Requirement Gathering for Car Rental System

Use Case: JP008 – Car Rental System

1. Introduction

This document contains the prerequisites for **CarLo**, which is a car rental system. The application operates through a website and aims to modernize the car rental process for customers while efficiently managing rentals for the car rental company's administrative tasks.

Technology Stack

Frontend:

- HTML: Structures web pages.
- CSS: Styles web pages.
- JavaScript: Enables dynamic interactions and updates.
- AJAX: Facilitates dynamic content loading.

Backend:

- JSP: Generates dynamic web pages. **(Middle layer between front and back end)**
- JDBC: Handles database connections and CRUD operations.
- MySQL: Stores and manages data.

2. System Overview

The system consists of two main user categories:

- **Admin:** Manages the car inventory, approves customer rental requests, and performs CRUD (Create, Read, Update, Delete) operations on car details.

- **Customer:** Registers with the system, searches for available cars based on location and dates, books cars, and views booking details.

3. Functional Requirements

3.1 Admin Section:

- **Login:**
  - User login using username and password.
  - Secure password storage (SHA-12 encryption).
- **Car Management:**
  - Add car details (name, colour, plate number, price per day, location).
  - View a list of all cars with details.
  - Edit existing car details.
  - Delete car information from the system.

- **Booking Management:**
  - View a list of all pending customer booking requests.
  - Approve or reject individual booking requests.
  - View details of approved bookings.
  - View Payment History

3.2 Customer Section:

- **Registration:**
  - User registration with basic information (name, email, phone number).
  - Password creation with password strength requirements. (Minimum 8 characters)
  - Account confirmation through email verification.

- **Car Search:**
  - Search for available cars based on pickup location, preferred dates (from and to).
  - Search results should display car details like name, colour, price per day, and location.
  - Filter search results by car attributes (name, model, location, price range)
  - Provide option for hiring a driver.

- **Booking:**
  - Book a car by selecting it from the search results.
  - System generates a unique booking ID upon successful booking.
  - Option to modify or cancel booking before admin approval.

- **Booking Status:**
  - View booking details using the unique booking ID.
  - View booking status (pending, approved, rejected, cancelled).

3.3 Payment:

- Calculate the total rental cost based on the selected car and rental duration.
- Integrate with a secure online payment gateway for secure payment processing (UPI, Debit Card).
- Allow alternative payment methods like cash or inbuilt wallet.

3.4 Liability:

- Customers are liable for any damage caused for the vehicle unless they opt for insurance upon booking.

4. Non-Functional Requirements

- **Security:**
  - Secure user authentication and authorization.
  - Regular security checks and vulnerability assessments.

- **Performance:**
  - The system should be responsive and handle user requests efficiently.
  - Search results should be displayed quickly.

- **Scalability:**
  - The system should be able to accommodate future growth in user base and data volume. (MySQL)

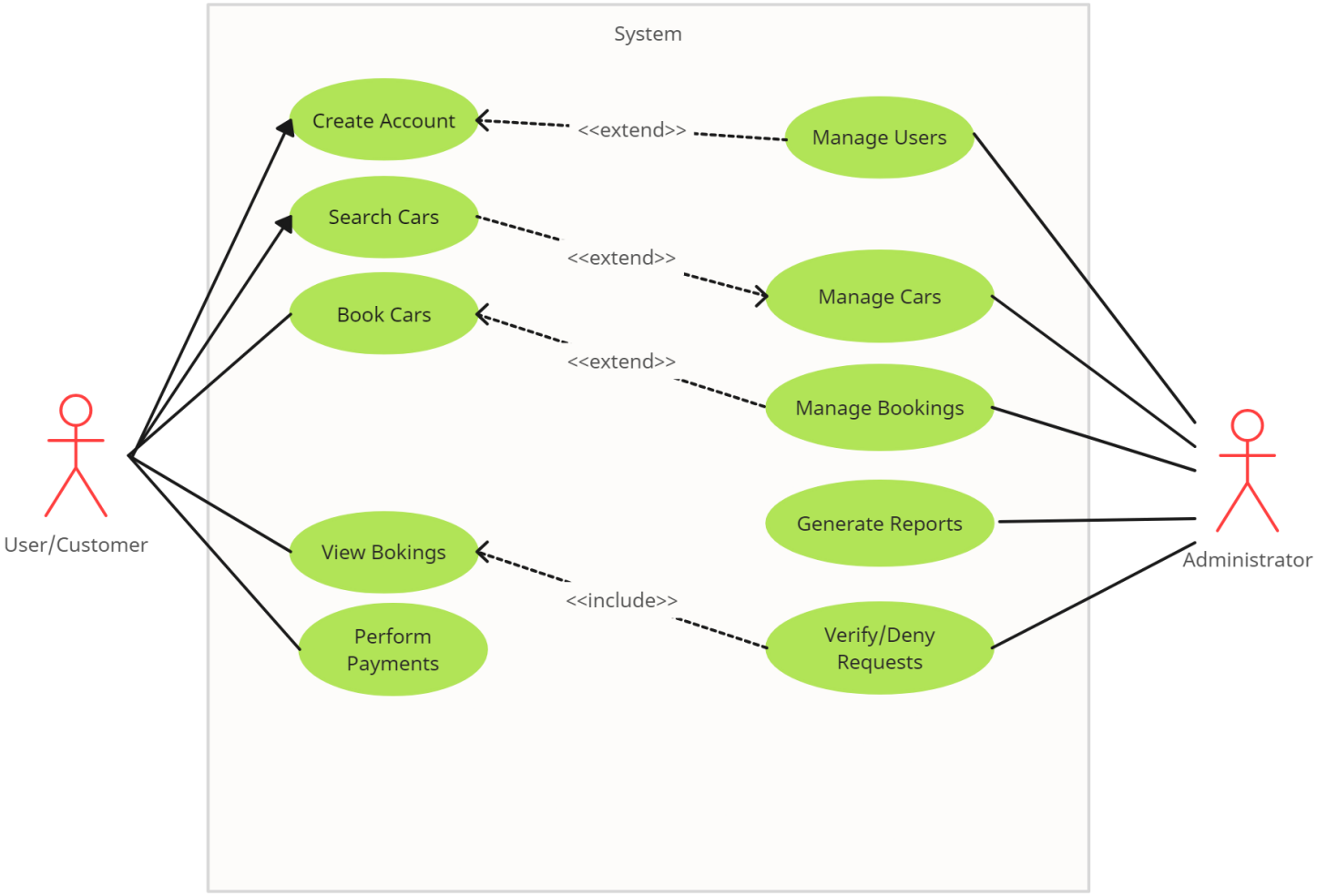
- **Usability:**
  - User-friendly interface with clear navigation and intuitive functionalities.
  - Responsive design for optimal viewing across different devices (desktop, mobile, tablet).

5. Additional Considerations

- **Notifications:** Send email or SMS notifications to users regarding booking status, payment confirmation, etc.
- **Customer Service:** Allow customers to report any issues or provide feedback regarding service.

6. Design and Ideate

6.1 Use Case Diagram:



6.2 Application Flow:

Admin > Login > Admin Dashboard > User Management > View existing users > Create new user accounts > Edit user information > Ban or delete user accounts > Car Management > Add new cars > Edit existing car information > Deactivate or delete cars > Booking Management > View pending booking requests > Review booking requests > Approve or reject booking requests > View details of approved and completed bookings > Reporting (Optional) > Generate reports > Logout

Admin

1. Login:

- Admin enters username and password on the special admin login page.
- System validates credentials against the user database.
- Upon successful login, the system redirects the admin to the **Admin Dashboard**.

2. Admin Dashboard:

- **User Management:**
  - View a list of existing users.
  - Create new user accounts with appropriate roles (admin, customer)
  - Edit existing user information.
  - Ban or delete user accounts.

- **Car Management:**
  - Add new cars to the system, including details like name, colour, plate number, price per day, location, and images (optional).
  - Edit existing car information (e.g., update price, add/remove images).
  - Deactivate or delete cars from the system if necessary.
- **Booking Management:**
  - View a list of all pending booking requests from customers.
  - Review each booking request, including car selection, rental dates, and customer details.
  - Approve or reject booking requests based on car availability and other criteria.
  - View details of approved and completed bookings, including cancellations.

- **Reporting (Optional):**
  - Generate reports on various aspects of the system, such as car rentals, revenue, user activity, and booking trends.

3. Logout: Admin logs Out

Customer

Customer > Home Page > Login or Register > Customer Interface > Search Cars > (Choose by location or vehicle filters) > Booking Process > Review and Book Vehicle > Check for liability Insurance > Perform payment via secure gateway > Receive Booking ID. My Booking > View Bookings History > Report for any issues faced. Add money to wallet (optional) > Logout

1. Home Page:

- Customers arrive at the homepage, showcasing the car rental service and potentially featuring key features.

2. Login/Register:

- Existing users:
  - Click on "Login" and enter their credentials (username/password) to access the system.
- New users:
  - Click on "Register" and create an account by providing basic information like name, email address, and password.

3. Customer Interface:

- **Search Cars:**
  - Enter preferred location and rental dates (from and to).
  - Optionally filter search results by car type, price range, etc.
  - View available cars with details like name, image, price per day, and location.
- **My Bookings:**
  - View a list of their current and past bookings, including:
    - Car information
    - Rental dates
    - Booking status (pending, approved, rejected, cancelled)
    - Total cost

4. Booking Process:

- Select a desired car from the search results.
- Review booking details and total estimated cost.
- The system may redirect the customer to a secure payment gateway or display alternative payment methods offered.
- Upon successful payment, the system confirms the reservation, generates a unique booking ID, and updates the "My Bookings" section.
- Customer receives notification of successful booking.

5. Logout: User logs out

6.3 Mind Map: