SRS Document for Car Rental System

1. Introduction

1.1 Purpose

This document specifies the requirements for a Car Rental System. The system allows customers to reserve, rent, and return vehicles. It also manages vehicle inventory, customer information, and rental transactions.

1.2 Scope

The Car Rental System is designed for use by car rental companies to manage their vehicle fleets and rental processes. It provides an interface for both customers and administrators to interact with the system, ensuring smooth and secure operations.

1.3 Definitions, Acronyms, and Abbreviations

- CRS: Car Rental System
- UI: User Interface
- API: Application Programming Interface
- VIN: Vehicle Identification Number

1.4 References

- IEEE Standard for Software Requirements Specifications (IEEE Std 830-1998)

1.5 Overview

The document is structured into sections detailing the functional and non-functional requirements, system features, external interface requirements, and more.

2. Overall Description

2.1 Product Perspective

The Car Rental System is part of the company's IT infrastructure, connected to a central database that stores vehicle, customer, and transaction data.

2.2 Product Functions

- Customer registration and authentication
- Vehicle search and reservation
- Rental agreements creation
- Vehicle pickup and return processing
- Payment processing
- Reporting and analytics for administrators
- Notifications for maintenance and vehicle availability

2.3 User Classes and Characteristics

- Customers: Individuals renting vehicles
- Administrators: Company staff managing rentals and fleet

2.4 Operating Environment

- Software: Runs on web servers, accessible via web browsers and mobile apps
- Hardware: Requires access to the internet, supports desktop and mobile devices

2.5 Design and Implementation Constraints

- Compliance with local transportation regulations
- Secure payment processing

- Data encryption for sensitive information

2.6 Assumptions and Dependencies

- Stable internet connection for accessing the system

- Regular updates to vehicle and customer data

3. External Interface Requirements

3.1 User Interfaces

- Web-based UI for customer and admin interaction

- Mobile app UI for on-the-go access

3.2 Hardware Interfaces

- Integration with vehicle tracking devices (GPS)

- Payment terminals for in-person transactions

3.3 Software Interfaces

- API integration with payment gateways

- Integration with GPS tracking services

3.4 Communication Interfaces

- Secure protocols like SSL/TLS for data transmission

4. System Features

4.1 Customer Registration and Authentication

- Description: Allows users to create accounts and log in to the system.

- Functional Requirements:

- The system shall allow users to register with personal details and payment information.
- The system shall authenticate users using email and password.

4.2 Vehicle Reservation

- Description: Enables customers to search for and reserve available vehicles.
- Functional Requirements:
  - The system shall allow users to search for vehicles based on location, date, and type.
  - The system shall reserve a vehicle upon user confirmation.

4.3 Rental Agreement Management

- Description: Manages the creation and storage of rental agreements.
- Functional Requirements:
  - The system shall generate a rental agreement for each reservation.
  - The system shall store rental agreements in the database.

4.4 Vehicle Pickup and Return

- Description: Manages the process of picking up and returning vehicles.
- Functional Requirements:
  - The system shall update vehicle status upon pickup.
  - The system shall process vehicle return and update the inventory.

4.5 Payment Processing

- Description: Handles payments for vehicle rentals.
- Functional Requirements:
  - The system shall process payments via integrated payment gateways.
  - The system shall generate receipts for completed transactions.

4.6 Reporting and Analytics

- Description: Provides reports and analytics for administrators.

- Functional Requirements:

  - The system shall generate reports on vehicle usage, revenue, and customer demographics.

  - The system shall support export of reports in various formats.

5. Non-Functional Requirements

5.1 Performance Requirements

- The system shall respond to user inputs within 2 seconds.

- The system shall handle up to 1,000 concurrent users.

5.2 Security Requirements

- The system shall encrypt all sensitive data.

- The system shall require multi-factor authentication for administrators.

5.3 Usability Requirements

- The system shall have a user-friendly interface for both customers and administrators.

- The system shall support multiple languages.

5.4 Reliability Requirements

- The system shall have an uptime of 99.9%.

6. Other Requirements

6.1 Regulatory Requirements

- The system shall comply with local transportation and data protection laws.

6.2 Environmental Requirements

- The system shall operate in various environments, including offices and customer locations.

Requirements Traceability Matrix (RTM)

The RTM ensures that all requirements are covered by design, development, and testing activities.

Requirement ID	Requirement	Design Specification	Implementation Module	Test Case
R1	Customer Registration	UI Design Document	Registration Module	TC-001
R2	User Authentication	Authentication Logic	Authentication Module	TC-002
R3	Vehicle Search	Search Algorithm Design	Search Module	TC-003
R4	Vehicle Reservation	Reservation Logic	Reservation Module	TC-004
R5	Rental Agreement Creation	Rental Agreement Template	Agreement Module	TC-005
R6	Vehicle Pickup	Pickup Process Flow	Pickup Module	TC-006
R7	Vehicle Return	Return Process Flow	Return Module	TC-007
R8	Payment Processing	Payment Gateway Integration	Payment Module	TC-008
R9	Report Generation	Report Layout Design	Reporting Module	TC-009
R10	Notifications	Notification Workflow	Notification Module	TC-010
R11	GPS Integration	GPS API Design	GPS Module	TC-011
R12	Security (Data Encryption)	Encryption Protocol Design	Security Module	TC-012
R13	Multi-language Support	Language Pack Design	UI Module	TC-013
R14	System Performance	Performance Optimization	System Core	TC-014
R15	Uptime (Reliability)	High Availability Design	Infrastructure	TC-015