



Tribhuvan University
Faculty of Humanities and Social Science

CAR RENTAL PORTAL
A PROJECT REPORT

Submitted to
Department of Computer Application
Danfe College

In partial fulfillment of the requirements for the Bachelors in Computer Application

Submitted by
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Under the Supervision of
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SUPERVISOR'S RECOMMENDATION

I hereby recommend that this project was prepared under my supervision by SHOVA MAHARJAN entitled "**CAR RENTAL PORTAL**" in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

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LETTER OF APPROVAL

This is to certify that this project was prepared by SHOVA MAHARJAN entitled " **CAR RENTAL PORTAL** " in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

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ABSTRACT

Car Rental Portal is a web-based application that allows customers to rent vehicles for a specified period. This system provides a convenient and flexible way for customers to reserve, select, and rent vehicles. The system includes features such as vehicle search and selection, booking management and customer service. With the car rental portal, customers can browse through a range of vehicles, select their preferred one, and make a booking. The car rental portal helps businesses to manage their vehicle inventory and track rental bookings, and customer feedback. Overall, the car rental portal provides a streamlined and efficient process for renting vehicles, saving time and effort for both customers and businesses.

Keywords: Vehicles, Website, Customers, Booking

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LIST OF ABBREVIATIONS

CRP:	Car Rental Portal
DFD:	Data Flow Diagram
ER:	Entity Relationship
FR:	Functional Requirement
HTML:	Hypertext Markup Language
CSS:	Cascading Style Sheets
PHP:	Hypertext Preprocessor
SQL:	Structured Query Language
UC:	Use Case
UI:	User Interface

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CHAPTER 1: INTRODUCTION

1.1 Introduction

A car rental portal is a website or online platform that allows customers to rent vehicles for a specific period of time. The portal provides an easy and convenient way for customers to search and book rental cars in one place. The portal usually includes a search function that allows customers to specify dates and times, as well as their preferred vehicle type and rental options. Customers can then compare prices and availability and book their preferred car online.

A car rental portal is wishing to have a user interface that will allow their customers to view the models, descriptions and prices of different cars available. The user has the ability to register and log in to the website and see their rental plan. The administrator will also be able to login and have the ability to add/remove new car rentals, change prices, and so on. Overall, a car rental portal is a convenient and efficient way for customers to find and book rental cars, making it easier for them to plan their travel and transportation needs.

1.2 Problem Statement

For those who do not have private transport, finding a transportation facility is a nightmare. On many occasions such as weddings, vacations, home moving, tours, and several other occasions, we have encountered a big problem in trying to find a suitable and readily available means of transport that will suit the occasion. Hence we have felt the need for a car rental system to solve the issue.

There exist a number of solutions to the problem of finding cars for the purpose of traveling. Other than that there are a number of car hiring companies to avail their vehicles for hire. However, what I am suggesting is different from the already existing solutions. Car rental portal will be focused on customer satisfaction. The online rental system will be developed in such a way that it allows for the customers to select the specific car they want to use, when, and for what purpose. This will allow for flexibility on both the side of the customer and that of the business owner.

1.3 Objectives

The objective of this project are:-

- To offer a hassle-free way for customers to rent cars for a specific period, allowing them to travel comfortably and efficiently without the responsibilities of ownership.
- To provide a wide selection of vehicles, ensuring easy booking and return processes, maintaining vehicle safety and cleanliness, and delivering excellent customer service to enhance the overall rental experience.

1.4 Scope and Limitation

1.4.1 Scope of System

The scope of the system is defined on the basis of various functionalities provided by the system. The scope can be explained as:-

- Users can register and they can view and change their details.
- Users can make the reservation for specific period of time.
- General users as well as the company's staff will be able to use the system effectively.
- Anyone can view the website and can book if they have an account.
- Admin can modify the details of the website including car information, etc.

1.4.2 Limitations

- In order to rent a vehicle, user must login to their own profile.
- As with all other online platform, there may be loss of data in the database due to some error.
- There is no online payment.
- The system does not allow rent the same car for the same date. If such a consequence happened, the system will give fatal error.

1.5 Development Methodology

Waterfall Model is used to develop this system. In waterfall model, each phase must be completed before next phase can begin and there is no overlapping in the phases. This means, output of previous phase works as input to another phase.

The Car Rental Portal is developed using waterfall model. The reason for choosing this approach is its simplicity. Likewise, we were accustomed with the objectives and intended course of action that were going to follow to make this project a reality. Hence, waterfall model seemed to be the best method to implement this project.

1.6 Report Organization

Chapter 1 includes introduction of the system CAR RENTAL PORTAL with its problem of statement, objective and its scope and limitation.

Chapter 2 includes the background study of CAR RENTAL PORTAL and some literature review of other rental systems.

Chapter 3 includes the functional and non-functional requirements along with feasibility analysis and architectural design of the CAR RENTAL PORTAL.

Chapter 4 includes about the tools used in this system and the testing that are done.

Chapter 5 includes about the outcome of this system as well as the future recommendations for the CAR RENTAL PORTAL

CHAPTER 2: BACKGROUND STUDY AND LITERATURE REVIEW

2.1 Background Study

In our modern world, many people need cars for short periods, like vacations or business trips, but owning a car isn't always practical. This is where car rental services come in – they allow people to rent cars for specific durations, providing a convenient and affordable solution for their transportation needs.

Car rental services used to operate mainly through physical offices where you'd go and fill out paperwork to rent a car. But now, with the internet and smartphones, renting a car has become much easier. You can book a car online or through an app, making the whole process quicker and more accessible. A good car rental system solves many of these challenges. It helps customers easily book cars online, tracks vehicles in real-time, handles payments smoothly, and ensures clear communication between the rental agency and the customers. Moreover, it aids in managing the fleet effectively and keeping the cars safe and well-maintained. Essentially, a well-designed car rental system makes the whole process convenient and pleasant for both the rental company and the customers.

Understanding the changing needs of customers and the advancements in technology is crucial for the success of a car rental business. By creating a user-friendly, efficient car rental system, rental companies can meet these needs effectively. This background study sets the stage for developing a system that simplifies the car rental process, ensuring customer satisfaction and the growth of the business.

2.2 Literature Review

Literary Analysis

i. Study of Existing System

Spark Car is the car rental in Kathmandu, Nepal offering car hire service in Nepal to make splendid travel to any place in Nepal. Khojnu.com is online business directory and Local Business Listing. Find local businesses, tourist attraction, properties and more. Self Drive Nepal is a self drive car rental marketplace which itself is a pioneer in the self drive car rental industry.

ii. Literature Review

The advent of digital technologies has ushered in a new era for the transportation industry, with significant transformations witnessed in the way individuals' access and utilize vehicles. Car rental systems, particularly those operating online, have emerged as pivotal

players in this paradigm shift. A substantial body of literature has explored the multifaceted dimensions of these systems, shedding light on their impact on urban mobility, consumer behavior, technological advancements, and the overall transportation landscape. Previous research by Smith highlighted the increasing trend of consumers preferring the flexibility and convenience offered by online car rental platforms, emphasizing the diminishing significance of traditional brick-and-mortar rental agencies. Johnson et al. delved into the economic implications of this shift, revealing how online platforms have not only expanded the market reach for rental companies but have also optimized operational costs, leading to increased profitability. In the realm of consumer behavior, Brown and Wilson conducted a comprehensive study on the preferences and decision-making processes of individuals when choosing rental services. Their findings underscored the significance of factors such as pricing strategies, vehicle options, and customer service quality in shaping consumer choices, thereby emphasizing the importance of strategic management within car rental platforms. Moreover, Garcia et al. explored the integration of mobile applications in car rental systems, emphasizing the role of user experience design in enhancing customer satisfaction. Their research demonstrated that intuitive interfaces, real-time booking capabilities, and seamless navigation significantly influenced user engagement and loyalty. From a technological perspective, Chen et al. investigated the implementation of IoT devices in rental vehicles, enabling features like GPS tracking and remote diagnostics. Such innovations not only improved fleet management but also enhanced vehicle safety measures, addressing critical concerns related to security and reliability. However, amidst the rapid advancements, challenges have emerged, as indicated by Jones and Smith, who discussed the legal and regulatory hurdles faced by online car rental platforms, ranging from insurance liabilities to compliance with local transportation laws. As the industry moves forward, researchers are increasingly focusing on sustainable practices and the integration of electric and autonomous vehicles into rental fleets, as demonstrated by recent studies. In conclusion, the literature surrounding car rental systems highlights their transformative impact on the transportation sector, emphasizing the need for continuous innovation, strategic management, and regulatory adaptation to ensure a sustainable and customer-centric future for these platforms.

CHAPTER 3: SYSTEM ANALYSIS AND DESIGN

3.1 System Analysis

The system analysis is done by conducting requirement analysis, feasibility analysis, data modeling, and process modeling as follows:

3.1.1 Requirement Analysis

i. Functional Requirement

A functional requirement is an outline of the service that the Car Rental Portal must offer. Features the system must provide are refined into use case diagrams to best capture the functional requirements of the system.

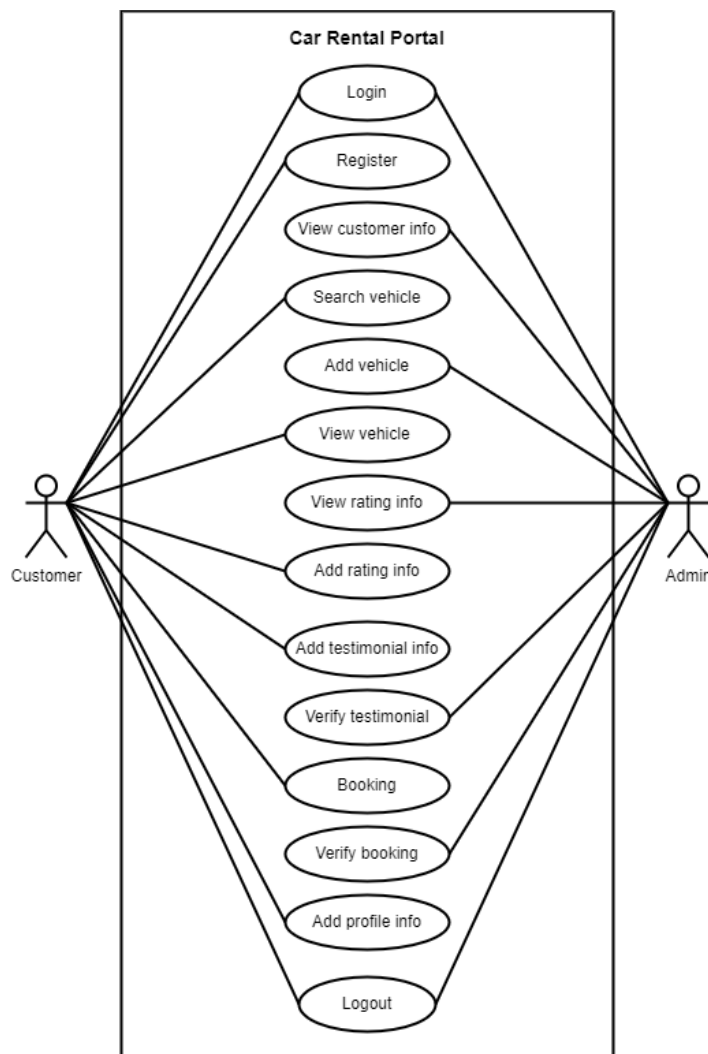


Figure 3.1: Use Case Diagram of Car Rental

The figure 3.1 is the use case diagram of Car Rental Portal. There are two actors, customer and admin. Customer shall register themselves into the system, after registration they shall login and logout, rent different vehicles, and rate the vehicles that they have rented. Similarly, the admin shall login and logout of the system, they

shall manage customers and vehicles.

ii. Non-Functional Requirements

a) Performance Requirement:

This system is designed for clean overall performance result. The performance of the Car Rental Portal will highly depend on the performance of the hardware and software components of the installed devices. Responses to view information shall take no longer than 5 seconds to appear on the screen.

b) Usability Requirement:

This system is very easy to use as it is written using basic HTML and PHP so that the user can interact with the system easily to do the needed work. And its security feature makes it very secure and reliable.

c) Availability Requirement:

This project is a web-based application. Meaning any browsers (Microsoft Edge, Chrome etc.) can be used. Also, the system shall be operational 24hrs a day and 7 days a week.

d) Environmental Requirement:

The system shall require a localhost server, database server, and a web browser to run successfully.

e) Compatibility Requirement:

The system shall be compatible across all platforms under the required environment.

f) Security Requirement:

Every user shall have a unique Session while logging into the system. The user password shall be in encrypted format in the database

3.1.2 Feasibility Analysis

The feasibility analysis of Car Rental Portal is done by measuring the feasibilities, which are explained as follows:

i. Technical Feasibility

The system can be implemented in various technologies presently available and in all technologies that will be implemented in the future.

ii. Operational Feasibility

This project is feasible to operate. The current mode of operation provides adequate throughput and response. So this project is entirely operational and can be operated on any platform.

iii. Economic Feasibility

This system is quite simple and it does not require extra software and hardware.
So, it is economically feasible.

iv. Schedule Feasibility

Here is the Gantt chart showing the probability of the project being completed within its scheduled time limits by a planned due date.

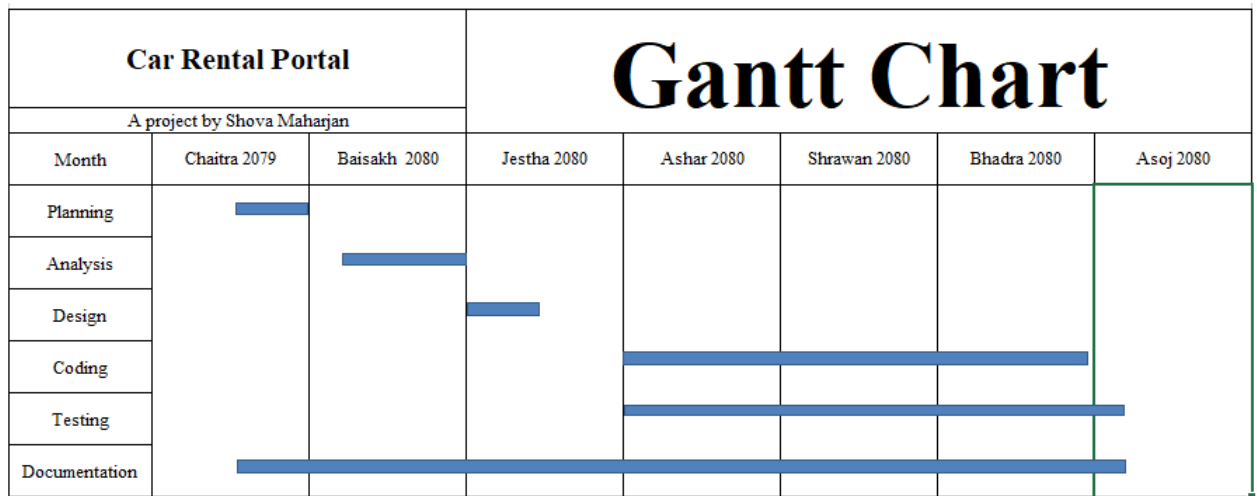


Figure 3.2: Gantt Chart of Car Rental Portal

3.1.3 Data Modeling (ER Diagram)

For data modeling, the ER diagram of Car Rental Portal is shown below:

Here, one Admin manages many vehicles and verifies different customers. One vehicle has vehicleid, vehiclename, vehiclenu, etc. Each entity has its own primary key attribute. For example, customer has user_id as a key attribute, and Admin has adminid as a key attribute.

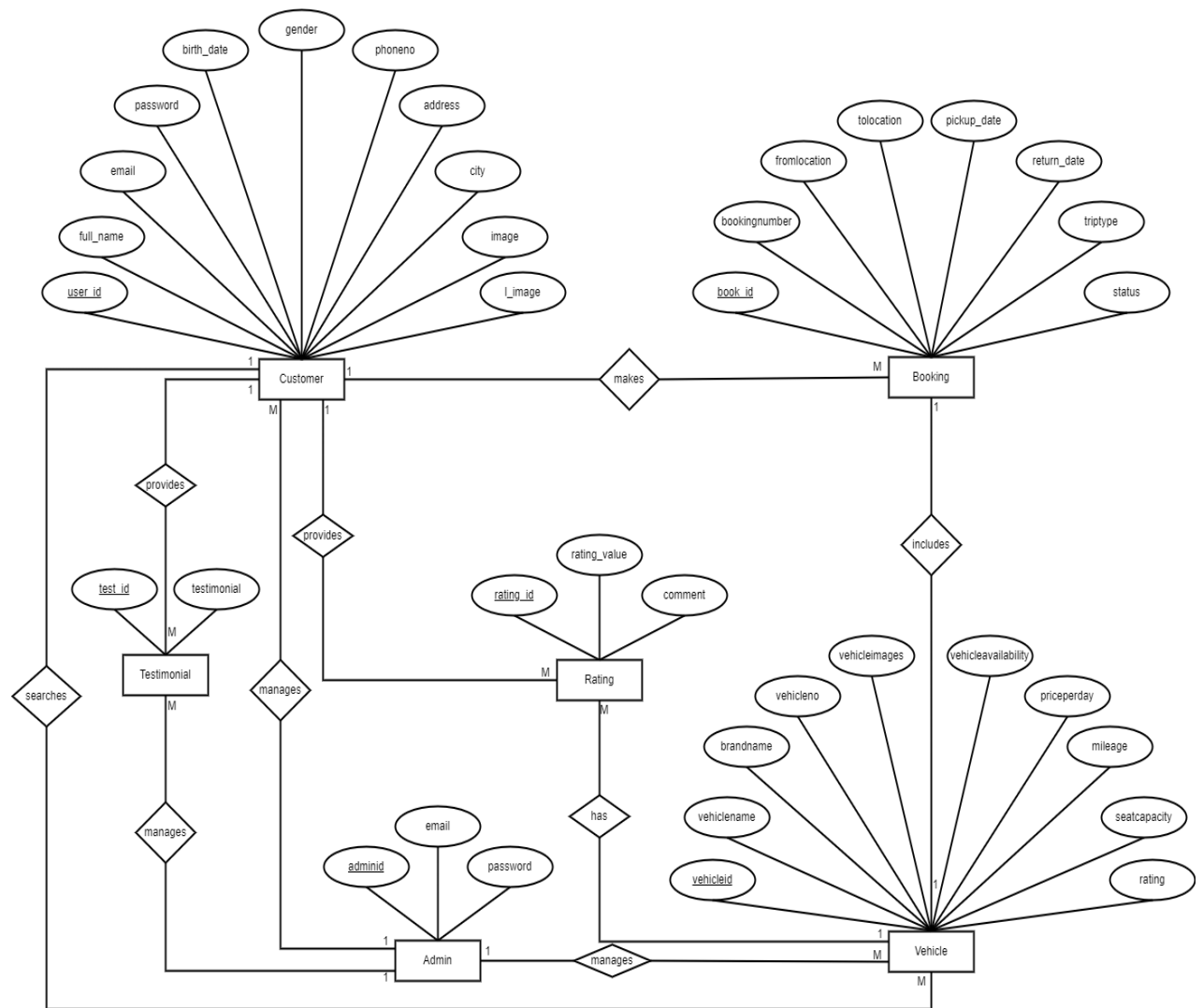


Figure 3.3: ER Diagram of Car Rental Portal

3.1.4 Process Modeling (DFD)

For process modeling of Car Rental Portal, context diagram and level 0 DFD are as follows:

Context Diagram

In the context diagram, there are two entities Customer and Admin. The context diagram below shows the corresponding data flows from each entity. The figure 3.4 is also known as context level diagram. It's a basic overview of the whole system or process being designed. The above context level diagram shows the basic overview of "Car Rental Portal". Here Customer shall register themselves in the website by filling their basic information which is then stored in database. They shall also view the vehicles and rate the vehicles that they have rented, also they shall logout of the system as pleased. Similarly, the admin shall view and manage all the vehicle related info and view the ratings given by customer, also shall logout of the system as well.

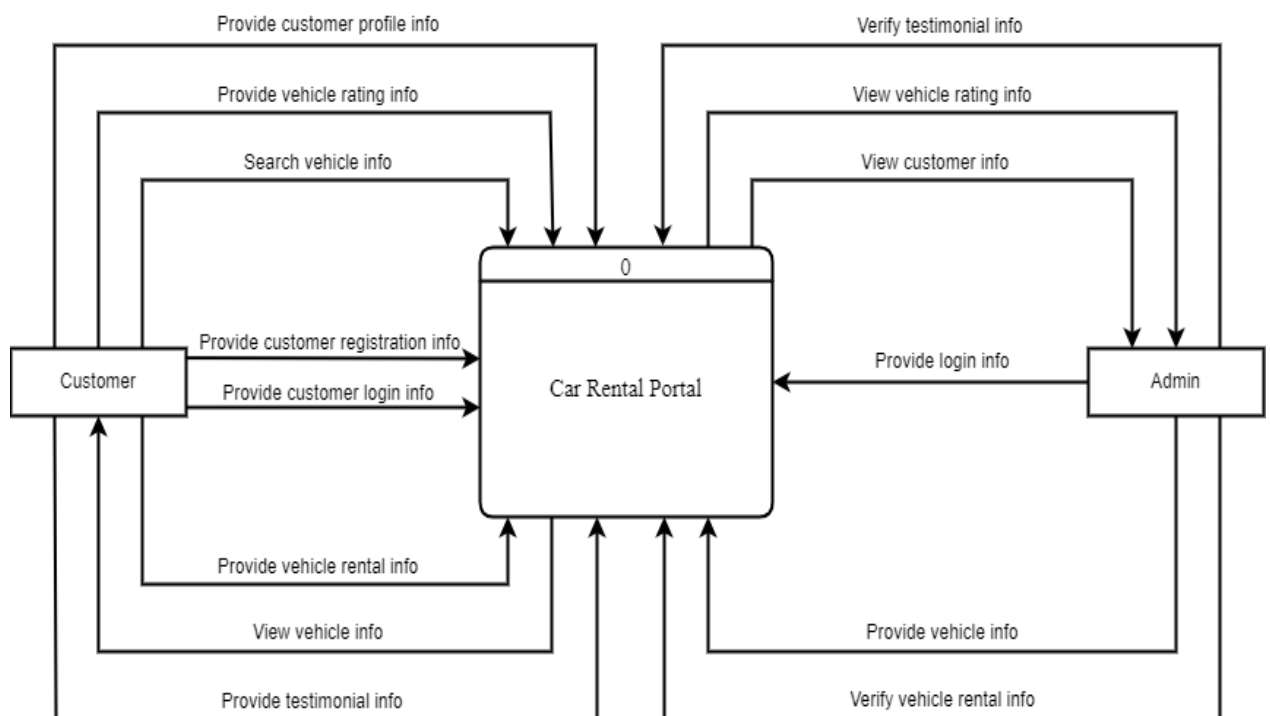


Figure 3.4: Context Diagram of Car Rental Portal

Level 0 DFD

The Level 0 DFD for Car Rental Portal is shown below:

The figure 3.5 shows the level 0 DFD of Car Rental Portal. It is the detailed view of context level DFD of Car Rental Portal.

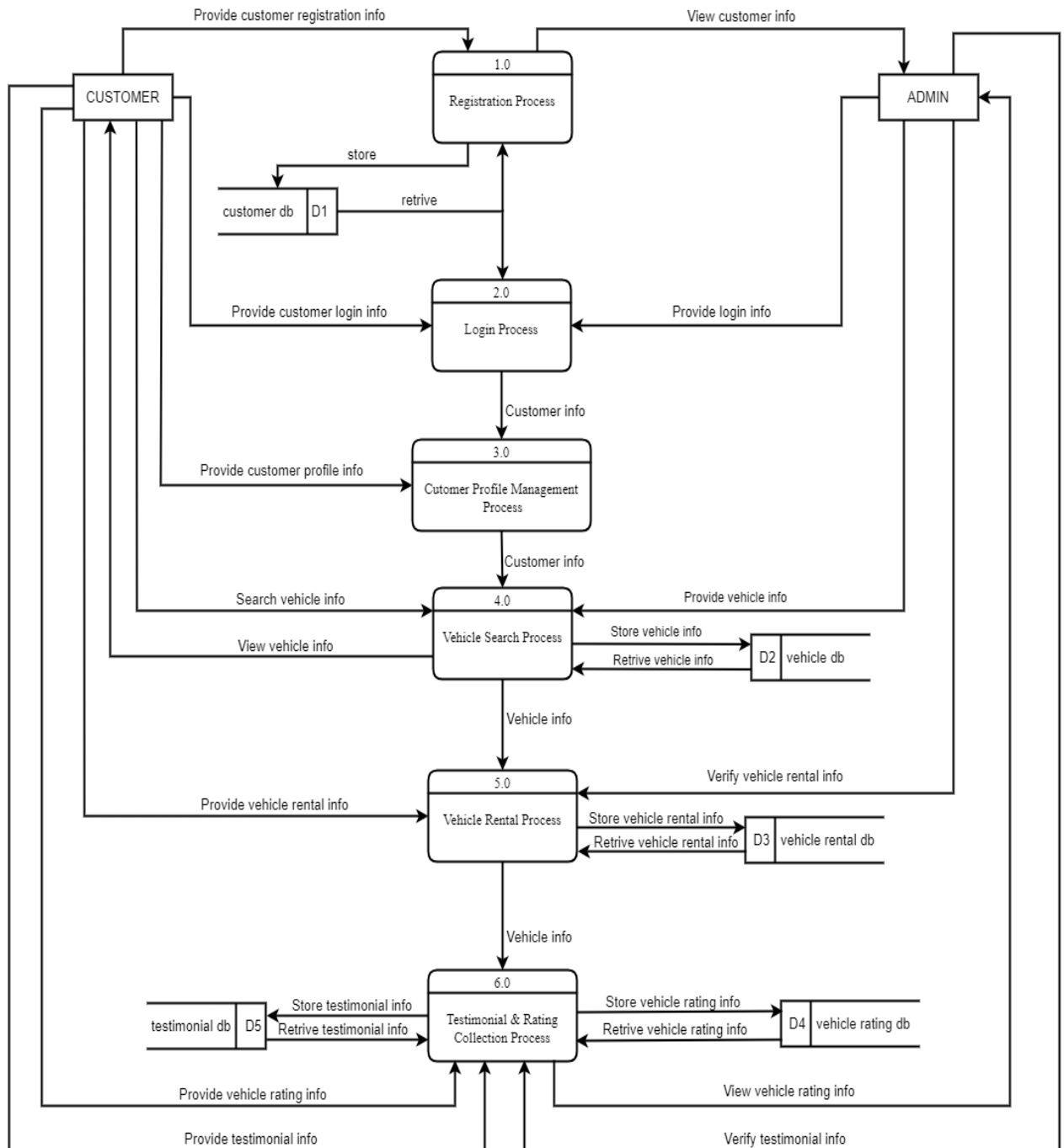


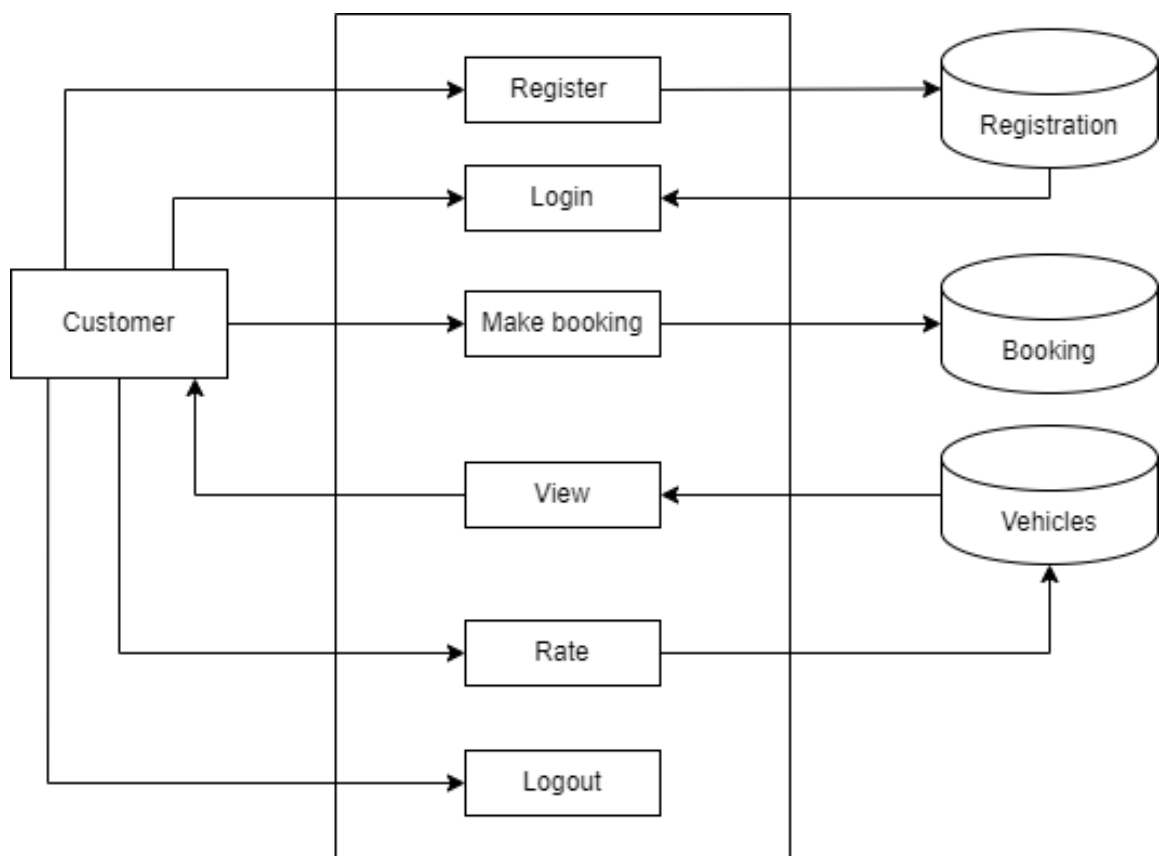
Figure 3.5: Level 0 DFD of Car Rental Portal

3.2 System Design

The system design of Car Rental Portal consists of architectural design, database schema design, user interface design, and physical DFD are shown as follows:

3.2.1 Architectural Design

The figure 3.6 represents the architectural design of the system Car Rental Portal. There are two modules in this system Customer and admin. Customer shall register themselves into the system by filling up the necessary details and those details are saved in the users table of the database. After registration they shall login to the system and they shall view the vehicles and rate the vehicles rented saved in the ratings table in the database. Similarly, admin shall login to the system, manage vehicles and view the review given by customer as they have access to the database.



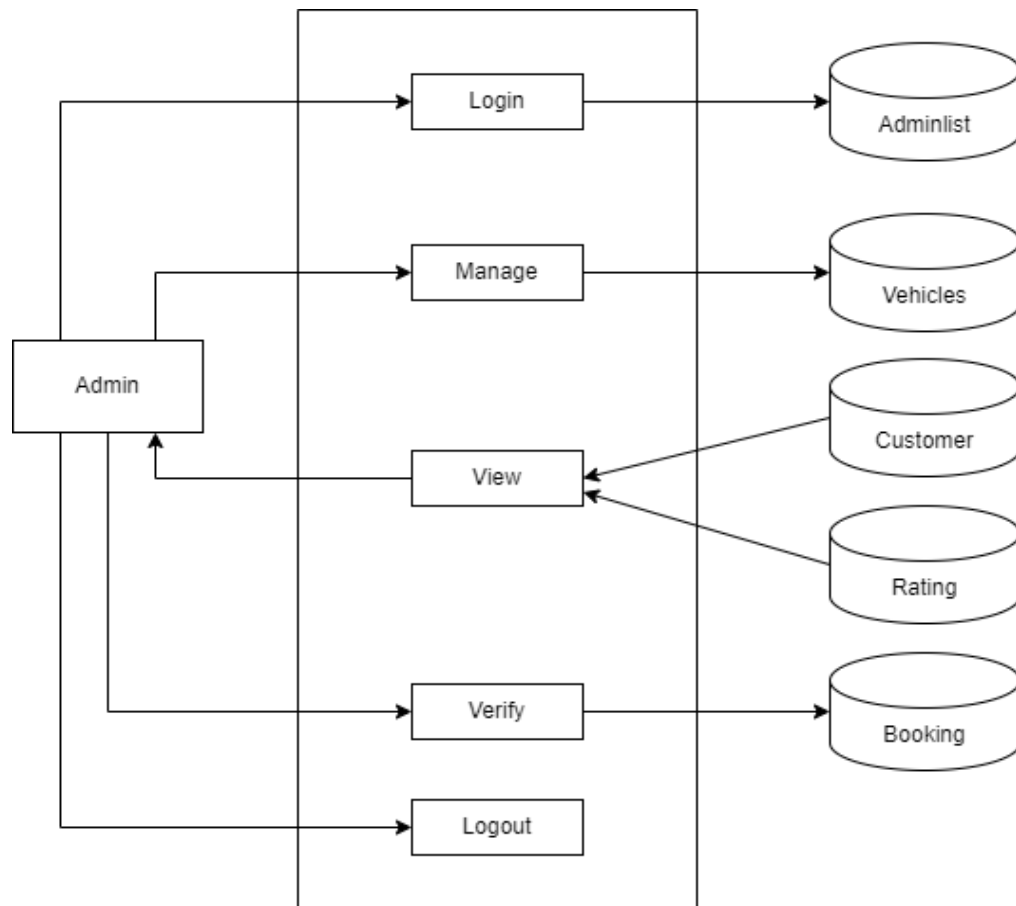


Figure 3.6: Architectural Design of Car Rental Portal

The system flowchart of Car Rental Portal is shown as follows:

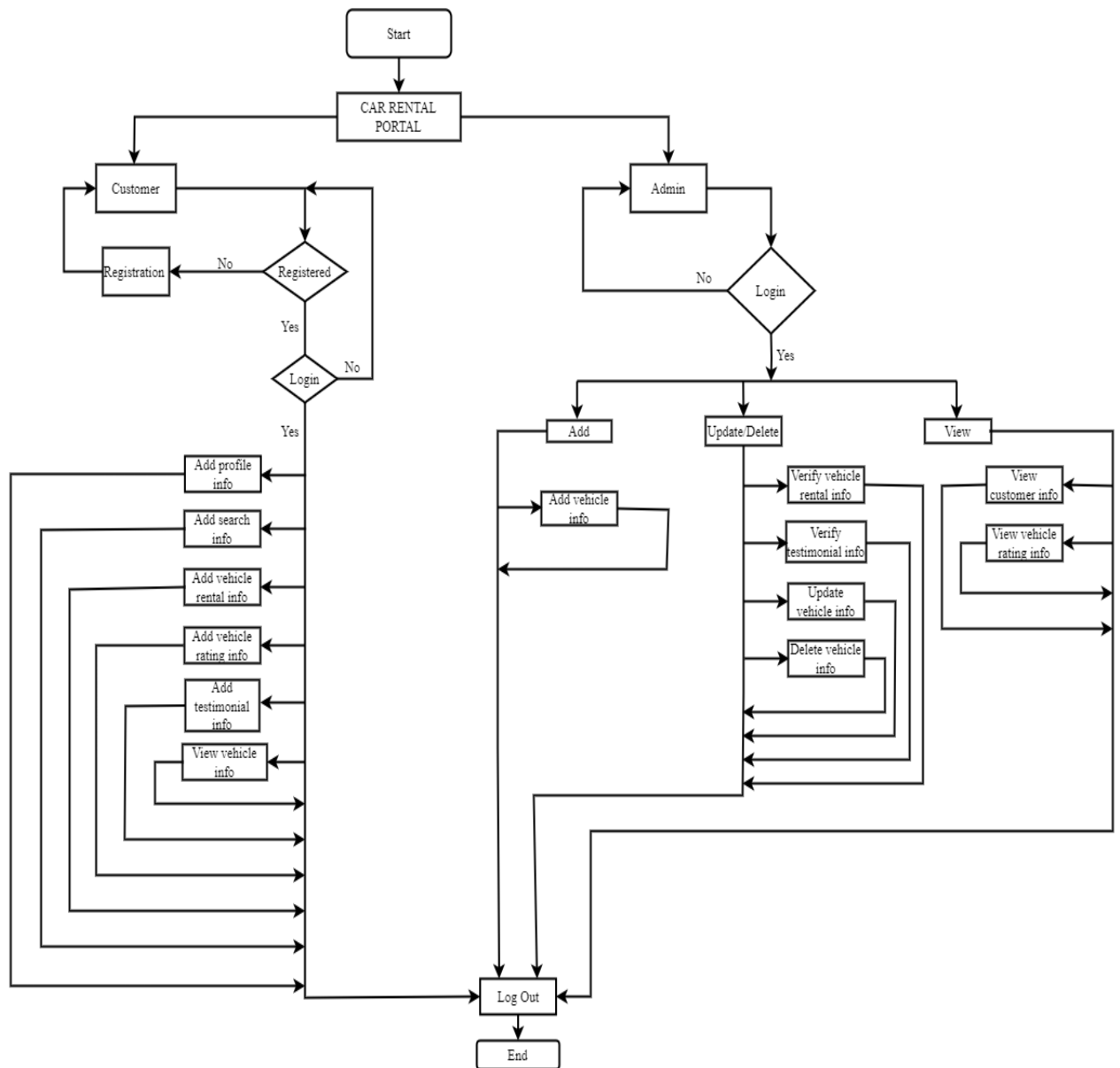


Figure 3.7: System Flowchart of Car Rental Portal

3.2.2 Database Schema Design

The database schema design for Car Rental Portal showing all the relations (Admin, vehicles, customers, booking) along with their respective attributes and inter-relationship between the relations is shown below:

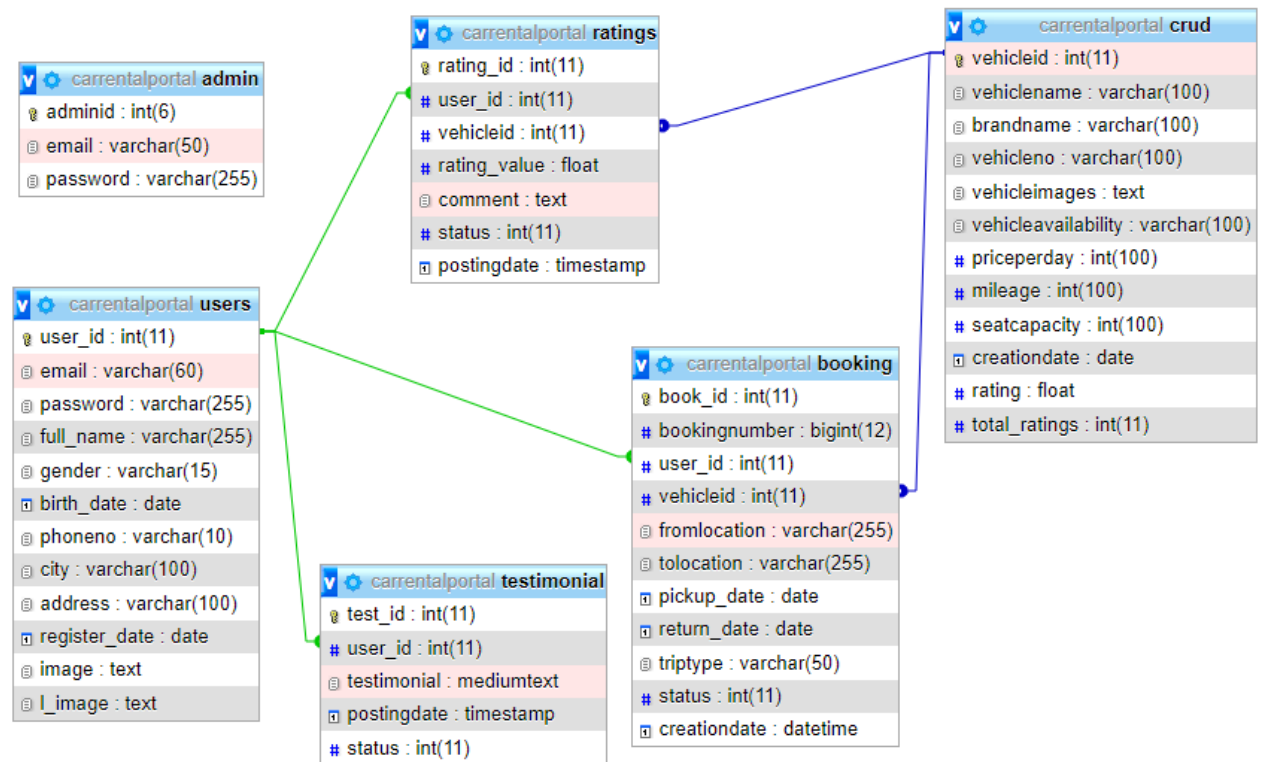


Figure 3.8: Database Schema Design of Car Rental Portal

3.2.3 Interface Design (UI Interface)

The interface design for all the major pages of Car Rental Portal are shown as follows:

Home Page:

The fig 3.9 is the user interface of Car Rental Portal. It is the first page that opens in the screen when the customer visits the website via any browser. From there customers shall login if they have an account by pressing the signin button and register if they don't have an account. They shall also explore all the vehicles that are available and book the desired vehicle.

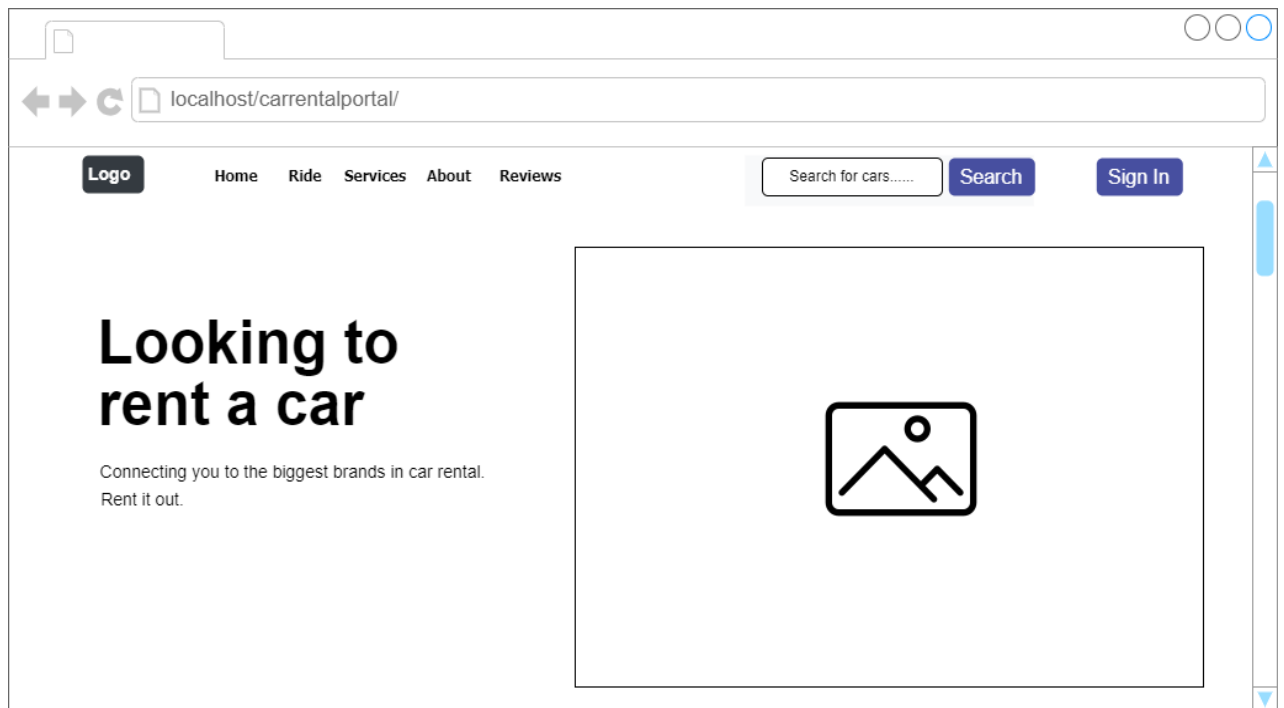
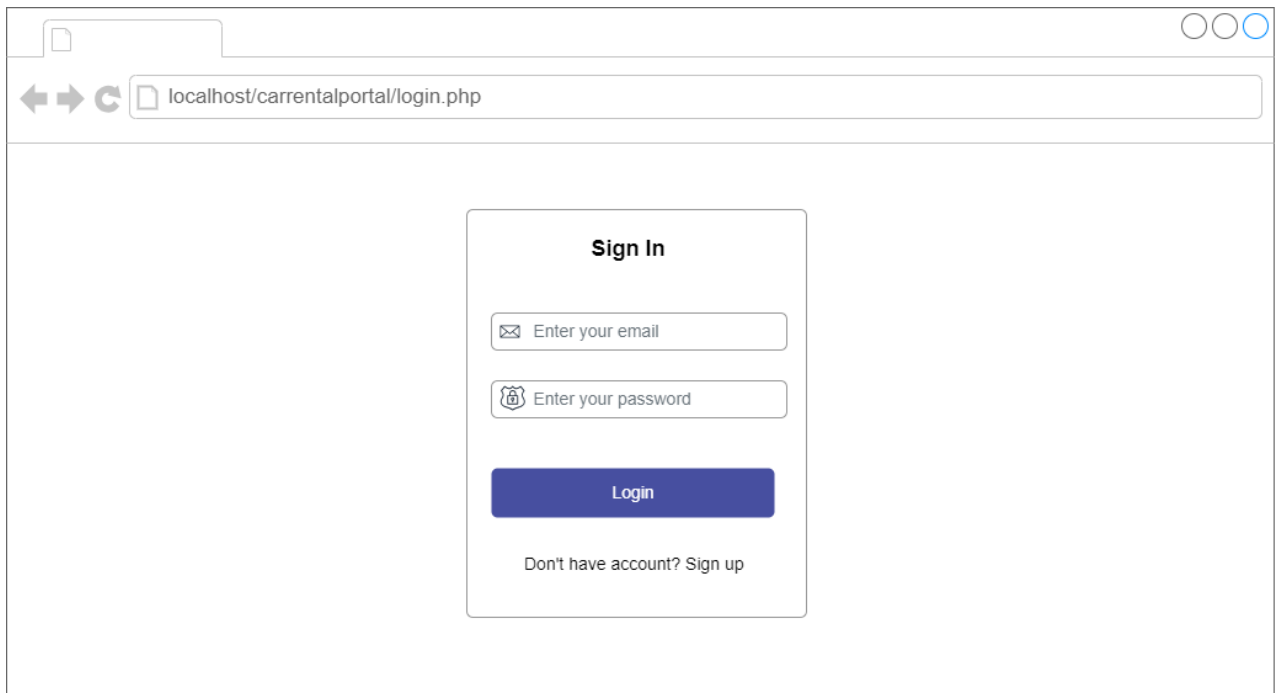


Figure 3.9 UI of Home Page of Car Rental Portal

Signin page:

Figure 3.10 is the user interface of the sign in page of Car Rental Portal. By clicking on the login button, customers log into the system by providing their correct email and their password if they have an account. Customers have the option to register if they don't have an account. If they provide an incorrect email or password the system won't let them log into the system.



The screenshot displays a web browser window with the address bar showing `localhost/carrentalportal/login.php`. The main content area features a centered "Sign In" form. The form has a title "Sign In" at the top. Below the title are two input fields: "Enter your email" with an envelope icon and "Enter your password" with a lock icon. A blue "Login" button is positioned below these fields. At the bottom of the form, there is a link that says "Don't have account? Sign up".

Figure 3.10 UI of Signin Page of Car Rental Portal

Signup page:

Figure 3.11 is the user interface of the sign up page of Car Rental Portal. Customers enter their full name, email address, phone number, birth date, gender, address, password and click the submit button. By clicking on the submit button, customers register into the system. Customers have the option to log in if they already have an account. If they provide an incorrect format of email, phone number, password, etc the system won't let them register into the system.

Sign Up

Full Name

Email Address

Phone Number

Birth Date

Gender
☒ male ☐ female ☐ prefer not to say

Address

Password

Submit

[Don't have account? Sign up](#)

Figure 3.11 UI of Signup Page of Car Rental Portal

Service page:

The fig 3.12 is the user interface of service page of Car Rental Portal. By clicking on the services link customer gets transferred to the service page where they can view the vehicle details along with their prices and book as per need.


Logo Home Ride Services About Reviews


Search for cars..... **Search** [Profile](#)


Find The Best Car Suitable For You

Car Name
 Rs.xxxx/day
 Brand: abc
 Availability: Available
 Mileage: xx kmpl
 Seat Capacity: x
Rent Now
 Average Rating: x.x **Rate This Vehicle**

Recently Added Cars


 Car Name


 Car Name


 Car Name


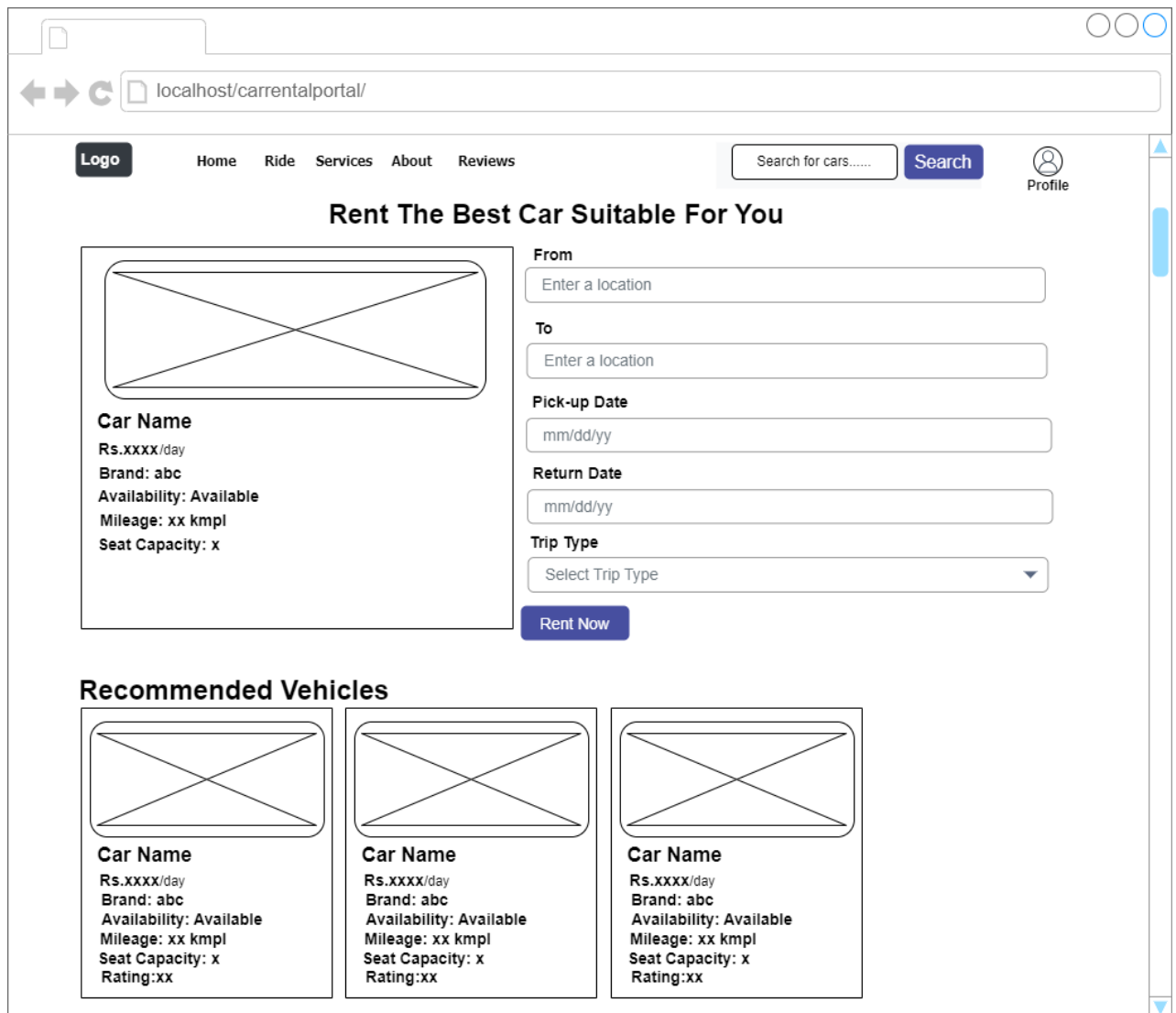

 Car Name

Figure 3.12 UI of Service Page of Car Rental Portal

Rent page:

Figure 3.13 is the user interface of the rent page of Car Rental Portal. Customers enter the details for renting car and click the rent button. By clicking on the rent button, customers rent the vehicle. If they provide an incorrect data the system won't let them to rent the vehicle.



The image shows a web browser window displaying the 'Rent' page of a Car Rental Portal. The browser's address bar shows 'localhost/carrentalportal/'. The page has a navigation bar with links: Home, Ride, Services, About, and Reviews. A search bar with the placeholder 'Search for cars.....' and a 'Search' button is located on the right. A user profile icon labeled 'Profile' is also present. The main heading is 'Rent The Best Car Suitable For You'. Below this, there is a large placeholder for a car image. To the right of the placeholder are input fields for 'From' (location), 'To' (location), 'Pick-up Date' (mm/dd/yy), 'Return Date' (mm/dd/yy), and 'Trip Type' (a dropdown menu). A 'Rent Now' button is at the bottom of this section. Below the main heading, there is a section titled 'Recommended Vehicles' which contains three identical placeholder boxes. Each box contains the following text: 'Car Name', 'Rs.xxxx/day', 'Brand: abc', 'Availability: Available', 'Mileage: xx kmpl', 'Seat Capacity: x', and 'Rating:xx'.

localhost/carrentalportal/

Logo Home Ride Services About Reviews Search for cars..... Search Profile

Rent The Best Car Suitable For You

From
Enter a location

To
Enter a location

Pick-up Date
mm/dd/yy

Return Date
mm/dd/yy

Trip Type
Select Trip Type

Rent Now

Recommended Vehicles

Car Name
Rs.xxxx/day
Brand: abc
Availability: Available
Mileage: xx kmpl
Seat Capacity: x
Rating:xx

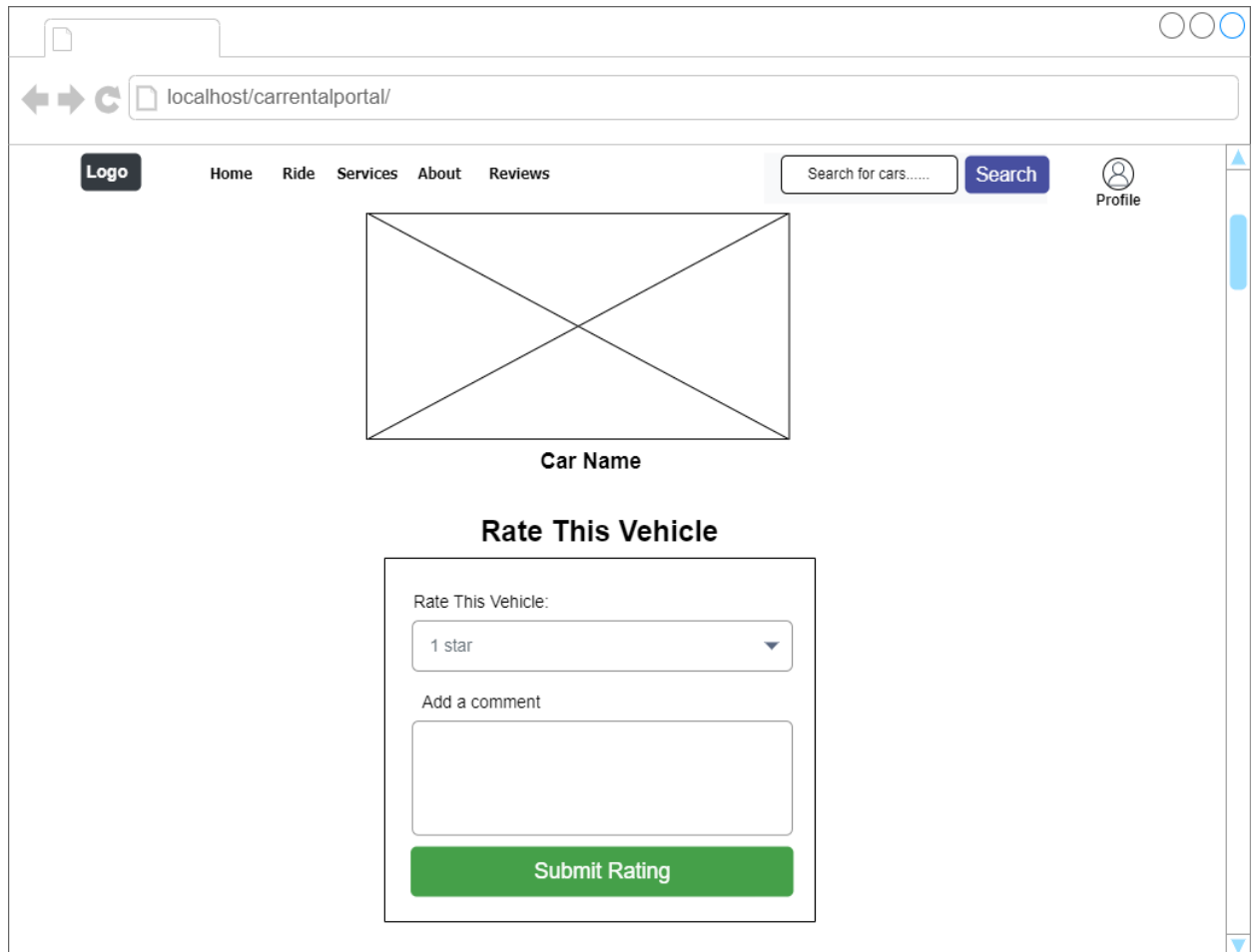
Car Name
Rs.xxxx/day
Brand: abc
Availability: Available
Mileage: xx kmpl
Seat Capacity: x
Rating:xx

Car Name
Rs.xxxx/day
Brand: abc
Availability: Available
Mileage: xx kmpl
Seat Capacity: x
Rating:xx

Figure 3.13 UI of Rent Page of Car Rental Portal

Rate page:

Figure 3.14 is the user interface of the rate page of Car Rental Portal. Customers choose from 1 to 5, enter comment and click submit rating button. By clicking on the rating button, customers rate the vehicle.



The screenshot shows a web browser window with the address bar displaying 'localhost/carrentalportal/'. The page has a navigation bar with a 'Logo' button and links for 'Home', 'Ride', 'Services', 'About', and 'Reviews'. On the right side of the navigation bar, there is a search input field with the placeholder text 'Search for cars.....', a 'Search' button, and a 'Profile' link with a user icon. The main content area features a large rectangular placeholder with a diagonal 'X' and the text 'Car Name' below it. Below this is the heading 'Rate This Vehicle'. Under the heading is a form box containing a 'Rate This Vehicle:' label, a dropdown menu currently showing '1 star', a text input field labeled 'Add a comment', and a green 'Submit Rating' button.

Figure 3.14 UI of Rate Page of Car Rental Portal

3.2.4 Physical DFD

The physical DFD of Car Rental Portal is shown as follows:

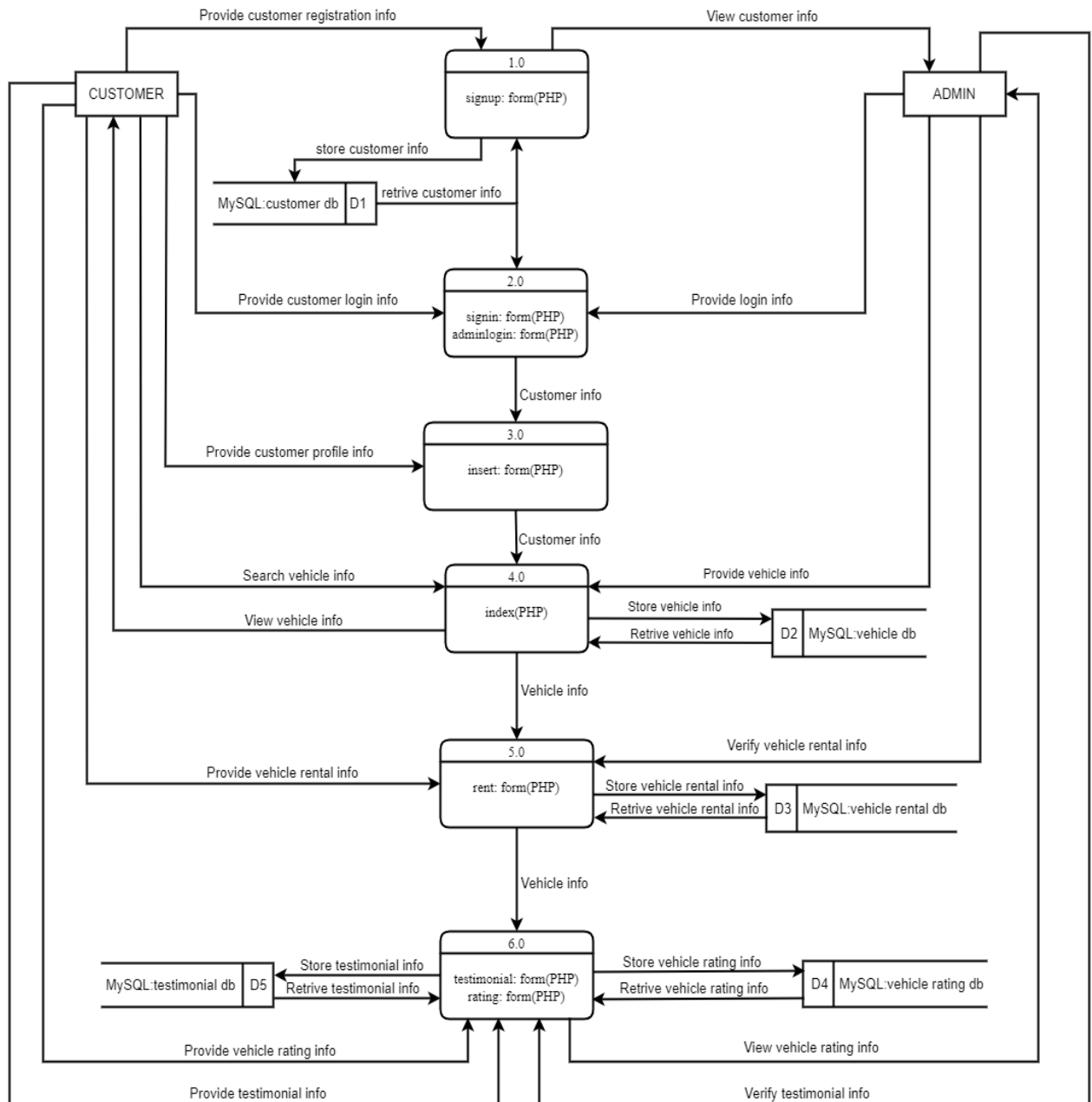


Figure 3.9: Physical DFD of Car Rental Portal

3.3 Algorithm Details

The Car Rental Portal makes the use of Rating Algorithm (RA) for vehicle recommendation. Rating is a technique that uses to rank the vehicle in the proposed system. This technique is used in to show the popularity of vehicle among the customers.

Rating Algorithm (RA) shows the most rated vehicle which can be rated by the customer on the scale of five. Customers are given rights to rate vehicle according to their choice, and then every time different customers choose to rate a vehicle and then average rating is generated and shown in the vehicle.

Steps in the Rating algorithm are:

Step 1: Start

Step 2: Create database to store rating.

Step 3: Implement your ranking algorithm as part of your database query in each vehicle.

Step 4: Run a job that calculates 'ranking' for each vehicle and updates that field in your database.

Step5: Fetch the rating details into each vehicle.

Step 6: Then simply query your data and recommend by ranking.

Step 7: End

We can calculate the average rating by adding all individual scores, divide by the number of individual responses, and we have our average rating. The rating is rounded to nearest tenth.

An example let's say we received the following responses:

Customer 1: 3 star for vehicleid 30

Customer 2: 4 star for vehicleid 30

Total scores = 7 and total responses = 2, the calculation becomes:

Average rating = total scores/total responses

$$= 7/2 = 3.5$$

In this way, we calculate the average rating.

CHAPTER 4: IMPLEMENTATION AND TESTING

4.1 Implementation

The tools and techniques used to implement the system and the implementation details of various modules of Car Rental Portal are as follows:

4.1.1 Tools Used (CASE tools, Programming languages, Database platforms)

The tools used for the implementation of Car Rental Portal are listed below:

Draw.io

Draw.io is an online diagram editor constructed around google drive. Using draw.io we have been capable of creating UML diagrams, entity relations diagrams, and plenty more. One of the benefits of draw.io is that it stores the information in google drive, consequently, there's no need for an extra third party.

HTML CSS & JavaScript

HTML, CSS, and JavaScript were used for the front-end development. HTML was used for the webpage elements. CSS was used to provide its styling to the components. JavaScript was used for client-side validations and adding dynamic components to the website.

PHP

PHP is a server-side scripting language that is embedded in HTML. It is included with some of the famous databases, which include MySQL, and its usage has helped us add, delete, and modify elements inside our database via PHP. Using PHP, we had been capable of limiting customers to get entry to a few pages of our website.

MySQL

MySQL is presently the most famous database management system software used for dealing with relational databases. It was used along with PHP scripts for developing our database structure. It became extensively utilized to carry out numerous activities like insertion, deletion, and update of the records saved in the database.

Visual Studio Code

Visual Studio Code is a lightweight but powerful source code editor which runs on computer systems and is available for Windows, MacOS, and Linux.

4.1.2 Implementation Details of Modules

The major functional modules of Car Rental Portal and their implementation is shown in the figure below:

1. Signup Module:

This module is used to register the new customer into the system. Here customer has to fill up all the necessary details about themselves to get registered. These data gathered are first validated and then stored into the database using SQL query. After the registration the registered customer shall log into the system by providing email and password which is identical to the email and password stored into the database.

```
$insert = mysqli_query($connection, "INSERT INTO `users` (full_name ,email, password, gender, birth_date, phoneno, city, address) VALUES('$full_name','$email','$password', '$gender','$birth_date', '$phone', '$city', '$address')");
```

2. Vehicle Management Module:

This module is used to entry new vehicles in the database. Here admin has to fill up all the necessary details about the vehicles. These data gathered are first validated and then stored into the database using SQL query.

```
$sql = "INSERT INTO `crud` (vehiclename, brandname, vehiclenu, vehicleimages, vehicleavailability, priceperday, mileage, seatcapacity) VALUES ('$vehiclename','$brandname','$vehiclenu','$vehicleimages','Available','$priceperday', '$mileage','$seatcapacity')";
```

3. Booking Management Module:

This module is used for the manipulation of booking details which include booking vehicles. Admin has the full access to the database so only, they can cancel any booking of any customer as pleased or as instructed.

```
$insert_query = "INSERT INTO booking (bookingnumber, user_id, vehicleid, fromlocation, tolocation, pickup_date, return_date, triptype, status) VALUES ('$bookingnumber', '$user_id', '$vehicleid', '$fromlocation', '$tolocation', '$pickup_date', '$return_date', '$triptype', $status)";
```

4.2 Testing

The testing section is accomplished to affirm and validate the Car Rental Portal. The Car Rental Portal is examined to test if the final system can work in keeping with what we have been waiting for and is free from any programming and logical errors. It additionally makes sure whether or not all of the systems and requirements are met or not.

4.2.1 Test Cases for Unit Testing

Unit testing is a software program development method in which the smallest testable components of an application, known as units, are individually and independently scrutinized for correct operation. Below are the numerous tables for distinctive test cases:

Table 4.1: Test Case 001-Login

Pre-conditions: The user has a valid email and password				
Dependencies: Sign-Up Module				
S.N.	Test Steps	Input	Expected Result	Actual Result
1	Navigate to login page		Login page should open	As Expected i.e.Customer is navigated to login page of system
2	Correct email and password	Customer must login successfully	Customer logged into the system	As Expected i.e. Customer was able to access the services provided by the system
3	Incorrect email but correct password	Customer must not login	Customer was not logged into the system	Customer was not able to access the services provided by the system
4	Correct email but incorrect password	Customer must not login	Customer was not logged into the system	Customer was not able to access the services provided by the system
Post-conditions: Customer is validated with database and successfully login to Car Rental Portal.The account session details are logged into the database.				

Table 4.2: Test Case 002-Insert Vehicles

Pre-conditions: Admin is logged into Car Rental Portal				
Dependencies: Login Module				
Step	Test Steps	Input	Expected Result	Actual Result
1	Navigate to admin page		Admin page should open	As Expected i.e.Admin is navigated to admin page of system.
2	Provide all required information	Vehicle Name= Hyundai i10 Brand Name= Hyundai Vehicle Reg. Number= Ba 12 Pa 1290 Price Per Day= 3000 Mileage= 20 Seat Capacity=5	Credential can be entered	As Expected
3	Data Insertion	Click on the create button	Admin should be able to add vehicles to the system	As Expected i.e. Admin can add the vehicle to the system
Post-conditions:				
The event is successfully inserted to database.				

4.2.2 Test Cases for System Testing

System Testing is a form of software testing that is executed on a complete integrated system to assess the compliance of the system with the corresponding requirements.

Table 4.3: Test Case 003-System

S.N.	Test Case	Input	Expected Outcome	Output
1	Check with login	Email:shilu@gmail.com Password: shilu123	Successful login	Opens dashboard of Car Rental Portal
2	Check with Customer Register	If required fields are filled with defined data type	Successful entry of new customer	Inserted data into database in registration table
3	Check with delete, edit customer	Search user_id. Click edit or delete button	Must be edited or deleted	Edit or delete customer in database
4	Check with vehicle entry	If required fields are filled with defined datatype	Successful entry	Inserted data into database in vehicle table
5	Check with delete, edit vehicles	Search vehicleid. Click edit or delete button	Must be edited or deleted	Edit or delete vehicle in database
6	Check with booking	If required fields are filled with defined data type	Successful booking	Inserted data into database in booking table
7	Check with cancel booking	Search book_id. Click delete or cancel button	Must be cancelled	Delete booking details from database
5	Check with logout	Click logout button	Successfully logout	Redirect to login

CHAPTER 5: CONCLUSION AND FUTURE RECOMMENDATIONS

5.1 Lesson Learnt

This project has helped to learn how to develop web-based car rental portals and implement them across various platforms. It helped to learn how to host a web application locally on a host computer. It helped to learn how a customer can search vehicle and rent the vehicle online. It helped to learn how to do pair programming and finish the project within the schedule. It helped to know how to implement theoretical knowledge gained from various subjects in practical life. This project has helped to gain great skills for project management and software development.

5.2 Conclusion

Car rental business has emerged with new goodies compared to the past experience where every activity concerning car rental businesses 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 customer's need at the click of a button.

5.3 Future Recommendations

The possible improvements that can be made for the Car Rental Portal include:

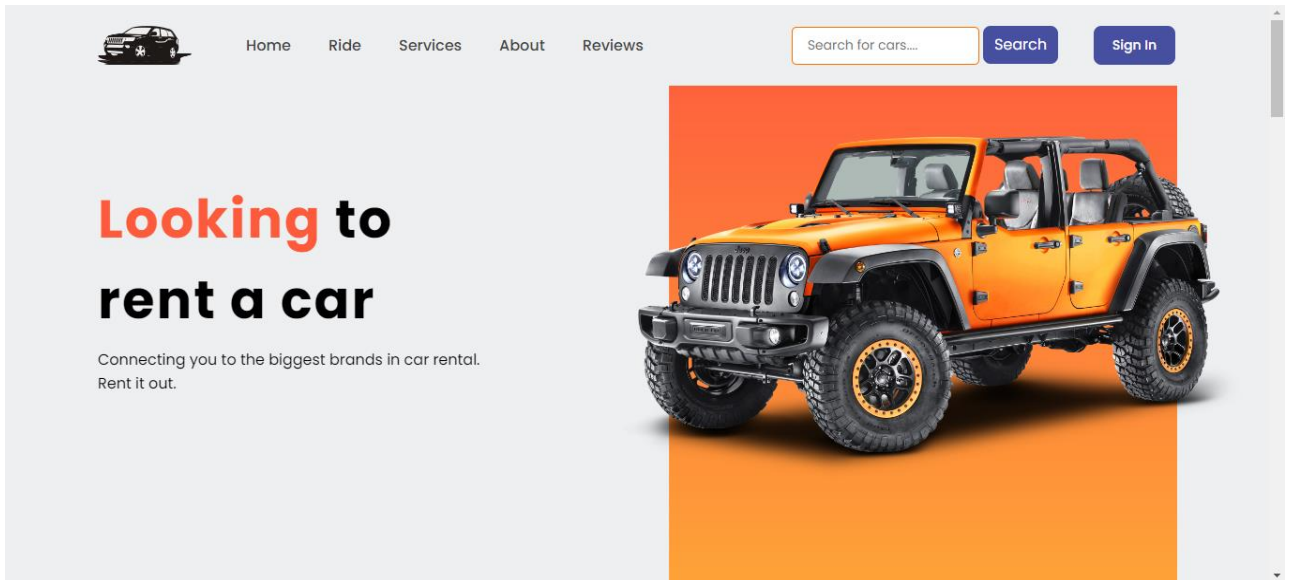
- Making the graphical user interface friendlier and more functional in the next development.
- Adding online payment System.

REFERENCES

1. Somerville, Software Engineering, 10th ed. London: Pearson Education Limited, 2016.
2. Silberschatz, H. Korth and S. Sudarshan, DATABASE SYSTEM CONCEPTS, 6th ed. New York: McGraw-Hill, 2011, pp. 39-55, 259-321.
3. P. Deitel and H. Deitel, Internet & WorldWideWeb HOW TO PROGRAM, 4th ed. New Jersey: Pearson Education, Inc., 2008.
4. Draw.io, "Flowchart Maker & Online Diagram Software," app.diagrams.net, 2023. <https://app.diagrams.net/>.
5. Khojnu search. Available at: <https://www.khojnu.com/>
6. "Project Report on Car Rental System," [Online]. Available: <https://www.freeprojectz.com/project-report/1743>.
7. "Car Rental Management System," [Online]. Available: https://www.researchgate.net/publication/353174644_Car_Rental_System

APPENDICES

1. Home Page



2. Sign Up Page

The screenshot shows the sign-up page of a car rental website. The page has a dark blue background. The sign-up form is centered and has a white background. The form is titled "Sign Up" and contains the following fields and options:

- Full Name:** A text input field with the placeholder text "Enter full name".
- Email Address:** A text input field with the placeholder text "Enter email address".
- Phone Number:** A text input field with the placeholder text "Enter phone number".
- Birth Date:** A text input field with the placeholder text "mm/dd/yyyy" and a calendar icon.
- Gender:** Three radio button options: "male" (selected), "Female", and "prefer not to say".
- Address:** A dropdown menu for "City" and a text input field for "Enter your address".
- Password:** Two text input fields: "Enter Your Password" and "Confirm Password".

At the bottom of the form is a large blue "Submit" button. Below the button, there is a link that says "Already have an account? [Signin](#)".


3. Signin Page


Sign In

Login


Don't have an account? [Signup](#)

4. Service Page


[Home](#) [Ride](#) [Services](#) [About](#) [Reviews](#)

[Search](#)  [Profile](#)


Recently Added Cars




Hyundai i10




Suzuki Baleno



Toyota Yaris L




Hyundai Santro



Maruti Suzuki Swift

Find The Best Car Suitable For You



Hyundai i10


Rs.3000/day

Brand: Hyundai
Availability: Available
Mileage: 20 kmpl
Seat Capacity: 5


Rent Now

Average Rating: 3.2 [Rate This Vehicle](#)


5. Rent Page

[Home](#) [Ride](#) [Services](#) [About](#) [Reviews](#)

Search for cars... [Search](#)

 [Profile](#)

Rent The Best Car Suitable For You



Hyundai i10
Rs.3000/day
Brand: Hyundai
Availability: Available
Mileage: 20 kmpl
Seat Capacity: 5

From

To

Pick-up Please fill out this field.


Return Date

Trip Type


Select Trip Type

Rent Now


Recommended Vehicles




Hyundai i10
Rs.3000/day
Brand: Hyundai
Availability: Available
Mileage: 20 kmpl
Seat Capacity: 5
Rating: 19



Hyundai Creta
Rs.6000/day
Brand: Hyundai
Availability: Available
Mileage: 16 kmpl
Seat Capacity: 5
Rating: 15



Toyota Yaris L
Rs.5000/day
Brand: Toyota
Availability: Available
Mileage: 17 kmpl
Seat Capacity: 5
Rating: 12





Suzuki Baleno
Rs.4000/day
Brand: Maruti Suzuki
Availability: Available
Mileage: 23 kmpl
Seat Capacity: 5
Rating: 6

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[f](#) [t](#) [i](#)

6. Rate Page

[Home](#) [Ride](#) [Services](#) [About](#) [Reviews](#)

[Search](#)  [Profile](#)



Hyundai i10

Rate This Vehicle


Rate this vehicle:


1 star


Add a comment:


Submit Rating


7. Admin Dashboard Page


 Car Rental Portal


 Dashboard


 Brand


 Vehicles


 Registered Customer

 Manage Testimonials

 Bookings

 Manage Ratings

 Log out



Welcome To Admin Dashboard

14

Registered Users

Full Detail →

6

Listed Vehicles

Full Detail →

8

Total Bookings

Full Detail →

5

Listed Brands

Full Detail →

5

Testimonials

Full Detail →

8. Manage Vehicle Page

Car Rental Portal

Dashboard

Brand

Vehicles

Registered Customer

Manage Testimonials

Bookings

Manage Ratings

Log out

Insert Vehicle Details

Vehicles Name:-

Select Brand:

Choose

Vehicle Reg. Number:-

Vehicle Image:

Choose File

No file chosen

Price Per Day:-

Mileage:-

Seat Capacity:-

Create

Update and Delete

Car Rental Portal

Dashboard

Brand

Vehicles

Registered Customer

Manage Testimonials

Bookings

Manage Ratings

Log out

Vehicle List

New

VehicleId	Vehicle Name	Brand Name	Vehicle Reg. Number	Vehicle Images	Vehicle Availability	Price Per Day	Mileage	Seat Capacity	Rating	Total Ratings	Action
30	Hyundai i10	Hyundai	Ba 12 Pa 1290	car1.jpg	Available	3000	20	5	19	6	<div>update</div> <div>Delete</div>
31	Suzuki Baleno	Maruti Suzuki	Ba 67 Pa 456	car2.jpg	Available	4000	23	5	6	2	<div>update</div> <div>Delete</div>
32	Toyota Yaris L	Toyota	Ba 89 Pa 6780	car3.jpg	Available	5000	17	5	12	3	<div>update</div> <div>Delete</div>
											<div>update</div> <div>Delete</div>