Table 5.3: Task Scenario Completed/Time Taken to Complete Given Task Scenario

	Task scenario 1	**Task scenario 2**	**Task scenario 3**
Mr. Paul	Yes / 1 min 45sec	Yes / 5 min 05sec	Yes / 5 min 08sec
Mr. Chong	Yes / 1min 27sec	Yes / 4min 49 sec	Yes/ 5 min 32 sec
Mr. Krishnan	Yes / 1min 40sec	Yes / 5 min 35 sec	Yes/ 6 min 11 sec

Table 5.4: The Summary of the Usability Problem and Usability
Recommendations/Requirements from Paper Prototype

Usability Problems	**Usability Recommendations/Requirements**
Participant suggested labelling each step with numbers.	Each step will be labelled with Step 1, Step 2 and so on.
The participant suggested that the departure flights and the arrival flights should be differentiated by colour.	Two different colour contrasts to each for the departure flight and the arrival flights.
One participant suggested including am and pm to differentiate the evening and morning flights.	To provide am and pm on the time of the flight for easier differentiation of timing of flight.
Suggested by participant to have breadcrumbs highlighted on the related pages. Easier to identify the page they are in.	Breadcrumbs are highlighted on related pages.
One participant looked for a 'Table of Content',	To provide 'Table of Content' on the first page.
Suggested for "Return Trip" for the word return.	The word return trip is used instead of return.

Nouns are suggested to be changed to Verbs.	Hotels, Flight and Package are changed to Hotel Booking, Flight Booking and Package Booking.
Flight and Fare is suggested to be 'Flight List'	Flight and List' is changed on the title the flight list page for better understanding of the function of the page.
'Main page' is suggested to be replaced with 'First Page'	Main Page identifies the first page. So the Main page is changed to 'First Page'
Participant did not understand what was the function of a' + 'and' –' sign	Buttons are replaced to Text Size: Increase (+), Decrease (-).
Member Registration too difficult to locate.	Member registration to be in all pages.
Participant suggested the fare breakdowns to be bold and big. The day to be stated.	The fare breakdown has to be clear to users. The day is also stated there.
At Select room Type make details changeable.	Provide Destination Drop down menu
Participant suggested eliminating unwanted or not important 'Term n Conditions'.	None of the Term and Condition can be eliminated as each one of it has its importance. To make it easier to read Only main title is provide with the links.
Unable to view other hotels at hotel list.	At Hotel List other hotels to be viewable.
Position of buttons to be changed	From top right to bottom left
Just include a calendar only.	Booking search will have calendar only.
The package steps are complicated so the participant suggested to provide them with existing tours packages.	Tour packages are created and the function is reduced to choosing the tour packages.
To include links to other important modules as example tabs.	All main pages have tabs linking to important modules such as flight, hotel and package.

Table 5.5 summarizes table 5.4 into appropriate usability requirement which is incorporated in section 5.4. There are identified usability requirements which add to functionality and efficiency of use which is one of the main principles of usability. These usability requirements are prioritized to be on top of each category and labelled with an '*'.

Table 5.5: Usability Requirements from Paper Prototype

Category	Usability Recommendations/Requirements
Content	*To provide am and pm on the time of the flight for easier differentiation of timing of flight.
	*Hotel List to have other hotels viewable
	*At 'Hotel Room' the information selected earlier are changeable
	Light blue colour is provided on departure flights and pink on arrival flights. Colour contrasts to each for the departure flight and the arrival flights.
	Buttons are replaced to text 'Increase (+), Decrease (-)' in all the pages.
	'Flight and Fare' title is changed to 'Flight List' to describe the function of the page better.
	Main Menu is used to identify the first page. So the Main page is changed to 'First Page'
	The word 'Return trip' to be substituted for 'Return'.
	Hotels, Flight and Package are changed to Hotel Booking, Flight Booking and Package Booking.
	The fare breakdown has to be clear to users. The day is stated there.
	None of the Term and Condition can be eliminated as each one of it has its importance. To make it easier to read only main title is provide with the links.
Layout & Style	*Tour packages are created; the function is reduced to tour packages.
	The booking search will have calendar only.
	To provide 'Table of Content' on the first page.

	Member registration is included in all the pages.
	All buttons to move bottom left.
Navigation and Mechanism	Each step will be labelled with Step 1, Step 2 and so on.
	All the pages have tabs linking to important modules such as flight, hotel and package.

5.4 Blue Air Travel Website Design and Implementation (High Fidelity Prototype 1)

This section introduces the high fidelity prototype 1. This prototype is designed according to the findings from chapter 4 (user interface requirement), chapter 2 (recommended guidelines) and usability requirements from table 5.5. In this version, many functions are more obvious and interactive to the participants. Although the features are more distinguishable in this iteration for example the functions of the buttons but the more complex programmes are added in the high fidelity prototype 2.

5.4.1 Software Used to Design

The designs are firstly created using Microsoft Dreamweaver. The static designed pages are saved as html files but some of the dynamic pages are saved as aspx pages as these pages involve more complex programmes later. The HTML files are composed to set the appearance of the webpage. Features such as the background colour, text colour, page title, hyperlinks and position of the elements (graphics, tables,) are specified in the HTML files. Colours contribute to the size of an image file. The more colours an image has, the larger the file size is. Therefore the number of colours used in a particular image is kept to the minimum possible without degrading the image quality.

The other software and images that contribute to the design features also involve Likno Web Button maker, Adobe Photoshop, Sothink Button creator and Microsoft Visual Studio.NET 2003 are used to design the buttons and icons. The images are saved for web usage, mostly as gif files and a few jpeg files to be used in the design. This ensures that the file size is small and the image downloads quickly when the website is viewed.

5.4.2 Application of the Recommended Guidelines in the Design

The application of each recommended guidelines features from chapter 2 (Table 2.3) is discussed in Table 5.6.

Table 5.6 Incorporated Guidelines applied in Blue Air Travel Website

The Most Recommended Guidelines for Elderly Website Design		Incorporated Guidelines into Blue Air Prototype
A. CONTENT		
A.1	**Colour**	
1	Avoid putting blue, yellow and green together	Main colour of the page was white and a slight combination of light blue.
2	Background and font to contrast with each other and avoid patterned background	The plain light blue and the black colour text are contrast enough for elderly to read.
3	Choose complementary colours	Light Blue
A.2	**Font**	
4	Typeface Sans serif (not condensed)	No decorative fonts are used only sans serif is used.
5	Large font size, use 12-14 point font	Texts are at sized 12 on the body and size 14 at the titles only.
6	Use capital and bold only in headlines	Figure 5.8 shows that all headlines uses bold and capital fonts
7	Intense enough to read	Fonts are medium size
A.3	**Content Design**	
8	Information clear and familiar and positive statements	Web contents here all used only positive statements. As figure 5.8 shows. Elderly can have their time to browse at ease.
9	Simple language/terminologies as simple as possible	All terminologies used are simple English for the elderly to have a comfortable journey to book a flight ticket
10	Break lengthy document in short sections or separate pages	All pages are broken into short segments and different modules to ease the elderly to book their preferred journey.

11	Minimize irrelevant screen information	All content to be direct to the point and no elaborations.
12	Clear organization of content:	All content are added with enough white space to make a clear appearance of the content.
13	Help and Information	Instructions given are as concise as possible. Apart from some short instructions intended for elderly on the main pages of the website, there is no long, extensive text in the website
14	On-line aiding and support documentation	These features are not incorporated as it was eliminated by the participants at paper prototyping. They have considered this as space consuming. Furthermore, the elderly have viewed that they do not like to follow on the links provided as they are afraid of being lost.
B.	**LAYOUT AND STYLE**	
15	Justification to the left	All the radio button and menus are all kept to the left as illustrated in the example in Figure 5.9.
16	1.5 or double space for all body text	This can be seen on the screen shot below. This is to increase white space which helps to ease reading ability among elderly.
17	Consistent layout	All three booking tab's are using similar designs; the top header is the same in each page. There is a participant name and password and also the name of the website or the company on top of every page, to make the participant feel comfortable that they are at the right zone. In addition to this, the same navigational terms are used throughout the website
18	Page design as simple as possible	No fancy design which distracts the elderly from their main motive on the website
19	Do not use a deep hierarchy and group information into meaningful categories	The pages are arranged accordingly, there are three main categories and they are Flight Main, Package Main and Hotel_Main. No deep hierarchy at all in any pages.
20	Provide ample time to read information	All pages have been given ample time before going to the next step.
C.	**NAVIGATION MECHANISM**	
21	Reserve underlines for links only	This feature was practiced on this websites to link to the help information at the participant password and not at any other place on the website prototype.
22	Step by step navigation procedures, label and link carefully	Most of the links use either tabs or button. This makes the links more visible than the underlines. Also included is back and forward button.
23	Mouse: Single click	This feature is incorporated on all the links to next page.
24	Avoid automatic scrolling	Regardless of whether the participant views the pages at a screen resolution of 80 x 600 pixels or 1024 x 768 pixels, there is no need for participants to scroll down the pages, so the elderly have no problem as none of the page needs scrolling.
25	Site map provided	Each page has a site index at the left corner to help guide

		the elderly if they are to be lost and to be aware of their current location on the website
26	Hyperlinks set as icons with text	Buttons with text are used as hyperlinks to next pages
27	Hyperlinks in bold type of a different colour than the rest of text	Most hyperlinks are made of buttons and are distinguishable as illustrated on the example Figure 5.11
28	Labelled links to promote ease of navigation	All links are labelled
D. MULTIMEDIA AND ANIMATION		
29	Avoid moving text	No moving text is included in any pages
30	Icons should be simple and meaningful and distinguishable	All icons related to the location of the booking are distinguishable images of the location.
31	Photo/graphic should be relevant only	Images are representing certain locations and certain information only are used
32	Animation, video and audio used with limit	No animation, video and audio are used on this page as there is no relevancy for it.
33	Text alternatives for graphics	All graphics, and images has text alternatives
34	Incorporate text with icon	Only the main page browsers are incorporated with text on top of it.

The screen shot presented in Figure 5.14, Figure 5.15, Figure 5.16 and Figure 5.17 with

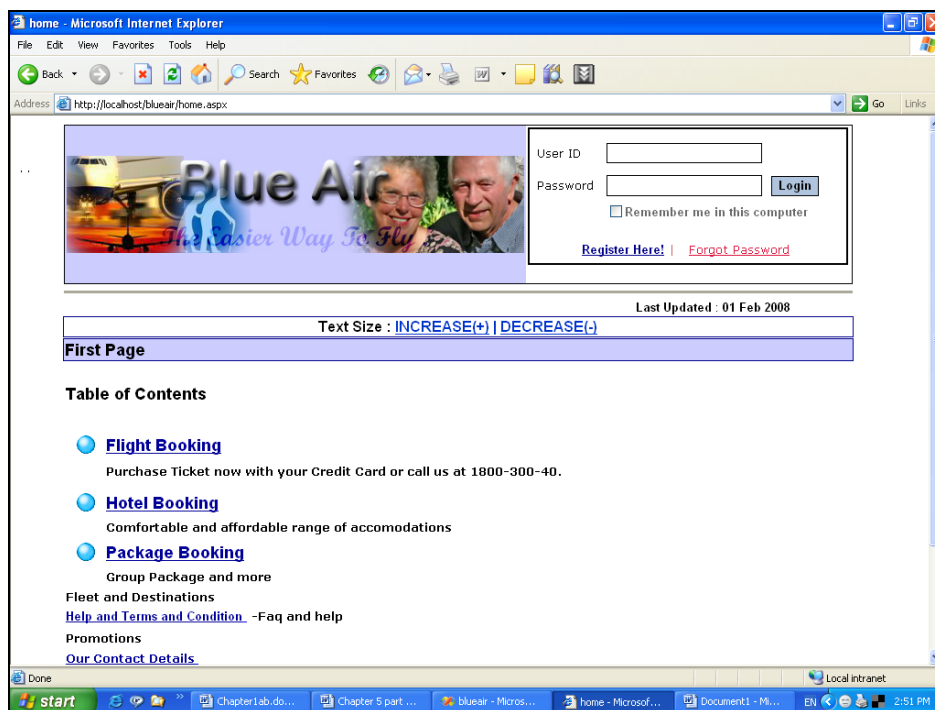the implemented features into the software prototype.
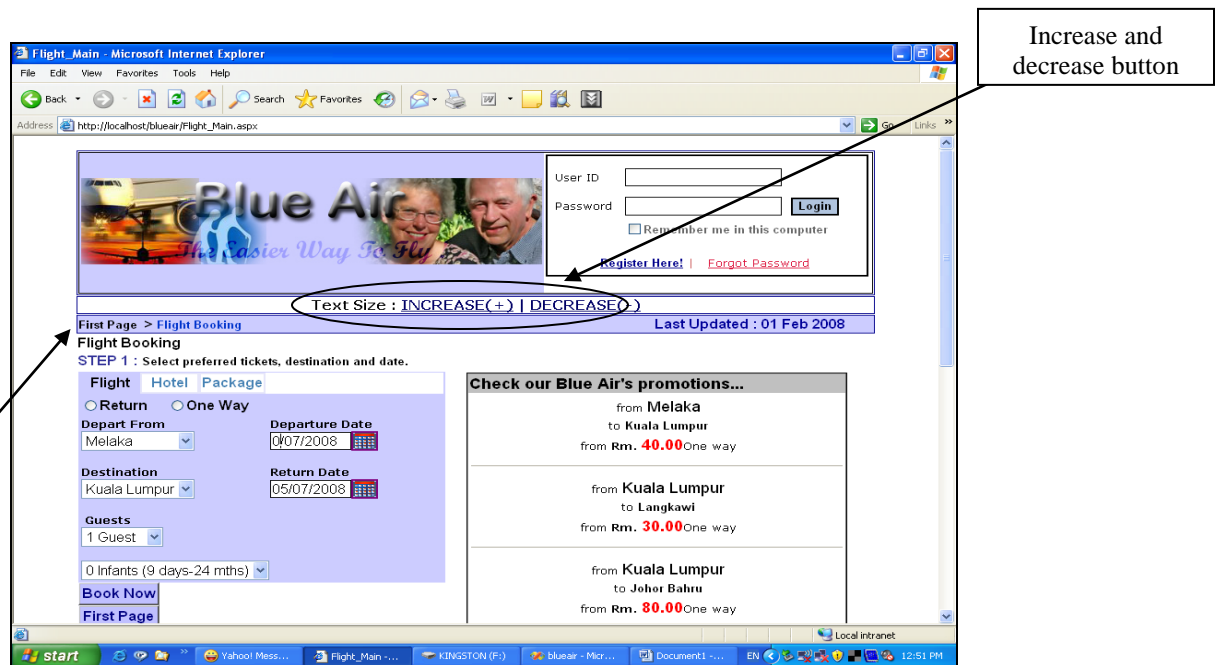

Figure 5.14: Colour Contrast of the Page

Figure 5.15: The Increase and decrease font button and Indent to Left
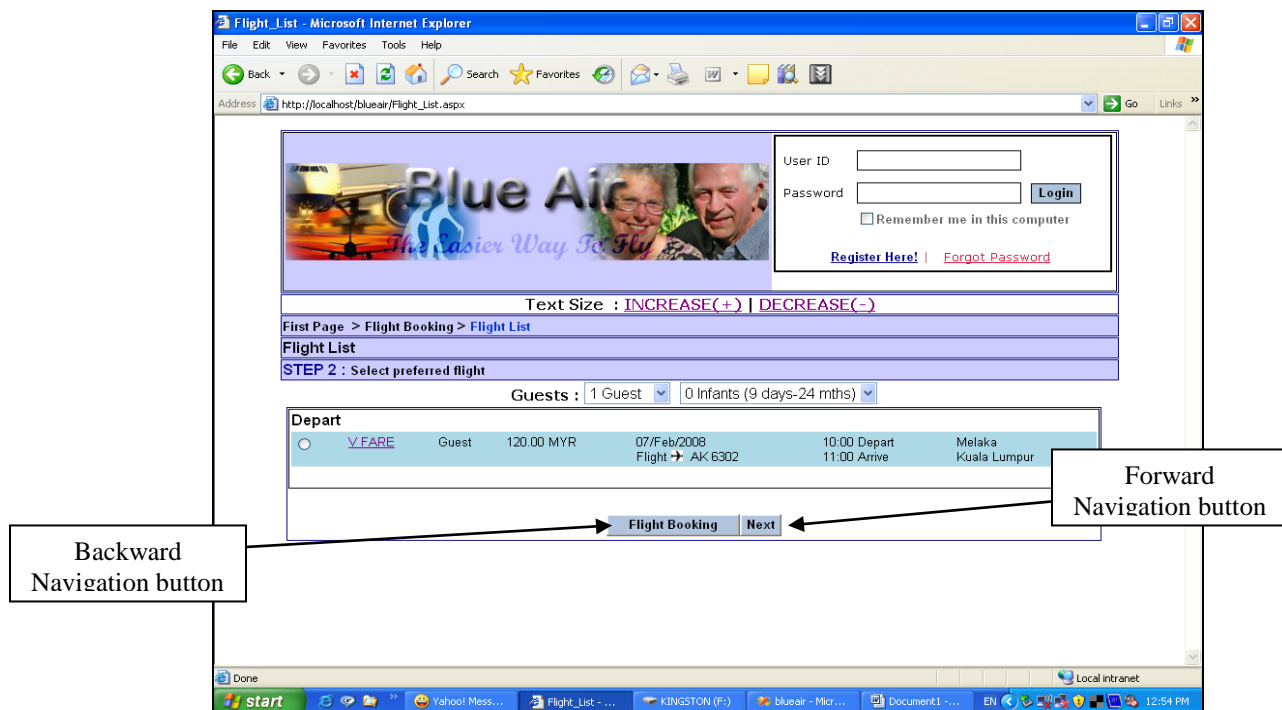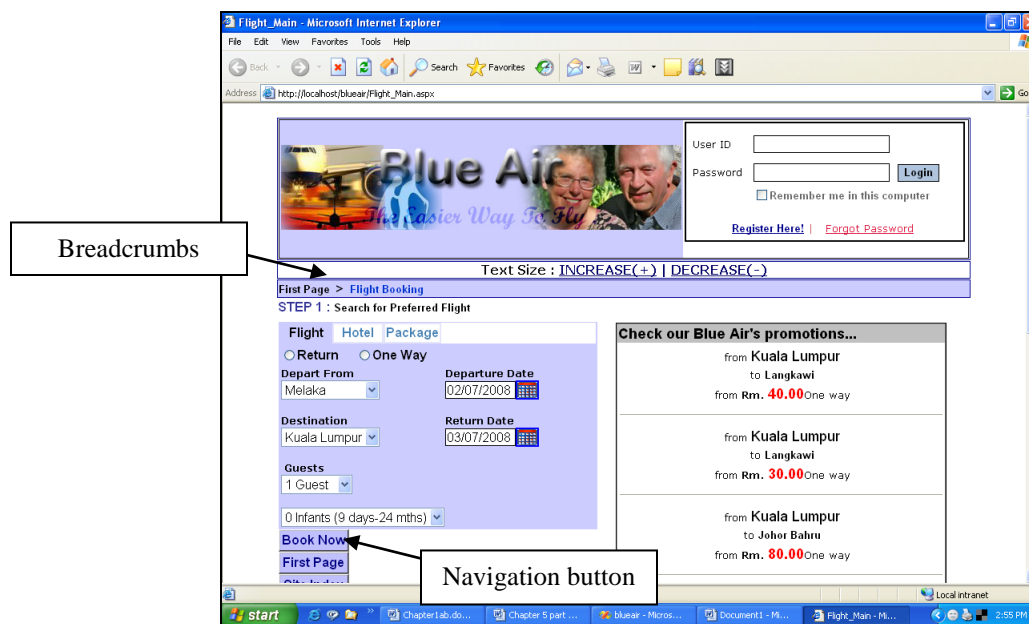

Figure 5.16: Backward and Forward Navigation Button

Figure 5.17: Navigation buttons and breadcrumbs are provided in all the Pages and the

Hyperlink labelling

5.4.3 Conducting User Testing on the High Fidelity Prototype 1

The screen shots of the high fidelity Prototype 1 are attached in Appendix A. The participant who participated in the paper prototype was invited to this session held in the NASCOM centre. Researcher conducted this session separately with each participant. Each of them was briefed on the way the prototype is evaluated. It is similar to the paper prototype so no participant found it hard to understand. Researcher then gave out the task scenarios to be carried out on the prototype. The tasks were similar to the once given out earlier which is divided into three type of task that is easy, moderate and difficult. The task sheet is shown in Figure 5.18. The researcher then takes down the feedbacks of the participants while they conducted the tasks.

Task Scenario
Task One-Easy
1**.** Find the entire destination available on the flight booking drop down menu. Please write it behind this sheet.

Task Two-Moderate
2. Please book a flight booking for 2 adult from Langkawi to Kuala Lumpur from Feb 26th till Feb 28th .Book the cheapest fare. State the total price here RM_____.

Task Three-Difficult
3. Please book a package to go Langkawi from Kuala Lumpur for two people. The date to book is from 20th March till 25th March 2007. Please state the total amount here. RM_____.

Figure 5.18: Task Scenarios for User Testing on High Fidelity Prototype 1

5.4.4 Results of User Testing On the High Fidelity Prototype 1

Table 5.7 is the participant's user testing results from the high fidelity prototype 1. The timing for each task scenario in the user testing is recorded after each of them is completed and is tabulated in table 5.8. The timing determines the time taken to finish for each of the tasks on the website, whereas table 5.9 describes the user testing feedbacks which consist of comments and suggestions. Table 5.10 summarizes table 5.9 into appropriate usability requirement (according to the guidelines category) that are to be incorporated in the high fidelity prototype 2. There are identified usability requirements which add efficiency to functionality of the website.

Table 5.7 Task scenario Feedback Result during High Fidelity Prototype 1

Participant /Task scenario	Mr. Chong	Mr. Paul	Mr. Krishnan
Task scenario 1	- Task was easy and no comments. He was surprised the 'Increase Text button and Decrease Text button existed before this as + and - . 48 sec	- Task was easily carried out He was happy to see the Increase Text button and Decrease Text button. -He commented that the Flight's Main Page is less Obvious, same as the other two modules. 56 sec	-Commented the button was very easy to find. 57 sec
Task scenario 2	-He asked about the colour difference he suggested earlier. He was assured that on high fidelity prototype it will be seen. He was happy to see the time has the am and pm. -He said he was confused with the label Itinerary and he suggested the name be same as the name of the page 'Reservation Details' 4 minutes 27 sec	-He complimented the terms and conditions to be effective now. -He suggested the changes to the promotions to be simple and to the point. 4 minutes 1 sec	-He liked the flow of the booking but still commented if can lessen the information requested. 4min 14sec

Task scenario 3	- He did the task easily and commented and supported the fares. He also liked the tab looking function on the pages. The packages look better and the steps are easier. 4.11 minutes	-He conducted the task smoothly. 3 minutes and 57 seconds	- He said it was easy this time. 5min 04 sec

Table 5.8: Task scenario Completed/Time Taken to Complete Given Task scenario on the
High Fidelity Prototype 1

	Task scenario 1	**Task scenario 2**	**Task scenario 3**
Mr. Paul	Yes / 48 sec	Yes / 4min 27sec	Yes / 4 min 11sec
Mr. Chong	Yes / 56 sec	Yes / 4min 01 sec	Yes/ 3 min 57 sec
Mr. Krishnan	Yes / 57 sec	Yes / 4 min 40 sec	Yes/ 5 min 04 sec

Table 5.9 Usability Problem/Feedback and Usability Recommendations from High Fidelity Prototype 1

Usability Problem from High Fidelity Prototype 1	Usability Recommendation for High Fidelity Prototype 2
The Promotion to be simple in words. Not many pictures	To provide the Promotion in words more than pictures.
The Flights Main Page, Hotel's Main Page and Package Main Page are less obvious.	Flight Booking's main page, Hotel's Booking's main page and Package Booking's main page to change name to Flight Main, Hotel Main and Package Main.
Suggested to change the Itinerary to the page name	The label Itinerary is to be changed to Reservation Details
Lesser information is requested	More white spaces are suggested to look neat and less congested.

Table 5.10: Usability Requirements to be Incorporated into High Fidelity Prototype 2

Category	Recommended Solution
Layout and Style	To provide the Promotion with photos together with descriptions
	The label 'Itinerary; is to be changed to 'Reservation Details'
	Flight Booking, Hotel Booking and Package Booking main page to be changed to Flight Main, Hotel Main and Package Main.
	The page to have more white space and to look neat and simple to look less congested.

5.5 Design and Implementation of Blue Air Travel Website (High Fidelity Prototype 2)

The section describes the design and implementation of the Blue Air Travel Website (High Fidelity Prototype 2). Featured here are the hardware and software used for the implementation. The Blue Air Travel website is almost fully functional and it has the feel of the travel website for the participants. The website shows no connection to credit card and debit formalities, although it shows the process. It does not involve a business model in it because it may need more time to conduct the study and also permissions from certain airline board to get the real business model of the website database.

5.5.1 Programming Language and IDE

The Blue Air Travel Website is developed using ASP.NET 1.1. The Integrated development environment that the Blue Air Travel website uses is the Microsoft Visual Studio.NET 2003.

5.5.2 Databases and Connection

Ms Access provides the database solution for the Blue Air Travel Website. Tables and queries are used to store the data. All data are directly retrieved from the database tables in Ms Access. The database updates and stores in Microsoft Visual Studio.NET 2003 through OleDbConnection. OleDbConnection is an object that represents a connection string to a data source. So its role is an intermediate object sitting between the client and server. In other words, it is a connecter for stringing the database to the requested site.

5.5.3 Internet Information Services

The execution was done using the support of IIS 5.1 or the Internet Information Services a windows component under Microsoft Windows XP Professional. It is a component which supports the Active Server Pages and databases.

5.5.4 Platform

The Blue Air Travel website is developed on the Windows XP Professional Version 2002 Service pack 2 platforms. Since it is using the .net it can run on any platform which means on any type of operating system.

5.5.5 The High Fidelity Prototype 2 Screen Shots- Flight Booking

There are three main modules in this Interactive version of Blue Air Travel website. They are Flight Booking, Hotel Booking and Package Booking. However, only the Flight Booking module is presented here and the other two are attached in the Appendix A. Usability Requirement as shown in table 5.10 is incorporated into this designs.
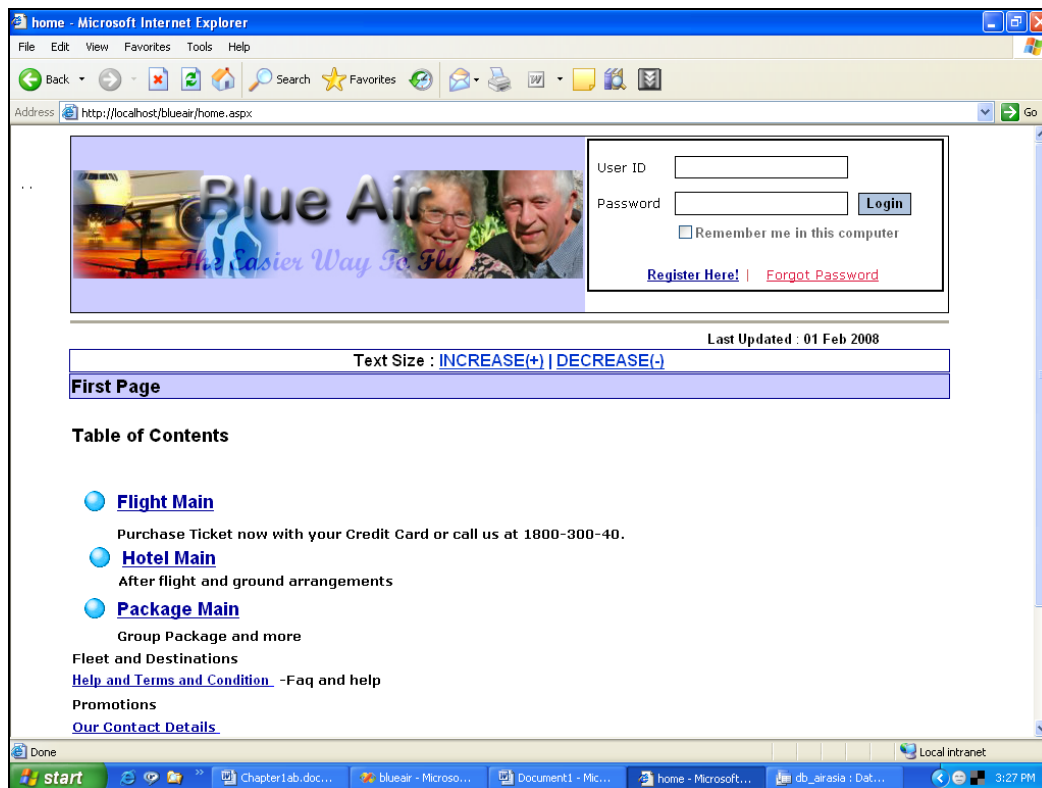
Figure 5.19: Implementation of Blue Air Travel Website for the Elderly User

Main Page

The Main page has only three main links. The others are all information on the project

and 'contact us' information. The three main links are highlighted with three blue balls as

a target to click which includes Book Now (flight booking), hotel booking and packages.

Referring to figure 5.19 the page has table of contents which shows the list of content

available throughout the website. It was a suggestion from an elderly participant through

one of the iteration. Participant login is also placed here.

The Flight Booking Module

This link is used to book flight. The main page of flight booking is called 'Flight Main'

as seen in figure 5.20. At the initial stage at the flight module the elderly has to enter the

option in the radio button to either book a return ticket or a one way journey ticket. After that the original place of the participant has to be selected and the date of departure has to be chosen from the calendar. Next the destination and the date have to be selected. Next number of adults and infants has to be selected. Then 'Next' button is selected to call from the database the available flights for the particular dates. The 'Flight List' page will open and it shows the particular dates have flight. The screen shoot on Figure 5.21 shows that there no flight available. If there are many options then the radio button is selected to the suitable time. Figure 5.22 shows morning and evening flight for Departure only where the morning flights row is coloured blue and the evening flights row is colour pink. In the case shown on figure 5.23 there is only one flight available in the morning. After selecting the wanted flight, the next button is clicked to submit the selected flight ID. The website then dynamically calculates the price for the flights selected and shows the confirmation page. This is shown on Figure 5.24. Next after entering all the requested detail, the confirmation button is selected which then leads to the last page. Figure 5.25 shows the reservation details which are available for print.
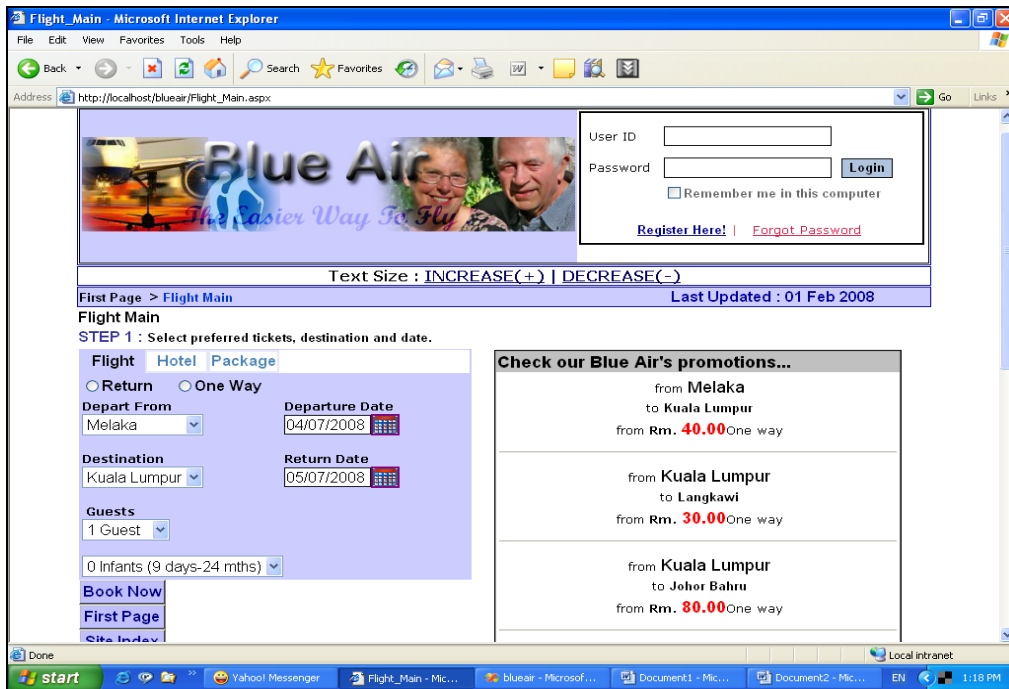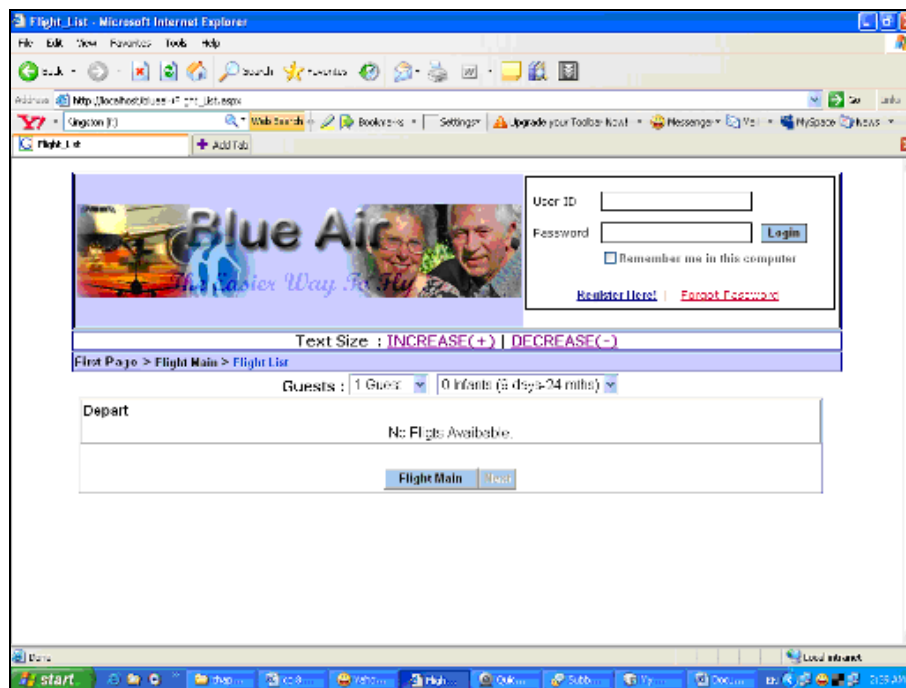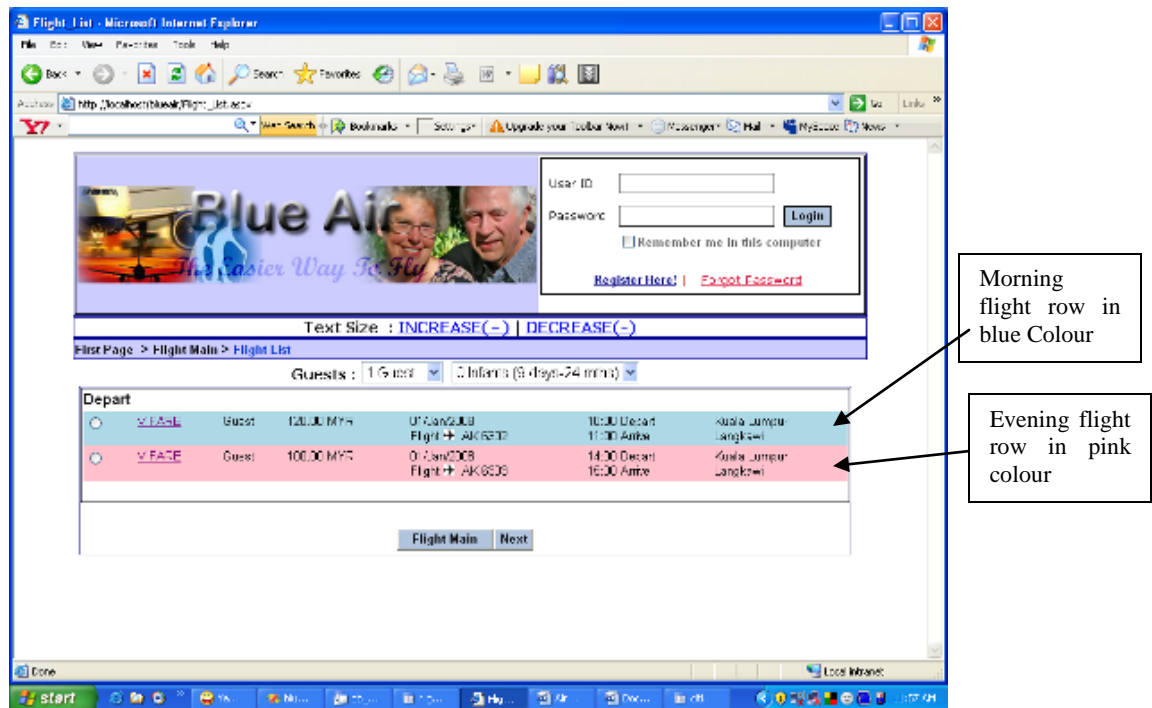
Figure 5.20 Flight Booking's Main Page

Figure 5.21 Screen Shot showing No Flights Available

Morning flight row in blue Colour

Evening flight row in pink colour

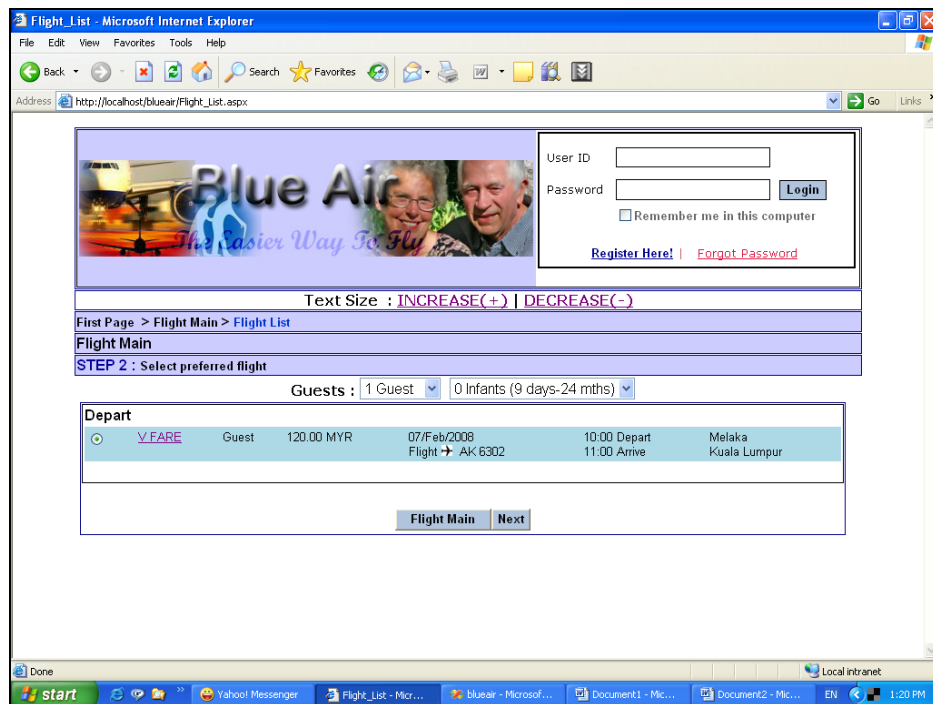5.22: Flight List shows morning and evening flight for Departure only

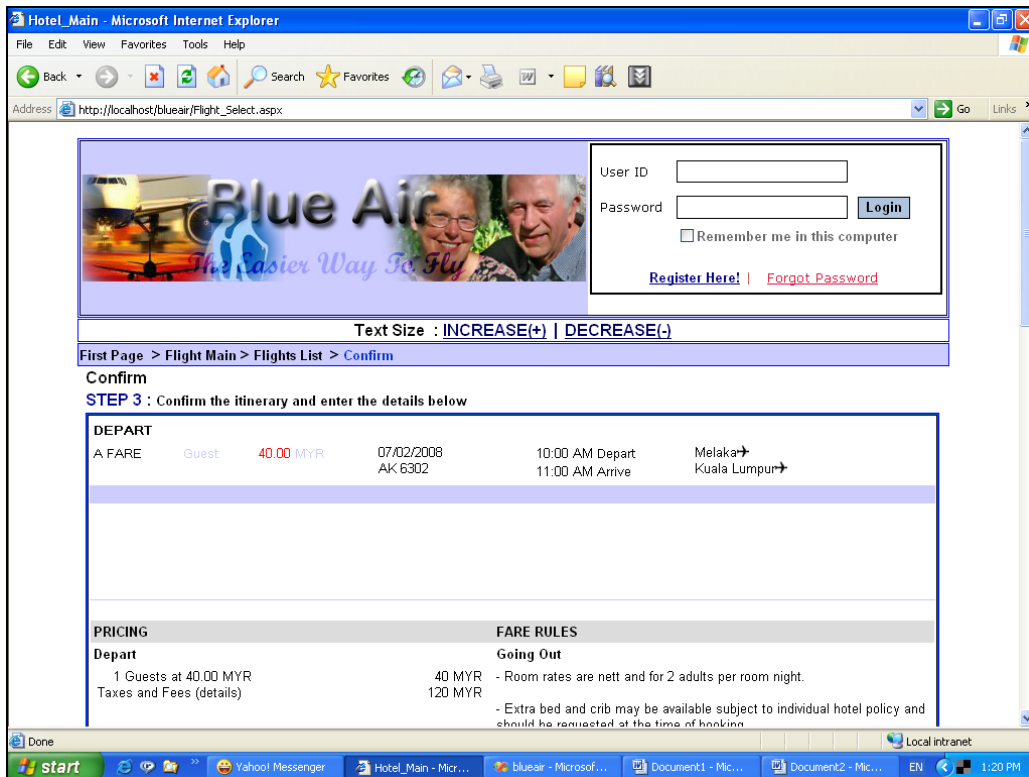

Figure 5.23: Flight List show only One Flight Available

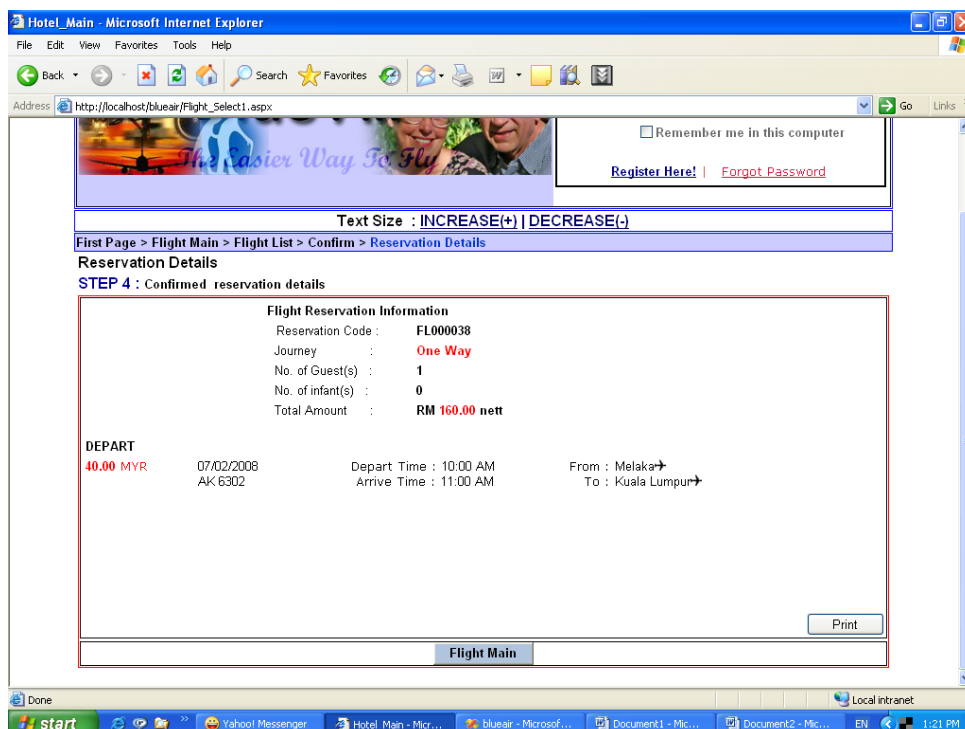Figure 5.24: Screen Shot of the Flight Confirmation Page

Figure 5.25: Screen shots of the Reservation Details for the Flight Booking

5.6 Summary

This chapter involves iterations of paper prototype, high fidelity prototype 1 and high fidelity prototype 2 to produce a more usable Blue Air Travel Website. The next chapter describes the final user testing of the Blue Air Travel Website.