

Project Title

Car Rental Management System

The Car Rental Management System is a versatile desktop application designed to assist car rental service companies in efficiently managing customers, services, and business operations across various service locations nationwide. It functions as a centralized repository for organizing and tracking critical business data. This application is adaptable and can be customized for various user interfaces, including tablets and mobile phones.

Project Scope

Features

1. Customer Management

- **User Registration:** Customers have the option to register either online or in-person at our service point, where our dedicated staff will assist with the registration process. During registration, we verify the provided information, such as a driver's license, to ensure compliance with legal requirements for car rental.
- **Customer Analyse:** Registered customers may receive newsletters via email, informing them of any promotional events or offers. Additionally, the customer database is a valuable resource for analyzing preferences, which allows us to enhance our car inventory based on customer feedback and demand trends.

2. Product Management

- **Car Search:** Available cars can be sorted by general filter criterion such as rental price and type of the car. Complex search is also available by combining several searching filters. This feature allows the user to find the car best fits his/her needs.
- **Inventory Management:** Customers All cars information can be found in inventory section, this will be not limited the basic info like VIN, cost etc., also the status and its tracking info will be listed.

- **Car Maintenance Management:** This feature makes it easy for the company to track the records of cars' maintenance history and get notifications when a car's next regular maintenance day is closed. This feature help to improve the product management.
- **Car Insurance Management:** All car's insurance record were filed with detailed terms and conditions. This allows company to quickly get info when needed.
- **Vendor Management:** In Car Rental Management System, all the car has been assigned to a specific vendor, here it is the garage which is in charge of the car's maintenance and repair if needed. The company can easily check the vendor's information and easily make appointment through the system for necessary maintenance or repair.

3. Service Management

- **Car Reservation:** Customers can reserve the vehicle they want in advance through this system, and they can choose when and where to pick up the vehicle.
- **Important Info:** Customers can access important information on the system such as contact details for customer support, location addresses, and frequently asked questions (FAQs).
- **Make a Payment:** Customers can pay in-store or online.
- **Search Stores:** Both customers and car rental company can search stores according to the city, province.
- **Payment process:** The payment process feature will allow owner to accept the payments easily and securely. The customers will have option to pay for their services online or in person.
- **Report:** Car rental company can get the monthly or yearly sales report of each store or the whole companies', this feature facilitates the company business management.

End Users

The end users of this Car Rental Management System can be customers, car rental company management team and their employee.

Customer will use the system to search cars, reserve car and pay for their orders, they also will get answers to frequently asked questions.

Car rental company can use this system to track each order and payment, can check car's maintenance status and the company's sales records.

Vendor will use the system to receive maintenance schedule or repair notification.

Integration of End Users with the Project (User Stories)

- As a customer, I would like to find the car based on my budget and reserve it in advance. I hope I can do this without going to the local store. So, I find this app and register it within few minutes. I input my budget and the SUV as type and the location I would like to pick up the car. Very quickly all the information present on the screen. I choose the one with the color I like most and 7 seats which perfectly adapt to my trip plan. I submit the order and pay for it in few seconds. I am looking forward to the trip!
- As a manager in one car rental shop, I use the application for managing my store. I receive the notification of the newly order, then I can make sure I get the car ready before the customer coming to pick it up. I also use the system to know well each of our car's status, including the maintenance history and insurance information. I can check the sales report of my store and then prepare the report I need to submit to head office.
- As a management team in car rental company head office, I need to know the overall sales of my company, so I generate a report from the application. I also want to check the inventory and make sure we have enough functional cars to fit in the forecasted market share we have in coming months or year.
- As a garage owner, I use the application to check if I have scheduled maintenance or repair order from one or more car rental company. I need this information to get my mechanics ready for the work. With this system, it's easy for me to not only arrange my workers but also, I know well the coming cars details information

so I can prepare the relevant parts, materials. The system makes our work more efficient.

Car Rental Management System will cover the following areas:

- User Registration.
- User Authentication.
- Payment Process.
- Inventory Record.
- Report generation.
- Production Selection and Reservation.

Project Users, Actors, Vendors, Actuators:

1. Project Users/Beneficiaries:

- **Car Rental Company:** The primary user of the project is the car rental company. They rely on the system to efficiently manage various aspects of their business, including car reservations, inventory management, sales reporting, and customer analysis.

2. Actors/Third-Party Companies:

- **Payment Processors:** Payment processors can leverage the project to provide secure payment processing services for online transactions within the car rental management system.
- **Software Development Companies:** Software development companies can contribute expertise and support for project development. They also offer valuable software tools, frameworks, and libraries.
- **Marketing Agencies:** Marketing agencies can utilize the project to create and manage marketing campaigns for the car rental company. They benefit from the valuable data generated by the system to optimize marketing efforts.

- **Cloud Providers:** Cloud providers play a crucial role by offering cloud infrastructure and services for hosting and deploying the project, ensuring scalability and reliability.

3. Vendors:

- **Hardware Vendors:** Hardware vendors supply essential equipment and devices required for the project's operation, including servers, routers, and switches.
- **Software Vendors:** Software vendors provide software components that seamlessly integrate with the project. This includes database management systems, content management systems, and customer relationship management software.

4. Actuators:

- **Servers:** Servers serve as the backbone of the project, responsible for running software components and managing critical data.
- **Databases:** Databases act as secure repositories for various project data, encompassing reservations, inventory, customer information, payment records, staff details, and store information.
- **APIs:** The APIs enable communication between the various components of the project, such as google map API which will be used in this project.

Project Properties:

- **Functionality:** The system must encompass essential functionalities for comprehensive management of car rental operations. This includes reservation management, a secure online payment process, inventory tracking, and reporting capabilities.
- **Usability:** The system should prioritize user-friendliness, ensuring an intuitive and easy-to-navigate interface for both car rental company staff and customers.
- **Security:** Robust security measures must be in place to safeguard sensitive data, such as customer information, financial records, and inventory data.
- **Scalability:** The system must exhibit scalability, accommodating a growing user base and increasing data volumes as the business expands.
- **Performance:** Emphasis should be placed on system performance, ensuring rapid response times and overall responsiveness.

- Customization: The system's architecture should support customization, enabling tailoring to the specific requirements of various car rental companies.
- Accessibility: Accessibility features should be integrated into the system, making it usable by a diverse range of users, including those with disabilities.
- Maintenance: The system should facilitate easy maintenance and updates. Regular backups and the ability to apply security patches are essential for system integrity.

Here are some platforms and software applications that could be used when developing a car rental management system:

- Frontend: HTML 5, CSS 3, JavaScript ES6, React 18.0.0
- Backend: C# 10 and ASP.NET Core 6.0
- Database: PostgreSQL 15

Plan Details:

Week 1-4: Front-end development

- Develop the front-end user interface using React.
- Implement responsive design and user-friendly interface.
- Implement all the features including car searching, reservation, inventory management, customer management, payment process, etc.

Week 5-7: Back-end development

- Develop the back-end server-side logic and API using the chosen framework.
- Integrate with the front-end interface.
- Implement user authentication and authorization functionality.
- Implement necessary data storage and retrieval methods.

Week 6-8: Testing, Debugging and Deployment

- Perform integration testing of the entire system.
- Identify and resolve any issues found during testing.
- Prepare the application for deployment to the production environment.
- Configure any necessary server-side components and services.

Contributions:

Team member: [Li Fan 2395027 \(50%\)](#)

[Shaojun Jiang 2395049 \(50%\)](#)

<div>Task</div> <div>Team member</div>	Project Title	Project Scope <div>Features</div> <div>End users</div>	Project Scope <div>User stories</div> <div>Cover areas</div>	Project Users <div>Actors</div> <div>Vendors</div> <div>Actuators</div>	Project Properties	Plan Details
Li Fan			√	√		√
Shaojun Jiang	√	√			√	