WXES3182 Latihan Ilmiah 2
Faculty of Computer Science and Information Technology
University of Malaya

Automobile Parts Modification Systems(ModifiCARtor)

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Bismillahirrahmanirrahim

Abstract

This project document been written for Latihan Ilmiah 2 (WXES3182) in order

to accomplish the need of graduation structure of Bachelor of Computer Science

(Software Engineering) of University of Malaya. This document been written with the

practice of knowledge learned from the Faculty of Computer Science and Information

Technology, University of Malaya.

     The difficulty and challenge that have been faced through out the project is all

about to give the student experience how the real software development world works. Its

also give a chance for student to practice what they have learned before entering

working environment.

Acknowledgement

Unlimited thanks to Allah Almighty for His Merciful. Thousands of thanks to everyone who helped directly or indirectly to finish this work.

Mrs. Zarinah Mohd. Kasirun as Supervisor of this project, Mrs. Azwina Yusof as Moderator of this project, all personnel involved in interview and research, course mate who give support, close-friends for their friendship, magnificent people in Spatialworks Sdn. Bhd. , house mate of 27, Jln 17/21B, PJ for their co-operation, and the person I love so much. All of you are something to this.

Never ending love to my father, mother, brothers, sisters, and to all my lovely nieces and nephews. Without them I am no one. Love mom.

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1.Introduction

1.1 Project Introduction

Number of personal own car increasing year by year. It is same goes with the price itself. Older model sometime more optimum than newer model for example fuel consumption. Some people prefer older design because may be they look classic. Or may be some people like to express their creativity. All these lead car owner to modify their existing car to a new look and new performance car.

Car maker such as Toyota, Honda, Proton and many more, from business view, do not like people to modify car. For sure they want people to buy their car more. Because of that, for car modifier to get modify part could be difficult from the original carmaker. Their choice always used auto part from third party auto part seller.

1.2 Project Rationale

There is still no system to help car modifier to identify compatibility of the part, to preview desired modified car and to directly order desired part that been previewed. This system will give new experience for car modifier to search auto parts.

Chapter 1
Introduction

1.Introduction

1.1 Project Introduction

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Car maker such as Toyota, Honda, Proton and many more, from business view, do not like people to modify car. For sure they want people to buy their car more. Because of that, for car modifier, to get the correct auto part could be difficult from the original carmaker. Their choice always used auto part from third party auto part seller.

1.2 Project Rationale

There is still no system to help car modifier to identify compatibility of the part, to preview desired modified car and to directly order desired part that been previewed. This system will give new experience for car modifier to search auto parts.

1.3 Project Objective

The main objectives of the system are:

- Preview

To let car modifier to preview theirs desired car before making decision on which part to choose.

- Shopping Cart

At the same time car modifier choose their part, its also working as shopping cart which car modifier can choose base on their budget.

- Expert Advice

Car modifier can also ask for expert advice before modifying their car or to put on their budget and criteria the system will help to choose and recognize part for car modifier.

1.4 Project Scope

This project will cover all modification aspect of a car. Proton Satria have been choosing as car model study. This model is the most modified models by car owner.

1.5 Target user

Target users for sure are the car owner who would like to modify their car. It's also for any person who have plan in future to modify their car.

1.6 Expected Outcome

The expected outcome would be a useful system that could help car modifier to choose part, preview part, comparing price, and make order for the part.

1.7 Project Scheduling

Analyses have been done about constraint and risk that probably will be faced. This effect the duration of the system can be delivered. A project schedule based on the analyses has been drawn in order to deliver this system in timely manner.

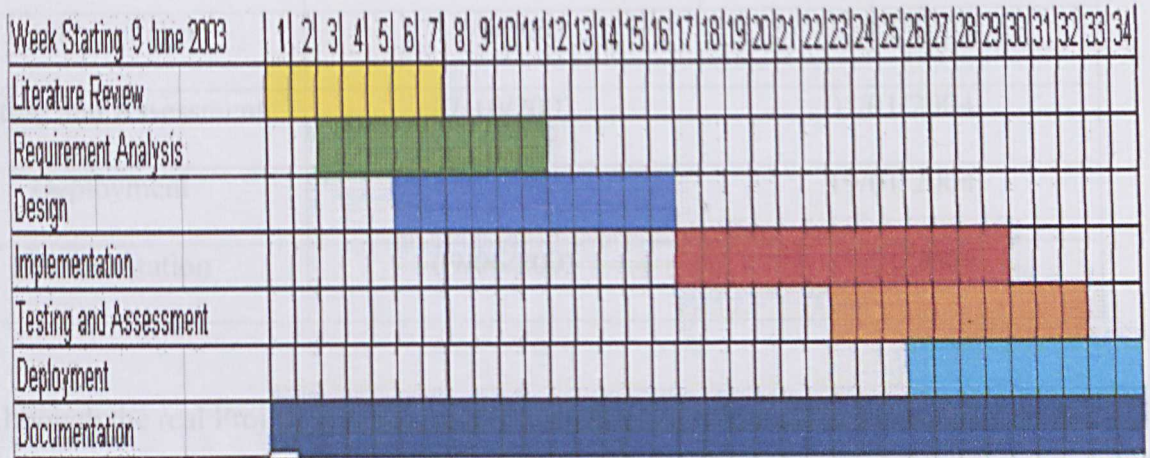| Week Starting 9 June 2003	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Literature Review																																		
Requirement Analysis																																		
Design																																		
Implementation																																		
Testing and Assessment																																		
Deployment																																		
Documentation																																		

Figure 1.1 Project Schedule

Project schedule have been divided to each workflow. The project schedule start from 9 June 2003 and expected to be deliver completely in 34 weeks.

All the work flow schedule exact date had been describe in table below:

Table 1.1 Project Schedule Date

Work flow	Start Date	End Date
Literature Review	09/06/2003	28/072003
Requirement Analysis	23/6/2003	11/08/2003
Design	14/7/2003	15/9/2003
Implementation	15/9/2003	15/12/2003
Testing and Assessment	27/10/2003	05/01/2004
Deployment	17/11/2003	19/01/2004
Documentation	09/06/2003	19/01/2004

Although the real Project duration is 36-38 weeks, project schedule been set to create

buffer in case of task delay in any workflow.

Chapter 2
Literature Review

2.Literature Review

2.1. Introduction

In this literature review, studies are conducted to understand and expose ourselves to various issue regarding car modification. Questions pertaining to various subjects are studied and researched upon. The main objective in literature review is to obtain an understanding in all the system needs in terms of technical and documentation. Information that relates to concepts, software and tools and techniques are gathered to develop the system and points to ponder are listed. Some of the existing systems are provided in this chapter to make comparisons among them and to determine basic aspects that should be included in ones system.

2.2. Sources of survey

In order to gain useful information in this project, several resources have been used to supply this project with sufficient and accurate information. These includes:

- **The Internet**

The main source of this project. Most of the information in each topic are collected and downloaded from here. Helps a lot in observing existing systems and software reviews.

- **Documents room**

Thesis done by senior students have been studied and reviewed from time to time to gain skills in developing a system and documentation.

- **Printed media**

  Additional knowledge can be retrieve from newspapers, magazines and reference books. The local bookshop helps a lot in providing these books.

- **Meetings with the supervisor**

  Meetings with the supervisor are carried out at least two times a week to discuss about each aspect in the system. This is to make sure that the progress of the project will lead to its objectives

- **Auto parts company and car workshop**

  Meetings with Auto parts company representative and car mechanics to have their view about car modification and any issue concern about car modification. From the meetings we can have clearer view about car modification

2.3. Car Parts and Modification Issue

Car Parts

Before going into modification, we need to know about car. There many things to know to understand car and its functionality. This is important in order to design a system which base on car. There are hundreds parts of car. Each must be known.

For this, refer to appendixes, which was collected from www.car-part.com .The figure list all parts of car which from that list, we identified car part. For this project we use the list to help us to identify car parts.

From that collected information, the decomposition of a car have been list below:

1. Engine
2. Tire and Wheel/Rim
3. Suspension
4. Body kit
5. Body Part
6. Interior furnishing
7. Steering
8. Dashboard
9. Brake

Modification Issue

From research and interview been made, there are some issue that concern about car modification.

1. Used part

   Car modifier usually goes for used parts because it is cheaper. Car modifier usually modifies their older version car to another car model. With some modified parts the car will look like another model.

2. Half – cut

   Half – cut mean parts of car usually come from original car. It's usually come from Japan. Japan practices a law to demolish car after certain years. The demolished car usually had been cut into two. This where the term half – cut come. The half – cut been export to other countries. Usually half – cut have a lot of parts can be used by car modifier. Half – cut also come from crashed car.

3. Turbo/Supercharger

   Engine modifier eager to convert their regular engine to Turbo/Supercharger .
   Turbo/Supercharger is engine-booster to get more power produce from their
   engine. Upgrading to this type of engine require more additional car parts.

4. Car lowering

   Beside get engine boost up, car lowering also affect car stability and
   performance. On the other hand car lowering also make car look sportier.

5. Custom made kit

   Custom made kit usually the final choice of the modifier when they can not
   get the original kit. The kit, like spoiler and lips, can be custom made using
   glass-fiber. The price usually depends on how difficult to make and how rare
   requested kit is.

2.4. Project Requirement

Project requirement have been done through few study on available tool and
technology. Below are the requirements list divided into few categories:

2.4.1. Platform

· Windows 98

· Windows NT Workstation

· Windows 2000 Advanced Server

2.4.2. Server

· Windows 2000 Advanced Server

IBM PC or compatibles with the following configurations

· Intel Pentium II 333MHz processor

· 64MB SDRAM

· 500MB Hard disk space

2.4.3. Client

· Windows 98/NT Workstation

IBM PC or compatibles with the following configurations

· Intel Pentium 166MHz processor

· 32MB SDRAM

· 20MB Hard disk space

2.4.4. Database

· Microsoft SQL Server 2000

2.4.5. Software

· Microsoft Visual Studio

· Microsoft SQL Server 2000

· Aurigma Graphics Processor

2.4.6. Network

Local Area Network for Development

Internet Connection

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2.5. Existing System

The search of similar system has been done massively from the internet and
software released. There still no exactly the same system like this system.
However there are so much site offer search engine for auto parts.
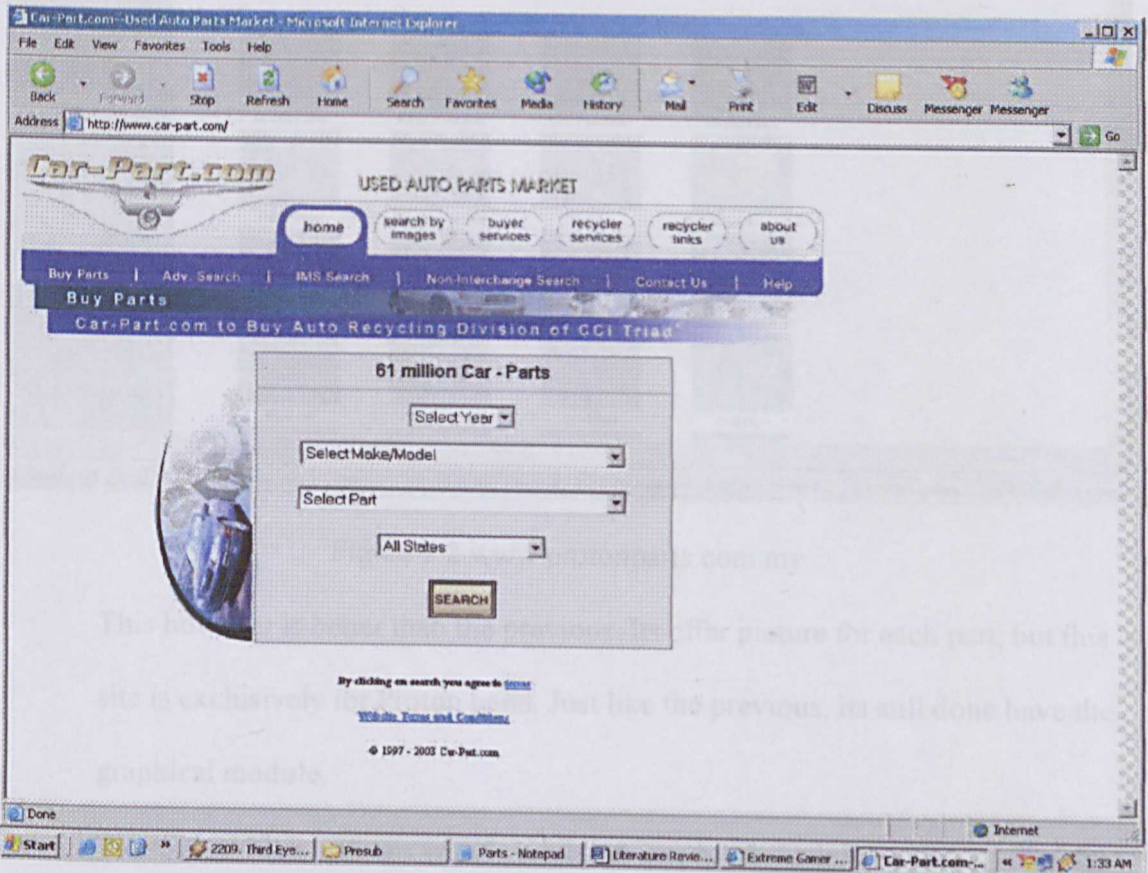
www.car-part.com

Figure 2.1 www.car-part.com

This site offers a search engine from various types of cars, years, and every auto
parts. The data collection is more than enough. But as been mentioned before this
site could not offer user to preview their desired parts into their desired car.
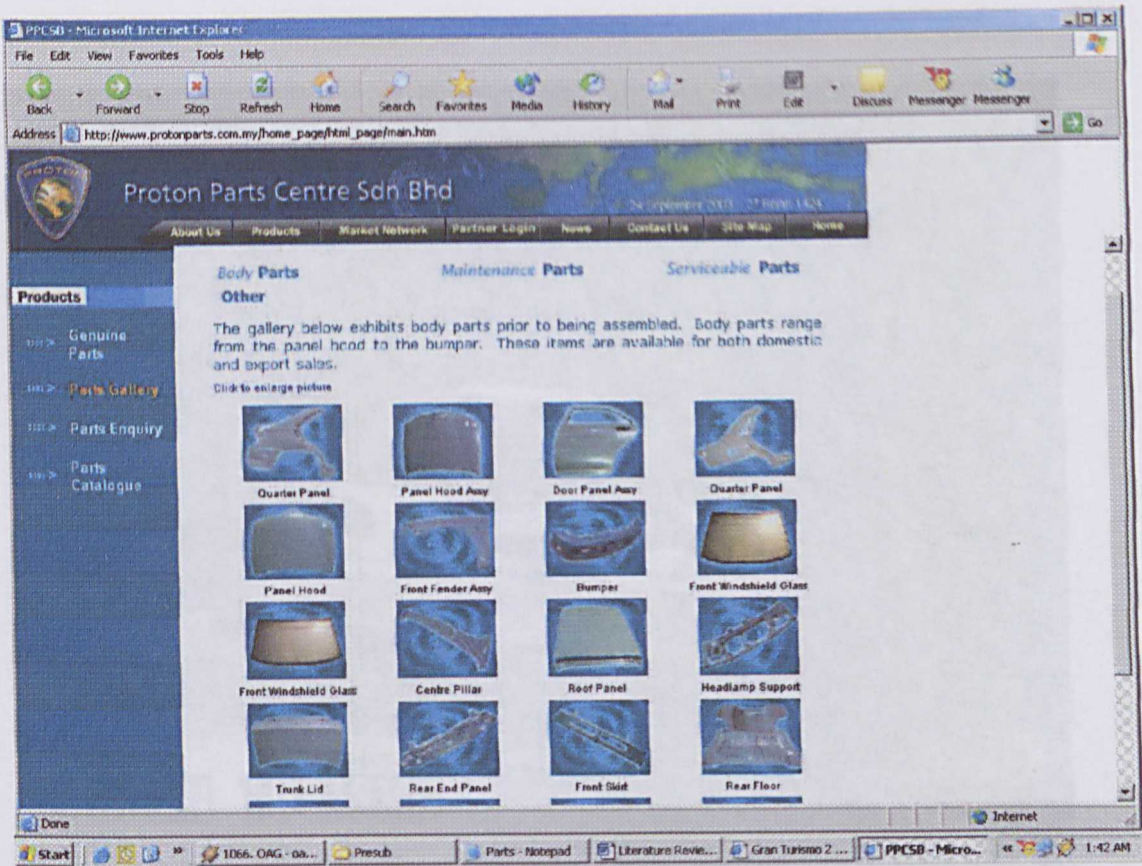
www.protonparts.com.my

Figure 2.2 www.protonparts.com.my

This however is better than the previous. Its offer picture for each part, but this site is exclusively for Proton parts. Just like the previous, its still done have the graphical module.

There also other systems which similar to graphical module on this system. Its can be found in interactive games. Its can be found in car modification module in Gran Turismo 2 and F1 Manager. The idea of car modification simulation also had been use in the movie, Fast and Furious, where all the idea of this system comes.
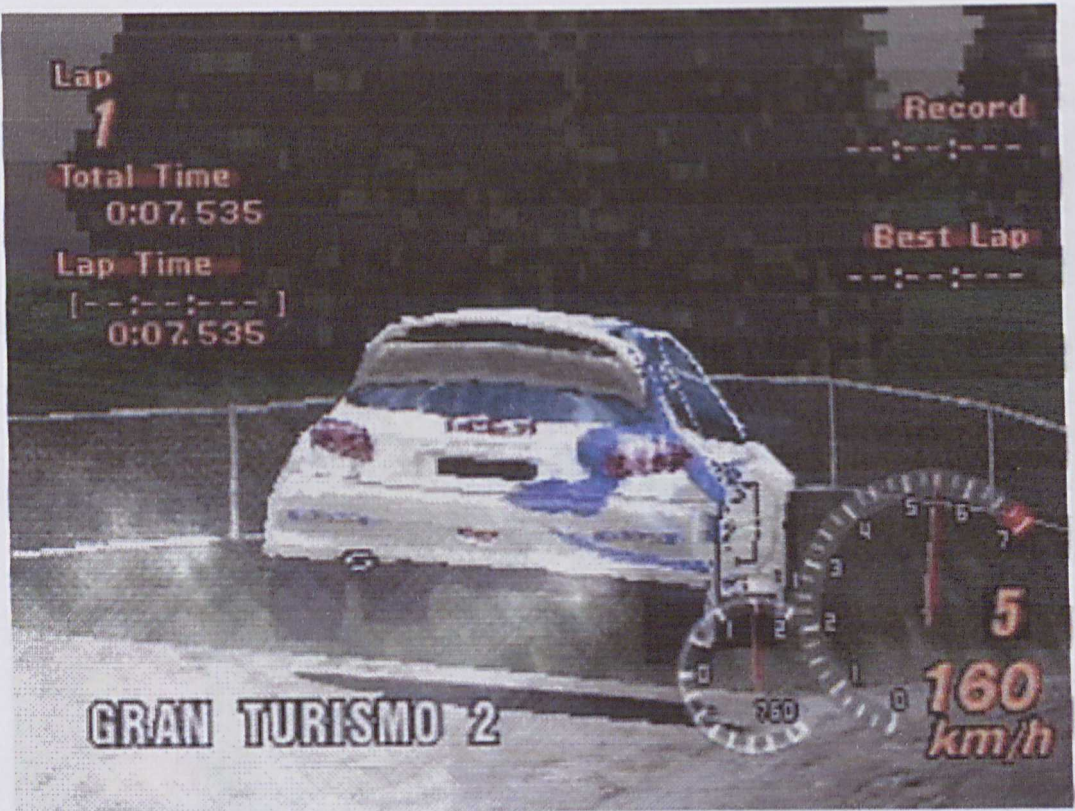
Gran Turismo 2

Figure 2.3 Gran Turismo 2

F1

Manager

Figure 2.4 F1 Manager

Table of Comparison

	Cart	Part Search	Part Preview (Graphical)	3D Presentation	Variety of Part
www.carparts.com	No	Yes	No	No	Yes
www.protonpart.com.my	No	Yes	No	No	No
Gran Tourismo 2	No	No	Yes	Yes	Yes
F1 Manager	No	No	Yes	Yes	Yes
Proposed Systems	Yes	Yes	Yes	No	Yes

Table 1.2 Comparison

Chapter 3
Methodology

3.Methodology

3.1. Introduction

In this chapter, all the info gathered and collected in literature review are analyze and put into use to define the system needs. The most suitable system development module is chose depending on the level of complexity of the system and the time limitations. There are two categories of requirements for this system: functional requirements and non-functional requirements. Functional requirements describe all the functions that make up the whole system meanwhile non-functional requirements are the limitations placed on the system that narrow the choices that can be made for implementation.

3.2. Methodology

Methodology is a sequence of formal and consistent processes in developing a system. It is also known that process modelling will then define the activities, techniques, system development automation tools, system deliverance and system maintenance. Process modelling is important to:

- Acquire an overall understanding of the development processes.
- Detect inconsistencies, redundancies and omissions.
- Generate general processes in situation where it is needed.

Chapter 3
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- Detect inconsistencies, redundancies and omissions.

- Generate general processes in situation where it is needed.

There are a few known models:

- Waterfall model
- Waterfall model with prototype
- V model
- Prototype model
- 'Operation specification' model
- Transformation model
- Unified Process Life Cycle/RUP

Choosing the right model to develop a system will determine the smoothness of the system development besides meeting the objectives. This project is an object oriented system. Through out the research have been made, the best methodology for object oriented is Unified Process Life Cycle. So this methodology had been choosing for this project.

Unified Process Life Cycle/RUP

Widely known as **Rational Unified Process(RUP)** because of Rational is the leading software vendor for Unified Process.

Jacobson et. al develop and evolved a process that has become known as the Unified process and which utilizes UML for modeling [1]

What exactly is the Rational Unified Process, or RUP? Here are several answers to this question, from different perspectives:

What is the purpose of the RUP?

It is a software engineering process, aimed at guiding software development organizations in their endeavors. [2]

How is the RUP designed and delivered?

It is a process product, designed like any software product, and integrated with the Rational suites of software development tools. [2]

What is the structure of the RUP?

The RUP has a very well-defined and regular structure, using an object-oriented approach for its description. [2]

RUP is a use-case driven modeling, architecture centric, iterative and incremental. It been design from spiral model. Its can be divide into 4 phases, which are:

1. Inception
2. Elaboration
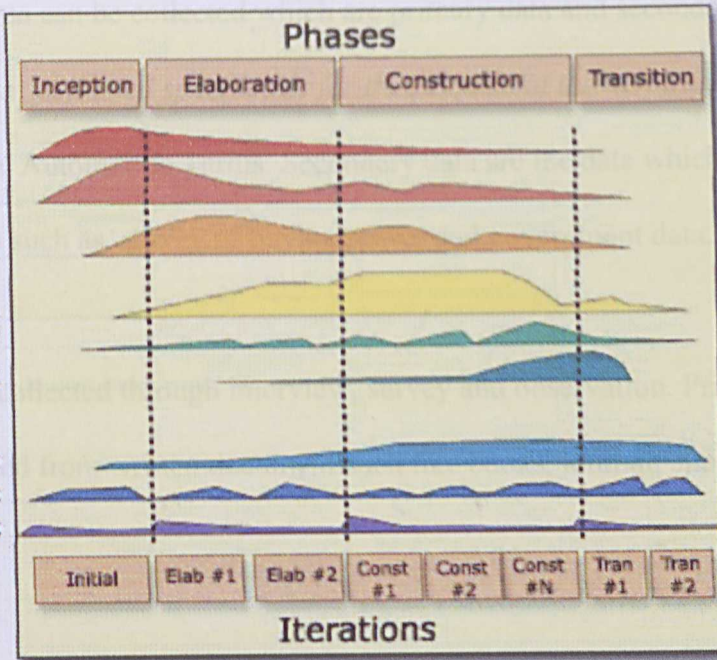3. Construction
4. Transition

Figure 3.1 RUP Phases and Workflow

There are 9 core process workflows in RUP:

1. Business modeling – Literature Review

2. Requirements - Translating the need into the behaviors of an automated system.

3. Analysis and design - Translating requirements into a software architecture.

4. Implementation – Creating software that fits within the architecture and has the required behaviors.

5. Test - Ensuring that the required behaviors are correct, and that all required behaviors are present.

6. Deployment - Everything needed to roll out the project.

7. Configuration and change management - Keeping track of all the different versions of all the work products.

8. Project management - Managing schedules and resources.

9. Environment - Setting up and maintaining the development environment.

3.3. Information collecting technique

There are two type of data can be collected which are primary data and secondary data. Primary data are the data *"collected specifically for the purpose of the investigation at hand"* [3]. For example, Automobile Terms. Secondary data are the data which basically to support investigation such as, survey of buying power and government data.

Secondary data can be collected through interview, survey and observation. Primary data basically can be collected from written document such like books, journal, and internet publishing.

Chapter 4
Analysis Design

Chapter 4
Analysis Design

4.System Requirement Analysis

4.1. Introduction

System requirements analysis covers the areas of functional and non-functional requirements of the ModifiCARtor. Functional requirements are modules that make the system works. The existences of each of these modules are crucial in achieving the systems main objective. On the other hand, non-functional requirements are definition of system properties and constraints under which a system must operate.

4.2. System Requirement

ModifiCARtor is developed in Microsoft Visual Studio which use ASP(Active Server Pages) and additional component. ModifiCARtor consist of few module which will be describe below:

4.2.1. Functional Requirement

1. Auto Parts Search

This module will let user to search auto parts whether new parts or used parts. The search engine will let user to search from various parameter such as year, model, type and price. This module is a common module for many auto part web site.

2. Make-up Studio

This graphical module will let user to choose the car they want to modify their car look. User will be prompt to choose which part to modify and choose desired part from the database to fit in their chosen car. The system

will suggest compatible part for their car. User also can customize the part if the part they desire is not available or they like to customize existing part. This module will be connected with Performance Studio module.

3. Autotips

Information collected from various source about automobile and modification tips will be provided here to guide user and for their knowledge.

4. Modify Pundit

User can also get expert view for modification tips. Successfully modified car also be reviewed here. Here also user can get budget advisor which user can put their budget and system suggest the most optimum selection following criteria inserted by user.

5. Shopping Cart

User virtually has a cart while logging on the system. This will enable user to pick any part from any module and review the price.

4.2.2. Non-Functional Requirement

The following are the system's non-functional requirements. These non-functional requirements are very subjective. Much less these requirements plays an important role in supporting the systems survival. These non-functional requirements are as important as the functional requirements mentioned earlier.

▪ **User friendly**

This factor is important to be considered. A user friendly system has a high level of interaction with the user. But interaction without the ease of use is no good anyway,

in fact it's annoying. The system has to be user friendly thus offers ease of use, as most users are first timers.

- **Reliability**

The system should be reliable in performing its functions and operations and does not produce dangerous or costly failures when used in a reasonable manner. It should not cause unnecessary and unplanned downtime of the overall system environment.

- **Accuracy**

  The system should provide accuracy measures such as precision of computations and control. This will enable the smooth interaction between the user and the system.

- **Maintainability and expandability**

Maintainability is the degree to which architectural, data and presentation design can be extended. As such the system should be easy to maintained, corrected or enhanced. It is design to be expandable in the future as more functions will be added.

4.3. Result of Analysis of Development Kit

After a series of research and analysis, the hardware and software requirements to develop ModifiCARtor are identified. The following lists are the hardware and software required for implementation of the system.

4.3.1. Software

Each of these system and application software is vital to the development of ModifiCARtor. Each plays a part in one or several module production. The list of softwares is as follows:

- Operating system: Microsoft Windows 2000 Advanced Server

- Macromedia Dreamweaver MX

- Microsoft Visual Studio

- Microsoft SQL Server 2000

- Adobe Photoshop 7.0

4.3.2. Hardware

The list of hardware below is the minimal requirements in developing the system:

- Intel Pentium III 800Mhz

- 256 MB SDRAM

- ATX VA motherboard

- 64 MB Geforce2 graphic card

- At least 3GB free hard disk space

- 48x CD-RW drive

- Input device: keyboard, mouse, microphone, digital camera

- Output device: 800 x 600 digital monitor, color printer

Chapter 5
System Design

5.System Design

5.1. Introduction

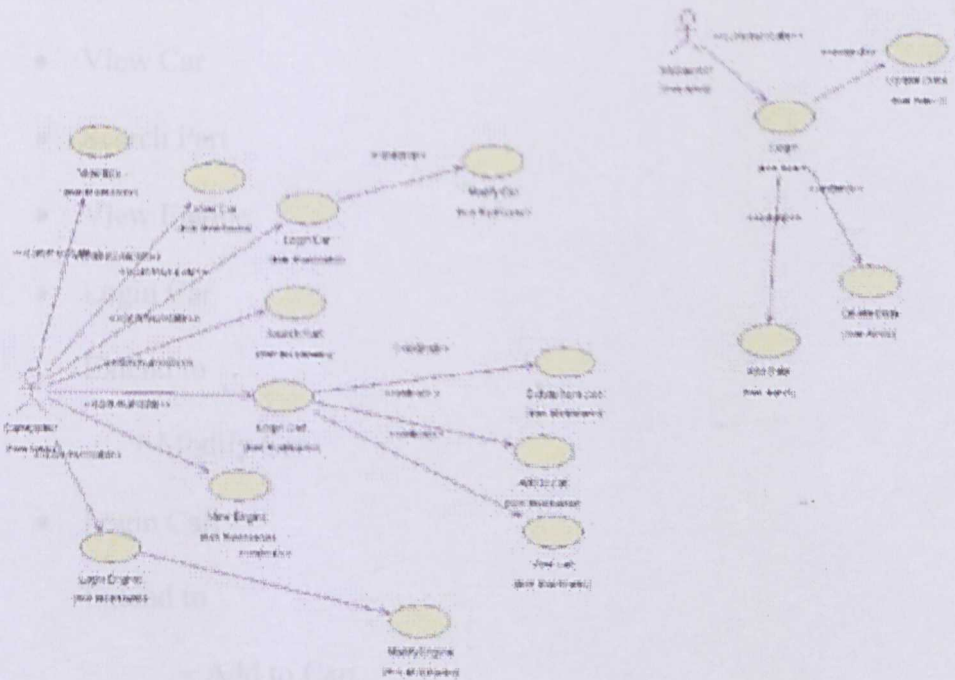System design had been deriving from requirement analysis that has been made.

From the requirement we decided how the system will be design structural and

behavioral.

For this purpose, UML had been use as the method to design the system.

*A non-proprietary, third generation **modeling language**. The Unified Modeling*

Language is an open method used to specify, visualize, construct and document

*the artifacts of an **object-oriented** software-intensive system under*

development.[4]

5.2. UML use case diagram

Refering to use case diagram (see Reference) ,that are all use case and the relationship. There are 2 actors, CarModifier and WebAdmin. CarModifier is the user who use the system. WebAdmin meanwhile is the user who have access to maintain the system.

For CarModifier, the use cases as follow:

- View Tips

- View Car

- Search Part

- View Engine

- Login Car

  Extend to

      + Modify Car

- Login Cart

  Extend to

      + Add to Cart

      + Delete from Cart

      + View Cart

- Login Engine

  Extend to

      + Modify Engine

For WebAdmin, the use cases as follow:
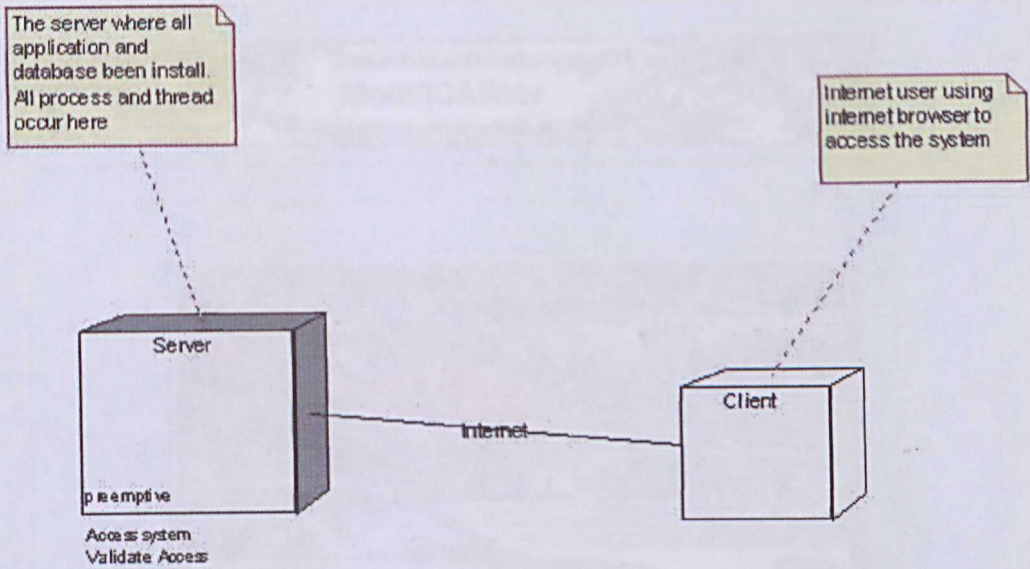
- Login

  Extend to

  + Add Data

  + Delete Data

  + Update Data

5.3. UML class diagram

Referring to class diagram (see Reference), all class needed for the system deriving from use case diagram been drawn. This class been identified based on requirement.

5.4. UML deployment diagram

The server where all application and database been install. All process and thread occur here

Internet user using internet browser to access the system

Server

preemptive

Access system
Validate Access

Internet

Client

Refering to deployment diagram, that is how this system will be deploy after implementation. A server needed to run the system, and internet user may access the system Through internet browser from the client. Server and client requirement have describe in System Analysis.

Interface Design

Figure 5.1 Interface

Chapter 6
Implementation

6.Implementation

Installation Strategy

The following steps need to be performed to install the application system components

in the production environment.

* MAPPING THE DEFAULT WEBSITE

This step can be performed using "Internet Service Manager" also known as IIS.

Active Server Pages – All pages that contain web application including script

Images – All images used

Style Sheets – Document that

* COPYING AND

Copying all component needed for the application.

* CREATE ANOTHER SUB DIRECTORY (COM)

This step involves several steps to create the database, stored procedures, tables and

populating the look up tables.

  ➤ Creating an empty database

  ➤ Executing SQL Scripts

  ➤ Inserting the minimum data required

* UPDATING GLOBAL.ASA

Setting for global variables in server

6.Implementation

Installation Strategy

The following steps need to be performed to install the application system components in the production environment.

- **MAPPING THE DEFAULT WEB SITE**

This step can be performed using "Internet Service Manager" also known as IIS.

Active Server Pages – All pages that contain web application including script

Images – All images used

Style Sheets – Document that support web presentation

- **COPYING AND INSTALLING COM COMPONENTS**

Copying all component needed for the application.

- **CREATE ANOTHER SUB DIRECTORY (COM)**

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  - ➤ Creating an empty database

  - ➤ Executing SQL Scripts

  - ➤ Inserting the minimum data required

- **UPDATING GLOBAL.ASA**

Setting for global variables in server.

7. Testing

Web Testing

Testcases exercise each of the following functions

Links – Navigate every link from the Home page to the rest of the website pages.

User Interface—Make sure all graphics appear properly (i.e. size, colour, and resolution).

Search options and criteria (i.e. searching by item category, item description)

Shopping options—adding/removing items from cart.

Calculation of the total value and number of shopping cart items.

Sample Test-case

Objective: To verify that customers can pick item from the catalog database, and that item information and totals are recorded correctly, using a representative sample of browser and workstation configurations (i.e. operating system/browser/modem speed/screen resolution, etc.).

Setup:

1. Set up a test website with production-level server hardware and database content.

2. Configure the workstations and browsers.

3. Distribute testscripts to participating testers, for each selected configuration.

Test Steps (repeated on each configuration):

1. Browse the catalogue database for an item.

2. Select the item.

3. Add the item to the shopping cart.

Chapter 7
Testing

7.Testing

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· Search options and criteria (i.e. searching by item category, item description)

· Shopping options—Select size, colour, number, etc.

· Calculation of the total value and number of shopping cart items.

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Test Steps (repeated on each configuration):

1. Browse the catalogue database for an item.

2. Select the item.

3. Add the item to the shopping cart.

4. Verify the Total amount in the shopping cart.

Expected Results:

1. No broken page links are encountered.

2. Product catalog picture quality is satisfactory.

3. Correct item is added to picklist, and inventory count is reduced appropriately.

4. Shopping cart total value is correct.

Stress Testing

The tester generates the trade volume (transactions per second) that is expected during the first few opening minutes, checking the speed of response and that totals and counts are properly accumulated.

Sample Testcase

Objective: To confirm that the system responds within an acceptable time during a period of high trade volume.

Setup:

1. Set up a complete system with production level hardware and software.

2. Ensure that the system is clear and clean of any other activity.

3. Set up all monitoring components (to monitor CPU usage, network traffic, and queue size).

Script:

1. Start all components of the system.

2. Run any pre-production jobs that are used to initialize a trading day.

3. Start the system stress tester

4. At a predetermined time, start the system stress tester and execute the expected

number of transactions.

5. Shut down the system stress tester.

6. Ensure that all trades have completed.

7. Ensure that all logging processes have completed.

8. Shut down the other monitoring components.

9. Remove and save all statistics.

Expected Results

1. Response time for the average transaction is within acceptable limits.

2. The count of logged transactions is equivalent to the number of trades sent through.

3. Network traffic does not exceed 50%.

4. Network traffic does not show too many errors (as determined by the business).

5. Queues never exceed 200 items, and are cleared within a reasonable time after the

completion of the test.

Chapter 8
Conclusion

8.Conclusion

8.1. Project Strength and limitation

The strength

As the whole analysis, requirement and design have been describe before, the project strength definitely the idea of combining car simulation and auto parts search engine. Like before, car modifier need to know what type of parts they going to search and what are its use. By using this system they can know lease about the auto parts, because this system will help them with information about auto parts. It could be much enjoyable to search auto parts with simulation rather than using search engine alone.

There structure of this system also has been design not to depend on specific car. This system concerns about if there a need to add more type of car.

The limitation

For this purpose of study, there are limitations for this system. This system will only cover one type of car which is Proton Satria due to it's widely been modified by car owner. This is because the data must be collected for this car alone is bulk. The data consist of every detail of parts, all angle pictures and the compatibility of the parts. However the system been design to make easy if there new car model data want to be include.

The simulation of the car will be present in 2 dimension format. Its just a manipulation of conventional picture with accurate positioning. There will be no rendering or 3 dimension display.

The other limitation is the shopping cart is just for user to view there budget if they choose the parts. There will be no online transaction from the shopping cart. However user can print out their selected item as reference.

8.2. Project enhancement

Display

Since the system just using 2 dimension displays, the enhancement of course the implementation of 3 dimension display for simulation. The rendering of car would be more attractive for user. More modules such as car tour can be implemented too.

Online transaction

The shopping cart can be extending to online transaction form. This require more business analysis to be done.

8.3. Leasson learned during project period.

A lot of new thing learn during developing this system.

Time management

This is the most crucial aspect. Since there are so many process involved and time frame given are short, time management and scheduled work must be put into priority.

Skill set

From this project we know that software development task is not easy. It's requiring various set of skill. It gives me a picture on how a software

development company running their business. The effort given must be huge to get perfect result.

Human interaction

Early stage of software development process requires a lot of interaction with people. This gives me new experience to communicate with people and how to deal with people and to manage their expectation.

8.4. Summary

So many experiences absorb in completion of this system. Like doing other thing, planning is the most important thing. A proper planning gives much benefit. In industry where cost always a main factor, a proper planning will absolutely reduce cost.

Chapter 9
User Manual

When user get into ModifiCARter site the page as above will be displayed. User need to select one of the menu provided as below:

Main Page

When user get into ModifiCARtor site the page as above will be displayed. User need to
select one of the menu provided as below.

Main Menu - Autotips
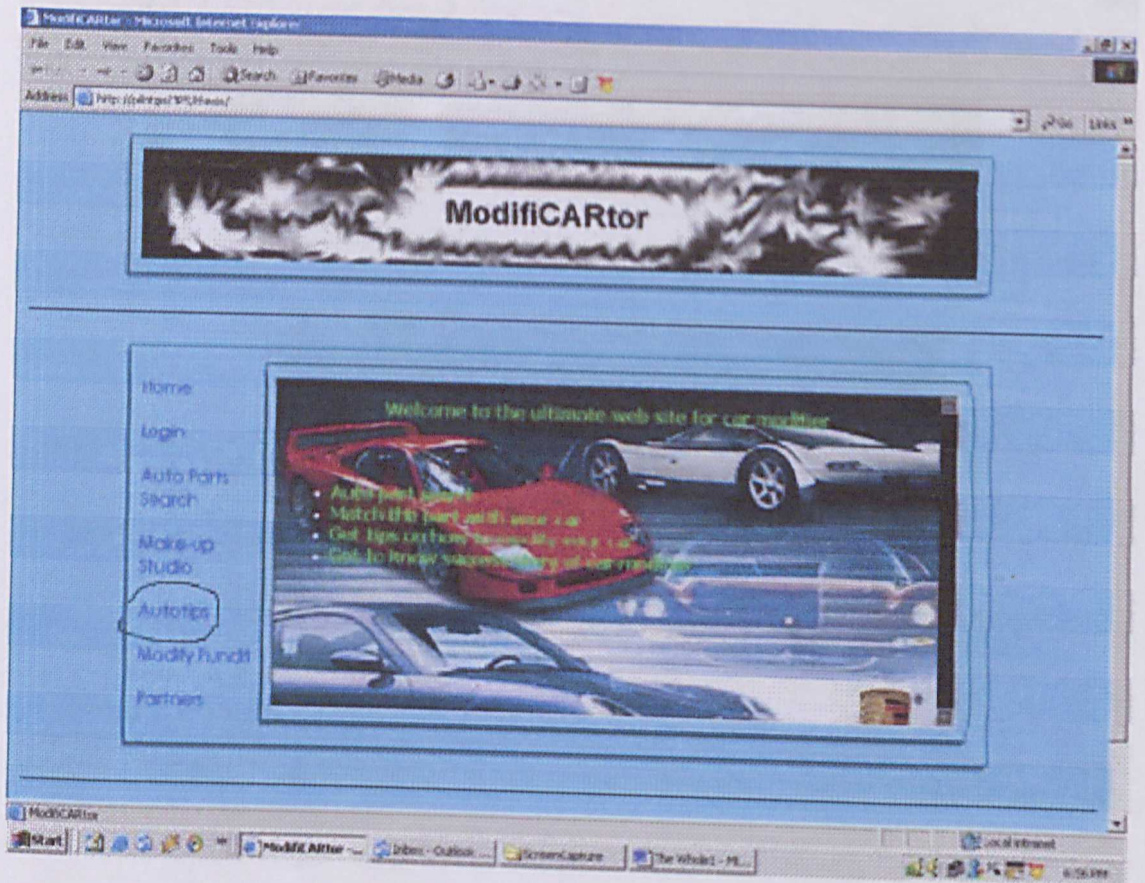
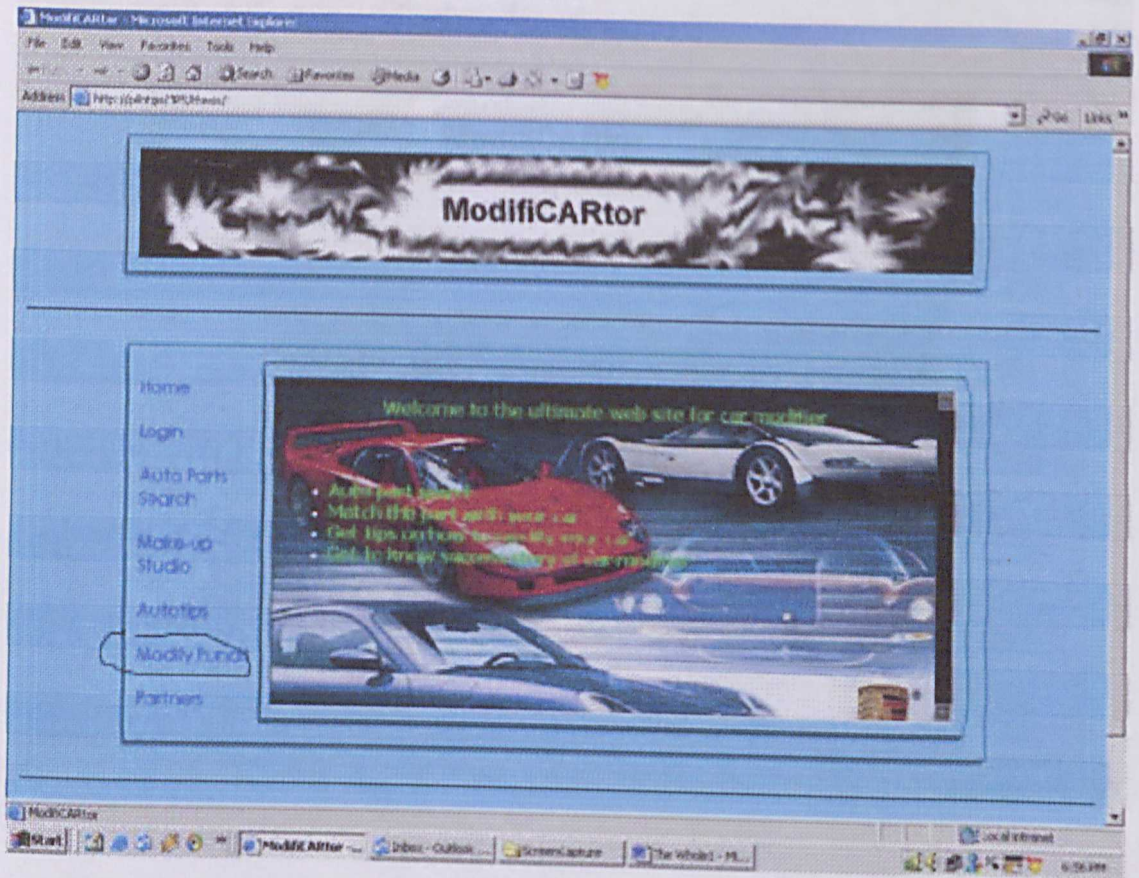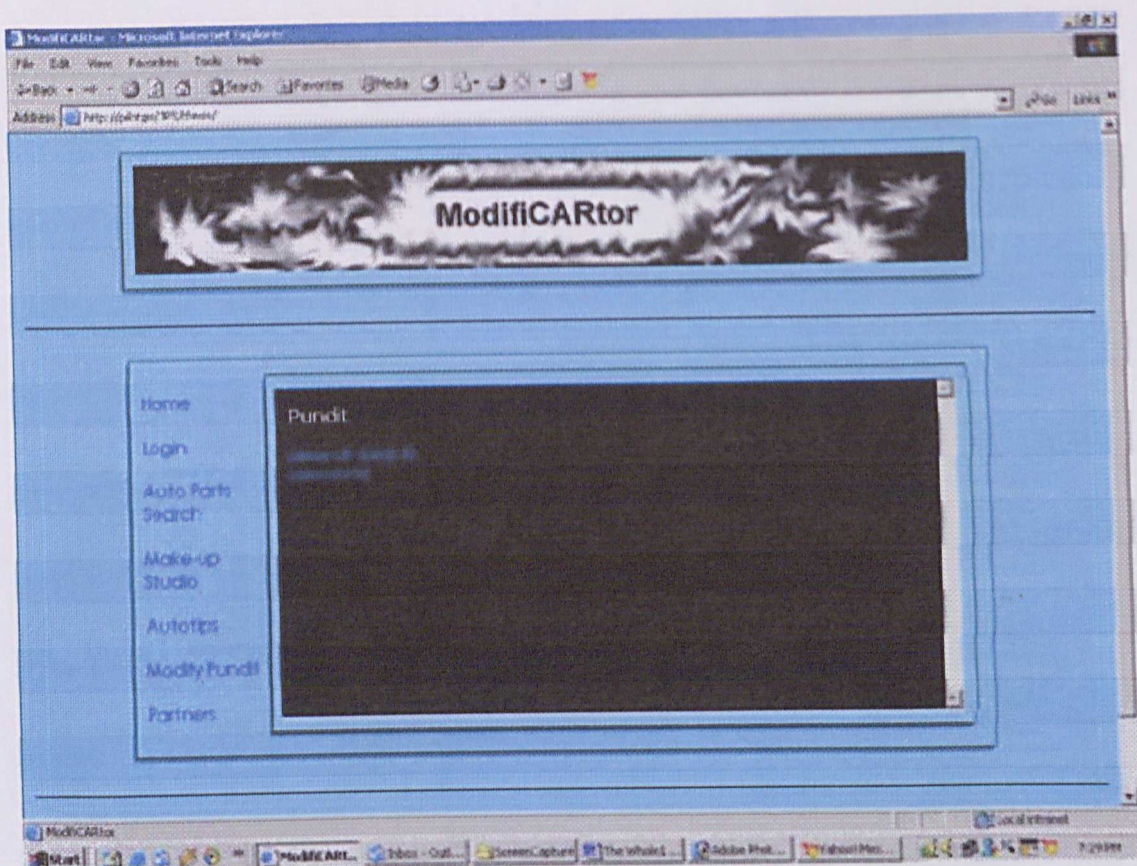This menu user will be able to view various tips on car modofication.
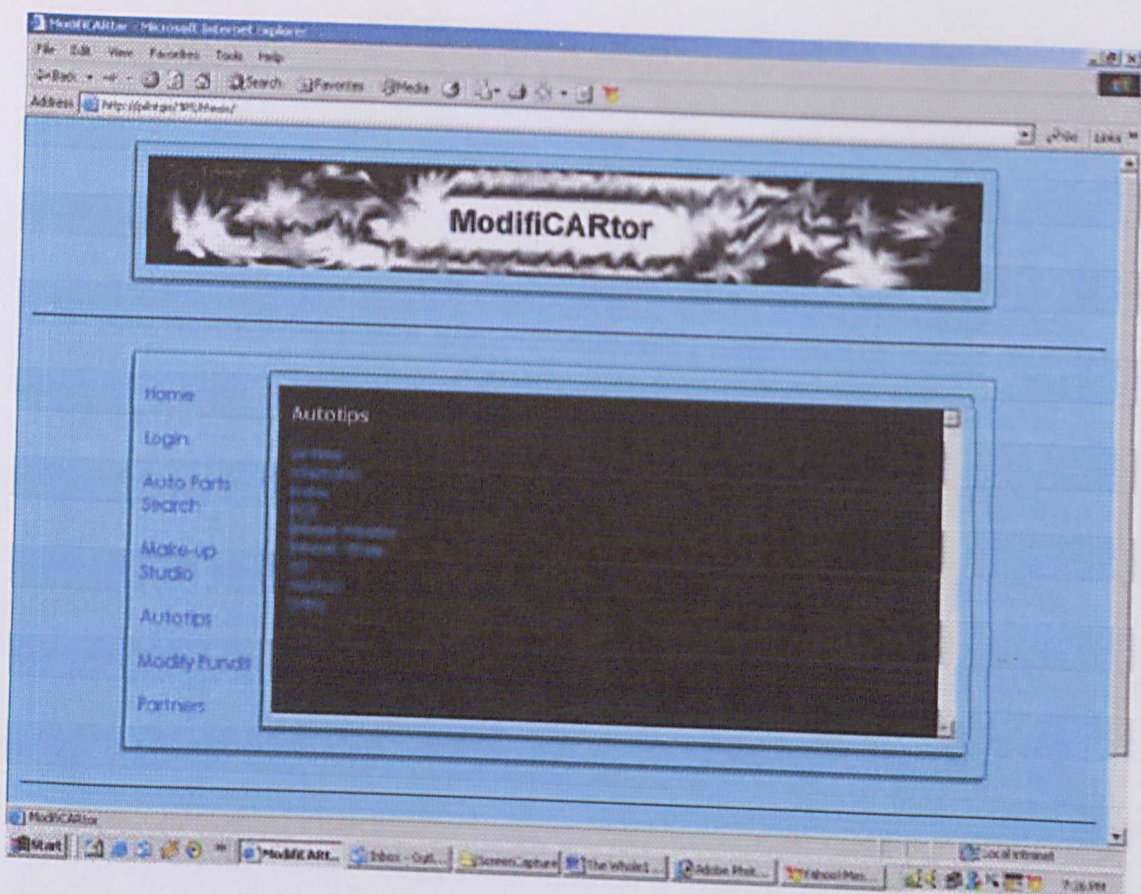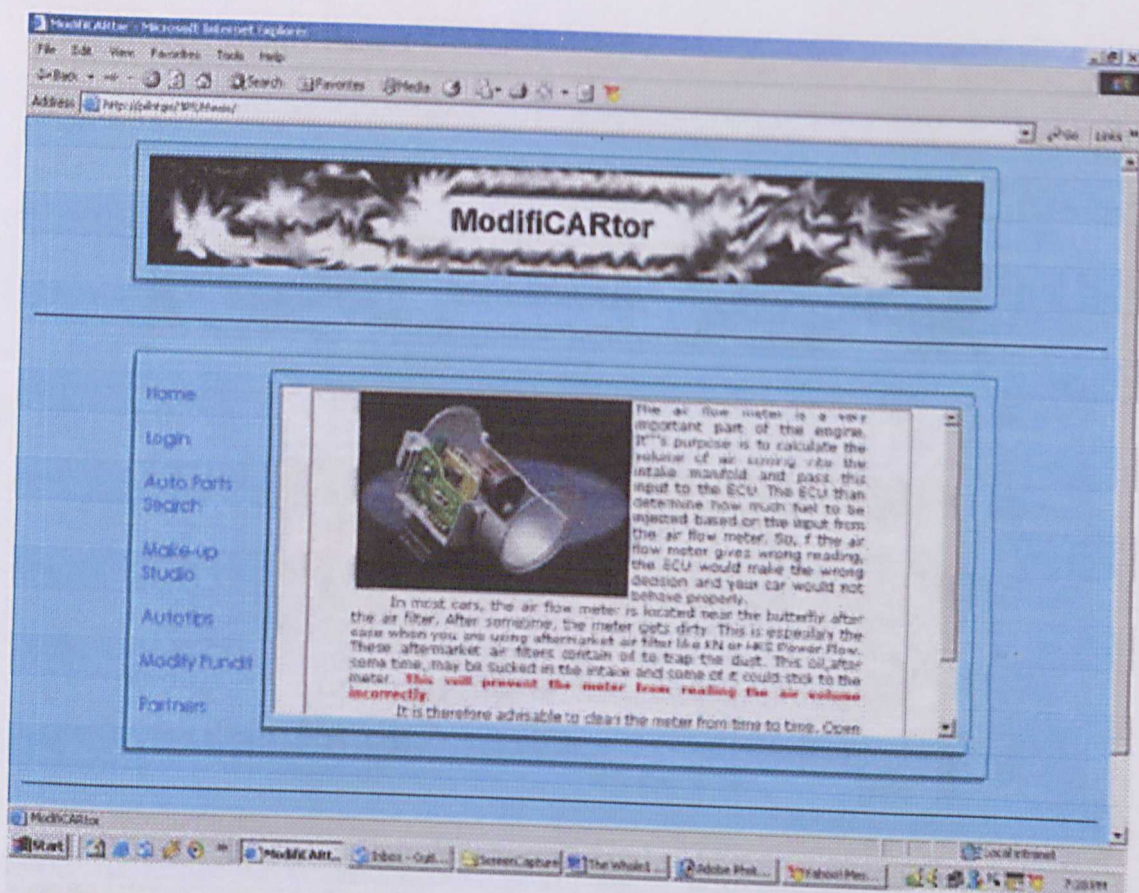
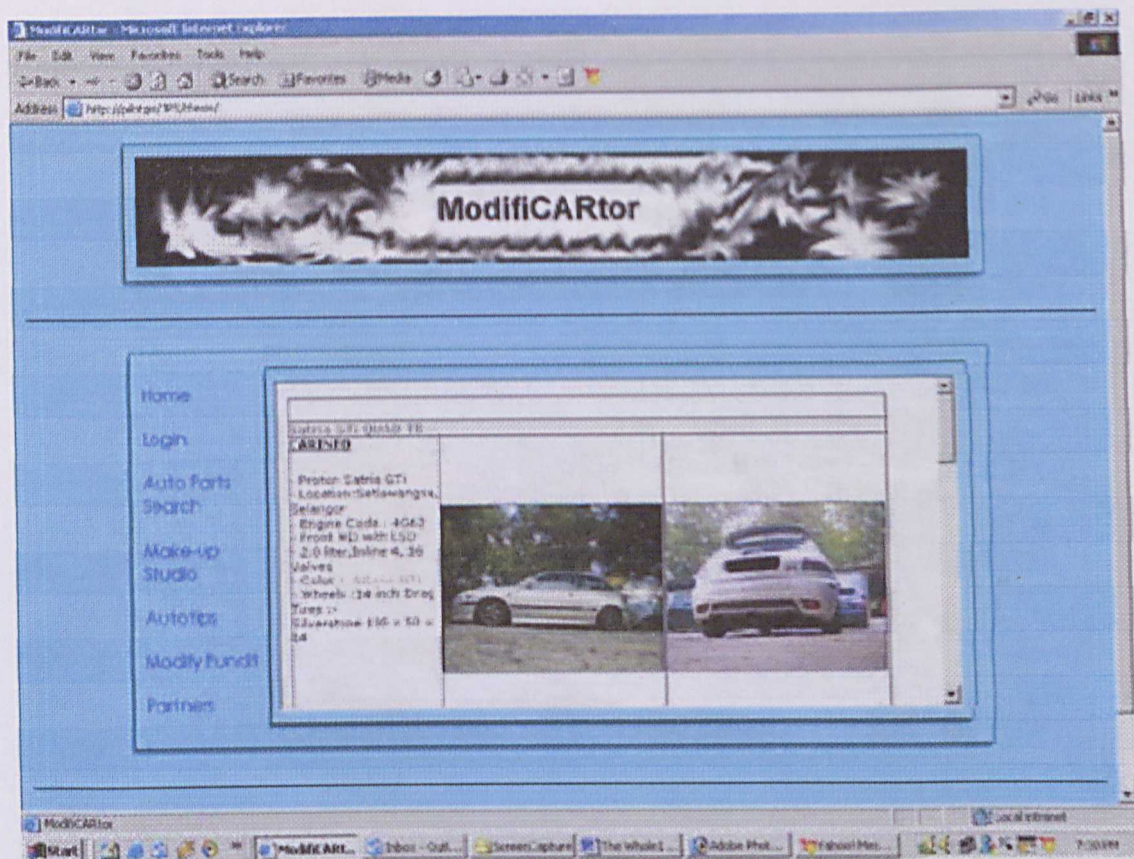From this menu user will be able to view some excellence modified car.

Main Menu – Modify Pundit

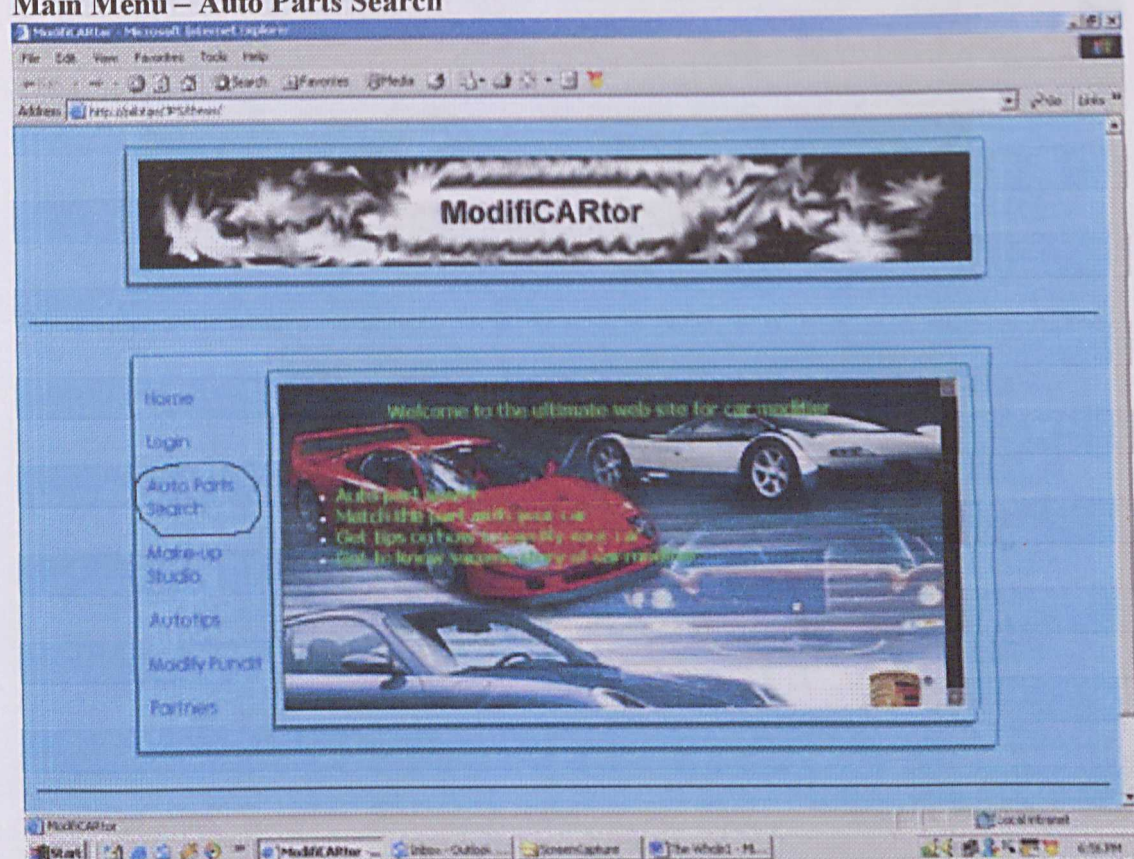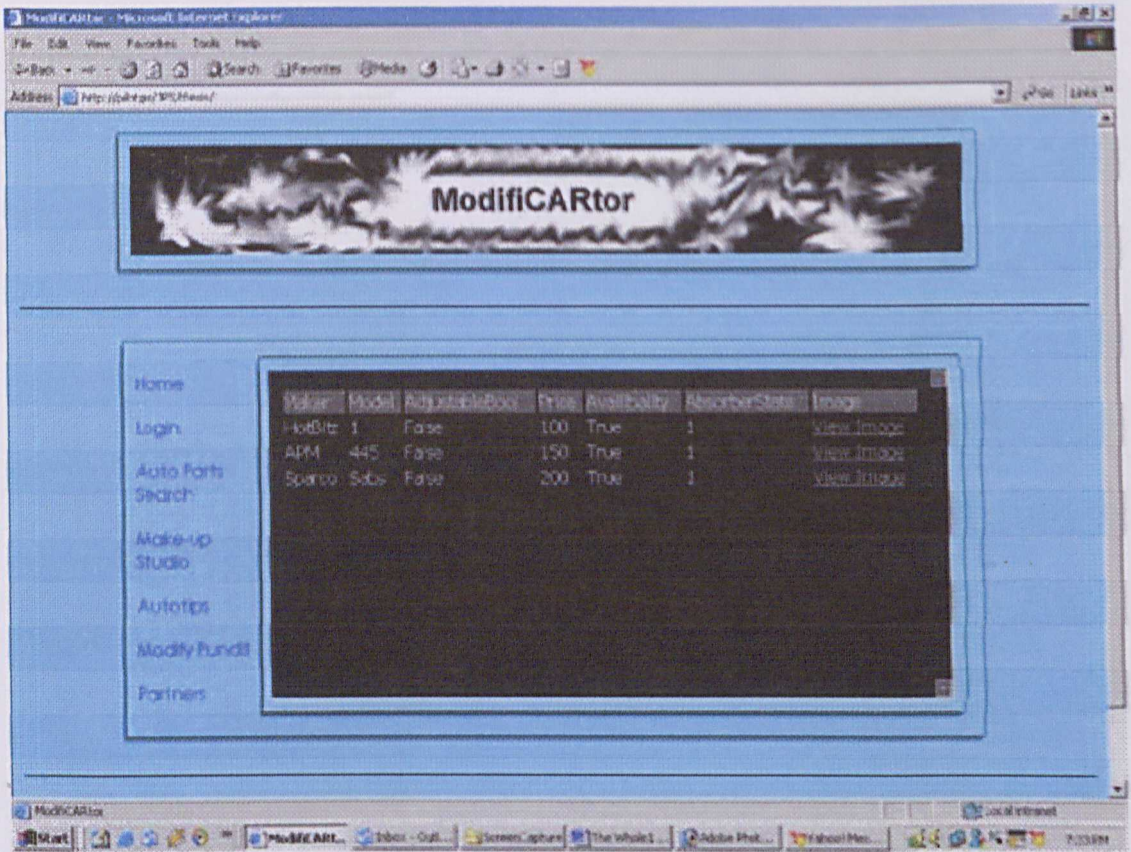From this menu user will be able to view some excellence modified car.

From this menu user will be able to search all part available through conventional search.

Main Menu – Auto Parts Search

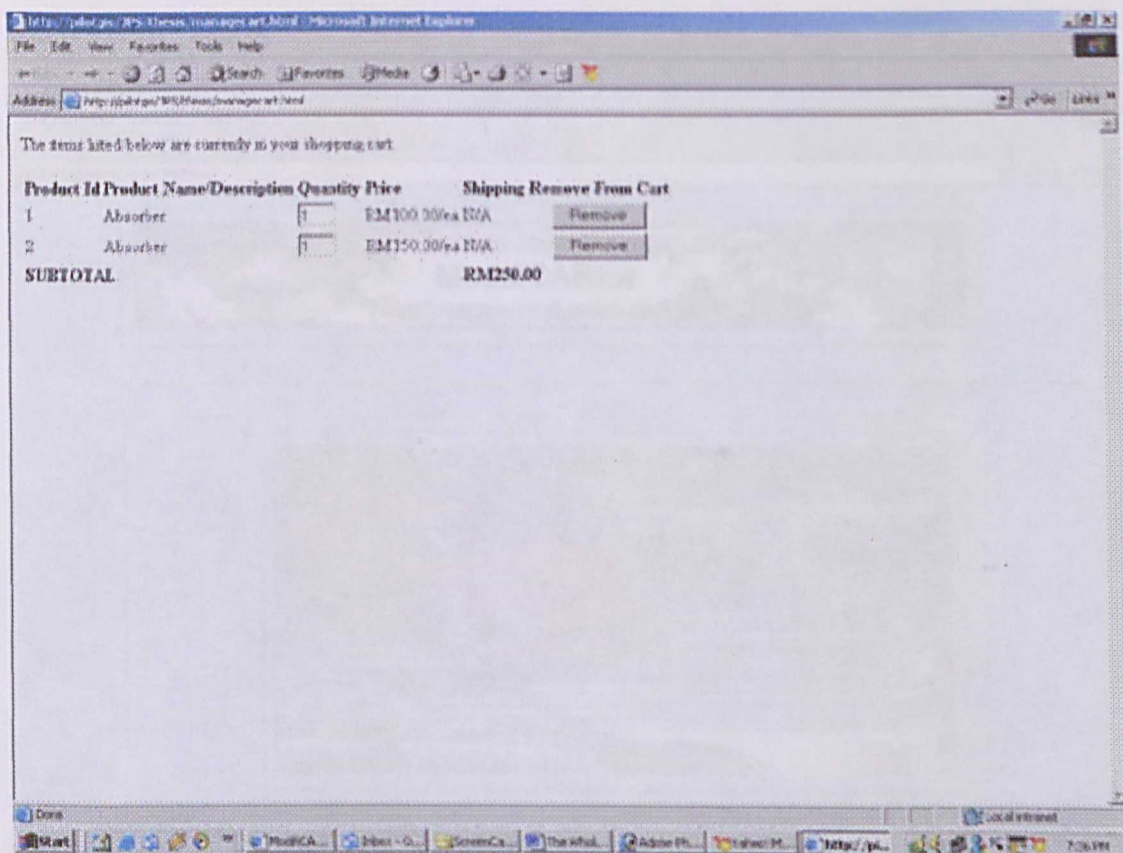From this menu user will be able to search all part available through conventional search.

For logged in user, user will have a cart service that make easier for them to calculate the price from what ever part they choose.
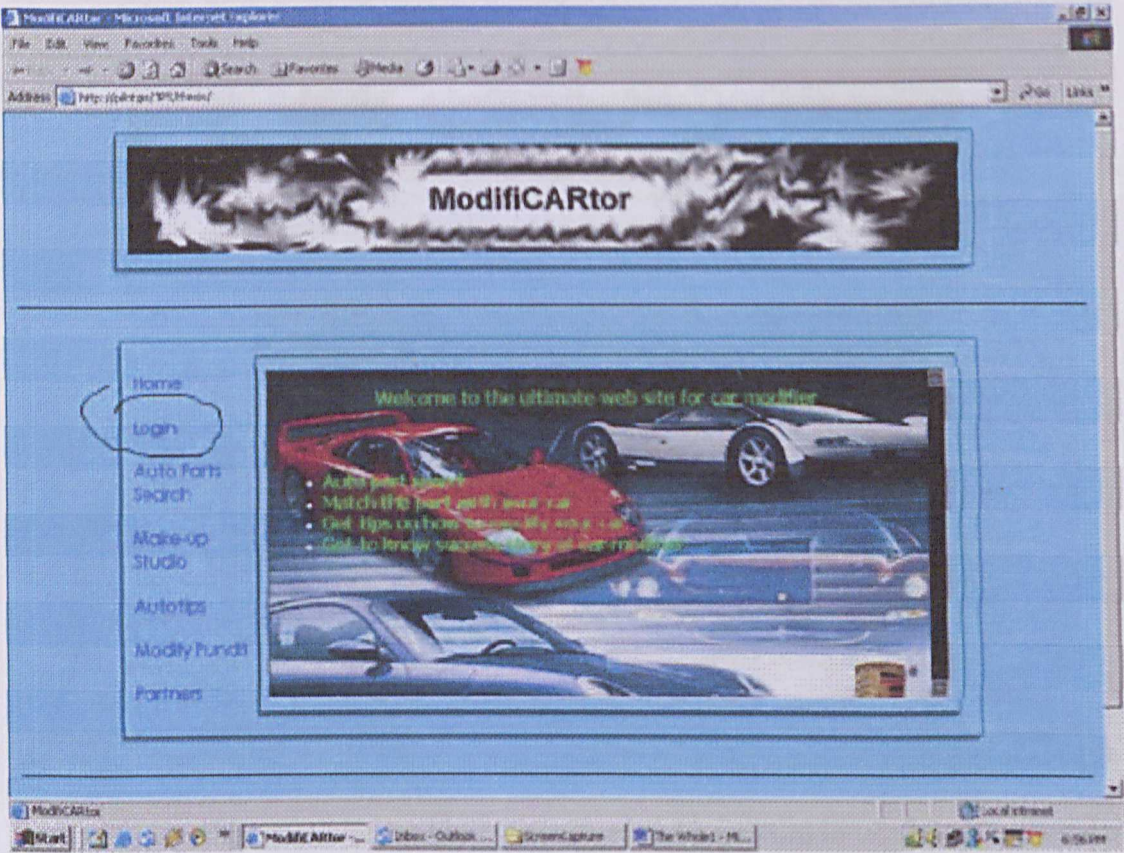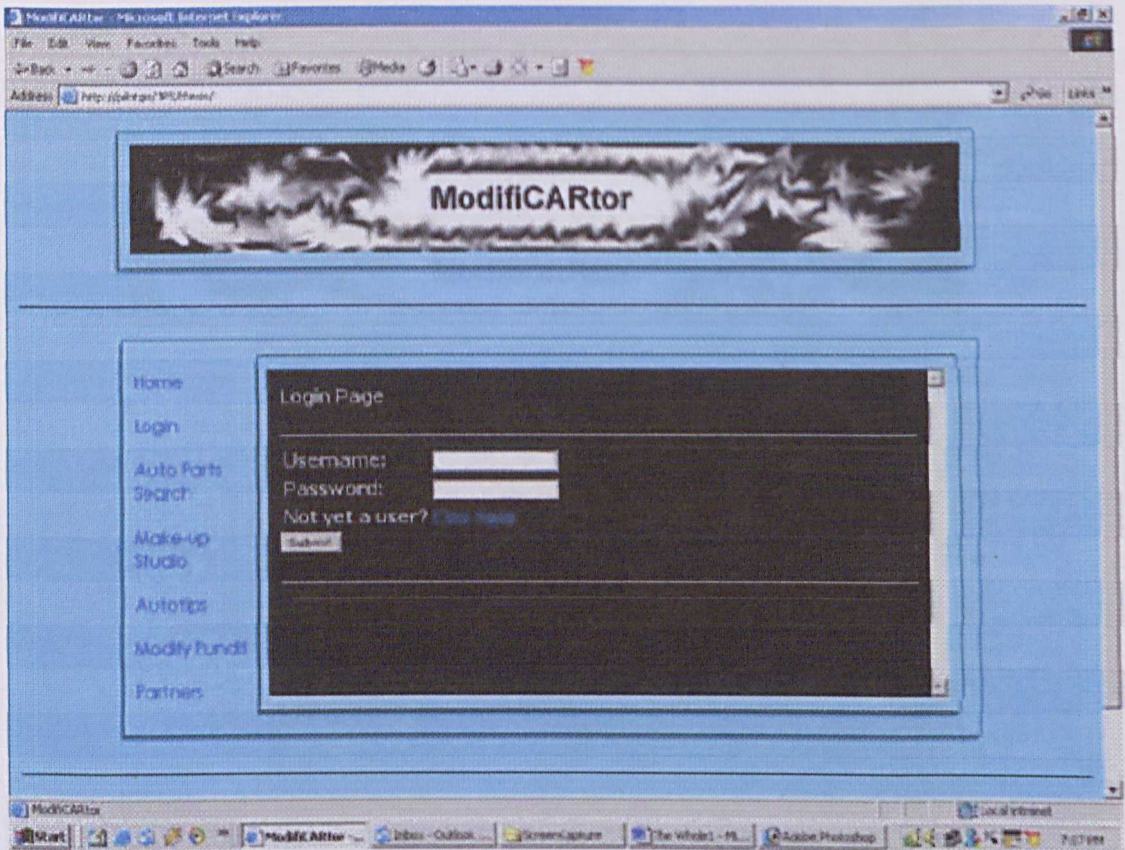
Main Menu - Login

User will be redirect to next page.

If user first time using the system they need to register and click "Click here" will

redirect them to register page.

User will enter user name in text box 'Username' and password in text box 'Password'.
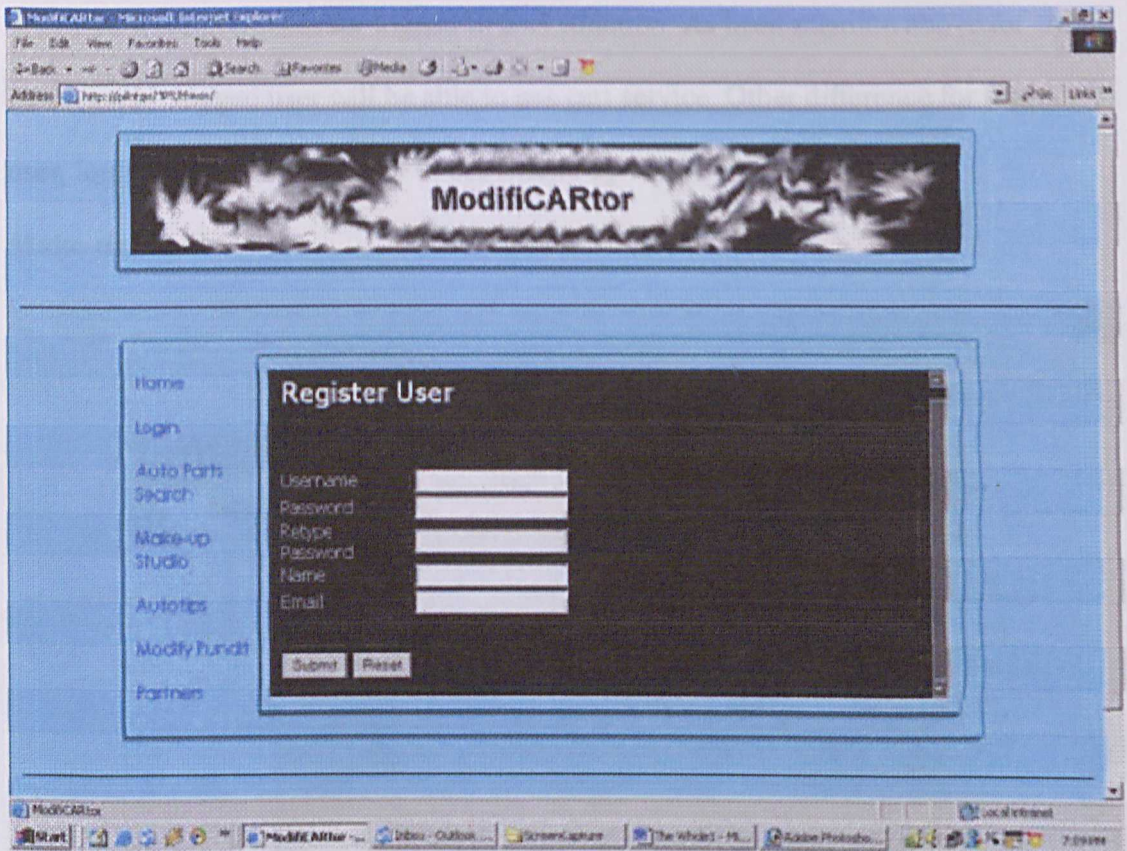
Then user can submit login when click button 'Submit'.

If user first time using the system they need to register and click 'Click here' will

redirect them to register page.

Register Page

User need to enter text box no 1 to 5 which are:-

- User name

- Password

- Password confirmation

- Name

- E-mail

After user fill the entire text box, user can submit application with click 'Submit' button.

User can also reset all text box by clicking button 'Reset'.

Logged in User Page

There's a few differences for logged in user function. As been mention above for 'Auto Part Search' logged user will be able to use cart service. Other difference for logged user, logged in user will be able to use 'Make-up Studio Page .

Make-up Studio Page

From user information, the existing car setup own by user will be displayed in table.

User can view their car by clicking view image and will be view in new window.

User also can set up by clicking 'Setup new car'

By clicking Setup column user can edit their existing car setup.

User also will be able to delete their existing car setup.

References

[1] Ivar Jacobson et al., *The Unified Software Development Process*, Addison-Wesley-Longman, Reading, MA (1999).

[2] Philippe Kruchten, *The Rational Unified Process -- An Introduction*, 2nd ed., Addison-Wesley-Longman, Reading, MA (2000).

[3] from www.udel.edu.

[4] definition from www.hyperdictionaty.com

Appendixes