|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Software Requirement Specifications**  Car Showroom Rental Management  Version: [xx.xx]   |  |  | | --- | --- | | Project Code |  | | Supervisor | Miss Mahrukh Khan | | Co Supervisor |  | |  |  | | Project Team | AyeshaNasir  22k4387  Saad Arshad  22k-4141 | | Submission Date |  | |

[Instructions]

* No section of template should be deleted. You can write ‘Not applicable’ if a section is not applicable to your project. But all sections must exist in the final document.
* All comments/examples mentioned in square brackets ([]) are in the template for explanation purposes and must be replaced / removed in final document.
* This’ Instruction’ section should also be removed in final document.
* MS-Word Reviewing feature must be used to get the document reviewed by supervisors or co-supervisors.

Document History

[Revision history will be maintained to keep a track of changes done by anyone in the document.]

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Name of Person** | **Date** | **Description of change** |
|  |  |  | [e.g. Document Created] |
|  |  |  | [Added Non-functional requirements] |
|  |  |  | [Added UseCase x.x.xx] |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Distribution List

[Following table will contain list of people whom the document will be distributed after every sign-off]

|  |  |  |
| --- | --- | --- |
| **Name** | **Role** | |
| Miss Mahrukh | | Supervisor |
|  | | Co- Supervisor |
|  | |  |

Document Sign-Off

[Following table will contain sign-off details of document. Once the document is prepared and revised, this should be signed-off by the sign-off authority.

Any subsequent changes in the document after the first sign-off should again get a formal sign-off by the authorities.]

|  |  |  |
| --- | --- | --- |
| **Version** | **Sign-off Authority** | **Sign-off Date** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Table of Contents**

[1. Introduction 7](#_Toc178130213)

[1.1. Purpose of Document 7](#_Toc178130214)

[1.2. Intended Audience 7](#_Toc178130215)  
1.3 Abbreviations ………………………………………………………………………………………...7

[1.4. Document Convention 7](#_Toc178130216)

[2. Overall System Description 8](#_Toc178130217)

[2.1. Project Background 8](#_Toc178130218)

[2.2. Project Scope 8](#_Toc178130219)

[2.3. Not In Scope 8](#_Toc178130220)

[2.4. Project Objectives 8](#_Toc178130221)

[2.5. Stakeholders 8](#_Toc178130222)

[2.6. Operating Environment 8](#_Toc178130223)

[2.7. System Constraints 8](#_Toc178130224)

[2.8. Assumptions & Dependencies 8](#_Toc178130225)

[3. External Interface Requirements 9](#_Toc178130226)

[3.1. Hardware Interfaces 9](#_Toc178130227)

[3.2. Software Interfaces 9](#_Toc178130228)

[3.3. Communications Interfaces 9](#_Toc178130229)

[4. Functional Requirements 10](#_Toc178130230)

[4.1. Functional Hierarchy 10](#_Toc178130231)

[4.2. Use Cases 10](#_Toc178130232)

[4.2.1. [Title of use case] 10](#_Toc178130233)

[5. Non-functional Requirements 11](#_Toc178130234)

[5.1. Performance Requirements 11](#_Toc178130235)

[5.2. Safety Requirements 11](#_Toc178130236)

[5.3. Security Requirements 11](#_Toc178130237)

[5.4. User Documentation 11](#_Toc178130238)

[6. References 12](#_Toc178130239)

[7. Appendices 13](#_Toc178130240)

1. Introduction

* 1. Purpose of Document

The **Vehicle Listings and Inquiry Management System** is a comprehensive solution designed to cater to the needs of a car, bike, and 3-wheeler showroom business. It aims to streamline the process of listing, managing, and promoting vehicles, while also providing a seamless experience for customers to interact with the showroom. The system allows users to search, filter, and inquire about vehicles, schedule test drives, and explore financing options for purchasing.

The primary goals of this system include:

**Simplifying Vehicle Discovery**: Users can easily browse and search for vehicles based on various parameters like type, brand, price, and features.

**Streamlining Customer Interaction**: The system facilitates direct customer engagement through features like test drive scheduling and inquiries for installment plans.

**Efficient Vehicle Management**: Admin users can manage vehicle listings, user inquiries, and test drive schedules efficiently, ensuring that the business operates smoothly.

**User-Friendly Experience**: By leveraging modern web technologies, the system provides a responsive, intuitive interface suitable for a wide range of users, including customers and showroom staff.

* 1. Intended Audience

This document is intended for the following audiences:

* **Developers**: They will use this document to understand the functional and non-functional requirements.
* **Project Managers**: They will use this for tracking the scope and deliverables.
* **Testers**: This document will guide the creation of test plans and test cases.
* **End Users**: Although they are not the primary audience, they should be aware of the intended functionalities described here.

Suggested reading order:

1. Begin with the **Introduction** and **Overall Description** to understand the product's scope.
2. Review **External Interface Requirements** to understand system interfaces.

Dive into the **System Features** for detailed requirements

**1.3 Abbreviations**

|  |  |
| --- | --- |
| UI | User Interface |

|  |  |
| --- | --- |
| DB | Database |

|  |  |
| --- | --- |
| HTML | HyperText Markup Language |

|  |  |
| --- | --- |
| CSS | Cascading Style Sheets |

|  |  |
| --- | --- |
| CRUD | Create, Read, Update, Delete |

|  |  |
| --- | --- |
| SSL | Secure Sockets Layer |

|  |  |
| --- | --- |
| SRS | Software Requirements Specification |

|  |  |
| --- | --- |
| API | Application Programming Interface |

|  |  |
| --- | --- |
| MySQL | Structured Query Language-based DBMS |

* 1. Document Convention

This document uses the following conventions:

* **Priority Levels**:
  + **High**: Critical requirements for system functionality.
  + **Medium**: Important but non-critical features.
  + **Low**: Desirable but non-essential features.
* **Terminology**:
  + **Vehicle Listings**: Collection of available vehicles.
  + **Admin User**: A user with privileges to manage the system.
* **Notes**: Any assumptions or constraints are highlighted for clarity, such as access to the internet and modern browsers.

1. Overall System Description
   1. Project Background

* The car showroom industry currently faces challenges with manual processes for managing vehicle listings, customer inquiries, and sales. These inefficiencies can lead to errors, delays, and difficulty in tracking inventory and sales performance.
* This project aims to address these issues by developing a digital platform that will automate and streamline operations for car showrooms. The system will enable customers to browse available vehicles, apply filters based on their preferences, inquire about vehicles, and schedule test drives.
* By implementing this system, the showroom will be able to improve inventory management, customer interactions, and sales tracking, ultimately enhancing overall business efficiency and customer satisfaction.
  1. Project Scope

The Car showroom rental enables car showroom businesses to manage vehicle listings and customer inquiries. The system facilitates test drive scheduling, user profile management, vehicle favorites, and finance options. It targets car and bike dealerships. The system integrates with a backend using MySQL, ensuring secure and efficient management of data.

2.3 Not In Scope

The following functionalities are explicitly out of the scope for this project:

* Mobile Application: The system will be developed as a web-based platform only and will not include a mobile app version.
* Advanced Inventory Forecasting: Predictive analytics or AI-driven inventory management is not part of the project’s scope.
* Vehicle Purchase Integration: The system will not handle payment processing or actual vehicle purchases. The focus is on vehicle browsing, inquiries, and test drive scheduling.
* Vehicle Delivery Management: Managing the logistics of vehicle delivery to customers will not be included.
* Third-Party Integration: The system will not integrate with external platforms for financing or insurance services.

2.4 Project Objectives

The project aims to develop a comprehensive and efficient car showroom management system that will:

* Streamline operations by automating vehicle listing, customer inquiries, and sales tracking.
* Enhance customer experience by allowing easy vehicle browsing, test drive scheduling, and inquiry management.
* Improve inventory control by providing real-time updates and management tools for showroom staff.
* Provide detailed sales reports to help showroom managers track performance and make data-driven decisions.
* Increase operational efficiency, reducing manual effort and errors in vehicle management, thus improving overall business productivity.

The end result will be a user-friendly, fully functional web-based system that supports showroom owners and customers in a seamless and efficient manner.

2.5 Stakeholders

The key stakeholders for this project are:

* Admin Users: Showroom staff or managers who will manage the vehicle listings, process inquiries, and track sales.
* Customers: Individuals who will use the system to browse available vehicles, inquire about vehicles, and schedule test drives.
* System Developers: The development team responsible for building, testing, and deploying the system, including frontend (HTML, CSS) and backend (Python Flask, MySQL) developers.
* Project Managers: Individuals overseeing the progress of the project, ensuring timelines are met and objectives are achieved.
* Technical Support Team: Personnel who will provide post-launch support, addressing any system issues or user queries.
* Quality Assurance Testers: Team members responsible for testing the system to ensure it meets all requirements and functions as intended.
  1. Operating Environment
* **Frontend**: The system will be a web-based application that works across modern browsers like Chrome, Firefox, Safari, and Edge.
* **Backend**: The server will run on Python Flask with a MySQL database. The application will be hosted on cloud-based infrastructure (AWS, Azure, etc.).
  1. System Constraints

The system development and deployment are influenced by a range of external and internal constraints, which are listed below:

* Software Constraints:
  + The system must be developed using Python Flask for the backend.
  + The frontend is restricted to HTML and CSS (with optional use of Bootstrap for styling).
  + MySQL will be used as the database, managed through phpMyAdmin.
  + The system should operate correctly on major browsers (e.g., Chrome, Firefox).
* Hardware Constraints:
  + The application must run on standard hardware with minimal system requirements:
    - At least 4 GB RAM and 2 GHz processor for server hosting.
    - Client systems should support modern browsers and have internet access.
* Cultural Constraints:
  + The primary language for the interface is English. Future support for regional languages can be added as an enhancement.
* Legal Constraints:
  + The system must comply with basic data privacy laws, such as secure handling of customer data.
  + Any use of third-party libraries or payment gateways must adhere to their licensing terms.
* Environmental Constraints:
  + The software will be deployed in a showroom office environment. Hence, audio feedback is not required or expected.
  + The interface should remain usable under moderate lighting conditions.
* User Constraints:
  + Users include both showroom administrators and customers.
  + The system should have a clean, intuitive interface accessible to users with basic computer literacy.
  + Customers should be able to perform tasks like browsing cars, booking test drives, and submitting inquiries with minimal training.
* Third-party Components Constraints:
  + phpMyAdmin as a DBMS tool has limitations in query customization and performance under high loads.
  + If any payment integration (e.g., Stripe, PayPal) is added later, it must follow the third-party API usage limits and authentication protocols.

* 1. Assumptions & Dependencies
* The system will rely on a cloud-based infrastructure for hosting.
* The system assumes users will have access to modern browsers.
* The project depends on third-party payment gateways for installment options

1. External Interface Requirements

**3.1 Hardware Interfaces**

* **Client Devices**: Users will access the system from devices with internet access (PCs, smartphones, tablets).
* **Server**: The backend server will communicate with the frontend via HTTP requests and responses.

**3.2 Software Interfaces**

* **Database**: The system will interact with a MySQL database to fetch and store data.
* **External APIs**: Integration with third-party APIs for payment processing (installments) and vehicle features.

**3.3 Communications Interfaces**

* **HTTP**: Used for communication between the client and server.

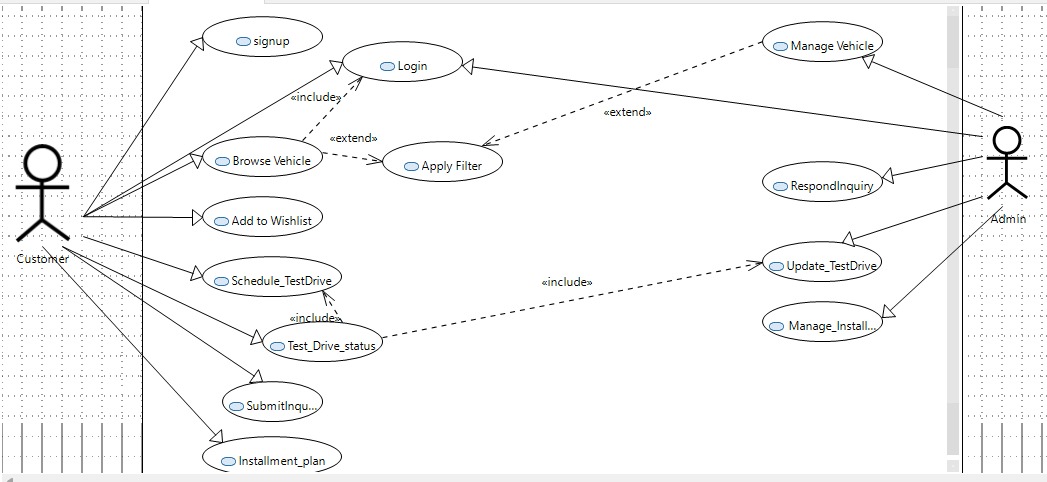
SSL/TLS: All communication between the client and server will be encrypted

1. Functional Requirements
   1. Functional Hierarchy

This section provides an overview of the system's major modules and their sub-functions, giving a high-level view of how the entire system operates.

1. **User Authentication**
   1. User Registration
   2. User Login/Logout
   3. Admin Authentication
2. **Vehicle Management**
   1. Add/Edit Vehicle Listings
   2. Remove Vehicle Listings
   3. Search Vehicle Listings
   4. View Vehicle Details
3. **Customer Interaction**
   1. Inquiry Submission
   2. Test Drive Booking
   3. Schedule Appointment
4. **Sales and Reports**
   1. Generate Sales Report
   2. View Test Drive Stats
   3. Track Vehicle Sales and Performance
5. **Admin Dashboard**
   1. Manage Inventory
   2. Manage User Roles (Admin/Customer)
   3. View System Analytics
   4. Use Cases

**Browse Vehicle & Apply Filter**

****

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **UC02: Browse Vehicle & Apply Filter** | | | | |
| **Use case Id:** | | UC02 | | |
| **Actors:** Customer (User), System | | | | |
| **Feature:** Vehicle Management | | | | |
| **Pre-condition:** | | The user must be logged in to the system or be a guest user. The system should have at least one vehicle listed in the inventory. | | |
| **Scenarios** | | | | |
| **Step#** | **Action** | | | **Software Reaction** |
| **1.** | The user navigates to the vehicle listing page. | | | The system displays a list of all available vehicles. |
| **2.** | The user selects one or more filters (e.g., vehicle type, price range, brand). | | | The system applies the filters and updates the displayed list of vehicles. |
| **3.** | The user browses through the filtered vehicle listings. | | | The system dynamically loads and displays the filtered vehicles. |
| **4.** | The user clicks on a vehicle from the list to view detailed information. The system displays the detailed vehicle information (e.g., images, specifications). | | | The system displays the detailed vehicle information (e.g., images, specifications). |
| **5.** | The user applies additional filters (e.g., color, year of manufacture). | | | The system updates the list to match the newly selected filters. |
| **Alternate Scenarios:** | | | | |
| **1a:**  **If no vehicles match the selected filters:**   * **The system displays a message saying "No vehicles found matching the selected filters."**   **2a:**  **If the user applies too many filters:**   * **The system may prompt the user to remove some filters to see more results** | | | | |
| **Post Conditions** | | | | |
| **Step#** | **Description** | | | |
|  | |  | | --- | |  |  |  | | --- | | The user can see the list of vehicles matching the applied filters | | | | |
|  | The user can view detailed information about any vehicle listed. | | | |
|  | The system ensures the vehicle listings are dynamically updated according to the selected filters. | | | |
| **Use Case Cross referenced** | | | UC10 : Add The Wishlist | |

5.Non-functional Requirements

**5.1 Performance Requirements**

The system must handle at least 500 simultaneous users without a significant drop in performance. Responses to user actions, such as searching for vehicles, should be returned within 2 seconds.

**5.2 Safety Requirements**

The system must ensure that sensitive data, such as user information and payment details, are securely handled and stored following best practices for encryption and data protection.

**5.3 Security Requirements**

* All user authentication must be done via secure login mechanisms.
* The system must comply with GDPR for data privacy.
  1. User Documentation

The following user documentation will be provided with the system:

* User Manual: A simple guide for customers explaining how to register, browse vehicles, send inquiries, and book test drives.
* Admin Manual: A guide for showroom staff on how to manage vehicle listings, view inquiries, handle test drive requests, and monitor system performance.
* Quick Start Guide: A brief document with essential steps to get started for both users and admins.
* Online Help Section: Embedded help content on the website to assist users with common tasks and questions.
* FAQs: A list of frequently asked questions to address basic troubleshooting and usage concerns.

1. References

The following documents are referenced in the development of the Vehicle Listings and Inquiry Management System:

1. **Flask Documentation**
   * **Title**: Flask Documentation
   * **Date**: Ongoing updates
   * **Publisher**: Pallets Projects
   * **Source**: https://flask.palletsprojects.com
2. **PHPMyAdmin Documentation**
   * **Title**: PHPMyAdmin Documentation
   * **Date**: Ongoing updates
   * **Publisher**: PHPMyAdmin
   * **Source**: https://www.phpmyadmin.net/docs/
3. **Bootstrap Documentation**
   * **Title**: Bootstrap Documentation
   * **Date**: Ongoing updates
   * **Publisher**: Bootstrap
   * **Source**: https://getbootstrap.com/docs/
4. **MDN Web Docs - HTML/CSS/JavaScript**
   * **Title**: HTML, CSS, JavaScript MDN Docs
   * **Date**: Ongoing updates
   * **Publisher**: Mozilla
   * **Source**: <https://developer.mozilla.org/>
5. **General Data Protection Regulation (GDPR) Guidelines**
   * **Title**: GDPR Compliance Guidelines
   * **Date**: May 2018
   * **Publisher**: European Commission
   * **Source**: <https://gdpr.eu>
6. Appendices

* **Admin**: A user with privileges to manage the system's data, including vehicle listings, user accounts, and financial details.
* **Vehicle Listing:** A collection of vehicles available for browsing and purchase on the showroom platform. This includes detailed information such as specifications, price, and availability.
* **Test Drive:** A scheduled event where a customer can experience a vehicle firsthand before deciding to purchase it.
* **User**: A registered or guest individual who interacts with the system to browse vehicles, schedule test drives, or inquire about installment options.
* **Finance Inquiry:** A request made by a user to learn about installment plans or financial details for purchasing a vehicle.
* **Favorites/Wishlist:** A feature that allows users to save vehicles they are interested in for easy access later.
* **Installment Plan:** A financial arrangement that enables users to pay for a vehicle in periodic payments rather than a single lump sum.
* **Database Normalization:** The process of organizing data to minimize redundancy and ensure data integrity, implemented up to Boyce-Codd Normal Form (BCNF) in this project.
* **SQL:** Structured Query Language, used for managing and querying the MySQL database.
* CRUD Operations: Basic database operations — Create, Read, Update, and Delete — used for managing data in the system.
* **Responsive Design:** A design approach ensuring the system is usable across different devices, including desktops, tablets, and smartphones.
* **Encryption:** A security measure that converts sensitive information into unreadable formats to prevent unauthorized access during data transmission.
* **Features Management:** The ability for admins to add, update, or delete vehicle-specific features displayed on listings.
* **User Profile Management:** A feature allowing users to update personal information, view their activity, and track interactions with the system.