American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

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Section: E

Software Quality Assurance and Testing

Car Rental Management System

A Report submitted
By

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SUBMITTED TO

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Revision History

Revision	Date	Updated by	Update Comments
0.1	2023.08.04	Abdullah Muhammad Hamja	First Draft
0.2	2023.08.05	Abdullah Muhammad Hamja	Second Draft
0.3	2023.08.05	Sabbir Ahamed Hamja	Third Draft
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0.6	2023.08.16	Abdullah Muhammad Hamja	Final Draft

1. TEST PLAN IDENTIFIER: RS-MTP01.3

2. REFERENCES

- [1]Busse, M., Busse, M., Swinkels, J., Swinkels, J., Merkley, G., & Merkley, G. (2017). Enterprise rent-a-car. Kellogg School of Management Cases, 1–15.https://doi.org/10.1108/case.kellogg.2016.000112.

- [2] Ghoreishi, N., & Shajari, M. (2010). Web-Based SMS Passenger Application: New Approach to Inform Passengers via SMS in Airlines.In Proceedings of theInternational Conference on e-Education, e- Business, e- Management, and e- Learning 2010.

3. INTRODUCTION

Background to the Problem

The car rental industry has recently begun to expand at a noticeably higher rate. Sophisticated management software is needed to handle a car rental business' complete system in order to keep things running smoothly. Because it requires a lot of physical labor in the absence of any management system. Both employees and customers dislike the conventional automobile rental method. Due to the manual nature of their work, employees may make mistakes that cause confusion and inconvenience to customers, such as giving them the incorrect bill or booking the incorrect vehicle type, pick-up or drop-off dates, or assign a vehicle to the wrong customer. Customers would become annoyed with the business because of all these errors made by people.

The majority of the software used for these rental companies is costly to create and maintain. As a result, the majority of companies use a manual system. As a result, most tiny companies and newly established rental businesses lacks management systems.

Solution to the Problem

The challenges faced by the car rental industry due to manual operations and the lack of sophisticated management systems, I propose the development and implementation of a comprehensive Car Rental Management Software (CRMS). This solution is particularly appropriate because it aims to streamline and automate various aspects of the car rental business, leading to improved efficiency, accuracy, and customer satisfaction. The proposed solution is feasible and aligned with the business objective of enhancing the overall car rental experience.

Solution: Car Rental Management System (CRMS)
The Car Rental Management System (CRMS) is a comprehensive software solution designed to address the challenges faced by car rental businesses, offering an efficient and user-friendly platform to manage the entire rental process. The purpose of CRMS is to streamline operations, reduce human errors, enhance customer satisfaction, and facilitate the growth of the car rental industry.

Key Benefits: Automated Operations, Enhanced Customer Experience, Error Reduction, Billing and Invoicing Accuracy, Time and Resource Savings, Reporting and Analytics, Online Reservations and Payments etc.

Objectives and Goals:
The main objectives of implementing the Car Rental Management System are as follows:
1. Minimize Human Errors: Reduce errors caused by manual processes, leading to accurate bookings, invoicing, and customer data management.
2. Improve Customer Satisfaction: Enhance the overall customer experience by providing a user-friendly booking platform, transparent pricing, and reliable services.
3. Facilitate Business Growth: Provide a foundation for the growth of the car rental business by enabling easy scalability, efficient fleet management, and data-driven decision-making.
4. Ensure Data Security: Implement robust security measures to protect customer data, payment information, and sensitive business data.
5. Promote Technological Innovation: Embrace modern technology to stay competitive in the evolving car rental industry and attract tech-savvy customers.

Existing studies in the problem area have highlighted the challenges faced by the car rental industry due to manual operations and the need for sophisticated management software. These challenges include errors in billing, booking, and vehicle assignment, leading to customer dissatisfaction. Many companies still rely on manual systems due to the cost of developing and maintaining software solutions.
Several software solutions are available to address these issues: Rental Management Software, Cloud-Based Systems, Mobile Apps, Online Booking Platforms, Custom Software Development etc.
These solutions offer ways to automate processes, reduce errors, and enhance customer satisfaction.

4. REQUEIREMNT SPECIFICATION

4.1 System Features

1. User Authentication (Login/Sign in)

Functional Requirements:

1.1 The software shall provide a login interface for users to enter their username and password.

1.2 Users shall be able to log in using valid credentials.

1.3 Users should be able to recover their forgotten passwords through a password reset process.

Priority Level: High

Precondition: User has a valid username and password

2. User Registration (Signup)

Functional Requirements:

2.1 The system shall allow new users to register by providing required personal information.

2.2 Users shall be required to provide a unique username and password during registration.

2.3 The system shall validate and ensure the uniqueness of each username.

2.4 After successful registration, users shall receive a confirmation email.

Priority Level: High

3. Forget Password

Functional Requirements:

3.1 Users shall have the option to reset their password if forgotten.

3.2 The system shall prompt users to enter their email address to initiate the password reset process.

3.3 After verification, the system shall send a password reset link to the user's registered email.

Priority Level: Medium

4. Change Password

Functional Requirements:

4.1 Authenticated users shall be able to change their password from their profile settings.

4.2 Users shall be required to enter their current password and then provide and confirm a new password.

4.3 The system shall validate and enforce password complexity rules during the password change process.

Priority Level: Medium

Precondition: User is logged in

5. Profile Management (Update + View)

Functional Requirements:

5.1 Authenticated users shall be able to view their profile information.

5.2 Users shall have the ability to update their profile details, including contact information and preferences.

5.3 The system shall ensure that user data is stored securely and accurately.

Priority Level: Medium

Precondition: User is logged in

6. Logout

Functional Requirements:

6.1 Authenticated users shall be able to log out of the system.

6.2 After logging out, the system shall redirect users to the login page.

Priority Level: Medium

Precondition: User is logged in

7. Employee Management

Functional Requirements:

7.1 Admin shall be able to add new employees by providing their personal details.

7.2 Admin shall have the ability to remove employees from the system.

7.3 Admin shall set and update the salary of employees.

Priority Level: High

Precondition: Admin is logged into the system.

8. Employee Promotion and Demotion

Functional Requirements:

8.1 Admin shall be able to promote employees to higher roles.

8.2 Admin shall have the ability to demote employees to lower roles.

8.3 The system shall restrict certain actions based on the employee's role.

Priority Level: Medium

Precondition: Admin is logged into the system.

9. Car Management

Functional Requirements:

9.1 Admin shall be able to add new cars to the system, including vehicle details and availability.

9.2 Admin shall have the ability to remove cars from the system.

9.3 Admin shall update car information, such as model, make, and rental rates.

9.4 The system shall track car availability and prevent overbooking.

Priority Level: High

Precondition: Admin is logged into the system.

10. Driver Management

Functional Requirements:

10.1 Admin shall be able to add new drivers by providing their personal details and qualifications.

10.2 Admin shall have the ability to remove drivers from the system or block their access temporarily.

10.3 Admin shall update driver information, including licenses and certifications.

10.4 The system shall ensure that only qualified drivers are assigned to vehicles.

Priority Level: High

Precondition: Admin is logged into the system.

11. Voucher Management

Functional Requirements:

11.1 Admin shall create new vouchers with specified discounts or promotions.

11.2 Admin shall be able to modify existing vouchers or deactivate them.

11.3 The system shall validate voucher codes during booking and apply corresponding discounts.

Priority Level: Medium

Precondition: Admin is logged into the system.

12. Reporting and Analytics

Functional Requirements:

12.1 Admin shall have access to various reports, including employee performance, rental activity, and financial summaries.

12.2 The system shall generate reports based on specified date ranges and criteria.

12.3 Admin shall be able to export reports in different formats (e.g., PDF, Excel).

Priority Level: Medium

Precondition: Admin is logged into the system.

4.2 System Quality Attributes

Usability:

- Users, including employees and customers, should be able to navigate and interact with the system easily and intuitively.
- Common tasks such as booking a car, managing reservations, and updating profiles should be straightforward and require minimal training.
- The system interface should be responsive and compatible with different devices and screen sizes.

Reliability:

- The system should be available and operational 24/7, with minimal downtime for maintenance.
- Data integrity should be maintained, ensuring accurate and consistent information throughout the system.
- Critical functionalities such as login, booking, and payment processing should have high availability and low failure rates.

Performance:

- Users should be able to engage with the system swiftly, enabling quick completion of tasks like booking reservations and automobile searches.
- Concurrent user requests ought to be supported by the system without significantly affecting its performance.
- Even during periods of high traffic, page load times and transaction processing times should adhere to reasonable standards.

Scalability:

- The system ought to be built to manage rising user loads and expanding data quantities without compromising performance.
- The system should be able to easily handle more vehicles, workers, and clients as the company grows.

Security:

- To avoid unwanted access, user data, including financial and personal information, should be securely maintained.
- To make sure that users only have access to the capabilities necessary for their responsibilities, role-based access control should be created.
- To avoid fraud and data breaches, critical processes such as payment processing should adhere to industry security requirements.

Flexibility:

- The system architecture should make it simple to integrate with outside services like email providers, payment gateways, and mapping services.
- As the business requirements change, it should be quite simple to add and adjust new features and functionalities.

Maintainability:

- The system codebase should be well-organized and documented, making it easier for developers to understand and maintain.
- Regular updates, bug fixes, and improvements should be feasible without causing significant disruptions to the overall system.
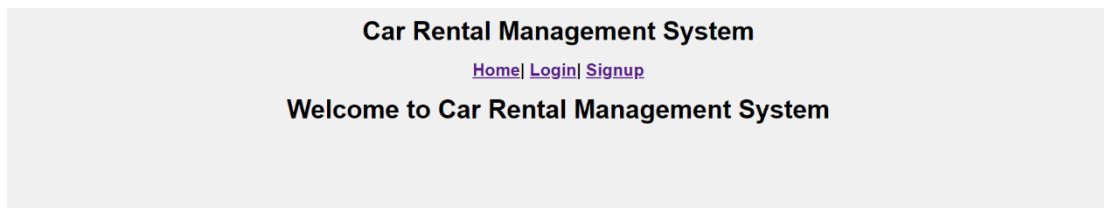
User Experience:

- The overall user experience should be engaging, visually appealing, and consistent across different pages and sections of the website.
- Error messages and notifications should be clear, informative, and help users troubleshoot issues effectively.
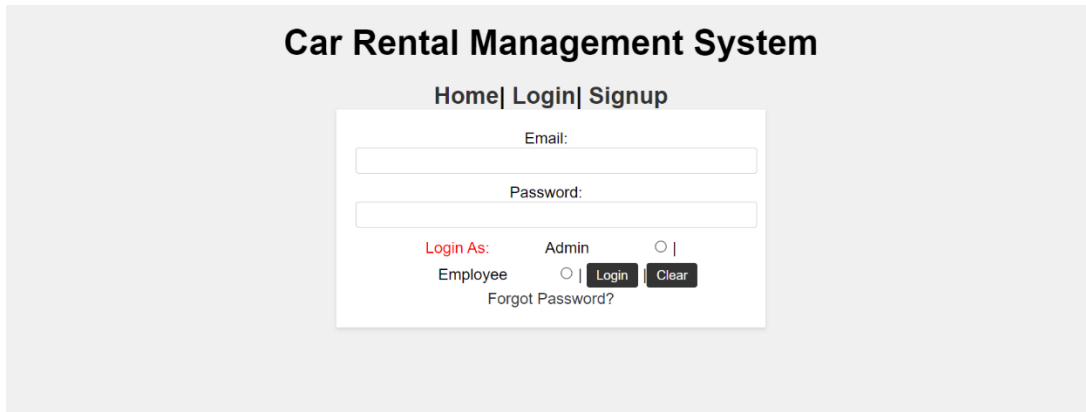
4.3 System Interface

System interface where the users can interact with the system's functionality are given below with description.

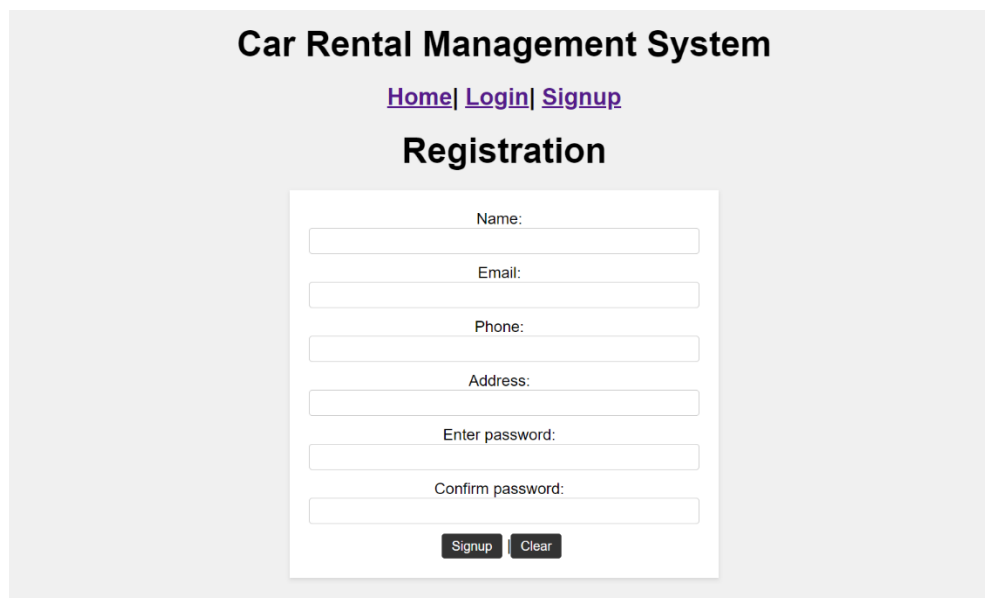1. **Home Page:** This is the home page of the website which welcomes the user.

Car Rental Management System

Home| Login| Signup

Welcome to Car Rental Management System

2. **Login Page:** From here Admin or Employee can login.

3. **Registration Page:** From here user can create a new account.

4. **Forgot Password:** From here Admin or Employee can reset their password.

Car Rental Management System

Home| Login| Signup

Email:

Phone:

Enter password:

Confirm password:

Usertype: Admin ○ | Employee ○

Reset Password | Clear

5. **Admin Page:** The main panel of the system, from here admin can control everything.

Admin Panel | Logout

Admin Profile | Change Password

Manage Employee | Manage Car | Manage Driver | Manage Voucher

6. **Admin Profile:** From here admin can change profile photo & edit the all admin informations.

Admin Panel | Logout

Admin Profile | Change Password

Manage Employee | Manage Car | Manage Driver | Manage Voucher

Change Profile Picture

ID: 1

Edit Profile

7. **Change Password:** From here admin can change password.

Admin Panel | Logout

Admin Profile | Change Password

Manage Employee | Manage Car | Manage Driver | Manage Voucher

Change Password

Enter password: [   ]
Confirm password: [   ]

[Change Password] [Clear]

8. **Manage Employee:** From here admin can edit any employee information or delete, block, unblock any employee.

Manage Employee | Manage Car | Manage Driver | Manage Voucher

Add an employee

Name	Email	Phone	Address	Salary	Position	Status	Action			
Hamja Hasan	hassan@mail.com	01666666787	Fakirapul	10000	leader	blocked	Delete	Block	Unblock	Edit
Muhammad	md@mail.com	01232351465	Chittagong	200000	leader	active	Delete	Block	Unblock	Edit
avin	avin@gmail.com	01965699412	Mugda	12000	junior	active	Delete	Block	Unblock	Edit

9. **Add employee:** Admin can add new employee & set employee information like name, email, phone, address, salary, position.

Manage Employee| Manage Car| Manage Driver| Manage Voucher

Name:
[   ]
Email:
[   ]
Phone:
[   ]
Address:
[   ]
Salary:
[   ]
Choose Employee Position
○
Junior

○
Senior

○
Leader
Enter password:
[   ]
Confirm password:
[   ]

[Add] [Clear]

10. **Manage Car:** Admin can delete, block, unblock any unavailable car.

Managing Car

Add a Car

Location	Car Type	Car Name	Picture	Status	Action		
Sylhet	jeep	suzuki		active	Delete	Block	Unblock
Chittagong	luxury	suzuki		blocked	Delete	Block	Unblock
Dhaka	sports	GT		active	Delete	Block	Unblock
Dhaka	luxury	X		active	Delete	Block	Unblock

11. **Add Car:** Admin can add new car with proper details.

Name: [   ]
location: [   ]
Choose Car type
○ luxury
⦿ Micro
○ Sports
○ Jeep
picture:
[Choose File] No file chosen
[Add] [Clear]

12. **Manage Driver:** Driver profile can be edited, also can delete, block, unblock. any unavailable driver.

Manage Employee| Manage Car| Manage Driver| Manage Voucher

Add A driver

Name	Email	Phone	Address	Status	Action			
avin	avin@gmail.com	01965699412	mugda	active	Delete	Block	Unblock	Edit
Rakib	rakib@gmail.com	01965699418	Bashabo	active	Delete	Block	Unblock	Edit
X	x@gmail.com	01781639125	Bashabo	active	Delete	Block	Unblock	Edit

13. **Edit Driver:** A new driver can be added new driver with proper information.

Name:	
Email:	
Phone:	
Address:	
Enter password:	
Confirm password:	

Add | Clear

14. **Logout Page:** After log out the home page will appear.

Car Rental Management System

Home| Login| Signup

Welcome to Car Rental Management System

4.4 Project Requirements

For Developer Team:

Team Member	Total Number	Hour/Day	Monthly Salary (Per Person)	Total Salary
Business Analyst	1	6	60,000/-	60,000
Senior Developer	2	6	50,000/-	100,000
UX Designer	2	4	40,000/-	80,000
Front-end Developer	2	3	45,000/-	90,000
Back-end Developer	2	3	45,000/-	90,000
Quality Tester	2	5	45,000/-	90,000

Estimated Monthly Salary for Developers:
$$(60,000 + 100,000 + 80,000 + 90,000 + 90,000 + 90,000) = 510000/-$$

So, the total salary cost for one month of development is 510000 BDT

The time it will take to finish the development is estimated to be around 1 year 3 months months or 15 months.

Estimated Total Salary During Project Development: 510000 X 15 = 76,50,000 BDT

5. FEATURES NOT TO BE TESTED

The following list of components and areas will not be specifically tested as part of the Car Rental Management System project, along with the justification for doing so:

Applications for Third-Party Spreadsheets:

- This project does not include testing of PC-based spreadsheet analysis programs, such as those that use reallocated sales data.
- These applications are beyond the project's scope and are managed by the client.
- Data base format information will be provided to customers to facilitate data extraction, but testing of these applications is the responsibility of the application maintainer/developer.

6. TESTING APPROACH

6.1 Testing Levels

Unit Testing:

- Developers conduct unit testing for their assigned components, ensuring code functionality and meeting requirements.
- Unit tests require approval from the development team leader.
- Proof of unit testing (test cases, outputs, defects) is shared with the team leader and test manager.

System/Integration Testing:

- Test manager leads System/Integration testing with developer collaboration.
- No specific test tools designated.
- Programs enter this phase after addressing critical unit test defects.
- Up to two Major defects allowed if not hindering testing and workarounds exist.

Acceptance Testing:

- Actual end users, supported by test manager and team leader, perform acceptance testing.
- Parallel testing with manual process for one month post System/Integration phase.
- Real-world scenarios ensure system meets user needs.

6.2 Test Tools

The testing tool that used to test the system is Selenium IDE. The project is based on Web Technologies which includes HTML, PHP, CSS, JS, MYSQL etc. Here are some screenshots of the testing process:

Fig: Testing Edit Admin Profile

Fig: Testing Add Employee Feature

Fig: Testing Manage Car Feature

Fig: Testing Add Driver Feature

6.3 Test Tools

The meeting will be held each week to assess progress and identify trends and issues with errors as soon as possible. The project manager and the head of the testing team will also meet every two weeks. These two sessions will take place in separate weeks. Extra meetings may be called in an emergency.

Additional meetings should be conducted with the respective stakeholders of the system, specially who are investing on the system. If suppose the system we will make would be maintained and configured in house then we will have to sit down with their IT team and make them understand the overall system.

7. TEST CASES/TEST ITEMS

Project Name: Car Rental Management System			Test Designed by: Hamja		
Test Case ID: FR_1			Test Designed date: 01/08/23		
Test Priority (Low, Medium, High): High			Test Executed by: Hamja		
Module Name: Login Session			Test Execution date: 01/08/23		
Test Title: verify login with valid username and password					
Description: Test website login page					
Precondition (If any): User must have valid username and password					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to the website 2. Enter username 3. Enter password 4. Click submit	Username: admin@hotmail.com Password: hamja1234	User should login into the application	As expected,	Pass	
Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.					

Project Name: Car Rental Management System	Test Designed by: Hamja
Test Case ID: FR_2	Test Designed date: 01/08/23
Test Priority (Low, Medium, High): High	Test Executed by: Hamja
Module Name: Add New Employee	Test Execution date: 01/08/23
Test Title: Inserting New Employee	
Description: Test the update of Add Employee page	
Precondition (If any): Admin must be logged in to the system				

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Add an Employee 2. Insert Name, Email, Password, Salary, Position 3. Click Add	Name: Avin Email: avin@gmail.com Password:12345678| Position: Junior Salary: 12000 Address: Dhaka	Admin should insert new employee information	As expected,	Pass

Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.

Project Name: Car Rental Management System			Test Designed by: Hamja		
Test Case ID: FR_3			Test Designed date: 02/08/23		
Test Priority (Low, Medium, High): Medium			Test Executed by: Hamja		
Module Name: Remove Employee			Test Execution date: 02/08/23		
Test Title: Removing an employee					
Description: Test removal of an employee					
Precondition (If any): Admin must be logged in to the system					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Manage Employee 2. Select the Employee id/name 3. Click delete	Name: Avin	Admin should be able to remove an employee	As expected,	Pass	
Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.					

Project Name: Car Rental Management System	Test Designed by: Hamja
Test Case ID: FR_4	Test Designed date: 02/08/23
Test Priority (Low, Medium, High): High	Test Executed by: Hamja
Module Name: Add New Driver	Test Execution date: 02/08/23
Test Title: Inserting New Driver	
Description: Test the update of Add Driver page	
Precondition (If any): Admin must be logged in to the system					

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Add an Driver 2. Insert Name, Email, Password, Salary, Address 3. Click Add	Name: Rakib Email: rakib@gmail.com Password:12345678| Salary: 10000 Address: Dhaka	Admin should insert new driver information	As expected,	Pass

Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.

Project Name: Car Rental Management System			Test Designed by: Hamja		
Test Case ID: FR_5			Test Designed date: 02/08/23		
Test Priority (Low, Medium, High): Medium			Test Executed by: Hamja		
Module Name: Remove Driver			Test Execution date: 02/08/23		
Test Title: Removing an driver					
Description: Test removal of an driver					
Precondition (If any): Admin must be logged in to the system					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Manage Driver 2. Select the Driver id/name 3. Click delete	Name: Rakib Password: 12345678	Admin should be able to remove an driver	As expected,	Pass	
Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.					

Project Name: Car Rental Management System				Test Designed by: Hamja	
Test Case ID: FR_6				Test Designed date: 04/08/23	
Test Priority (Low, Medium, High): High				Test Executed by: Hamja	
Module Name: Add New Car				Test Execution date: 04/08/23	
Test Title: Inserting New Car					
Description: Test the update of Add Car page					
Precondition (If any): Admin must be logged in to the system					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Add Car 2. Insert Car type, Name, Picture, Address 3. Click Add	Name: NOAH Type: SUV Picture: img_232.png| Address: Dhaka	Admin should able to add new car information	Adding picture part has some issues.	Fail	
Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.					

Project Name: Car Rental Management System	Test Designed by: Hamja
Test Case ID: FR_7	Test Designed date: 04/08/23
Test Priority (Low, Medium, High): Medium	Test Executed by: Hamja
Module Name: Remove Driver	Test Execution date: 04/08/23
Test Title: Removing a Car	
Description: Test removal of a Car	
Precondition (If any): Admin must be logged in to the system				

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Manage Car 2. Select the Car id/name 3. Click delete	Name: NOAH	Admin should be able to remove a car	As expected,	Pass

Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.

Project Name: Car Rental Management System			Test Designed by: Hamja	
Test Case ID: FR_8			Test Designed date: 05/08/23	
Test Priority (Low, Medium, High): High			Test Executed by: Hamja	
Module Name: Update Password			Test Execution date: 05/08/23	
Test Title: Changing Password				
Description: Test update of a password				
Precondition (If any): Admin must be logged in to the system				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Change password 2. Enter old password 3. Enter new password 4. Click Confirm	Old password: hamja1234 New password: hamja12345	Admin should be able to update password	As expected,	Pass
Post Condition: Admin is validated with database and successfully login to account. The account session details are logged in the database.				

8. ITEM PASS/FAIL CRITERIA

The testing process will be completed when the employee and manager can successfully perform tasks such as logging into their respective accounts and modifying information without encountering any errors. To ensure the system's successful operation, all functional requirements must be thoroughly tested. However, one of our functional requirements could not be met because a customer could not order multiple items at the same time. Some of the minor errors could have been overlooked.

9. TEST DELIVERABLES

The following test deliverables will be produced during the testing phases of the Car Rental Management System project:

Acceptance Test Plan:

- Comprehensive plan outlining the scope, objectives, approach, and schedule for acceptance testing.
- Details of testing scenarios, criteria for success, and responsibilities of end users.

System/Integration Test Plan:

- Detailed plan specifying the scope, strategy, and schedule for System/Integration testing.
- Identification of test cases, data, and environment requirements for thorough system-level validation.

Unit Test Plans/Turnover Documentation:

- Individual unit test plans created by developers for their components.
- Documentation describing the executed unit tests, outcomes, and any defects addressed.

Screen Prototypes:

- Initial prototypes of new screens developed using AS/400 Screen Design Aid (SDA).
- Provides visual representation of screen layouts and content for review by sales administration staff.

Report Mock-ups:

- Visual mock-ups illustrating the format and layout of system-generated reports.
- Aids in validating report requirements and visual presentation.

Defect/Incident Reports and Summaries:

- Detailed documentation of defects and incidents identified during testing.
- Summaries categorizing and prioritizing defects for resolution.

Test Logs and Turnover Reports:

- Logs capturing test execution details, including executed test cases, outcomes, and issues encountered.
- Turnover reports providing an overview of completed testing activities and outcomes.

10. STAFFING AND TRAINING NEEDS

Staffing:

- Preferably, at least one full-time tester should be assigned for system/integration and acceptance testing phases.
- Initially, a person will be assigned part-time for project participation, transitioning to full-time testing about four months into the project.
- If a dedicated tester is unavailable, the project manager/test manager will assume the testing role.

Training:

- Developers and tester(s) need training on basic operations of the EDI interface.
- Operations staff requires comprehensive training on the EDI communications process prior to final project acceptance.
- Sales administration staff needs training on the use of new screens and reports.

These staffing and training considerations are essential to ensure effective testing and to equip the project team and relevant staff with the necessary skills and knowledge for successful development, testing, and implementation of the Car Rental Management System.
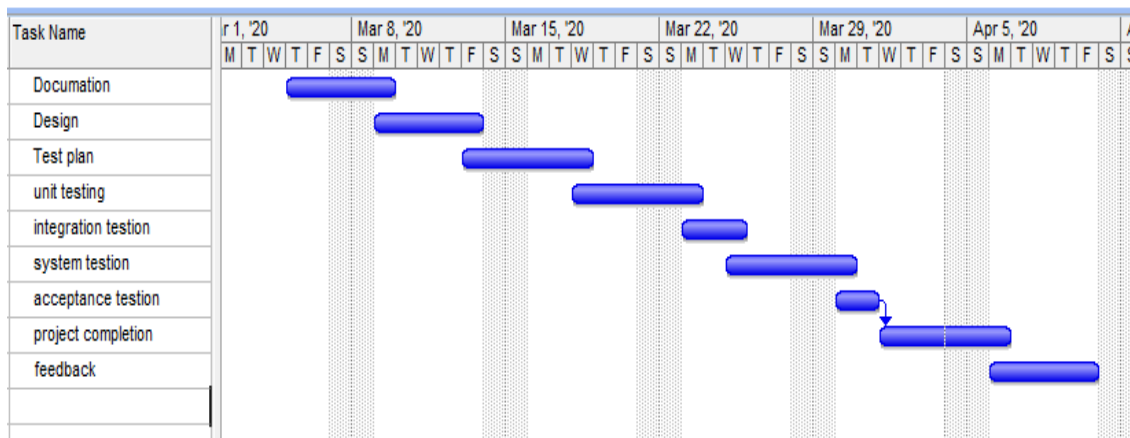
11. RESPONSIBILITIES

	TM	PM	Dev Team	Test Team	Client
Execution and documentation of the acceptance test	X	X		X	X
System/Integration test Exec. & Documentation	X		X	X	
Execution & Documentation of Unit Tests	X		X	X	
Reviews of system designs	X	X	X	X	X
Evaluations of specific designs	X	X	X	X	
Rules and procedures for tests	X	X	X	X	
reviews of the prototype's display and report			X	X	X

Testing Regression and Control Test	X	X	X	X	X

12. TESTING SCHEDULE

The testing schedule is integrated within the project plan, with allocated time for the following testing activities. Specific dates, times, and responsible personnel are outlined in the project timeline and plan. Coordination of teams and stakeholders will be managed by the project manager, in collaboration with the development and test team leaders.

13. PLANNING RISKS AND CONTINGENCIES

Risk: Limited Reassigned Sales Staff

- The Reassigned Sales administration staff currently has two unfilled positions.
- Staff shortage may cause delays in document reviews and participation in the Acceptance test process.
- Delays in review and testing activities may impact project timelines.

Contingency:

- In the event of staff shortages, project timelines for reviews and acceptance testing will be adjusted accordingly.
- No shortcuts or bypassing of review and testing processes will be pursued to maintain thoroughness and quality.

This risk and contingency plan addresses potential delays arising from a limited Reassigned Sales staff, ensuring that project timelines are adapted if staffing challenges arise while maintaining the integrity of review and testing processes.

14. APROVALS

Team Leader & Project analyst	Abdullah Muhammad Hamja
Test Manager	Abdullah Muhammad Hamja
Tester	Abdullah Muhammad Hamja