

TEST PLAN:

THE OBJECTIVE IS TO TRACK THE MOVEMENT OF ALL THE COMPANY'S TRUCKS THROUGHOUT THE UNITED STATES. EACH TRUCK WILL HAVE A TRANSPONDER THAT WILL REPORT ITS LOCATION, SPEED, DIRECTION, AND CARGO. EACH AND EVERY OF THE ABOVE LISTED FEATURES WILL BE TESTED FOR ITS DESIRABLE OUTCOME ACCORDING TO THE PRODUCT REQUIREMENT DOCUMENTS AS WELL AS APPLICATION SECURITY.

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1 Introduction

This test plan has been created to communicate the test approach the team members will complete. The plan will include the objectives, scope, schedule, risks and approach. This report will identify what the test plans deliverables will be and what is deemed in and out of scope. It includes information about the resources required to conduct testing, the testing environment, test schedules, and the roles and responsibilities of the testing team members.

Test cases are individual steps that will be taken to validate the software's features. Essentially the test case will describe the expected behavior of the software under specific conditions. They will be created based on the requirements and specifications of the software product and are executed by the testing team members so that they can verify that the software meets the specified requirements to function correctly.

A test cycle on the other hand is a set of test cases that are executed together to validate the particular functionalities of the software. A test cycle will include the planning, execution, and reporting of test results. The testing team will execute the test cycles multiple times during the testing phases to make sure that any defects or issues are identified and fixed before the release of the application.

To sum it all up, test cases are created based on the requirements and specifications of the software product, and then they are organized into test cycles. The test plans are created at the beginning of the testing phase to outline the overall testing strategy and scope of the testing. Test plans serve to guide the testing team in executing the test cycles and establish that the testing process is consistent and thorough. During the testing phase, the testing team will execute the test cases in each test cycle and report any of the defects or issues to the development team. That development team will fix the defects and issues, and then they will have the testing team re-executes the test cases to assure that the fixes have been implemented correctly. The process will continue until all the defects and issues have been resolved, and the software product is ready for release to users.

1.1 Objectives

The objective of this test plan is to ensure that the new application for tracking trucks is secure and functions correctly before it is deployed to the internal network. This test plan will focus on the following application features, including truck location, speed, direction, and cargo tracking.

Phase 1: Identification

1.a: Identify all the different types of hardware/devices and OS that the application will be used on by the company.

1.b: Analyze where all the global locations the application will be used on the internal network.

1.c: Determine all regions where the truck drivers will be driving during the test.

Phase 2: Functionality

2.a: Ensure that the semis have functionality to track and filter all the trucks, without any downtime or interruption.

2.b: Verify that all the user features will work as expected, including the ability to set filters.

2.c: Confirm that all cargo types will be accurately tracked and can be reported by the system.

2.d: Functionality testing is considered to be more important than the delivery date for the project.

Phase 3: Security

3.a: Test all of the security points of the application, specific to Identity and Access Management.

3.b: Verify all user accounts so they can be identified and logged to properly monitor user accounts, IT contractor usage, and make sure that root credentials are changed and stored on the local network device securely.

3.c: Safeguard root credentials so that they are stored in a secure environment with adequate encryption.

3.d: Confirm the application will only be accessible via the internal network, and have no unauthorized access.

1.2 Team Members

Resource Name	Role
Martin	Project Manager
Barbara	Test Lead
Smith James Mary Robert	Product Tester
John Patricia Michael	Application Developer
Taseen	Cybersecurity Analyst
Jennifer	Pen Tester
Linda	QA Analyst
David Elizabeth William	Truck Drivers

2 Scope

The testing approaches shall cover the functional, performance, and the security aspects of the application, so that it will meet all the requirements ready for deployment. All the test cases will be documented, so that any defects or issues discovered will be logged for follow-up by the development team. The test scope will includes the following:

1. Unit Testing: Testing of the individual software components, like transponders, to ensure that they function as expected.
2. Integration Testing: A test of how different components are integrated together to make sure that they work together without issues.
3. System Testing: Examination of the overall system, such as the tracking of specified regions, cargo types, and speeds, to assure that it will meet functional requirements and performance expectations.
4. Regression Testing: A re-testing of the previously passed tests to certify that new changes/updates will not introduce new issues or negatively impact existing functionality.
5. Client Acceptance Testing: Client's perspective type testing to ensure that it meets the users needs and requirements.
6. End-to-end Testing: Is the testing of the entire system from front to back, including all interfaces and interactions with the other systems on the local network.
7. Accuracy Testing: Ensuring the accuracy of the recorded application data, including the following: location, speed, direction, and cargo information.
8. Access Control Testing: Verifying that the access controls only allow authorized personnel that have access to the application and that their access is properly monitored and logged.
9. Credential Testing: The testing of the termination of all the non-active and unnecessary user credentials so that there are no unauthorized accesses that may lead to potential vulnerabilities.

3 Assumptions / risk

3.1 Assumptions

- The company has many established internal policies and procedures for software development, testing, and deployment that would comply with the relevant laws and regulations.
- The software development team that is in India is following the industry-standard practices in their country for software development and testing.
- The application has been developed in accordance with the functional requirements that were provided and has undergone the unit testing by the development team.
- The application will be hosted on the secure internal network that is protected by firewalls, as well as other security measures.
- The transponders that are used to track the trucks will be functional and accurately report the location, speed, direction, and the cargo information.
- The users of the application will have all the necessary technical knowledge as well as training to use it effectively.
- The testing team will have access to all the necessary hardware, software, and data required for testing of the application.
- The testing team will have all the necessary skills and expertise to test the application adequately, including the knowledge of the security testing methodologies and tools.
- The testing team has to be able to complete testing within the designated timeframe and budget.
- The testing team will always have access to all the necessary stakeholders so that they can report and resolve any of the issues or defects discovered during the testing.

3.2 Risks

The following risks have been identified and the appropriate action identified to mitigate their impact on the project. The impact (or severity) of the risk is based on how the project would be affected if the risk was triggered. The trigger is what milestone or event would cause the risk to become an issue to be dealt with.

#	Risk	Impact	Trigger	Mitigation Plan
1	Scope Creep - as testers become more familiar with the tool, they will want more functionality.	High	Delays in implementation date.	Each iteration, functionality will be closely monitored. Priorities will be set and discussed by stakeholders.
2	Changes to the functionality may negate the tests already written and we may lose test cases already written.	High	Loss of all test cases.	Export data prior to any upgrades and re-import after upgrade.

3	Weekly delivery is not possible because most of the end users work off shores.	Medium	Product did not get delivered on schedule.	Whenever necessary use different testing and communication approaches.
4	There might be an authentication issue that results in access issues.	High	Loss of all test cases.	Each user should be properly configured to the internal network and should also be an authorized user in the network.
5	Data collected from tests have inaccuracies.	Medium	Poor quality hardware, insufficient bandwidth, or poor signal strength.	Perform testing on the application in various network locations to ensure adequate signal strength and bandwidth. Test the application on different types of hardware and devices to ensure compatibility.
6	Inability to track all trucks in real-time or accurately report on the movement of the cargo.	Medium	Multiple different regions and conditions.	Implement appropriate error handling and notification mechanisms to alert users if there are any inaccuracies or discrepancies in the data.
7	Production and Development and Test environments do not have different log-in credentials	High	If there are credentials that have been compromised.	Create separate log-in credentials for appropriate users in the development and test and production environments to make sure there is no unauthorized access or changes made.
8	The application can suffer from poor performance.	Medium	High traffic or data overload.	Optimize the application for performance by minimizing data duplication and optimizing data retrieval and storage.
9	Poor user adoption.	Medium	Inadequate user training.	Develop comprehensive training materials and conduct training sessions for all users.

4 Test Approach

The project will be using an agile approach, with weekly testing iterations. At the end of each of the weeks, the requirements identified for that iteration will be delivered to the team and to be tested. The agile methodology is designed to be flexible and adaptable, so the teams are allowed to adjust to changes as they occur. Meaning that since this project has multiple phases and will potentially have many changing requirements, an agile approach will allow for the changes to be made more easily without having the entire development process disrupted. The agile methodology will have frequent testing throughout the development process, which will be critical for a project like this, that will require testing for the functionality and security of the application.

4.1 *Accounts and Access*

The following accounts and access will be required for testing:

- All team members will need access to the internal networks.
- Administrative access of the application for a small number of privileged employees.
- Access to the transponder data for product testers.

4.2 *Specialized Tools*

The following specialized tools will be required for testing:

- Security testing tools that will identify vulnerabilities.
- Load testing tools to measure the application's performance under very heavy loads.
- Test management tools so that the testing process can be managed and tracking of bugs can be conducted.

4.3 *Documentation and Recording of results*

The following documentation will be created from the testing:

- Test Plan: outlines the testing approach and the testing scope.
- Test Cases: describes all the individual steps for testing each of the features of the application.
- Test Cycles: is a set of test cases executed together so that the validation of specific functionality can be conducted.
- Bug Reports: documentation of issues that are identified during testing.
- The results will be recorded using the test management tool, so that the tracking of the status of each test case and bug can be conducted. The tool will also provide detailed test reports and has to be accessible to all of the team members.

5 Test Environment

This test will be carried out in a non-production environment. If every functionality works as planned we can move it to the live environment. Functionality of the tests will take place by testers on the local network. SEMI drivers will be directed by project managers and routes will be chosen to represent realistic life cycles of SEMI drivers in a production environment.

6 Test Cases Plan

6.1 Transponder Tracking

Test Case 1.1: Verification of the application's ability to track the location of each of the trucks accurately.

- Select a random truck and confirm its location in the application.
- Next, physically verify the location of that said truck with a GPS or a manual inspection.
- Then, compare the physical location of the truck to the location that is displayed in the application.
- Confirm that the location is accurate within a predefined reasonable tolerance.

Test Case 1.2: Verify that the application can track the speed of each truck accurately.

- Select a truck and confirm its speed in the application.
- Physically verify the speed of the truck with a speedometer.
- Compare the speed displayed in the application to the actual speed of the truck.
- Confirm that the speed is accurate within a reasonable tolerance.

Test Case 1.3: Verify that the application can track the direction of each truck accurately.

- Select a truck and confirm its direction in the application.
- Physically verify the direction of the truck with a compass.
- Compare the direction displayed in the application to the actual direction of the truck.
- Confirm that the direction is accurate within a reasonable tolerance.

6.2 Cargo Tracking

Test Case 2.1: Verify that the application can track the type of cargo each truck is carrying.

- Select a truck and confirm its cargo type in the application.
- Physically verify the cargo type with the driver or shipping manifest.
- Compare the cargo type displayed in the application to the actual cargo type.
- Confirm that the cargo type is accurate.

Test Case 2.2: Verify that the application can filter by cargo type.

- Select a cargo type and confirm that the application displays only trucks with that cargo type.
- Physically verify that the displayed trucks have the selected cargo type.

6.3 User management

Test Case 3.1: Verify that user accounts can be created and deleted.

- Create a user account and confirm that it is added to the user list.
- Delete a user account and confirm that it is removed from the user list.

Test Case 3.2: Verify that user roles can be assigned and edited.

- Assign a user role to a user and confirm that it is applied.

- Edit a user role and confirm that the changes are saved.

6.4 *Security*

Test Case 4.1: Verify that access controls are in place.

- Attempt to access the application without proper authentication.
- Confirm that access is denied.

Test Case 4.2: Verify that root credentials are changed and stored securely.

- Verify that root credentials are changed from default.
- Verify that root credentials are stored in a secure environment with adequate encryption.

7 MILESTONES

7.1 Test Schedule and Cycles

The initial test schedule follows-

Task Name	Start	Finish	Effort	Comments
Test Planning	2/22/23	2/1/23	10d	Taseen creates the test plan.
Review Requirements documents	3/2/23	3/4/23	2 d	Complete a review of the test plans scope and objective with stakeholders and management to determine if they are relevant
Create initial test estimates	3/5/23	3/5/23	1 d	Conduct budget estimates of software, hardware, employee compensation, etc.
Staff and train new test resources	3/7/23	3/30/23	15d	Conduct user interface training on the overall objectives of the application. Make sure different user login credentials are assigned. Test Drivers are given required schedules and routes and ensure they are available to do so.
First deploy to QA test environment	3/7/23	3/8/23	2d	Make sure different user login credentials are assigned.
Identification- Iteration 1	3/9/23	3/14/23	5d	Identify all different types of hardware/devices and OS that the application will be used on by the company. Identify

				all global locations where the application will be used on the local network. Identify all regions the truckers will be driving to test.
Functional Testing- Iteration 2	3/15/23	3/30/23	16d	Ensure that all features and functionalities of the application are tested thoroughly, including the ability to track the location, speed, direction, and cargo of the trucks, setting filters, and generating reports. The test cases should be reviewed and updated to ensure that they cover all possible scenarios and edge cases.
Unit Testing	3/15/23	3/19/23	5d	
Integration Testing	3/20/23	3/24/23	5d	
System Testing	3/25/23	3/30/23	6d	
Security Testing- Iteration 3	4/1/23	4/30/23	30d	Ensure that all security features and access controls are tested to identify any vulnerabilities in the application. The test cases should cover all aspects of identity and access management, including user account management, root credential

				management, and encryption. It is important to ensure that all identified risks and solutions are addressed during the testing process. Reference CIS controls 7,8,9, and 18.
Identity and Access Management Testing	4/1/23	4/15/23	15d	
Penetration Testing	4/16/23	4/30/23	15d	
Regression Testing- Iteration 4	5/1/23	5/15/23	15d	Testing of all functional changes and bug fixes
UAT- Iteration 5	5/1/23	5/7/23	7d	End-to-end testing of the system. Testing of all interfaces of all systems that interact with the application on the local network.
Test Completion and Reporting- Iteration 6	5/7/23	5/15/23	8d	Resolution of final defects and final build testing. Ensure accuracy of recorded application data. Terminate all non-active and unnecessary user credentials before going live. Complete final testing reports.
Deploy to Staging environment	5/15/23	5/21/23	6d	
Performance testing	5/15/23	5/21/23	6d	
Release to Production	5/22/23	5/23/23	1d	