LAB REPORT

Submitted by

RITU SINGH [RA2011003011048]

Under the Guidance of

Dr. Bibin Christopher V

In partial satisfaction of the requirements for the degree of

**BACHELOR OF TECHNOLOGY
in
COMPUTER SCIENCE ENGINEERING**

SCHOOL OF COMPUTING

COLLEGE OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

KATTANKULATHUR - 603203

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SRM INSTITUTION OF SCIENCE AND TECHNOLOGY
KATTANKULATHUR-603203

BONAFIDE CERTIFICATE
Register No. RA2011003011048

Certified to be the bonafide record of work done by …………………………………of……………………………………… ……………………………….B.Tech Degree course in Practical **18CSC206J-SOFTWARE ENGINEERING AND PROJECT MANAGEMENT** *in SRM Institute of Science and Technology ,Kattankulathur during the academic year 2021-2022.*

Date: **Lab Incharge**

Submitted for University Examination held in ……………………SRM Institute of Science and Technology.

Examiner-1   **Examiner -2**

TABLE OF CONTENTS

LIST OF FIGURES

Experiment No 1

Title of Experiment- To identify the Software Project, Create Business Case, Arrive at a Problem Statement

Aim

To Frame a project team, analyze and identify a Software project. To create a business case and Arrive at a Problem Statement for the <title of the project>

Project Title: SELLAZA- used car dealer website

Project Description

It is an online marketplace application or a platform where users can buy/ second-hand Cars. We design online marketplace application to ensure the safety and security of users for each transaction they enter into. We are making an outstanding car dealer website design to boost traffic and engage your customers.The global car market has a high competition rate. Having a great website for car dealerships is crucial for gaining customer trust in the first few moments.

Business Case
        <Incorporate the Business Case template>

Sellaza-used car dealer website

DATE	15 Feb-2022
SUBMITTED BY	RITU, JAHNAVI, KRISHNA
TITLE / ROLE	USED CAR DEALER WEBSITE

THE PROJECT

In bullet points, describe the problem this project aims to solve or the opportunity it aims to develop.

- It is an online marketplace application or a   platform where users can buy/   second-hand Cars.
- We design online marketplace application to ensure the safety and security of users for each transaction they enter into.
- We are making   an outstanding car dealer website design to boost traffic and engage your customers.
- The global car market has a high competition rate. Having a great website for car dealerships is crucial for gaining customer trust in the first few moments.

THE HISTORY

In bullet points, describe the current situation.

- Only one in three potential car buyers know the exact vehicle that they want to purchase. User-friendly design helps to make the right decision.
- 95% of vehicle buyers use the internet as a source of information. Therefore, a responsive website design lets your business get inside the customers' smartphones.
- 76% of new and used vehicle shoppers run a Google search before buying. The SEO-friendly design makes your website be at the top of search results.

LIMITATIONS

List what could prevent the success of the project, such as the need for expensive equipment, bad weather, lack of special training, etc.

- The absence of landing pages. The lack of relevant landing pages is a widespread problem. If your website contains a wide range of different vehicles for sale, having a landing page is obligatory. It will help you rank high up in specific search results pages.
- Lack of posting schedule. If we do not update the information on Facebook, LinkedIn, or Twitter accounts, people will not be able to regularly follow us. We need to be always in touch with the customers though social media.

APPROACH

List what is needed to complete the project.

- Knowledge of HTML, JavaScript and CSS.
- Knowledge of how data is cleaned and scraped from the internet
- Windows 7 or later, macOS X or later.
- Minimum of 4gb of RAM
- Jupyter / Google Collab

BENEFITS

In bullet points, list the benefits that this project will bring to the organization.

Result

Thus, the project team formed, the project is described, the business case was prepared and the problem statement was arrived.

<u>**Experiment-:2**</u>

Title of the experiment: Identification of process Methodology and stakeholders description.

Aim

      To identify the appropriate Process Model for the project and prepare Stakeholder and User Description.

Project Title: SELLAZA- used car dealer website

Selection of Methodology

- **< Summarize their understanding of "Waterfall" or "Agile" Methodology> We have planned to follow the Agile Methodology , it is a way to manage a project by breaking it up into several phases. It involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating. Continuous collaboration is vital, both with team members and project stakeholders. A project management methodology characterized by building products using short cycles of work that allow for rapid production and constant revision.**
    - **Scrum - A PM methodology in which a small team is led by a Scrum master, whose main job is to clear away all obstacles to completing work. Work is done in short cycles called sprints, but the team meets daily to discuss current tasks and roadblocks**
    - **Extreme Project Management (XPM)- A PM methodology where the project plan, budget, and final deliverable can be changed to fit evolving needs, no matter how far along the project is.**

Incorporate information to below table regarding stakeholders of the project [Make use of below examples]

Stakeholder Name	Activity/ Area /Phase	Interest	Influence	Priority (High/ Medium/ Low)
G JAHNAVI	Lead the team in every aspect.	High	High	High
RITU AND JAHNAVI	Managing time frames and meeting targets within specified time.	High	High	High
RITU	Provides Feedback	High	High	High
R MADHAVA	Ensure the project requirements are achieved.	High	High	High
RITU AND R MADHAVA	Providing technical assistance in creating project.	Medium	Medium	Medium
JAHNAVI AND MADHAVA	Maintenance and smooth running of project.	High	Medium	High

Interest and Influence matrix

Interest	**Influence**
High	High
Low	Low
Low	High
High	Low

2 . STAKEHOLDER INTEREST, INFLUENCE, PRIORITY IDENTIFICATION

Stakeholder	Responsibility	Interest	Influence	Estimated Priority
Owner	To monitor the functioning of the company	High	High	1
Sponsor	For providing financial assets	Low	Low	7
Team members	Look after the various departments of the organization	High	High	3
Project Manager	Responsible for communication with external stakeholders	High	High	2
Investors	For providing financial assets	Medium	Medium	6
Resource Manager	To monitor the usage of resources taking place in the organization	High	Medium	4
Suppliers Dealerships)	For providing vehicles on lease	High	Medium	5
End Users	Providing Feedback	Medium	Low	8

Result

Thus the Project Methodology was identified and the stakeholders were described.

<div align="center">**Experiment No-3**</div>

Title- **System, Functional and Non-Functional Requirements of theProject.**
Aim

       To identify the system, functional and non-functional requirements for the project.

Project Title: <SELLAZA-Car selling website >

System Requirements:

Html, JavaScript, CSS, figma, windows 8 or later, macOS Sierra 10.12
or later, intel processor, memory 2GB minimum 4GB recommended,
screen resolution-1280*1024 or later, application window size -
1024*680 or later, internet connection required.

Functional Requirements:

- The system must allow the customer to register for reservation.
- The system must notify on selection of unavailable cars while reservation.
- The system must view list of available car during reservation.
- The system should allow manager and user or employee to login to the system using their username and password.
- The system shall allow customer staff to Search cars by specific record.

- The system shall allow staff to update information of the car in need of modification.

- The system must be able to provide a unique reservation conformation number for all successfully committed reservations.

- The system must be able to display reservation summary for successfully committed reservation.

Non-Functional Requirements

- Usability
- Security
- Performance
- Availability
- Error handling
- Ease of use

Result

Thus the requirements were identified and accordingly described.

Title: Prepare Project Plan based on scope, Calculate Project effort based on resources and Job roles and responsibilities.

Aim

To Prepare Project Plan based on scope, Calculate Project effort based on resources, Find Job roles and responsibilities

Requirements

<Incorporate the Project plan template>

1. Project Management Plan

Quality Management:

- Quality Assurance: Quality assurance will be managed including governance, roles and responsibilities, tools and techniques and reporting
- Quality Control: Specify the mechanisms to be used to measure and control the quality of the work product

Risk Management:

- Identifying the risk that is occurred
- Analyze -what is the risk and what can be the solution to solve
- Prioritizing project risks -which one solve first

Cost Management:

- Estimate Effort
- Assign Team
- Budget Control

Stakeholder:

- Identifying, Analyzing, Engaging Stakeholders

2. Estimation

2.1.   Effort and Cost Estimation

Activity Description	Sub-Task	Sub-Task Description	Effort (in hours)	Cost in INR
Login	Sign up	User will enter his/her email id and password.	3	3000
	Verification	A mail will be sent to the registered email for verification.		
	Sign in	Now user can search for the car he/she wants to buy.		
Search Box		Also, user can search for the car he/she wants to buy.	5	5000
		All the information related to that car will be displayed on the website along with some photographs.		

Effort (hr)	Cost (INR)
1	1000

2.2.   Infrastructure/Resource Cost [CapEx]

Infrastructure Requirement	Qty	Cost per qty	Cost per item
Web-server	3	1,50,000	4,50,000

2.3   Maintenance and Support Cost [OpEx]

Category	Details	Qty	Cost per qty per annum	Cost per item
People	Network, System, Middleware and DB admin Developer, Support Consultant	3	2,000,000	6,000,000
License	Operating System Database Middleware IDE	10	10000	100,000
Infrastructures	Server, Storage and Network	20	20000	400,000

3. Project Team Formation

3.1.   Identification Team members

Name	Role	Responsibilities
G Jahnavi	Key Business User (Product Owner)	Provide clear business and user requirements
Ritu Singh	Project Manager	Manage the project
R Madhava	Business Analyst	Discuss and Document Requirements
Ritu Singh	Technical Lead	Design the end-to-end architecture

G Jahnavi	UX Designer	Design the user experience
R Madhava	Frontend Developer	Develop user interface
Ritu Singh	Backend Developer	Design, Develop and Unit Test Services/API/DB
G Jahnavi	Cloud Architect	Design the cost effective, highly available and scalable architecture
R Madhava	Cloud Operations	Provision required Services
G Jahnavi	Tester	Define Test Cases and Perform Testing

3.2. Responsibility Assignment Matrix

RACI Matrix	Team Members			
Activity	Name (BA)	Name (Developer)	Name (Project Manager)	Key Business User
User Requirement Documentation	G Jahnavi(A)	R Madhava(C)	Ritu Singh(I)	G Jahnavi(R)

A	Accountable
R	Responsible
C	Consult
I	Inform

Reference

1. https://www.pmi.org/
2. https://www.projectmanagement.com/
3. https://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/ti-it/ervcpgpm-dsfvpmpt-eng.html

Result:

Thus, the Project Plan was documented successfully.

Experiment No-5

Title: Prepare Work breakdown structure, Timeline chart, Risk identification Table.

Aim-

To Prepare Work breakdown structure, Timeline chart and Risk identification table

<Incorporate WBS, Timeline chart and Risk table>

WBS and Risk Management Plan

Lab Session #5

Table of Contents

1. Executive Summary

In our project, a milestone is a specific point in time within our project lifecycle which is used to measure the progress of Park My Pro toward its ultimate goal. In project management, milestones are used as signal posts for significant events, decision points, or deliverables such as: The project's start date (March 2022) and Project end date(July 2022) Risk management is the process of analysing exposure to risk and determining how to best

handle such exposure. Our project undertakes a best practices approach and focuses on understanding the key risks and managing them within acceptable levels.

2. WBS With Project Schedule

< Assign team members for sub-tasks based on RACI and skill requirement>

Module (#)	Activity (#)	Sub-Task(#)	Assignee(s)	Planned Start Date	Planned End Date	Actual Start Date	Actual End Date	Status
UX Design	Design the user interface	Display the user privacy policy	G Jahnavi	08 Mar 2022	15 Mar 2022	-	-	Open
		Create a login page for the user to enter their credentials		11 Mar 2022	20 March 2022	10 Apr 2022	10 Apr 2022	Closed
		Present information provided by the backend server		10 May 2022	20 May 2022	-	-	Open
Database management	Designing backend	Refer to what data must be exchanged between user and admin	Ritu Singh	08 Apr 2022	1 May 2022	10 Apr 2022	12 Apr 2022	Closed
		Encrypt credentials		15 Apr 2022	16 May 2022	-	-	Open
		Acquire the empty parking slots from park my pro using the credentials provided		05 May 2022	09 May 2022	11 Apr 2022	15 Apr 2022	Closed
		Integrate back end to the front end of the website		24 May 2022	25 June 2022	-	-	Open
Admin	Control and repository maintenance	Create a privacy policy for the user to ensure the safety of their credentials	G Jahnavi R Madhava Ritu	03 June 2022	30 June 2022	-	-	Open

		Maintain the server / repository		10 June 2022	14 June 2022	-	-	Open
Test releases	Testing	Test the software with multiple test cases	R Madhava	14 June 2022	25 June 2022	-	-	Open
		Report bugs		20 June 2022	26 June 2022	-	-	Open

3. Risk Identification

SWOT ANALYSIS

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STRENGTHS

- Strong need to students and staff in the institution
- Knowledged team
- We are able to respond very quick and give good customer care

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-
-
- **WEAKNESSES**
  Low reputation
  Small team
  Unforeseen problems

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OPPORTUNITIES

Broadening the team
Broadening the project
- Unique product
-
-

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THREATS

- Failing to use https or any other security protocols
- Sudden rework of Park My Pro framework
- Technical bugs

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</table>

3.1. List (Describe) Register

<Issue can potentially occur in future and list all risks identified >

Risk ID (#)	Risk Description	Impact Description
R01	Technical Bugs	Sudden rework of the Park My Pro framework
R02	Disbanding of a team member	Not being able to complete the project before the deadline
R03	Developing Glitch	Failing to use https or any other security protocols
R04	Inability to gain user commitment	Lack of effort / diligence

3.2. Managing Risk

<Risk should be categorised So action can be derived to address these risks could become an issue in future>

Risk ID (#)	Status [Open / Closed]	Risk Appetite [Accept/ Mitigate/ Transfer/Avoid]	Action	Action Owner	Target Date	Remarks

R01	Closed	Accept	Circumscribe the damage, Look into the potential problems and take precautions	Team Member	05 July 2022	-
R02	Closed	Avoid/Mitigate	Training the developers skillfully without any further obstacles/ shotcomings	Team Leader	10 July 2022	-
R02	Closed	Accept	Communicate the fix and resolve the issue	Team Member	20 July 2022	-
R04	Closed	Accept	Frequent and clear communication with the user	Team Member	08 July 2022	-

Reference

1. https://www.pmi.org/
2. https://www.projectmanagement.com/
3. https://www.tpsgc-pwgsc.gc.ca/biens-property/sngp-npms/ti-it/ervcpgpm-dsfvpmpt-eng.html

Result:

Thus, the work breakdown structure with timeline chart and risk table were formulated successfully.

Experiment No-6

Title: Design a System Architecture, Use Case and Class Diagram.

Aim

To Design a System Architecture, Use case and Class Diagram

Requirements

<System Architecture, Use Case and Class Diagram>

SYSTEM ARCHITECTURE –

SYSTEM ARCHITECTURE FOR CAR SALES SYSTEM

USE CASE DIAGRAM –

USECASE DIAGRAM OF CAR SALES SYSTEM
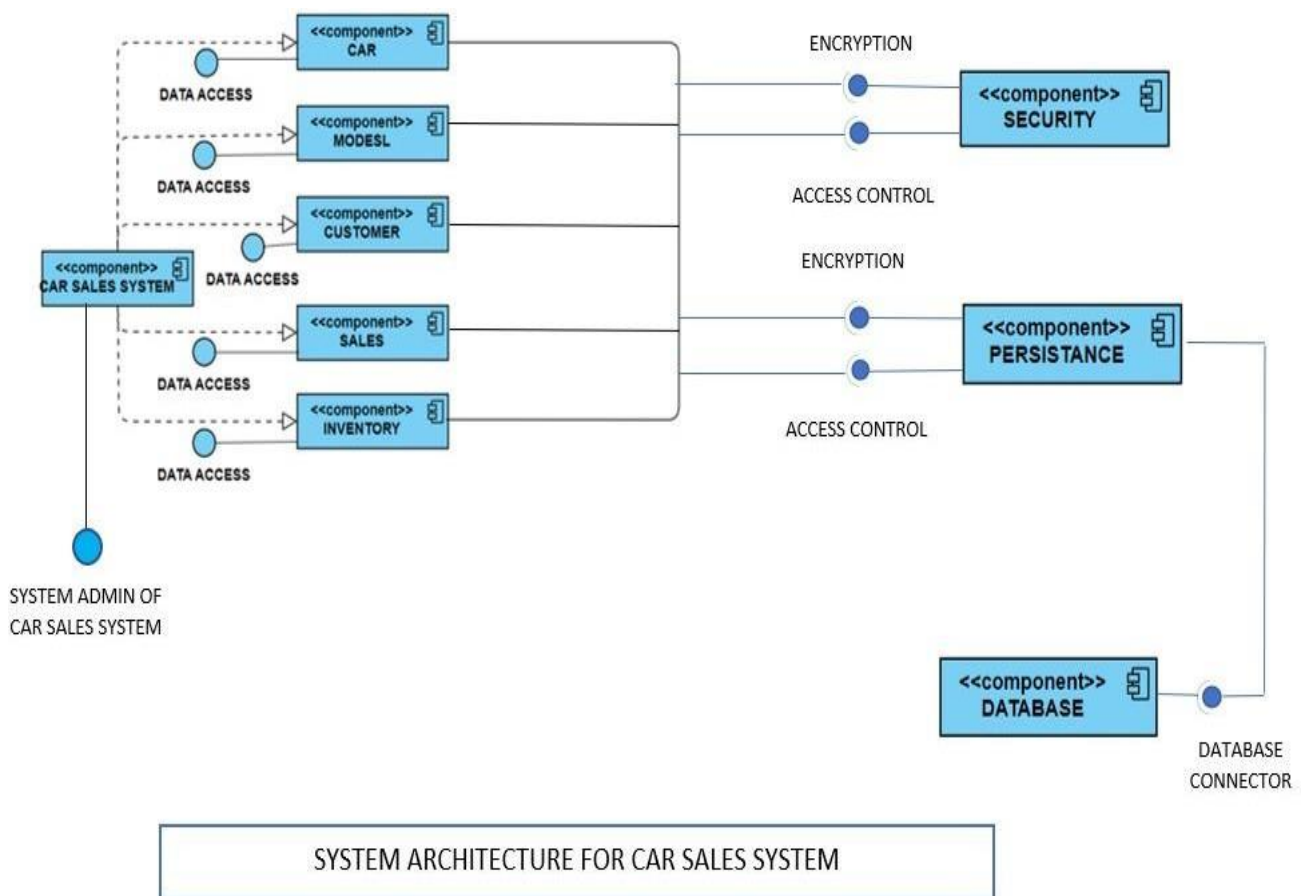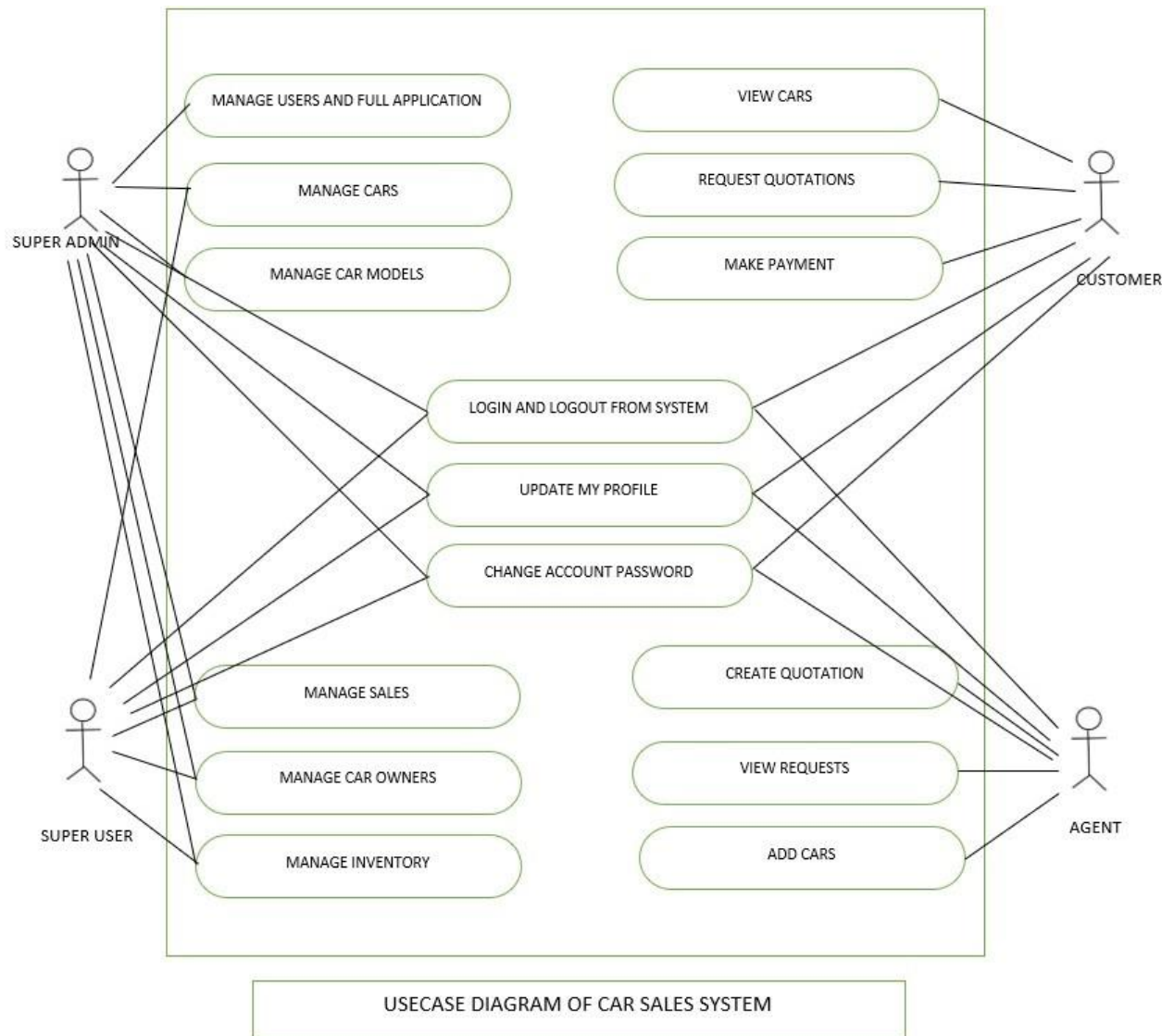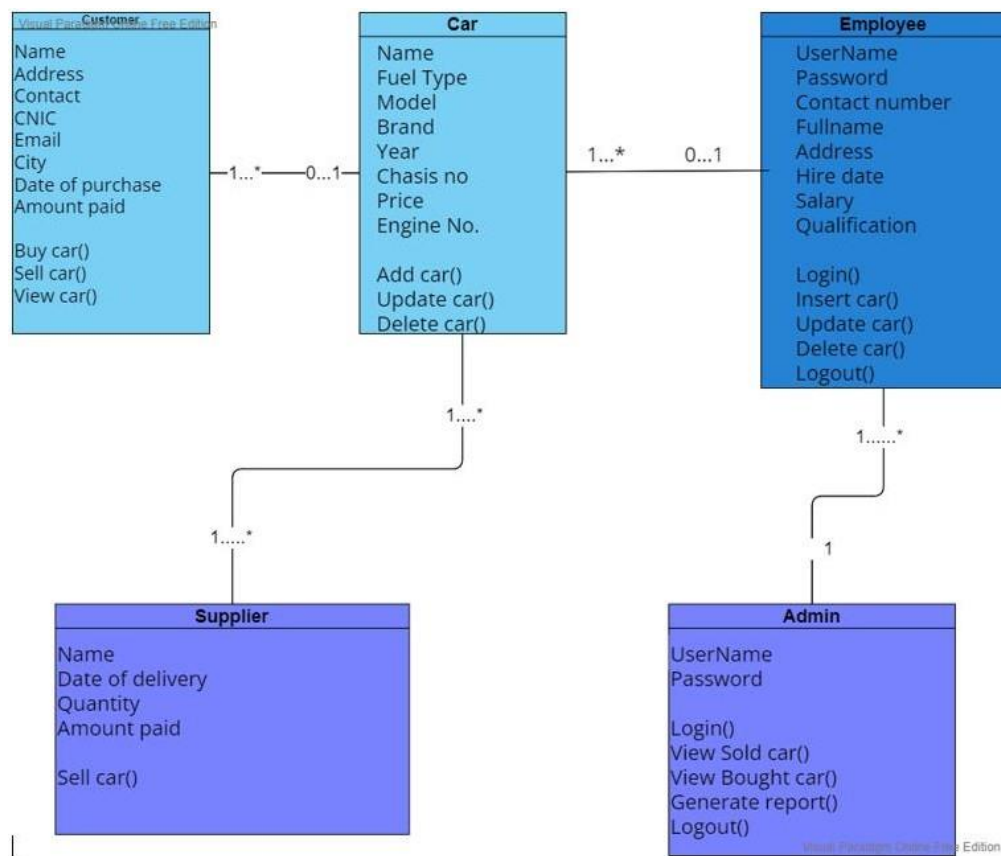
CLASS DIAGRAM –

CLASS DIAGRAM FOR CAR SALES SYSTEM

Result:

        Thus, the System Architecture, Use Case and Class Diagram were created successfully.

Title: Design a Entity relationship diagram.

   Aim

   To create the Entity Relationship Diagram

   <ER Diagram >
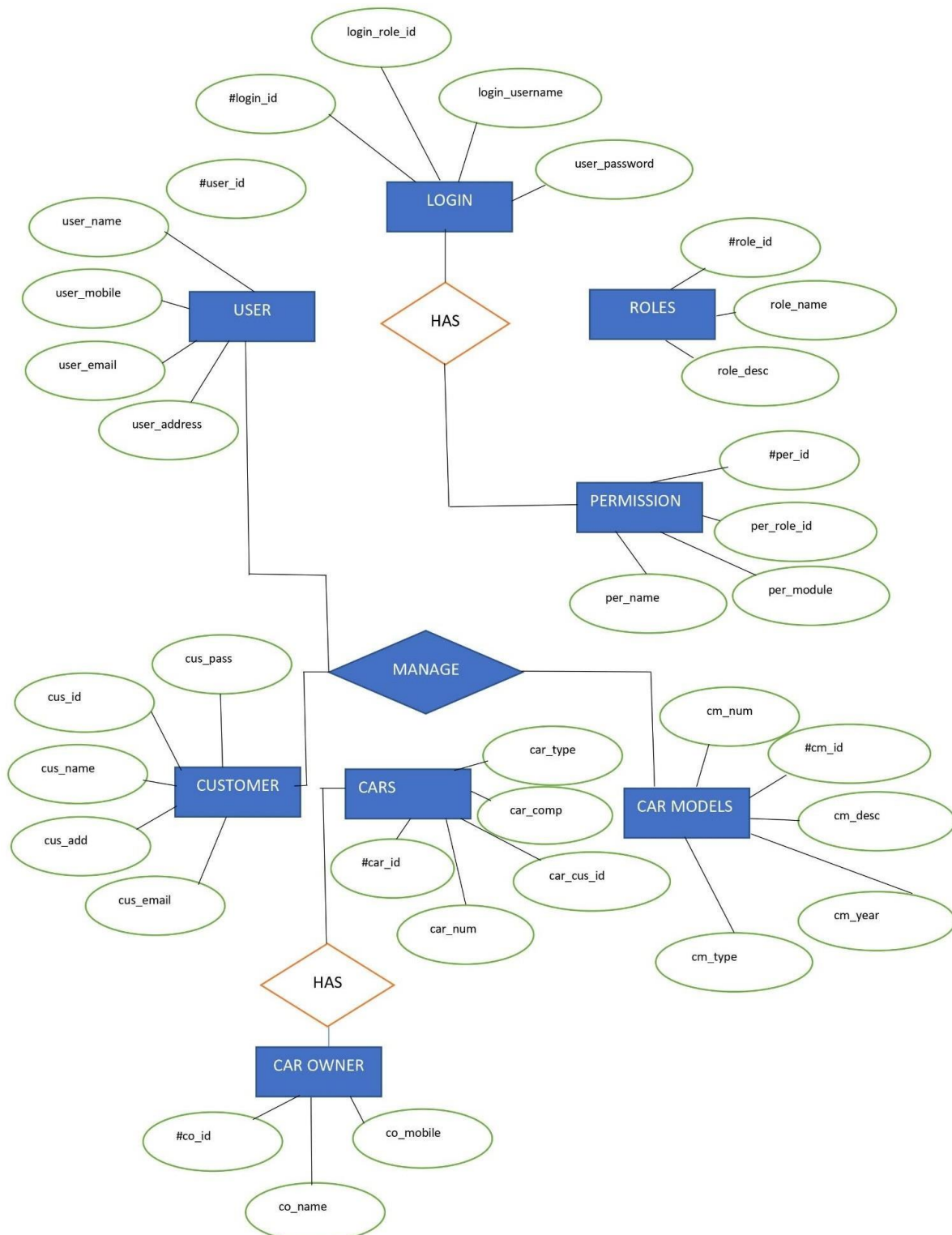
ER Diagram for Car Sales System

Result:

Thus, the entity relationship diagram was created successfully.

Title: Develop a Data Flow Diagram (Process-Up to Level 1)

Aim

To develop the data flow diagram up to level 1 for the Car dealer website.

<DFD >

Zero Level DFD-Car Sales System

Cars Management		Generate Cars Report
Car Models Management	Car sales system	Generate Car Models Report
Sales Management		Generate Sales Report
Car Owner Management		Generate Car Owner Report
Inventory Management		Check Inventory
Customer Management		Generate Customer Report
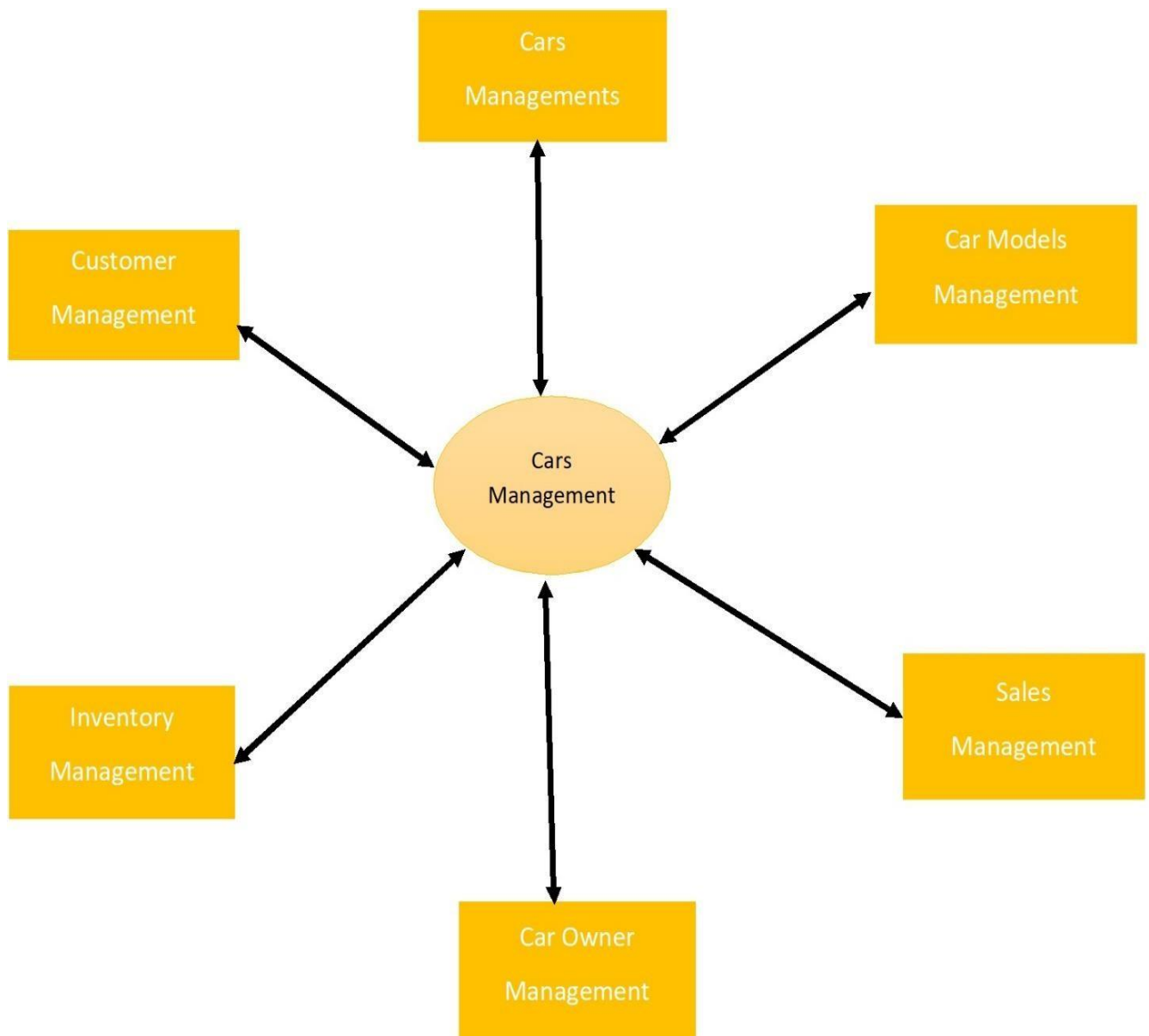
First Level DFD-Car Sales System
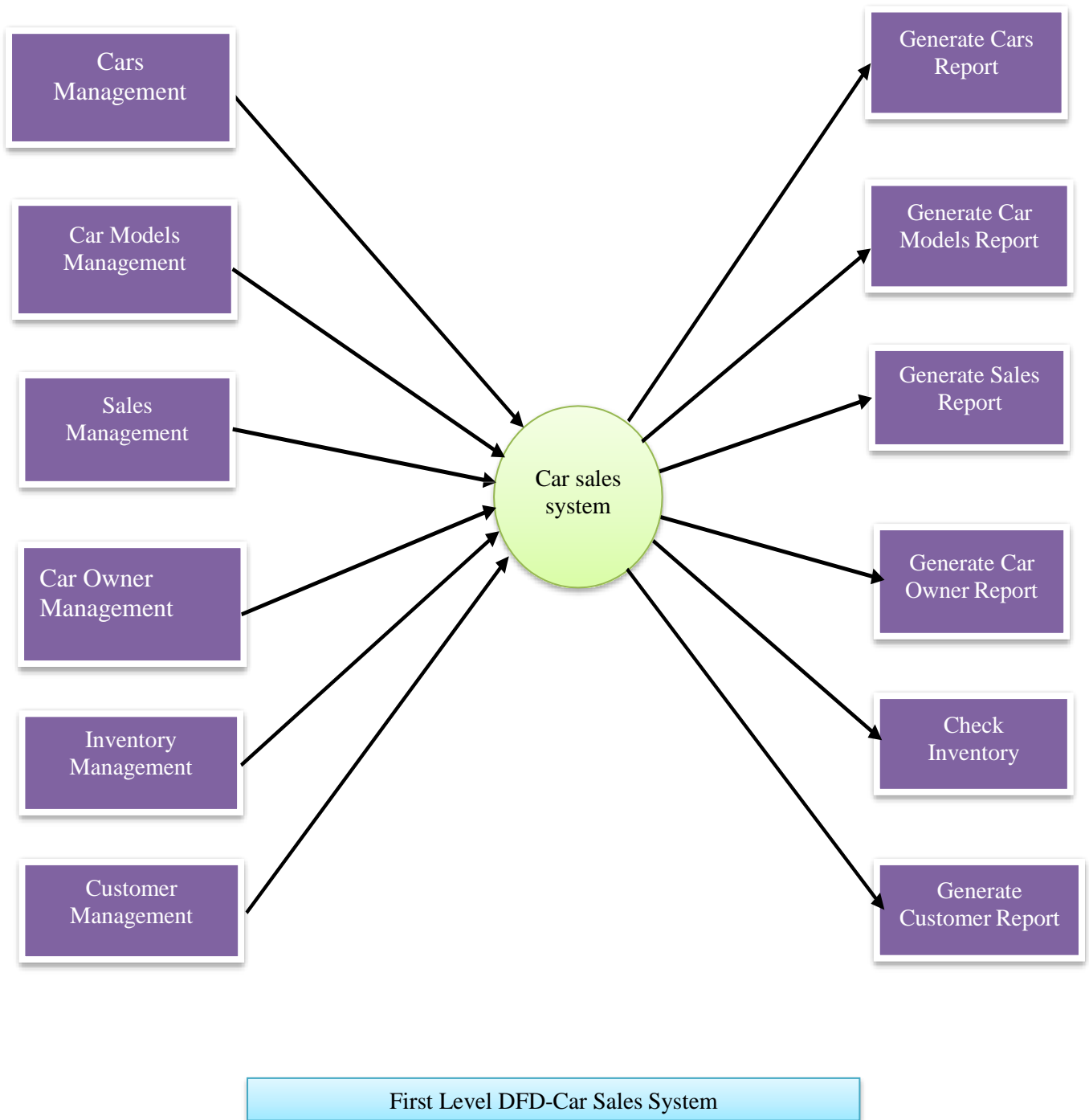
Result:

Thus, the data flow diagram have been created for the Car dealer website.

Experiment:9

Title: Design a Sequence and Collaboration Diagram.

Aim-

To create the sequence and collaboration diagram for the <project name>

<Sequence and Collaboration Diagram>

Sequence Diagram

Collaboration Diagram

Result:

     Thus, the sequence and collaboration diagrams were created for the Car Sales System/Website.

Experiment:10

Title: Develop a Testing Framework/User Interface

Aim

To develop the testing framework and/or user interface framework for the <car sales system>

User interface of the project:

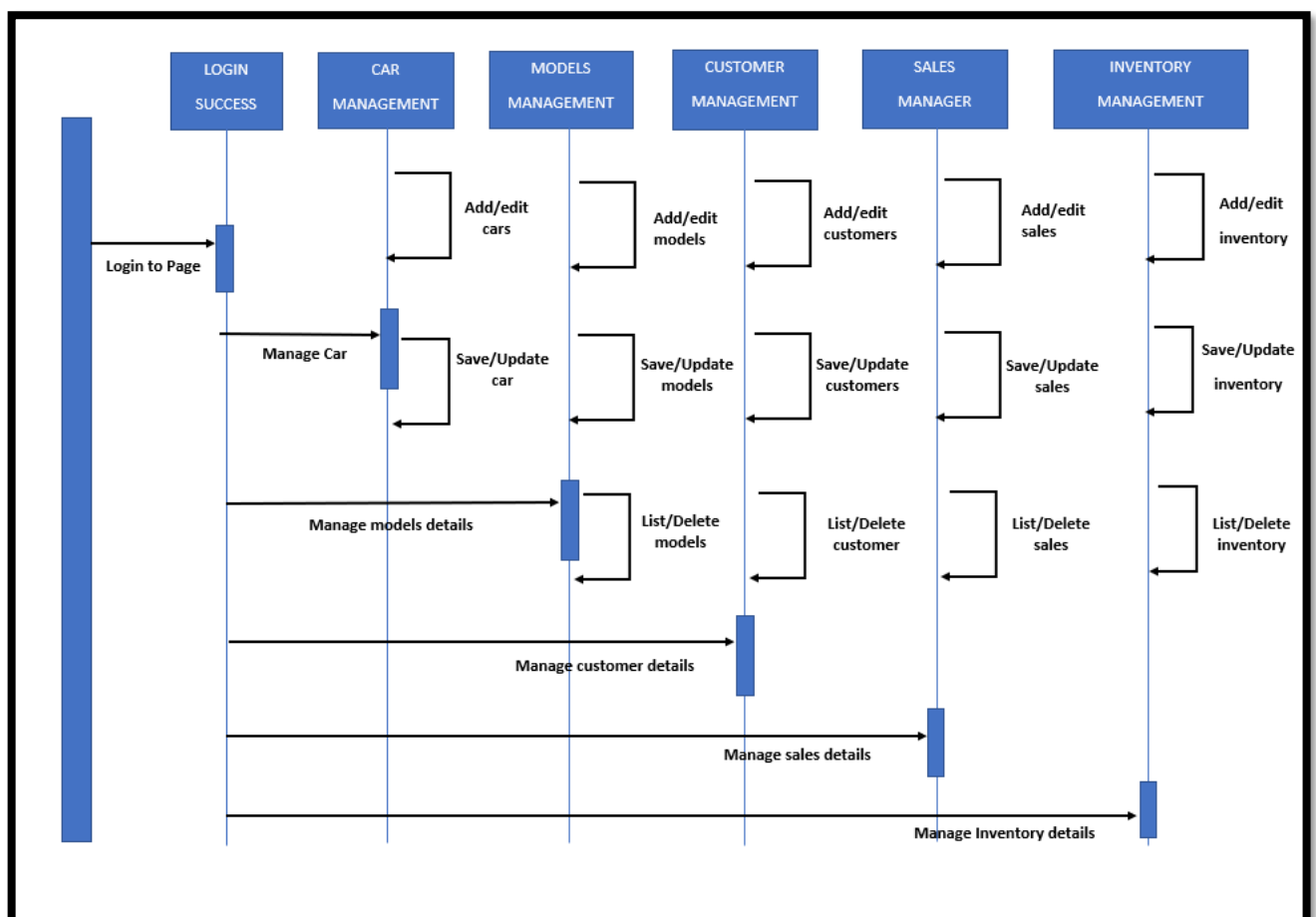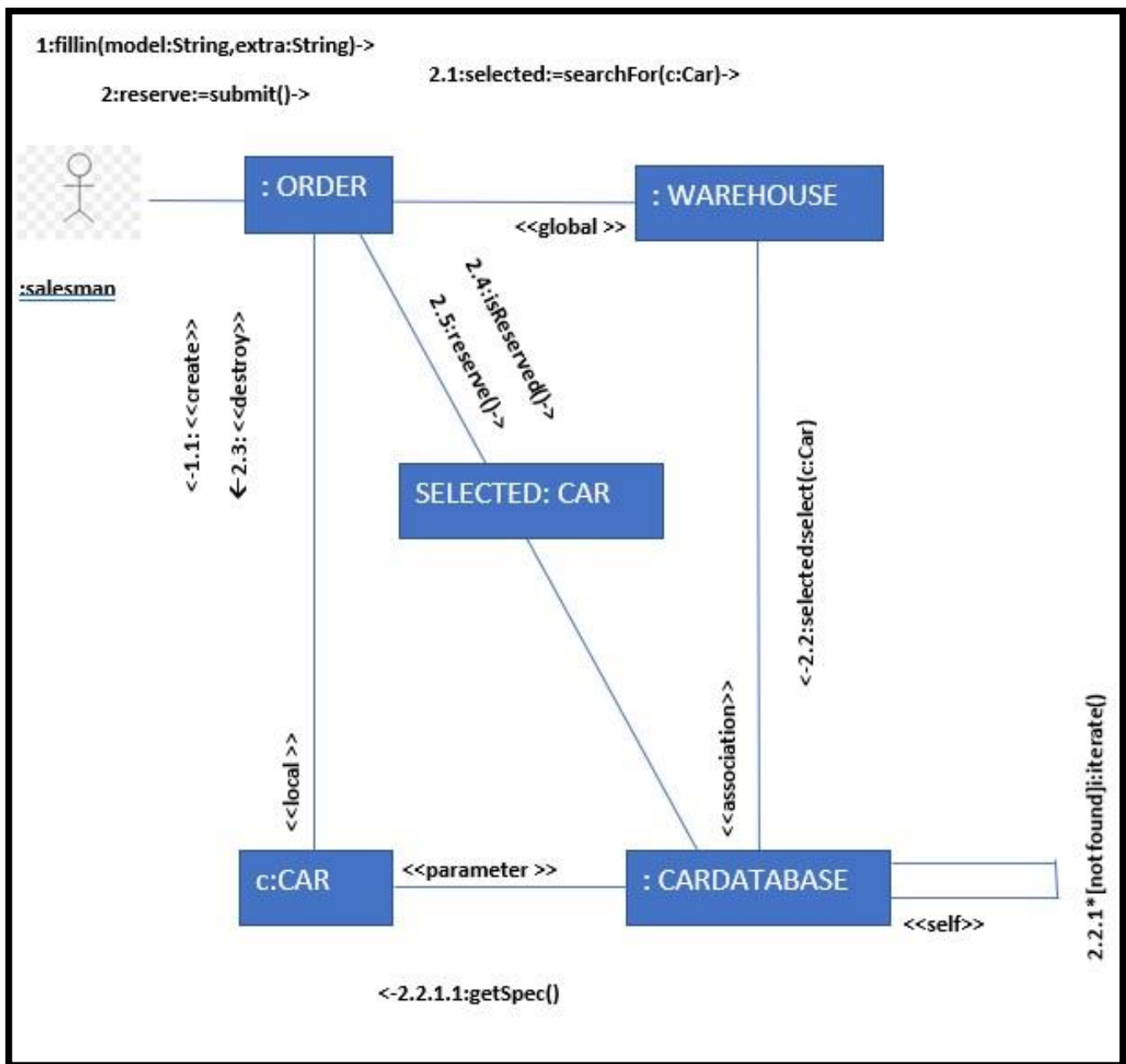Our frontend of the project will consist of a website which includes application of JavaScript and CSS. The website will consist of search bar through which the user will interact with the website and obtain the recommendations based on it. The search bar will be based on python and Machine learning models which will interact with the database systems. The website will interact with the API'S from the dataset and the obtained data will be shown on the website. The admin will manage the details of the users which in turn will avoid the bots and intruders ruin our website and hence increasing the user-experience.

Testing:

The website will be tested thoroughly on various devices so that our website don't get crashed on a set of devices. The testing will be done by sharing a link to a piece of people on various devices so that we can check whether the website is working properly or not. There are various types of testing phases which will be discussed below:

Functional testing: It checks for different functions that are performed or offered by a website. It checks for different activities that a website can perform:
- It tests the JavaScript and CSS that is been used to build the website.
- It tests the forms that are present on the website.
- It checks for the links of all types present on the web page.

Compatibility Testing: Compatibility testing is done on the basis of different contexts. The compatibility testing contexts are listed below in the list:
- **Based on Browser:** It checks for the working of the website in different browsers such as Firefox, Chrome, Safari, etc.
- **Based on Operating systems:** It checks for the compatibility of the website on different operating systems like: Windows, Linux, and Mac.

Usability testing: Usability testing is the most important testing that has to be done before deploying a website for live use. This testing is performed by users or a team of clients.
- It checks the controls of the website.
- Checks the content of web pages.

- Checks whether the user requirements are satisfied or not.

Interface testing: Interface testing is done to check or verify the interface and the data flow from one system to another system. It checks for data flow from the **Web server-side** and **Database server** side.

- **Database Server:** Here it checks for the data that is transported from the database is as required or not. It measures the correctness of the data that is delivered.
- **Web server:** It will check for the webserver that it handles all the queries that are being asked by the users.

Performance testing: It checks for the performance of the website under different conditions.

- It checks for the response time for any query at different connections speed.
- It tests for the load that a website can handle under various conditions.
- It checks for the performance of the website when the load exceeds the upper limit of the maximum load.
- It checks for the recovery of the website after the breakdown of the website due to excessive load.

Executive Summary

Scope, Objective, and Approach to test the website:

Scope:

Web testing or website application testing is the testing that is done before hosting or making your website live for general use to users. Web testing is done **to find out the bugs and errors in your website that can lead to website failure in the future**.

Objective:

The main motto of testing is to find maximum defects in a software product while validating whether the program is working as per the user requirements or not. Defects should be identified as early in the test cycle as possible.

Approach:

There are 6 best approaches which we use while testing the website:

- Functionality Testing
- Compatibility Testing
- Usability Testing
- Interface Testing
- Security Testing
- Performance/Load Testing

Test Plan

Scope of Testing

Web testing or website application testing is the testing that is done before hosting or making your website live for general use to users. Web testing is done to find out the bugs and errors in your website that can lead to website failure in the future.

Non-Functional: Are all NFR (Non-Functional Requirements) covered?

Types of Testing, Methodology, Tools

Category	Methodology	Tools Required (Software)
Functional	Manual	Spira Test, Appium
Compatibility	Manual	Browser Stack
Interface	Manual	Apptim
Security	Manual	Acunetix, Appspider
Performance/Load	Manual	Performance JMeter, CloudTest
Usability	Manual	Lookback, Loop11

Result:

Thus, the testing framework/user interface framework has been created for the **car sales system.**

Title: Test Cases

Aim

To develop the test cases manual for the Car sales system.

Test Case

Functional Test Cases

Test ID (#)	Test Scena rio	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
1.	System Performan ces	Can system provide recommendations under 50ms at the 99.99th percentile?	User will enter the car name in search box, then system will recommend car in least possible time	List of cars will be available.	List of cars	Pass	Success
2	Verify user registrati on	Accept valid mobile number.	1. User clicks on User Registration link 2. Enter the mobile Number on the text box 3. Click Register button	User should be taken tothe nextpage for entering more user details	User should be taken tothe nextpage for entering more user details	Pass	Success

Non-Functional Test Cases

Test ID (#)	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
1	Security	How a system is safeguarded against deliberate and sudden attacks from internal and external sources?	• A password should be in encrypted format • Application or System should not allow invalid users • Check cookies and session time for application	Secure	Secure	Pass	Success
2	Reliability	The extent to which any software system continuously performs the specified functions without failure.	• How system is giving output while searching same car every time?	Reliable output.	Reliable outcome	Pass	Success
3	Efficiency	The extent to which any software system can handles capacity, quantity and response time.	• How the system behaves under heavy load?	Speed of computer is fast.	Speed of computer is moderate.	Pass	Success
4	Usability	The ease with which the user can learn, operate, prepare inputs and outputs	• Is the system easy to use? • Help is provided for the users to understand the application/website.	Emails and phone conversations are used to provide assistance.	Emails and phone conversations are used to provide assistance.	Pass	Success

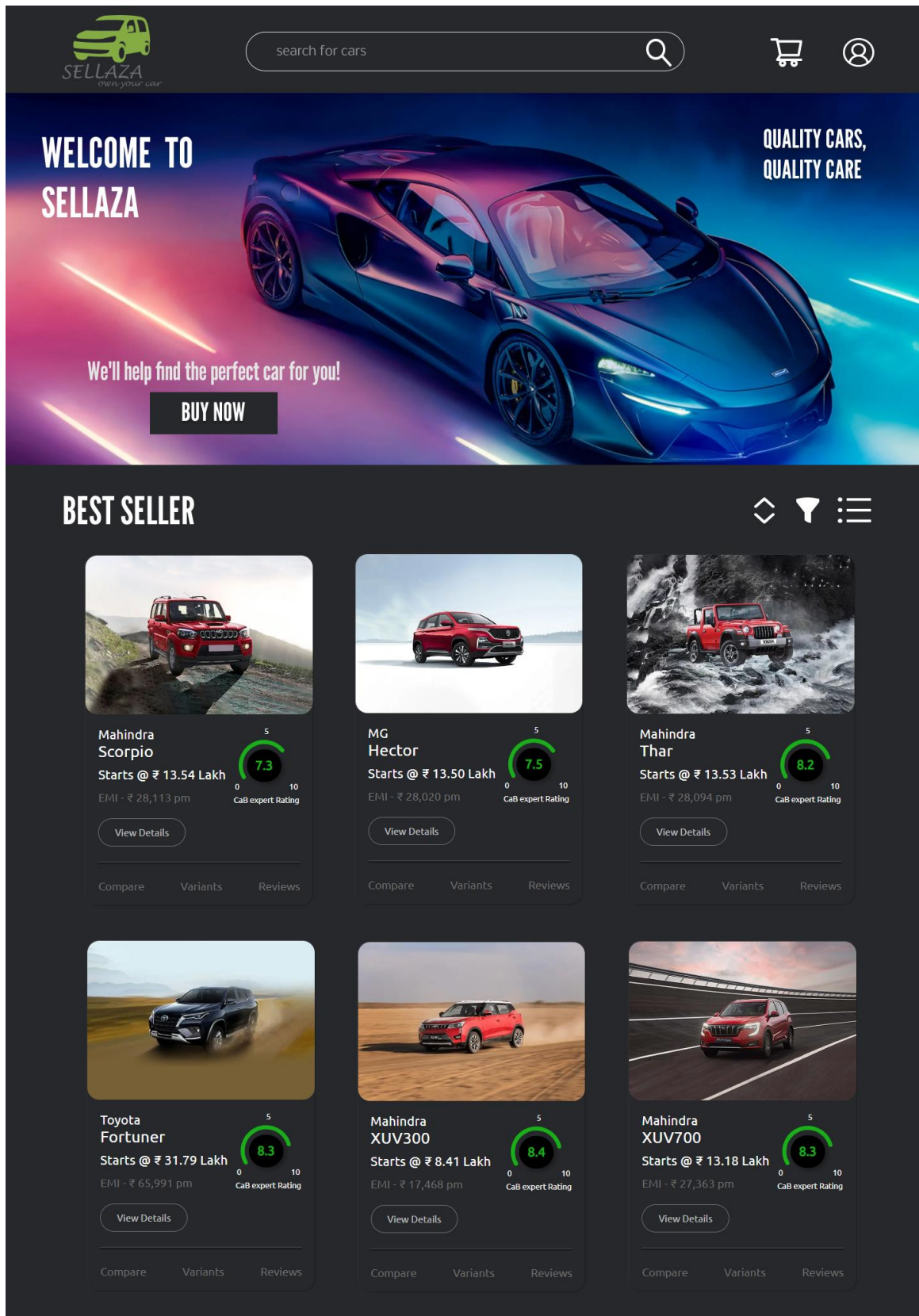|		through interaction with a system.					

Result:

Thus, the test case manual has been created for the Car sales system.

Chapter No:12

Title: Provide   the details of Architecture Design/Framework/Implementation
Aim

To provide the details of architectural design/framework/implementation

Result:

Thus, the details of architectural design/framework/implementation along with the screenshots were provided.