INSTITUTE FORADVANCED COMPUTING AND SOFTWARE DEVELOPMENT AKURDI, PUNE

DocumentationOn

“Car Rental System”

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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 Purpose of 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.
- J2ee 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

Overall Description

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 wants 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 labor.
- 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.

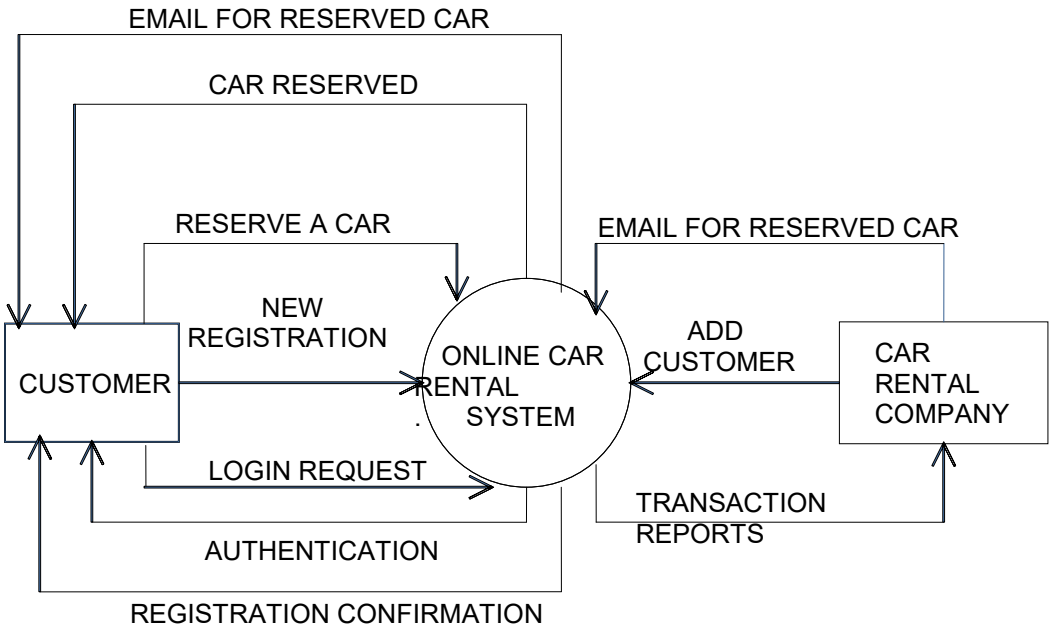
CHAPTER-4

SYSTEM 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.

Fig 4.1



D

DFDofOnline 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

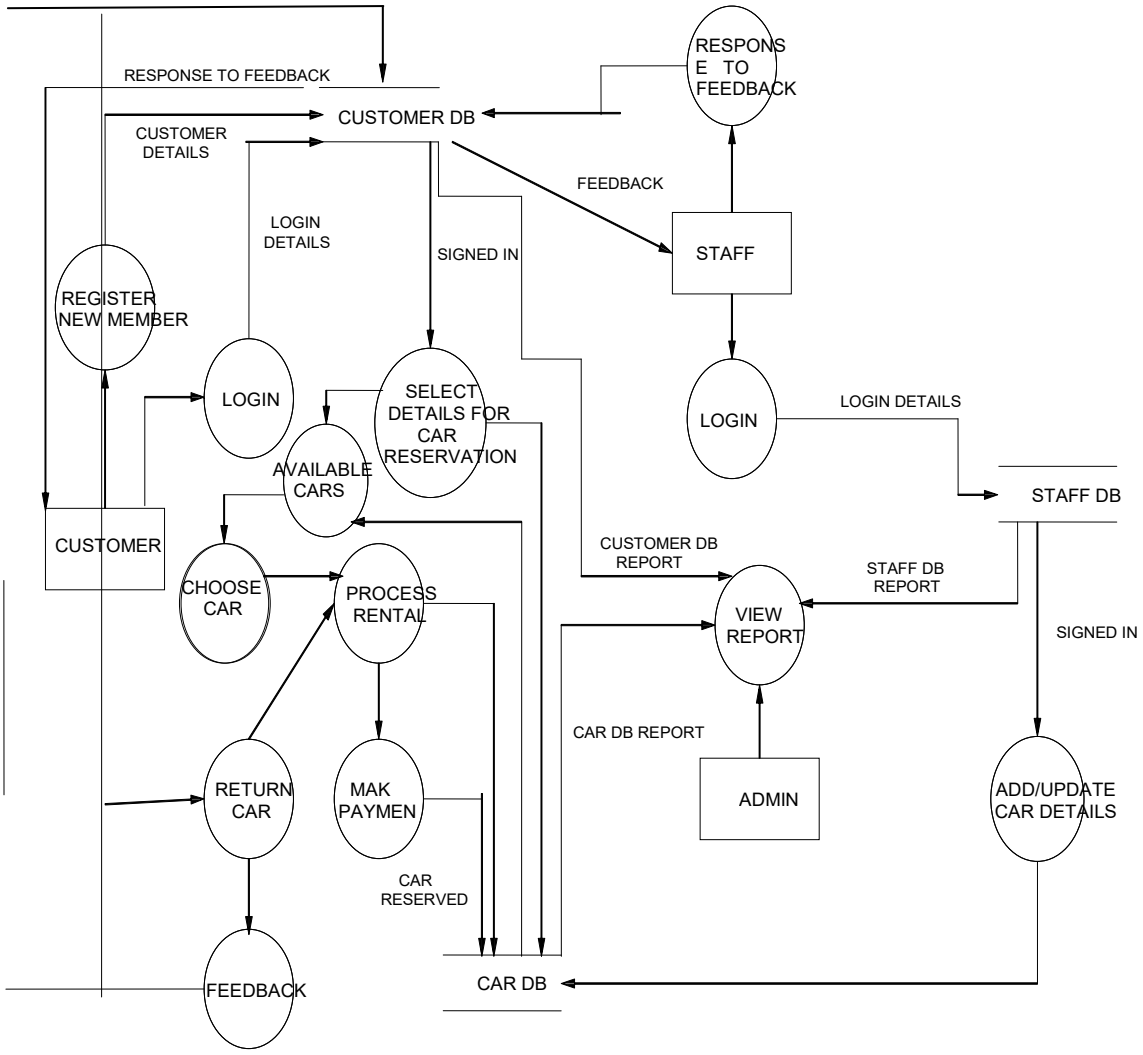


Figure 4.2 Level 1 DFD of Online Car Rental System

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
User	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.
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

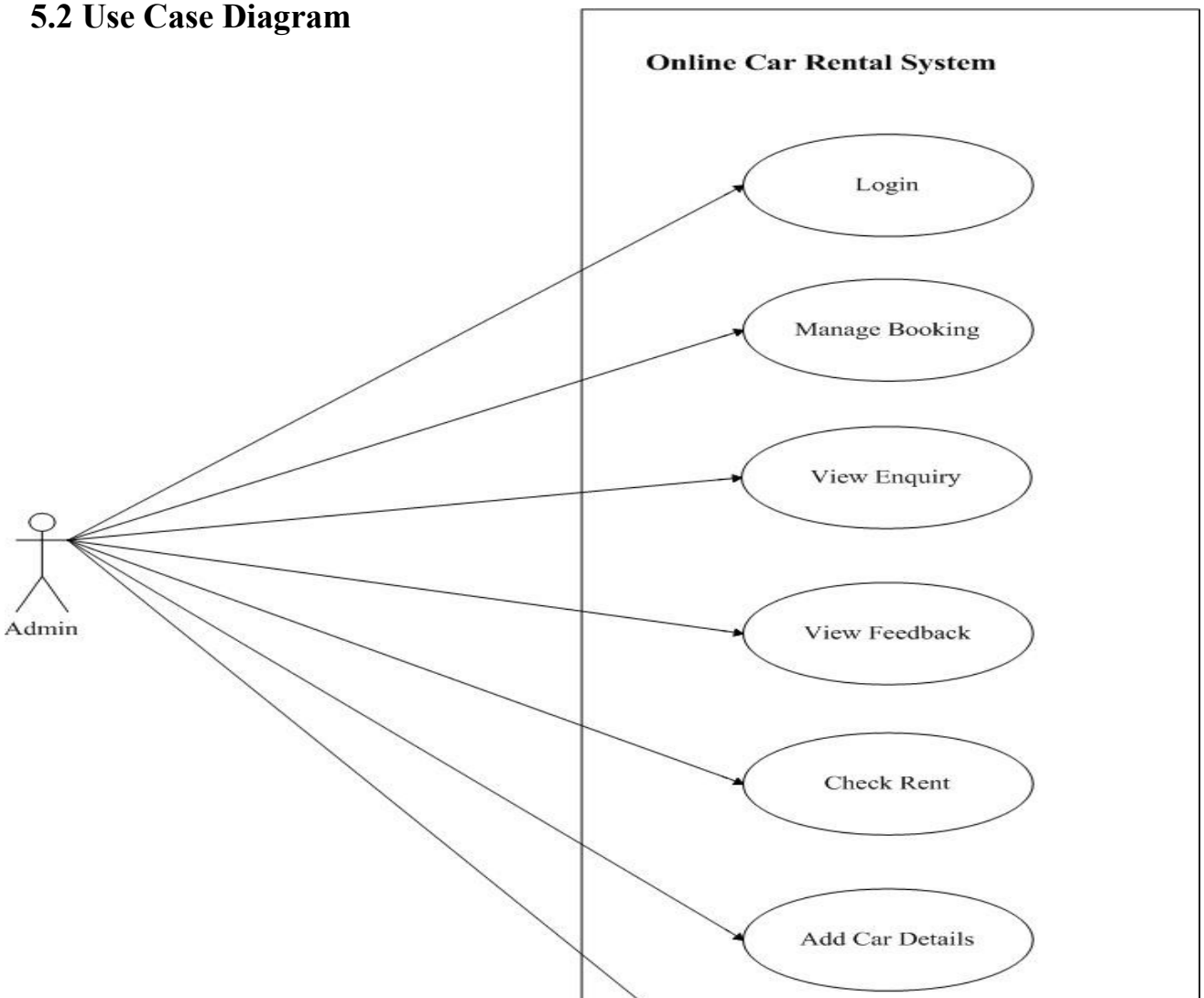


Figure 5.1: E-Car Rental System [use case-admin]

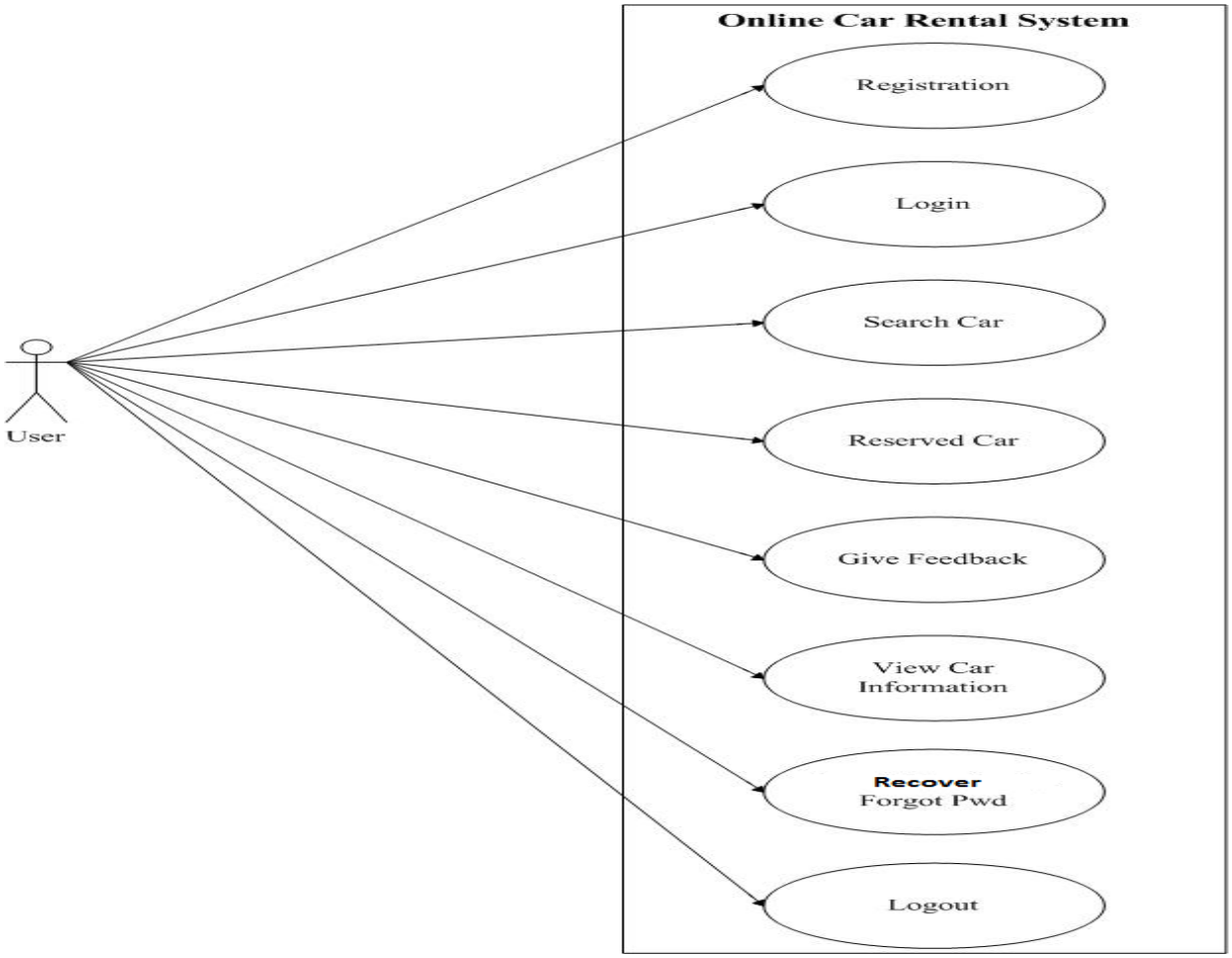


Figure 5.2: E-Car Rental System [use case-user]

5.3 System Flow Chart Diagram

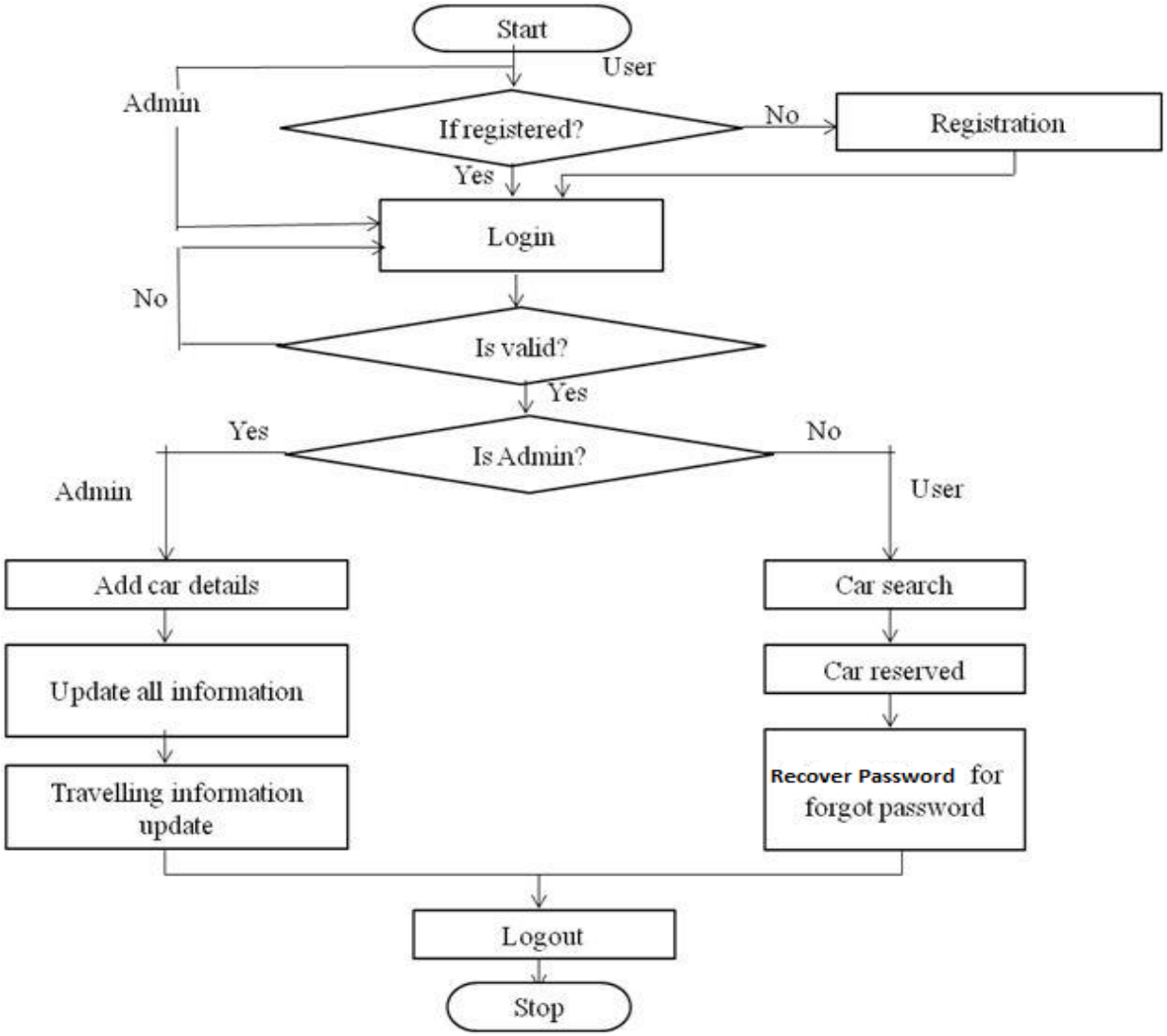


Figure 5.2: System Flow Chart

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 Activity Diagram for User

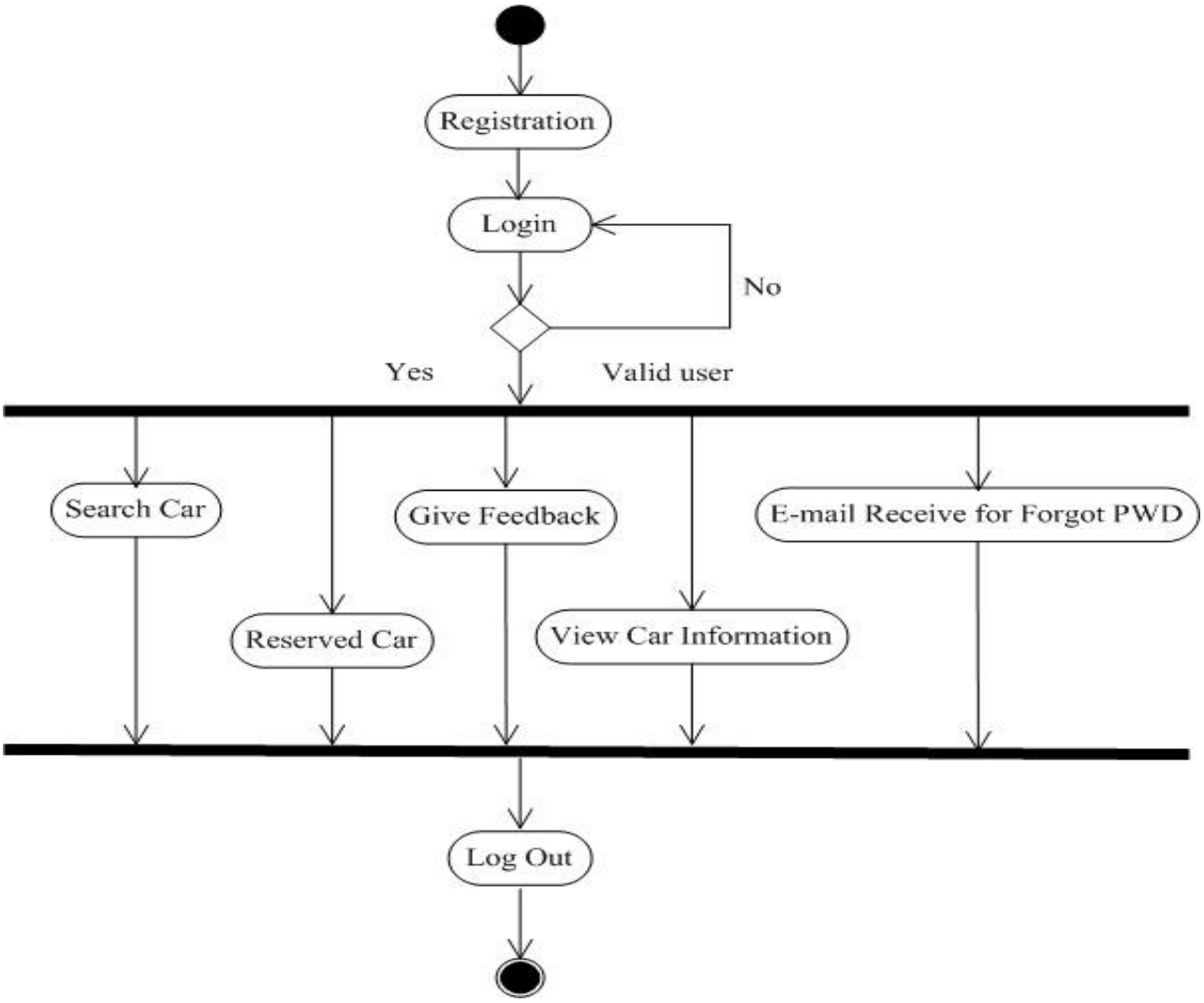


Figure 6.1: For User

6.2 Activity Diagram for Admin

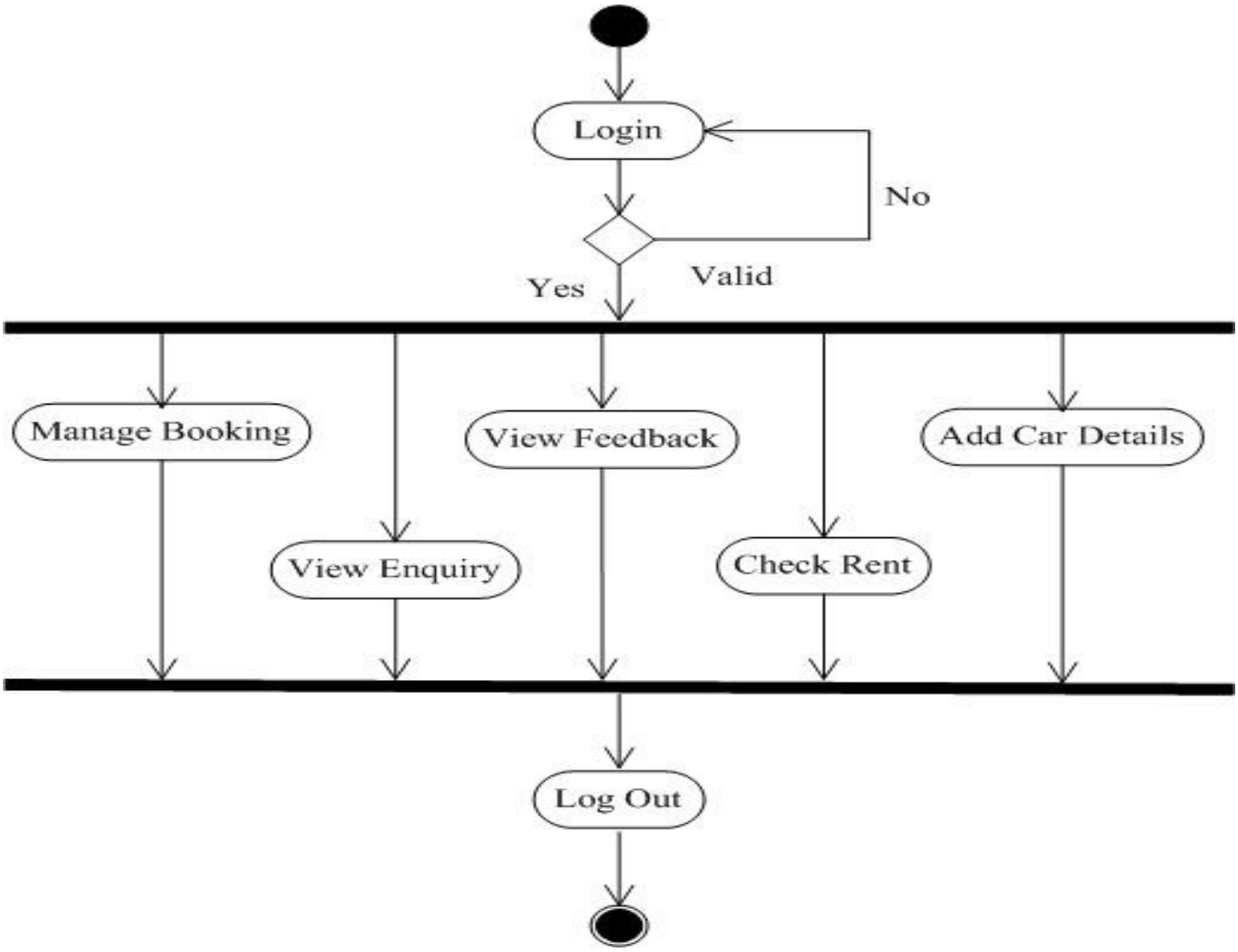


Figure 6.2: For Admin

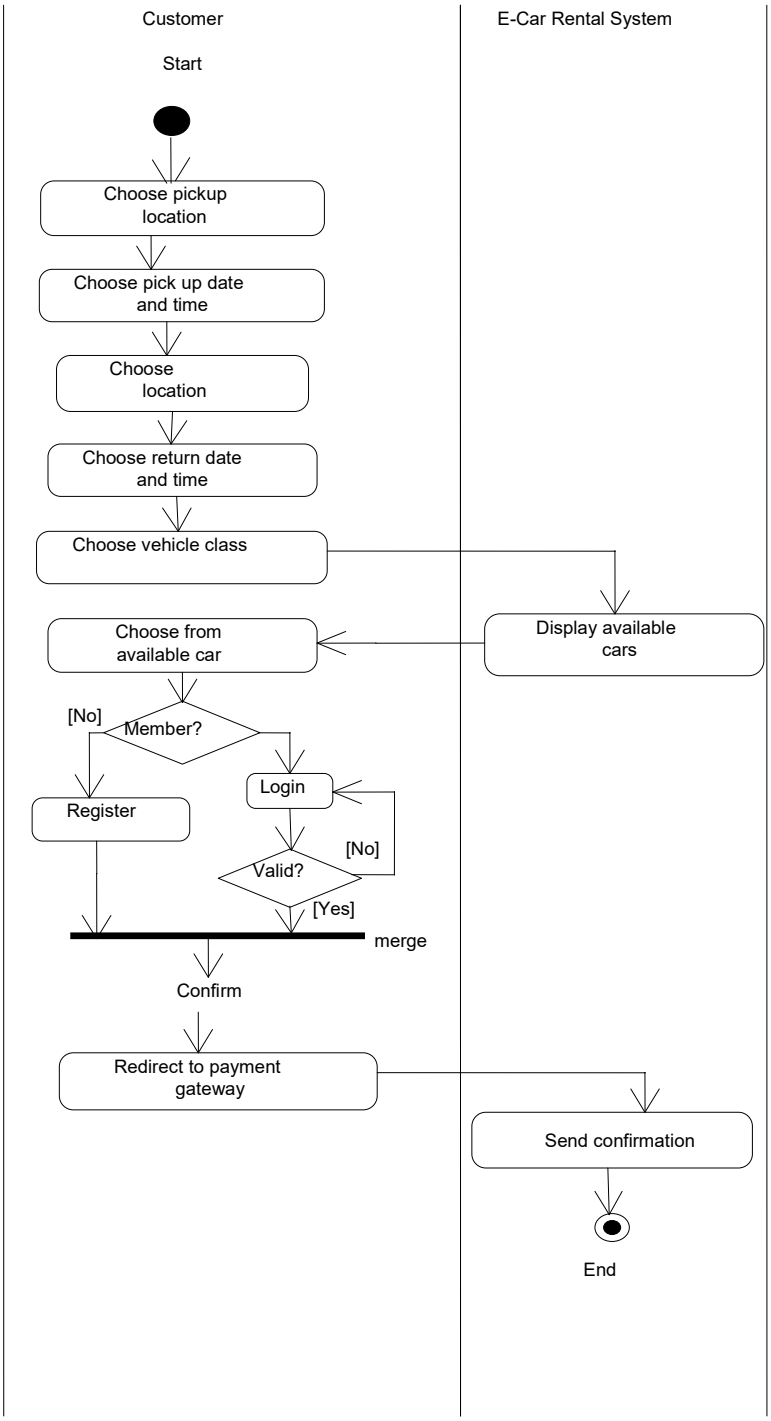


Figure 6.3: Make Reservation

6.1.4 Customer Feedback

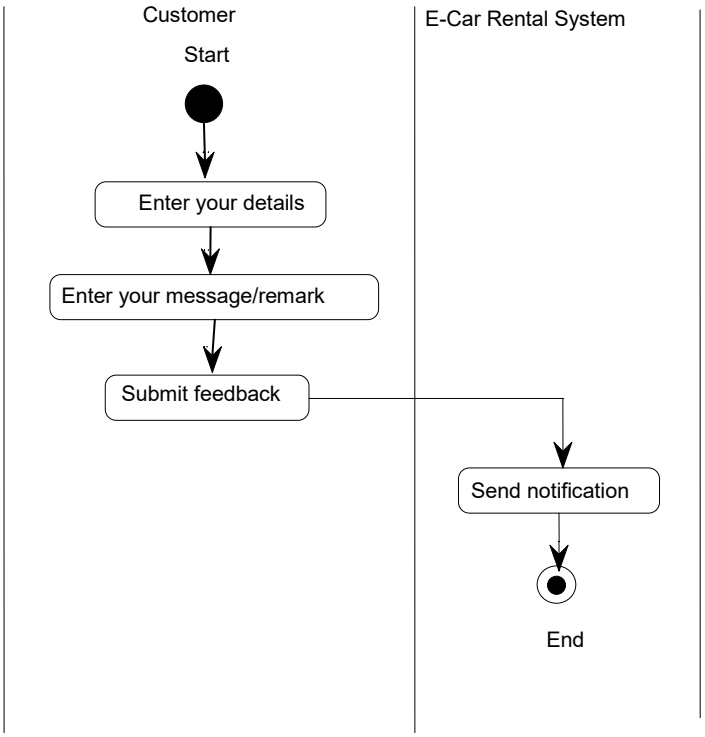
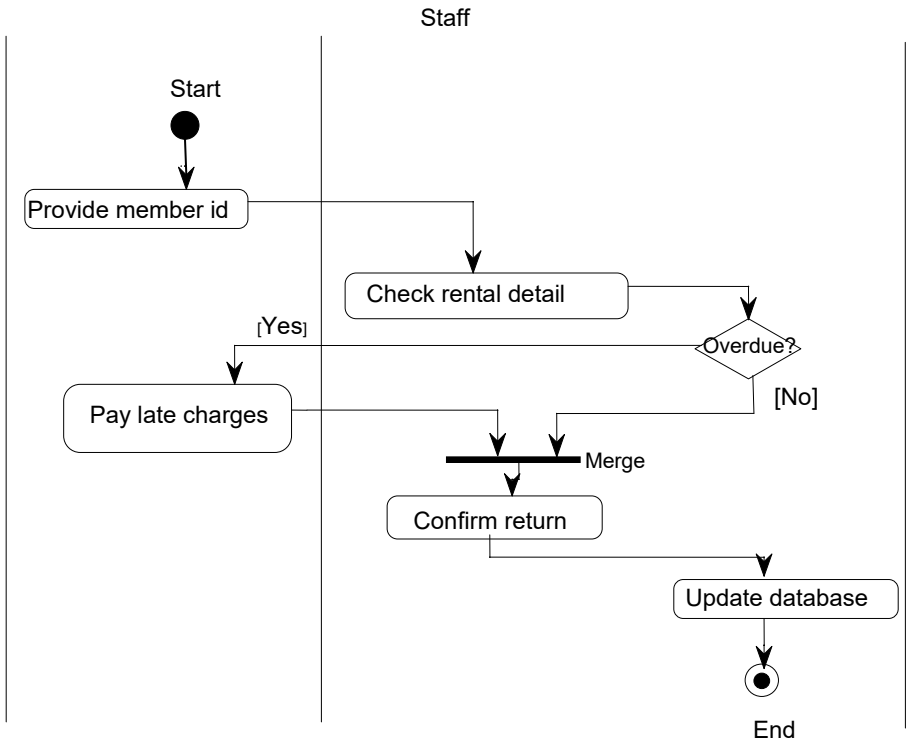


Figure 6.4: Give feedback/comment

6.1.5 Payment of Car Rent



6.1.6 Adding a New Car

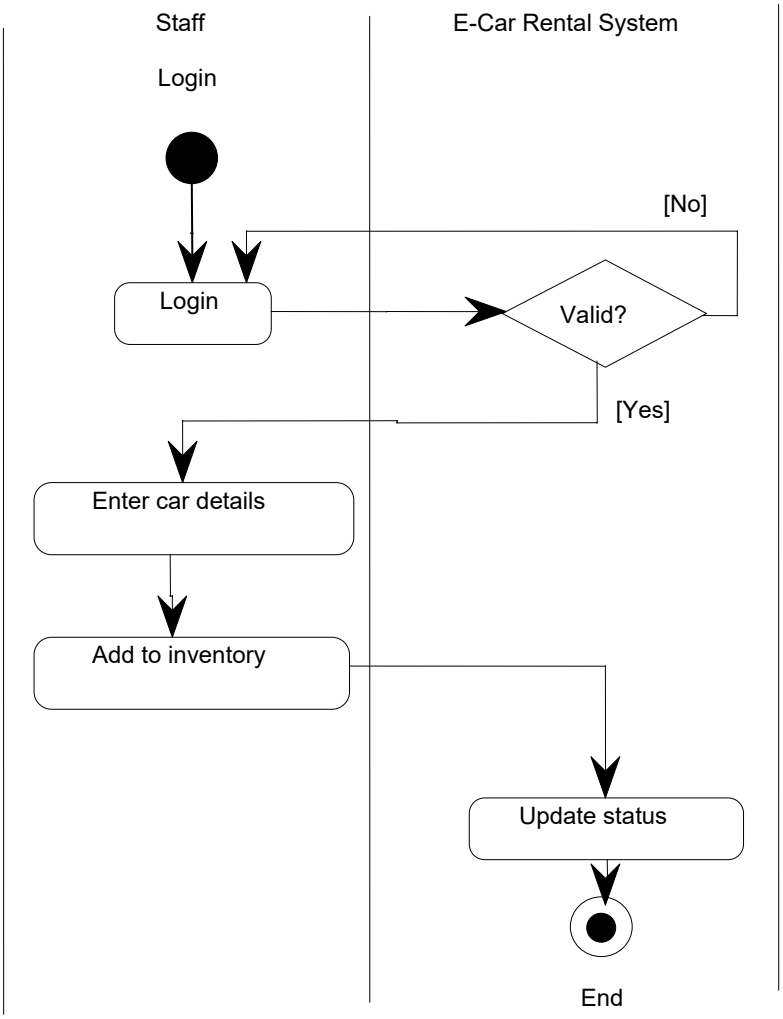
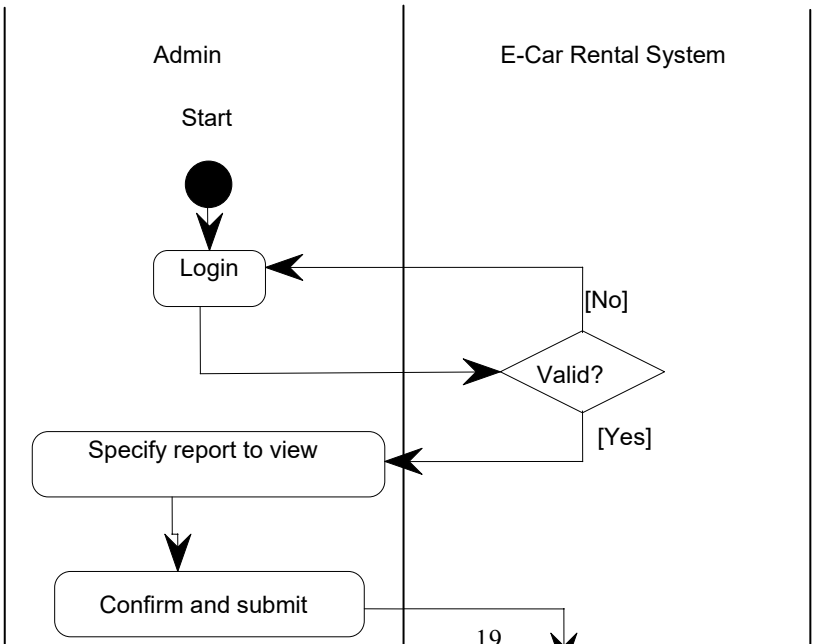


Figure 6.6: Add a New Car

6.1.7 View Report



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 themessagesthey 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 messagesfrom one object to another, and as such correspond to the methods and events supported by an object.

7.1.1 Member Registration

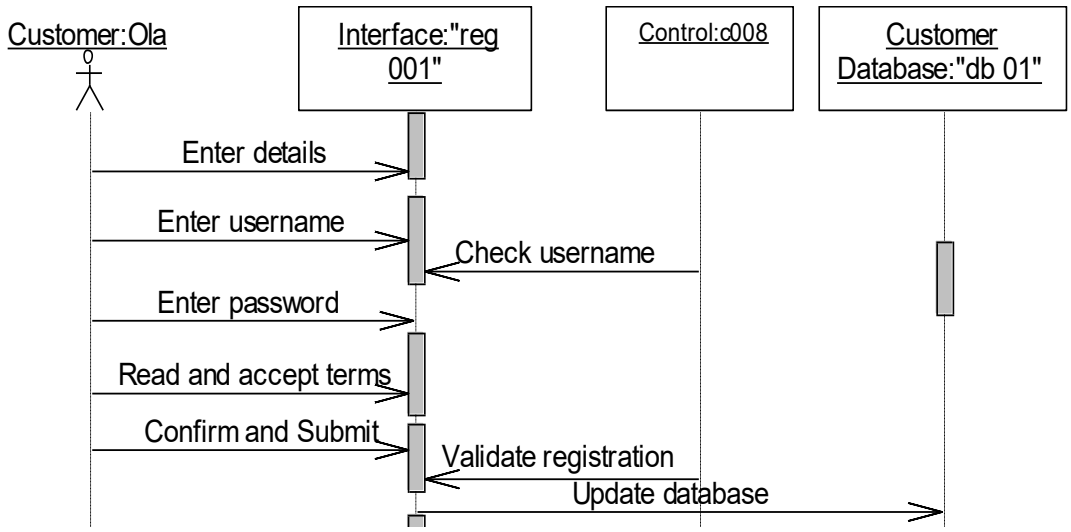


Figure 7.1: Register as member

7.1.2Reservation of Car

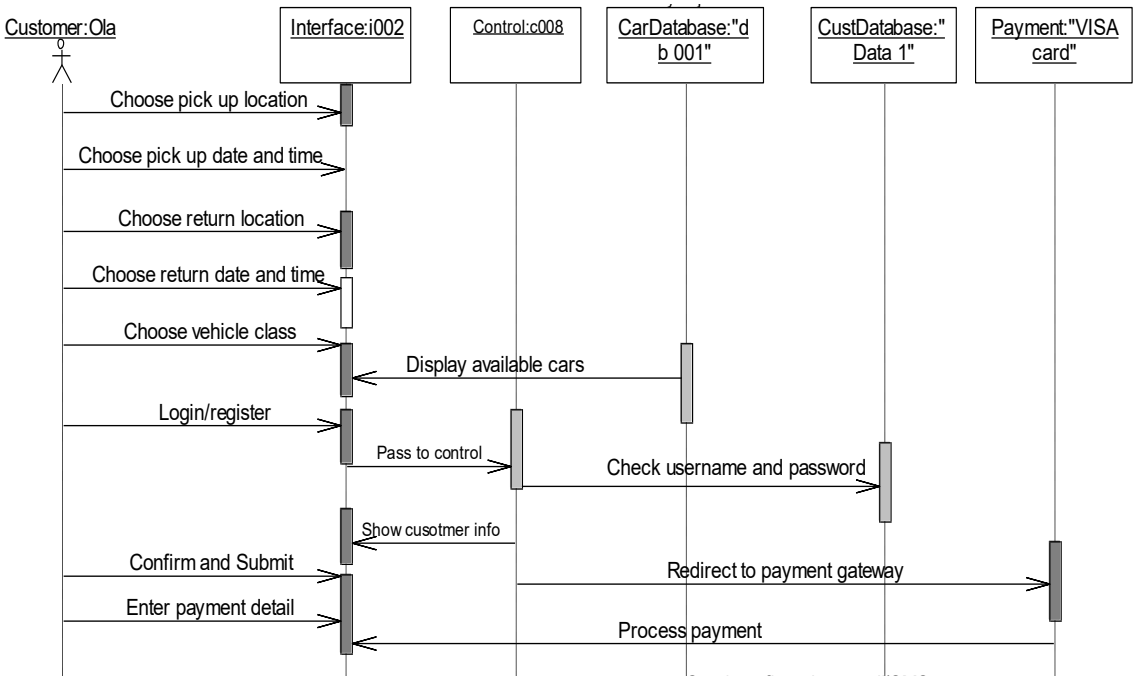


Figure 7.2: Make reservation

7.1.3Customer Feedback

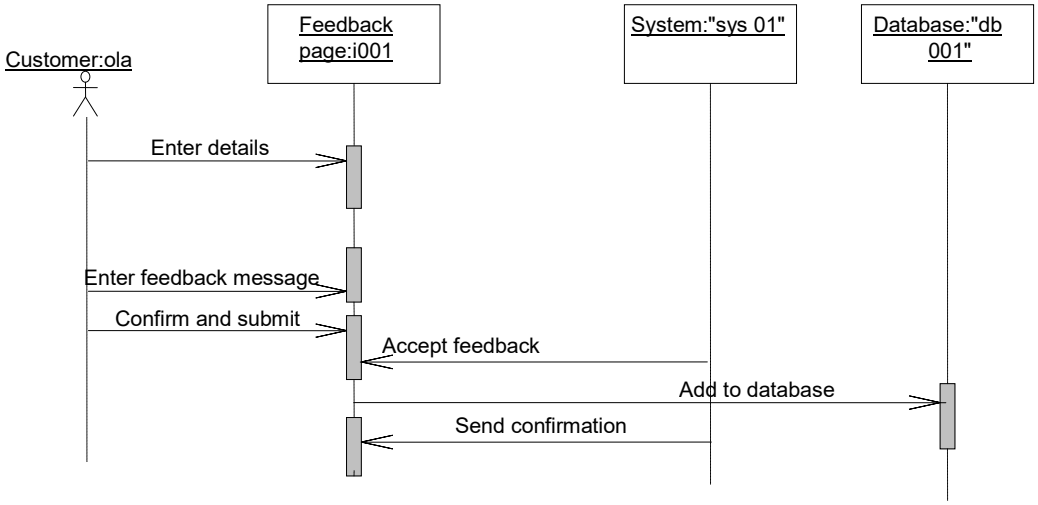


Figure 7.3: Give feedback

7.1.4Adding a New Car

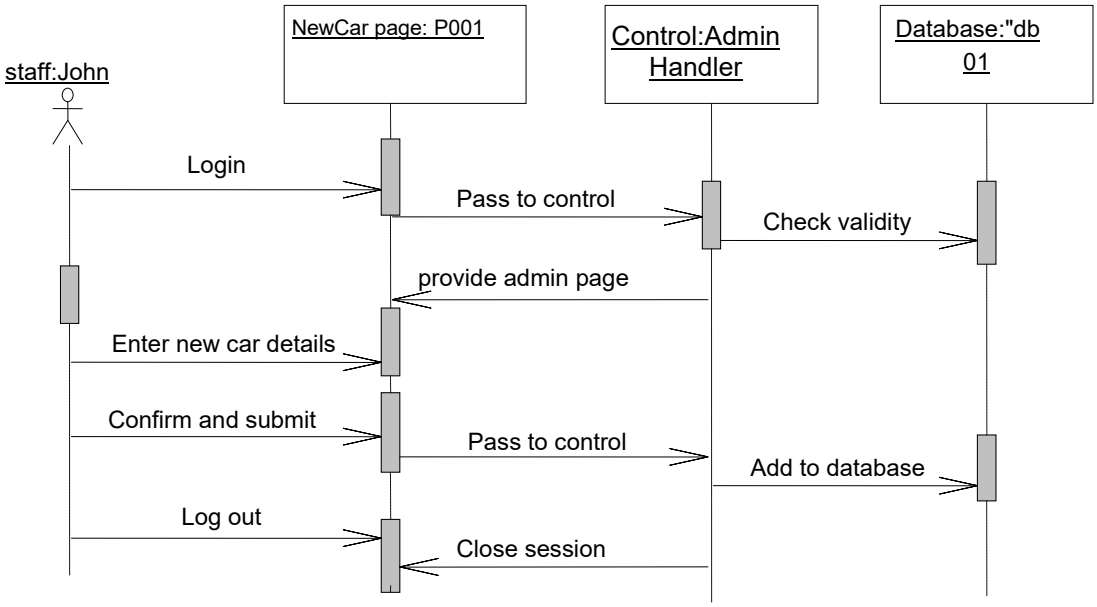


Figure 7.4:Add new car

7.1.5Feedback Response

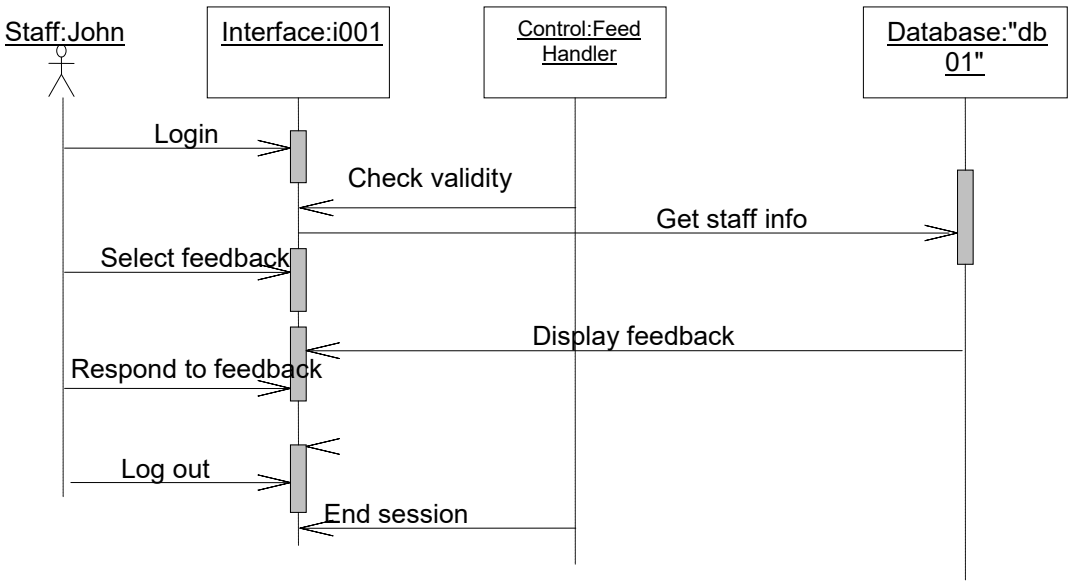


Figure 7.5: Respond to feedback

7.1.6Return Car and Check Rental Details

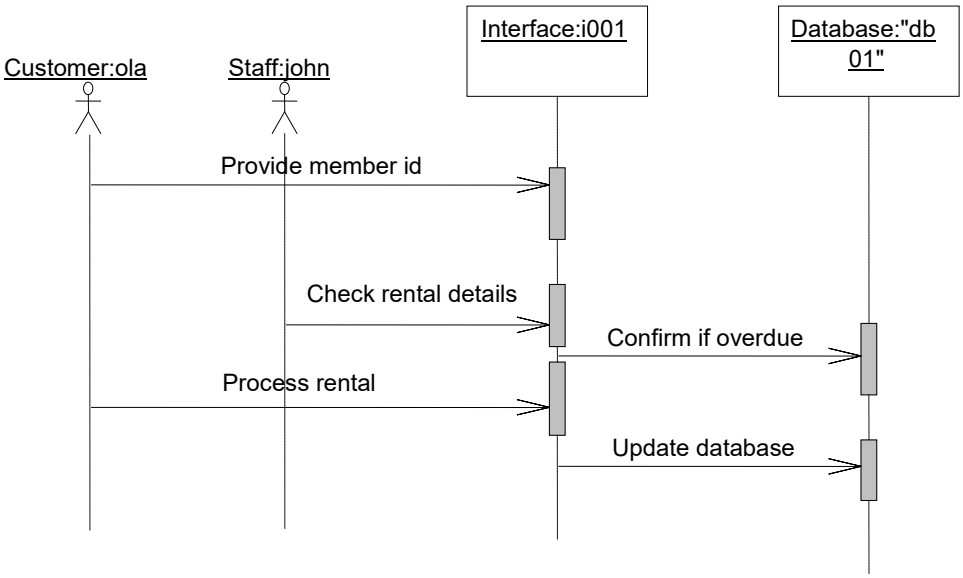


Figure 7.6: Return car

7.1.7View Report

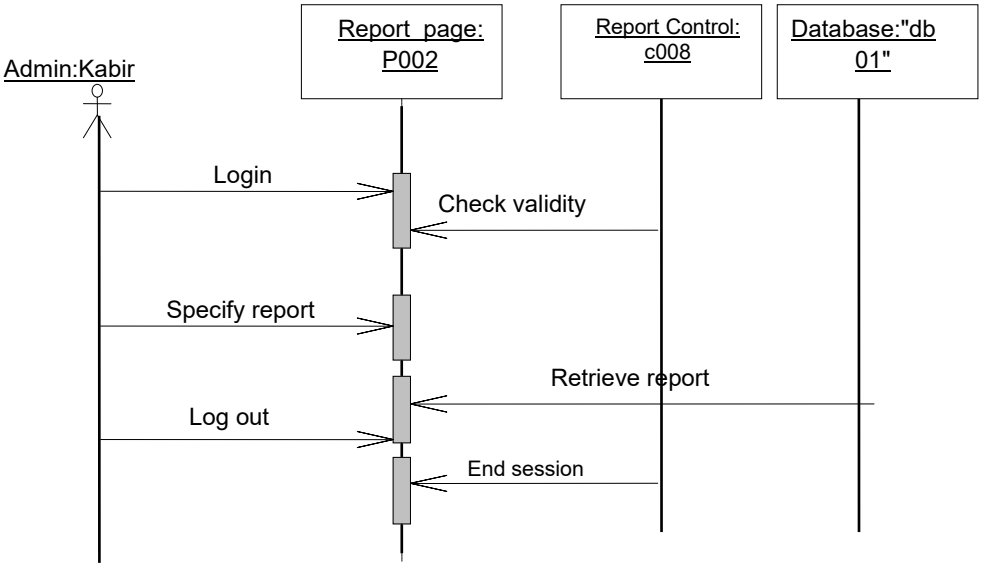


Figure 7.7: View report

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.

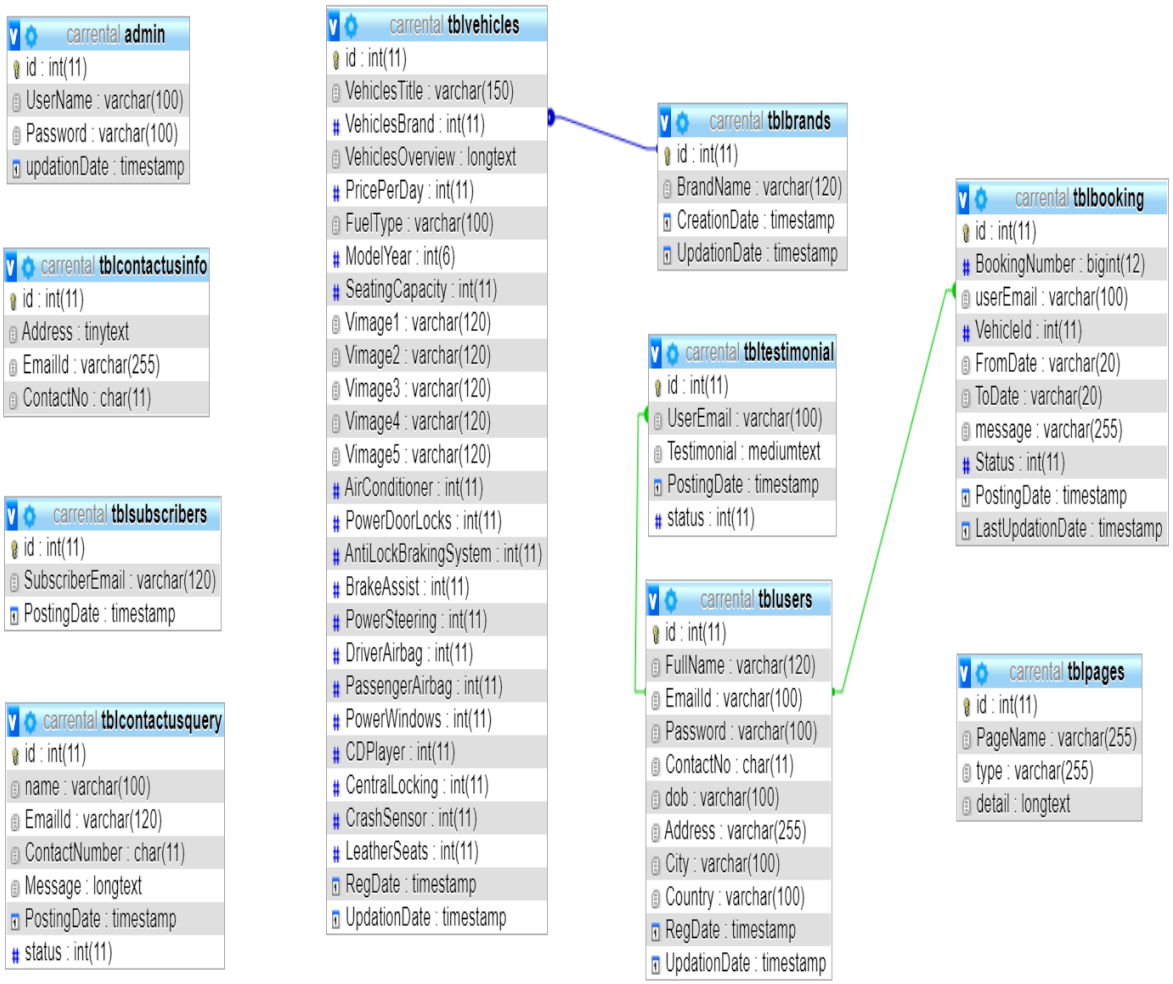
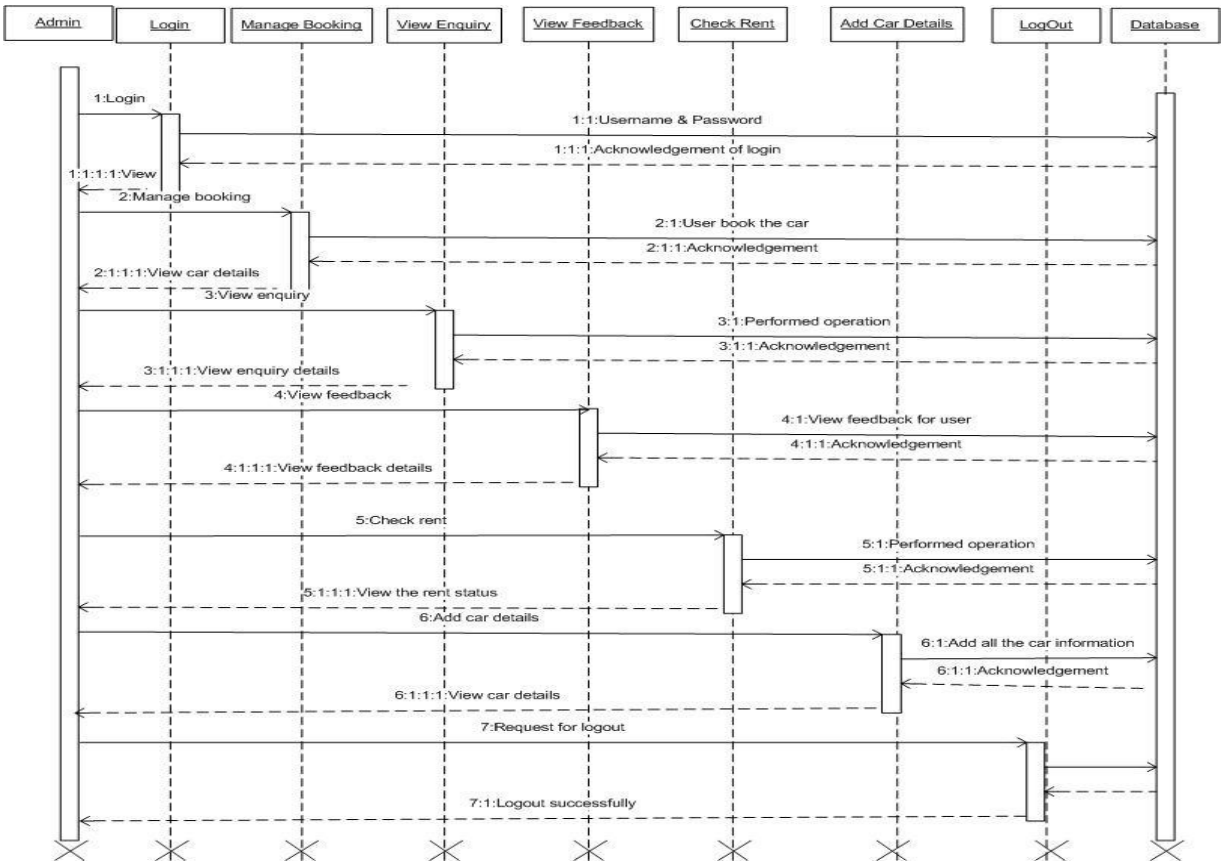
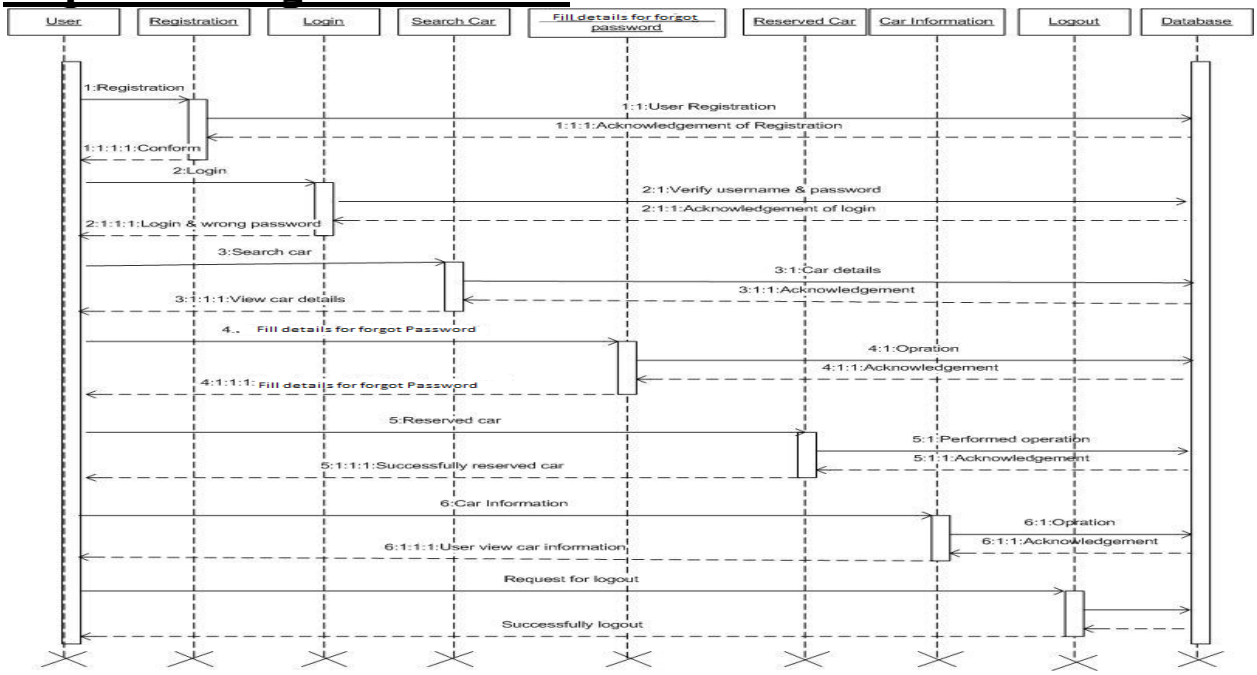


Figure 8.1 Class Diagram of Online Car Rental System

Sequence Diagram for admin



Sequence Diagram for User



CHAPTER-5

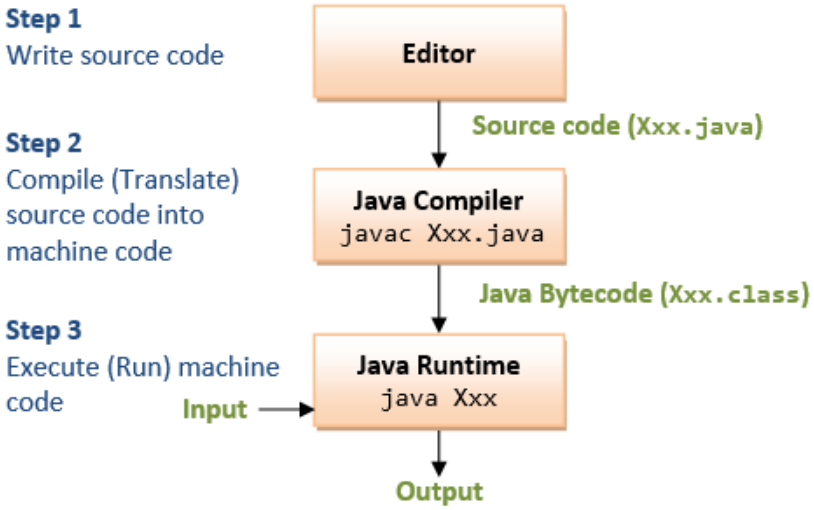
INTRODUCTION OF TECHNOLOGIES USED IN PROJECT

JAVA

1.1 Overview

Java is a general-purpose, concurrent, class-based, object-oriented computer programming language that is specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere" (WORA), meaning that code that runs on one platform does not need to be recompiled to run on another. Java applications are typically compiled to byte code (class file) that can run on any Java virtual machine (JVM) regardless of computer architecture. Java is, as of 2012, one of the most popular programming languages in use, particularly for client-server web applications, with a reported 10 million users [1][2]. Java was originally developed by James Gosling at Sun Microsystems (which has since merged into Oracle Corporation) and released in 1995 as a core component of Sun Microsystems' Java platform. The language derives much of its syntax from C and C++, but it has fewer lowlevel facilities than either of them. Java [3] can be used to write applications and applets. A Java application is similar to any other high-level language program: It can only be compiled and then run on the same machine. An applet is compiled on one machine, stored on a server in binary, and can be sent to another machine over the Internet to be interpreted by a Java-aware browser. Java comes with a large library of ready-made classes and objects. The key difference between Java 1.0

and 1.1 was in this library. Similarly, Java 2.0 has a very much larger library for handling user interfaces (Swing by name) but only small changes to the core of the language. 1.2 Object-oriented Programming Java supports object-oriented programming techniques that are based on a hierarchy of classes and well-defined and cooperating objects [4]. Classes.



ANGULAR

Overview Of Angular:-

Angular is a framework for building client applications in HTML and either JavaScript or a language like Type Script that compiles to JavaScript.
The framework consists of several libraries, some of them core and some optional.
You write Angular applications by composing HTML templates, writing component classes to manage those templates, adding application logic in services, and boxing components and services in modules.

The Eight main building blocks of an Angular application:
Modules
Components
Templates
Metadata
Data binding

Directives
Services
Dependency injection

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++.

DATABASE DESIGN

The data in the system has to be stored and retrieved fromdatabase. Designing the database is part of system design. Data elements and data structures to be stored have been identified at analysisstage.

They are structured and put together to design the data storageand retrieval system.

A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and efficiently. The general objective is to make database access easy, quick, inexpensive and flexible for the user. Relationships are established between the data items and unnecessary data items are removed. Normalization is done to get an internal consistency of data and to have minimum redundancy and maximum stability. This ensures minimizing data storage required, minimizing chances of data inconsistencies and optimizing for updates. The MS Access database has been chosenfor developing the relevantdatabases.

Admin:

Table Name	Admin
Description	This table is store information about Admin
Primary Key	id
Foreign Key	-

Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	id *(Primary)*	int(11)	Primary Key	It is store Admin id
2	UserName	varchar(100)	Not Null	It is store admin user name
3	Password	varchar(100)	Not Null	It is store the password of Admin
4	updationDate	timestamp	NotNull	It is store the profile updating date

User Registration:

Table Name	tblusers
Description	This table is provide the information about User registration
Primary Key	Id
Foreign Key	-

Sr. No	Field Name	Data type(Size)	Constraints	Description
1	id *(Primary)*	int(11)	Primary Key	It is store User id
2	FullName	varchar(120)	Null	It is store User name
3	EmailId	varchar(100)	Null	It is store email address of User
4	Password	varchar(100)	Null	It is store Password
5	ContactNo	char(11)	Null	It is store Contact no
6	dob	varchar(100)	Null	It is store Birthdate
7	Address	varchar(255)	Null	It is store Address
8	City	varchar(100)	Null	It is store city
9	RegDate	timestamp	CURRRENT_TIMESTAMP	It is store CURRRENT_TIMESTAMP
10	UpdationDate	timestamp	Null	It store updation date

Brands Table:

Table Name	tblbrands
Description	This table is provide the information about Car brands
Primary Key	Id
Foreign Key	-

Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	id *(Primary)*	int(11)	Primary Key	It is store brandid
2	BrandName	varchar(120)	Not Null	It is store Brand name
3	CreationDate	timestamp	CURRRENT_TIMESTAMP	It is store brand creation date
4	UpdationDate	timestamp	NotNull	It is store brand updation date

Contact us details Table:

Table Name	tblcontactusinfo
Description	This table is provide the contact information at website
Primary Key	id
Foreign Key	-

Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	Id	Int	PrimaryKey	It is id of the record
2	Address	tinytext	Null	It is store name of the company
3	EmailId	varchar(255)	Null	It is store of the company email
4	ContactNo	char(11)	Null	It is store of the company contact no

Enquiry Table:

Table Name	tblcontactusquery
Description	This table will store the information of car enquiry of user
Primary Key	Id
Foreign Key	-

Sr. No	Field Name	Data type(Size)	Constraints	Description
1	id *(Primary)*	int(11)	Primary Key	It is store enquiry id
2	name	varchar(100)	Null	It is store user
3	EmailId	varchar(120)	Null	It is store email id
4	ContactNumber	char(11)	Null	It is store contact no for user
5	Message	longtext	Null	It is store user message for enquiry
6	PostingDate	timestamp	CURRENT_TIMESTAMP	It store enquiry date
7	status	int(11)	NotNull	It is store status 0 for read and 1 for read

Feedback Table:

Table Name	tbltestimonial
Description	This table store information about feedback
Primary Key	F_Id
Foreign Key	-

Sr. No	Field Name	Data type(Size)	Constraints	Description
1	id *(Primary)*	int(11)	Primary Key	It is store feedback id
2	UserEmail	varchar(100)	Not Null	It is store user email
3	Testimonial	mediumtext	Not Null	It is store feedback
4	PostingDate	timestamp	NotNull	It is store posting date of feedback
5	status	int(11)	NotNull	It is store staus(0 for inactive and 1 active)

Pages Content Table:

Table Name	tblpages
Description	This table store information about website pages
Primary Key	Id
Foreign Key	-

Sr. No	**Field Name**	**Data type(Size)**	**Constraints**	**Description**
1	id *(Primary)*	int(11)	Primary Key	It is store page id
2	PageName	varchar(255	Null	It is store page name
3	type	varchar(255)	Not Null	It is store page type
4	detail	longtext	Not Null	It is store pages info

Subscriber Table:

Table Name	tblsubscriber
Description	This table store email address of subscriber
Primary Key	Id
Foreign Key	-

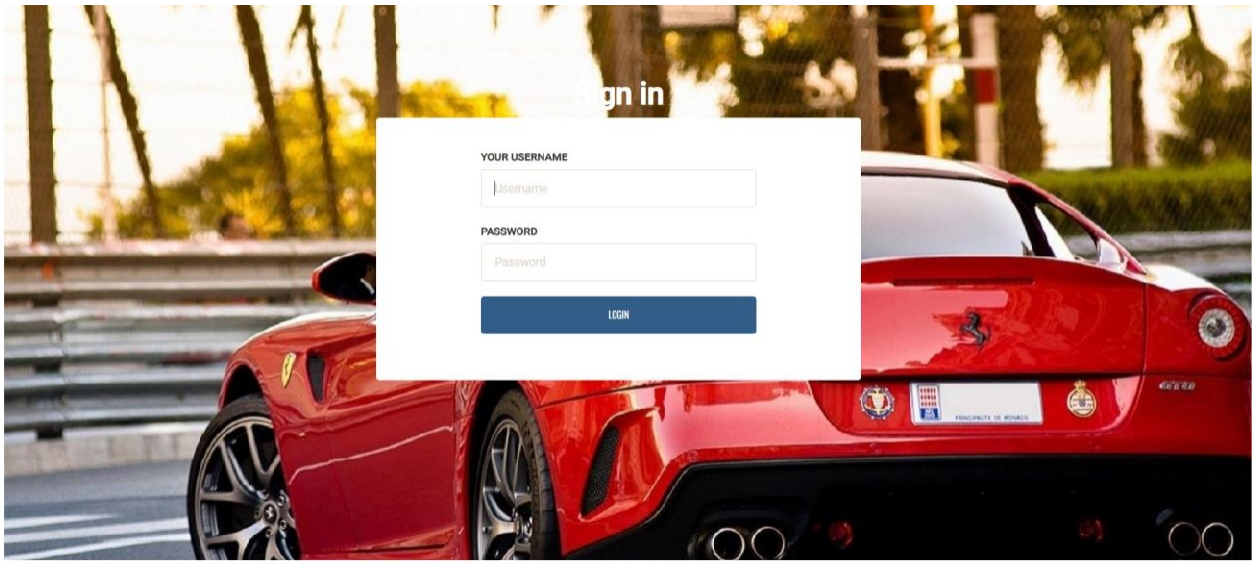
Sr. No	Field Name	Data type(Size)	Constraints	Description
1	id *(Primary)*	int(11)	Primary Key	It is store subscriber id
2	SubscriberEmail	varchar(120)	Null	It is store subscriber email is
3	PostingDate	timestamp	Null	It is store subscription date

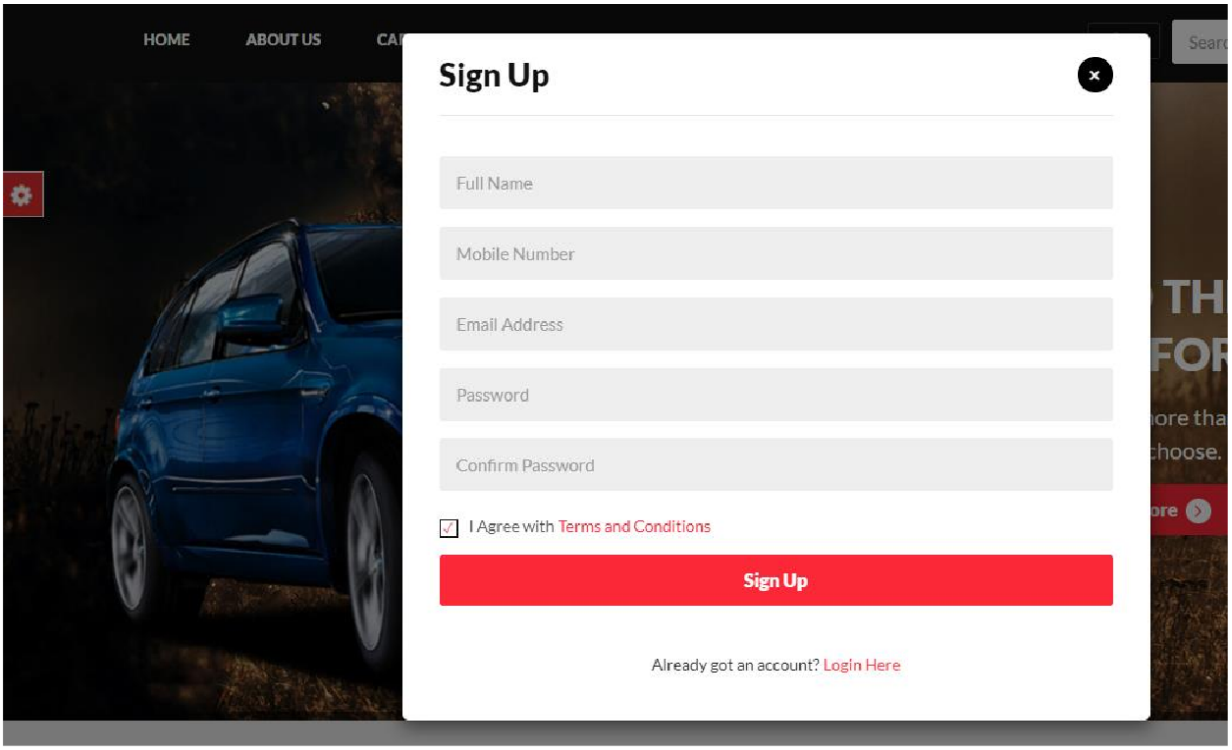
Vehicles Info Table:

Table Name	tblvehicles
Description	This table is provide the information about cars
Primary Key	Id
Foreign Key	-

CHAPTER-6

SNAPSHOTS





CHAPTER-7
CONCLUSION

Car rental business has emerged with a new goody 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.

References

Web Reference:

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- ✓ www.stackoverflow.com