the information in the system. Author will apply DSS concepts in implementing the system. This means that the system is constructed to support decision making activities.

In constructing the system, author will use Waterfall Model as the methodology for the work process. The detailed of the throw away prototyping will be explained in Chapter 3.

1.2 Problem Statement

In this section, author will explained the problem that has been identified and the important of the system.

1.2.1 Problem Identification

Nowadays, house has been one of the important needs for human being. House important for human being as a place to shed, to sleep, to eat, and many other things in routine life. Realizing this, many projects on the development of residential area had never stop in order to fulfil the demands. As this happen, it has lead to a few problem when a person want to buy a house.

Time consuming

When peoples wanted to buy a house, usually they will go to survey the houses around the area that they wish to buy. The problem arises when they have to spend a lot of time to search for suitable houses for them. More over, if the buyer searching for a house that is situated in other state, he/she has to sacrifice more time to go and look for the house.

Traveling cost

Besides time consuming, traveling cost also would be one of the problem especially for the outstation buyer. For example, if a buyer from Johor Bahru wishes to buy a house in Kedah, he/she needs to travel to Kedah in order to survey the house around Kedah. Thus, he/she need to invest some money to look for house that they may or may not want to buy.

Difficulties in making decision

This is also one of the problems when a person wishes to buy a house. Generally, before peoples bought a house, they will consider few factors (such as distance of house from town) that may influence the decision that they will made. The decision-making become complicated when they wanted to fulfill all the factors considered

within their budget for instance. The decision-making then would be more difficult if there is a lot of residential area located near to each other.

1.2.2 Significant of the Project

This system should be viewed as a general usage which can be used by anyone, whether by an individual person or group. This project will bring a lot of benefits when it is successfully implemented. From the author's study and point of view, there are some benefits that convince the author to continue with the project:

Improve the decision-making

The system provides a lot of features that will help the decision-making process before a person buys a house. Some of the features meant by the author are like selecting the type of house, specifying desired budget, selecting location of house and lot more features that will be discussed by the author in the result and discussion chapter. This system then will list out the possible houses to the buyer after they had entered the entire requirement. The use of DSS in developing the system surely will make the decision-making process become easier.

Less time consuming

Living in the modern world today's, time is very precious. As has been stated in the problem identification segment, a person requires to sacrifice some of their time to survey for houses. By having this system, it would not be necessary for buyers to waste their time walking around searching for a perfect house. This system will only need buyers to choose a house from a computer which would save a lot of their valuable time.

Reduced cost

As buyers will only need to select the house from their place, automatically, it would also avoid the cost of traveling to survey for houses. In this case, it refers to the person who wished to buy a house in another state.

1.3 Objectives and Scope of Study

In order to succeed in developing a project, the objectives of the system must be clearly defined. The development of “House Selection System” has its own objectives which would make this system become a worthwhile project.

One of the objectives of this project is to provide users with a system which can assist them to make a decision in finding the most suitable house for them to buy. The system will focus on preparing functions for the user to choose the specification of the house as desired. They will be able to select a house under their budget, selecting the type of house, selecting the number of rooms, and also the situation of the house. More interesting, the user also can view the map or the image of the selected house from several dimensions.

Other objectives of the system are:

To create high level of satisfaction

This system will ensure that the user will be very satisfied with the house they will buy because of advantages such as time and cost consuming and features provided by the system. Moreover, this system will only display the house within the buyers' requirement.

To ensure the ease of house finding

As this system can be accessed by using computers, people can just sit in front of the computer and specify the requirements they wanted for the house. This will make sure they can easily find a house even though the house they planned to buy is situated far away from their place.

1.3.1 Target User and Focus Area

The target users for this system would be the house buyers which can be anyone as the system is develop for general usage. Besides, any interested house developers also are also the target users of the system since they can advertise their houses in this system.

As this would be a pilot system after implementation, the focus area in this system would be restricted within a region. In this project, author had narrowed the scope of project by restrict the system to select houses within Sungai Petani, Kedah.

CHAPTER 2

LITERATURE REVIEW

It is a fact that living in the 21st century world which technology is rapidly growth, everything that we done are always needed to be fast and accurate. Data can be found and accessed very quickly through computers. A company for example, can be left behind in business competition if they can't quickly find and decide the solution to compete with other competitors. Thus, computers play an important role in today's life. A computer for example allows the decision-maker to do lot of calculation at high speed at low cost and make timely decision, which is very critical in many cases like stock dealing and marketing strategy. [1].

When talking about marketing strategy, it would be such a benefit if we can use web-based marketing as one of the platform to market a product. According to Robert M. O'Keefe and O'Connor G. [2], this material can be more extensive than the physical equivalent, can take advantage of multimedia and be customized for a specific registered user. Some advantages that are typically quoted when we use web-based marketing include global market coverage, efficiency compared to other marketing channels, and opportunities for new services based upon web technology [8]. By looking into this point, author believes that using web as one of the marketing strategies would give a lot of advantages to a company or individual rather than the other company that does not apply this strategy.

In web-based marketing, it usually would give benefits on both sides, which are the client or customers and the marketers. On the marketers' side, web-based marketing can allow the access to the market that previously inaccessible due to geographical constraints, gain access to previously unknown or inaccessible consumer influences and reduce printing and associated costs. While on the customers side, it can increased their

satisfaction with the services provided by the business and also allows them to access information they required quickly [4].

From the author point of view, web-based marketing can be divided into two generation. The first generation which is the current marketing efforts views the web as predominately electronic publishing. However, as technology progress, we can see the birth of the second generation systems. Besides including the elements of electronic publishing, the second generation systems take an advantage of interfaces and access to databases and models to provide more affluent systems. One of the models, is known as Customer Decision Support System(CDSS) [7]. This is what the author tries to implement in constructing the House Selection System.

What is Customer Decision Support System? O’Keefe and Mceachern [7] define customer decision support as “supporting the decision making process of an existing or potential customer”. From the definition, author believes that Customer Decision Support System is an approach to provide support for the customer in the process of decision-making.

Nevertheless, some of the people did look a DSS as a system to make a decision for them. This is not what a DSS is all about. Samson [5] stated that a DSS system does not specify an optimum decision, but rather helps decision makers to clarify options. It includes applications used by the decision makers which specifically assist in understanding or structuring a system. Hence, in the context of House Selection System, the users should understand that the system is implemented to help or support them in the process of making decision on selecting a house.

The House Selection System can be categorized as one of an intelligent decision support system due to its ability to produce results based on the input key in by the users. More over, this system is a web-based and consumer oriented, meaning to say that they are the main users of the system. According to Chien [6] consumer-oriented intelligent decision support system (CIDSS) can be generally identified as a web-based IDSS that provides generic and specific application functions, information resources,

model and knowledge computing mechanisms in assisting consumers through all the phases of the decision and transaction process.

One of the examples of a commercial web that provide a CIDSS features for the customer is www.geplastics.com which is owned by General Electric Plastic. General Electric Plastics provide datasheets, engineering calculator, and material selection tools on the company website to help their customers in analyzing product needs and getting an effective material solution [6]. Other company that provides similar system is such Wall Street City which helps the investors to simulate performances of their current investment portfolios and make suggestion for improvement. However, the facilities already provided to the consumers are still limited to specific products and tasks even though the needs to offer more powerful capabilities for consumer decision support system on the web sites are widely recognized [6].

From all the previous reviews, we can see how important the use of web-based marketing, DSS and CIDSS in businesses today. Author believes that the implementation of House Selection System which includes the element of web-based marketing and some element of CIDSS would be a useful system in supporting consumers' decision making process to select and buy houses.

CHAPTER 3

METHODOLOGY/ PROJECT WORK

3.1 Procedure Identification

Author has chosen the Waterfall Model technique as the methodology to complete the project. The reason for choosing this model is because of its step by step stages. By having this step by step stages, author can concentrate on one phase at a time as the principal of this model is stated that the following phase should not start until previous or current phase has finished.

Figure 3.1 shows the Waterfall Model fundamental development activities:

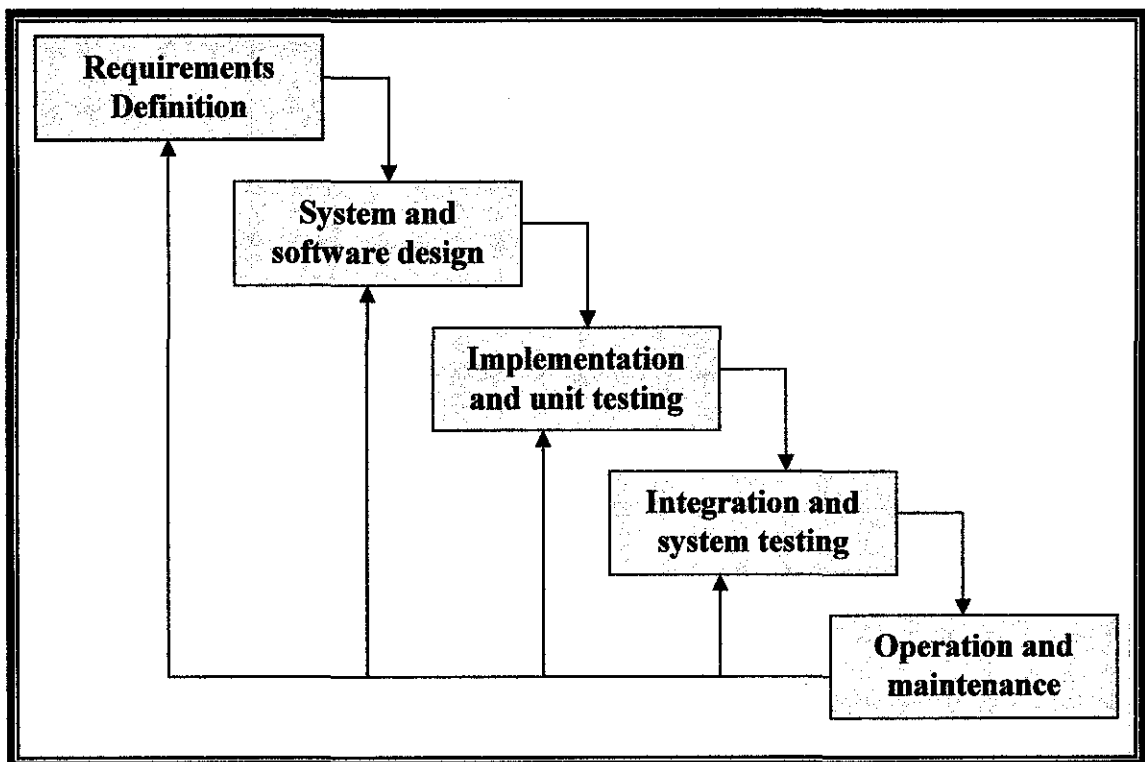


Figure 3.1: Waterfall Model

Requirement analysis and definition

This is the beginning phase where system's services, constraints, goals and objectives of the system are established by researching and consultation with the supervisor. Proposal submitted and has been approved by supervisor. Author established a preliminary report as the second step to proceed with the project. Preliminary report includes problem statement, important of project, literature review, etc.

In defining the user requirements in this phase, a survey had been conducted to identify the preferences that people would consider when selecting a house. This survey is important in order to avoid unnecessary features be include in the system. The survey form can be view in **Appendix 1**. The results and findings of the survey will be discussed further in Chapter 4.

In brief, what author had achieved in this phase are:

- Define and understand the scope of system
- Define users' requirement.
- Successfully conduct a survey.

System and software design

Further investigation has been made about the system specification, software and hardware that will be used in implementing the system. For this system specification, software and hardware, author had planned to:

- Choose and compare the suitable software to construct the system
- Identifying the minimum requirement need for the PC to be the platform to construct and run the system
- Identify and specify the function that the system should provide

Software design will involve the identifying and describing system abstraction and their relationship. A prototype will be constructed within this phase. A basic story board and the layout for the House Selection System also will be design in this phase.

Implementation and unit testing

During this stage, after the software design has been approved, it would be realized as a set of program or program units. Program will be tested unit by unit to ensure every unit meets its specification and working properly. Any error occurred during the unit testing will be debugged before all the unit can be combined together.

In this stage, what author has plans are:

- Test each page of the system to ensure all functions would work as expected. Focus would be more on 'Selection' page and 'House Listing' page as the complicated function is located on both page.
- Fix the all the error occurred during unit testing.

From all the planning, author had faced problem on:

- :Connecting the SQL database with the 'Selection' page. Database cannot retrieve and processed data entered by the users.

In this phase, all the unit testing is done by author himself which means that the testing still does not involved any users yet. Involvement of user will only be on the integration and system testing phase.

Integration and system testing

The individual program unit will be integrated and tested again as a complete system to make sure all the requirement have been met. The system testing will involved end users.

In this phase, author has plans to:

- Integrate each unit of system and test it whole
- Fix bug and error occurred during testing
- Close end user testing

The most challenging part in this phase is to fix bug and error occurred during testing. This is because author had to go through back at the hard code to find out the problem of the system.

Operation and maintenance

The system will be installed and put into practical use. This phase is the longest life-cycle phase. Maintenance phase will involved:

- Correcting errors which were not discovered in earlier stage of life-cycle.
- Enhancement of the system's service as new requirement are discovered.
- Enhance the system efficiency
- Adapted to accommodate changes in the external environment.

In this phase some planning done by author is to:

- Alter the features or function to meet the change of user requirement.
- Add new features if needed after FYP presentation.
- Upload the system into website for practical use

3.2 Tools Used

3.2.1 Software

- ✓ Macromedia Dream Weaver MX 2004
- ✓ Notepad++
- ✓ SQL database
- ✓ HTML for client-side scripting
- ✓ ASP for server-side scripting
- ✓ Adobe Photoshop
- ✓ Paint
- ✓ Microsoft Project

3.2.2 Hardware

A computer with minimum requirement:

- ✓ 2.0 GHz processors
- ✓ 256 MB RAM
- ✓ 10 G of hard disk

Windows XP Professional is use as operating system for the computer.

CHAPTER 4

RESULTS AND DISCUSSION

In this chapter, author will discuss about results and findings that the author has made. Author will focus on the approaches use by author to develop the system, the system workflow and also the results from the survey made by the author.

4.1 Observation/Survey

The “House Selection System” is a system with the objectives to improve people decision making in finding a suitable house for them. As this people would be the user for the system, it is very important for author to understand their requirements and needs that would be considered by them before they buy a house. Hence, author has decided to conduct a simple survey which will concerns about the people preferences in selecting a house.

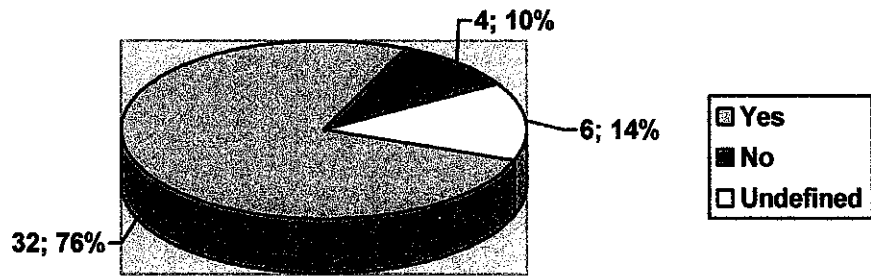
In the survey form, author had included eight question concerning about the people preferences in selecting a house. For example, one of the questions included in the form is “Does number of rooms is important to you when you want to buy a house?” The person then just need to choose the answer that is provided in the form.

After the survey has been done, all the data collection will be summarize and as a result, we can clearly see what is the most concern part for people when they wanted to buy a house and what is the least concern for people when they wanted to buy a house. Section 4.1.1 will discuss and show the full results from the survey conducted by the author.

4.1.1 Result and Findings

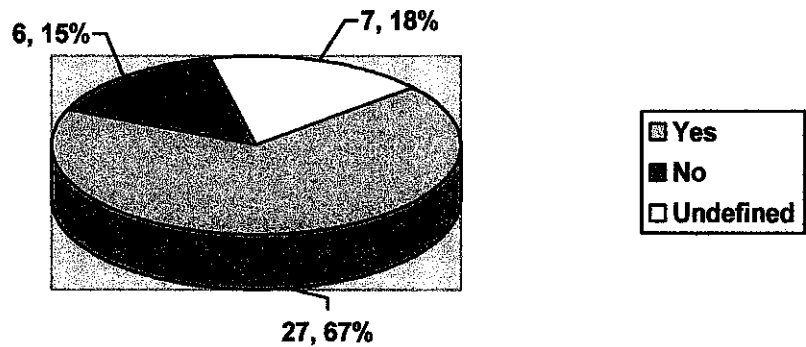
The survey had been conducted by using questionnaires. Author had distribute forty copies of the questionnaires randomly to the people to see their feedback when they wanted to buy a house. Below were the results acquired by author.

Q1: Does the house location in a city is important for you?



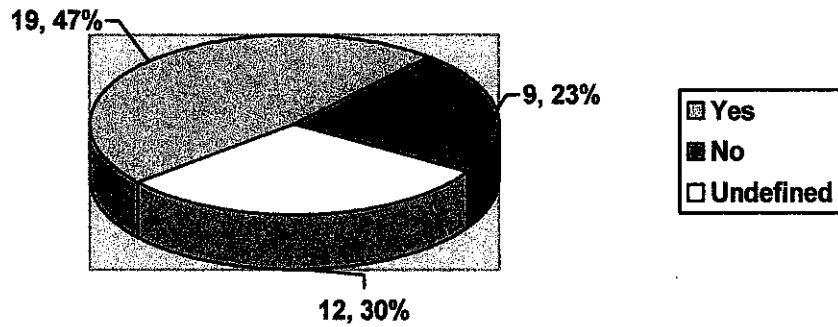
The result from the first question show that 32 person or 76 percent of the results agreed that house location is very important when selecting a house.

Q2: Does type of house is important for you?



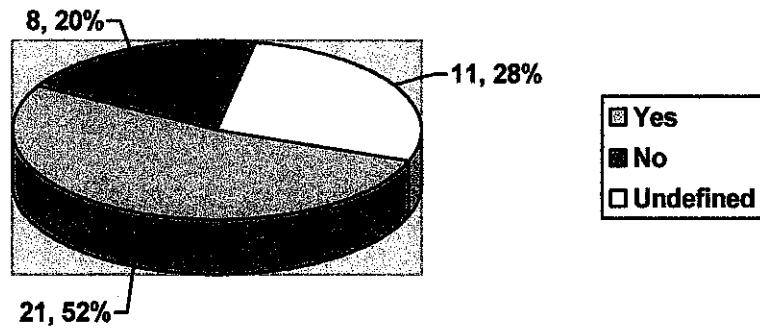
From the second question, 27 people said that the type of house is important to be consider in the process of selecting a house. The type of house here means such bungalow, semi detached apartment, etc.

Q3: Does you really concern about your budget in buying a house?



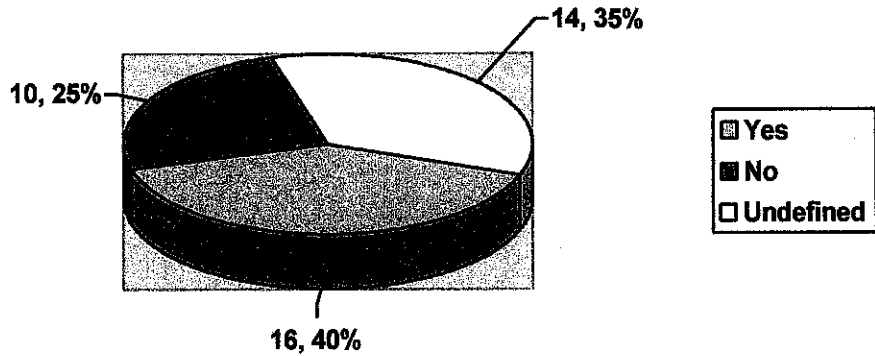
Budget also is considered as important element before a person buy a house as the results shows that 47 percent of respondents agreed budget is important in the process of buying a house.

Q4: Does number of rooms is important for you?



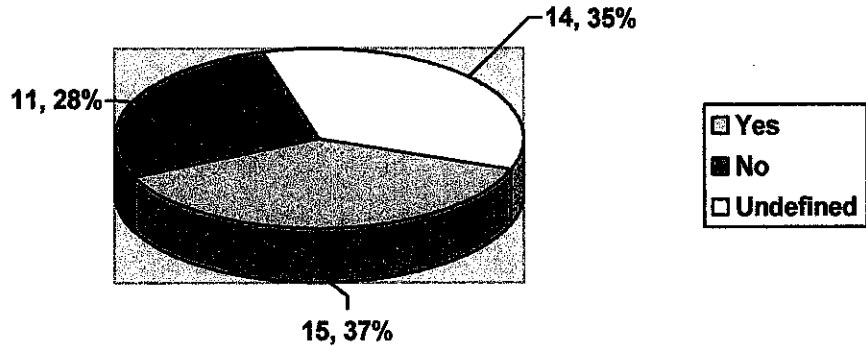
21 people out of 40 agreed that number of rooms also is an important features that they need to consider when buying a house. Thus, this feature will be included in the system by author.

Q5: Does number of bathroom is important for you?



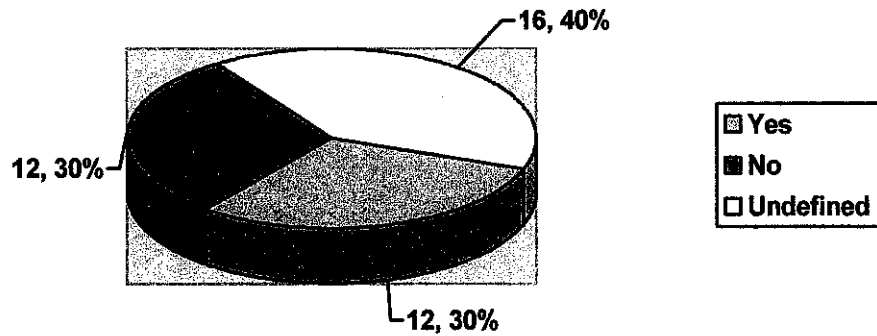
16 people said that number of bathrooms in an house is important while 14 of them cannot decide whether it is important or not. However, from the author's point of view, this features is quite important. Thus, this feature or preferences will be included in the system.

Q6: Do you really consider about the size of the garage?



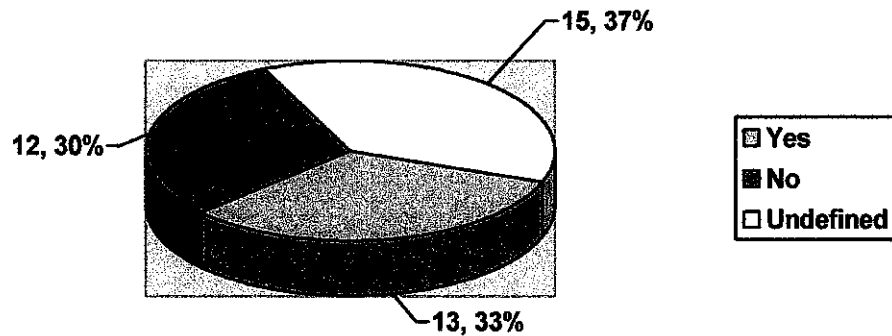
In question 6, we can see that 15 out of 40 voted that size of garage is also considered as important element in choosing a house. 11 people does not agree with the question while the balance cannot decide whether the size of garage should be considered or not.

Q7: If you're buying a terrace house, does it really concern you whether the house is a corner lot or not?



In this question, we can see that the number of people who felt the attributes is important and not, is equal. While the others cannot decide whether it is important or not.

Q8: If the house is a double storey house, does it really concern you whether the house has a balcony or not?



Only thirteen people agreed that balcony is important if they wanted to buy a double-storey house. While twelve people did not agree that balcony is important and the balance cannot decide as well.

The results of this survey will be used as reference for author to arrange the layout of the system so that it would be easier for users to fill in the form that is provided in the system. Table 4.1 below shows the conclusion of the survey that has been conducted by author.

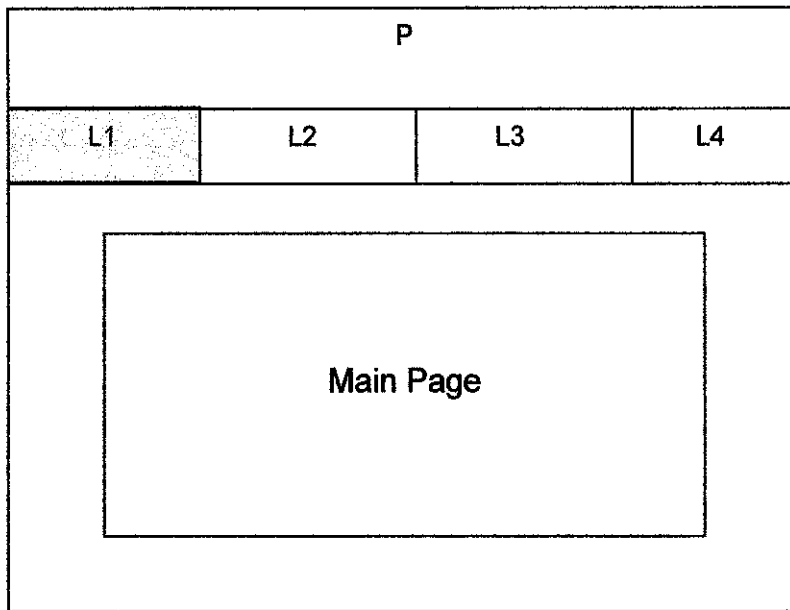
Preferences	Important		
	Yes	No	Undefined
Location	32	4	6
House Type	27	6	7
No. Of Rooms	21	8	11
Budget	19	9	12
No. Of Bathroom	16	10	14
Garage Size	15	11	14
Balcony(For Double Storey)	13	12	15
Corner Lot(For terrace)	12	12	16

Table 4.1: Results from the survey

The layout of the system will be arranged according to the result of the survey. Location will be placed at the first place in the layout followed by house type, number of rooms, budget, number of bathroom, garage size, balcony and lastly, corner lot. By arranging these preferences, author hope that it would be easier for users to choose the preferences when they are using the system.

4.2 Story Board and Layout

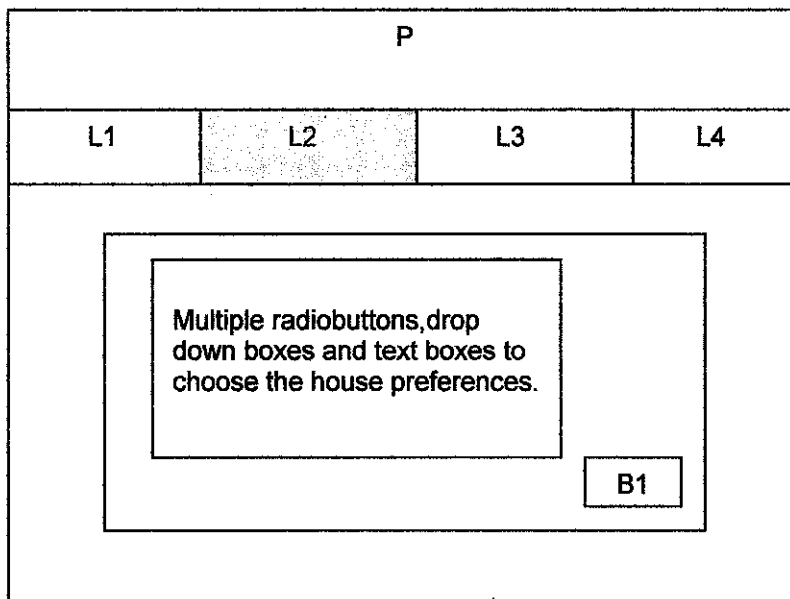
1) Main Page/Home Page (L1)



L	Link
P	Image

L1= Home Page L2= Start Selection L3= House Listing
L4= About SP city

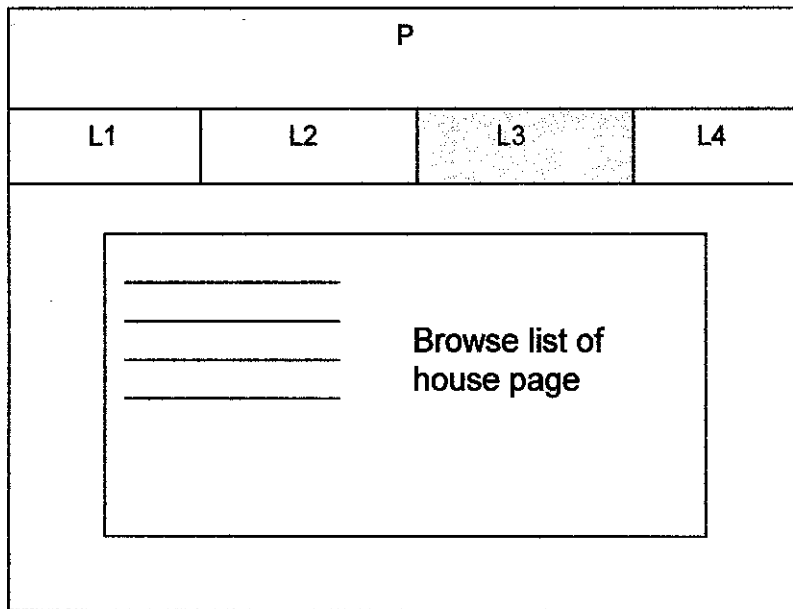
2) Selection Page (L2)



L	Link
P	Image
B	Button

L1= Home Page L2= Start Selection L3= House Listing
L4= About SP city B1=Search button

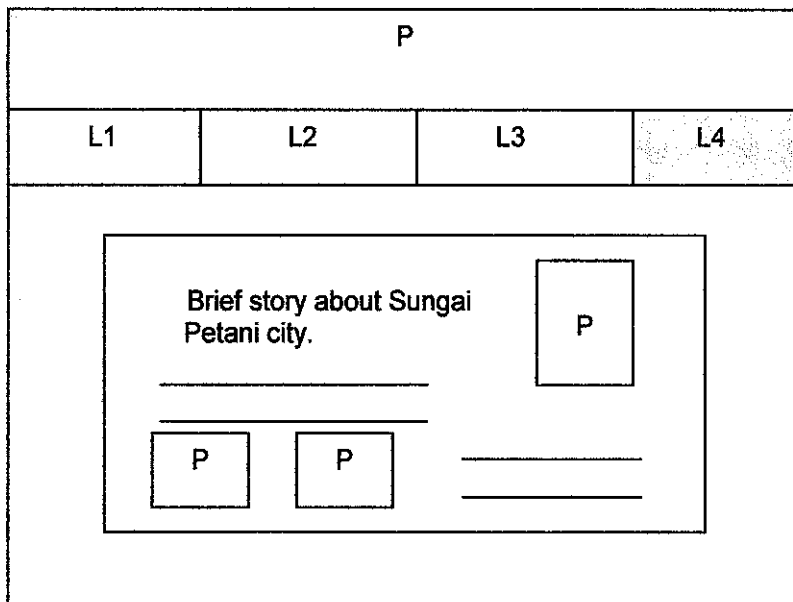
3) House Listing Page (L3)



L	Link
P	Image

L1= Home Page L2= Start Selection L3= House Listing
L4= About SP city

4) About SP city(L4)



L	Link
P	Image

L1= Home Page L2= Start Selection L3= House Listing
L4= About SP city

4.3 System Work Flow

In developing a system, the usage of software engineering discipline is very important in order to adopt a systematic and organized approach in building a system, as this is often the most effective way to produce high quality system. Besides, the use of software engineering methods also is important to make sure the system work flow is good and clear to understand.

Therefore, author had applied the requirement engineering process in constructing this system by using UML as a way to design the system workflow. After a few studies and analysis had been done, author had come out with the use case diagram, data-flow diagram and also sequence diagram.

4.3.1 Use-Case Diagram

Use-cases are a scenario-based technique for requirement elicitation which identifies the type of interaction and the actors involved in a system. The actors in the process is represented as a stick figures and each class of interaction is represented as a named ellipse. This set of use-cases represents all of the possible interactions to be represented in the system requirement [9].

The use-cases identify the individual interaction with the system. They can be documented with text linked to UML models that develop the scenario in more detail. Figure 4.1 shows the use-case diagram for the “House Selection System”.

Use case Diagram for "House Selection Assistant" system

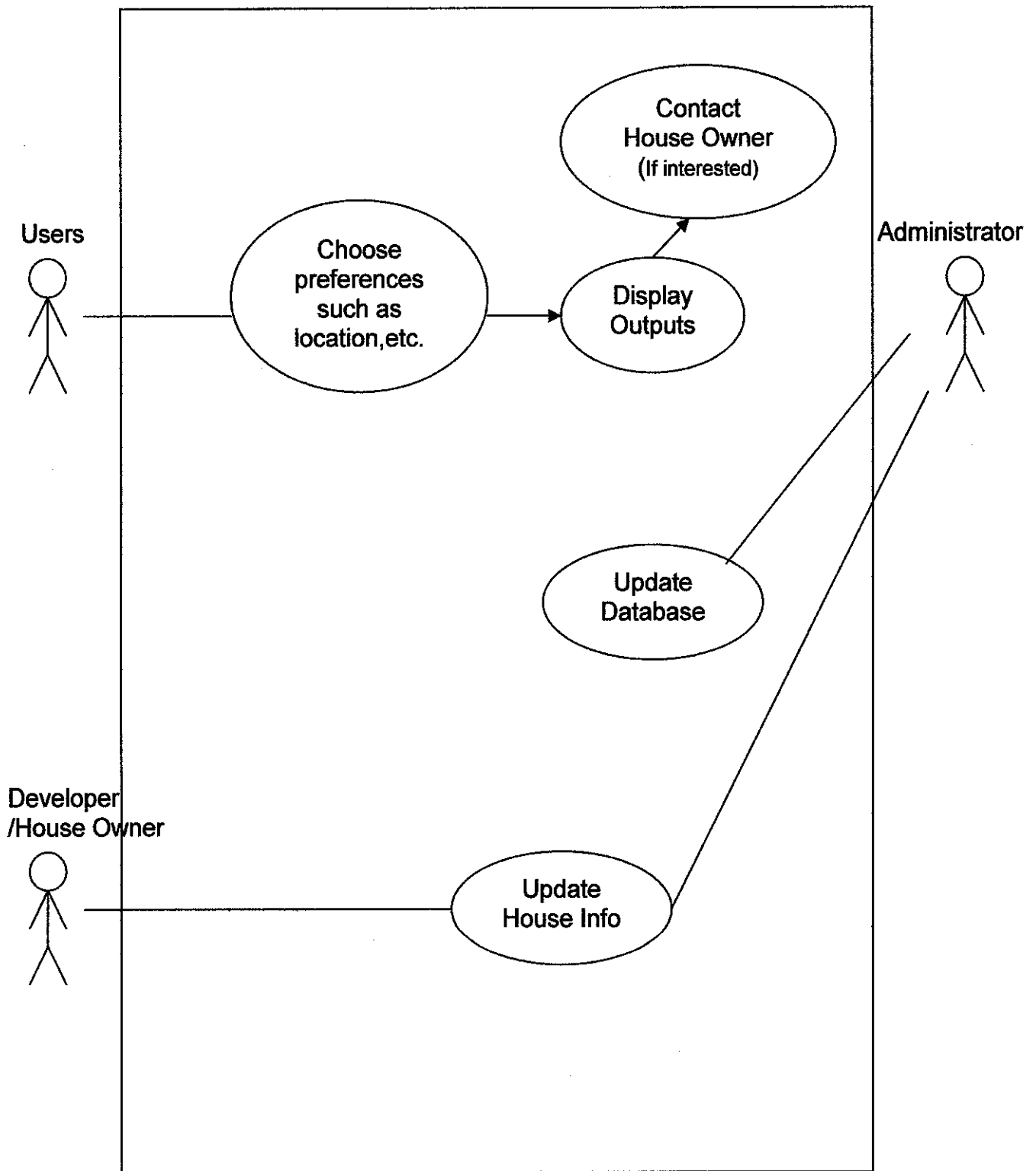


Figure 4.2: Use-Case Diagram

Use Case Diagram Description

1. Users will enter the system and select the specification as desired. The best three outputs then will be displayed by the system based on the specification.
2. Users also can contact the developer if they want to get more info or interested in buying the house
3. Administrator work is to update the database based on the information gave by the house developers.

4.3.2 Sequence Diagram

A Sequence Diagram is a Unified Modeling Language (UML) diagram that shows the processes that execute in sequence. The sequence diagram shows the sequence of messages, which are exchanged among roles that implement the behavior of the system, arranged in time. It shows the flow of control across many objects that collaborate in the context of a scenario [9].

Figure 4.2 shows the sequence diagram for the system:

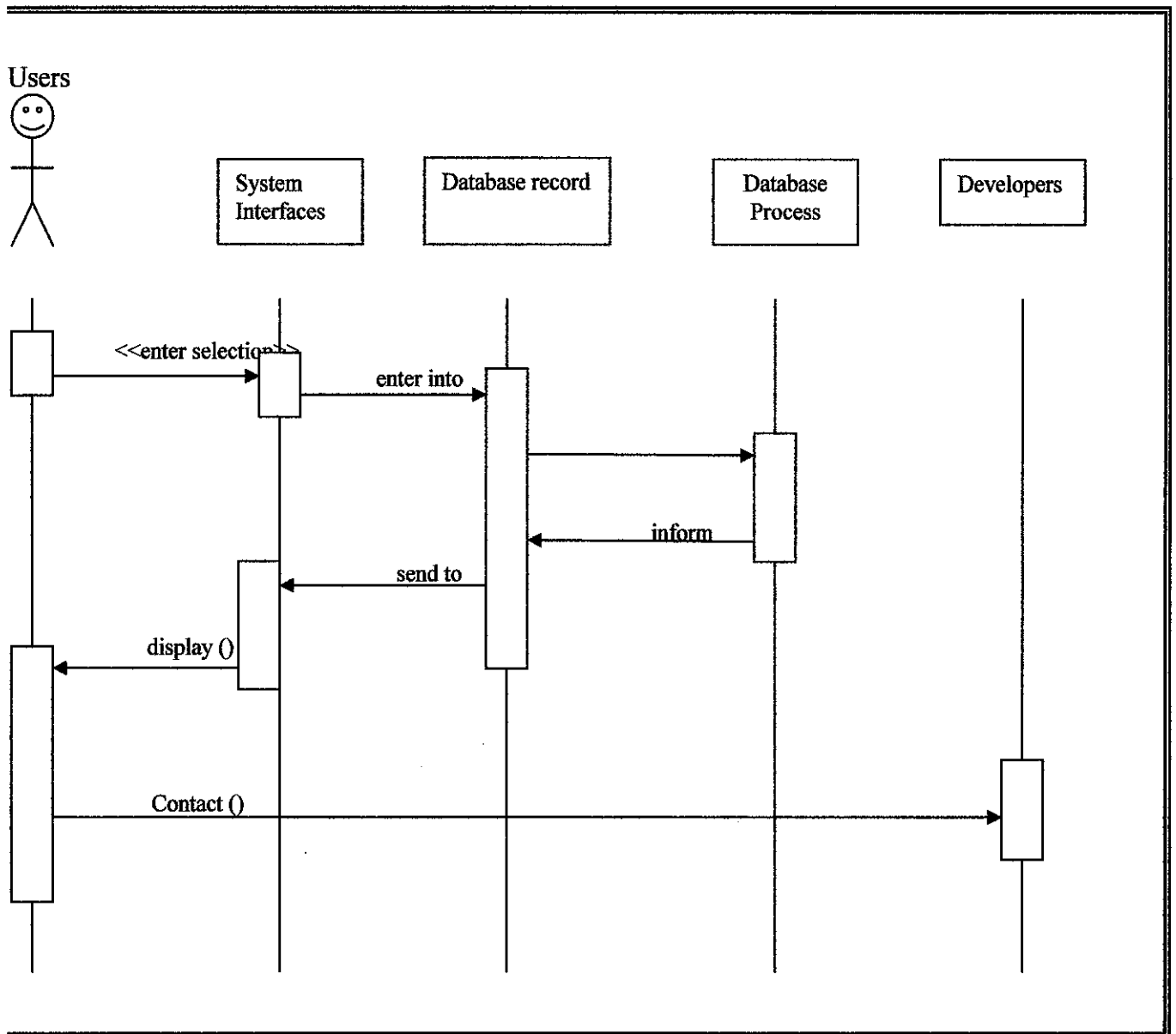


Figure 4.3: Sequence Diagram for the system

Description of the sequence diagram

1. Users at first will enter the house specification at the system interface.
2. The system interface then will send the information entered by the user into the database.
3. Database process the will process the value entered by the users to match with the data in the database record.
4. After data had been processed, it will inform to database record about which data should be displayed.
5. Database record will send the data to the system interface.
6. System interface will display the results to the users.
7. Users can contact the developers (through email or phones) of house if they interested to get more information about the house or dealing with the developers.

4.4 System Architecture

In developing a system that will interact with the users, the system architecture is important to understand the interaction between users and the system. Here, author used the classical 3-tier web application in constructing the “House Selection System” architecture. Figure 4.7 show the architecture overview:

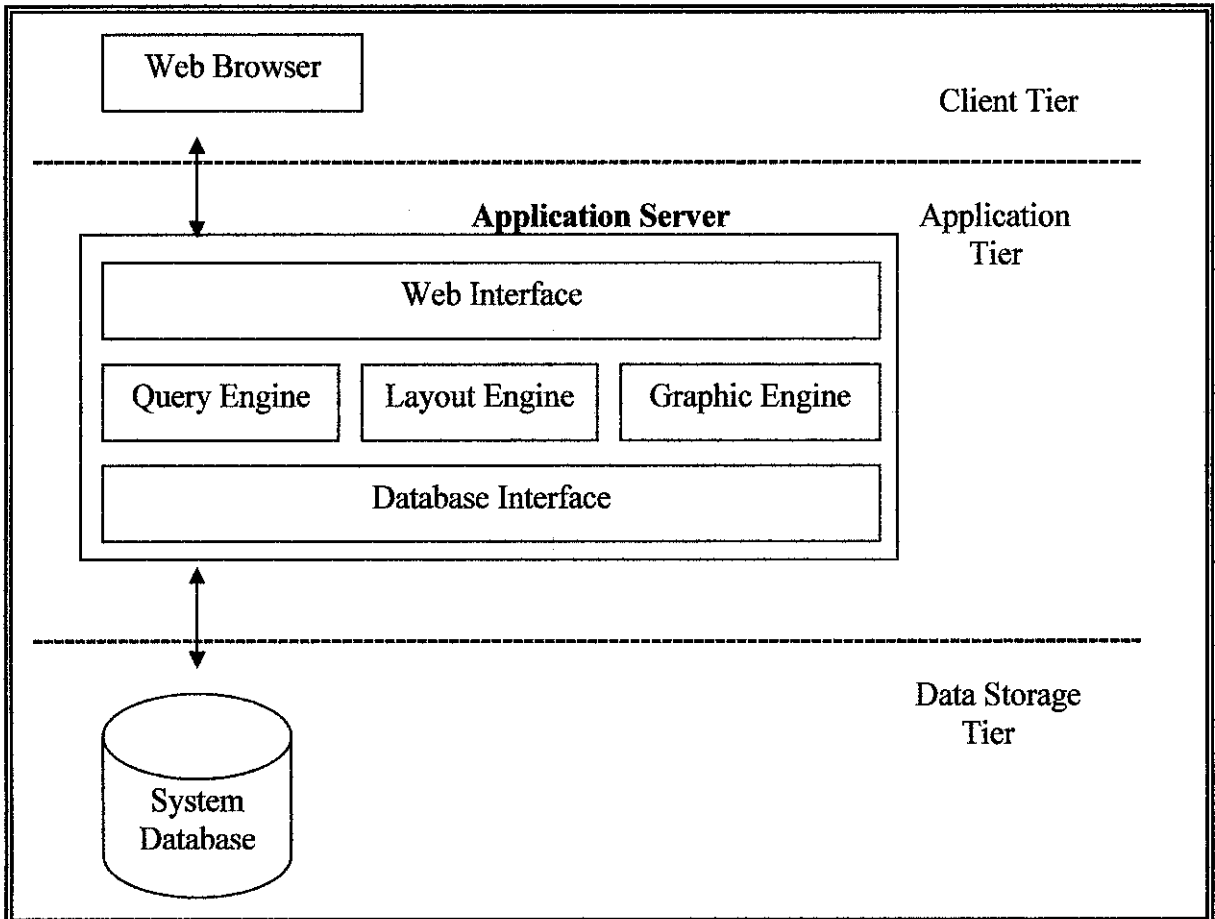


Figure 4.4: “House Selection System” Architecture Overview

Description of System Architecture

- 1) **Client Tier** - Users access the House Selection System service using a web browser such like Microsoft Internet Explorer or Mozilla Firefox or anything else. Users will enter their queries into HTML forms. The browser passes the query data to the system application server by sending a HTTP request. When the application server has finished query processing, the browser displays the

returned query results. Clicking on other internal links will triggers another HTTP request.

- 2) **Application Tier** - The main part of House Selection System is the application server. It accepts queries, retrieves the corresponding data from the database, computes the result and delivers it to the client tier.
- 3) **Data Storage Tier** – The part where the data of the house will be stored in the Database Management System (DBMS).

4.4.1 The Application Server

The application server can be said as the heart of the House Selection System. It consists of several components, which one of it will be implemented in PHP. The application server will be developed mainly on Microsoft Windows operating system. There are five components in the application server which are **web interface**, **query engine**, **layout engine**, **graphic engine** and also the **database interface**.

The **web interface** is responsible for the communication with the client tier. It receives the query in terms of a HTTP request with associated parameters. It parses the request and triggers the corresponding functionality of the query engine which processes the query and returns the result. The web interface uses the layout and graphics engine to transform results into a picture if available and delivers it to the client. The **query engine** executes the user queries. It extracts the required information from the database. The **database interface** is required for communication between the query engine and the database and **graphic engine** is used to generate images.

4.5 Problems & Constraints

In the process of developing the system, author had faced a few technical problems, which is mostly concern about connecting the system with the database. Even author had managed to overcome some of it, there were still some problem that author unable to face with. Table 4.5 shows the details of the problem and constraints:

Problems & Constraint	Difficulty Level		
	Beginner	Intermediate	Expert
1) Research on existing similar system			
2) Identifying suitable tools and software to develop the system			
3) Create a proper structure for house selection system:			
3.1. Identifying classes and attributes			
3.2. Linking classes and attributes			
4) Installation and configuration of database storage(MySQL)			
4.1. Installation and configuration			
4.2. Creating table and inserting attributes			
4.3. Normalizing the database			
4.4. Update and editing table			
5) Designing the system interface & and layout.			
5.1. Learning the HTML scripts			
5.2. Learning ASP scripts			
5.3. Arranging the layout			
6) Integration of system components.			
6.1. Connecting MySQL with the system			

Table 4.5: Level of Difficulty face by the author

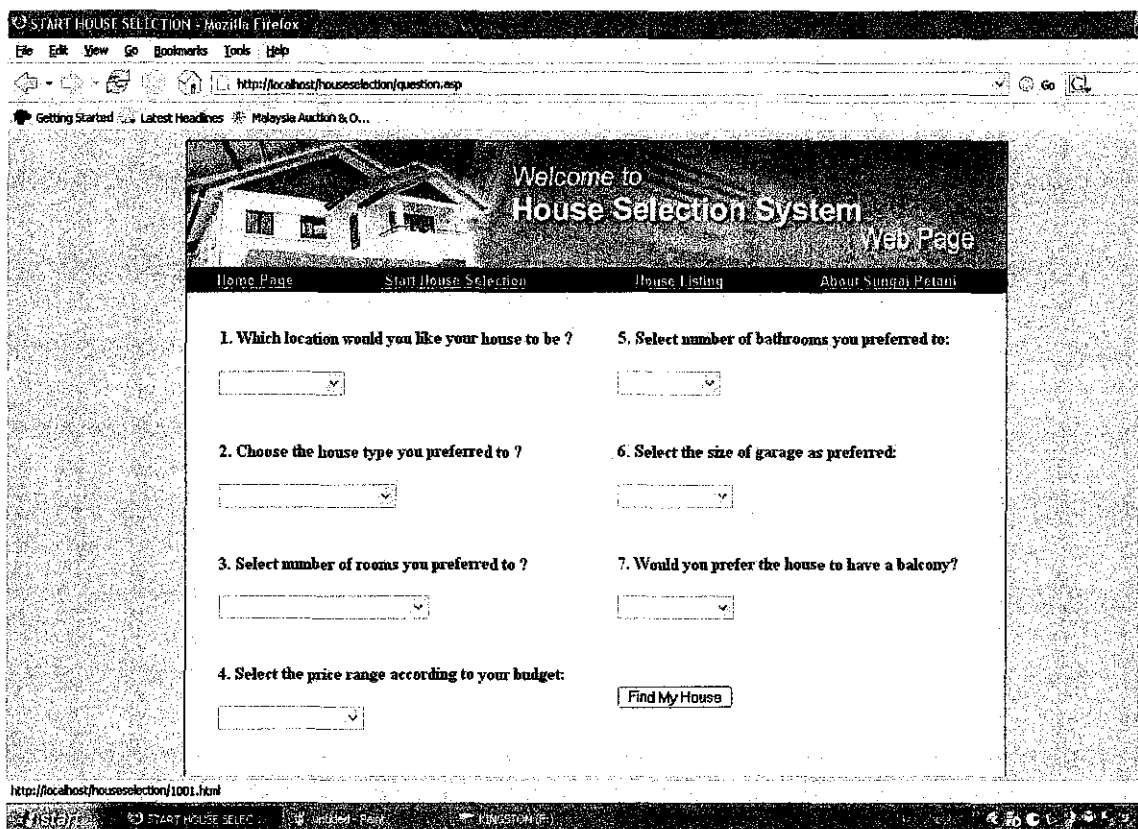
4.6 System testing

After the system has been implemented, the project had almost come to its end where the system will be testing unit by unit before it is tested as whole. In this phase, all the unit functionality need to be tested appropriately as any undetected bug or error will lead to serious problem afterwards.

In the phase of system testing author will describe further on the functionality of this system that has been successfully implemented.

4.6.1 System functionality

As has been explained before, the purpose of the House Selection System is to assist people in making decision when buying a house. Figure below will show the page that users need to fill in order to select a house:



The screenshot shows a web browser window with the title "START HOUSE SELECTION - Mozilla Firefox". The address bar shows "http://localhost/houseselection/question.asp". The page content includes a header with a house image and the text "Welcome to House Selection System Web Page". Below the header is a navigation menu with links: "Home Page", "Start House Selection", "House Listing", and "About Sungai Petani". The main content area contains a form with seven numbered questions, each with a dropdown menu:

1. Which location would you like your house to be ?
2. Choose the house type you preferred to ?
3. Select number of rooms you preferred to ?
4. Select the price range according to your budget:
5. Select number of bathrooms you preferred to:
6. Select the size of garage as preferred:
7. Would you prefer the house to have a balcony?

At the bottom right of the form is a button labeled "Find My House". The browser's status bar at the bottom shows "http://localhost/houseselection/1001.html".

Figure 4.6 : House Selection page

Figure 4.6 shows the page where the users need to fill in all the question that has been set up by author. As can be seen in the figure, author had placed drop-down boxes for each of the question. So, users just need to choose the answers that are available in each drop-down box.

Another special features that author had include in this page is the auto-disable function. This auto-disable function purpose is to minimize the number of possibilities for the system to search and display the house. For example, if let say a user choose “Flat” as his/her preferred house type, the system will automatically disable the user from selecting garage and balcony. By having this, it can prevent the system from accepting an impossible or illogical query.

After the users had select all the preferences, the users can click at the “Find My House” button and the system will displays the results as figure below:

The screenshot shows a web browser window with the URL `http://localhost/houseselection/question.asp`. The page title is "Welcome to House Selection System Web Page". The navigation menu includes "Home Page", "Start House Selection", "House Listing", and "About Sungai Petani".

The form contains seven questions with drop-down menus:

1. Which location would you like your house to be ?
2. Choose the house type you preferred to ?
3. Select number of rooms you preferred to ?
4. Select the price range according to your budget:
5. Select number of bathrooms you preferred to:
6. Select the size of garage as preferred:
7. Would you prefer the house to have a balcony?

A "Find My House" button is located below question 7.

The results table is as follows:

House ID	Location	Type	Rooms	Price
1001	Near Town	Bungalow	3 Rooms+1Master Bedroom	231000
1003	Near Town	Bungalow	3 Rooms+1Master Bedroom	221000

Figure 4.7 : Results page

The results will be display at the bottom of the questionnaires. Here, the system will displays only house_id, location, type of house, rooms and also price. For each of the result displayed, author had set it as a link, so that users can click at any desired link to see the details of the house. For instance, if the users click at house_id “1001”, the system will show the details as figure below:

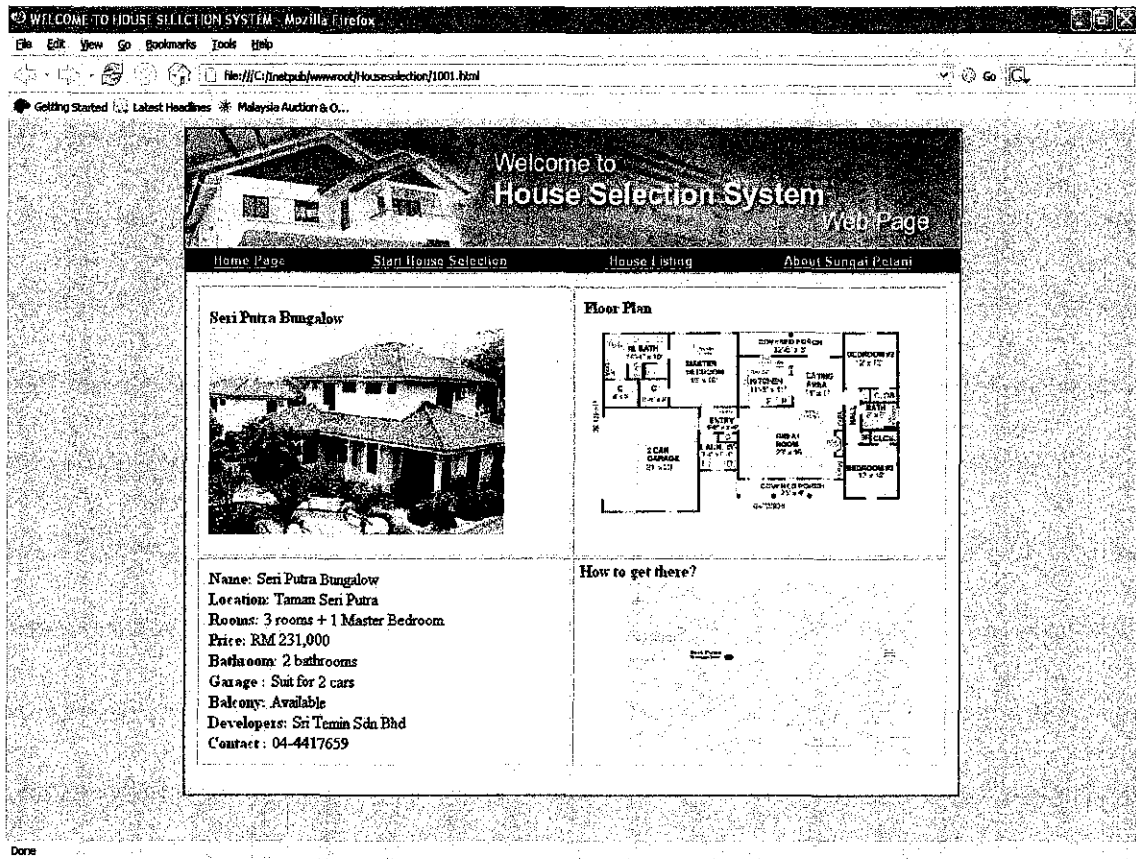


Figure 4.8 : Details of result page

In this details site, author had divided the page into four tables. The first table which is on the upper left show the image of the house. Below of the house image is the details of the house specification, developer name, and also developers contact number. On the right hand side, author has placed the floor plan of the house and also a map to guide the users or to show the house whereabouts.

4.7 Limitation of the system

House Selection System is developed with the purpose to help people in the process of decision making when selecting and buying a house. However, like the other existing systems, House Selection System has its own limitation as well.

Some of the system limitations are:

- No online booking features provided in the system
- Only one choice can be selected for each question that is provided in the system
- Users cannot view the complete image inside the house
- Only administrator can upload the information into the systems.

4.8 Project Roadmap

Completed: 03/03/2006	Propose FYP topics to supervisor.
Completed: 20/03/2006	Identifying problem with decision-making in selecting house. Identifying significant of the project and define the objectives and scope of study
Completed: 04/04/2006	Submission of preliminary report
Completed: 10/04/2006	Evaluating the software to be used for system development
Completed: 21/04/2006	Conducting a survey to categorize human preferences in selecting a house.
Completed: 27/04/2006	Develop a simple system using Exsys Corvid
Completed: 10/05/2006	Conducting a second survey to get more organized and detailed data
Completed: 16/05/2006	Choose the suitable software to develop the system
Completed: 20/05/2006	Develop the interface for Part A presentation
Completed: 05/06/2006	Presentation to the evaluators
Completed: 09/08/2006	Submission of Progress Report
Completed: 04/09/2006	Submission of Final Draft for supervisor to review
Completed: 18/09/2006	Submission of Final Report
Completed: 12/10/2006	Oral Presentation at Pre EDX
Completed: 08/11/2006	Submission of Dissertation Report
Completed: 08/11/2006	Submission of Logbook

Table 4.9: Project Roadmap

CHAPTER 5

CONCLUSION

The “House Selection System” is developed with the purpose to help human to make a better decision before they buy houses. This system offers a lot of features to the users which can make a decision making process become easier and better. It also had few advantages to users where they can save more time and cost by using this system.

Although author was not able to fully achieve all the project objectives, the author at least managed to come out with a method or idea to implement a system that can be classified as a decision support system. It is hoped that this system might contribute to something especially in context of making people life better.

As we live in the world where modern technology had make time very precious, this system should be evaluated as one of the tool to assist human to make a timely decision. Once again, the author would like to strengthen that this House Selection System should be viewed as a system to support people decision making process, not a system that make decision for people.

Future Recommendation

As the House Selection System that is implemented by the author still have a few weaknesses, author would like to recommend some features to enhance the system functionality and capability. If the features that will be recommended is successfully implemented in the future, the system may be can be used for commercial purposes.

- **Virtual Tour**

The House Selection System will become better if this feature will be successfully implemented in the future. This feature will make the users be able to see virtually the interior of the house that has been selected. This feature can be implemented by using the virtual reality concepts.

- **Online Booking**

This feature was planned by the author to be included as part of the project objectives. However, due to time constraint, author unable to achieve this. This online booking feature will allow the users to book the house if they're interested to buy the house.

- **Availability feature**

This function would allow the users to see whether the house that is selected is still available or not. This function would give such an advantage to this system because it would save time and cost for the users. This function is expected to automatically work if the house has been booked through online booking.

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APPENDICES

APPENDIX I

Survey : Preferences for buying a house

The purpose of this survey is to identify the important features that considered by peoples when buying a house.

Please answer all the question below. Just tick one answer for each question.

- 1) Does the house location in a city is important for you?
 - A. Yes
 - B. No
 - C. Undefined
- 2) Does type of house is important for you?
 - A. Yes
 - B. No
 - C. Undefined
- 3) Does you really concern about your budget in buying a house?
 - A. Yes
 - B. No
 - C. Undefined
- 4) Does number of rooms is important for you?
 - A. Yes
 - B. No
 - C. Undefined
- 5) Does number of bathroom is important for you?
 - A. Yes
 - B. No
 - C. Undefined

6) Do you really consider about the size of the garage?

- A. Yes
- B. No
- C. Undefined

7) If you're buying a terrace house, does you really concern whether the house is a corner lot or not?

- A. Yes
- B. No
- C. Undefined

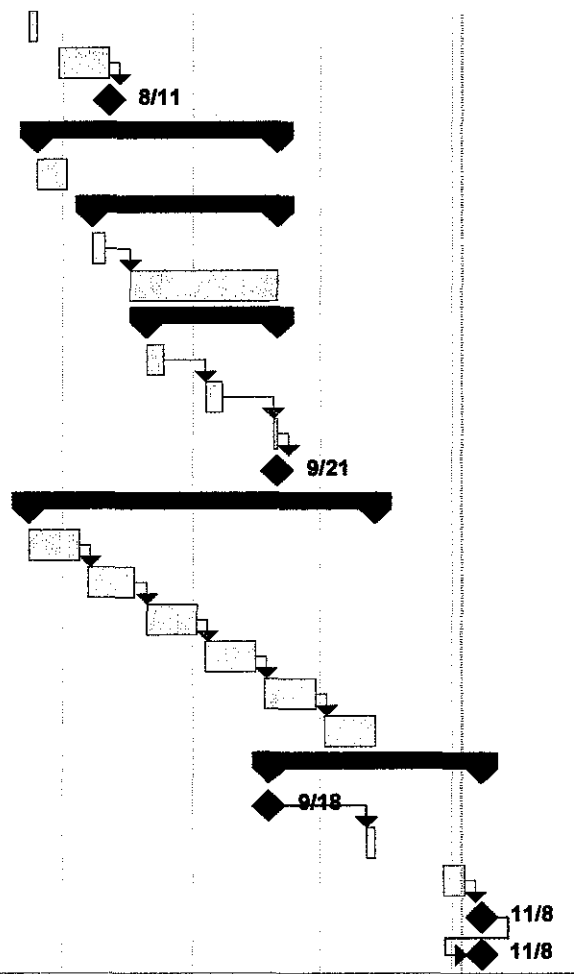
8) If the house is a double storey house, does you really concern whether the house has a balcony or not?

- A. Yes
- B. No
- C. Undefined

** Undefined here means you cannot decide whether it is important or not.*

APPENDIX II

2		Re-survey the public	2 days	Mon 7/24/06	Tue 7/25/06
3		Work On Progress Report	10 days	Mon 7/31/06	Fri 8/11/06
4		Submission of Progress Report	0 days	Fri 8/11/06	Fri 8/11/06
5		Executing	43 days	Wed 7/26/06	Thu 9/21/06
6		Re-analyzed the system function	5 days	Wed 7/26/06	Tue 8/1/06
7		Software Design	34 days	Tue 8/8/06	Wed 9/20/06
8		Software re-designed	3 days	Tue 8/8/06	Thu 8/10/06
9		System construction	26 days	Thu 8/17/06	Wed 9/20/06
10		System Testing	24 days	Mon 8/21/06	Wed 9/20/06
11		System Testing 1	4 days	Mon 8/21/06	Thu 8/24/06
12		System Testing 2	4 days	Mon 9/4/06	Thu 9/7/06
13		Final Testing	1 day	Wed 9/20/06	Wed 9/20/06
14		System Implemented	0 days	Thu 9/21/06	Thu 9/21/06
15		Controlling	62 days	Mon 7/24/06	Fri 10/13/06
16		Week 1 & 2	10 days	Mon 7/24/06	Fri 8/4/06
17		Week 3 & 4	10 days	Mon 8/7/06	Thu 8/17/06
18		Week 5 & 6	10 days	Mon 8/21/06	Fri 9/1/06
19		Week 7 & 8	10 days	Mon 9/4/06	Fri 9/15/06
20		Week 9 & 10	10 days	Mon 9/18/06	Fri 9/29/06
21		Week 11 & 12	10 days	Mon 10/2/06	Fri 10/13/06
22		Closing	36 days	Mon 9/18/06	Wed 11/8/06
23		Submission of Final Report	0 days	Mon 9/18/06	Mon 9/18/06
24		Pre-EDX Oral Presentation	2 days	Thu 10/12/06	Fri 10/13/06
25		Preparing Dissertation Report	5 days	Mon 10/30/06	Fri 11/3/06
26		Submission of Dissertation Report	0 days	Wed 11/8/06	Wed 11/8/06
27		Project Completed	0 days	Wed 11/8/06	Wed 11/8/06



Project: HUSE Public Policy Flow
Date: Fri 11/3/06

Task		Milestone		External Tasks	
Split		Summary		External Milestone	
Progress		Project Summary		Deadline	

APPENDIX III

Main Page/Home Page

WELCOME TO HOUSE SELECTION SYSTEM - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address: http://localhost/houseselection/frontpage.asp




WELCOME TO HOUSE SELECTION SYSTEM WEB PAGE

[Home Page](#) [Start House Selection](#) [House Listing](#) [About Sungai Petani](#)

Welcome to House Selection System

Whatever type of house you're looking for, this system will assist you in finding a suitable house for you. This system is specialized in finding houses in Sungai Petani area.

Now, the power is in your hand. Just sit in front of the computer and decide which house is the most best for you. Save your time, save you cost. To start the system, please click at 'Start House Selection' link above..



Done Local Intranet

Selection Page

The screenshot shows a Mozilla Firefox browser window with the address bar displaying `http://localhost/houseselection/question.asp`. The page content includes a header with a house image and the text "Welcome to House Selection System Web Page". A navigation menu contains "Home Page", "Start House Selection", "House Listing", and "About Sungai Petani". The main content area features seven numbered questions, each with a dropdown menu:

- 1. Which location would you like your house to be ?
- 2. Choose the house type you preferred to ?
- 3. Select number of rooms you preferred to ?
- 4. Select the price range according to your budget:
- 5. Select number of bathrooms you preferred to:
- 6. Select the size of garage as preferred:
- 7. Would you prefer the house to have a balcony?

A "Find My House" button is located below question 4. The browser's status bar at the bottom shows the URL `http://localhost/houseselection/1001.html`.


Results Page

START HOUSE SELECTION - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://localhost/houseselection/question.asp

Getting Started Latest Headlines Malaysia Auction & O...



Welcome to
House Selection System
Web Page

Home Page Start House Selection House Listing About Sungai Petani

1. Which location would you like your house to be ?

2. Choose the house type you preferred to ?

3. Select number of rooms you preferred to ?

4. Select the price range according to your budget:

5. Select number of bathrooms you preferred to:

6. Select the size of garage as preferred:

7. Would you prefer the house to have a balcony?

House ID	Location	Type	Rooms	Price
1001	Near Town	Bungalow	3 Rooms+1Master Bedroom	231000
1003	Near Town	Bungalow	3 Rooms+1Master Bedroom	221000

http://localhost/houseselection/1001.html

Listen START HOUSE SELECTION About Us Contact Us


Details of Results Page

WELCOME TO HOUSE SELECTION SYSTEM Mozilla Firefox
File Edit View Go Bookmarks Tools Help
file:///C:/inetpub/wwwroot/houseselection/1001.html
Getting Started Latest Headlines Malaysia Auction & O...

Welcome to House Selection System Web Page

Home Page Start House Selection House Listing About Sungai Pejanj

Seri Putra Bungalow



Floor Plan



Name: Seri Putra Bungalow
Location: Taman Seri Putra
Rooms: 3 rooms + 1 Master Bedroom
Price: RM 231,000
Bathroom: 2 bathrooms
Garage: Suit for 2 cars
Balcony: Available
Developers: Sri Temin Sdn Ehd
Contact: 04-4417659

How to get there?

Done

House Listing Page


Microsoft Internet Explorer window titled "About Sungai Petani". The address bar shows "http://localhost/houseselection/House%20List.asp".

WELCOME TO HOUSE SELECTION SYSTEM WEB PAGE

Navigation menu: [Start House Selection](#) | [House Listing](#) | [About Sungai Petani](#) | [Home Page](#)

Choose the category you would like to browse to:

- Browse by Location
- Browse by House Type
- Browse by Price



Local intranet

About Sungai Petani page

About Sungai Petani - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://localhost/houseselection/aboutsp.asp Go Links

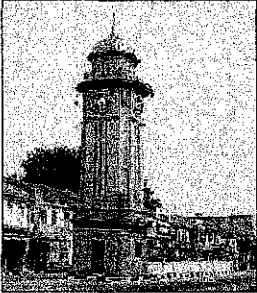
WELCOME TO
HOUSE SELECTION SYSTEM
WEB PAGE

[Start House Selection](#) [House Listing](#) [About Sungai Petani](#) [Home Page](#)

About Sungai Petani

Located at the south of Kedah, Sungai Petani can be categorized as one of the modern town in Malaysia. With the tower clock as a land mark, the town still has its own attraction even though the town had through a lot of development.

Click here for [more](#).



Local intranet

APPENDIX IV

Coding for the "Selection Page"

```

>
D>
<TITLE>START HOUSE SELECTION</TITLE>
<style type="text/css">

font-size: 16px;
font-weight: bold;

font-family: Verdana, Arial, Helvetica, sans-serif}

</style>
</script>
<script ValidateType () {
function f(document.all.selecthouse.type.value=="Flat") {
    document.all.selecthouse.balcony.disabled = true;
    document.all.selecthouse.garage.disabled = true;
}
else if(document.all.selecthouse.type.value=="Semi-D/One-Storey") {
    document.all.selecthouse.balcony.disabled = true;
    document.all.selecthouse.garage.disabled = false;
}
else{
    document.all.selecthouse.balcony.disabled = false;
    document.all.selecthouse.garage.disabled = false;
}
}
</script>
AD>
DY bgcolor = "#99CCFF">

Set DataConn = Server.CreateObject("ADODB.Connection")
DataConn.ConnectionString = "Provider=sqloledb;Server=UTP-A8F4240C5F9;User
;password=syazhan;database=house"
DataConn.Open

Dim srtSQL
srtSQL = "SELECT House_ID, location, type, rooms, price, garage, balcony FROM Datahouse
location = '" & request.form("location") & "' AND type = '" & request.form("type"
"' AND rooms = '" & request.form("rooms") & "' AND price = '" & request.form(
e") & "' AND bathrooms = '" & request.form("bathrooms") & "' AND garage = '" &
st.form("garage") & "' AND balcony = '" & request.form("balcony") & "' "

Dim objRecordset

```

```
Set objRecordset = Server.CreateObject("ADODB.Recordset")
objRecordset.Open srtsQL, DataConn, 0,1
```

```
√ align="center">
<TABLE border="0" cellpadding="0" cellspacing="0" width="750" id="table1"
  style="border-left: 1px solid #000080; border-right: 1px solid #000080;
  border-top: 1px solid #000080; border-bottom-width: 1px">
  <TR>
    <TD></TD>
  </TR>
</TABLE>
/DIV>
<DIV align="center">
BLE border="0" cellpadding="0" cellspacing="0" width="790" id="table2" bgcolor=
080">
TR>
  <TD>
  <TABLE border="0" width="100%" id="table3" style="border-collapse: collapse" >
  <TR>
    <td onmouseover="this.bgColor='#1613FF';" OnMouseOut="this.bgColor='#000080';">
      <p align="center"><b><font face="Arial" size="2" color="#FFCC00">
        <a href="frontpage.asp"><span style="text-decoration: none">
          <font color="#FFCC00">Home Page</font></span></a></font></b></td>
    <td onmouseover="this.bgColor='#1613FF';" OnMouseOut="this.bgColor='#000080';">
      <p align="center"><b><a href="question.asp"><font size="2" face="Arial" color=
C00">
        <a href="question.asp"><font color="#FFCC00">
          <span style="text-decoration: none">&nbsp;Start House Selection
n></font></a></b></td>
      <td style="background-image: url('images/split.gif'); background-repeat:
peat; background-position: center">&nbsp;
      </td>
    <td onmouseover="this.bgColor='#1613FF';" OnMouseOut="this.bgColor='#000080';">
      <p align="center"><b><a href="houselist.asp">
        <span style="text-decoration: none"><font face="Arial" size="2" color="#FFCC00">
        <span style="text-decoration: none">&nbsp;House Listing
t></a></b></td>
      <td style="background-image: url('images/split.gif'); background-repeat:
peat; background-position: center">
      <b><font size="2" color="#FFCC00">&nbsp;</td>
    <td onmouseover="this.bgColor='#1613FF';" OnMouseOut="this.bgColor='#000080';">
      <p align="center"><b><font face="Arial" size="2" color="#FFCC00">
        <a href="aboutsp.asp"><span style="text-decoration: none">
          <font color="#FFCC00">About Sungai Petani</font></span></a></font></b></td>
  </TR>
</TABLE>
```

```

</TD>
/TR>
ABLE>
>

align="center">
ole border="0" cellpadding="0" cellspacing="0" width="790" id="table4" style=
ar-left: 1px solid #000080; border-right: 1px solid #000080; border-top-width: 1px;
r-bottom: 1px solid #000080; " bgcolor="#FFFFFF">
tr>
<td style="">
<div align="center">
<form name="selecthouse" action="question.asp" method="post">
<table border=0 width="100%" cellpadding="20" style="border:solid 10px
smoke;">
<tr>
<td width="50%">
<b>1. Which location would you like your house to be ?</b>
<br><br>
<select name="location" size="1">
<option value=" "> </option>
<%
stringsql = "SELECT DISTINCT location FROM datahouse"
set rs = DataConn.Execute(stringsql)
rs.MoveFirst
do until rs.EOF
    %><option value="<%=rs("location")%>"><%=rs("location")%>
ion><%
        rs.MoveNext
        loop
        set rs=nothing
    %>
</select>
</td>
<td width="50%">
<b>5. Select number of bathrooms you preferred to:</b>
<br><br>
<select name="bathrooms" size="1">
<option value=" "> </option>
<%
stringsql = "SELECT DISTINCT bathrooms FROM datahouse"
set rs = DataConn.Execute(stringsql)
rs.MoveFirst
do until rs.EOF
    %><option value="<%=rs("bathrooms")%>"><%=rs("bathrooms")%>
ion><%
        rs.MoveNext
        loop
        set rs=nothing
    %>
</select>
</td>

```

```

</tr>
<tr>
  <td>
    <b>2. Choose the house type you preferred to ?</b>
    <br><br>
    <select name="type" size="1" onchange="ValidateType();" >
    <option value=" " > </option>
    <%
      stringsql = "SELECT DISTINCT type FROM datahouse"
      set rs = DataConn.Execute(stringsql)
      rs.MoveFirst
      do until rs.EOF
        %><option value="<%=rs("type") %>"><%=rs("type") %></option><%
        rs.MoveNext
      loop
      set rs=nothing
    %>
    </select>
  </td>
  <td>
    <b>6. Select the size of garage as preferred:</b>
    <br><br>
    <select name="garage" size="1">
    <option value=" " > </option>
    <%
      stringsql = "SELECT DISTINCT garage FROM datahouse"
      set rs = DataConn.Execute(stringsql)
      rs.MoveFirst
      do until rs.EOF
        %><option value="<%=rs("garage") %>"><%=rs("garage") %></option>
        rs.MoveNext
      loop
      set rs=nothing
    %>
    </select>
  </td>
</tr>
<tr>
  <td>
    <b>3. Select number of rooms you preferred to ?</b>
    <br><br>
    <select name="rooms" size="1">
    <option value="" SELECTED></option>
    <%
      stringsql = "SELECT DISTINCT rooms FROM datahouse"
      set rs = DataConn.Execute(stringsql)
      rs.MoveFirst
      do until rs.EOF
        %><option value="<%=rs("rooms") %>"><%=rs("rooms") %></option><%
        rs.MoveNext
      loop

```



```

        set rs=nothing
    %>
    </select>
</td>
<td>
    <b>7. Would you prefer the house to have a balcony?</b>
    <br><br>
    <select name="balcony" size="1">
    <option value="" SELECTED></option>
    <%
        stringsql = "SELECT DISTINCT balcony FROM datahouse"
        set rs = DataConn.Execute(stringsql)
        rs.MoveFirst
        do until rs.EOF
            %><option value="<%=rs("balcony")%>"><%=rs("balcony")%>
ion><%
                rs.MoveNext
            loop
        set rs=nothing
    %>
    </select>
</td>
</tr>
<tr>
<td>
    <b>4. Select the price range according to your budget:</b>
    <br><br>
    <select name="price" size="1">
        <option value=" " > </option>
        <option value="260000">Below RM 260,000</option>
        <option value="200000">Below RM 200,000</option>
        <option value="170000">Below RM 170,000</option>
        <option value="140000">Below RM 140,000</option>
        <option value="90000">Below RM 90,000</option>
    </select>
</td>
<td>
        <input type="submit" value="Find My House">
    </td>
</tr>
</table>
</form>

<table width="100%" cellpadding="20">
    <tr style="font-weight:bold" bgcolor="orange"><td>House ID</td><td>Location
<td>Type</td><td>Rooms</td><td>Price</td></tr>
    <%
        stringsql = "SELECT house_id, location, type, rooms, price FROM datahouse
"
        _
            & "location='" & request.form("location") & "' and " _
            & "type='" & request.form("type") & "' and " _
            & "rooms='" & request.form("rooms") & "' and " _

```

```
& "bathrooms=" & request.form("bathrooms") & "'"
```

```
' & "price <" & request.form("price") & "' and "_
```

```
if not request.form("garage") = "" then
    stringsql = stringsql & " and garage='" & request.form("garage") & "'
end if
if not request.form("balcony") = "" then
    stringsql = stringsql & " and balcony='" & request.form("balcony") & "'
end if
```

```
set rs = DataConn.Execute(stringsql)
```

```
do until rs.EOF
```

```
    %><tr>
```

```
        <td style="border-right:dashed 1px orange">
```

```
            <a href="<%=rs("house_id")%>.html">
```

```
                <%=rs("house_id")%>
```

```
            </a>
```

```
        </td>
```

```
        <td style="border-right:dashed 1px orange">
```

```
            <a href="<%=rs("house_id")%>.html">
```

```
                <%=rs("location")%>
```

```
            </a>
```

```
        </td>
```

```
        <td style="border-right:dashed 1px orange">
```

```
            <a href="<%=rs("house_id")%>.html">
```

```
                <%=rs("type")%>
```

```
            </a>
```

```
        </td>
```

```
        <td style="border-right:dashed 1px orange">
```

```
            <a href="<%=rs("house_id")%>.html">
```

```
                <%=rs("rooms")%>
```

```
            </a>
```

```
        </td>
```

```
        <td>
```

```
            <a href="<%=rs("house_id")%>.html">
```

```
                <%=rs("price")%>
```

```
            </a>
```

```
        </td>
```

```
    </tr><%
```

```
    rs.MoveNext
```

```
loop
```

```
set rs=nothing
```

```
%>
```

```
</table>
```

```
</div>
```

```
</td>
```

```
/tr>  
able>  
>  
  
>>>>>  
>>
```