

1. Car Rental Management System - Requirements Document

Renting a car can be one of the most frustrating parts of planning a trip. Rates are rarely standardized, meaning one company could offer a significantly different price than the brand down the street. The Car Rental Management System (CRMS) aims to automate the rental operations by managing the availability of vehicles, customer information, bookings, and vehicle maintenance. It helps ensure smooth operations through dynamic pricing based on car categories and rental duration while tracking maintenance to keep the fleet in optimal condition. The system will support multiple entities like cars, customers, bookings, and maintenance records and allow managers to generate reports to monitor operations.

2. Business Rules

1. Car Management

- Each car has a unique identifier, make, model, year, category (e.g., SUV, Economy), and rental status (e.g., available, rented, maintenance).
- A car cannot be rented when under maintenance.
- Cars are categorized to apply distinct pricing models.

2. Customer Management

- Customers provide their name, contact details, and license number during registration.
- Each customer has a unique ID.
- A customer can rent multiple cars, but each booking is tracked separately.

3. Booking Management

- Each booking captures car ID, customer ID, rental start and end dates, and the total rental cost.
- A car cannot be booked if it is already rented or under maintenance.
- Bookings can be canceled, making the car available again.

4. Car Maintenance

- Maintenance records include car ID, date, and type of service (e.g., oil change, repairs).
- Cars under maintenance cannot be booked.

5. Dynamic Pricing

- Rental cost is based on car category, rental duration, and seasonal demand.
- Discounts may apply based on promotions or long-term bookings.

6. Reports and Queries

- Reports on available cars, customer details, booking history, and maintenance status are accessible.
- The system tracks customers with active bookings or outstanding payments.

3. Identified Nouns (Entities)

- Car
- Customer
- Booking
- Car Category
- Maintenance Record
- Pricing
- Promotion

4. Identified Verbs (Actions)

- Register Customer – Add a new customer to the system.
- Add Car – Register new cars in the inventory.
- Book Car – Process a car rental for a customer.
- Cancel Booking – Cancel a booking and update the car's availability.
- Schedule Maintenance – Record a car's maintenance schedule.
- Update Status – Change the status of cars (e.g., from rented to available).
- Calculate Cost – Compute the rental price based on dynamic pricing rules.
- Generate Reports – Provide operational insights such as availability and bookings.