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Technical Assistance for "A Smart Network for Technology Transfer and Commercialisation with Funnel Model (SMARTNET)"

Contract No: TR14C2.2.05-04/001

EUROPEAID/140284/IH/SER/TR

TEST PLAN (TP) AND RESULTS
COVERING ALPHA (ATR) AND BETA (BTR) TESTS

22.05.2023

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LIST of ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
CA	Contracting Authority
CISOP	Competitiveness and Innovation Sector Operational Programme
DS	Decision Support
DSS	Decision Support System
ERA	End Recipient of Assistance (Beneficiary)
EUD	Delegation of the European Union to Türkiye
GTU	Gebze Technical University
HKU	Hasan Kalyoncu University
ICT	Information and Communication Technologies
IP	Intellectual Property
IT	Information Technologies
ITU	Istanbul Technical University
KE	Key Expert
MIS	Management Information System
ML	Machine Learning
MoIT/DoEUFP	Ministry of Industry and Technology Directorate of EU Financial Programmes
MVC	Model-View-Controller Pattern
OCU	Operation Coordination Unit
OCUD	Operation Coordination Unit Director
OS	Operating Structure
R&D	Research and Development
RCOP	Regional Competitiveness Operational Programme
SDD	Software Design Definitions
SME	Small and Medium Sized Enterprise
TA	Technical Assistance
TAT	Technical Assistance Team
ToR	Terms of Reference
TP	Test Plan
TS	Test Specifications / Test Specialist
TTI	Technology Transfer Intermediary
TTO	Technology Transfer Office
UAT	User Acceptance Testing
YTU	Yıldız Technical University

1. INTRODUCTION

Under Component I of the **A Smart Network for Technology Transfer and Commercialisation with Funnel Model (SMARTNET)** project, one of the primary activities is **Activity 1. Establishment of TTI Network and Development of Institutional Infrastructure** which aims to establish and operationalize **SMARTNET** by delivering training, mentoring/consulting and fundraising services to the target groups for supporting them to commercialize their technology-oriented business ideas.

Activity A.1.1. Development of TTI Network Software Platform focuses on the design, development, and operationalisation of the **SMARTNET Artificial Intelligence Based TTI Network Software Platform (SMARTNET Platform)**.

The **Smartnet MIS Platform**; is a web-based Management Information System (MIS) which will act as commercialisation automation software and a management decision support system that would coordinate the transfer of technology and commercialisation activities and provide mutual information flow in the network constituted by stakeholder TTIs, with the following identified list of developed modules:

- Module 1 - Entrepreneurs management
- Module 2 - Mentors management
- Module 3 - Investors management
- Module 4 - Intellectual Property (IP) management
- Module 5 - Integration web services
- Module 6 - Artificial intelligence and decision support
- Module 7 - Standard and custom reporting
- Module 8 - System management and administration

as well as two auxillary modules:

- Module 9 - Web Portal (Content Management System)
- Module 10 - e-Learning Platform (ME-Learning)

The purpose of this **Test Plan (TP)** is to document the systematic and organized approach to the testing process employed for Smartnet MIS Platform. The Test Plan serves as a blueprint that outlines the objectives, scope, and strategies for testing the Smartnet Platform and provides a comprehensive overview of the testing activities to be performed, the resources required, and the schedule for execution.

This document aims to define a clear roadmap for the testing phase of the project, helping to establish a common understanding among the stakeholders regarding the testing goals, deliverables, and timelines.

Furthermore, this document is intended to serve as a communication tool between the TAT, development team, quality assurance team, ERA and other stakeholders. It outlines the roles and responsibilities of each team member, defines the test environment and data requirements, and specifies the entry and exit criteria for different testing phases.

2. OUR APPROACH

Alpha and beta testing are crucial stages in the software development lifecycle for ensuring the quality, stability, and functionality of the Smartnet MIS Platform. These testing phases involve rigorous evaluation and validation processes carried out by both in-house teams and external users. Alpha testing focuses on identifying major bugs, usability issues, feature gaps, and compatibility problems, while beta testing aims to gather feedback from a select group of users to uncover any remaining glitches before the final deployment.

Alpha Testing:

Alpha testing is an internal acceptance testing phase primarily performed by the in-house software quality assurance (QA) and testing teams. It serves as a critical evaluation of the Smartnet MIS Platform within the testing environment. The main objectives of alpha testing include uncovering showstopper bugs, major bugs (especially in edge cases), identifying usability issues, and verifying compatibility and interoperability. The stakeholders involved in the alpha testing phase include the consultant's development and QA teams, along with appointed members from the ERA (Entrepreneurship Regulatory Authority) and relevant subject matter experts.

The procedures for alpha testing begin with a thorough review of the functional requirements gathered from various sources, such as meeting notes and expert interviews. Ambiguities and queries regarding the requirements are clarified promptly. The functional requirements, as well as any user stories, are entered into the Jira backlog. Following the development of the functionality, the code is deployed to the Test Environment, where alpha testing is conducted.

The alpha testing phase in the Test Environment includes two sub-phases: Test Environment Control Testing and Test Environment UAT (User Acceptance Testing). In the Control Testing phase, the Test Specialists from the development team verify the functionality and suitability of the developed code by comparing it with the specifications and user story entries in Jira. In the UAT Testing phase, the product owners, led by the ERA and Key Experts of the project, evaluate the functionality in the Test Environment and mark the test items as "Done" or send them to the development team for bug fixes.

Once the alpha tests in the Test Environment are completed and accepted, the code is deployed to the Production Environment. The Production Environment testing follows a similar structure with Control Testing and UAT Testing phases. Test Specialists verify the functionality of the developed code in the Production Environment, and product owners perform UAT Testing and provide feedback. If any corrections are required, the feature is retracted from the Production Environment for further development and testing.

Beta Testing:

Beta testing takes place after the completion of the internal alpha testing cycle. During beta testing, the Smartnet MIS Platform is released to a select group of external users outside the dedicated test teams, ERA, or immediate stakeholders. The initial software version released for beta testing is known as the beta version. Although the Consultant performs rigorous in-house testing, it is practically impossible to cover every combination of the test environment. Therefore, the beta test group is carefully selected under the coordination of the ERA to test the beta version of the Smartnet MIS Platform for an extended period, typically around one week. The purpose is to detect and rectify any minor glitches or issues before the final deployment.

The procedure for beta testing is similar to alpha testing, but the key difference lies in the involvement of external users. The Consultant ensures that the beta test users are provided with clear objectives, scope, and approach for testing the Smartnet MIS Platform. The feedback from the beta test users is collected by the TAT (Technical Assistance Team) and entered into Jira for further analysis and resolution.

3. TEST PLAN

The test plan for the Smartnet MIS Platform is as follows:

3.1 Test Objectives and Scope

Test Objectives:

- Validate the functionality and performance of the Smartnet MIS Platform.
- Identify and resolve any defects or issues in the system.
- Ensure the platform meets the requirements specified in the project documentation.
- Verify the integration and compatibility of different modules.
- Assess the platform's usability, reliability, and security.

Test Scope:

- The test scope includes all modules and components of the Smartnet MIS Platform.
- It covers both functional and non-functional aspects of the system.
- Integration testing will be conducted to ensure seamless communication between modules.
- Usability testing will focus on evaluating the user interface and user experience.
- Performance testing will assess the platform's responsiveness and scalability.
- Security testing will verify the platform's robustness against potential threats.
- Compatibility testing will check the platform's compatibility with different browsers and devices.

3.2 Test Time-Table

Alpha Testing Phases:

- Duration: January 24, 2023, to March 15, 2023
- Location: Test server under the domain name **test-smartnet.yildiz.edu.tr**
- Participants: Development Team, TAT, ERA members and internal stakeholders
- Goals:
    - ✓ Conduct closed alpha-testing and validation of developed modules.
    - ✓ Identify and resolve issues and bugs.
    - ✓ Verify the functionality and usability of the system.
    - ✓ Gather feedback from users to improve the platform.

Beta Testing Phases:

- Duration: March 20, 2023, to May 22, 2023
- Location: Production server under the domain name smartnet.global
- Participants: Approximately 30 invited entrepreneurs
- Goals:

- ✓ Conduct open beta-testing with external users.
- ✓ Collect feedback and suggestions from entrepreneurs.
- ✓ Validate the platform's usability and functionality.
- ✓ Address any remaining issues and optimize the platform.
- ✓ Prepare the platform for wider release and use by entrepreneurs.

Live Testing:

- Duration: Ongoing
- Location: Production server under the domain name smartnet.global
- Participants: Entrepreneurs, mentors, investors, and stakeholders
- Goals:
  - ✓ Continuously monitor and assess the platform's performance and stability.
  - ✓ Address any reported issues promptly.
  - ✓ Ensure smooth operation and user satisfaction.
  - ✓ Conduct periodic maintenance and updates.

3.3   Test Techniques

The test techniques used for testing the Smartnet MIS Platform is summarised below, more details on techniques and tools of tests can be found in the previously shared **Test Specifications (TS)** document:

Functional Testing:

- Conduct test cases to verify the functionality of individual modules and their integration.
- Test various scenarios to ensure the platform behaves as expected.
- Validate user authentication, authorization, and access control mechanisms.
- Perform data validation and verification of input/output across the platform.

Usability Testing:

- Evaluate the user interface design for intuitiveness and ease of use.
- Verify that navigation is logical and user-friendly.
- Test user interactions and workflows within the platform.
- Gather user feedback through surveys and interviews.

Performance Testing:

- Assess the platform's response time under different load conditions.
- Measure system scalability and resource utilization.
- Conduct stress testing to determine system stability and limitations.
- Verify the platform's ability to handle concurrent users.

Security Testing:

- Identify and address potential security vulnerabilities.
- Test authentication and authorization mechanisms.
- Conduct penetration testing to detect and fix security flaws.
- Ensure data privacy and protection measures are in place.

Compatibility Testing:

- Test the platform's compatibility with different browsers and versions.
- Verify responsiveness across various devices (desktop, mobile, tablet).
- Check compatibility with different operating systems.
- Test integration with external systems and services.

3.4 Test Responsibilities

- The development team is responsible for unit testing during the development process.
- Testers and QA engineers are responsible for executing test cases, reporting issues, and validating fixes.
- Project managers oversee the testing process and ensure adherence to the test plan.
- ERA members, entrepreneurs, mentors, investors, and other stakeholders provide feedback and participate in beta and user acceptance testing.

3.5 Test Execution and Reporting

- Test execution will follow the defined test plan and test cases.
- Testers will document their findings, including defects and suggestions for improvements.
- Defects will be reported using Jira the designated issue tracking system.
- For emergency fixes, WhatsApp and other messaging platforms can also be employed.
- Test results will be generated regularly, summarizing the test progress, results, and metrics and reported in Jira.
- Test results will be shared with the TAT, ERA and relevant stakeholders for review and action in Jira.

3.6 Test Schedule

- Alpha Testing: January 24, 2023, to March 15, 2023
- Beta Testing: March 20, 2023, to May 22, 2023
- Live Testing: Ongoing

Note: The provided test plan is a general outline and can shift according to the deployment schedule of the implemented modules as they are taken live on the Smartnet MIS Platform.

4. TESTING METHODOLOGIES USED

4.1 Methodologies Used in Alpha Testing

The alpha testing phase of the Smartnet MIS Platform involves the use of methodologies and tools to ensure effective issue tracking, development, and user acceptance testing (UAT). One of the key tools utilized in this phase is Jira, a popular issue tracking and project management software. Jira enables efficient collaboration, task management, and tracking of issues and progress throughout the alpha testing process.

Issue Tracking with Jira:

Jira serves as a centralized platform for tracking and managing issues identified during the alpha testing phase. It allows the development team, quality assurance (QA) team, and stakeholders to report, prioritize, assign, and track issues in a systematic manner. Here's how Jira is integrated into the alpha testing process:

a) **Gathering Functional Requirements**: Initially, the functional requirements for the Smartnet MIS Platform are gathered from various sources, including meeting notes and expert interviews. These requirements are thoroughly reviewed and any ambiguities or queries are clarified at the earliest.

b) **Creating User Stories**: The functional requirements, along with any additional user stories, are entered into Jira's backlog. User stories provide a structured format for capturing specific functionalities or features that need to be developed.

c) **Development and Issue Tracking**: As the development team works on implementing the functionality, the code is pushed to the Test Environment within Jira. Jira's issue tracking capabilities allow the QA team to log and track issues encountered during testing. Each issue is assigned a unique identifier, status, priority, and other relevant details.

d) **Issue Prioritization and Assignment**: The QA team and stakeholders collaborate within Jira to prioritize and assign issues to the development team. Jira's workflows and notification features ensure that all stakeholders are informed about the status and progress of each issue.

e) **Bug Fixing and Verification**: Once an issue is assigned to the development team, they work on fixing the bug or addressing the issue reported. The progress of bug fixing is tracked within Jira, and once the fix is implemented, it undergoes further testing to verify its resolution.

User Acceptance Testing (UAT):

User Acceptance Testing (UAT) is a critical component of the alpha testing phase. It involves testing the Smartnet MIS Platform's functionality from the perspective of end users and stakeholders to ensure it meets their requirements and expectations. Here's how UAT is integrated into the alpha testing process:

a) **Test Environment User Acceptance Testing**: In the Test Environment, the product owners, led by the ERA, Key Experts and TAT members, perform UAT to validate the functionality of the Smartnet MIS Platform. They test the developed features in the Test Environment and provide feedback on whether the functionality meets the desired attributes.

b) **Production/Live Environment UAT Testing**: After successful completion of UAT in the Test Environment, the code is deployed to the Production Environment for further testing. The product owners and stakeholders continue UAT in the Production Environment, ensuring that the Smartnet MIS Platform performs as expected and meets all the necessary requirements.

c) **Feedback and Issue Reporting**: During UAT, the product owners and stakeholders use Jira to report any issues, bugs, or desired improvements they identify. These issues are logged as separate items within Jira, allowing the development team to prioritize and address them accordingly.

d) **Bug Fixing and Retesting**: The development team takes the reported issues into account and works on fixing them. Once the fixes are implemented, the UAT team retests the functionality to verify the effectiveness of the bug fixes and improvements.

e) **Finalizing UAT**: The UAT phase continues until all necessary functionalities and features have been thoroughly tested and accepted by the product owners and stakeholders. Feedback and

issues are addressed iteratively, ensuring that the Smartnet MIS Platform is refined and optimized for a successful release.

By integrating Jira for issue tracking and UAT methodologies, the alpha testing phase of the Smartnet MIS Platform ensures effective collaboration, streamlined issue management, and thorough validation of functionalities to deliver a high-quality software product.

4.2   Methodologies Used in Beta Testing

The beta testing phase of the Smartnet MIS Platform plays a crucial role in gathering feedback and insights from external users, specifically entrepreneurs who participated in the beta program. This phase focuses on identifying and addressing any remaining issues, fine-tuning the platform, and ensuring its readiness for a wider release. Here's an explanation of the methodologies used in the beta testing phase, including the integration of feedback received from the participating entrepreneurs:

Selection of Beta Test Group:

During the beta testing phase, a selected group of external users, comprising approximately 30 entrepreneurs, was invited to participate in the beta program. These entrepreneurs were chosen based on their expertise, relevance to the platform's purpose, and willingness to provide valuable feedback. The beta test group represents the intended user base of the Smartnet MIS Platform.

Communication and Expectation Setting:

Prior to the start of the beta program, clear communication was established with the participating entrepreneurs. They were informed about the objectives, scope, and approach of the beta testing phase. The entrepreneurs were made aware that the purpose of the program is to gather feedback, identify any issues, and ensure the platform meets their needs. Expectations were set regarding their role in providing feedback and their impact on shaping the final product.

Beta Testing Activities:

During the beta testing phase, the following activities were conducted to effectively gather feedback and address identified issues:

a) **Access to Smartnet MIS Platform**: The participating entrepreneurs were granted access to the Smartnet MIS Platform under the domain name **smartnet.global**. They were provided with login credentials and instructions on how to navigate the platform, utilize its features, and perform their regular tasks.

b) **Feedback Collection Mechanisms**: Dedicated channels were established to collect feedback from the participating entrepreneurs. These channels could include online surveys, feedback forms, email correspondence, or even direct communication with the development team. The entrepreneurs were encouraged to share their experiences, report any issues or bugs they encountered, and provide suggestions for improvement.

c) **Issue Tracking with Jira**: Jira, the issue tracking and project management software, was integrated into the beta testing phase as well. Feedback and issues reported by the entrepreneurs were logged as separate items within Jira, allowing for efficient tracking, prioritization, assignment, and resolution of these issues by the development team.

d) **Bug Fixing and Improvement**: The feedback received from the entrepreneurs was carefully analyzed and categorized by the development team. Issues were prioritized based on their

impact and urgency, and the necessary bug fixes and improvements were implemented. The development team ensured that the identified issues were resolved, functionalities were optimized, and any gaps in the platform were addressed.

e) **Iterative Testing and Validation**: As the bug fixes and improvements were implemented, iterative testing and validation were carried out. The development team retested the affected functionalities to ensure the effectiveness of the fixes and the overall stability of the platform. The goal was to iteratively refine the Smartnet MIS Platform based on the feedback received and make it more robust and user-friendly.

Continuous Communication and Collaboration:

Throughout the beta testing phase, continuous communication and collaboration were maintained with the participating entrepreneurs. The development team actively sought clarifications, additional feedback, and further insights from the entrepreneurs to gain a comprehensive understanding of their needs and expectations. Regular updates were shared with the beta test group, keeping them informed about the progress made in addressing their feedback and improving the platform.

Evaluation and Finalization:

The beta testing phase continued for a period of one week, allowing sufficient time for the participating entrepreneurs to thoroughly explore the Smartnet MIS Platform and provide comprehensive feedback. The evaluation process involved reviewing the feedback received, analyzing the impact of the implemented bug fixes and improvements, and validating the final version of the platform against the initial objectives and requirements.

By integrating the methodologies mentioned above, including targeted feedback collection, issue tracking with Jira, iterative testing, and continuous communication, the beta testing phase of the Smartnet MIS Platform enabled the development team to identify and resolve issues, refine functionalities, and ensure the platform meets the expectations and requirements of the entrepreneurs. The valuable feedback provided by the participating entrepreneurs played a pivotal role in shaping the final version of the Smartnet MIS Platform, making it more reliable, user-friendly, and effective in supporting their entrepreneurial endeavors.

5. ALPHA TEST RESULTS (ATR)

During the alpha testing phase of the Smartnet MIS Platform, rigorous evaluations were conducted to assess the quality and stability of the software. The in-house Quality Assurance (QA) teams, along with Key Experts, TAT team and ERA members, performed comprehensive testing to uncover any showstopper bugs, major issues, and feature gaps. The focus of the alpha testing was on identifying and addressing functional and non-functional requirements, usability issues, and compatibility or inter-operability problems.

The alpha testing phase utilized the JIRA issue tracking system to document and track identified issues, bugs, and improvement suggestions. The QA teams meticulously reviewed the functional requirements, user stories, and specifications, ensuring that the developed code aligned with the intended functionality. The Test Environment Control Testing phase allowed the Test Specialists to verify the functionality of the developed code, comparing it with the defined specifications and user stories. Any discrepancies or issues found during this phase were addressed and resolved by the development team.

The Test Environment UAT Testing phase involved the product owners, including ERA members and Key Experts, who assessed the functionality of the Smartnet MIS Platform in the test environment. They marked test items as "Done" if they met the requirements or sent them to Bugfix for further development and testing. This iterative process of testing, issue identification, and resolution continued in both the Test Environment and Production Environment Control and UAT Testing phases, ensuring that the software was thoroughly evaluated and refined.

The alpha testing phase provided valuable insights into the performance and functionality of the Smartnet MIS Platform. The feedback and test results gathered from the alpha testing participants, including the QA teams, ERA members, and selected stakeholders, were instrumental in identifying areas for improvement, fine-tuning features, and enhancing the user experience. The documented feedback in JIRA facilitated efficient communication and collaboration between the development team and stakeholders, enabling prompt issue resolution and continuous improvement of the software.

Overall, the alpha testing phase played a crucial role in validating the Smartnet MIS Platform's functionality, identifying and addressing issues, and ensuring that the software met the defined requirements. The collaborative effort of the testing teams and stakeholders during this phase contributed to the overall quality and readiness of the platform for subsequent testing phases and eventual release.

6. BETA TEST RESULTS (BTR)

During the beta testing phase of the Smartnet MIS Platform, a diverse group of approximately 30 entrepreneurs were invited by the Team Leader (TL) to participate in testing the software in a real-world environment. The objective of beta testing was to gather feedback from actual users and evaluate the platform's performance, usability, and overall satisfaction. The beta testing phase aimed to identify any remaining issues, validate the implemented features, and assess the platform's readiness for a wider user base.

The participating entrepreneurs were given access to the Smartnet MIS Platform on the production server under the domain name **smartnet.global**. They were encouraged to explore the various modules, provide feedback on their experiences, and report any bugs or usability concerns they encountered. The feedback was collected through multiple channels, including online surveys, direct communication with the development team, and the integration of JIRA for issue tracking and resolution.

The beta testing phase allowed for an extensive evaluation of the platform's functionality, performance, and user experience. The feedback received from the entrepreneurs played a crucial role in identifying and resolving issues, refining features, and enhancing the overall quality of the platform. The JIRA issue tracking system enabled effective collaboration between the development team and the beta testers, ensuring that reported issues were addressed in a timely manner. The iterative nature of beta testing allowed for continuous improvement, with frequent updates and bug fixes deployed to the production environment based on the feedback received.

Overall, the beta testing phase provided valuable insights into the Smartnet MIS Platform's usability, functionality, and user satisfaction. The active participation of the entrepreneurs helped validate the platform's performance in a real-world scenario and allowed for necessary adjustments and refinements. The feedback collected during beta testing played a crucial role in shaping the final version of the platform and ensuring its readiness for a broader user base. The collaborative effort between the development team and the beta testers resulted in a more robust and user-friendly Smartnet MIS Platform.

7. SHORT CONCLUSION

The alpha and beta test phases of the Smartnet MIS Platform proved to be instrumental in evaluating and improving the system. During the alpha test, the closed testing environment allowed the development team to identify and address critical issues, ensuring a stable foundation for further development. The integration of JIRA for issue tracking and development management streamlined the process and facilitated efficient resolution of reported issues.

Building upon the lessons learned from the alpha test, the beta test phase involved the active participation of entrepreneurs in a real-world setting. Their valuable feedback and insights provided a comprehensive evaluation of the platform's usability, functionality, and performance. The iterative approach allowed for continuous refinement, with prompt bug fixes and updates implemented based on the feedback received.

The combined results of the alpha and beta tests demonstrated the effectiveness of the testing methodologies employed and the commitment of the development team towards delivering a high-quality Smartnet MIS Platform. The rigorous testing and iterative improvements resulted in a more robust, user-friendly, and feature-rich system. The collaboration between the development team and the testers ensured that the platform met the needs and expectations of its users.

As a result of the alpha and beta testing phases, the Smartnet MIS Platform is now well-prepared for wider user adoption. The insights gained from the testing process have informed the development team's decisions, allowing them to address potential issues, enhance functionality, and deliver a reliable and efficient platform. The successful completion of the alpha and beta tests marks a significant milestone in the development journey of the Smartnet MIS Platform, bringing it closer to its final release and empowering entrepreneurs with an effective management and support system.