SOFTWARE REQUIREMENTS SPECIFICATION

**For**

**Car Rental System**

**Prepared by:-**

*Mohanapriya J*

*Pavithra V*

*Ranjitha T*

# Introduction

## Purpose

The purpose of a car rental system is to facilitate the temporary provision of vehicles for individuals and businesses, catering to a diverse range of short-term transportation needs. These systems offer customers flexibility by providing a variety of vehicle options to choose from, allowing them to select a vehicle that aligns with their specific preferences and requirements.Car rental systems often incorporate online platforms, making the reservation and booking process seamless and providing a convenient means for individuals to access vehicles when and where they need them.

## Document Conventions

* + - Entire document should be justified.
    - Convention for Main title

Font face: Times New Roman Font style: Bold

Font Size: 14

* + - Convention for body

Font face: Times New Roman Font Size: 12

## Scope of Development Project

The scope of developing a car rental system encompasses a comprehensive solution that integrates various aspects of vehicle rental management. The project involves the creation of a user-friendly platform, accessible through web and mobile applications, to facilitate seamless booking, reservation, and payment processes. The system should support a diverse fleet of vehicles, allowing users to choose from different models and sizes based on their specific needs.

Additionally, the development project includes the implementation of robust backend functionalities, such as pricing strategies, and customer profiles. Integration with online payment gateways, real-time vehicle tracking, and automated billing systems are crucial components to enhance efficiency and user experience. Furthermore, the scope involves implementing security measures to safeguard customer data and ensure the integrity of transactions.

The successful development of a car rental system aims to optimize operations, streamline customer interactions, and provide a scalable solution that can adapt to the evolving needs of the car rental industry.

## Definitions, Acronyms and Abbreviations

JAVA -> platform independence SQL-> Structured query Language ER-> Entity Relationship

UML -> Unified Modeling Language

IDE-> Integrated Development Environment

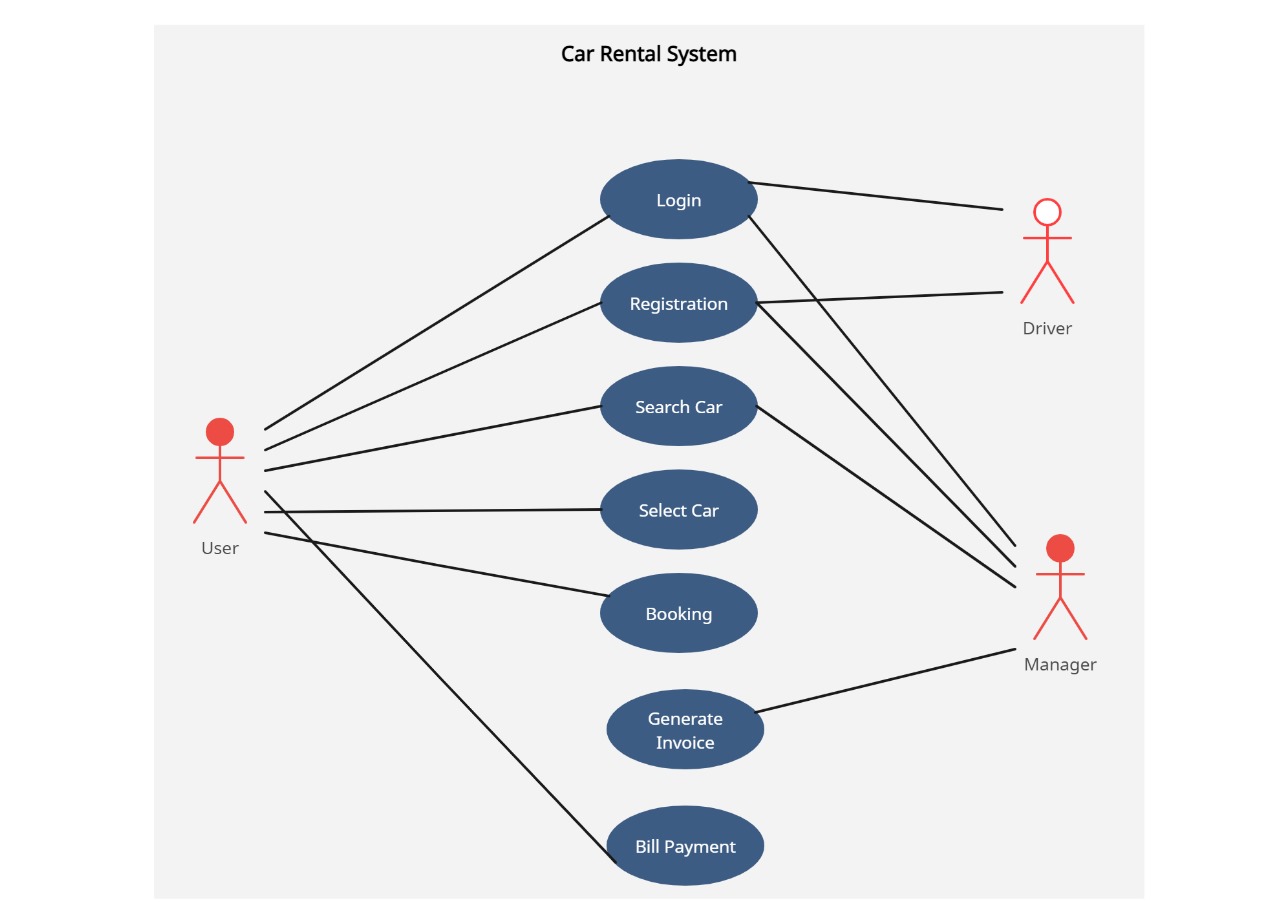
## References

* Websites
* [**https://www.freeprojectz.com/project-source-code-database-download/car-rental-system-project**](https://www.freeprojectz.com/project-source-code-database-download/car-rental-system-project)
* [**https://youtu.be/2tTVd3QMQl0?feature=shared**](https://youtu.be/2tTVd3QMQl0?feature=shared)
* [**https://www.freeprojectz.com/uml/car-rental-system-class-diagram**](https://www.freeprojectz.com/uml/car-rental-system-class-diagram)

# Overall Descriptions

## Product Perspective

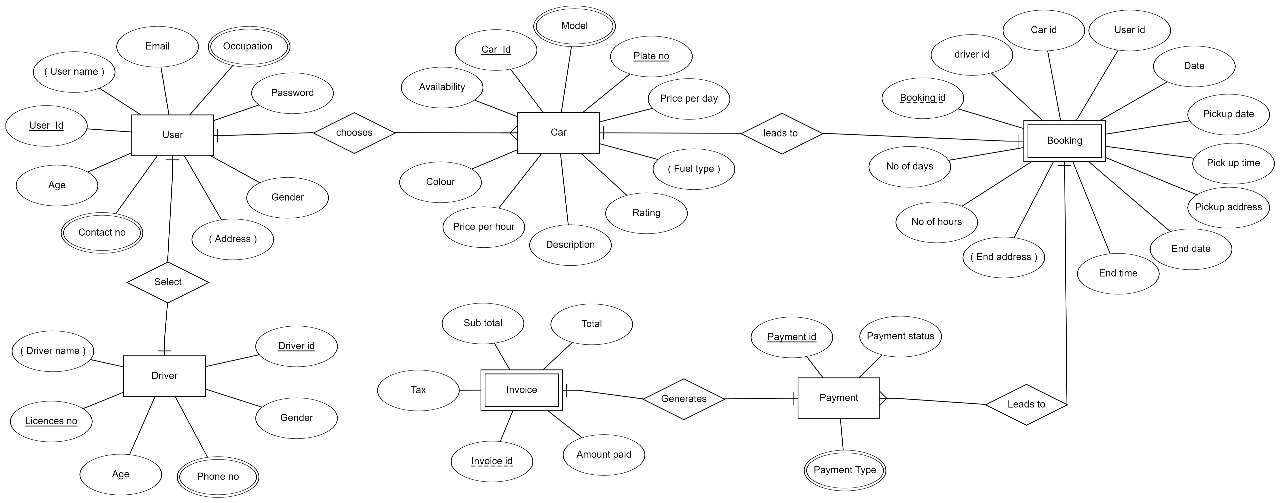
Use Case Diagram of Car Rental System



This is a broad level diagram of the project showing a basic overview. The users can be either customer or public. This System will provide a search functionality to facilitate the search of resources. This search will be based on various categories viz. The users of the system can request Search/Select/Book cars for which they would have to follow certain criteria.

## Product Function

Entity Relationship Diagram of Car Rental System



The Online Car Rental System provides online real time information about the cars available in the system and the user information. The main purpose of this project is to reduce the manual work. This software is capable of selectin a car, searching a car, booking a car , selecting driver and generating invoices. The Manager will act as the administrator to control Users and manage cars. The user’s status of booking car is maintained in the car database. The user’s details can be fetched by the manager from the database as and when required. The valid users are also allowed to view their account information.

## User Classes and Characteristics

The system provides different types of services based on the type of users [User/ Manager]. The Manager will be acting as the controller and he will have all the privileges of an administrator. The user can be a person who will be accessing the car for rental.

The features that are available to the Manager are:-

* A Manager can issue a car for rent to the member
* Can view the different categories of cars and its price available in the system
* Can view the List of cars available in each category
* Add cars and their information to the database
* Add drivers and their information to the database
* Edit the information of existing cars
* Can check the report of the existing cars and booked cars
* Can check the invoices of the booked cars
* Can access all the accounts of the user

The features that are available to the Users are:-

* Can view the different categories of cars available in the system
* Can view the List of cars available in each category
* Can own an account in the system.
* Can view the price of each cars
* Can view the details of drivers
* Can view the history of cars booked to them previously
* Can view the invoices after booking car

## Operating Environment

The product will be operating in windows environment. The Car Rental System is a website and shall operate in all famous browsers, for a model we are taking Microsoft Internet Explorer, Google Chrome, and Mozilla Firefox. Also it will be compatible with the IE 6.0. Most of the features will be compatible with the Mozilla Firefox & Opera 7.0 or higher version. The only requirement to book the cars would be the internet connection.

The hardware configuration include Hard Disk: 40 GB, Monitor: 15” Color monitor, Keyboard: 122 keys. The basic input devices required are keyboard, mouse and output devices are monitor, printer etc.

## Assumptions and Dependencies

The assumptions are:-

* + - The coding should be error free
    - The system should be user-friendly so that it is easy to use for the users
    - The information of all users, cars and billing must be stored in a database that is accessible by the website
    - The system should have more storage capacity and provide fast access to the database
    - The system should provide search facility and support quick transactions
    - The Car Rental System is running 24 hours a day
    - Users may access from any computer that has Internet browsing capabilities and an

Internet connection

* + - Users must have their correct usernames and passwords to enter into their online accounts and do actions

The dependencies are:-

* + - The specific hardware and software due to which the product will be run
    - On the basis of listing requirements and specification the project will be developed and run
    - The end users (admin) should have proper understanding of the product
    - The system should have the general report of booked cars and its invoices
    - The information of all the users must be stored in a database that is accessible by the Car Rental System
    - Any update regarding cars and its price should be recorded to be recorded to the database and the data entered should be correct

## Requirement

Software Configuration:-

This software package is developed using java as front end which is supported by sun micro system. Microsoft SQL Server as the back end to store the database.

Operating System: Windows NT, windows 98, Windows XP Language: Java Runtime Environment, Net beans 7.0.1 (front end) Database: MS SQL Server (back end)

Hardware Configuration:- Processor: Pentium(R)Dual-core CPU Hard Disk: 40GB

RAM: 256 MB or more

## Data Requirement

The inputs consist of the query to the database and the output consists of the solutions for the query. The output also includes the user receiving the details of their accounts. In this project the inputs will be the queries as fired by the users like create an account, selecting car and booking details. Now the output will be visible when the user requests the server to get details of their account in the form of time, date and cars booked are currently in the account.

# External Interface Requirement

## GUI

The software provides good graphical interface for the user and the administrator can operate on the system, performing the required task such as create, update, viewing the details of the cars and booking system.

* + - It allows user to view quick reports like Booked car summary and invoices.
    - It provides stock verification and search facility based on different criteria.
    - The user interface must be customizable by the administrator
    - All the modules provided with the software must fit into this graphical user interface and accomplish to the standard defined
    - The design should be simple and all the different interfaces should follow a standard

template

* + - The user interface should be able to interact with the user management module and a part of the interface must be dedicated to the login/logout module

Login Interface:-

In case the user is not yet registered, he can enter the details and register to create his account. Once his account is created he can ‘Login’ which asks the user to type his username and password. If the user entered either his username or password incorrectly then an error message appears.

Search:-

The Manger or user can enter the type of car he/she is looking for and the price he/she is interested in, then he/she can search for the required car by entering the brand name.

Categories View:-

Categories view shows the categories of cars available and provides ability to the manager to add/edit or delete category from the list.

Invoices View:-

Invoices View shows the summary of car available and provides ability to the manager to add/edit or delete category from the list.

Manager’s Control Panel:-

This control panel will allow manager to add/remove users; add, edit, or remove a resource. And manage lending options.

# System Features

The users of the system should be provided the surety that their account is secure. This is possible by providing:-

* User authentication and validation of users using their unique user ID
* Proper monitoring by the administrator which includes updating account status, showing a popup if the user attempts to issue number of cars that exceed the limit provided by the car policy, assigning fine to uses who skip the date of return
* Proper accountability which includes not allowing a user to see other user’s account. Only administrator will see and manage all user accounts

# Other Non-functional Requirements

## Performance Requirement

The proposed system that we are going to develop will be used as the Chief performance system within the different cities of the country which interacts with the different users across the country. Therefore, it is expected that the database would perform functionally all the requirements that are specified.

* The performance of the system should be fast and accurate
* Car Rental System shall handle expected and non-expected errors in ways that prevent loss in information and long downtime period. Thus it should have inbuilt error testing to identify invalid username/password
* The system should be able to handle large amount of data. Thus it should accommodate high number of cars and users without any fault

## Safety Requirement

The database may get crashed at any certain time due to virus or operating system failure. Therefore, it is required to take the database backup so that the database is not lost. Proper UPS/inverter facility should be there in case of power supply failure.

## Security Requirement

* + - System will use secured database
    - Normal users can just read information but they cannot edit or modify anything except their personal and some other information.
    - System will have different types of users and every user has access constraints
    - Proper user authentication should be provided
    - No one should be able to hack users’ password
    - There should be separate accounts for admin and members such that no member can access the database and only admin has the rights to update the database.

## Requirement attributes

* + - There may be multiple admins creating the project, all of them will have the right to create changes to the system. But the members or other users cannot do changes
    - The project should be open source
    - The Quality of the database is maintained in such a way so that it can be very user friendly to all the users of the database
    - The user be able to easily download and install the system

## Business Rules

A business rule is anything that captures and implements business policies and practices. A rule can enforce business policy, make a decision, or infer new data from existing data.This includes the rules and regulations that the System users should abide by. This includes the cost of the project and the discount offers provided. The users should avoid illegal rules and protocols. Neither admin nor member should cross the rules and regulations.

## User Requirement

The users of the system are customers/users and Manager who act as administrator to maintain the system. The users are assumed to have basic knowledge of the computers and internet browsing. The administrators of the system should have more knowledge of the internals of the system and is able to rectify the small problems that may arise due to disk crashes, power failures and other catastrophes to maintain the system. The proper user interface, user manual, online help and the guide to install and maintain the system must be sufficient to educate the users on how to use the system without any problems.

The admin provides certain facilities to the users in the form of:-

* + - Backup and Recovery
    - Forgot Password
    - Data migration i.e. whenever user registers for the first time then the data is stored in the server
    - Data replication i.e. if the data is lost in one branch, it is still stored with the server
    - Auto Recovery i.e. frequently auto saving the information
    - Maintaining files i.e. File Organization
    - The server must be maintained regularly and it has to be updated from time to time

# Other Requirements

## Data and Category Requirement

There are different categories of users namely, Customer, Admin, Manager, Public etc. Depending upon the category of user the access rights are decided .It means if the user is an administrator then he can be able to modify the data,delete, append etc. All other users except the Manager only have the rights to retrieve the information about database. Similarly there will be different categories of cars available. According to the categories of cars their relevant data should be displayed. The categories and the data related to each category should be coded in the particular format.

## Appendix

A: Admin, Abbreviation, Acronym, Assumptions; B: Business rules, Booking; C: Cars, Class, Client, Conventions; D: Data requirement, Dependencies; G: GUI; I: Invoices; K: Key; M: Manager; N: Non-functional Requirement; O: Operating environment;P: Price,Performance,Perspective,Purpose; R: Requirement, Requirement attributes; S: Safety, Scope, Security, System features; U: User, User class and characteristics, User requirement;

## Glossary

The following are the list of conventions and acronyms used in this document and the project as well:

* + - Administrator: A login id representing a user with user administration privileges to the software
    - User: A general login id assigned to most users
    - Client: Intended users for the software
    - SQL: Structured Query Language; used to retrieve information from a database
    - SQL Server: A server used to store data in an organized format
    - Layer: Represents a section of the project
    - User Interface Layer: The section of the assignment referring to what the user interacts with directly
    - Application Logic Layer: The section of the assignment referring to the Web Server. This is where all computations are completed
    - Data Storage Layer: The section of the assignment referring to where all data is recorded
    - Use Case: A broad level diagram of the project showing a basic overview
    - Class diagram: It is a type of static structure diagram that describes the structure of a system by showing the system’s cases, their attributes, and the relationships between the classes
    - Interface: Something used to communicate across different mediums
    - Unique Key: Used to differentiate entries in a database

## Class Diagram

A class is an abstract, user-defined description of a type of data. It identifies the attributes of the data and the operations that can be performed on instances (i.e. objects) of the data. A class of data has a name, a set of attributes that describes its characteristics, and a set of operations that can be performed on the objects of that class. The classes’ structure and their relationships to each other frozen in time represent the static model. In this project there are certain main classes

which are related to other classes required for their working. There are different kinds of relationships between the classes as shown in the diagram like normal association, aggregation, and generalization. The relationships are depicted using a role name and multiplicities. Here ‘Manager’, ‘User’ and ‘Car’ are the most important classes which are related to other classes.

