

Requirement Analysis

Testability of Requirements Document

Group-1

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Testability of Requirements

Introduction

To safeguard the integrity and functionality of software systems, a comprehensive and structured testing approach is essential. This approach involves meticulous planning and execution of test cases designed to validate specific functionalities and behaviors within the software. Below is an overview of a structured format for documenting test cases, which is designed to be universally applicable across various software testing scenarios. This format includes a blend of traditional test case documentation and Behavior-Driven Development (BDD) methodologies to ensure thorough testing and clear communication among all stakeholders involved in the development process.

Parameters Explained:

Test Case ID: A unique identifier for each test case, facilitating easy reference, management, and traceability throughout the testing lifecycle.

Requirement: This parameter identifies the specific feature or functionality being tested. It serves as a direct link between the test case and the software requirements, ensuring that testing efforts are aligned with the project's objectives.

Test Scenario: A high-level overview of what the test aims to verify or validate. The scenario provides context for the detailed test steps that follow, offering insight into the purpose and scope of the test.

Test Steps: This detailed enumeration guides the tester through the execution of the test. It includes all necessary actions to be performed, inputs to be provided, and the expected intermediate outcomes. These steps are critical for ensuring the test is conducted systematically and comprehensively.

Expected Result: Defines the outcome anticipated from executing the test steps, assuming the application behaves as intended. This benchmark is crucial for evaluating the software's actual performance against its expected behavior.

Actual Result: Documented during the test execution, this records the actual behavior observed in the application. The actual result is compared against the expected result to determine if the software behaves as required.

Pass/Fail: This outcome, determined after executing the test, indicates whether the software has met or failed to meet the criteria outlined in the test case. It provides a clear, binary assessment of the software's performance concerning the specified requirement.

Adopting this structured approach to documenting and executing test cases ensures that testing is both comprehensive and transparent. By integrating detailed, step-by-step testing instructions with user-centric BDD scenarios, teams can achieve a high level of clarity and alignment, facilitating effective communication and collaboration across technical and non-technical stakeholders. This methodology not only enhances the quality and reliability of the software but also supports the development of solutions that truly meet user needs and business objectives.

Testability of Requirements for Functional Requirements

Requirement: User Registration and Login

Behavior Drive Development Scenario

Given	When	Then
The user is not registered	They access the application's registration page	They are prompted to fill in the required details
The user has filled in their details	They submit the registration form	An email verification link is sent to the user's email
The user has received the verification email	They click the verification link in their email	Their account is verified, and they are directed to log in
The user's account is verified	They log in using the registered email and password	They successfully access the user dashboard

Test Scenario

Test Case ID: TC_001	
Field	Details
Requirement	User Registration and Login
Test Scenario	Ensure users can register an account and log in successfully.
Test Steps	<div>1. Access the application's registration page.</div> <div>2. Fill in the required details (e.g., name, email, password) and submit the form.</div> <div>3. Check your email for the verification link and click to verify your account.</div> <div>4. Return to the application and log in using the registered email and password.</div> <div>5. Confirm that the login is successful and the user dashboard is accessible.</div>

Expected Result	Users can register and, upon email verification, log in to access their dashboard without issues.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Car Registration

Behavior Drive Development Scenario

Given	When	Then
The user is logged into their account	They navigate to the "Add Vehicle" section	They are prompted to enter the vehicle's details
The user has entered the vehicle's details (make, model, year, VIN)	They submit the vehicle registration form	The vehicle is added to the user's profile
The vehicle has been added to the user's profile	The user views their profile	The vehicle's details are displayed correctly in the user's profile

Test Scenario

Test Case ID: TC_002	
Field	Details
Requirement	Car Registration
Test Scenario	Verify that users can register their car details in the system.
Test Steps	<ol style="list-style-type: none"> 1. Log into the user account. 2. Navigate to the "Add Vehicle" section. 3. Enter the vehicle's details (e.g., make, model, year, VIN). 4. Submit the vehicle registration form. 5. Confirm that the vehicle is added to the user's profile and displayed correctly.
Expected Result	Users are able to register their cars, and the details are correctly reflected in their profiles.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Request Repair/Maintenance Services

Behavior Drive Development Scenario

Given	When	Then
A user is logged into their account with a registered vehicle	They navigate to the "Request Service" option for their selected vehicle	The service request form is displayed
The user is on the service request form	They choose the type of service required and fill in additional details	They submit the service request
The service request is submitted	The user waits for a confirmation	A confirmation message is displayed, and the request is logged in the user's service history

Test Scenario

Test Case ID: TC_003	
Field	Details
Requirement	Request Repair/Maintenance Services
Test Scenario	Ensure users can request repair or maintenance services for their registered vehicles.
Test Steps	<ol style="list-style-type: none">1. Log into the user account.2. Select a registered vehicle and navigate to the "Request Service" option.3. Choose the type of service required (repair or maintenance).4. Fill in any additional details or specific requests.5. Submit the service request.6. Confirm that a confirmation message is displayed and the request appears in the user's service history.
Expected Result	Users can successfully submit repair or maintenance requests for their vehicles, with confirmations and historical tracking.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Specify Problem, Vehicle Details

Behavior Drive Development Scenario

Given	When	Then
The user has initiated a service request following the steps in TC_003	They are entering details in the problem description field	They specify the issue in detail
The problem description is detailed	The user ensures all vehicle details are included or pre-populated	They submit the service request
The service request is submitted	The user reviews the submitted request	The request includes a comprehensive problem description and accurate vehicle details

Test Scenario

Test Case ID: TC_004	
Field	Details
Requirement	Specify problem, Vehicle Details
Test Scenario	Verify the system allows detailed problem descriptions and vehicle details for service requests.
Test Steps	<ol style="list-style-type: none">1. Follow the steps to request a service as in TC_003.2. In the problem description, specify the issue in detail.3. Ensure all required vehicle details are included or pre-populated.4. Submit the service request.5. Review the submitted request for the accuracy of the problem description and vehicle details.
Expected Result	Service requests include comprehensive problem descriptions and accurate vehicle details.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Assign Pickup Request to Driver

Behavior Drive Development Scenario

Given	When	Then
A service request requiring vehicle pickup is submitted	The system processes the request	A driver is automatically assigned to the pickup request
A driver has been assigned	The backend or admin panel updates	Assignment details are communicated to both the driver and the user
The driver receives the assignment	The driver accepts the assignment and updates the status	The status update is visible to the user

Test Scenario

Test Case ID: TC_005	
Field	Details
Requirement	Assign Pickup Request to Driver
Test Scenario	Ensure service requests with pickup are assigned to a driver in the system.
Test Steps	<ol style="list-style-type: none">1. Submit a service request requiring vehicle pickup.2. Monitor the backend or admin panel for automatic driver assignment.3. Confirm assignment details are communicated to both the driver and the user.4. Verify the driver's ability to accept the assignment and update the status.5. Check that status updates are visible to the user.
Expected Result	Pickup requests are automatically assigned to drivers, with clear communication and status tracking for both parties.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Integration with GPS for Tracking

Behavior Drive Development Scenario

Given	When	Then
A pickup request has been assigned to a driver	GPS tracking is activated for the driver	The driver's location is accurately reflected in real-time
The driver's location is being tracked	There are significant status changes	The user receives notifications about the status changes
The driver completes the pickup	The system updates the pickup status	The completion of the pickup is confirmed through the tracking feature

Test Scenario

Test Case ID: TC_006	
Field	Details
Requirement	Integration with GPS for Tracking
Test Scenario	Confirm that GPS tracking is integrated for service requests involving vehicle pickup.
Test Steps	<ol style="list-style-type: none">1. Submit a pickup request as per TC_005.2. Once assigned, use the application to track the driver's location via GPS.3. Ensure the location is accurately reflected in real time.4. Verify the user receives notifications if there are significant status changes.5. Confirm the completion of the pickup through the system's tracking feature.
Expected Result	GPS tracking provides accurate, real-time location data for drivers during vehicle pickups, with notifications for status changes.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: List of Preferred Service Centers

Behavior Drive Development Scenario

Given	When	Then
The user is logged into their account	They navigate to the "Service Centers" option	A list of available preferred service centers is displayed
The user views the list of service centers	They select a service center as the preferred	The selection is saved and prioritized for future service requests

Test Scenario

Test Case ID: TC_007	
Field	Details
Requirement	List of Preferred Service Centers
Test Scenario	Verify users can view and select from a list of preferred service centers.
Test Steps	<ol style="list-style-type: none">1. Log into the user account.2. Navigate to the "Service Centers" or similar options.3. View the list of available preferred service centers.4. Select a service center as preferred for a service request.5. Confirm that the selection is saved and prioritized for future service requests.
Expected Result	Users can easily view, select, and save preferred service centers, which are then prioritized in future service requests.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Service Centers Receive Requests

Behavior Drive Development Scenario

Given	When	Then
A user submits a service request selecting a specific service center	The service center logs into their account/interface	The new service request appears in the incoming requests section
The service center views the incoming requests	They find the new service request	The details of the service request are correctly displayed
The service center checks the request details	They acknowledge receipt or respond to the request	The user's service request is successfully acknowledged or responded to

Test Scenario

Test Case ID: TC_008	
Field	Details
Requirement	Service Centers Receive Requests
Test Scenario	Ensure service centers can receive and view service requests from users.
Test Steps	<ol style="list-style-type: none">1. Submit a service request as a user, selecting a specific service center if possible.2. Log in to the service center's account/interface.3. Look for the new service request in the incoming requests section.4. Confirm the details of the service request are correctly displayed.5. Acknowledge receipt or respond to the service request as the service center.
Expected Result	Service centers receive and can interact with service requests submitted by users, with all details accurately presented.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Generate/Send Quotes

Behavior Drive Development Scenario

Given	When	Then
A service request is received by the service center	A quote for the requested service is generated	The quote, including parts and labor costs, is sent to the user
The quote is sent to the user	The user checks their account's service requests or email	The received quote details match the service request

Test Scenario

Test Case ID: TC_009	
Field	Details
Requirement	Generate/Send Quotes
Test Scenario	Verify service centers can generate and send quotes to users for requested services.
Test Steps	<ol style="list-style-type: none">1. As a service center, receive a service request from a user.2. Generate a quote for the requested service, including parts and labor costs.3. Send the quote to the user's account/email.4. As the user, check for the received quote in the account's service requests or email inbox.5. Confirm that the quote details match the service request.
Expected Result	Users receive accurate quotes from service centers in response to their service requests, with clear breakdowns of costs.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Review and Accept/Reject Services

Behavior Drive Development Scenario

Given	When	Then
A quote is received from a service center	The user reviews the quote details	The user decides to accept or reject the service based on the quote
The user makes a decision on the quote	They confirm their selection	The service center is notified of the user's decision

Test Scenario

Test Case ID: TC_010	
Field	Details
Requirement	Review and Accept/Reject Services
Test Scenario	Ensure users can review quotes and either accept or reject the proposed services.
Test Steps	<ol style="list-style-type: none">1. Receive a quote from a service center as outlined in TC_009.2. Review the details of the quote within the user account.3. Choose to either accept or reject the service based on the quote.4. Confirm the selection is recorded and the service center is notified.5. As a service center, verify receipt of the acceptance or rejection.
Expected Result	Users can make informed decisions to accept or reject services based on quotes, with their choices clearly communicated to the service center.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Partial Acceptance of Services

Behavior Drive Development Scenario

Given	When	Then
A detailed quote for multiple services is received	The user decides to accept only certain services	The service request is modified to reflect accepted services
The modified service request is submitted	The service center adjusts the quote or service plan	The service center communicates any changes based on partial acceptance

Test Scenario

Test Case ID: TC_011	
Field	Details
Requirement	Partial Acceptance of Services
Test Scenario	Test that users can partially accept services from a quote, modifying the service request as needed.
Test Steps	<ol style="list-style-type: none">1. As a user, receive a detailed quote for multiple services from a service center.2. Decide to accept only certain services from the quote.3. Modify the service request to reflect the accepted services and submit the updated request.4. Confirm that the service center receives the modified request and understands the partial acceptance.5. As a service center, adjust the quote or service plan based on the user's partial acceptance and communicate any changes.
Expected Result	Users can partially accept services from quotes, with the ability to modify their service requests accordingly. Service centers receive clear instructions on the modified service request and respond appropriately.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Documentation of Repair Process

Behavior Drive Development Scenario

Given	When	Then
A user has submitted a repair service request	The service is in progress	The user can view detailed documentation of the repair process
The user checks the service documentation	Updates are made to the documentation	The user receives real-time or updated documentation of the repair stages

Test Scenario

Test Case ID: TC_012	
Field	Details
Requirement	Documentation of Repair Process
Test Scenario	Verify that the repair process is documented and accessible to the user.
Test Steps	<ol style="list-style-type: none">1. Log in as a user who has submitted a repair service request.2. Once the service is in progress, navigate to the service history or current requests section.3. Click on the active service request to view detailed documentation of the repair process, including stages completed and any notes from the technician.4. Check for updates in real-time or as they are entered into the system.
Expected Result	Users can access detailed, step-by-step documentation of their vehicle's repair process in real time or as updates are made.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Detailed History of Services

Behavior Drive Development Scenario

Given	When	Then
The user logs into their account	They navigate to the "Service History" section	A detailed history of all services performed on their vehicles is displayed
The user selects a vehicle	They review the list of services and details	Detailed information about each service is accessible

Test Scenario

Test Case ID: TC_013	
Field	Details
Requirement	Detailed History of Services
Test Scenario	Ensure users can view a detailed history of all services performed on their vehicles.
Test Steps	<ol style="list-style-type: none">1. Log in to the user account.2. Navigate to the "Service History" or similar section.3. Select a vehicle to view its service history.4. Review the list of services, including dates, types of service, service center details, and outcomes.5. Click on a specific service entry to view more detailed information.
Expected Result	Users have access to a comprehensive history of services for each of their registered vehicles, with the ability to view detailed information about each service.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Secure Payment Gateway Integration

Behavior Drive Development Scenario

Given	When	Then
A user is going through the service payment process	They select a payment option and enter the details	The payment is processed through a secure payment gateway
The payment transaction is completed	The user waits for confirmation	A confirmation message and receipt are received in the user's email and account

Test Scenario

Test Case ID: TC_014	
Field	Details
Requirement	Secure Payment Gateway Integration
Test Scenario	Test the integration and security of the payment gateway for service payments.
Test Steps	<ol style="list-style-type: none">1. Go through the process of requesting a service that requires payment.2. At the payment stage, review the available payment options and select one.3. Enter payment details on the secure payment page.4. Complete the transaction and wait for a confirmation message.5. Check the user's email and account for payment confirmation and receipt.
Expected Result	The payment process is seamless, secure, and integrates well with the system, with users receiving clear confirmation of their transactions.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Billing and No-Charge Policy

Behavior Drive Development Scenario

Given	When	Then
A service request eligible for a no-charge policy is completed	The final bill is reviewed	The no-charge policy is correctly applied, and the bill is accurate
A service request not covered by the no-charge policy is completed	The billing for this service is reviewed	The bill accurately reflects charges without the application of the no-charge policy

Test Scenario

Test Case ID: TC_015	
Field	Details
Requirement	Billing and No-Charge Policy
Test Scenario	Ensure that billing is accurate and that the no-charge policy is applied correctly where applicable.
Test Steps	<ol style="list-style-type: none">1. Complete a service request eligible for a no-charge policy.2. Review the final bill to ensure that the policy has been applied and that no unnecessary charges are included.3. For comparison, complete a service request that is not covered by the no-charge policy and review the billing for accuracy.4. Contact customer service if there are discrepancies or questions regarding the bill.
Expected Result	The billing system accurately reflects the no-charge policy for eligible services, and all bills are free from errors or unnecessary charges.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Towing Services for Non-Drivable Vehicles

Behavior Drive Development Scenario

Given	When	Then
A user with a non-drivable vehicle logs in	They request a repair service and indicate the need for towing	The towing service request is confirmed, and location details are provided
The towing service request is made	The user receives notifications about the tow truck	Notifications include the tow truck's status and estimated arrival time

Test Scenario

Test Case ID: TC_016	
Field	Details
Requirement	Towing Services for Non-Drivable Vehicles
Test Scenario	Verify the process for requesting towing services for vehicles that cannot be driven to the service center.
Test Steps	<ol style="list-style-type: none">1. Log in as a user with a non-drivable vehicle needing service.2. Request a repair service and indicate the need for towing.3. Provide location details for the pickup.4. Confirm the towing service request and wait for the tow truck.5. Receive notifications regarding the tow truck's status and estimated arrival time.
Expected Result	Users can easily request towing services for non-drivable vehicles, with clear communication and timely service.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Requirement: Data Protection and Privacy Compliance

Behavior Drive Development Scenario

Given	When	Then
The system's data handling protocols are under review	Encryption of data in transit and at rest is verified	Sensitive data is securely encrypted
Unauthorized access attempts are tested	An audit for compliance with data protection regulations is conducted	The system shows full compliance with data protection and privacy laws
The user interface is checked	Privacy settings and consent form availability are verified	Users have access to privacy settings and consent forms, ensuring compliance

Test Scenario

Test Case ID: TC_017	
Field	Details
Requirement	Data Protection and Privacy Compliance
Test Scenario	Assess the system's compliance with data protection laws and privacy standards.
Test Steps	<ol style="list-style-type: none">1. Review the system's data handling and storage protocols.2. Verify encryption of sensitive data in transit and at rest.3. Test the system's response to unauthorized access attempts.4. Conduct an audit to ensure compliance with relevant data protection regulations (e.g., GDPR, CCPA).5. Check the user interface for the availability of privacy settings and consent forms.
Expected Result	The system fully complies with data protection and privacy laws, ensuring the security and confidentiality of user data.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Testability of Requirements for ASRs

Test Case ID: TC_018	
Field	Details
Requirement	Performance: Response Time - The system processes a service request and matches with a service center in under 5 seconds during peak loads.
Test Scenario	Evaluate the system's response time in processing and matching service requests during peak load conditions.
Test Steps	<ol style="list-style-type: none">1. Simulate peak load conditions with multiple simultaneous service requests.2. Measure the time taken from service request submission to service center match notification.3. Repeat the test multiple times to ensure consistency of response times.4. Analyze the results against the 5-second benchmark.
Expected Result	Under peak load conditions, the system consistently matches service requests with service centers in under 5 seconds.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Test Case ID: TC_019	
Field	Details
Requirement	Usability: User Interface Simplicity - A user with no prior experience is able to initiate a service request within 3 minutes of using the app.
Test Scenario	Verify that new users can navigate the app and initiate a service request efficiently.
Test Steps	<ol style="list-style-type: none">1. Recruit participants with no prior experience with the app.2. Observe and time how long it takes each participant to initiate a service request from login.3. Collect feedback on the user interface and any difficulties encountered.4. Analyze the data to determine if the average time is

	within the 3-minute target.
Expected Result	New users are able to navigate the app and initiate a service request in an average time of 3 minutes or less.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Test Case ID: TC_020	
Field	Details
Requirement	Security: Data Protection - Personal and vehicle information is encrypted in transit and at rest, complying with data protection standards.
Test Scenario	Ensure encryption of personal and vehicle information both in transit and at rest.
Test Steps	<ol style="list-style-type: none"> 1. Review the system's data encryption mechanisms for data in transit and at rest. 2. Conduct encryption verification tests to ensure data is encrypted according to the specified standards. 3. Attempt to access the data without proper authorization to test encryption effectiveness. 4. Validate compliance with relevant data protection standards.
Expected Result	Personal and vehicle information is fully encrypted both in transit and at rest, with no unauthorized access possible, complying with all relevant standards.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Test Case ID: TC_021	
Field	Details
Requirement	Availability: System Uptime - The platform is operational 24/7, with maintenance windows scheduled during off-peak hours and communicated in advance.
Test Scenario	Assess the system's availability and maintenance

	scheduling.
Test Steps	<ol style="list-style-type: none"> 1. Monitor the system's operational status continuously over a defined period. 2. Record any unplanned downtimes or performance issues. 3. Review the scheduling and communication process for planned maintenance windows. 4. Analyze system availability against the 24/7 operational requirement.
Expected Result	The system demonstrates high availability, meeting the 24/7 operational criteria with maintenance windows appropriately scheduled and communicated.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

Test Case ID: TC_022	
Field	Details
Requirement	Regulatory Compliance: Legal Adherence - The system is updated to adhere to new automotive service regulations within one month of enactment.
Test Scenario	Verify the system's compliance with newly enacted automotive service regulations.
Test Steps	<ol style="list-style-type: none"> 1. Identify a recent change in automotive service regulations applicable to the system. 2. Check the system for updates or modifications made in response to the new regulation. 3. Verify that these changes were implemented within one month of the regulation's enactment. 4. Evaluate the system's functionality to ensure compliance with the new regulation.
Expected Result	The system is updated in a timely manner (within one month) to comply with newly enacted automotive service regulations, with no compliance issues detected.
Actual Result	To be filled during testing
Pass/Fail	To be determined during testing

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