

Rent-A-Car

System Requirement Specification Document

Github Repository : <https://github.com/miu-bd/rent-a-car>

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1. Introduction

The Rent-a-Car Management Software is a comprehensive application designed to streamline and automate the operations of a car rental business. This software aims to enhance the efficiency and accuracy of managing car inventory, reservations, customer information, billing, and reporting. The system will be accessible to both administrative staff and customers, offering an intuitive and user-friendly interface.

2. Scope

The Rent-a-Car Management Software will include the following key features:

2.1 Car Inventory Management:

- ❑ Add, update, and delete car models with relevant details such as make, model, year, fuel type, transmission, and availability status.
- ❑ Track the number of available cars in real-time.
- ❑ Assign unique identification numbers to each car.

2.2 Reservation System:

- ❑ Allow customers to browse available cars based on various filters.
- ❑ Enable customers to make reservations by specifying pick-up and drop-off dates and times.
- ❑ Send reservation confirmations to customers via email or SMS.
- ❑ Support reservation modifications and cancellations.

2.3 Customer Management:

- ❑ Store and manage customer information, including name, contact details, and driving license details.
- ❑ Maintain a history of customer reservations and rental activities.

2.4 Billing and Invoicing:

- ❑ Automatically calculate rental fees based on factors like rental duration, car type, and additional services.
- ❑ Generate and send invoices to customers.
- ❑ Track payments and overdue balances.

2.5 Reporting and Analytics:

- ❑ Provide administrators with insights into rental trends, revenue, and car utilization.
- ❑ Generate reports on popular car models, peak rental periods, and customer feedback.

3. Functional Requirements.

3.1 Car Inventory Management

- ❑ The system shall allow administrators to add new car models to the inventory.
- ❑ The system shall enable administrators to update car details, such as availability and status.
- ❑ The system shall support the removal of cars from the inventory when they are no longer available for rent.
- ❑ Each car shall have a unique identification number.

3.2 Reservation System

- ❑ Customers shall be able to search and browse available cars based on criteria such as location, car type, and rental dates.
- ❑ Customers shall be able to view detailed information about each car, including its rental rate and specifications.
- ❑ The system shall allow customers to make reservations by specifying the pick-up and drop-off dates and times.
- ❑ Customers shall receive an email or SMS confirmation upon successful reservation.
- ❑ Customers shall have the option to modify or cancel their reservations, subject to the cancellation policy.

3.3 Customer Management

- ❑ The system shall store and manage customer details, including name, address, contact information, and driving license details.
- ❑ Customers shall be able to create accounts and update their profile information.
- ❑ The system shall maintain a history of each customer's past reservations and rental activities.

3.4 Billing and Invoicing

- ❑ The system shall calculate rental fees based on the car type, rental duration, and any additional services availed by the customer.
- ❑ Invoices shall be automatically generated and sent to customers upon completing their rentals.
- ❑ The system shall track payment status and generate reminders for overdue payments.

3.5 Reporting and Analytics

- ❑ The system shall generate various reports for administrators to analyze business performance, including rental trends, revenue reports, and car utilization.
- ❑ Reports shall be available in various formats (e.g., PDF, CSV) and can be scheduled for automatic delivery.

4. Non-Functional Requirements

4.1 Usability

- ❑ The software shall have an intuitive and user-friendly interface for both administrators and customers.
- ❑ The system shall provide clear and concise error messages to assist users in case of input errors.

4.2 Performance

- ❑ The system shall be able to handle concurrent user requests without significant delays.
- ❑ The response time for all operations should be fast, typically within a few seconds.

4.3 Security

- ❑ The system shall implement proper authentication and authorization mechanisms to ensure data privacy and security.
- ❑ Customer payment information shall be stored securely using encryption.

4.4 Reliability

- ❑ The system shall have a backup and recovery mechanism to prevent data loss in case of system failures.
- ❑ Regular system maintenance and updates shall be scheduled to ensure reliability and stability.

4.5 Scalability

- ❑ The software architecture shall be designed to accommodate future growth and an increasing number of users and rental cars.

5. Constraints

- ❑ The system development must comply with all applicable laws and regulations related to data protection and privacy.
- ❑ The software shall be compatible with popular web browsers and operating systems.

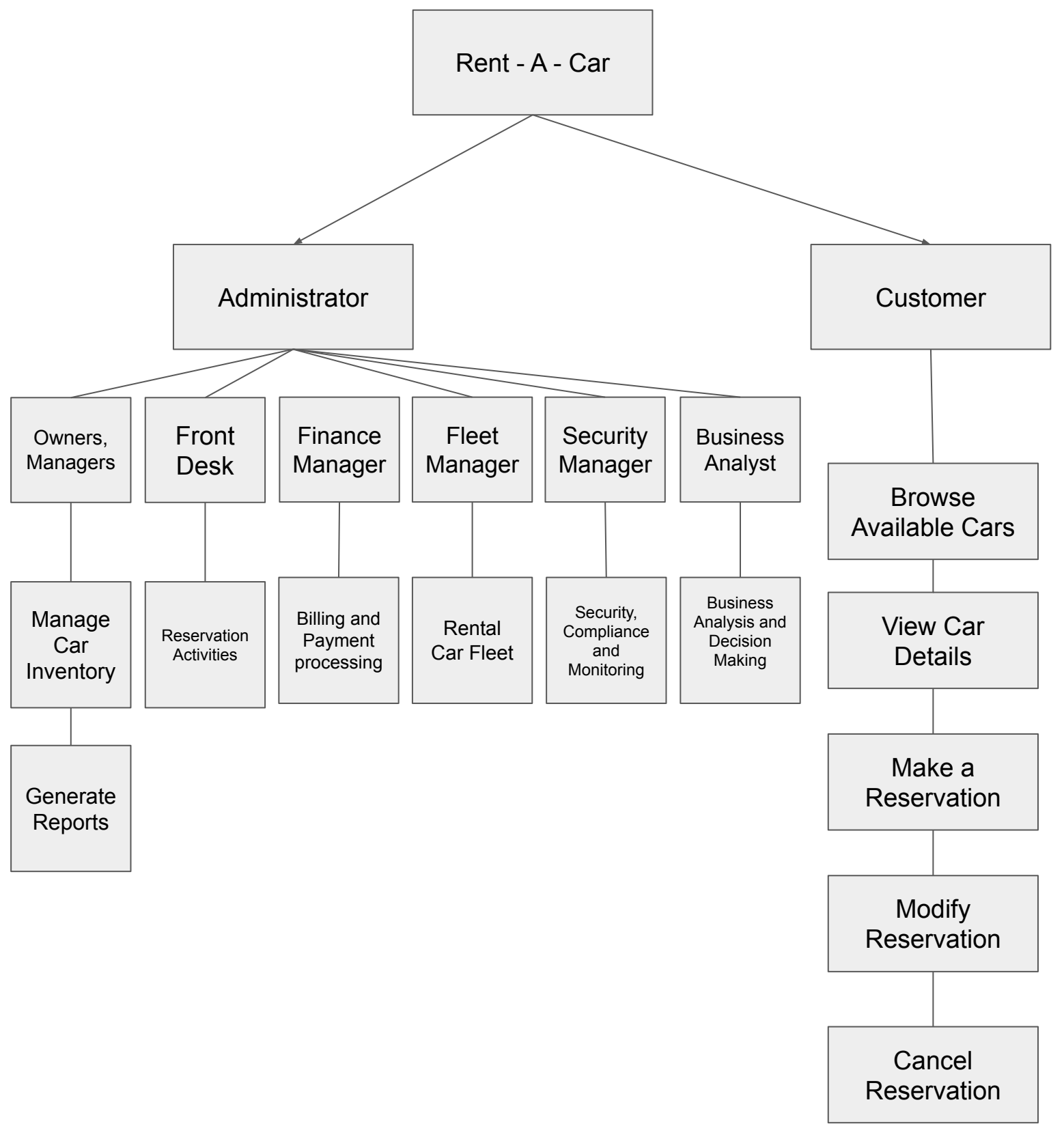
6. Technical Requirements

- ❑ The software shall be developed using JAVA & Springboot.
- ❑ The system shall be hosted on reliable and secure servers with adequate storage and processing capabilities.
- ❑ The software shall integrate with email and SMS services for reservation confirmations and notifications.

7. Glossary

- ❑ Administrator: An authorized user responsible for managing the Rent-a-Car Management Software.
- ❑ Owner / Managers : Administrator users with difference owners and manager capabilities
- ❑ Front Desk : Administrator users with front desk managing capabilities
- ❑ Finance Manager : Administrator users with payments and billing managing capabilities
- ❑ Fleet Manager : Administrator users with fleet managing capabilities
- ❑ Security Manager : Administrator users security managing and monitoring capabilities
- ❑ Business Analyst : Administrator users with business analysis and decision making capabilities
- ❑ Customer: An individual who rents cars through the system.
- ❑ Reservation: A booking made by a customer to rent a car for a specified period.
- ❑ Invoice: A document generated by the system detailing the rental charges and services availed by the customer.

8. Use Case Model



Use Case Number: 1	Manage Car Inventory	
Brief Description:	The administrator manages the car inventory, adding, updating, or removing cars from the system.	
Actors:	Administrator, Owners, Managers	
Preconditions:	The administrator has access to the Rent-a-Car Management Software	
User Actions:		System Actions:
1. The administrator logs in to the system with the appropriate credentials.		1. The system displays a list all functionalities.
2. The administrator navigates to the "Car Inventory Management" section.		2. The system presents a list of existing cars in the inventory with their details
3. The administrator can add a new car to the inventory by providing relevant details such as make, model, year, fuel type, transmission, and rental rate.		3. The system displays a list all accessible feature.
4. The administrator can update the information of an existing car (e.g., availability status, rental rate).		4. The system perform the operation according administrator demand.
5. The administrator can remove a car from the inventory if it is no longer available for rent.		
Postconditions:	Administrator have the current data to view and make decision	
Business Rule:	Only authorized Administrator can access for the operation.	

Use Case Number: 2	Generate Reports	
Brief Description:	The administrator generates reports to gain insights into business performance	
Actors:	Administrator, Owners, Managers	
Preconditions:	The administrator has access to the reporting section of the system.	
User Actions:		System Actions:
1. The administrator accesses the reporting section of the system.		1. The system displays a list all functionalities.
2. The administrator selects the desired report and specifies the date range or other criteria.		2. The system presents various report options, such as rental trends, revenue, car utilization, and customer feedback.
3. The administrator can view the report on-screen, print it, or download it for further analysis.		3. The system generates the report in the requested format (e.g., PDF, CSV).
Postconditions:	Administrator have the all report for view and to export	
Business Rule:	Only authorized Administrator can access for the report view operation.	

Use Case Number: 3	Reservation Activities	
Brief Description:	This use case involves interactions between front desk staff and the car rental system for handling reservations and customer inquiries.	
Actors:	Front Desk Staff, Customers	
Preconditions:	Front desk staff are logged into the system. There are available cars for rental.	
User Actions:	System Actions:	
1. Check car availability for specific dates.	1. Display car availability information.	
2. Create, modify, or cancel reservations.	2. Update reservation status based on staff actions.	
3. Verify customer identification and driver's license.	3. Store customer identification and license details.	
4. Provide rental agreement and terms to customers.	4. Generate and provide rental agreement documents.	
Postconditions:	Reservations are updated, and customer details are stored for reference.	
Business Rule:	Only authorized front desk staff can access reservation functionalities.	

Use Case Number: 4	Rental Car Fleet	
Brief Description:	This use case involves interactions between fleet managers and the car rental system for managing the rental car fleet.	
Actors:	Fleet Managers	
Preconditions:	Fleet managers are logged into the system. There are available cars for rental.	
User Actions:	System Actions:	
1. View the status of the entire rental car fleet.	1. Display the status of the rental car fleet.	
2. Schedule car maintenance and inspections.	2. Schedule maintenance and inspections as requested.	
3. Update car information (e.g., mileage, condition).	3. Update car information based on manager's actions.	
4. Decommission or retire cars from the fleet.	4. Manage car decommissioning process.	
Postconditions:	Fleet information is updated with maintenance schedules and car decommissioning details.	
Business Rule:	Only authorized fleet managers can access fleet management functionalities.	

Use Case Number: 5	Billing and Payment processing	
Brief Description:	This use case involves interactions related to billing and payment processing for car rentals.	
Actors:	Finance Manager, Customers	
Preconditions:	Customers have completed their car rental.	
User Actions:	System Actions:	
1. Generate and present the final bill to customers.	1. Calculate the final bill based on rental details.	
2. Receive payments via various payment methods.	2. Process and record payments in the system.	
3. Handle payment inquiries and issues.	3. Provide payment status and receipts to customers.	
Postconditions:	Payments are recorded and customers receive payment receipts.	
Business Rule:	Only authorized billing and payment staff can access billing and payment functionalities.	

Use Case Number: 6	Security, Compliance and Monitoring	
Brief Description:	This use case involves interactions between risk and security managers and the car rental system to ensure compliance and address security concerns.	
Actors:	Risk and Security Managers	
Preconditions:	Risk and security managers are logged into the system.	
User Actions:		System Actions:
1. Monitor system logs for suspicious activities.		1. Provide access to system logs for review.
2. Review and enforce security protocols.		2. Implement and enforce security measures.
3. Investigate and respond to security incidents.		3. Provide necessary information for incident investigation.
4. Set access levels and permissions for users.		4. Apply access level changes as requested.
Postconditions:	Security measures are enforced, and incidents are appropriately addressed and documented.	
Business Rule:	Only authorized risk and security managers can access risk and security functionalities.	

Use Case Number: 7	Business Analysis and Decision Making	
Brief Description:	This use case involves interactions between business analysts and the car rental system to gather insights and analyze data for decision-making.	
Actors:	Business Analyst	
Preconditions:	Business analysts are logged into the system.	
User Actions:		System Actions:
1. Generate reports on rental trends and performance.		1. Provide access to relevant data for analysis.
2. Analyze customer feedback and reviews.		2. Display rental trends and performance metrics.
3. Identify areas for improvement and optimization.		3. Store and provide customer feedback data.
4. Extract data for further analysis.		4. Export data as requested by the analyst.
Postconditions:	Business analysts have the necessary data and insights for decision-making.	
Business Rule:	Only authorized business analysts can access data analysis functionalities.	

Use Case Number: 8	Browse Available Cars	
Brief Description:	The customer searches for available cars based on various criteria.	
Actors:	Customer	
Preconditions:	The customer has access to the Rent-a-Car Management Software.	
User Actions:		System Actions:
1. The customer logs in to their account or accesses the system as a guest.		1. The system presents a list of available cars with details such
2. The customer navigates to the "Browse Cars" section.		2. The system displays the filtered results.
3. The customer can apply filters to narrow down the search results (e.g., car type, location, rental dates).		3. The system displays the filtered according to search criteria.
4. The customer selects a car from the list to view more details.		4. The system displays the car list as a filtered results.
Postconditions:	Customer have the necessary data and insights for decision-making.	
Business Rule:	Only authorized customer can access data view and access functionalities.	

Use Case Number: 9	View Car Details	
Brief Description:	The customer views detailed information about a selected car.	
Actors:	Customer	
Preconditions:	The customer has selected a car from the "Browse Available Cars".	
User Actions:		System Actions:
1. The customer selects a car from the list of available cars.		1. The system displays comprehensive details of the selected car, including make, model, year, fuel type, transmission, rental rate, and availability status.
Postconditions:	Customer have the necessary view of data and insights for decision-making.	
Business Rule:	Only authorized customer can access data view and access functionalities.	

Use Case Number: 10	Make a Reservation	
Brief Description:	The customer reserves a car for a specific rental period.	
Actors:	Customer	
Preconditions:	The customer has viewed car details in the "View Car Details" use case.	
User Actions:		System Actions:
1. The customer chooses the rental dates, pick-up, and drop-off times for the selected car.		1. The system checks the car's availability for the specified rental period.
2. If the car is available, the customer proceeds with the reservation.		2. The system prompts the customer to confirm the reservation.
3. The customer confirms the reservation.		3. The system generates a reservation confirmation and sends it to the customer via email or SMS.
4. The customer selects a car from the list to view more details.		4. The system displays the car list as a filtered results.
Postconditions:	Customer able to make reservation.	
Business Rule:	Only customer can access data view of his own reservation and functionalities.	

Use Case Number: 11	Modify Reservation	
Brief Description:	The customer modifies an existing reservation.	
Actors:	Customer	
Preconditions:	The customer has an active reservation.	
User Actions:		System Actions:
1. The customer logs in to their account		1. The system displays a list of their active reservations.
2. The customer accesses their reservations history.		2. The system allows the customer to change the rental dates or times.
3. The customer selects the reservation they want to modify		3. The system updates the reservation with the new details and sends a modified reservation confirmation to the customer
4. The customer confirms the modifications.		4. The system perform modification operation.
Postconditions:	Customer have the modified final data.	
Business Rule:	Only authorized customer can access his own data	

Use Case Number: 12	Cancel Reservation	
Brief Description:	The customer cancels an existing reservation.	
Actors:	Customer	
Preconditions:	The customer has an active reservation	
User Actions:		System Actions:
1. The customer logs in to their account		1. The system displays a list of their active reservations.
2. The customer accesses their reservations history.		2. The system prompts the customer to confirm the cancellation
3. The customer selects the reservation they want to cancel.		3. The system updates the reservation status as canceled and sends a cancellation confirmation to the customer.
4. The customer confirms the cancellation.		4. The system perform the cancel operation.
Postconditions:	Customer have the current data to view and make decision	
Business Rule:	Only authorized can access for cancellation for his own data.	