**Empirical Domain Model for Web Browser Data Entry**

by

Rajaletchume A/P Annamalai

Dissertation submitted in partial fulfillment of
the requirement for the
Bachelor of Technology (Hons)
In Business Information System

DECEMBER 2005

Universiti Teknologi PETRONAS
Bandar Seri Iskandar
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CERTIFICATION OF APPROVAL

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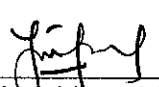
Approved by,

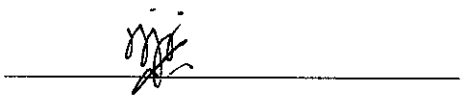


(Mr. Saipunidzam bin Mahamad)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
DECEMBER 2005

## CERTIFICATION OF ORIGINALITY

This is to 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 original work contain herein have not to be undertaken or done by specified sources or person.



RAJALETCHUME ANNAMALAI

# ABSTRACT

The objectives of this experimental web browser project is to show that a web browser can be modified more to enhance the features for a better experience surfing on the web. Other than that, it will increase user satisfaction and productivity in performing their work. Besides that, is to develop a prototype applied model for the web browser and improve on the data entry including qualities of the interfaces that is to alter the address bar to make it into split menu. Without the proper menu function on the address bar users will have difficulty in looking for information fast and accurately. In the normal browser, we cannot look for the address in alphabetical order and users will have to scroll the list. The scope of study will cover the literature review on the background of split menu and it uses to the web browser and the research, surveys done by other individuals. Meanwhile, the methodology that is used in the development of this project will feature the four processes that are planning, analysis, design and implementation. Performance and effectiveness will provide an ease of use among users and they will find that split menu in a web browser will have a lot of effect in terms of navigation and graphical user interface. There are several strong justifications which are presented to rationalize the development of this project. The result seems to be positive as many users really like the split menu applied in the web browser. They find it something different and save a lot of time. Overall the web browser is something very useful to everyone and most importantly it achieves the objectives of getting information fast by implementing the split menu.

# ACKNOWLEDGEMENT

My deepest praises to God for this project is finally completed. Gratitude to Mr. Saipunidzam bin Mahamad for his guidance in making the project a success, Empirical Domain Model for Web Browser Data Entry. It is with your patience and understanding during the advice sessions that led to achieving the objectives of the project. Thank you for the leadership, dedication and tireless effort that prove to be a miracle during the development phases of the project. His understanding and quality based policy urged the author to give the best to achieve the goals of the project. It was privileged to work with such a great person. Thank you.

Deepest appreciation to all the IT/IS lecturers for their inspiration and encouragement to complete this project. Their corporation and guideline regarding the approach that needs to be taken helped a lot in the development of the project. Your comments, suggestions and constructive criticisms made a real difference in the quality of the project. Thank you.

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# CHAPTER 1

# INTRODUCTION

## 1.1 BACKGROUND OF STUDY

As all of us have entered the new paradigm, the technology shift has been so vast that it is impossible for us to catch up with it. The one item that created a revolution is the World Wide Web that has changed how information is distributed among people. In using the web there are many aspects that need to be considered such as the presentation, simplicity, usefulness, looking or information and many more. All this aspects are in the human computer interaction that shows how communications between both elements are. As users one has always known human computer interaction plays a major role in determining the usability of a website or web page. When talking about usability, it is how well goals can be achieved in completing tasks or looking for information in web page. It is proven that menu bars, tool bars, icons and many more aspects which is the Graphical User Interfaces (GUI) to make a web page usable has a major function in determining the functions of the web page.

Navigation is also 80% of usability. That is what the professionals tell us. If the navigation is right definitely the users will be able to find the items on the site without getting confused provided they are looking for the right thing. But getting the navigation right is not that easy as many aspects of design factor comes into an effective menu systems. When we apply a lot of things, the main question is whether the user going to adapt to it or not? Even though there are many advantages, the drawbacks are visible reduced learning time and lack of learning to transfer to new applications.

The most fundamental element in GUI is the menu elements. In many applications such telecommunications, networking, appliances and others has few buttons that lead to many menus under them. At the same time this menu items covers many features that are necessary in these applications. Menu with selection support offer

user's faster access to frequently used functions. Well designed selection-support menus facilitate learning for new users by offering a staged, guided path to support the discovery of available functions and useful resources. It is always said that the traditional design of a GUI of a single menu bar is not enough to support large applications that has many functions. But by using hot list that includes pull down menu, "Hotbox" combines several GUI techniques which are generally used independently: accelerator keys, modal dialogs, pop-up/pull down menus, radial menus, marking menus and menu bars. These techniques are fitted together to create a single, easy to learn yet fast to operate GUI widget which can handle significantly more menu items than the traditional GUI menu bar.

The menu element that is going to be on research here is the split menu that is important in data entry and navigation. Split menu according to Sears and Shneiderman, in which two or three most frequently selected items are at the top of the menu and then the remaining items in a bottom section [1]. These most frequent items will be placed at the top of the menu as a hot list items. Hot list enhances human computer interaction by arranging the most likely options for easy selection by the users.

## 1.2 PROBLEM STATEMENT

### 1.2.1 Problem Identification

Currently maybe the web browser does not have many problems that are obvious but what that is trying to be done is to enhance the current features of the web browser so that it will be more useful to the users. But there are some problems associated with it that is:

a) Without the proper menu function on the address bar on a web browser, the users might not be able to get the right information at the most quickest time.

b) There is no proper arrangement for all the addresses now and user's still have to browse the scroller to look for the address.

c) There is no separation for the most frequently visited webpage. In other words no hot list is available and no alphabetical arrangement of the address.

### 1.2.2 Significance of the Project

This web browser will enhance and improve the quality of the surfing the web pages. Through this project, users will benefit a lot as it will increase their productivity and efficiency. By using split menu in web browser, it will shorten the time taken to type the address and scroll the address bar. By having split menu, there is hot list feature that will list the most frequent web page that has been visited by the users. Overall, it provides friendly, efficient, reliable, secure and simpler implementation for a different type of web browser.

## 1.3 OBJECTIVES AND SCOPE OF STUDY

### 1.3.1 Objectives

The objectives of this project are:

a) To demonstrate the experimental domain model that is associated with the interface on improving data entry, desirability and quality.
b) To embed the model into the web browser data model.
c) To develop a prototype applied model for the web browser.

### 1.3.2 Project Scope

The prototype will be a model to show that split menus can be used in web browser to increase effectives of the users. It also increases user's satisfaction and saves a lot of time. The application will have a web browser where split menus will be implemented in the URL bar to give the separation.

## 1.4 RELEVANCE & FEASIBILITY OF THE PROJECT

### 1.4.1 Relevancy of the project

This project is relevant to the ever changing technology that involves the World Wide Web that always comes out with something new each time. It will be a useful tool for the users who are looking for something that can save time and increase user satisfaction while being on the net.

### 1.4.2 Feasibility of the project

The initial feasibility of the project can be evaluated through many factors.

a) Operational feasibility

This aspect can be evaluated by using performance, economy and efficiency. In terms of performance this project minimizes the user's effort to look for information compared to the normal web browser where the users have to type the address or scroll through it.

For efficiency, it improves productivity of the user's and the hot list makes the users using the web browser more at ease. It saves a lot of time rather than looking for the addresses. It will be an added advantage for users who always forget their web address. Furthermore, the arrangement in the alphabetical order sorts the address in an orderly way.

b) Schedule feasibility

The schedules have been divided according to the System Development Life Cycle phases that can be viewed in the Appendix 1 with the timeline in Microsoft Project.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 INTELLIGENT SPLIT MENUS

Split menus have been used for a very long time since the introduction of Microsoft in the software market. According to James R. Warren, split menus group a selection of frequently used items in a top section of the menu and then give the remaining items in a bottom section [2]. The high frequency item is usually placed above so that users know the item that they most. One good example of split menus can be seen featured on Microsoft Word font selection where it has a setoff likely font selection above a complete alphabetic list of all the available fonts. The most used fonts are placed above the line and the others below the line. This can be seen in Figure 2.0 below.

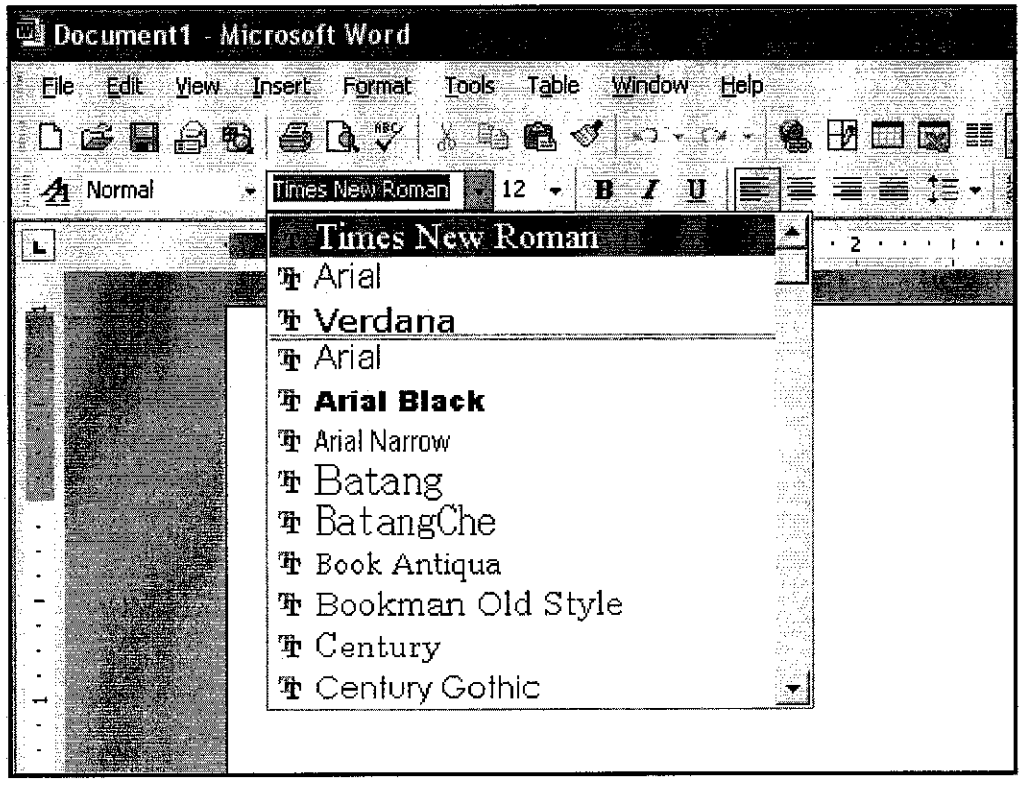


**Figure 2.0: Split menu in Microsoft Word**

There are also other menus such as folded menus that are presented in Microsoft Office where the high frequency items appear alone and first. It is called folded menus because it "folds" the low frequency items and presents them only when requested. Figure 2.1 shows an example of folded menu.

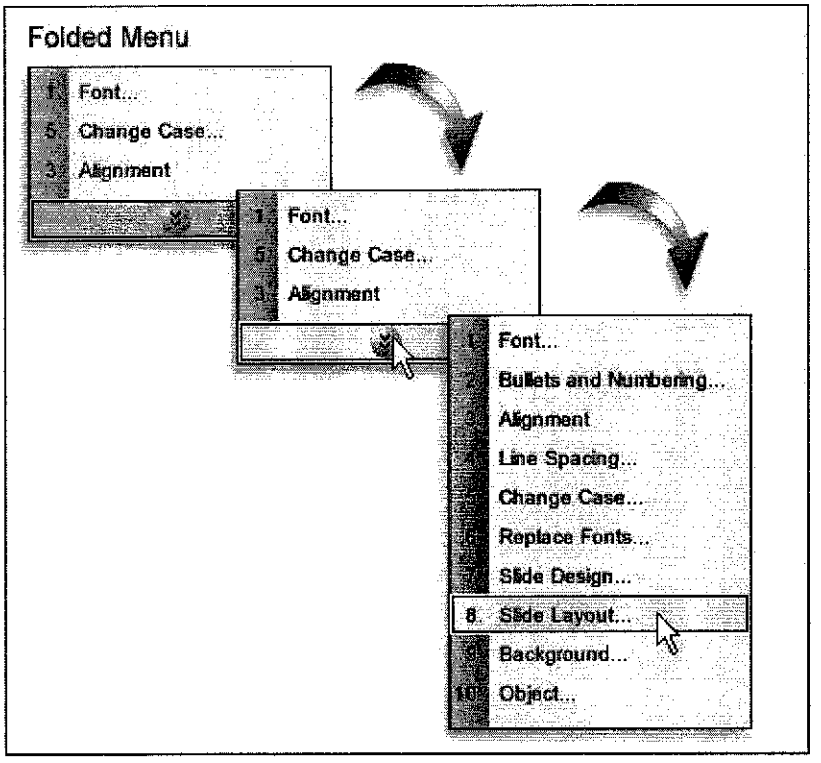


**Figure 2.1: Folded menu in Microsoft Office**

But comparing both, it seems that split menu is better than folded menu because it does not have delay time and present the items that we want to see.

Using split menu, we want to make it *intelligent* if its top section alters its values to suit the factors of the current context according to Patrick Bolton in one of his journals. Split menu has partial selection support which means that the items are selected on a 70-90% basis [2]. According to Dong Seok-Lee, he claims that these menus make it is easier to select the high-frequency items by giving them priority over the low-frequency items. Selection supportive menus are also designed to help a user by providing cues about which items may be most appropriate [3]. This encourages first time users to choose the items correctly. When giving guidelines for formatting data, Smith and Mosier suggested: "Where some data items are used more frequently than others, consider grouping those items at the top of the display."

They do not indicate how to select these "high-frequency" items, how to organize them at the top of the display, or what to do with the remaining items. Refining this suggestion, and applying it to menus results in *split menus* [12].

Split menu has been used in a GP Medicine and proved to be a working product where the top 20 list for mouse click entry of opthamology diagnoses was the most used data entry method for doctors [2]. In other researches also they have done a comparison between split menu, folded menu and temporal menu.

## 2.2 MENU DESIGN ADAPTATION

Menu adaptation is very important to any software that is created because the effectiveness of the menus shows how easily the users can learn the particular software and use it efficiently. Flexibility of the software through interfaces has become very important to accommodate the specific users and their mental models according to Paula Selvidge [9]. Developers must really do a lot of research before coming up with an appropriate menu design because it involves a lot cost and the benefits must be analysed before incorporating the menu interface onto the system. The two types of adaptation that can be done are functionality and design of the interface. In a research conducted by Paula she compared between split menu, alphabetical menu and frequency menu. But comparison done between adaptive menu and static menus, it seems that most users prefer static menus that adaptive menus because they not used to it but after some training time mistakes are reduced [9].

Paula also conducted another research in locating menu items in the adaptive menu and static menus. This research is important as because it involves a lot of testers and result could be accurate. The important aspect that they researched upon is the selection speed and error rate. 73 individuals were involved in this exercise that required them to complete 12 tasks. The task that they have been asked to do is to choose names from directory 30 times applying both menus. As usual in the static menu nothing was changed and items were arranged as it is and in the adaptive menu items were arranged according to high regularity. Using the adaptive menu the

research proved that adaptive menu caused less errors and completion time was faster. Therefore we can conclude that adaptive menu is better than static menu. Meanwhile in another research, 30 users were asked to try out between split menu, alphabetical menu and frequency menus that required them to complete 100 tasks that involve selection. Between the three menus the one that proved fastest results was the split menu in terms of application but in terms of error rate they are all the same. One thing that needs to be considered is the user's preference whether they agree to the change or not. If the users are not satisfied with the interaction no matter how good the software is they would still not use it.

But by introducing the adaptive menus in the application for the user, it also has the disadvantages that are the loss of control where the users are no longer in full control of the application. Other than that, there is transparency in which users may not know how the item functions. There is also an issue on predictability where the adaptive system may not produce the same result as the same input and there are potential errors when the system infers with the user's needs where the users do not trust the system anymore to make decision.

## 2.3 ADAPTIVE INTERFACE APPLICATION

There have been many applications using adaptive interface options such as filtering and recommendation application in the net to help users to cope with information overload. It is based on collaborative based information filtering [16].Collaborative filtering is predicting items a user may be interested in based on feedback from many different users [17]. It will allow users to rate the quality of the pages as they browse through the pages of the web. Besides that, the most popular application of adaptive interface is the menus which self adjust to meet user's needs. With adaptive interface also we can predict value in forms such an online form where the system has been developed based on previously completed forms.

Besides that, it is also used as an adaptive route advising that implements voice interface for providing direction which analyses the driver's familiarity with the road and which route is taken all the time. It has also been used for proposing meeting times that is a repetitive task. It can aid users by telling the time, date and venue when setting up a meeting. There will be suggestions from users as to whether they agree or not on that timing.

## 2.4 BENEFITS OF SPLIT MENU

There are many benefits of split menu that can help users to achieve and complete their task faster. Sears & Schneiderman showed that "split menus" increase both performance and satisfaction for users [1]. In their study, split menus outperformed traditional static menu presentations. Split menus reduce the selection time for high frequency items by providing spatial recognition support and it can be seen when items were presented in alphabetical order and reordered within the complete list by frequency of use. According to James R. Warren [2], intelligent split menus should improve user efficiency if current selection methods require 3 seconds or more per item.

Other than that, it seems that users find where the item is because it is easier to see and point than to remember and type. Therefore, if applied it in a web browser the

users do not have to type the addresses and it would not be a problem if they forget the address that they have currently visited. Users memorize where frequently used tasks are on the screen and access them by location – at times before the menu is even painted. If the split menu is done properly it would smooth the progress of high frequency tasks. It would definitely be like a trigger for certain commands. Users prefer systems that anticipate the user's intentions and accommodate their work habits, and adjust their interfaces accordingly, thus making the tasks less burdensome and they dislike if their task is obstructed with and this is according to W. C Yoon [3]. But compared to folded menus users like split menu because they do not have to do the extra click or delay waiting for the menu to come out. Based on the research done by Lee and Yoon, they did a comparison of split menu, traditional menu, folded menu and temporal menu [3]. They evaluated how sensitive each menu was to spatial and temporal features in frequency distribution. The one with most votes was split menu because it has the fastest overall performance.

In another research done by Mitchell & Shniederman [9], they found out that the adaptive menus were better than the static ones in a survey done to 12 people. In this context, split menus are also known as adaptive menus. This study supports the use of static menus over adaptive menus due to increased training time and user preference, but alternative studies have supported the use of adaptive menus. Based on the research, they have proved that users significantly faster completion time and significantly fewer errors than the static directory. Users preferred the split menus, followed by alphabetical and frequency menus.

### 2.4.1 Improving Selection in Pull down menu

Most techniques introduced to improve selection times in cascading pull-down menus have focused on the selection of first-level items. The process of selecting a menu item to invoke the corresponding operation is a frequent task which can be burdensome and time consuming for many users. If the menu items are wide, a rather long horizontal motion is needed to navigate into a sub-menu. During the horizontal motion, it is important that the cursor movement does not move away too much in the vertical direction and leave the parent item, which will close the sub-menu. This is especially difficult in the navigation of mobile computing where the user's find it slow and time consuming. Basically, in designing the perfect menu has to use calculation to estimate the distance of the menus based on the Fitts Law [10]. By using these laws, an error free and accurate menu design will be the results.

A split menu basically adapts to user behavior and relocates the menu items according to usage where top menu is the most frequently used and the bottom ones are arranged accordingly. Therefore, here one can conclude that the distance of items depends on the selection probability. Before using the pull down menu, the user must read the alternatives in the menu, choose the desired menu, effect the choice and find out the consequences. For some it may be a burdensome task and time consuming task for users. Menu navigation for example becomes particularly difficult in the context of mobile computing where input devices with questionable ergonomic properties. In every way the designers are trying to make things easier for the users to make menu selection easier and faster. In every day life, people often consider how frequently they use items when organizing them. Phone books often have an easily accessed section for frequently dialed numbers and bookcases are often organized with a section for frequently used books. Several researchers have suggested organizing menu items by how frequently they are selected [12].

## 2.5 SPLIT MENU APPLICATION

Most of the research done, it seems that many parties have tried using split menu in daily applications to ease the jobs. Such an application is General Practice Medicine where they applied this technique in which drug to choose based on the patient's already specified drugs. This research is done on an experiment basis by Jim Warren. Split menu has been used in a GP Medicine and proved to be a working product where the top 20 list for mouse click entry of opthamology diagnoses was the most used data entry method for doctors [2]. In other researches also they have done a comparison between split menu, folded menu and temporal menu.

Based on that, the results were positive where the hit list of the item is picked out all the time. The users of the system found it to be more effective than the normal way of putting in information about the patient's medication [2]. For example, they have hot lists for RFE (reasons for encounter- symptoms, complaints, checkups, etc). When this hot listing is done it will minimize the typing done and maximize the ability to specify items from long lists with point and click methods. Other than that, it is used in many applications.

Besides that, they also have been used on telephone menus and many other custom applications. In another research done by Mona Tom [11] she claims that split menu can be used in automobile mobile multimedia application. Menu designs here is challenging because it has to be optimized so that the driver can easily accomplish the desired task while controlling the vehicle. According to her, menu interfaces for automotive environments must promote a rapid search and selection process where the user intuitively knows where to find and activate a specific menu item within the menu structure.

The process of selecting a menu item to invoke the corresponding operation is a frequent task which can be cumbersome and time consuming for many users. If the menu items are wide, a rather long horizontal motion is needed to navigate into a sub-menu. During the horizontal motion, it is important that the cursor movement does not move away too much in the vertical direction and leave the parent item, which will close the sub-menu [11]. Menu navigation becomes particularly difficult

in the context of mobile computing where input devices with questionable ergonomic properties (such as the track point, the touch pad and the touch ball) are used. Furthermore, the environment in which mobile computing takes place (in planes, in trains etc.) most often puts additional constraints upon the user during GUI navigation, in particular when precise input device motions are required. There have many issues regarding the menu development issues in term of interactivity and how they represent the task to the users. If the interface is designed according to the user's conceptual organization, it will be easier to use. Therefore, they suggested a clustering approach to the menu.

## 2.6 WEB BROWSER DESIGN

In order to apply this split menu where we have to prove that split menu is more effective than the normal menu, one has to try to apply it on a web browser's URL bar to compare it with the normal browser. So far, there has been no split menu application on a web browser. This will be the main element of the research. The identification of factors that affect the usability of the World Wide Web has become increasingly important as the Web continues to revolutionize how people obtain information, buy products, and conduct business transactions. In order to design a web browser, a lot of things have to be considered. The most important aspect is the navigation in the web browser. The navigation should be useful to the user where they may choose to leave the current node either by following an outgoing link or by going back to the previous node in the path from the root. After going back, the user may also choose to go forward to the next node on the most recent path from the root [13]. The web design should somehow support user needs and satisfaction to complete a job fast. This is according to Marc H. Brown in his article.

A lot of common web browsers use the hot list utility to jump to other addresses which is a very common scene. In an experimental web browser created by Marc H. Brown, they made a browser that has desk abstraction to organize the materials. The interface designs are visually apparent and forgiving, instilling in their users a sense of control. Users quickly see the breadth of their options, grasp how to achieve their goals, and do their work. Applications should attempt to anticipate the user's wants

and needs. Users are not expected to search for or gather information or evoke necessary tools. Bring to the user all the information and tools needed for each step of the process. If it possible developers can use status mechanism to keep the users updated. The colors that are used to convey the information should be clear, so as to people who are color blind.

No matter how the design is, the consistency is very important such as the interpretation of user behavior, e. g., shortcut keys maintain their meanings, invisible structures, the overall look of the item and the platform consistency. All this structures plays a major role in determining the best application for the user. The only way to ascertain user expectations is to do user testing. No amount of study and debate will substitute. Another important aspect is that the menu or button should have the important keyword first. People explore in ways beyond navigation. Sometimes they want to find out what would happen if they carried out some potentially dangerous action. Sometimes they do not want to find out, but they do anyway by accident. If this happens, they should be able to reverse back their actions by having 'undo'. In the absence of such dialogs, people slow down even further. A study a few years back showed that people in a hazardous environment make no more mistakes than people in a supportive and more visually obvious environment, but they worked a lot slower and a lot more carefully to avoid making errors.

In the end, the whole thing has to give a learning curve to the users and the most important thing is that user's must never lose their work on the mistake that was done on their part or any other reason other than the completely unavoidable, such as sudden loss of power to the client computer.

# CHAPTER 3

# METHODOLOGY

## 3.1 PROCEDURE IDENTIFICATION

The methodology that has been used in this project contains many of the same elements as a traditional information development process.

### 3.1.1 Phases of Project Development

The four phases of the methodology follows:

a) Planning Phase

During planning, the product designed so that it meets the objective of the project. One has to see whether the project is plausible or not in terms of the product. The information has to be planned through defining, specifying, and supporting the information that must be collected, how it is done and how the information will be updated. Analyzing the skills needed for doing the project and the resources needed to support the operation and development of the system has to be done.

b) Analysis Phase

In this phase a lot of analysis has been done on the topic. Information has been gathered and compared about the split menu and how to apply it in the web browser. All the alternatives are weighted and information is gathered to help with the decision in the process of planning, design, implementation or development. A lot of research has been done on the research materials to come up with the product and report.

c) Design Phase

During this phase, the specification of the system must be worked out and make decision on how the actual components are going to be constructed. One has to take into consideration the purpose, objectives and information. The design process is the most important compared to others but there must be knowledge on how the structure is going to be. For this the design structure of the browser is made and the components needed are added. A storyboard of how the browser looks is made.

d) Implementation Phase

In this phase, the prototype is built using Visual Basic 6.0 to create a web browser that going to implement the split menu in the address bar. The split menu is made using msdn library, inserting the right codes at the menu function and also using Microsoft Access as the database.

## 3.2 TOOLS AND UTILITIES

These are the tools and utilities that are going to be used in the project:

| NO | ELEMENTS | TOOLS |
|---|---|---|
| 1 | **Project Management** | Microsoft Project |
| 2 | **Documentation** | Microsoft Word |
| 3 | **System Modeling** | Microsoft Word |
| 4 | **Hardware** | • 166 MHz processor or higher<br>• Hard disk space of 19.1 GB<br>• 256 MB of RAM |
| 5 | **Software** | • Visual Basic 6<br>• Microsoft Access<br>• Microsoft 98/NT/2000/XP Service Pack 1 |

# CHAPTER 4

# RESULT AND DISCUSSION

## 4.1 FINDINGS

### 4.1.1 Hot list in the split menu

Split menus should prove useful when a small subset of the menu items represent the majority of selections. By moving these frequently used items to the top of the menu, users should be able to locate and select them more rapidly. As the length of the menu increases, the potential benefits of split menus also increase. Hot list that we find on Internet Explorer and Netscape store the most frequently used addresses. In other ways users can say that it has a list of valuable website addresses. By having this thought in mind, the application of hot list in the split menu will further enhance the function of the application. In a normal hot list the menu has a command that allows us to add the current page to the hot list and we can be able to perform delete, edit task on the hot list. In the split menu there is no such application of search and delete but the top five most frequently used web addresses will be there. The hot list will be part of the split menu aspect itself. Both this combination makes the web browser very constructive.

### 4.1.2 Web browser architecture

When thinking about a web browser, the first idea that comes into our mind is the navigational ability of the browser. Without good navigational property, the web browser will be of no use. In this application, a web browser using Microsoft Visual Basic is done. The basic interface design is the same as the usual browser. Before designing, we have to consider various aspects such as the colours, the character entities, plug-in and many more. The normal design is of course having stop, refresh, go and many other functional buttons. All this functions are supposed to fulfill the

user's needs to use the web browser effectively. When including it in the browser, the usability principle has to be considered where it is a direct manipulation interface and new set of guideline should be developed for it. This guideline will be a base to the users on how to use split menu. Other than that, by not just experimenting on the browser this interface has to be moved into the industry so that many individuals can know the usefulness. Below is the architecture of Internet Explorer and Mozilla Firefox that shows the basic design of a web browser with all the buttons. Based on this, the necessary design will be incorporated into Raji's Web Browser and enhancing the address bar.

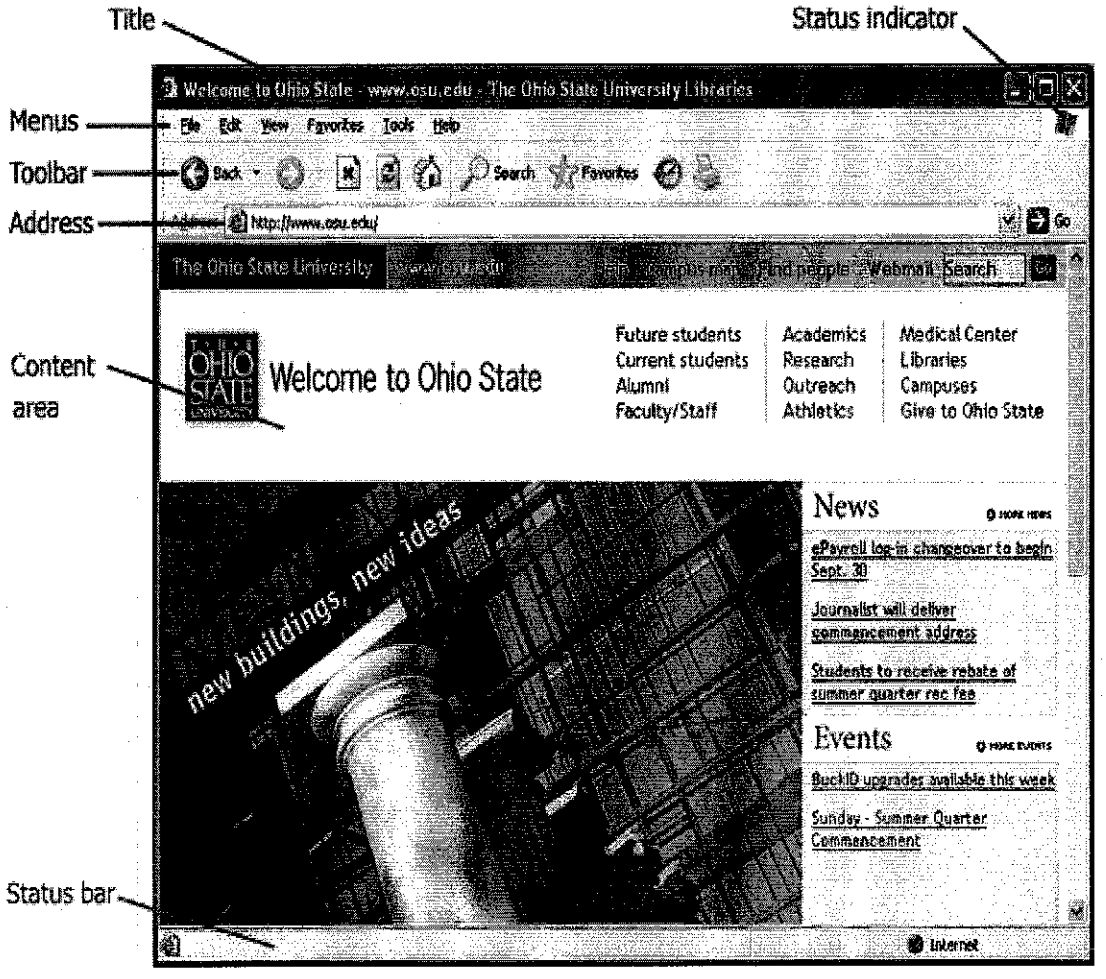


**Figure 4.0: Internet Explorer Architecture**

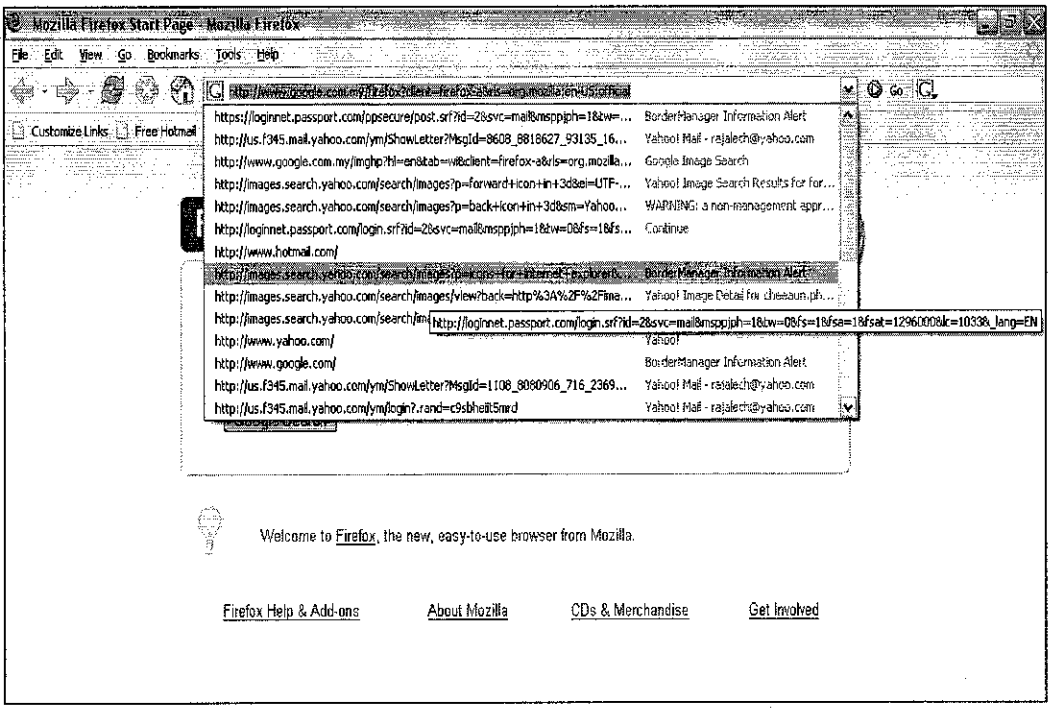


**Figure 4.1: Mozilla Firefox Architecture**

### 4.1.3 Adaptive interface in web browser

Adaptive interface have been incorporated into many applications that have been known to us. It has been a great challenge to implement and evaluate the interface. One of the most popular adaptive interfaces is the split menu that has proved to be the best application so far. It will be really effective to the user if the split menu is applied on the web browser. It will be optimal to the web browser. According to the research that has been done, split menu has been used for so many applications to help the user to accomplish the objective of completing their task faster. Therefore, it is possible the same concept in web browser application to see the effectiveness of it. In some ways it will help the user to look for information faster. If this is implemented in the web browser, the usefulness of the browser will increase.

### 4.1.4 Split menu and web browser application

A lot of application has been created by using split menu so why not try it on the browser. By applying split menu in the web browser it will increase the value of the browser that has been created. The most important thing is the completion time of the task that is being done. Applying split menu in the address bar, the effectiveness will be based on the quality of information the user is able to retrieve. Even in situation where users do not save time, they may prefer a menu organization that emphasizes frequently selected items. This is what that is going to be applied in the web browser's address bar to see the effectiveness of this split menu. Based on this usage adaptive interface can be proved in something very beneficial to the industry.

## 4.2 DISCUSSION

Based on all the research that has been done, it is found that so far no split menu application has been used on a web browser currently. By doing this empirical web browser, the effectiveness of the split menu can be analyzed in a different environment. The implementation of web browser and split menu in general will help most of the web user's to make decision and speed up the process of finding information.

Microsoft Visual Basic has been used as it is the latest technology used for web browser abilities and furthermore it is much simpler to apply. Besides that, the presentation capability is much more efficient compared to other development tools. The browser is created using ActiveX Control and Internet Explorer component which is later added with all the other essential functions of a web browser. For each button, the coding is done to add the functionality of the button so that it can perform the duties. As the web browser functions takes place, the next step is to add in the split menu in the address bar. This is done by implementing special coding into that function. This is done by having the MSDN (Microsoft Developer Network) Library and implementing the dynamic drop down list. The MSDN (Microsoft Developer Network) Library is an essential resource for developers using Microsoft tools, products, and technologies. It contains a bounty of technical programming information, including sample code, documentation, technical articles, and reference guides that can be used by developers.

In the dynamic drop down list, the codes for the split menu are done. Other than that, there should be a database using Microsoft Access that stores all the address and gives the hotlist options. A counter has been implemented to calculate the number of times user enters the particular website. Once user types the address in the address bar, the data will be automatically captured in the database and the number of times the user accesses the website is featured there. This is where the split menu and hot list is created. This appears in the configuration list that shows the number of times user enters. A lot of people maybe hesitant to try out this new application as they are so used with the current Internet Explorer or Firefox because they feel they have to

find out and learn the new function. But in this application, there is not much changes as the application is similar to other web browsers. For the user's this will be a revolutionary way to try out the web browser that has different features and they have the tendency to try out something new.

In order to implement the split menu into browser it has to be adapted according to user's needs and goals. User models are typically used to represent information collected about the user whose needs and goals are to be determined. A user model is an explicit representation of the properties of an individual user; it can be used to reason about the needs, preferences or future behavior of the user. One way to collect information about the model is to indirectly infer a user's preferences or goals through their interaction with the interface. For example, an email reader will monitor the type of mails that is read by the user. It is most appropriate if we design such as the user can view and modify the information in the user model. Although this may add additional complexity to a system that is attempting to simplify tasks through adaptive techniques, there are substantial benefits where users will be better able to understand the system's automated actions and correct errors in the model that cause infuriating performance. Before starting off with the project, a basic outline of the web browser with all the buttons is in Appendix 2.

After implementing the codes in the function and together with the database the whole web browser can be seen really effective in helping users to look for information fast and efficiently. It is totally something different than the conventional browser that they have used previously. Users just need to follow the normal steps they take in navigating the normal browser by typing in the address or just simply scrolling at the address bar where the addresses are available because the history of the previous session is not deleted. This is an advantage to the user who does not to remember what he has surfed the previous day and particularly effective if the web address is complicated and difficult to remember. Finally, the browser will show the specified web page that user has requested for with all its contents.

### 4.2.1 Browser Construction

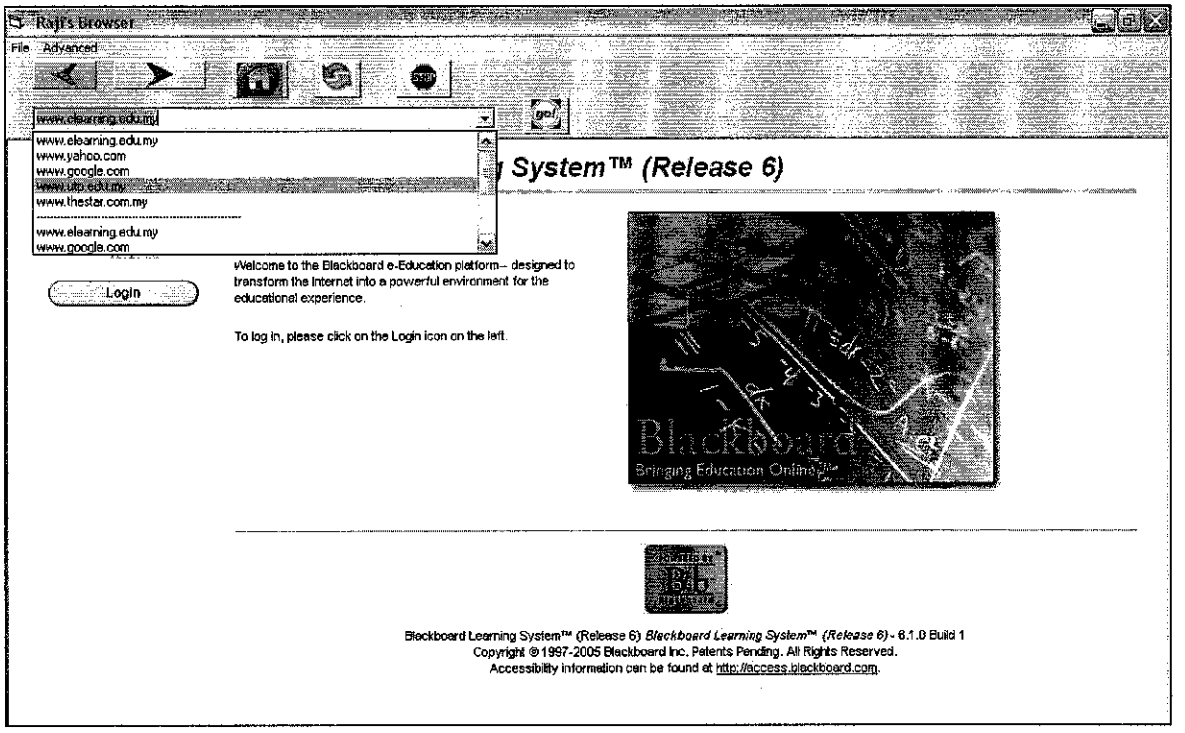


**Figure 4.2: Raji's Web Browser with split menu**

The interface consists of back and forward button, home button, refresh button, stop button and a go button. All this are almost similar to the normal web browser that we are using now. This is because these are the basic functionalities of a web browser that is very important and essential to every user. The back button is used to return to a previously viewed page. The forward button is to return to the page you just came from. Meanwhile, the home button is to return to the home page that is set for the browser that the user is using. If the user has not selected one, it will return to the default home page. In this case, maybe Google or Yahoo homepage.

The refresh button is used to fetch a fresh copy of the page that is currently in the browser window. The reason users refresh is because sometimes all of the elements of a web page have not loaded the first time because the file transfer is interrupted. Also when the user downloads a web page, the data is cached, meaning it is stored temporarily in the computer's memory. The next time the user wants that page, instead of requesting the file from the web server, the web browser accesses it from the cache. But if a web page is updated frequently, as may be the case with news, sports scores or financial data, user would not get the most current information. By

reloading the page, this timely data is updated from the web server. The stop buttons functions to interrupt the transfer in progress or stops the browser from loading the current page. In the file menu option there is a save function that allows user to save any web pages or information. There is also a print function in the same menu option that lets the user to make a hard copy of the current page that is loaded in the web browser. All this features can be seen in Appendix 4 in the screen shots of the web browser. In Appendix 6, the user manual is given for the reference of the users.

Figure 4.2 shows the page of the web browser in the split menu and hot list features. The split menu shows the top 5 sites that have been browsed by the user at the top and the remaining sites at the bottom in alphabetical order. The top section applies the hot list feature that arranges the most likely options for the user to choose. The bottom section arranges the address in alphabetical order. This is where the database plays their roles in capturing the information and counting the number of times the user enter the particular web site. This will directly enter the URL table in the database.

## 4.3 SYSTEM EVALUATION

### 4.3.1 Method of Data Gathering User Data

Further towards the development of the product a research will be done to make a comparison between the normal web browser and the one with the split menu. For this a questionnaire will be done and given to the users to evaluate the web browser. The purpose of the questionnaire is to elicit information on the efficiency and effectiveness of the new web browser. This questionnaire is an excellent way of obtaining either quantitative or qualitative data, since user data are written and can be tallied to illustrate preference. The user's opinion on the interface can only be evaluated from the questionnaire and not their behavior while using it. Please refer to Appendix 3 for the questionnaire sample.

For this reason the Delphi survey is the best approach. Delphi was used to describe a reliable consensus of opinion obtained from a group of experts by a series of intensive questionnaires interspersed with controlled opinion feedback [14]. This approach is characterized as a method for the systematic solicitation and collation of judgments on a particular interspersed with summarized information on feedback of opinions derived from earlier responses [15].

Delphi is particularly useful when accurate information is unavailable or expensive to obtain or where evaluation models require subjective inputs to the point where they become the dominating parameters. This survey has three special features:

1. Anonymity of participants
2. Iteration and controlled feedback between rounds
3. Statistical summary of group resources

Administering the survey by distributing the questionnaire is that they can be administered without an evaluator present whereby forms can be distributed to the individuals. Besides that, the benefits are forms can be given to people in widely distributed places and large populations. But one of the drawbacks is that the question cannot be rephrased like in the verbal interview.

From the initial research question, a research has to be logically designed in order to make a sensible and accurate conclusion. After deciding on the Delphi technique, the following decisions were made:

- The appropriate number of participants will be from 50 people in total, where there are 30 students from UTP and 20 lecturers.
- Since there is a time constraint, this technique can only be done one round
- Structured questions would be used for the questionnaire so that evaluators can analyze and understand the data well

The main steps involved in conducting the Delphi survey included:

- Identifying and contacting respondents to gain their agreement
- Designing and sending the questionnaire to the intended user
- Analyzing the results of the first round
- Producing feedback
- Preparing the final presentation of results

Before that making sure that the people who are in this survey are individuals who have a deep interest in the subject matter and the knowledge can be valuable for the study is very important. Therefore later in the study, a number of qualified individuals have to be selected to answer the questionnaire and their opinions on the subject matter.

### 4.3.2 Reactions to the idea of Split menu in the Web Browser

The response from various people was very interesting because many had different opinions on the subject matter. Many wanted to know what this whole thing is all about. Explaining to the users took some time because they did not understand about split menu and hot list that well. Until mentioning the similarity of it in Microsoft Word then they got the idea what is it all about. Irrespective of their initial views, most responded with questions about the nature, format and the purpose of split menu in a web browser. Then later they understood about the hot list and his was referred throughout the discussion

The respondent's first tendency was to consider the benefits and negative aspects of split menu and is it really worth it to be applied in a web browser and for themselves as an individual and the implications to everyone as a whole. Most of them argued that it could provide a lot of benefit in terms of navigation capabilities.

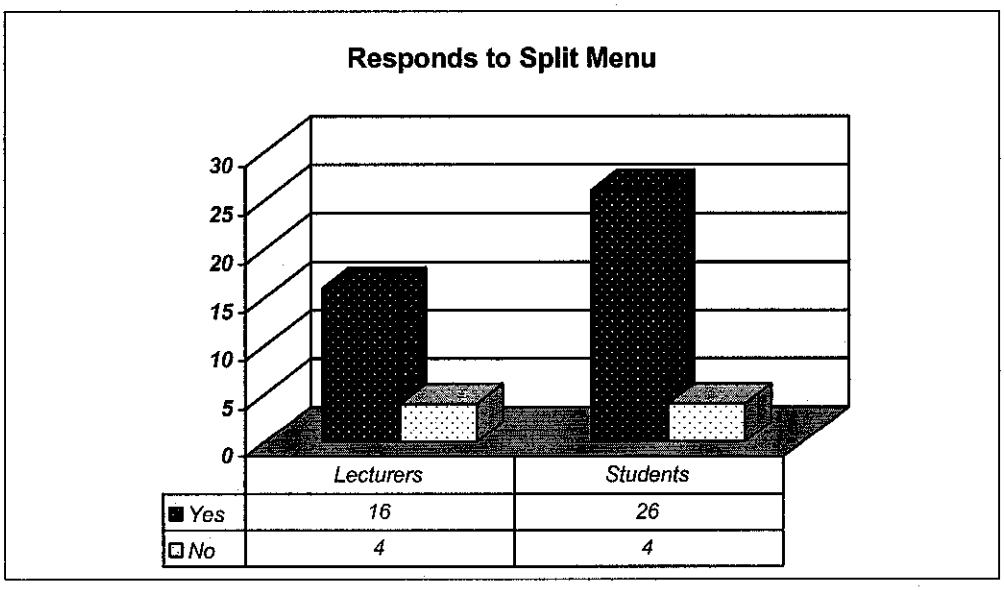


**Figure 4.3: Responds to Split Menu**

From here we can see that everyone is giving importance on information. When explaining about split menu, 26 of the 30 students strongly agree that split menu is very useful. Meanwhile 16 of the lecturers think it may and may not be a good thing to implement because it will change the current web browser and the remaining

lecturers and students prefer the old web browser and still do not really understand the subject matter and more convincing needs to be done.

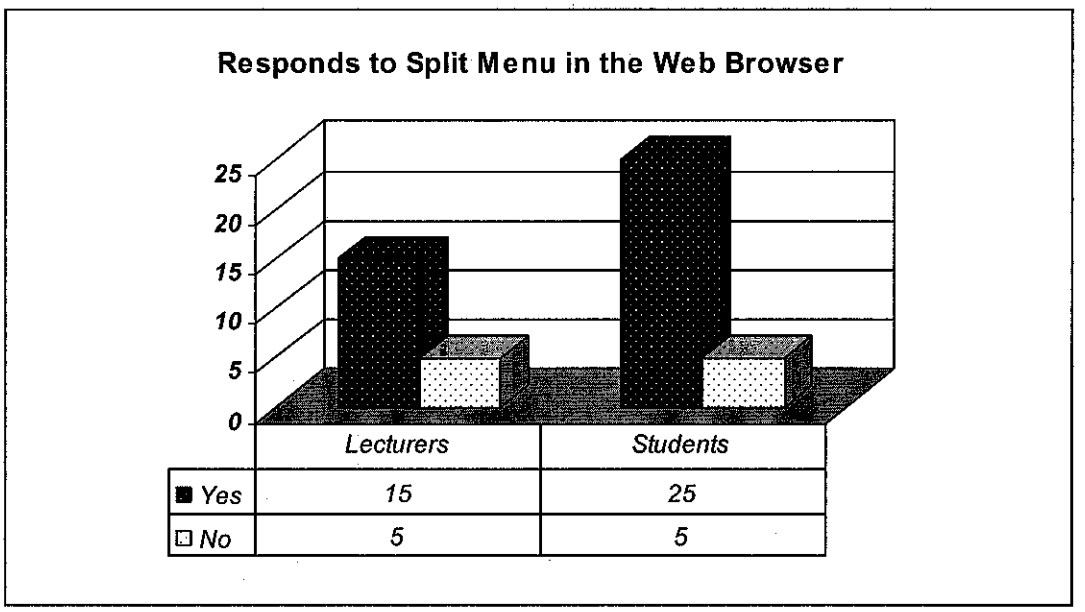


**Figure 4.4: Responds to split menu in the web browser**

From Figure 4.4 we can see that the students are the most people that use the Internet to look for information. Therefore, the web browser's abilities to render information must be fast. 25 of the students think that split menu can improve their web browser experience to make it better. 15 of the lecturers think split menu can make a difference in surfing the net. In this case, it shows that the students and lecturers seem to be very supportive with the idea after explaining to them the rough definition about split menu. The rest still do not agree to have split menu in the web browser

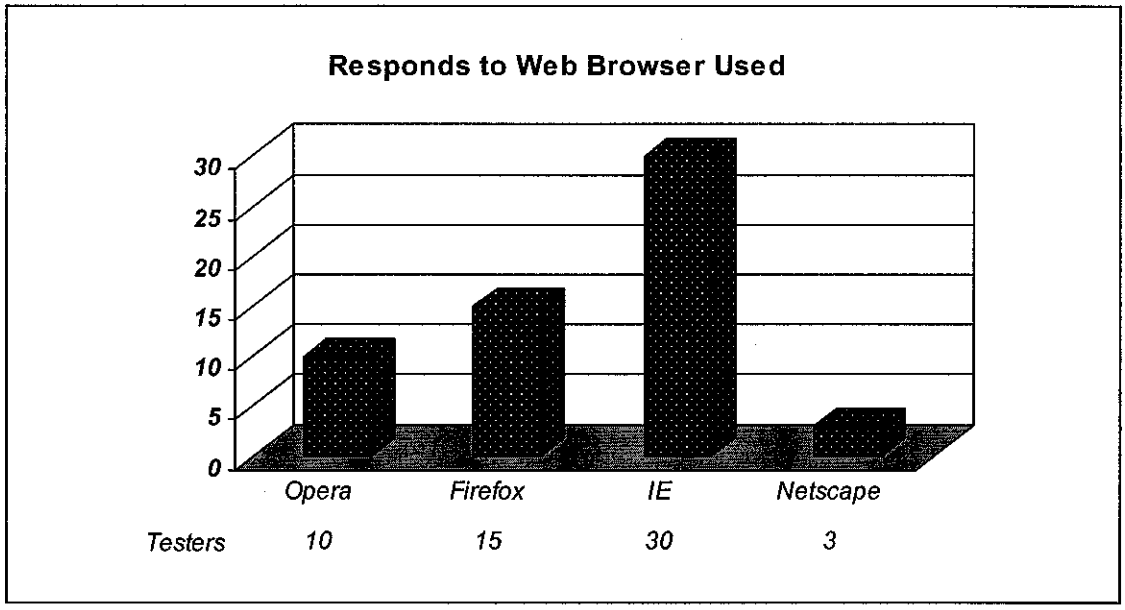


**Figure 4.5: Responds to the web browser used**

From this we can see that the most popular web browser is still Internet Explorer. All of the testers choose Internet Explorer compared to other web browsers. It is one of the most stable browsers and there are no security flaws. 15 of them use Firefox which they claim is faster, looks nicer and good search capability. In some pages, they are presented with a long list of items, such as insurance companies, in which they have to find one to work on. Instead of cumbersome scrolling, they can simply press Ctrl+F and enter the first few characters of the desired item, and Firefox scrolls directly to and highlights that item. While Internet Explorer also has a search feature, it opens in a new dialog instead of a border extension, requiring many more keystrokes and moustrokes to operate. The Firefox "Find" feature is so easy that it is a joy to use. This is what makes more users to choose both Internet Explorer and Firefox.

Other than that, 10 of them claim Opera is better than other browsers because of navigational property and the least is Netscape Navigator where there are only 3 testers which show that they use it. The advantage of e browsers like Firefox and Opera on the other hand are actively developed and updated. New updated release can be found almost every month. They are more open to ideas and suggestions. Bugs and Security issues are easier to submit. Advantage with Opera and Firefox is the alternative platform support. Firefox is released for all the major platforms in

Windows, Linux, and MacOS. Meanwhile Opera have official installers for Windows, Mac, Linux, FreeBSD, Solaris, OS/2, QNX, and many mobile platforms. This is why many users prefer to use alternative web browsers.

### 4.3.3 Reactions to the idea of Split menu in Raji's Browser

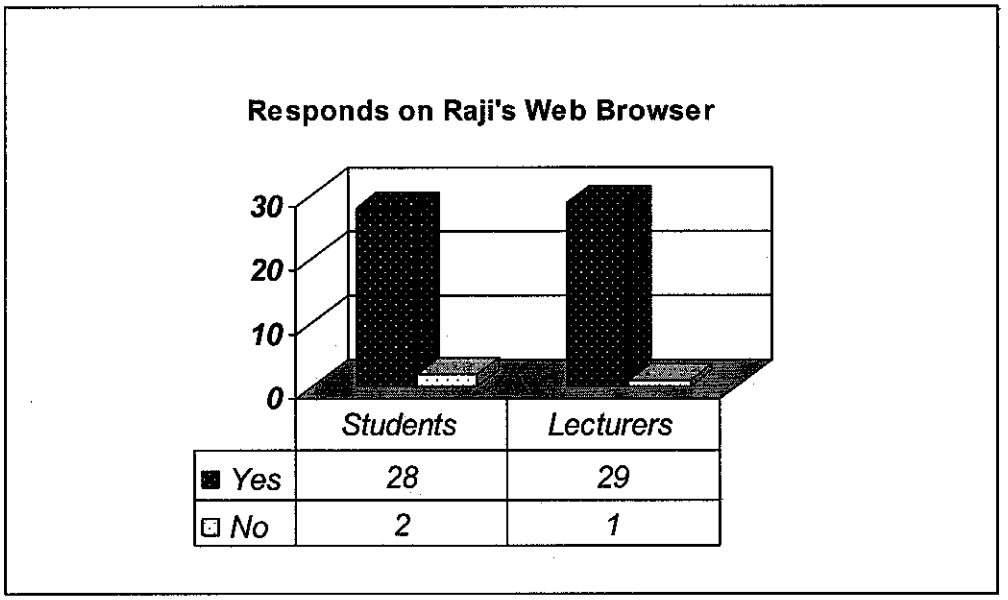


**Figure 4.6: Responds on Raji's Web Browser**

Many respondents think that the new web browser is much more effective than the current one that they are using. 28 students and 29 lecturers claim that they can find something much more easily with the split menu while 3 testers said they rather stick to the old browser because they are rigid towards changes and they have to be really convinced further . Most of them were impressed with the hot list function in the address bar. They claimed that they have not used any web browser of such kind.

In relation to the current browser and the Raji's Web Browser that has been created many find it difficult to maximize the value of the idea because they are so used with the current browser they are using. Some people don't really want to accept the changes so they rather stick to the old browser. Respondents need to be told many times that this new browser is something different from the current one. There is a lot of convincing that needs to be done perhaps by explaining to them more in detail of the split menu and hot list. The reason respondents feel uncomfortable with the

new browser is because they do not know and understand deeply split menu concepts and the effectiveness of it.

Most of the students agree that split menu is beneficial to them compared to the other browser. Lecturers somehow feel it is useful in some ways but both have its own specialty. They know that by using split menu and hot list, they can reduce typing and scrolling time for the address. They never realized the split menu in Microsoft Word because it is a small component, therefore they do not know the importance of it until it is applied in the web browser and finally they got to know the specialties of it.

# CHAPTER 5

# CONCLUSION

## 5.1 CONCLUSION

Information is wealth like claimed by many people and time is gold. As entering the new paradigm, the search for information on various subject matters becomes important. This new web browser with the split menu feature is hoped to satisfy the user's needs and goals and at the same time satisfy their hunger for fast information on the World Wide Web. It is appropriate that the controlled testing that has been as it provides a valuable support for the split menu. After this testing, everyone will know the benefits of the split menu in storing information.

It is advised so that interface designer has this split menu in mind when design adaptive interfaces for software so that it will be in use. After analyzing all the benefits it is proven that split menu is the best menu so far compared to the normal menu. It is proven to reduce time for the people who have to do repetitive task of choosing menus as they can choose the menu faster. This will improve efficiency and effectiveness to the workers who are using this browser. Besides that, when a comparison is made between the conventional web browser and the new web browser a vast difference can be seen. After integrating this with expert knowledge, it will prove to be one of most useful application for a web browser. Overall, after the completion of the whole project it is hoped that the system will achieve all its main objectives.

## 5.2 SUGGESTED FUTURE WORK FOR EXPANSION AND CONTINUATION

For the future recommendation, the author has planned for enhancements by increasing the functions in the web browser by adding in history properties and many more. Other than that, when the user types at the address bar the first alphabet of a web address should come out.

Besides that, the search capability should be more detailed so that it can really help other people. In this browser, the search item is not emphasized. Because search is such an essential element in web browser, it is important we find ways to implement it so that it can further ease the users.

If it is possible in the future, the author will try to implement voice recognition into the browser so that users can eliminate the need to type. Users do not need to type at all. This will be an added advantage to the blind people. In this case, data input will even be faster with the split menu. In this case, the web browser can be said to have achieved its ultimate usage.

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## APPENDICES

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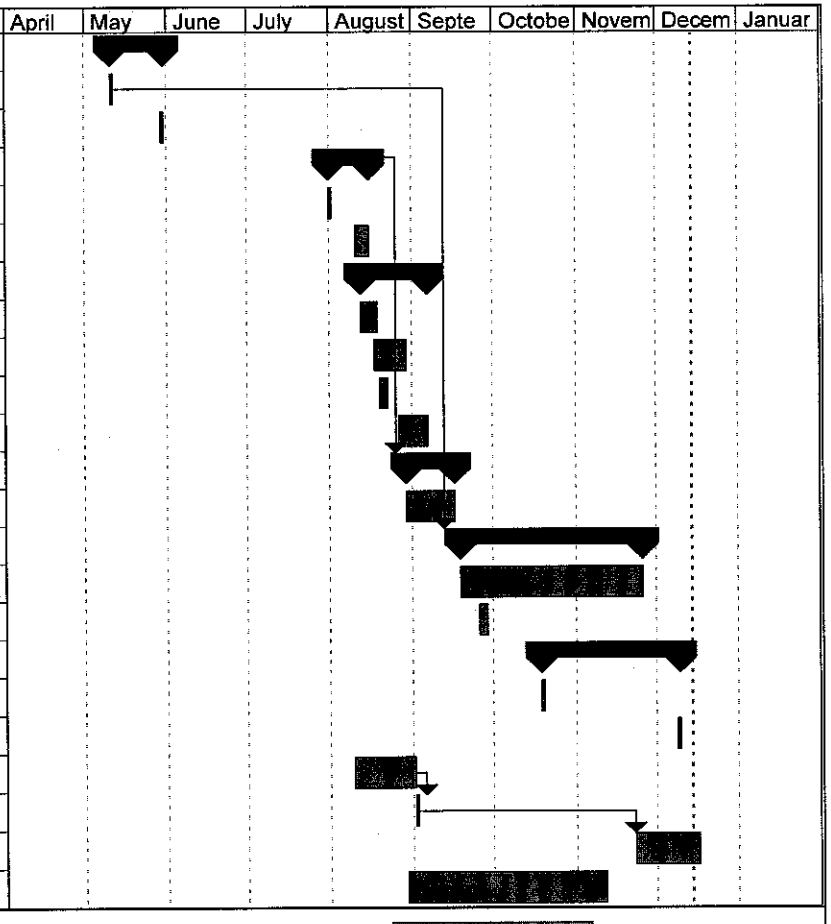
| Appendix 2 | Storyboard of Web Browser |
| Appendix 3 | Questionnaire |
| Appendix 4 | Print Screens of Raji's Web Browser |
| Appendix 5 | Database Design |
| Appendix 6 | User Manual |

# APPENDIX 1:

Proposed Project Timeline

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | **1.0 Selection of Project Topic** | **14 days** | **Wed 5/11/05** | **Mon 5/30/05** |
| 2 | 1.1 Propose Topic | 1 day | Wed 5/11/05 | Wed 5/11/05 |
| 3 | 1.2 Topic Assigned to Students | 1 day | Mon 5/30/05 | Mon 5/30/05 |
| 4 | **2.0 Analysis** | **12 days** | **Mon 8/1/05** | **Mon 8/15/05** |
| 5 | 2.1 Research and Planning | 1 day | Mon 8/1/05 | Mon 8/1/05 |
| 6 | 2.2 Pass up preliminary report | 4 days | Thu 8/11/05 | Mon 8/15/05 |
| 7 | **3.0 Design Phase** | **20 days** | **Sat 8/13/05** | **Tue 9/6/05** |
| 8 | 3.1 Conceptual Design | 5 days | Sat 8/13/05 | Thu 8/18/05 |
| 9 | 3.2 Physical Design | 10 days | Thu 8/18/05 | Mon 8/29/05 |
| 10 | 3.3 Input and output design | 2 days | Sat 8/20/05 | Mon 8/22/05 |
| 11 | 3.4 User Interface design | 8 days | Sat 8/27/05 | Tue 9/6/05 |
| 12 | **4.0 Construction Phase** | **14 days** | **Tue 8/30/05** | **Fri 9/16/05** |
| 13 | 4.1 System Construction | 14 days | Tue 8/30/05 | Fri 9/16/05 |
| 14 | **5.0 Integration & Publishing Phase** | **50 days** | **Mon 9/19/05** | **Fri 11/25/05** |
| 15 | 5.1 Integration & Testing | 50 days | Mon 9/19/05 | Fri 11/25/05 |
| 16 | 5.2 Publishing Testing | 3 days | Mon 9/26/05 | Wed 9/28/05 |
| 17 | **6.0 Oral Presentation** | **38 days** | **Wed 10/19/05** | **Fri 12/9/05** |
| 18 | 6.1 Pre- EDX exhibition | 1 day | Wed 10/19/05 | Wed 10/19/05 |
| 19 | 6.2 Oral Presentation | 1 day | Fri 12/9/05 | Fri 12/9/05 |
| 20 | **7.0 Documentation** | 20 days | Wed 8/10/05 | Thu 9/1/05 |
| 21 | 7.1 Submit Progress Report | 1 day | Fri 9/2/05 | Fri 9/2/05 |
| 22 | 7.2 Submit Dissertation | 18 days | Wed 11/23/05 | Fri 12/16/05 |
| 23 | 7.3 Logbook | 54 days | Tue 8/30/05 | Fri 11/11/05 |

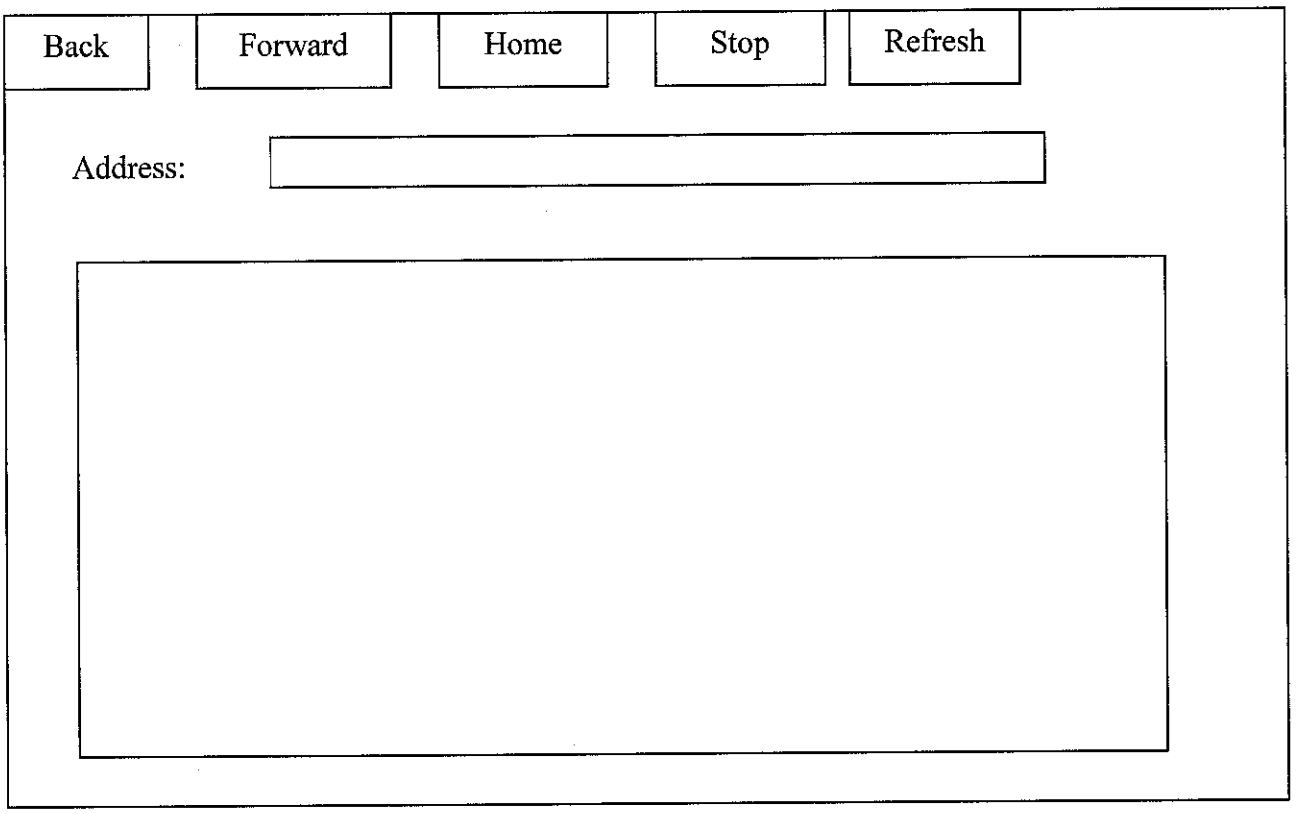



Project: rajifyp
Date: Wed 12/14/05

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

## APPENDIX 2:

Storyboard of Raji's Web Browser




Sketch of the web browser

# APPENDIX 3:

Questionnaire

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PETRONAS

The purpose of this questionnaire is to elicit information on the efficiency of the web browser with the implementation of split menu with hot list in the address bar.

*Soal selidik ini adalah untuk mengumpul maklumat tentang keberkesanan pengunaan laman web dengan aplikasi 'hot list' dalam tempat menaip alamat.*

---

Age/ *Umur* : [ ] 20-35 [ ] 36-50 [ ] Over 65/ *Atas 65*

Gender/ *Jantina* : [ ] Male/ *Lelaki* [ ] *Perempuan*

Race/ *Bangsa* : [ ] Malay/ *Melayu*
[ ] Indian/ India
[ ] Chinese/ *Cina*
[ ] Others/ *lain-lain*

Status : [ ] Student/ *Pelajar*
[ ] Lecturer/ *Pensyarah*
Others/ *lain-lain* _____

Level of education/ *Status pendidikan* : [ ] School/ *Sekolah* [ ] Degree/ *Ijazah*
[ ] Master's / *Ijazah Lanjutan* [ ] Phd./ *Dr. Falsafah*

---

1. What is the kind of web browser currently employed?

   *Apakah jenis laman web yang digunakan anda sekarang?*

   [ ] Internet Explorer [ ] Netscape Navigator
   [ ] Mozilla Firefox [ ] Opera

2. How many hours do you spend working with computers per week?

   *Berapa jam dalam seminggu anda menggunakan komputer untuk bekerja?*

   [ ] 60 hrs or more/ *60 jam atau lebih*
   [ ] 40 hrs / *40 jam*
   [ ] 20 hrs/ *20 jam*
   [ ] 10 hrs or less/ *10 jam atau kurang*

3. Are you using a computer based application to look for information in completing daily activities?

   *Adakah anda menggunakan system berkomputer untuk mancari maklumat dalam menyiapkan kerja seharian?*

   [ ] Yes/ *Ya*
   [ ] No/ *Tidak*

4. The amount of time spent browsing?

   *Masa di ambil untuk malayari laman web?*

   [ ] 10hrs or more/ *10 jam dan lebih*
   [ ] 7- 9 hrs/ *7 hingga 8 jam*
   [ ] 4- 6 hrs/ *4 hingga 6 jam*
   [ ] Less than 3 hours/ *Kurang 3 jam*

5. Do you have problem with the address bar of the current web browser?

   *Adakah anda mempunyai masalah dengan menu alamat dalam laman web sekarang?*

   [ ] Never / *Tidak Pernah*
   [ ] Often / *Kerap Kali*
   [ ] Occasionally/ *Kadangkala*
   [ ] Aways / *Selalu*

6. What is your primary motivation behind browsing?

   *Apakah tujuan anda melayari laman web?*

   [ ] Education/ *Pendidikan*
   [ ] Personal/ *Hal peribadi*
   [ ] Commercial/ *Komersil*
   [ ] Others/ *Lain –lain*

7. What are the current problem with the conventional web browser?

   *Apakah masalah dengan laman web yang sedia ada?*

   [ ] The need to type the address every time and scrolling through the address bar/ Keperluan untuk menaip alamat setiap kali dan xxxxxxxxx

   [ ] There is no proper arrangement for the addresses and hot list/ *Alamat tidak tersusun dengan efektif dan tiada hot list*

   [ ] No problem/ *Tiada masalah*

8. Have you ever used a web browser using Visual Basic 6.0?

   *Adakah anda pernah menggunakan laman web mengunnakan Visual Basic 6.0?*

   [ ] Yes/ *Ya*
   [ ] No/ *Tidak*
   [ ] Not sure/ *Tidak Pasti*

9. Do you know what split menu and hot list is?

   *Adakah anda mengetahui tentang pembahagi menu dan 'hotlist'?*

   [ ] Yes/ Ya
   [ ] No/ Tidak
   [ ] Not sure/ Tidak Pasti

10. Do you agree with the idea of replacing the current URL bar to split menu and hotlist?

    Adakah anda bersetuju dengan idea and aplikasi pembahagi menu dan 'hot list' dalam laman web?

| Strongly agree<br>Sgt Tidak Bersetuju<br>1 | Disagree<br>Tidak Bersetuju<br>2 | No Comments<br>Tiada Komen<br>3 | Agree<br>Setuju<br>4 |
|---|---|---|---|

11. Do you think this is an effective way to apply on a web browser ?

*Pada pendapat anda, adakah ini merupakan cara yang efektif dalam aplikasi laman web?*

[ ] Yes/ Ya
[ ] No/ Tidak
[ ] Not sure/ *Tidak Pasti*

12. What do you consider the benefits of applying split menu to the web browser?

*Pada pendapat anda, apakah faedah yang diperoleh daripada pengunaan menu terbahagi dalam laman web?*

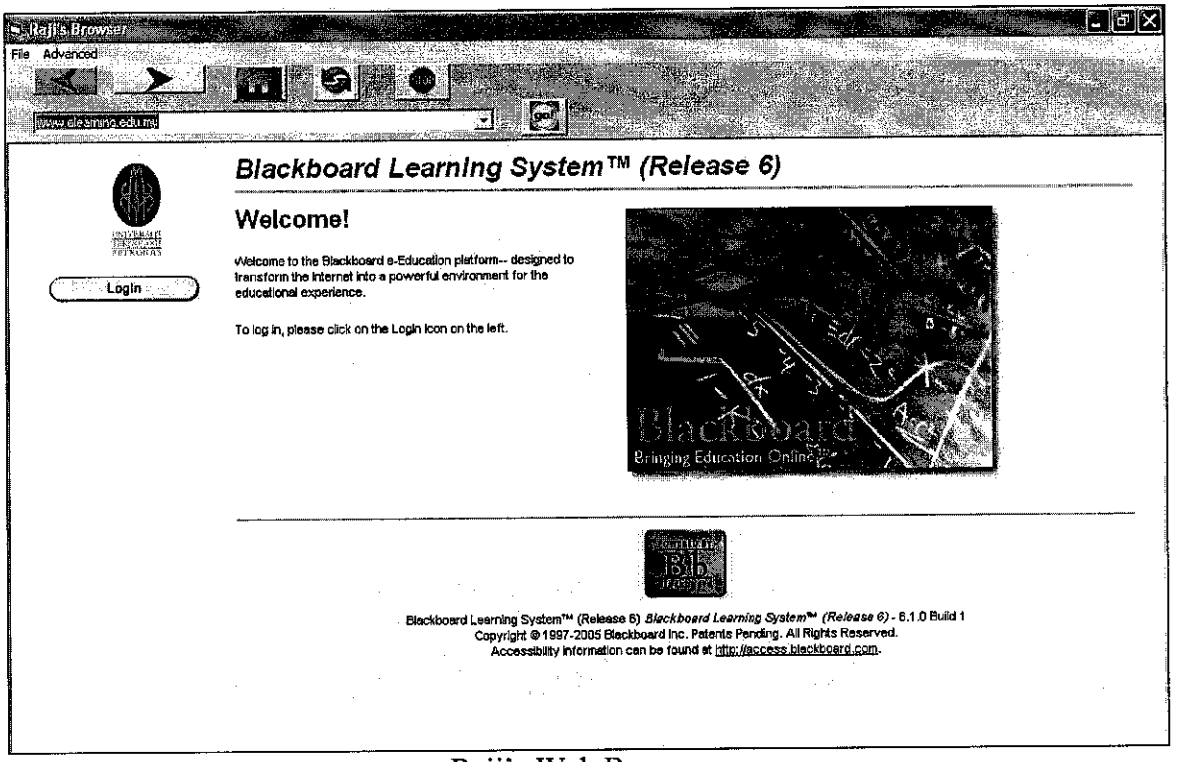
[ ] Increase performance and satisfaction of user / *Meningkatkan perlaksanaaan dan*
*kepuasan pengguna*

[ ] Easier to see and point than to remember and type/ *Senang untuk dilihat dan di tunjuk*
*daripada menaip*

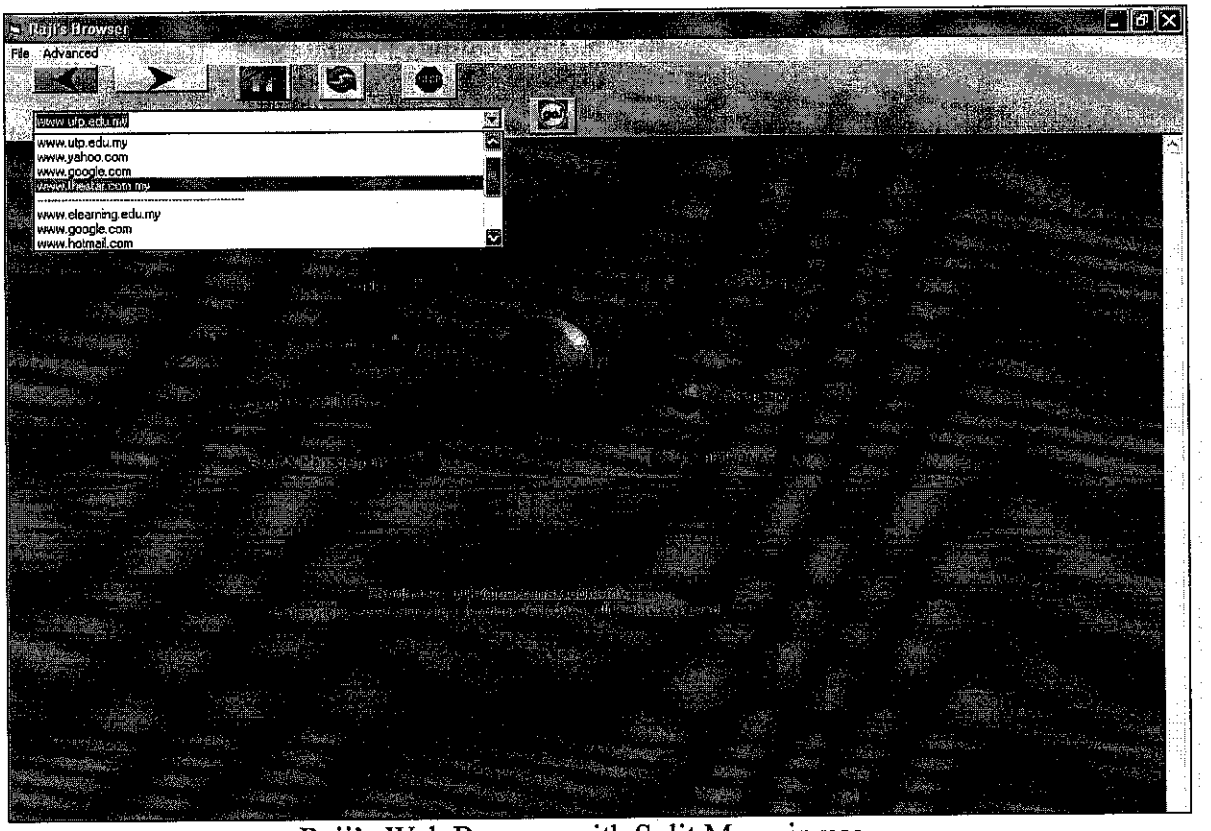
[ ] Faster completion time and reduced error/ *Kerja cepat habis dan kesalahan minimum*

# APPENDIX 4:

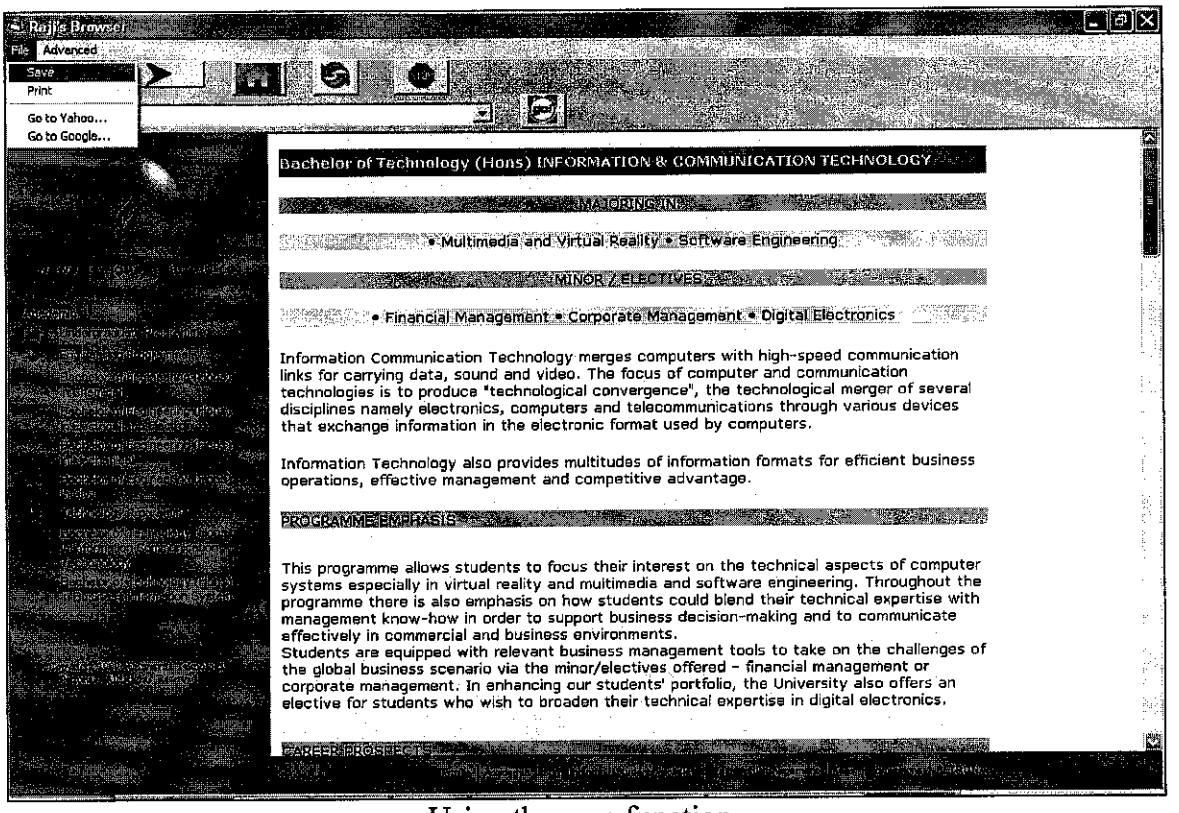
Screenshots of Raji's Web Browser



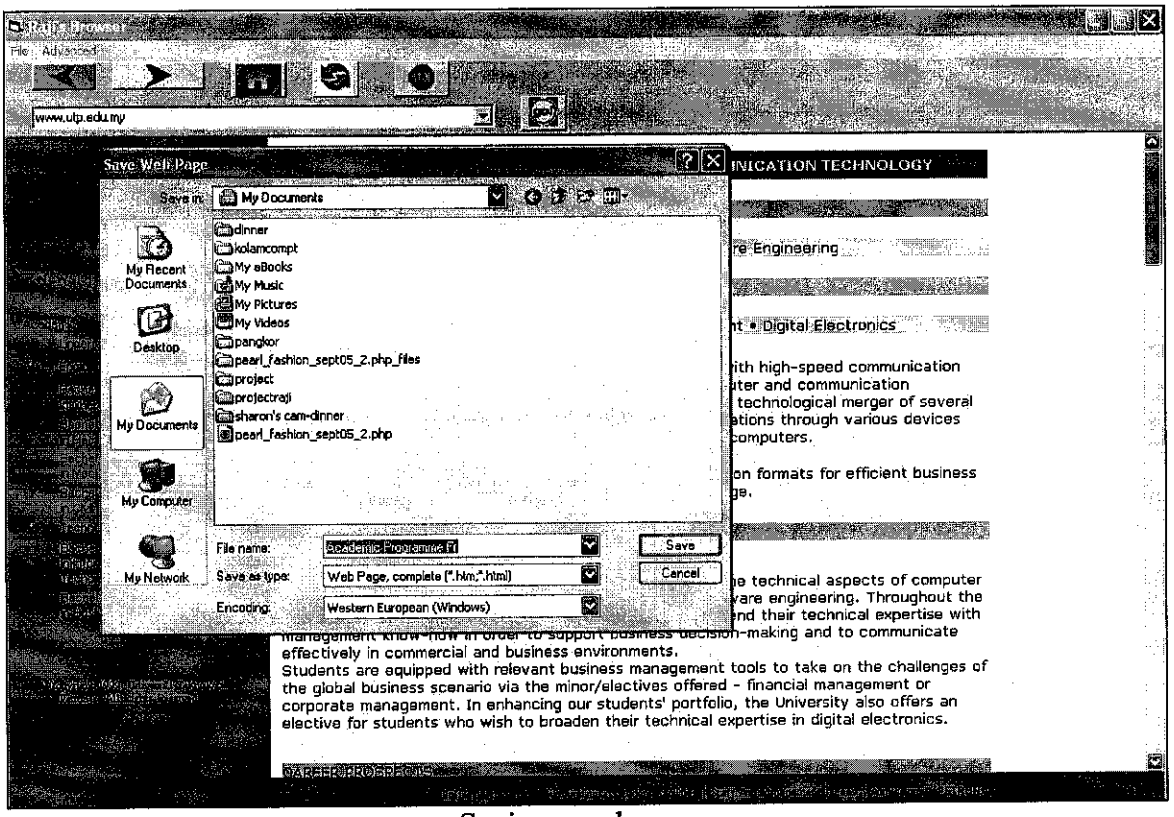

Raji's Web Browser



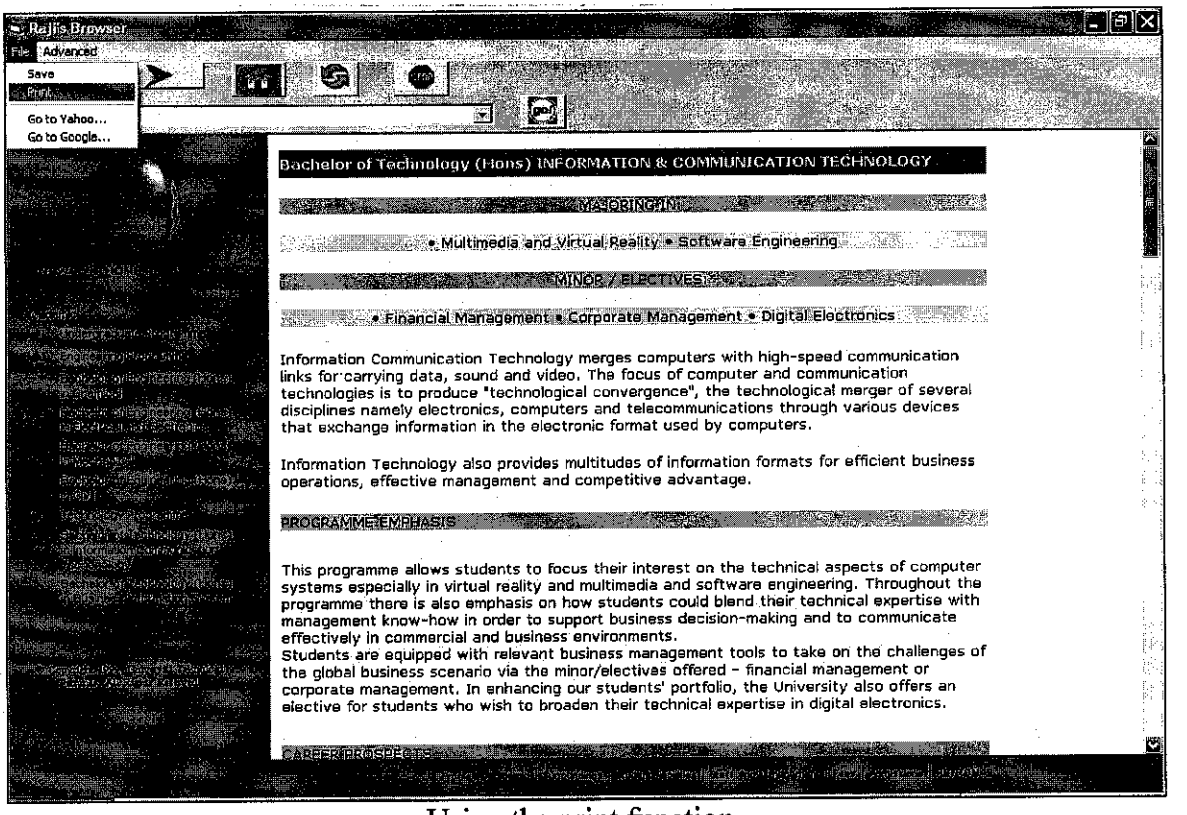

Raji's Web Browser with Split Menu in use



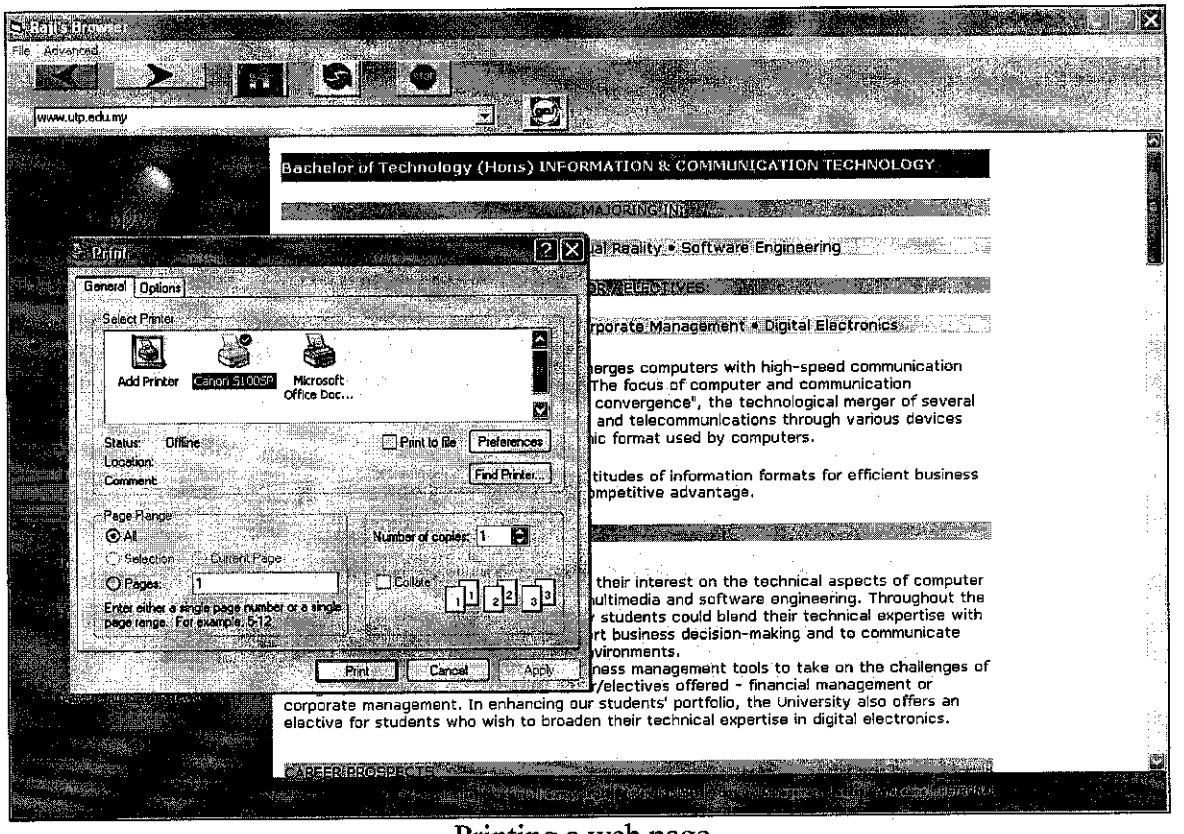

Using the save function




Saving a web page



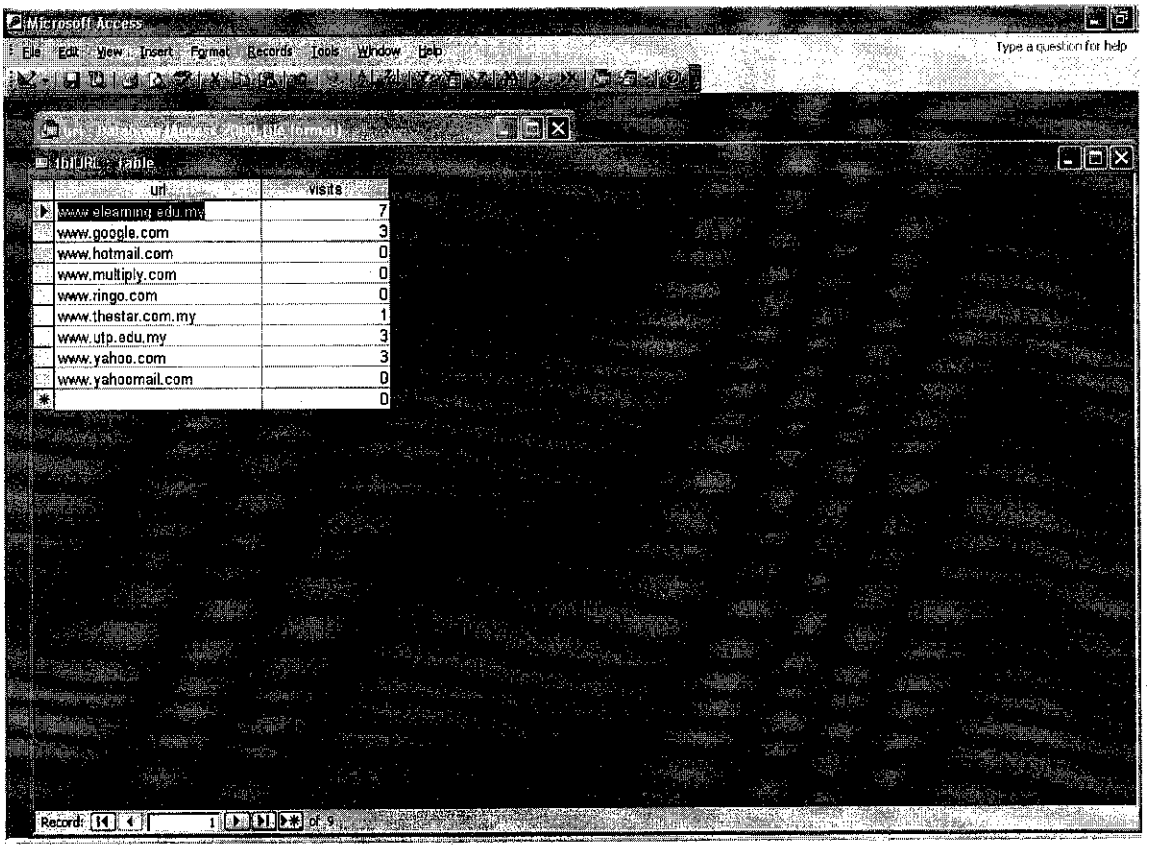

Using the print function




Printing a web page

# APPENDIX 5:

Database Design




Database design

# APPENDIX 6:

User Manual

# USAGE AND REFERENCE MANUAL FOR RAJI'S WEB BROWSER

# 1. INTRODUCTION

The Internet is a collection of computer networks that connects millions of computers around the world. Raji's Web Browser (RWB) enables you to connect to the Internet to gain access to the vast stores of information on these computers. Whether you're searching for information or having it delivered to your computer, RWB has many features that make it easy to browse the Internet. It has the basic functionalities of a web browser with all the necessary icons. For first time users they can use it like how they would use a normal web browser.

RWB is quite flexible as it can be installed in any computers that have Microsoft Visual Basic 6.0 as that is the running software. Considerable effort was spent attempting to anticipate possible experimental stimulation requirements during its design and development. Some of its features include:

- Simple and straightforward navigational properties
- Easy to understand icons
- Has a featured hot list in the address bar
- Low cost
- History of the previous day address is there
- Web pages can be saved
- Web pages can be printed

## 1.1 Execution Environment

To implement stable, reliable timing of the RWB in the DOS operating system requires detailed foreknowledge of the performance of the host computer through a broad range of the processing tasks. The computer should be stable and does not have any major problem.

## 1.2 Operating Systems

RWB is intended to run in a DOS environment. It runs on Windows 95, 98, 2000, XP or rather anywhere where Microsoft Visual Basic 6.0 can be installed. Other operating system such as Windows NT and UNIX are also capable of running the system.

## 1.3 System Requirements

The software will take advantage of installed hardware to maximize the performance of the browser.

Required:

- 166 MHz Pentium processor or higher
- Hard disk space of 19.1 GB
- 256 MB RAM
- Microsoft Visual Basic 6.0

## 2. INSTALLATION

### 2.1 Before you begin

The most important thing is to start up the Windows environment on your computer. If there is no Microsoft Visual Basic 6.0, you have to install that software first.

### 2.2 Installing Visual Basic 6.0

To install Microsoft Visual Basic 6.0, put in the installation CD and click on the setup. Usually there is an auto-run on the setup. Follow the instructions that appear. Installation may take a few minutes or even longer depending on the speed of the processor. Install it in the directory that you prefer.

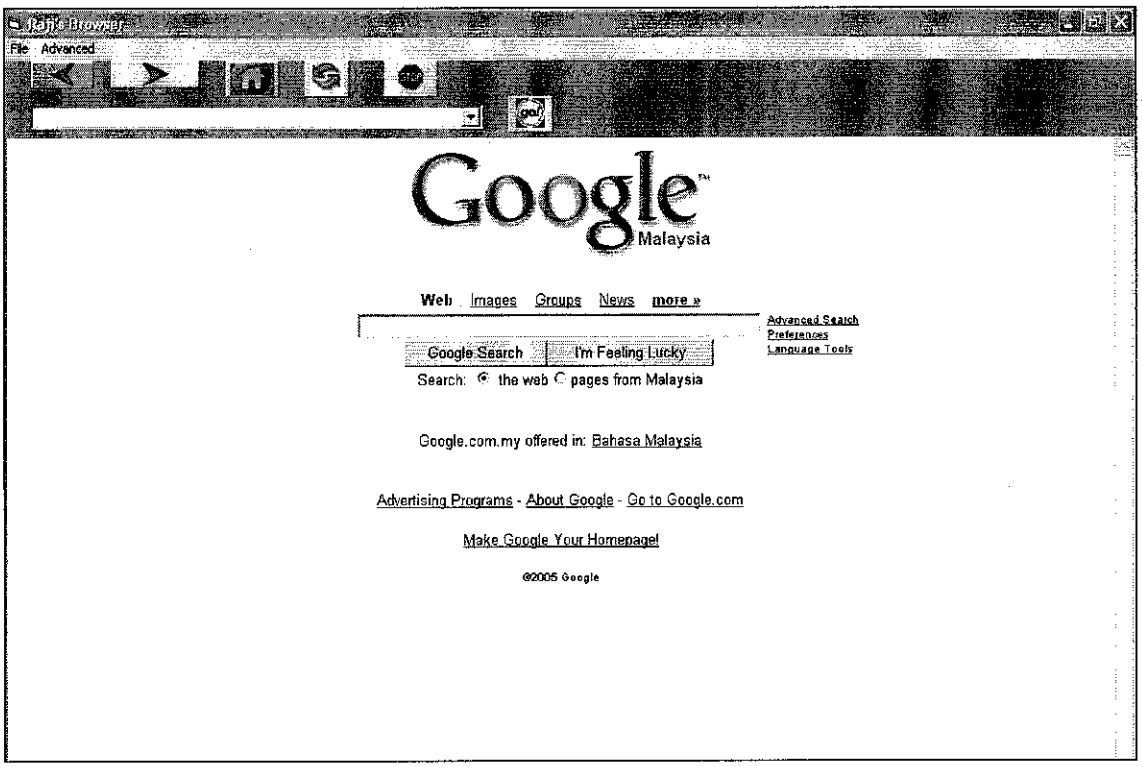
### 2.3 Running RBW

After the installation of the Visual Basic 6.0 is complete, now you should be able to run RBW and use it.

- Copy and paste projectraji folder in any of your directory in your computer.
- Click on url configuration settings and change the third line. Put in the location where you stored the projectraji folder. Make sure there is '\ 'sign at the end of the line. Save the file before closing it. For example, C:\Documents and Settings\user\My Documents\project\
- Click on Project2 Visual Basic Project. This should open the Microsoft Visual Basic 6.0 Environment.
- Click the play button below the diagram menu *or* go to Run → Start
- The RBW should open as a web browser and you can start using it.

## 3. USAGE

RBW is easy to use once you have installed it properly. You must ensure that the path is correct. The basic outlook of the web browser will look like this:




### 3.1 Moving to a known site

There are several ways to go to a different Web page from the page you are currently viewing. In addition, you can search for Web pages if you do not have a particular address or link.

- In the address bar, type the Web page that you want to review or click the down arrow to select from the hot list or the alphabetical menu items. Click the 'GO' button.
- If you want to view any home page go to File ⟶ Go to Yahoo or Google.

- If you want to go back to the previous page click the **Back** button on the toolbar.
- If you want to go forward to the next page (provided you have viewed it just previously), click the **Forward** button on the toolbar.

### 3.2 Searching for information

There are several "Search Engines" that will help you find a site that contains information related to a topic of your choice. Experiment with each search engine to determine which is best for you:

- For example, go to Yahoo or Google

### 3.3 Saving pages

The file will be text file that can be retrieved in any word processor.

- View the page that you want to save
- From the File menu select Save
- Double click the folder you want to save page in
- In the filename box, type a name for the file
- Click the OK button

### 3.4 Printing pages

- Select Print from the File menu
- Select the printer and the pages
- Click the OK button

### 3.5 Deleting History

- Select Configuration from the Advanced menu
- Click OK if the open mode is selected to db_mode_readwrite
- Click delete all URL history
- Click OK

### 3.6 Button functions

| | |
|---|---|
| **Back** | Returns to previous page |
| **Forward** | Moves to the next page accessed |
| **Stop** | Quits any activity |
| **Refresh** | Reload entire page to provide updates |
| **Home** | Returns to the home page location |
| **Go** | Opens the page that has been typed in the address bar |

### 3.7 Working with files

- **Downloading a graphic file**
  - Use your mouse to point to the graphic and right click
  - Select Save Picture As
  - Choose a drive and directory
  - Click OK

- **Downloading or FTPing a file**
  - Choose Save from the File menu
  - Identify a File Name, Drive, Directory, and Type choose text
  - Click OK
  - RBW will automatically save the page and all the associated graphics in a folder on your disk