MINI PROJECT

(2021-22)

"VEHICLE RENTAL SYSTEM"

Project Report

Institute of Engineering & Technology

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Declaration

I/we hereby declare that the work which is being presented in the Bachelor of technology. Project **"Vehicle Rental System"**, in partial fulfillment of the requirements for the award of the ***Bachelor of Technology*** in Computer Science and Engineering and submitted to the Department of Computer Engineering and Applications of GLA University, Mathura, is an authentic record of my/our own work carried under the supervision of **Mr. Akash Chaudhary, Technical Trainer, Dept. of CEA,GLA University.**

The contents of this project report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree.

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Certificate

This is to certify that the project entitled "Vehicle Rental System", carried out in Mini Project – I Lab, is a bonafide work by Abhinav Kumar Sharma, Chandra Priy Singh, Gautam Singh and Ayush Pandey and is submitted in partial fulfillment of the requirements for the award of the degree Bachelor of Technology (Computer Science & Engineering).

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ACKNOWLEDGEMENT

Presenting the ascribed project paper report in this very simple and official form, we would like to place my deep gratitude to GLA University for providing us the instructor Mr. Akash Chaudhary, our technical trainer and supervisor.

He has been helping us since Day 1 in this project. He provided us with the roadmap, the basic guidelines explaining on how to work on the project. He has been conducting regular meeting to check the progress of the project and providing us with the resources related to the project. Without his help, we wouldn't have been able to complete this project.

And at last but not the least we would like to thank our dear parents for helping us to grab this opportunity to get trained and also my colleagues who helped me find resources during the training.

Thanking You

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ABSTRACT

We developed this project to book a car on rent at the fare charges. In present system all booking work done manually and it takes very hard work to maintain the information of booking and cars. If you want to find which vehicle is available for booking then it takes a lot of time. It only makes the process more difficult and hard. This aim of the project is to automate the work performed in the car rental management system like generating daily bookings, records of car or cab available for booking, record of routes available, rental charges for cars for every rout, store record of the customer. Car rental management system is a car booking software that provides a complete solution to all your day-to-day car booking office running needs. This system helps you to keep the information of Customer online. You can check your customer information any time by using this system. Cab rental management system is a unique and innovative product. Using this this you can also keep the information of number of bookings in current month or in last 6 month or in last year. This helps you to track your business and you earning in particular month or in any year. Based on this information you can take decision regarding your business development.

In this framework we can procure bike and car rents. For travelling for more than 1-month you can hire a bike or car on rent. Seller will put their bicycles and bikes/cars on lease, the clients can choose the bikes/cars according to the accessibility, after choosing bike/car of their choice they can book and pay online. This rental system has three modules namely Admin, User and Vendor. Admin can login, can add, update and delete vendors information and also bikes list. He/she can view bookings, user and feedbacks given by users. Users can register on the website and then login, can check of availability of bikes and book the bike of his/her choice and pay accordingly. Vendor's can login, update and delete the bikes/car list and also can view bookings.

CHAPTER-1

INTRODUCTION TO ONLINE CAR RENTAL SYSTEM

1.1 Introduction

This project is designed so as to be used by Car Rental Company specializing in renting cars to customers. It is an online system through which customers can view available cars, register, view profile and book car.

1.2 Reason for the Project

The advancement in Information Technology and internet penetration has greatly enhanced various business processes and communication between companies (services provider) and their customers of which car rental industry is not left out. This E-Car Rental System is developed to provide the following services:

- Enhance Business Processes: To be able to use internet technology to project the rental company to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).
- Online Vehicle Reservation: A tools through which customers can reserve available cars online prior to their expected pick-up date or time.
- Customer's registration: A registration portal to hold customer's details, monitor their transaction and used same to offer better and improve services to them.
- Group bookings: Allows the customer to book space for a group in the case of weddings or corporate meetings (Event management).

1.3 Problem Statement

A car rental is a vehicle that can be used temporarily for a fee during a specified period. Getting a rental car helps people get around despite the fact they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who needs a car must contact a rental car company and contract out for a vehicle. This system increases customer retention and simplify vehicle and staff management.

1.4 Aims & Objectives

- To produce a web-based system that allow customer to register and reserve car online and for the company to effectively manage their car rental business.
- To ease customer's task whenever they need to rent a car.

1.5 Scope

This project traverses a lot of areas ranging from business concept to computing field, and required to perform several researches to be able to achieve the project objectives. The area covers include:

- Car rental industry: This includes study on how the car rental business is being done, process involved and opportunity that exist for improvement.
- PHP Technology used for the development of the application.
- General customers as well as the company's staff will be able to use the system effectively.
- Web-platform means that the system will be available for access 24/7 except when there is a temporary server issue which is expected to be minimal.

CHAPTER-2

CAR RENTAL SERVICES

2.1 How Car Rental Services Work

A car rental is a vehicle that can be used temporarily for a period of time with a fee. Renting a car assists people to get around even when they do not have access to their own personal vehicle or don't own a vehicle at all. The individual who want to rent a car must first contact the car rental company for the desire vehicle. This can be done online. At this point, this person has to supply some information such as; dates of rental, and type of car. After these details are worked out, the individual renting the car must present a valid Identification Card.

Most companies throughout the industry make a profit based of the type of cars that are rented. The rental cars are categorized into economy, compact, compact premium, premium and luxury. And customers are free to choose any car of their choice based on their purse and availability of such car at the time of reservation.

2.2 Benefits of Online Car Rental Services

- This online car rental solution is fully functional and flexible.
- It is very easy to use.
- This online car rental system helps in back office administration by streamlining and standardizing the procedures.
- It saves a lot of time, money and labour.
- Eco-friendly: The monitoring of the vehicle activity and the overall business becomes easy and includes the least of paper work.
- The software acts as an office that is open 24/7.
- It increases the efficiency of the management at offering quality services to the customers.
- It provides custom features development and support with the software.

CHAPTER-3

FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

3.1 Functional Requirements

Requirement analysis is a software engineering technique that is composed of the various tasks that determine the needs or conditions that are to be met for a new or altered product, taking into consideration the possible conflicting requirements of the various users.

Functional requirements are those requirements that are used to illustrate the internal working nature of the system, the description of the system, and explanation of each subsystem. It consists of what task the system should perform, the processes involved, which data should the system holds and the interfaces with the user. The functional requirements identified are:

a. Customer's registration: The system should allow new users to register online and generate membership card.
b. Online reservation of cars: Customers should be able to use the system to make booking and online reservation.
c. Automatic update to database once reservation is made or new customer registered: Whenever there's new reservation or new registration, the system should be able update the database without any additional efforts from the admin.
d. Feedbacks to customers: It should provide means for customers to leave feedback.

3.2 Non-Functional Requirements

It describes aspects of the system that are concerned with how the system provides the functional requirements. They are:

a. Security**:** The subsystem should provide a high level of security and integrity of the data held by the system, only authorized personnel of the company can gain access to the company's secured page on the system; and only users with valid password and username can login to view user's page.
b. Performance and Response time: The system should have high performance rate when executing user's input and should be able to provide feedback or response within a short time span usually 50 seconds for highly complicated task and 20 to 25 seconds for less complicated task.
c. Error handling: Error should be considerably minimized and an appropriate error message that guides the user to recover from an error should be provided. Validation of user's input is highly essential. Also the standard time taken to recover from an error should be 15 to 20 seconds.
d. Availability: This system should always be available for access at 24 hours, 7 days a week. Also in the occurrence of any major system malfunctioning, the system should be available in 1 to 2 working days, so that the business process is not severely affected.
e. Ease of use: Considered the level of knowledge possessed by the users of this system, a simple but quality user interface should be developed to make it easy to understand and required less training.

CHAPTER-4

DATA FLOW DIAGRAMS

4.1 Data Flow Diagram (DFD)

A Data Flow Diagram (DFD) is a graphical representation that depicts the information flow and the transforms that are applied as data moves from input to output.

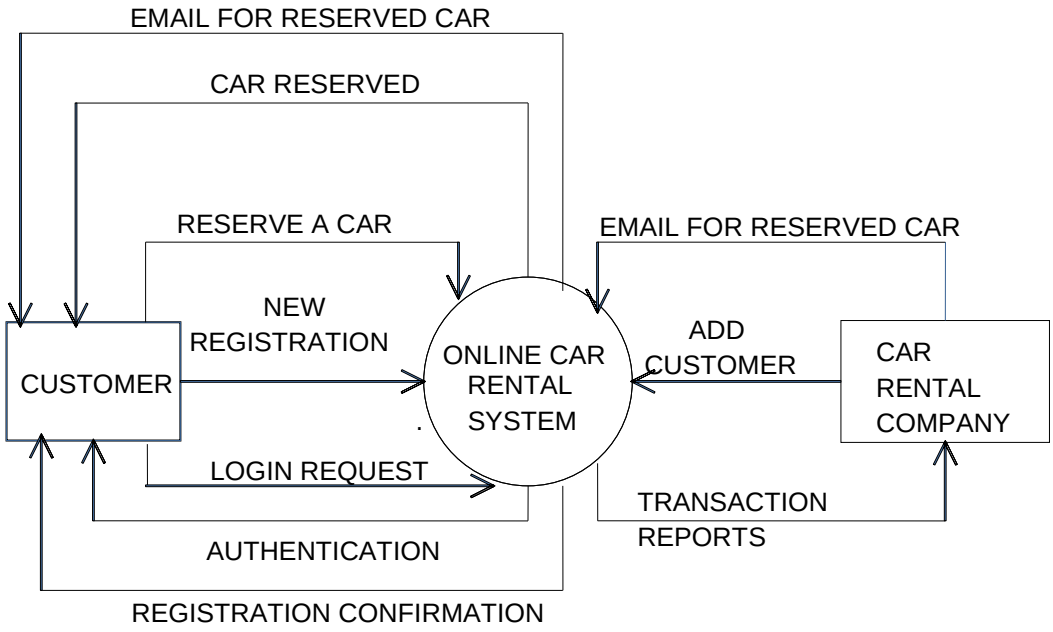

Figure 4.1 Level 0 DFD of Online Car Rental System

In this diagram, Customer and Car Rental Company are the two entity sets.

Functions of Customer:

- New Registration
- Login Request
- Registration Confirmation by the System
- Reserve Car

- Car Issued by the System
- Email received for Reserved Car

Functions of Car Rental Company:

- Add Customer
- Send E-Mails for Reserved Car
- View Transaction reports

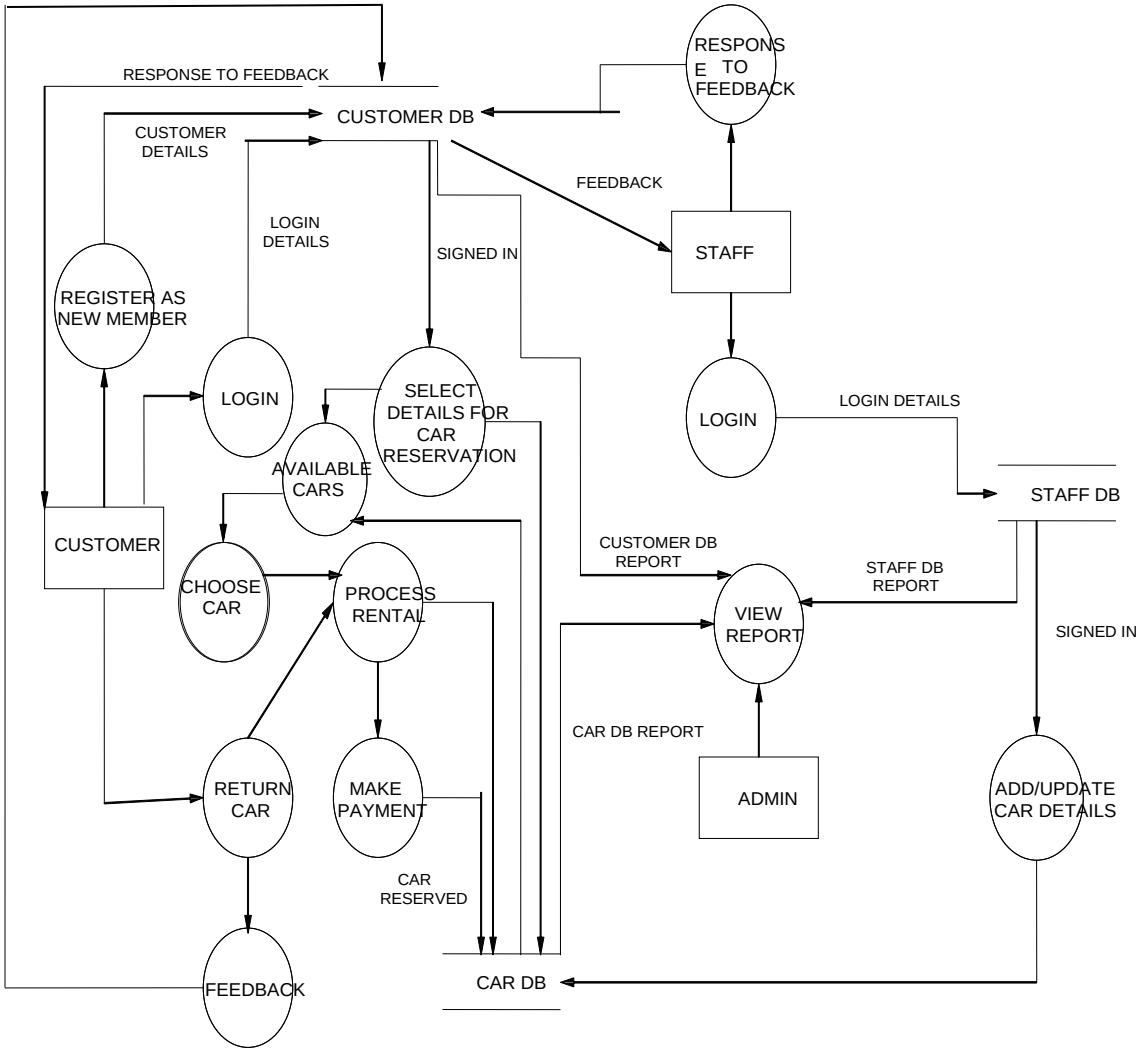

Figure 4.2 Level 1 DFD of Online Car Rental System

CHAPTER-5

USE-CASE DIAGRAMS

5.1 Actor and Use Case Description

Actor and use case description shows the detail description of interaction between the actors and their use cases. The description enables to have a proper understanding of how actor interacts with the system through their use cases.

Actor	**Use Case**	**Use Case Description**
Customer	Register as member	This use case describes the activities of the customer to register online and become a member. Customer's details are required as part of the registration. Login detail is automatically sent to the customer after successful registration.
	Make reservation	This use case enable customer to search and make reservation. Non-register customer will be directed to register before their reservation can be confirmed. Notification is automatically send to the customer after the task is completed.
	Return car	This use case describes the event of customer returning the car borrowed, the use case extends "process rental" use case from the staff actor.
	Give feedback	This use case is used by the customer to provide feedbacks/comment to the company; a confirmation notification will be send to the customer once a feedback has been submitted.

Staff	Add new car	This use case is used by the staff to add new car to the company's fleet database. Staff will need to login to activate this use case.
	Update car details	This use case is used by the staff to edit and modify car details whenever there is new renewal (insurance, road tax). It allows the company to keep up-to-date record of their fleet.
	Reply to customer’s feedback	This use case describes the event by which staff sends reply to customer's earlier feedback. It depends on `give feedback' use case from the customer.
	Process rental	This use case described the event by which staff updates the system when customer pick up or when returning car.
Admin	Add new staff	This use case describes the event by which Admin add new staff detail to the company's staff database. It is invoke whenever a new staff join the company.
	View report	This use case is used by the Admin to view transaction report.

Table 5.1 Actors and Use Case Description

5.2 Use Case Diagram

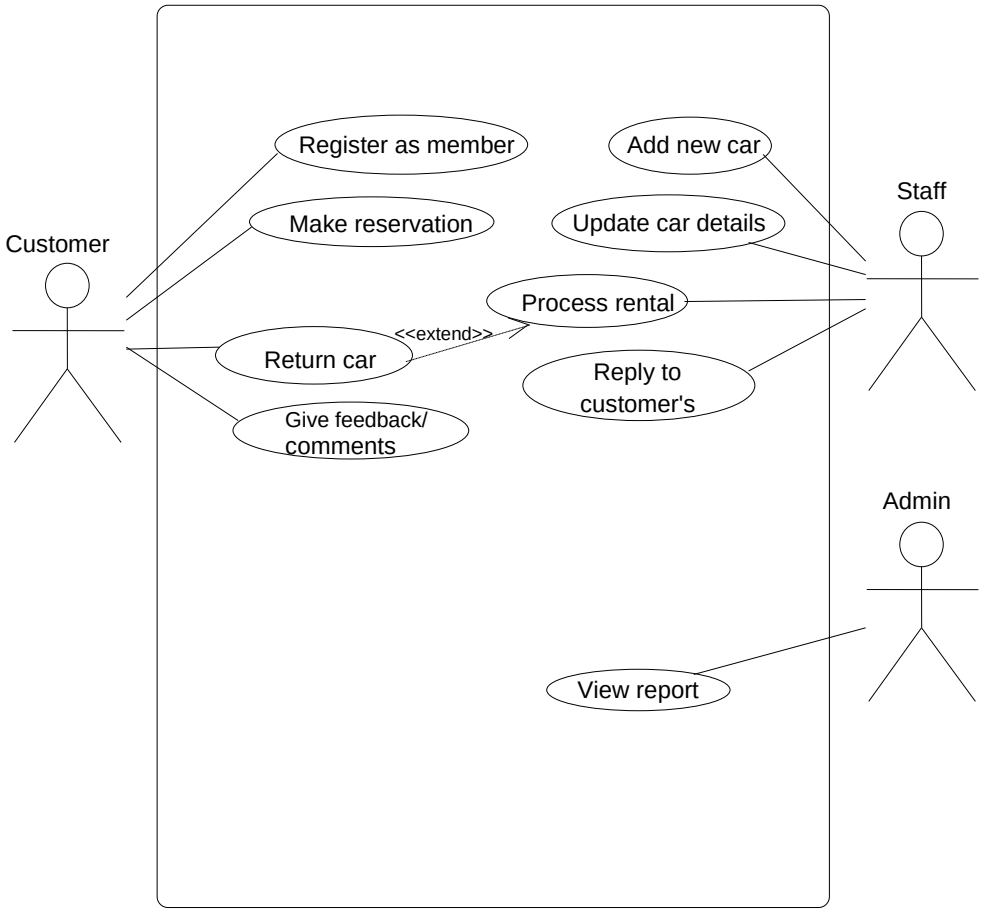

Figure 5.1: E-Car Rental System [use case]

5.3 Use-Case Dependency Diagram

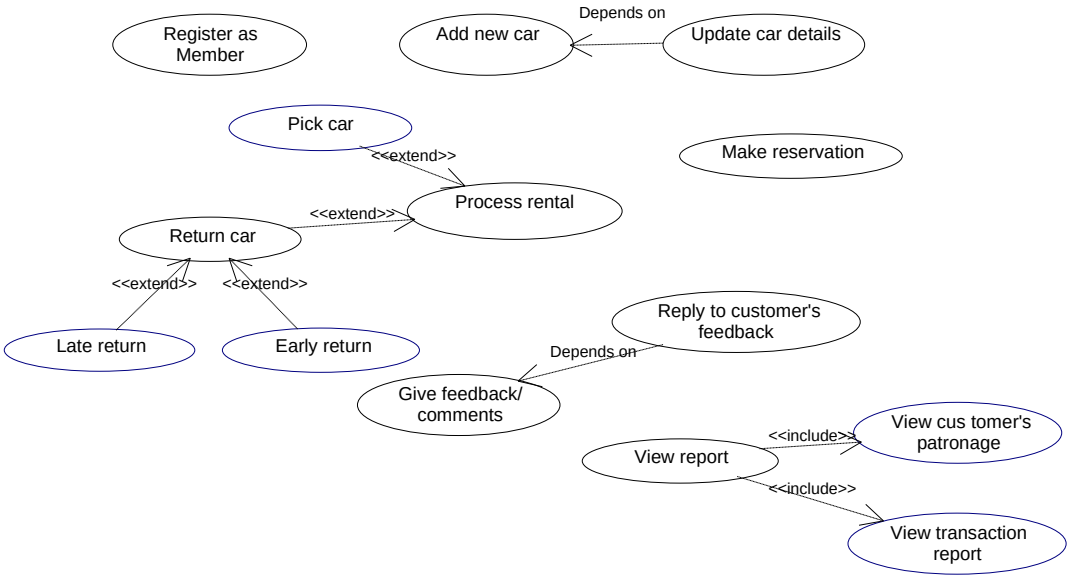

Figure 5.2: Use Case Dependency Diagram

CHAPTER-6

ACTIVITY DIAGRAMS

6.1 Activity Diagram

Activity diagrams graphically represent the sequential business and operational workflows of a system. It is a dynamic diagram that shows the activity and the event that causes the object to be in the particular state. The workflows from activity diagram will serve as guide for system navigation in the final design phase of the system.

6.1.1 Member Registration

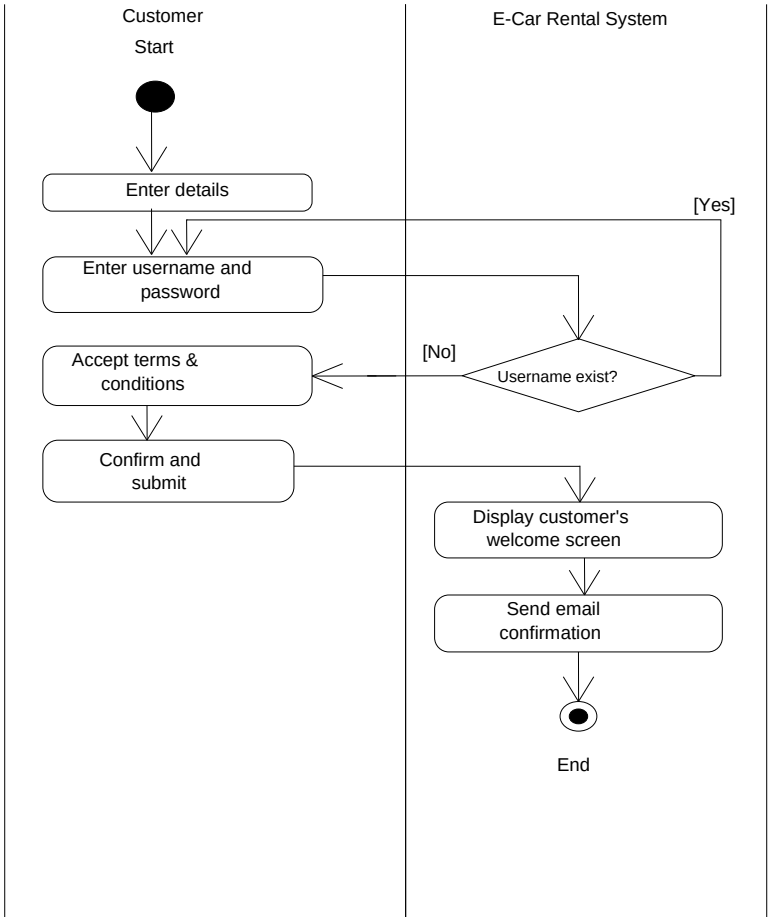

Figure 6.1: Register as member

6.1.2 Profile Modification

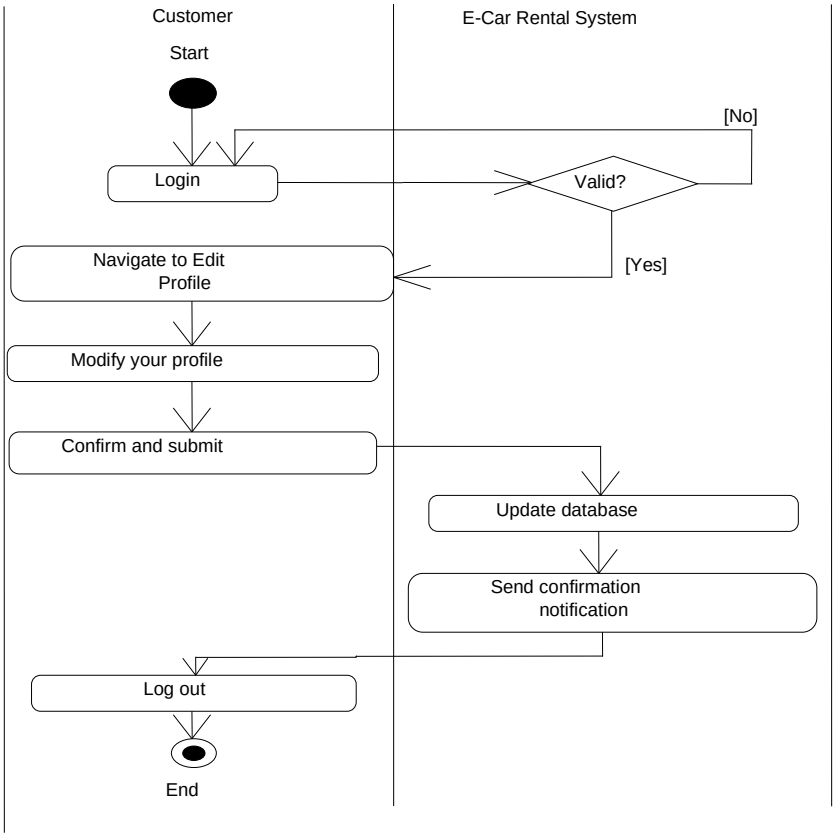

Figure 6.2: Modify profile

6.1.3 Reservation of Car

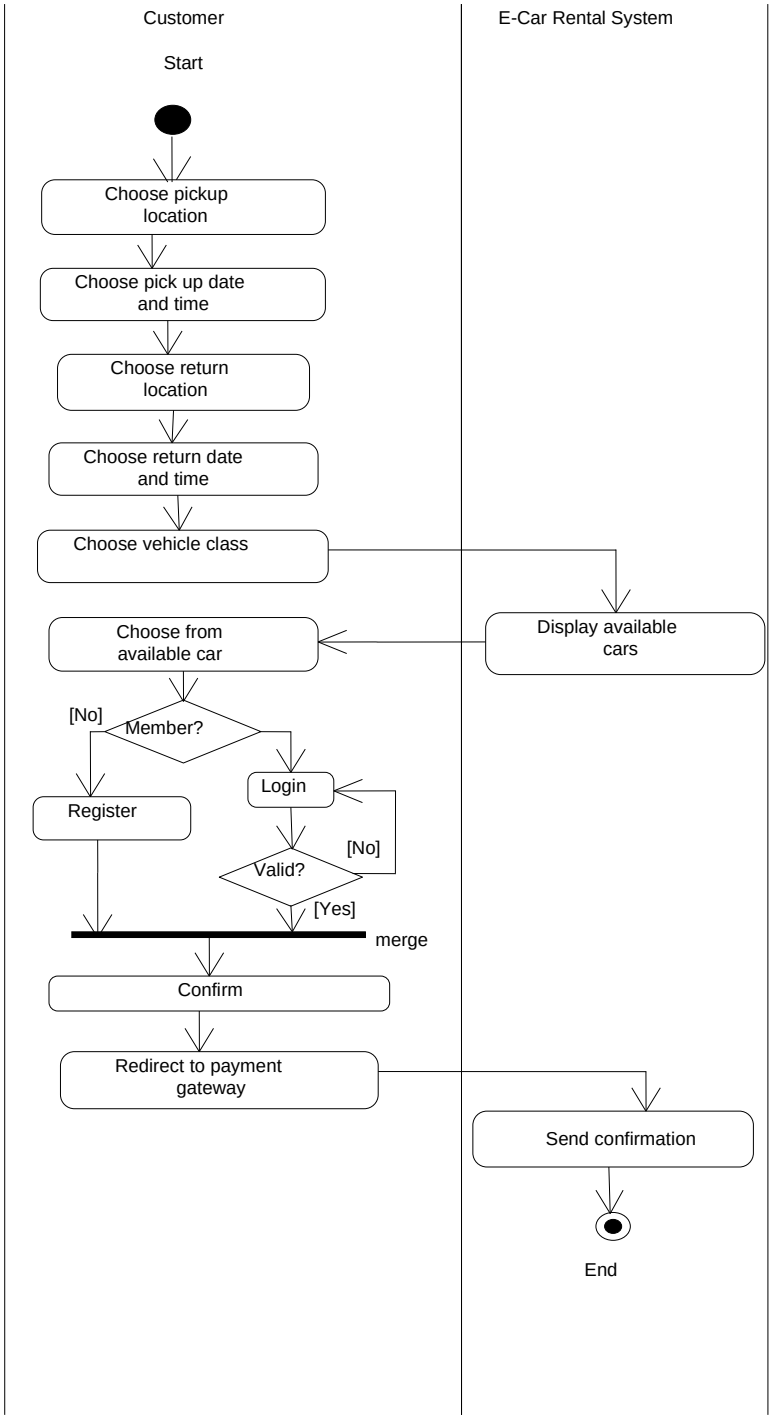

Figure 6.3: Make Reservation

6.1.4 Customer Feedback

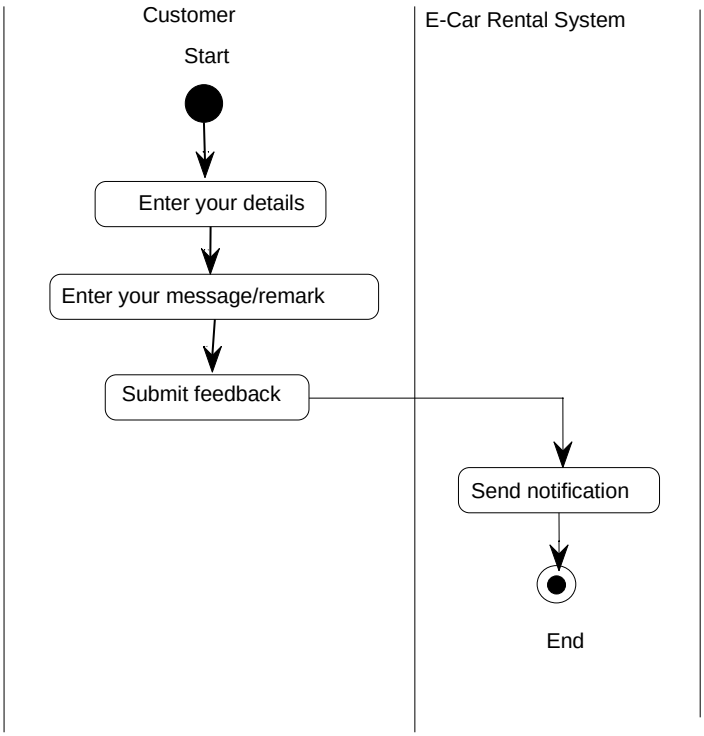

Figure 6.4: Give feedback/comment

6.1.5 Payment of Car Rent

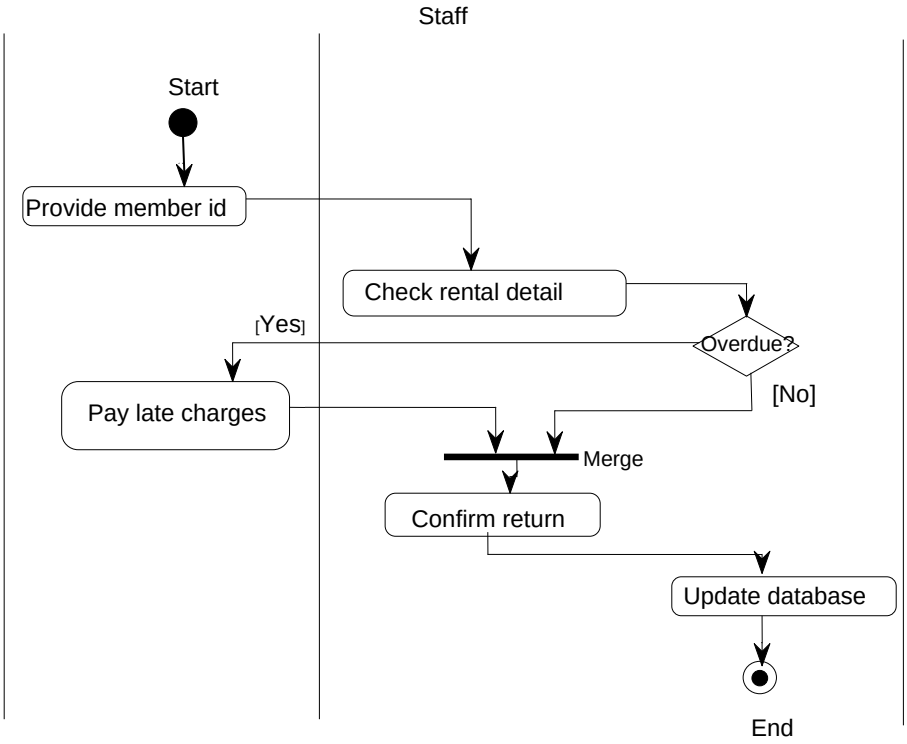

Figure 6.5: Rent a Car

6.1.6 Adding a New Car

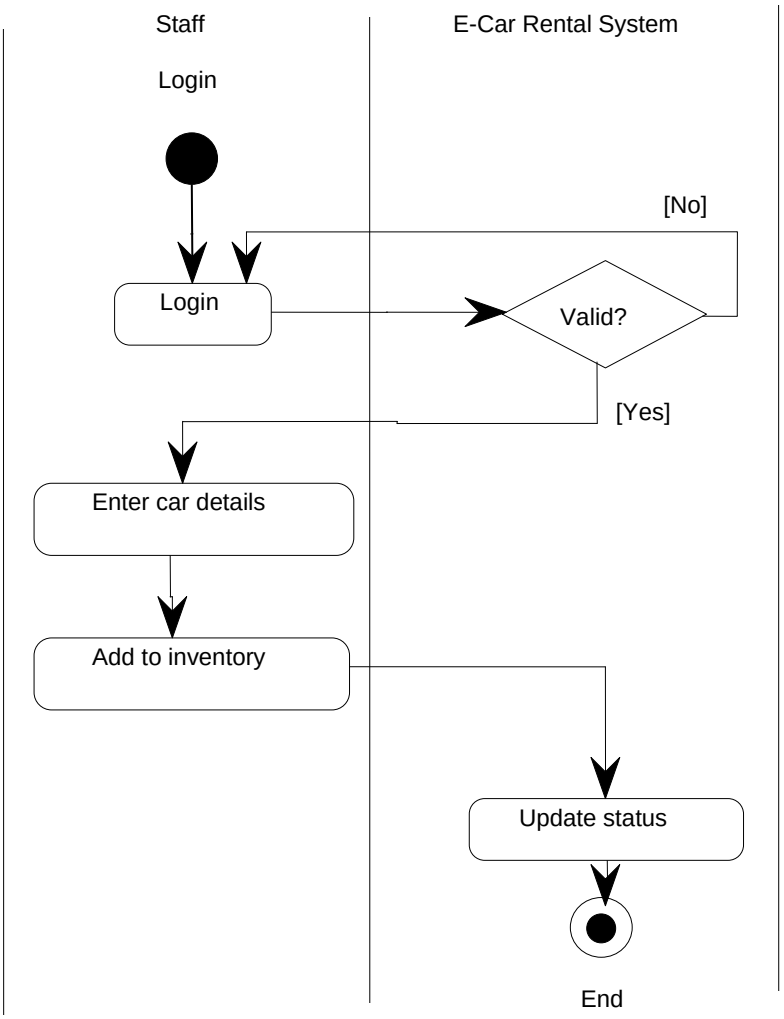

Figure 6.6: Add a New Car

6.1.7 View Report

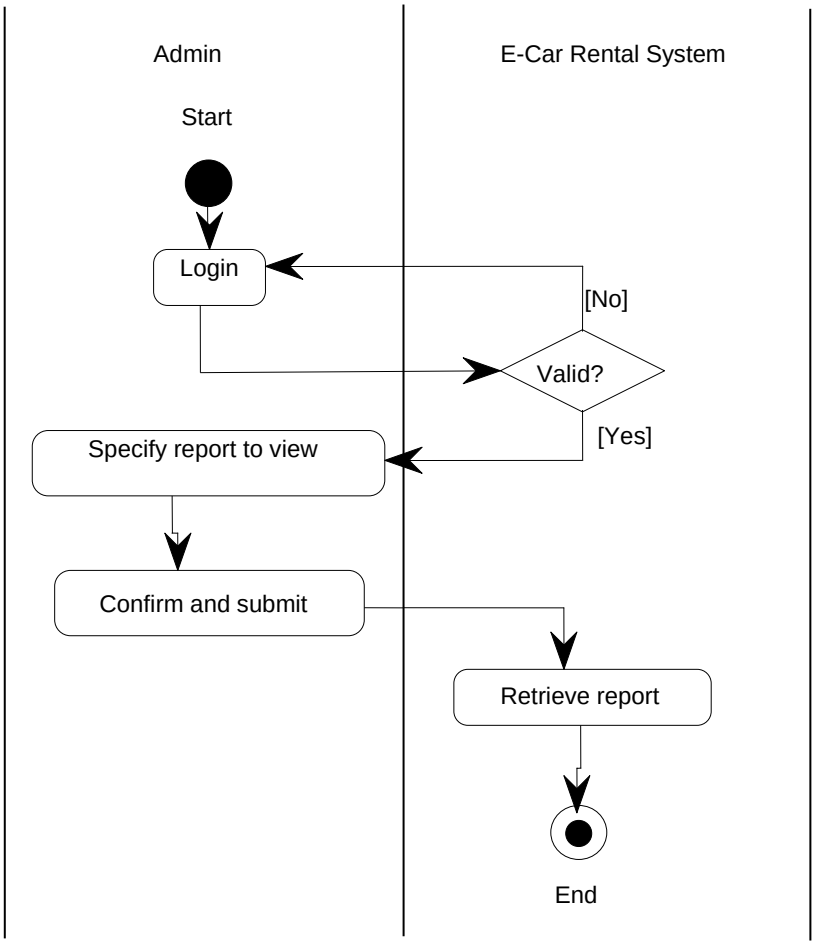

Figure 6.7: View report

CHAPTER-7

SEQUENCE DIAGRAMS

7.1 Sequence Diagram

Sequence diagrams are used to demonstrate the behavior of objects in a use case by describing the objects and the messages they pass. It provides a graphical representation of object interactions over time. Sequence diagrams show an actor, the objects and components they interact with in the execution of a use case. One sequence diagram represents a single Use Case 'scenario' or events. Sequence diagrams show the flow of messages from one object to another, and as such correspond to the methods and events supported by an object.

7.1.1 Member Registration

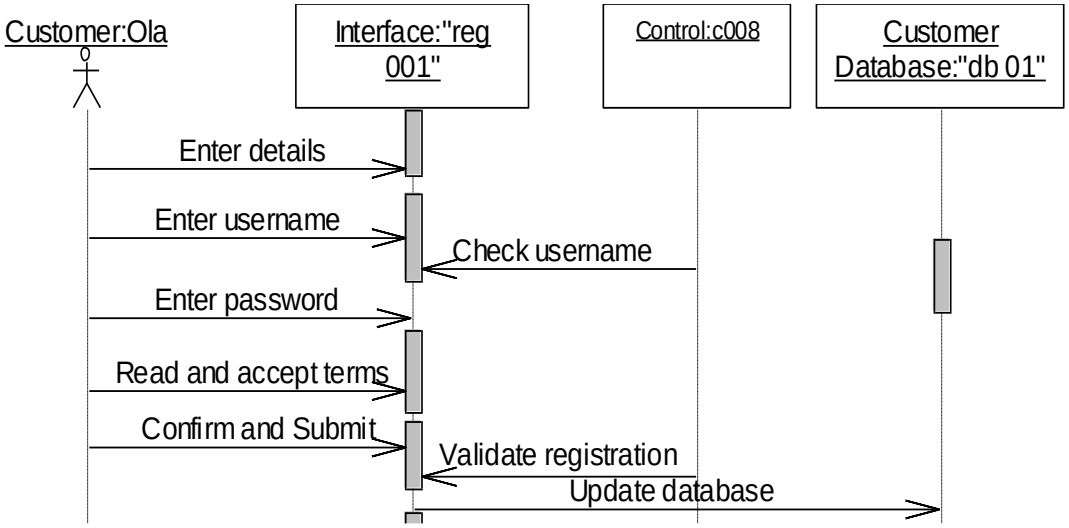

Figure 7.1: Register as member

7.1.2 Reservation of Car

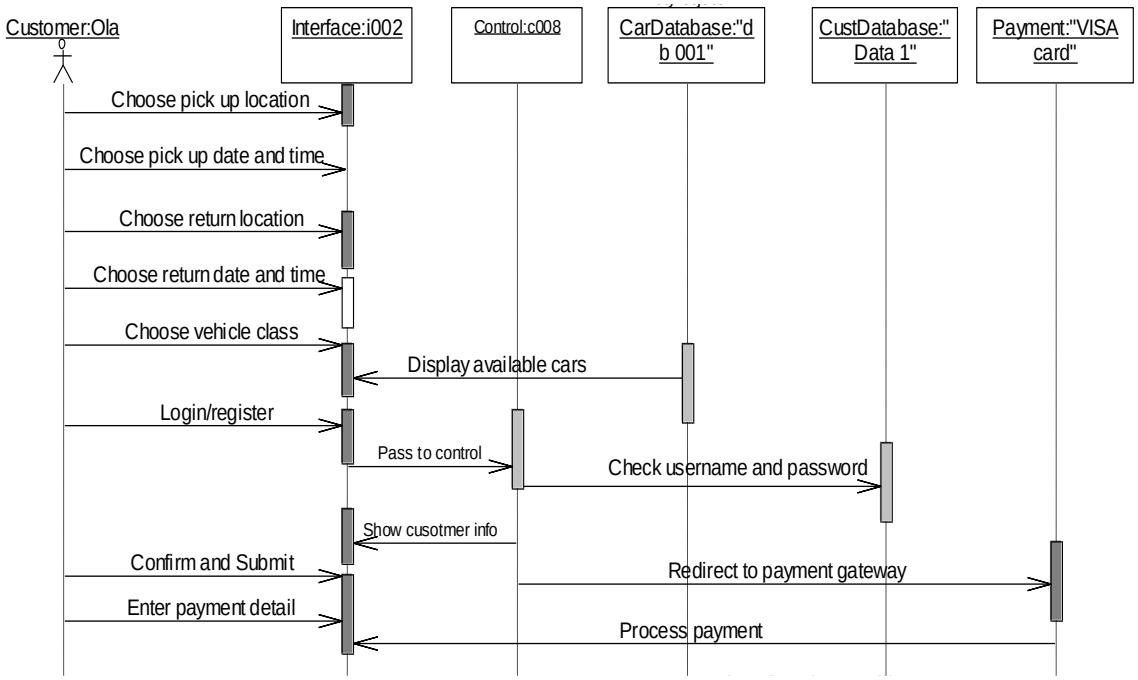

Figure 7.2: Make reservation

7.1.3 Customer Feedback

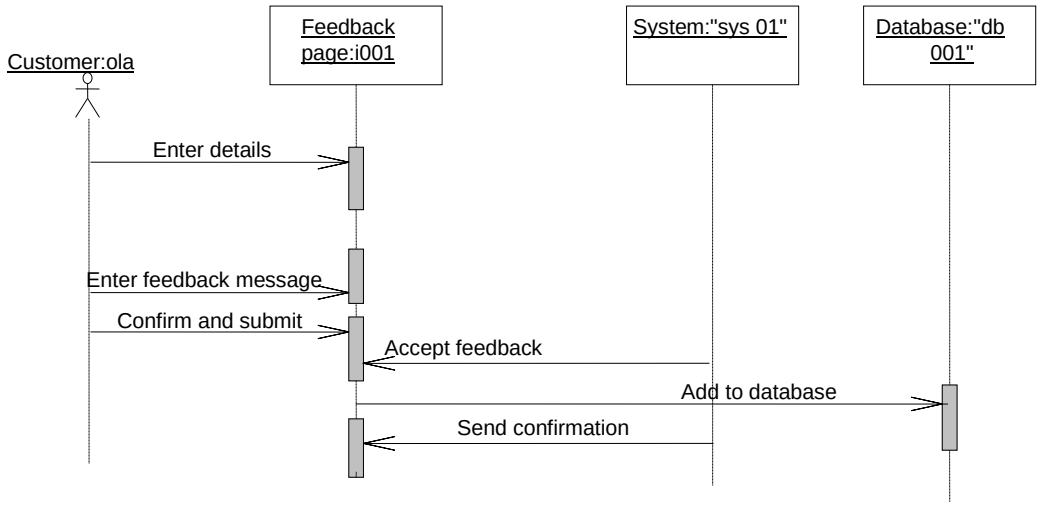

Figure 7.3: Give feedback

7.1.4 Adding a New Car

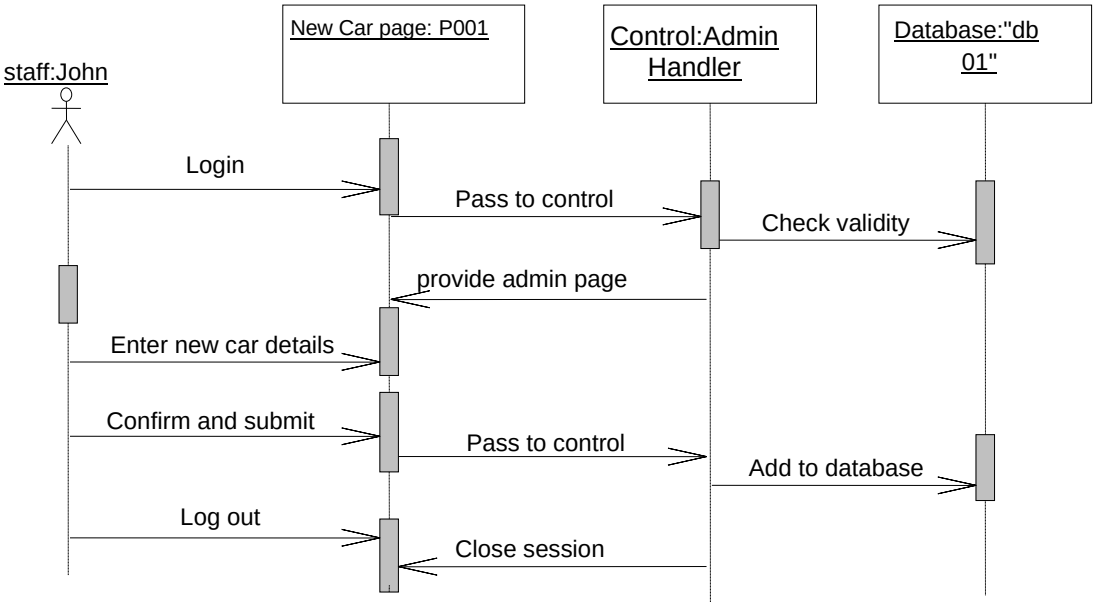

Figure 7.4: Add new car

7.1.5 Feedback Response

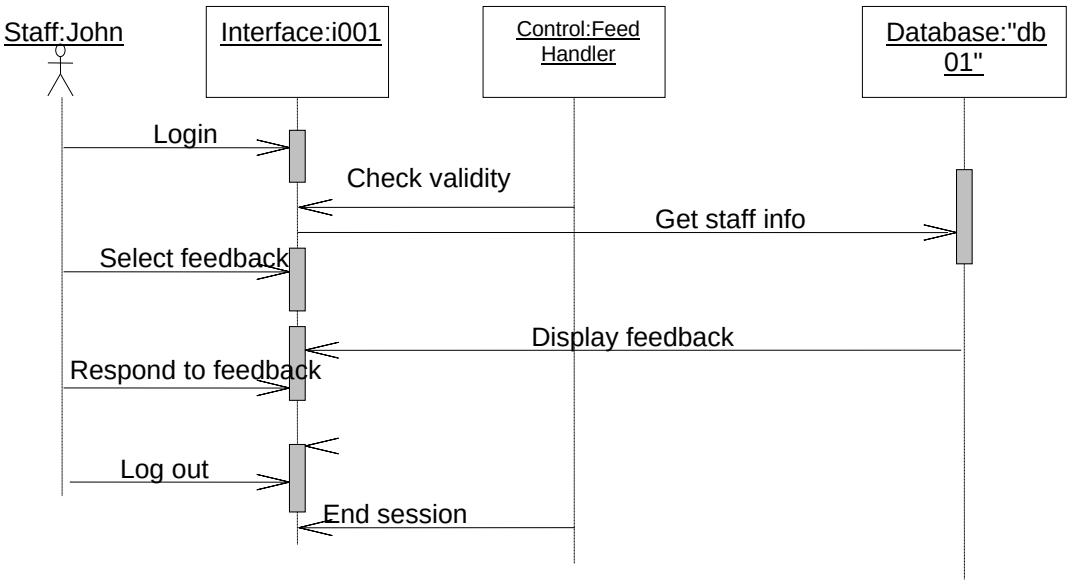

Figure 7.5: Respond to feedback

7.1.6 Return Car and Check Rental Details

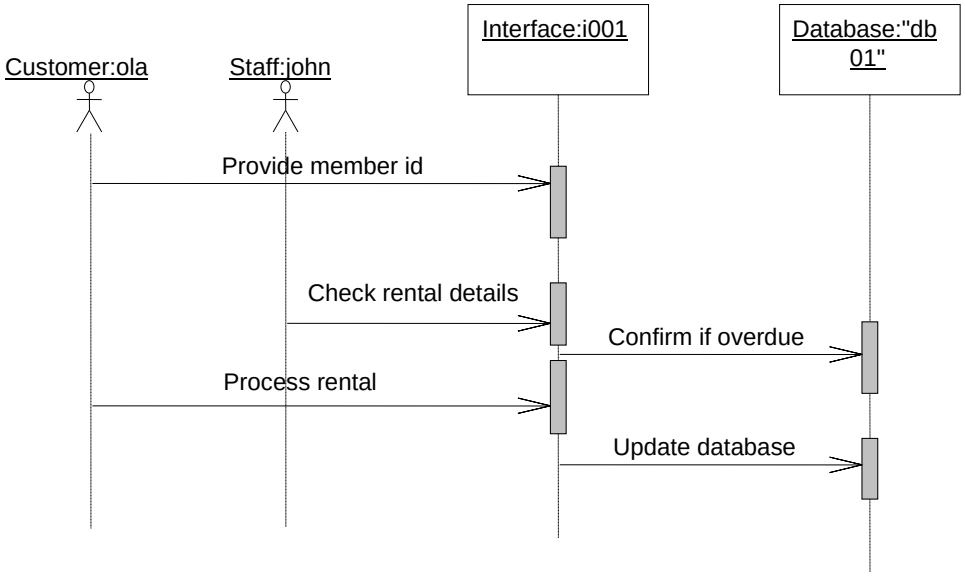

Figure 7.6: Return car

7.1.7 View Report

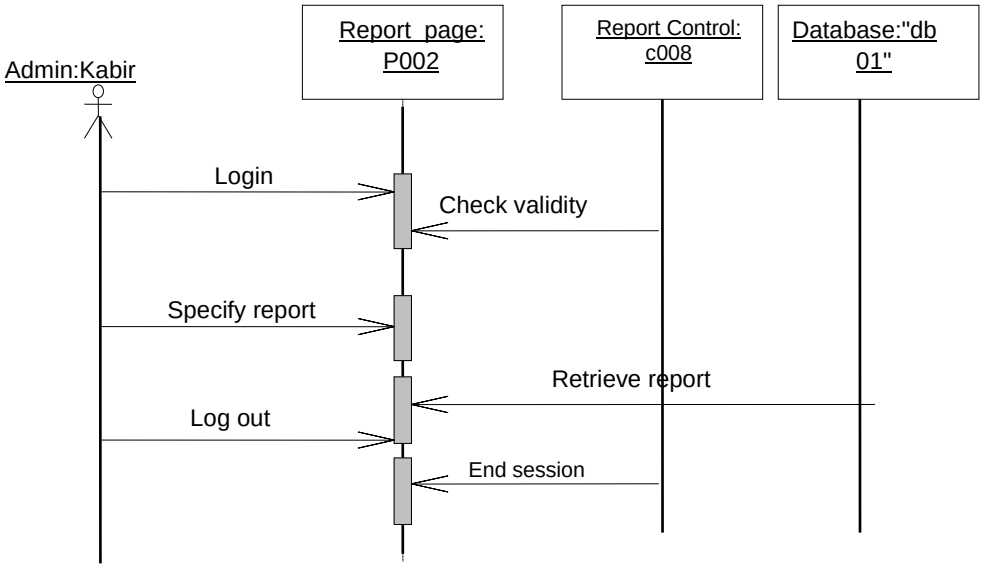

Figure 7.7: View report

CHAPTER-8

CLASS DIAGRAM

8.1 Class Diagram

The class diagram is the main building block, a number of classes are identified and grouped together in a class diagram which helps to determine the statically relations between those objects.

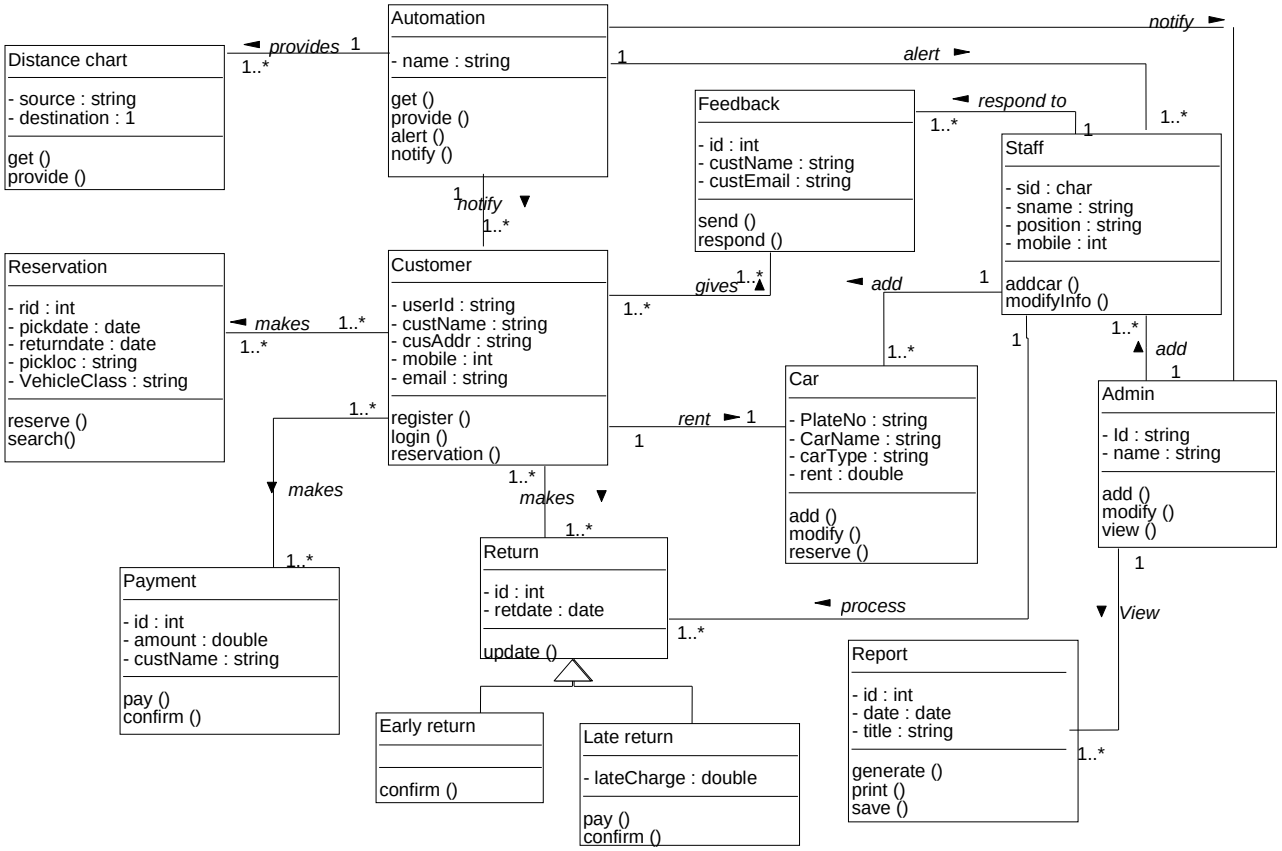

Figure 8.1 Class Diagram of Online Car Rental System

CHAPTER-9

INTRODUCTION OF TECHNOLOGIES USED IN PROJECT

9.1 About PHP

PHP: Hypertext Pre-processor is a widely used, general-purpose scripting language that was originally designed for web development to produce dynamic web pages. For this purpose, PHP code is embedded into the HTML source document and interpreted by a web server with a PHP processor module, which generates the web page document.

As a general-purpose programming language, PHP code is processed by an interpreter application in command-line mode performing desired operating system operations and producing program output on its standard output channel. It may also function as a graphical application. PHP is available as a processor for most modern web servers and as standalone interpreter on most operating systems and computing platforms.

PHP was originally created by Rasmus Lerdorf in 1995 and has been in continuous development ever since. The main implementation of PHP is now produced by the PHP Group and serves as the *de facto* standard for PHP as there is no formal specification. PHP is free software released under the PHP License.

PHP is a general-purpose scripting language that is especially suited to server-side web development where PHP generally runs on a web server. Any PHP code in a requested file is executed by the PHP runtime, usually to create dynamic web page content. It can also be used for command-line scripting and client-side GUI applications. PHP can be deployed on most web servers, many operating systems and platforms, and can be used with many relational database management systems. It is available free of charge, and the PHP Group provides the complete source code for users to build, customize and extend for their own use.

Originally designed to create dynamic web pages, PHP now focuses mainly on server-side scripting, and it is similar to other server-side scripting languages that provide dynamic content from a web server to a client, such as Microsoft's Active Server Pages, Sun Microsystems' Java Server Pages, and mod_perl. PHP has also attracted the development of many frameworks that provide building blocks and a design structure to promote rapid application development (RAD). Some of these include CakePHP, Symfony, CodeIgniter and Zend Framework, offering features similar to other web application frameworks.

9.2 PHP Syntax:

HTML and PHP code is written on the same page, and to distinguish PHP code from HTML, the PHP code is enclosed within <? php ?> Tags.

For example:

```
<html>

<head><title>php basics</title></head>

<body>

<h2>HELLO</h1>

<?php

 echo "hello";

?>

</body>

</html>
```

In the above example PHP code is embedded within HTML. In this way PHP and HTML coding is combined on the same page.

Since PHP is a server side scripting language, the PHP coding cannot be seen by the end user through view source option, due to this feature PHP is very secure.

PHP is a parsed language; therefore PHP environment is necessary at the server for running PHP scripts.

9.3 Working of PHP:

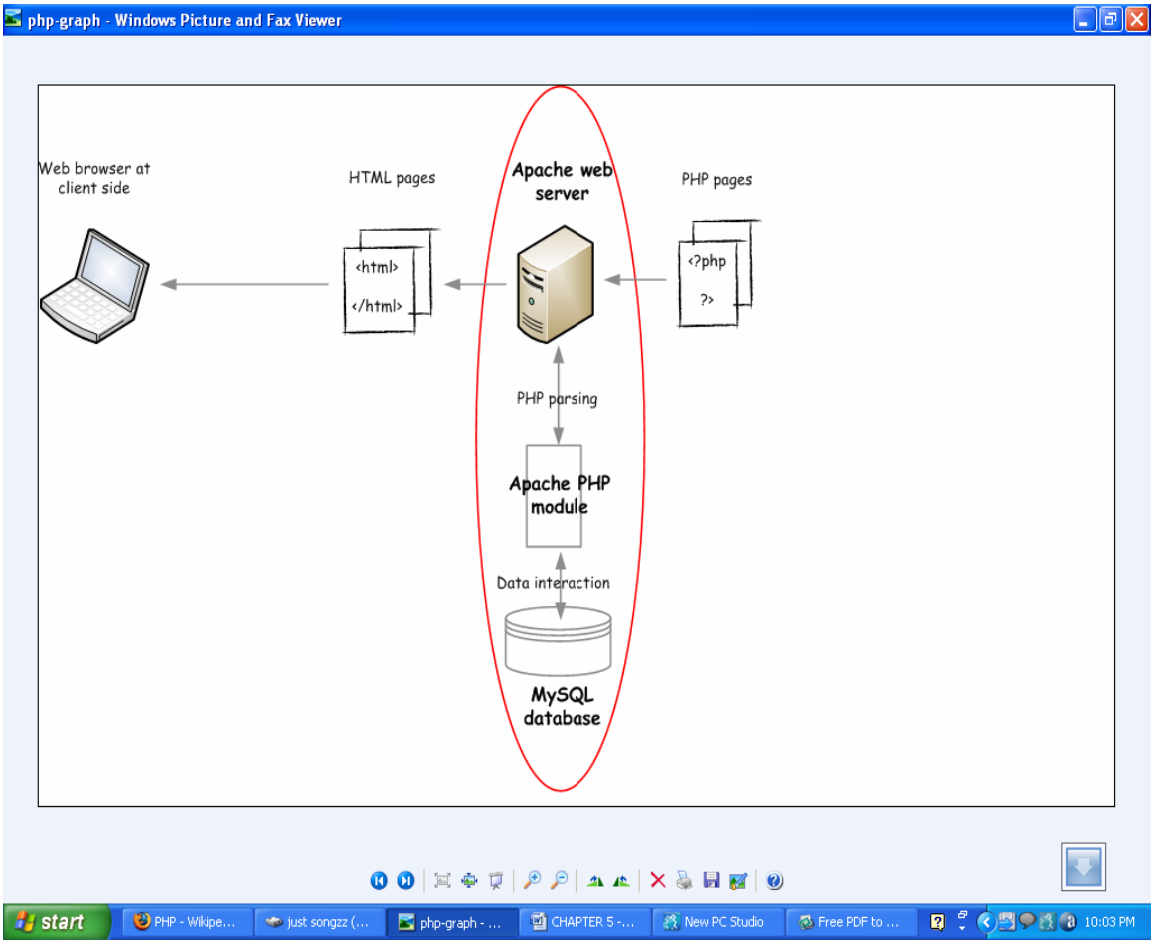

Figure 9.1 Working of PHP

When a client requests web page containing PHP code from the server, then the requested PHP pages are parsed under PHP environment and interaction with database is made if required.

After server side processing, the resulting HTML pages are passed to client and displayed on the browser.

In this way the working of php is complete.

9.4 Connecting PHP Application to MySQL Database

1) Make a connection variable to the database:

```
$con= mysql_connect ("localhost","servername","password");
```

Here $con is a connection variable to database.

2) Select a database over that connection variable:

```
$db=mysql_select_db("databasename",$con);
```

3) Prepare a sql query to execute:

```
$qry= Select * from abc;
```

4) Run the sql query:

```
$result=mysql_query($qry);
```

5) Iterate over the result:

```
while($row = mysql_fetch_array($result))
{
        //some logic
}
```

9.5 Introduction to MySQL:

MySQL is a relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. MySQL is officially pronounced ("My S-Q-L"), but is often pronounced ("My Sequel"). It is named for original developer Michael Widenius's daughter My.

The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL is owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Sun Microsystems, a subsidiary of Oracle Corporation.

MySQL code uses C and C++. The SQL parser uses yacc and a home-brewed lexer, sql_lex.cc.

MySQL works on many different system platforms, including AIX, BSDi, FreeBSD, HP-UX, i5/OS, Linux, Mac OS X, NetBSD, Novell NetWare, OpenBSD, OpenSolaris, eComStation, OS/2 Warp, QNX, IRIX, Solaris, Symbian, SunOS, SCO OpenServer, SCO UnixWare, Sanos, Tru64 and Microsoft Windows. A port of MySQL to OpenVMS also exists.

All major programming languages with language-specific APIs include Libraries for accessing MySQL database. In addition, an ODBC interface called MyODBC allows additional programming languages that support the ODBC interface to communicate with a MySQL database, such as ASP or ColdFusion. The HTSQL - URL based query method also ships with MySQL adapter allowing direct interaction with MySQL database from any web client via structured URLs. The MySQL server and official libraries are mostly implemented in ANSI C/ANSI C++.

9.6 Introduction to XAMPP SERVER:

In this project XAMPP server is used to parse and execute PHP pages, before deploying websites on the server, the website should be tested at the developer side to get a feel of how the website will work on actual server.

Therefore XAMPP server is like a local server on the developer side, XAMPP server should be informed about the environment on which it should work.

In our project XAMPP server is configured to work with PHP, in this way all the PHP pages are parsed and executed by the server.

When XAMPP is installed on the system, then its services is controlled by XAMPP service monitor.

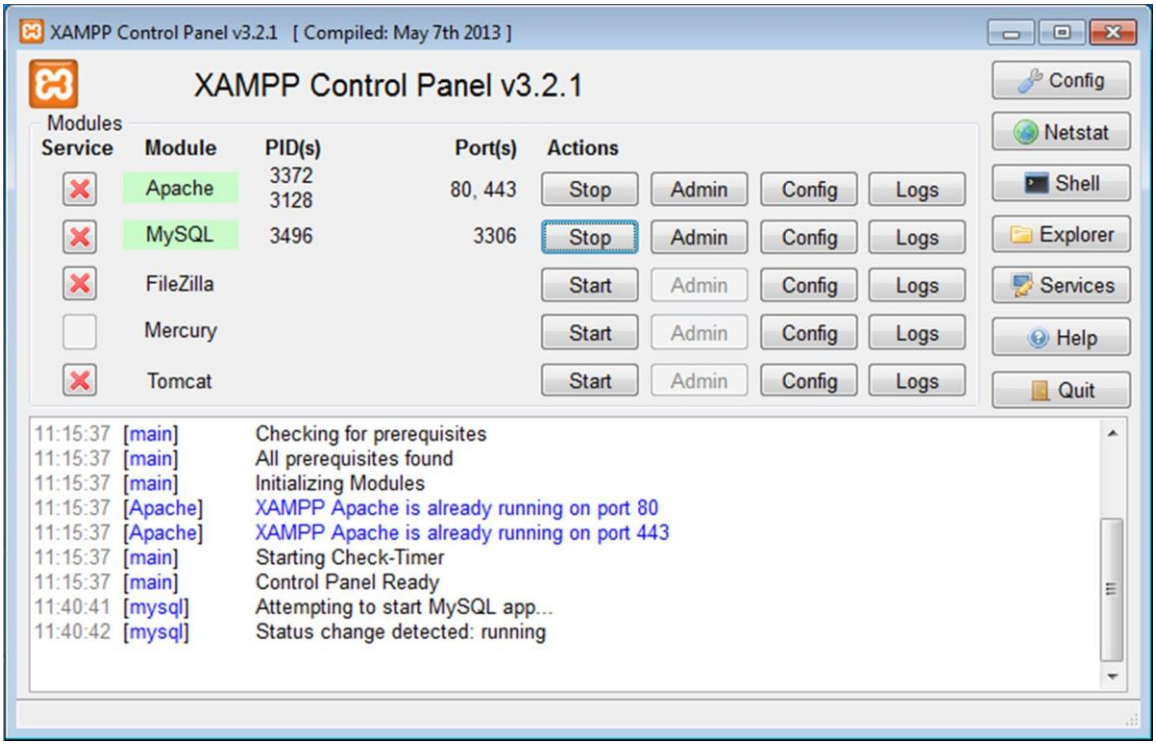

Figure 9.2 APACHE Service Monitor

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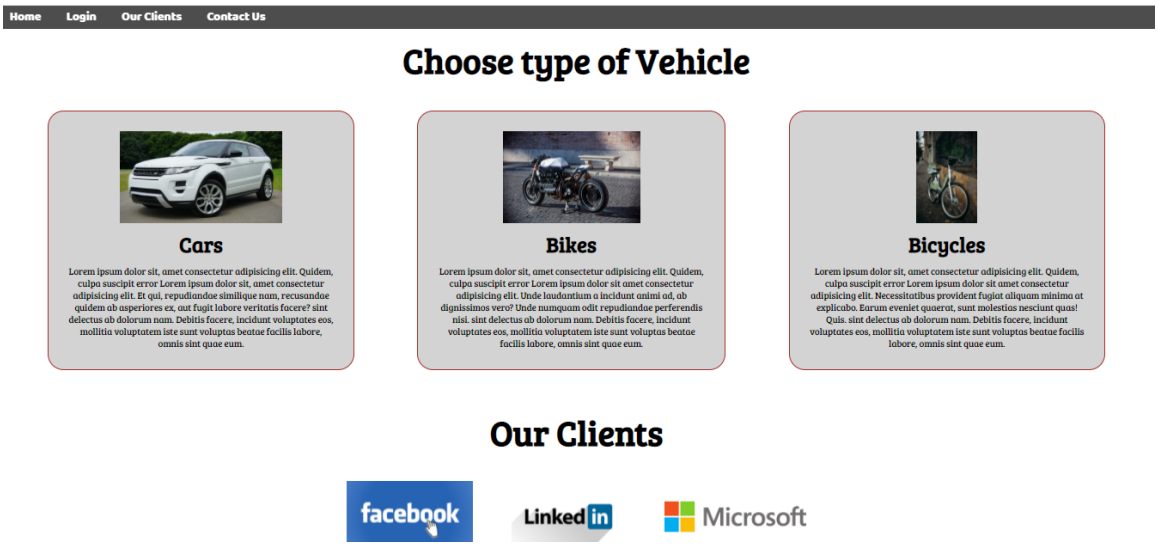
SNAPSHOTS



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CONCLUSION

Car rental business has emerged with a new goodies compared to the past experience where every activity concerning car rental business is limited to a physical location only. Even though the physical location has not been totally eradicated; the nature of functions and how these functions are achieved has been reshaped by the power of internet. Nowadays, customers can reserve cars online, rent car online, and have the car brought to their door step once the customer is a registered member or go to the office to pick the car.

The web based car rental system has offered an advantage to both customers as well as Car Rental Company to efficiently and effectively manage the business and satisfies customers' need at the click of a button.

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