TEST PLAN

Cognitive Assistant for Networks (CAN) 6.0

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Document History - To maintain a list of modifications

Version	Date	Author	Description of Change
1	12/01/2022	Reshmi Murali	Draft

Approvers List - To track reviewers and signoff on the test plan

Name	Role	Approved/ Reviewed	Approval / Review Date
Chiranjib Bhandary	**Chief Technology Officer**		

Reference Documents - Documents used as an input to create the test plan

Version	Date	Document Name
5.0	03/27/2021	CAN 5.0 User Manual
6.0	06/15/2021	CAN 6.0 Requirement Document

Table of Contents

1. INTRODUCTION

1.1. Purpose

This Test plan describes the testing approach and overall framework that drives the testing of the Cognitive Assistant for Networks, Release 6.0. The document introduces:

- **Test Strategy**: It describes the rules to test. It includes the input available for the project (e.g. start / end dates, objectives, assumptions); description of the process to set up a valid test (e.g. entry / exit criteria, creation of test cases, specific tasks to perform, task scheduling and data strategy).
- **Execution Strategy**: It describes the procedure to test, process to identify & report the defects, fix defects and implement fixes.
- **Test Management**: It describes the process to handle the logistics of the test and all the events that come up during execution (e.g. communication, escalation procedures, risk and mitigation, team roster).

1.2. Project Overview

The Avanseus™ Cognitive Assistant for Networks is an Artificial Intelligence driven application. It predicts the potential failure of network events and recommends the preventive measures. It helps to detect failures that cannot be identified by existing network monitoring systems. It uses the advanced machine learning software to continuously extract the ever-improving information for the efficient network operations. The solution analyzes both structured and unstructured data. This includes internal data such as syslog messages, trouble ticket and alarm information, network configuration data, and customer complaints; as well as external data such as weather conditions. After analysis of data, the solution significantly reduces the time for Root Cause Analysis (RCA), automatically identifies the recommended actions and improves the network availability. The solution is delivered to the users via interactive smartphone, tablet or PC applications along with daily reports.

1.3. Audience

- Project Team members perform the tasks specified in this document, and provide input and recommendations on this document.
- CTO plans the testing activities in the overall project schedule, reviews the document, tracks the performance of the test in accordance with the task specified, approves the document and is accountable for the results.
- Test Lead, UI/ UX Manager, Lead-Technical Writer, Senior Technical Manager, Senior Product Manager and Delivery Team representative (UAT Team) takes part in the UAT Test to ensure that the business is aligned with the results of the test.
- Technical team ensures that the test plan and deliverables are in line with the design, provides the environment for testing and follows the procedures related to fixing the defects.

2. TEST STRATEGY

2.1. Test Objectives

The objective of the Test is to verify that the functionality of Cognitive Assistant for Networks (CAN), Release 6.0 works according to the specifications.

The Test will execute and verify the Test cases. It will also identify, fix and retest all the critical, high and medium severity defects as per the entrance criteria. It also prioritizes the lower severity defects for future fixing via Requirements.

The final product of the Test is twofold:

- A production-ready software
- A set of stable Test cases that can be reused for Functional and UAT Test execution.

2.2. Test Assumptions

2.2.1. Key Assumptions

- Production like data is required and should be available in the system prior to start of Functional Testing.
- In each Testing phase, after the functionality Testing (Cycle 1), a round of complete testing (Cycle 2) will be initiated if the defect rate is high in Cycle 1.

2.2.2. General

- Perform the Smoke Testing once the build is ready for testing.
- Performance Testing is not considered for this estimation.
- All the defects come with a snapshot in JPEG format.
- The Test team assumes all the necessary inputs required during Test design and Development Manager will support execution appropriately.
- The QA group will perform the Test case design activities.
- Development Team will own the Test environment and preparation activities.
- Development Team will provide defect fix plans based on the defect meetings during each cycle to plan. The same will be informed to Test team prior to start of the defect fix cycles.
- The CTO will review and sign-off all the Test cases prepared by the Test team prior to start of the Test execution.
- Sharepoint excel tracks all the defects. Any plan of defect fixes will be shared with the Test Team prior to applying the fixes on the Test environment.
- CTO will review and sign-off all the Test deliverables.
- The release will provide Test planning, Test design and Test execution support.
- Test Team will manage the testing effort with close coordination with Senior Technical Manager-Development / CTO.
- Development Team has the knowledge and experience and has received adequate training in the system and the development process.
- There is no environment downtime during the Test due to outages or defect fixes.
- The system will be treated as a black box; if the information displays correctly in the reports online, it will be assumed that the database is working properly.
- Cycle 2 will be initiated, if there are more defects in Cycle 1.

2.2.3. Module Wise Functional Testing

- During this testing, when a module is developed, it will be pushed into the Test environment and the Testing team will test the module with the requirements available and the UI Design.

2.2.4. UI Testing

- Once the complete UI is designed and when the application is ready in the Test environment for testing, the first round of testing will be the UI/UX testing.
- The Test Lead with the help of Manager-UI/UX will perform this testing.
- The Testing team will use the UI Design of all the screens available in **Invision** to test the UI/UX of the application.

2.2.5. Functional Testing

- During Functional Testing, testing team will use preloaded data that is available on the system at the time of execution.
- The Test Team will perform Functional Testing and Regression Testing only on Cognitive Assistant for Networks (CAN) 6.0.

2.2.6. UAT

- UAT Team of the organization will perform the UAT Test execution and will provide their support on creating UAT Test cases.

2.2.7. Automation Testing

- Data Driven Framework using selenium is designed and will be upgrading to Page Object Model.
- Test cases are running using a nightly job scheduled in Jenkins.
- Maven is the build automation tool used.
- Around 190 automated test cases are up and running.

2.3. Test Principles

- Testing will be focused on meeting the business objectives, cost efficiency, and quality.
- There will be common, consistent procedures for all the teams supporting the testing activities.
- Testing processes will be well defined, yet flexible, with the ability to change as needed.
- Testing activities will be built upon previous stages to avoid redundancy or duplication of effort.
- Testing environment and data will emulate a production environment utmost.
- Testing will be a repeatable, quantifiable, and measurable activity.
- Testing will be divided into distinct phases, each with clearly defined objectives and goals.
- There will be an entrance and exit criteria.

2.4. Data Approach

- In functional Testing, Cognitive Assistant for Networks (CAN) 6.0 will contain pre-loaded test data. It will be used for testing activities.

2.5. Scope and Levels of Testing

2.5.1. Smoke Testing

PURPOSE: The purpose of this test is to make sure that the critical defects are removed before starting next levels of testing.

SCOPE: First level navigation and testing the various scenarios from login to logout in an exploratory way.

TESTERS: Testing team.

METHOD: Smoke Test is carried out in the application without any Test scripts and documentation.

TIMING: At the beginning of each cycle.

2.5.2. Functional Test and Automation Test

PURPOSE: Functional/Automation Testing will be performed to check the functionality of application. The functional Testing is carried out by feeding the input and validates the output from the application. Automation test cases are also designed.

Scope: The scope is high level due to changes in the requirement.

TESTERS: Testing team.

METHOD: The Test will be performed according to Functional scripts/Test cases that are designed and stored in Sharepoint excel. Automation scripts are designed using Selenium and run on a daily basis.

TIMING: After the completion of Smoke Test.

TEST ACCEPTANCE CRITERIA:

1. Approved User Manual and Requirements document must be available prior to start of Test design phase.
2. The Test cases are approved and signed-off prior to start of Test execution.
3. Development completed, unit tested with pass status and results are shared to Testing team to avoid the duplicate defects.
4. Test environment with application installed, configured and ready to use state.

Sign-off	Readiness
• Approved Requirements Document • Approved Test cases	• Development completed & unit Tested • Application deployed and system ready for Testing on Test environment • Production like data is available to Test all the functionalities. • Defect fixes planned based on Defect triage (Unit Testing) and evaluation criteria

TEST DELIVERABLES

Sl. No.	Deliverable Name	Author	Reviewer
1.	Test Plan	Test Lead	CTO
2.	Functional Test cases	Test Team Member	Test Lead
3.	Logging Defects	Test Team Member	Test Lead
4.	Daily/Weekly Status Report	Test Team	Test Lead
5.	Test Closure Report	Test Lead	CTO

Testing is not carried out in one cycle. Based on testing scope, team can estimate the required time and establish the time.

2.5.2.1 Regression Test

PURPOSE: This Test validates the functionality of the system after all the defects have been retested. It allows the testers to complete the final review of the functionality of the system prior to UAT Testing. The testers test and confirm that a recent program or code change has not adversely affected the existing features.

TESTERS: The QA group of the organization performs the Regression Testing.

METHOD: Software Testing is an activity that includes enhancements, error corrections, optimization and addition/deletion of the existing features. These modifications may cause the system to work incorrectly. Therefore, Regression Testing becomes necessary.

TIMING: After the Functional Testing.

TEST DELIVERABLES:

Sl. No.	Deliverable Name	Author	Reviewer
1.	Regression Test cases	Test Team	Test Lead's Sign-off

2.5.3. UI/UX Test

PURPOSE: UI/UX testing will be performed to check if the look and feel of application is as per the design given by the UI/UX designer. The UI/UX Testing is carried out by using the design screens present in the **Invision** as inputs and validates the output from the application.

Scope: The scope is high level due to changes in the requirement.

TESTERS: Testing team and supported by UI/UX-Design lead.

METHOD: The Test will be performed according to Functional scripts/Test cases, which are designed and stored in Sharepoint Excel.

TIMING: After the completion of Smoke Test and parallel to Functional Test and before Regression test.

TEST ACCEPTANCE CRITERIA:

1. Approved Requirements document and the UI/UX screens' design must be available prior to start of Test design phase.
2. The test cases are approved and signed-off prior to start of test execution.
3. Development completed, unit tested with pass status and results are shared to Testing team to avoid the duplicate defects.
4. Test environment with application installed, configured and ready to use state.

TEST DELIVERABLES:

Sl. No.	Deliverable Name	Author	Reviewer
1.	UI/UX test cases	Test Lead	Manager-UI/UX designer

Testing is not carried out in one cycle. Based on testing scope, team can estimate the required time and establish the time.

2.5.4. User Acceptance Test (UAT)

PURPOSE: This Test validates the business logic. It allows the end users to complete the final review of the system prior to deployment.

TESTERS: The UAT Team of the organization performs the UAT. The UAT team consists of Test Lead, UI/ UX Manager Lead-Technical Writer, Technical Manager, Product Manager and Delivery Team representative.

METHOD: Since the business users are most indicated to provide input around business needs and how the system adapts to them, the users do some validation that are not contained in the scripts. UAT Test Team will write the UAT Test cases based on the inputs from End users.

TIMING: After all other levels of Testing (Smoke, Functional and Regression) are done. Only after completion of this test, the product can be released to production.

TEST DELIVERABLES:

Sl. No.	Deliverable Name	Author	Reviewer
1.	UAT Test cases	Test Team	CTO's Sign off

3. EXECUTION STRATEGY

3.1. Entry and Exit Criteria

- The Entry Criteria refers to the desirable conditions in order to start the test execution. The migration of the code and fixes need to be assessed at the end of each cycle.
- The Exit Criteria are the desirable conditions need to be met in order to proceed to the next stage.
- The Entry and Exit Criteria are the flexible benchmarks. If they are not met, the Test Team will assess the risk, identify the mitigation actions and provide a recommendation. These are the inputs to the project manager for a final “Go-No Go” decision.
- The Entry Criteria to start the execution phase of the Test: Activities listed in the Test Planning section of the schedule are 100% completed.
- The Entry Criteria to start each cycle: Activities listed in the Test Execution section of the schedule are 100% complete at each cycle.

Exit Criteria	Test Team	Technical Team	Notes
100% Test Scripts executed			
95% pass rate of Test Scripts			
No open Critical and High severity defects			
95% of Medium severity defects have been closed			
All remaining defects are either cancelled or documented as requirements for a future release			
All expected and actual results are captured and			

documented with the test cases			
All defects logged in Sharepoint Excel tracker tool			
Test Closure Memo completed and signed off			

3.2. Test Cycles

- There will be two cycles for functional testing. In each cycle, the test team will execute all the test cases.
- The objective of the first cycle is to identify any blocking, the critical defects, and high defects. It is expected to use some work-around in order to get to all the scripts.
- The objective of the second cycle is to identify the remaining high and medium defects, remove the work-around from the first cycle, correct gaps in the scripts and obtain the performance results.
- The UAT Test will consist of one cycle.

3.3. Validation and Defect Management

- The testers execute all the scripts/test cases in each of the cycles described above. However, the testers could also do additional testing, if they identify a possible gap in the scripts. If a gap is identified, the scripts and traceability matrix will be updated. A defect will be logged against the scripts.
- Defects will be tracked in Sharepoint tracker. The technical team will gather information on a daily basis from the tracker, and request additional details from the Defect Coordinator. The technical team (Development Team) will work on fixes.
- It is the responsibility of the tester to open the defects, link them to the corresponding script, assign an initial severity, priority and status, retest and close the defect. It is the responsibility of the test lead to review the severity of the defects and facilitate the technical team with the fix and its implementation. Communicate with the test team whether the test can continue or halt, request the tester to retest, and modify the status as the defect progresses through the cycle. It is the responsibility of technical team to review the defects on a daily basis, ask for details (if necessary), fix the defect, communicate to the test lead if the fix is complete, and implement the solution as per the test lead's request.

The defects found during the testing will be categorized as follows:

Severity	Impact
1 (Critical)	▪ This bug is critical enough to crash the system, lead to file corruption, or potential data loss. ▪ It causes an abnormal return to the operating system (crash or a system failure message appears). ▪ It causes the application to hang and requires re-booting the system.
2 (High)	▪ It causes a lack of vital program functionality with workaround.
3 (Medium)	▪ This Bug will degrade the quality of the system. However, there is an intelligent workaround to achieve the desired functionality. For example, through another screen.

	▪ This bug prevents the testing of other areas of the product. However, other areas can be independently tested.
4 (Low)	▪ There is an insufficient or unclear error message, which has minimum impact on product use.
5 (Cosmetic)	▪ There is an insufficient or unclear error message that has no impact on product use.

3.4. Test Metrics

Test metrics measure the progress and level of success of the test and is shared with the Head of Technology for approval. Some of the metrics are as follows:

Report	Description	Frequency
Test Preparation & Execution Status	To report on % Complete, % WIP, % Pass, % Fail	Weekly
	Defects severity wise status - Open, Closed, any other status	Daily (optional)
Daily Execution Status	To report on Pass, Fail, Total defects, Highlight Showstopper/Critical defects	Daily
Project Weekly Status Report	Project driven reporting (As requested by HoT)	Weekly - If Project Team needs weekly update apart from daily status reports.

4. TEST MANAGEMENT PROCESS

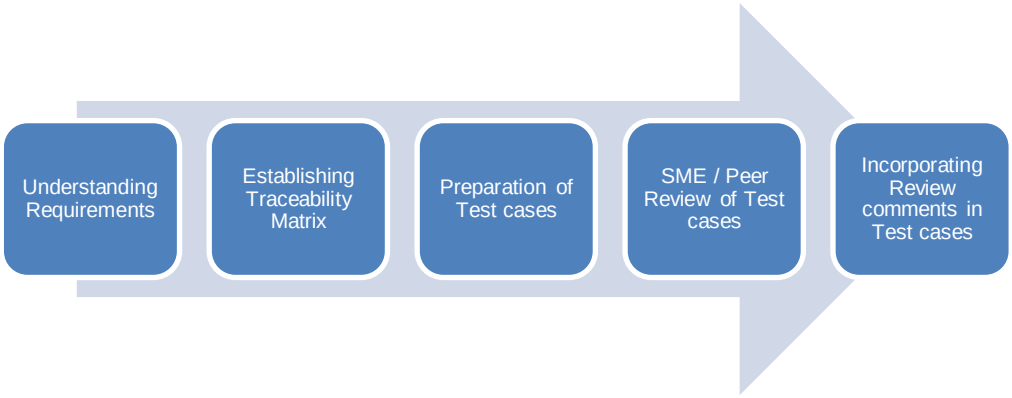
4.1. Test Management

Avanseus uses Sharepoint Excel for the Test Management. All testing artifacts such as test cases, Test results are updated in the Sharepoint Excel and are shared among the team.

- The testing team will have all the details required for the design of test cases.
- During the Test Design phase, all the test cases are written in Sharepoint Excel. Any change to the test case will be directly updated in the Sharepoint Excel.
- Each tester will directly access their respective assigned test cases and update the status of the test cases in the Sharepoint Excel directly.
- Any defect encountered will be described in the Defects tab in Sharepoint Excel tracker and link the defect number to the particular test case/test step.
- During defect fix testing, defects are re-assigned to the tester to verify the defect fix. The tester verifies the defect fix and updates the status directly in defect status field in the Sharepoint Excel tracker.

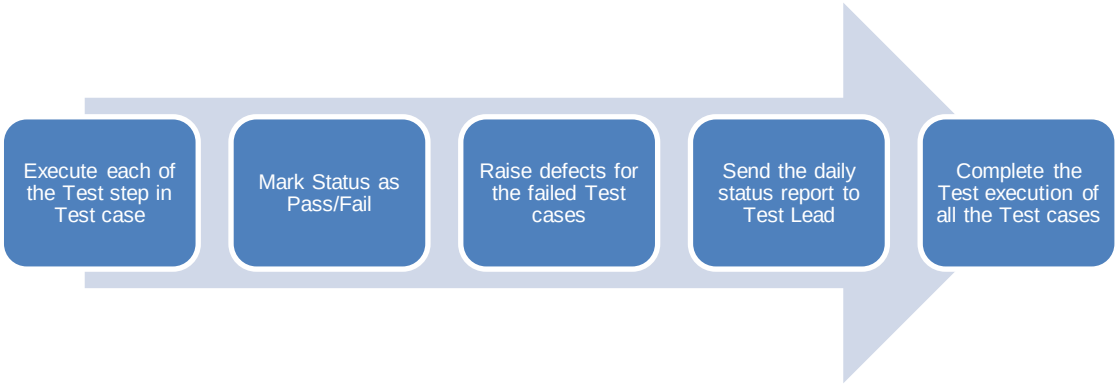
- Reports tab shows the status report of test cases executed, passed, failed, No. of open defects, severity wise defects, etc.

4.2. Test Design Process



- The tester will understand each requirement and prepare corresponding test case to ensure all requirements are covered.
- Each test case will be mapped to Requirements as part of Traceability matrix.
- Head of Technology will review each test case and the reviewed defects are captured and shared with the test team. The tester will rework on the reviewed defects and finally obtain approval and sign-off from the Head of Technology.
- During the preparation phase, tester will use the functional requirements document and the UI/UX design of the screens to write systematic test cases.
- Testers will maintain a clarification Tracker sheet, it will be shared periodically with the Requirements team, and accordingly the test case will be updated. The clarifications may lead to Change Requests or not in scope or detailing implicit requirements.
- Head of Technology will communicate the Sign-off for the test cases to the Test Lead.
- Any subsequent changes to the test case, if any, will be directly updated in the Sharepoint Excel.

4.3. Test Execution Process



- Once all test cases are approved and the test environment is ready for testing, tester will test the application to ensure the application is stable for testing.
- Tester needs necessary access to the testing environment, Sharepoint Excel and for updating the test status and raise defects. If any issues arise, it will be escalated to the Head of Technology.
- If any showstopper during the smoke Testing, it will be escalated to the respective development SPOCs for fixes.

- The tester performs systematic execution and updates the executions status. The tester enters Pass or Fail Status for the Test cases in the Test cases sheet.
- Tester will prepare a Run chart with execution details on a daily basis.
- If any failure occurs, defect will be raised as per severity. It will have the detailed steps to simulate along with screenshots and will be assigned to the developer. It will be sent as an email and the details will be documented in the Sharepoint Excel Tracker.
- Daily test execution status and Defect status will be reported to the Head of Technology.
- Testing team will participate in defect triage meetings in order to ensure all test cases are executed with either pass/fail category.
- If there are defects that are outside the test steps, such defects need to be captured and mapped against the test case level or at the specific step where that issue was encountered (after confirming with Test Lead).
- Repeat this process until all test cases are executed completely with Pass/Fail status.
- During the subsequent cycle, any defect fixes applied will be tested and results will be updated.

As per the process, final sign-off or project completion process will be followed.

4.4. Test Risks and Mitigation Factors

Risk	Prob.	Impact	Mitigation Plan
SCHEDULE Testing schedule is constricted. If the start is delayed due to design tasks, the test cannot be extended beyond the UAT scheduled start date.	High	High	Testing team can control the preparation tasks (in advance) with an early communication with involved parties.
RESOURCES One member in the testing team.	High	High	Holidays and vacation are estimated and built into the schedule; deviations from the estimation could result in delays in the testing.
DEFECTS Defects are found at a later stage of the cycle; defects discovered late are most likely due to unclear specifications and are time consuming to resolve.	Medium	High	Defect management plan ensures prompt communication and fixing of issues.
SCOPE Scope completely defined	Medium	Medium	Scope is well defined but the changes in the functionality are not finalized or may keep on changing.
Non-availability of Independent test environment and accessibility	Medium	High	Due to non-availability of the environment, the schedule gets impacted and leads to delayed start of test execution.

Risk	Prob.	Impact	Mitigation Plan
Delayed testing due to new issues	Medium	High	During testing, some “new” defects may be identified that will take time to resolve. There are defects that can be raised during testing because of unclear document specification that will need time to resolve. If these issues become showstoppers, it will affect the overall project schedule. If new defects are discovered, the defect management and issue management procedures immediately provide a resolution.

4.5. Role Expectations

The following list defines the expectations related to the roles directly involved in the management, planning or execution of the Test for the project.

Sl. No.	Roles	Name	Contact Info
1.	CTO	Chiranjib Bhandary	
2.	Test Lead	Reshmi Murali	
3.	Manager-UI/UX	Sindhu Varun	
4.	Lead-Technical Writing	Raksha N	
5.	Senior Product Manager	Abhilash R	
6.	Development team	Development team members	
7.	Senior Technical Manager	Naveen Mahale	

4.5.1. Project Management

- CTO: Reviews the content of the test plan and sign-off.

4.5.2. Test Planning (Test Lead)

- Ensure the entrance criteria is used as input before starting the execution.
- Develop test plan and guidelines to create test conditions, test cases, expected results and execution scripts.
- Provide guidelines to manage defects.

- Attend status meetings in person or via conference call.
- Communicate to the test team, the changes required to the test deliverables or application and the completion time.
- Provide requirements management and UI/UX design to test team personnel (if needed).

4.5.3. Test Team

- Develop test conditions, test cases, expected results, and execution scripts.
- Perform execution and validation.
- Identify, document and prioritize the defects.
- Re-test after the software modification according to the schedule.
- Provide regular status.

4.5.4 Test Lead

- Acknowledge the completion of a section within a cycle.
- Give the confirmation to start next level of testing.
- Facilitate the defect communication between testing team and technical / development team.

4.5.5 Development Team

- Reviews the testing deliverables (test plan, cases, scripts, expected results, etc.) and provide timely feedback.
- Assists in the validation of results.
- Supports the development and testing processes that are used to support the project.
- Certify that the correct components are delivered to the test environment at the points specified in the testing schedule.
- Inform the project team and the head, of potential software delivery date slips based on the current schedule.
- Define processes/tools to facilitate the initial and ongoing migration of components.
- Conduct first line investigation into execution discrepancies and assist the test executors to create the accurate defects.
- Implement fixes to defects according to the schedule.

5. TEST ENVIRONMENT

Cognitive Assistant for Networks (CAN) branch master: 6.0 will be hosted on two servers: One to host the actual application and second to host the database (optionally Application).

A windows environment with Internet Explorer 10 and above, Microsoft Edge, Firefox 89.0, and Google Chrome 91.0 or later should be available to each tester.

6. APPROVALS

Name and Title of the person who approves the Test Plan.

Name:	**Chiranjib Bhandary**
Role:	**Chief Technology Officer**
Date:	