TRUSTS
Trusted Secure Data Sharing Space

D5.2 'Pilot planning and operational management report II'

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TRUSTS

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Glossary of terms and abbreviations used

Abbreviation / Term	Description
AML	Anti - Money Laundering
B2B	Business to Business
B2C	Business to Customer
BV	Business Validation
CRM	Customer Relationship Management
E2E	End to End
EU	European Union
FIs	Financial Institution (s)
FRs	Functional Requirement (s)
GA	Grant Agreement
GDPR	General Data Protection Regulation
H2020	Horizon 2020
KPIs	Key Performance Indicator (s)
MVP	Minimum Viable Product
PDCA	Plan-do-check-act
PSI	Private Set Intersection
RDC	Research Data Corporation
SC	Scenario
TRUSTS	Trusted Secure Data Sharing Space
TV	Technical Validation
UC(s)	Use Case (s)
WP	Work Package

Executive Summary

This deliverable is part of the Work Package 5 "Demonstration of the Trusted Secure Data Sharing Space (TRUSTS) Platform in three business-oriented Use Cases (UCs)", of the TRUSTS project and gives a detailed description of the planning and operational information for each of the three UCs according to the business and functional requirements (FRs), as defined in WP2 "Requirements Elicitation and Specification".

This is the second version of the Project's Deliverable titled: ''Pilot planning and operational management report'', addressing the Task 5.1 "Planning, setup and operational management", along with the work that has been performed under WP2 and WP3 accordingly.

The purpose of this deliverable is to set up the procedure for the implementation and testing plan for the second demonstration cycle of the UCs following the feedback and TRUSTS improvements from the first demonstration cycle. A description is given to the initial UCs plan of the first cycle and an update is then followed by the revised plan and process with regards to the preparation of the second phase of the trials, which begins in January 2022.

The goal of this deliverable is to define and to document the framework setup for the implementation of the UCs, during the planning phase, including indications on the baseline conditions, relevant assumptions to be considered, along with measurable metrics and Key Performance Indicators (KPIs). The validation methodology, the planning and monitoring of the activities, and the consequent learning process are also included along with recommendations from the first evaluation phase and best practises.

The document lays out a description of the general context and detailed information regarding the current state of physical setup, integration along with the preparatory actions and activities. It also follows the methodology as defined in Deliverables D2.4[1] and D2.5[2] and describes an overall plan of the trials and in which sequence will these activities take place to achieve their objectives.

The planning and the envisaged procedure are monitored by the WP5 in coordination and in alignment with WP2 and WP3 to guarantee the compliance with the project objectives. The process described in this deliverable will be continued within the lifetime of the related WP, and all the activities, implementation, deployment and testing of the UC's will be monitored, alongside the final upcoming final version of the periodical report, D5.3 to be submitted in M33 (September 2022) concluding the work under Task 5.1.

[1] *D2.4 "Methodologies for the technological/business validation of use case results I", submitted June 2020 (M6)*

[2] *D2.5 "Methodologies for the technological/business validation of use case results II", submitted December 2021 (M24)*

1 Introduction

The TRUSTS project supports the emergence of a European data market and economy, based on secured, safe and General Data Protection Regulation (GDPR) compliant data exchanges and aims to develop a platform supporting these exchanges.

The successful creation and adoption of a pan-European data sharing space will mark a milestone in the growth of the new data economy. Emerging Data Ecosystems that enable large-scale data to be securely connected, valorised, and shared, rely on Europe's purposes under the scale of H2020 and technological development. Therefore, TRUSTS will make the difference in the sphere of data technology and data innovation while the data market is empowering in Europe and worldwide.

D5.2 "Pilot planning and operational management report II" is the second version of a series of deliverables with the same title responding to the work performed originally within T5.1 "Planning setup and operational management". The deliverable is part of the WP5 "Demonstration of the TRUSTS Platform in three business-oriented UCs" and its purpose is to give a detailed analysis of the planning and operational procedures to be followed by the three business-oriented UCs for the second demonstration phase of TRUSTS.

The project involves three UCs, involving the processing of aggregated personal (e.g., name, surname, nationality) and public data (e.g., RDC[3]) for the testing and validation of the TRUSTS platform. Depending on the particularities and specific characteristics of each UC, described in detail in the first version of the deliverable D5.1[4], the appropriate guidance towards compliance with the H2020 ethical guidelines and the European Union (EU) data protection framework will be provided before the start and during the carrying out of each demonstration phase.

The objectives of the first version of this deliverable, D5.1 were essentially to set-up the plan, processes and the monitoring of the UCs progress and implementation. It accommodated the implementation and testing plan of the UCs for the first phase of the trials started by May 2021, and summarised the actions taken thus far under T5.1. Additionally, the business and FRs were acknowledged as defined in D2.2[5]. It gave further detail of the three UCs and the methodology selection of using the PDCA model in managing, planning, and monitoring the WP achievements and progression. It also described the functionalities required for the planning and execution of the first phase of the trials and added to the overall work done by WP2 "Requirements Elicitation and Specifications" and WP3 "TRUSTS Platform Implementation".

D5.2 is the updated version produced at the end of the first demonstration phase considering the evolved updates, experience, and recommendations, to reflect on the second demonstration cycle and during the life cycle of the project. An updated third and final version of this report will be submitted in M33 (September 2022), right after the end of the second demonstration phase in M32 (August 2022) concluding the UCs progress and implementation as well as the updates and recommendations ultimately evolved.

1.1 Mapping Projects' Outputs

[3] *RDC https://rdc.com/*

[4] *D5.1 "Pilot planning and operational management report I"*

[5] *D2.2 "Industry specific requirements analysis, definition of the vertical E2E data marketplace functionality and use cases definition I"*

The purpose of this section is to map TRUSTS GA commitments, within both the formal Deliverable and Task description, against the project's respective outputs and work performed.

Table 1: Adherence to TRUSTS GA Deliverable & Tasks Descriptions

TRUSTS Task		Respective Document Section(s)	Justification
T5.1 Planning, setup, and operational management	*This is the management and monitoring task of WP5 whose objective is to provide the necessary demonstration testbench to the stakeholders, so as to be able to demonstrate through actual field trials that the TRUSTS Platform is capable of supporting the stringent KPI requirements defined in WP1. The process in planning, setting-up and managing the demonstration pilots and their use cases, will be agile, so that a constant interaction cycle of progress will be delivering the results incrementally. To this end, the pilots will be following the Deming Plan–Do–Check–Act (PDCA) cycle. There will be a constant interplay between their progress and the technical developments. Specifically, for each pilot, the task will (a) provide the overall planning as well as the setup activities for the deployment and testing of the use cases; (b) Prepare the evaluation of the pilot as per methodology defined in T2.3, including indications on the baseline conditions (in terms of criteria for defining the sample), relevant assumptions to be considered (if any), workflow, checklists and templates, reference/target KPIs to be met/benchmarked according to D1.1, and key roles and interactions within this process; (c) prepare a Gantt chart of the expected tests, analysis and feedbacks loops. Once this procedure is structured, and before actually implementing it, it will be presented to and validated with all relevant partners in order to check its feasibility and maximize its efficiency. This task includes also the operational management and monitoring of the pilots, which will allow the project staff to take stock of relevant data, define datasets for impact analysis, process collect measurements, and organize outcomes into actionable information. EBOS will also monitor the implementation progress of the execution of the use cases, in coordination with the Project*	*Section 2* *Section 3, 4, 5* *Section 6* *Section 7*	*Offers a brief overview of the previous version of the deliverable and a recap of the first demonstration phase with an indication of the preliminary lessons learned, establishing the ground for the following sections.* *Refer to the three UCs overall scope and objectives, following the end of Cycle 1 of trials, the UCs elements, and narratives as well as its revised KPIs and scenarios and steps to follow within the second demonstration phase.* *Gives a detailed plan and vision of the second demonstration phase of the TRUSTS UCs trials, offering the objectives of this phase as well as the platform version and the functionalities to be tested.* *Concludes on the findings of the report along with its outcomes combined*

	Manager, NOVA, REL, LST, EMC, FORTH and PB as well as the WP3 and WP4 leaders to guarantee the compliance with the project objectives. The monitoring exercise will feed into the performance evaluation and lessons learned tasks (T5.3 led by NOVA). This task will also ensure that all activities in the pilots will be carried out in accordance with the ethics principles defined in the protocol produced in T6.1. A strong stewardship for the data shared in the pilots will be established together with KUL, which participates in this task to provide the necessary legal expertise.		*with the planned next actions.*

TRUSTS Deliverable
D5.2 'Pilot planning and operational management report II' The deliverable contains the implementation and testing plan for the pilots, updated at the end of each demonstration phase period.

1.2 Deliverable Overview and Report Structure

The document is part of the Task 5.1, the management and monitoring task of WP5, where the validation of the TRUSTS platform is taking place via the execution of advanced field trials in specific industry sectors while delivering lessons learned and addressing stakeholders' perspectives.

Based on the objectives and the work carried out under Task 5.1, D5.2 reports on the project's three business-oriented UCs updated execution plan, and operational management with respect to their implementation and accomplishment for the second phase of the trial's execution.

Section 1 is serving as the introduction of the report by describing its objectives, the overview, and its structure. It provides a detailed description of the TRUSTS's goal and task description as well as the mapping to the deliverables' output with information on how these are addressed within the report.

Section 2 offers a brief overview of the previous version of this deliverable and a recap of the first evaluation phase with an indication of the preliminary lessons learnt, establishing the ground for the following sections.

Section 3, Section 4 and Section 5 refer to the three UCs respectively, covering each UC's:

- Scope, objectives, and elements,
- Scenarios update for the TRUSTS platform and the UC applications/services,
- Scenario's FRs applicability,
- UC evaluation KPIs.

Section 6 gives a detailed plan and vision of the second demonstration phase of the TRUSTS UC trials, offering the objectives of this phase as well as the platform version and the functionalities to be tested. It also presents a set of common scenarios to be tested by the three UCs based on scalability, security assessment, platform operator, open access and federation.

Section 7 offers the report's conclusions and findings along with its outcome combined with the planned next actions.

2 Outline of the first evaluation phase

This section delivers a synopsis of the TRUSTS project, as well as a recap on the previous first version of this report analysing the first evaluation phase of the project's developed product, serving as a foundation to this report.

2.1 TRUSTS vision

TRUSTS envisages to become more than a regular data market, accommodating a full range of data trading and respective collaboration services in one unified platform dealing with both sensitive private and industrial data. This, along with the ability to develop a sustainable business model, are what differentiates TRUSTS from other data marketplaces.

2.1.1 Evaluation of the TRUSTS platform

The E2E platform functionality, processes and operation is tested through the UC trials to ensure the establishment of a unified, broad, viable, expandable, and future-proof data marketplace service.

TRUSTS and WP5 defined two demonstration phases for a 360° evaluation of the TRUSTS marketplace. WP5 produced and submitted in March 2021, its first deliverable D5.1 "Pilot planning and operational management report I", focusing on the first demonstration phase preparation and documenting the plan, design and definition of the three UCs prior executing the first demonstration cycle between May and November 2021.

2.2 TRUSTS first demonstration phase

The actual field trials designed and executed in the first cycle of TRUSTS trials were well defined to address all aspects of the current implementation and produced sound initial results. A comprehensive analysis of the initial lessons learned from the first demonstration cycle was submitted in December 2021 (D5.10[6]).

The first release of the D5.1 in March 2021 provided the set-up conditions, methodology and deployment of the three UCs within the WP5 tasks, containing the implementation and testing plan for the three pilots for the first demonstration cycle. A corresponding section for each of the three UCs was reported, giving an extensive analysis of their objectives, and expected outcome as well as the required services to be included in the TRUSTS platform for each, including the stakeholder's role per UC. Each section consisted of each UC's detailed work that was developed within Year 1 of the project, and the expected progress and outcome throughout the project's lifetime.

Furthermore, a mapping with the TRUSTS functionalities was provided for each of the UCs as well as the envisaged functional architecture of each UC with a high-level description of the defined scenarios and test steps that were envisaged for the first demonstration phase, in the direction of testing the E2E product to provide valuable feedback towards improving both technical and business aspects of the TRUSTS data marketplace.

The first demonstration phase followed the subsequent direction:

- User Experience testing,
- Functional Testing,
- System testing and unit testing,
- Performance Testing,

[6] D5.10 "Performance evaluation and Lessons Learned Report I", submitted December 2021

Besides, the first demonstration and evaluation cycle trials evaluated the following:

- Enrolment process,
- Asset's upload,
- Catalogue search,
- Applications usage.

2.2.1 Pilot setup and framework

Indeed, not all aspects and parameters of the platform development were known, decided, or implemented back then but TRUSTS is a work in progress and with the Consortium well-versed in the progress and contribution to the project's objectives, is set to achieve. That is to develop a platform that will act independently as a platform federator, while following the legal and ethical aspects that apply on the entire data valorisation chain, from data providers to consumers. In addition to advancing a fully operational and GDPR compliant European Data Marketplace, targeting individual and industrial use.

The purpose of the TRUSTS research project is the development and testing of a federated data marketplace. The initial version of the FRs of the envisioned TRUSTS platform ranging from functionality to operation of the service, were identified under T2.2 and reported in D2.2[7]. The requirements were retrieved from FIs, telecom operators and corporate data providers/users, as well as from industrial stakeholders. Their capture involved the documentation of industrial and regulatory needs and ideas about new innovative data marketplace service verticals, which set the baseline for conducting the actual measurements during the UC trials. Their collection was initially performed expressing an eagerness for the TRUSTS results, since all agreed that getting access to a *trusted data marketplace that will be able to accommodate a big number of data and services, in respect of the EU legal framework relating to privacy and data protection*, would be a useful tool in their daily processes.

In the first set of trials, an implementation of the TRUSTS platform with only partial functionality was available to evaluate a prototypical implementation, a MVP v1 of the TRUSTS platform (as reported in D3.9).

2.2.2 TRUSTS first evaluation

As presented in the Figure 1 below, three sets of BV and two sets of TV were identified over the projects' lifecycle, allowing the interaction between the business needs, business models and the technical enablers. More details on what was validated and how these validations were performed along with the involved partners and templates used, is presented in D2.4 and the updated D2.5.

The first set of business and technical validation was performed in terms of the first demonstration phase where the BV offered the base for the start of the trials cycle with a detailed collection of business information about the UCs including the description of the problem (before TRUSTS) and the expected benefit (after TRUSTS), different personas, their roles and who is directly impacted by the UC. Finally, the definition of what are the expected (required or nice to have) functionalities provided by the TRUSTS data marketplace which will benefit at a business level the involved parties of each UC with a definition of several scenarios that were executed by each UC along with the expected results and a mapping of requirements and functionalities for each scenario. The TV resulted to lessons learnt combined with the initial lessons learned of each UC and are further documented in D5.10 and correspondingly for each UC, in D5.4 (UC1), D5.6 (UC2) and D5.8 (UC3) as well as fed in D2.5[8] for the updated and revised validation methodology.

[7] D2.2 Industry specific requirements analysis, definition of the vertical E2E data marketplace functionality and use cases definition I

[8] D2.5 'Methodologies for the technological/business validation of use case results II'

In a more mature project stage while entering year three as the final project implementation year, this report is documenting the overall planning of the second demonstration phase of the project prior to starting the execution of the actual field trials as per the WP5 Gantt Chart below (Figure 1).

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
						MS1						*MS2*						*MS3*
WP5																		
Task 5.1											Preparatory activities, planning, setup of UC's and operational management for 1st phase of trials							
Task 5.2																1st phase		
Task 5.3																		
BV							1st Business Validation											
Deliverables														*D5.1 (eBOS)*				

	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36
	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
							MS4											*MS5*
WP5																		
Task 5.1					Planning, setup of UC's for 2nd phase of trials													
Task 5.2							2nd phase											
Task 5.3																		
BV					2nd Business Validation							3rd Business Validation						
TV	1st Technical Validation						2nd Technical Validation											
Deliverables						*D5.4 (eBOS) D5.6 (NOVA) D5.8 (REL) D5.10(NOVA)*	*D5.2 (eBOS)*							*D5.5 (eBOS) D5.7 (NOVA) D5.9 (REL)*	*D5.3 (eBOS)*	*D5.11(NOVA)*		

Figure 1: TRUSTS WP5 Gantt Chart

3 Smart big-data sharing and analytics of Anti-Money Laundering compliance, Use Case 1

This section covers the UC1 overall plan and setup activities for the second demonstration cycle of TRUSTS trials that envisages to follow.

3.1 UC1 scope and Objectives

The objective of this UC is to demonstrate the capabilities of the TRUSTS Platform for AML purposes while establishing and validating how data shared via the platform can feed into an existing AML solution enhanced with big data analytics, for providing faster and more accurate detection of financial crime and money laundering, and how this enriched data can be securely traded via the platform to interested customers who need to perform AML checks.

UC1 leverages the power of the TRUSTS Platform's concept for securely sharing data between organisations, applying smart big data analytics for AML compliance purposes as well as fairly trading the resulting data to the end-users such as Financial Institutions (FIs), internal/external auditors, fiduciaries, audit firms, etc.

The TRUSTS Platform sits at the centre of data exchange between actors and facilitates the trading of the resulting data and data analytics services for a wide range of actors interested in progressing to the next step of AML compliance.

3.2 UC1 elements

The TRUSTS UC1 is demonstrated in three main narratives. This section introduces the components, actors, and applications and services to be deployed in the platform and are emulated in this UC.

UC1 is supported by two applications and one service EBOS has developed and enhanced towards their deployment and adoption in the TRUSTS platform. The below sub-sections introduce the overview of the UC1 main components and framework and provide more details on the connectivity setup as well as the main UC1 actors. These components are:

3.2.1 AML Screening *Service*[9]

AML Screening service provides a tool to identify a client's (or potential client's) risk profile. The first step that a company must take before on-boarding new clients (physical persons or legal entities) is to perform a background check against them. As part of their AML compliance policy, companies must have in place controls to avoid violating various sanctions. It screens the customers against Politically Exposed People (PEP) lists, sanction lists, adverse media sources, watch lists, country risk profiles etc. It is integrated with the world's largest risk-relevant database, provided by RDC. The service has a user-friendly interface that can be accessed from the browser at the port specified. When a client request is made via the RESTful API, through the service's user interface, the representation of the state of the resource to the requester is delivered in a JSON format via HTTP. The service gives the user the option to run a background check for persons or entities while the results / the output is shown below.

[9] *service: a piece of software that is executed on the provider's infrastructure and that answers requests by the consumer*

3.2.2 AML RiSC - Risk Assessment *application*[10]

This application allows enterprises to determine the risk level of their clients. This makes the RiSC solution a critical tool for Compliance Officers for effectively complying with the AML law and regulations. Risk Assessment provides a wide view of customers' relationships, rates their risks based on a dynamic rule-based engine, monitors activities, detects, investigates, and documents suspicious cases. The application comes with a default AI/ML model that was trained on the eBOS dataset and provides scores using a traditional rule-based system.

The application is to be used by customers to perform AML checks with the aim to provide accurate risk scores and categorise entities as *Low*, *Medium*, or *High* risk, using a risk-based approach. To this end, it was developed with two different approaches; a traditional rule-based system that is based on a set of deterministic rules, and a data-driven approach that is based on AI and ML algorithms that can better capture relationships from historical data. The new AI/ML-based approach leverages the potentials of the TRUSTS platform, by securely sharing data between organisations, and be benchmarked against the rule-based system. Both approaches provide a risk score and the respective risk category conditional on responses of a Money Laundering and Terrorist Funding questionnaire.

3.2.3 AML Transaction Monitoring *application*

The AML TRM application is to be used by customers to perform AML checks with the aim to provide suspicious transactions for money laundering purposes. Therefore, the end user can observe on the screen only the suspicious transactions, however if they download the data the end-user will be able to observe the non- suspicious transactions too.

3.2.4 The main actors of UC1

UC1 as per the GA has three participants. EBOS contributes its existing WiseBOS ERP AML solutions, which is used as the baseline for the KPI measurements of the UC, while building on the WiseBOS solution capabilities, EBOS designed, developed, and integrated new adaptive analytics algorithms and cognitive self-learning models into the three upgraded AML modules with new functionalities, to benchmark the performance improvement. EBOS also acts as the main-super admin, UC leader and application/service and data provider of the UC1 as well as end-user/consumer by providing input data necessary for the execution of the trials.

The UC1 notion of having ML models sent back to the application provider involves multiple parties. UC1 brings together the application and service provider (EBOS), contributing in support to the UC1, three AML solutions, where NOVA and InBestMe as end-users, acting as interested in sharing and trading data via the TRUSTS Platform, in view of validating the effectiveness of the platform and ensuring high levels of AML compliance.

NOVA and InBestMe act as end-users by providing input data necessary for the execution of the trials. All above parties are also involved on the metadata and datasets uploaded and provided to the platform (i.e., trained models).

3.3 UC1 Scenarios update for the TRUSTS platform

Through the first demonstration cycle of the UC1 trials, innovative processes were tested for their user friendliness, completeness, and business effectiveness leading to an inclusive evaluation of the TRUSTS platform. More precisely, UC1 was designed to test several functionalities of the TRUSTS platform following the scenarios that were defined and documented in D5.1, submitted in March 2020.

[10] *application: a piece of software that is executed on the consumer's infrastructure*

This section offers the revised defined scenarios intended for the second demonstration phase of TRUSTS UC1:

1. Companies' subscription.
2. Applications/service onboarding.
3. Applications/Service search on catalogue.
4. Contract fulfilment.
5. Dataset's uploading / announcement.
6. Federation.
7. AML Screening service execution.
8. AML RiSC application execution.
9. AML Transaction Monitoring execution.

divided into two different categories, defining six scenarios and their steps envisage to practise, in terms of evaluating the TRUSTS platform (Table 2), as well as three scenarios for the evaluation of the developed to support UC1 applications/service (Table 3).

Table 2: UC1 Scenarios update for the TRUSTS platform

<table>
<tr><td>TRUSTS UC1</td><td colspan="3">Smart big-data sharing and analytics of Anti-Money Laundering compliance</td></tr>
<tr><td>UC1-SCENARIO 1</td><td colspan="3">Companies' subscription</td></tr>
<tr><td>REQUIREMENTS REFERENCE</td><td colspan="3">FR25, FR27, FR28, FR30, FR31, FR33A, FR36, FR37, FR44, NFR1, NFR4, NFR5</td></tr>
<tr><td>SCENARIO TEST PROCEDURE</td><td>ASSUMPTIONS & CONSTRAINTS</td><td>EXPECTED RESULTS</td><td>ADDITIONAL NOTES</td></tr>
<tr><td>The UC1 end-users (EBOS, NOVA, and InBestMe) subscription.</td><td>EBOS, NOVA, and InBestMe are subscribed to a specific subscription service using the TRUSTS UI provided.</td><td>Successful subscription of EBOS, NOVA and InBestMe on TRUSTS.
Successful access and registration of one or more companies.</td><td>Selection of plan, subscription, companies' representative's definition, and roles.</td></tr>
<tr><td colspan="4">1. The UC1 end-users (EBOS, NOVA and InBestMe) accesses the TRUSTS portal.
2. The UC1 end-users (EBOS, NOVA and InBestMe) access the registration area of the portal and select the appropriate subscription service.
3. The subscriber selects the appropriate contract and electronically signs it.
4. The TRUSTS platform system activates the contract and introduces the subscriber into the catalogue to be visible in all federated nodes.
5. The TRUSTS corporate node is deployed in EBOS, NOVA and InBestMe premises.
6. All transactions above are logged to ensure quality and traceability.</td></tr>
<tr><td>UC1-SCENARIO 2</td><td colspan="3">Applications/service onboarding</td></tr>
</table>

REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR10, FR11, FR12, FR13, FR14, NFR2, FR36, FR37, NFR4, NFR5, NFR6, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
On board of the AML: • *Screening service* • *RiSC application* • *TRM application* *Verify that they are properly on-boarded and are accessible via the platform.*	Uploading an asset to the TRUSTS platform.	Successful on-boarding of the three AML applications/service, verifying that they are properly on-boarded and are accessible via the platform.	Three UC1 applications/service to be deployed on the TRUSTS federated infrastructure. Verify that they are properly on-boarded and are accessible via the platform.
1. The application provider (EBOS) accesses the TRUSTS portal. 2. The application provider (EBOS) reads the portal information and informative text. Also, standards that the TRUSTS marketplace complies with and privacy policies e.g., GDPR, etc. 3. The application provider (EBOS) accesses the registration area of the portal and selects the appropriate application upload subscription service. 4. The application provider (EBOS) selects the appropriate contract and electronically signs it. 5. The application provider (EBOS) accesses the TRUSTS application upload area. 6. The application provider (EBOS) uploads the three AML applications/service in the TRUSTS application area. 7. TRUSTS operators check the applications/service quality and security issues, and if all is ok, TRUSTS accepts the applications/service. 8. TRUSTS introduces the *AML RISC application,* the *AML Transaction Monitoring application,* and the *AML Screening service* in the catalogue. Terms of usage of the applications/service are included. 9. TRUSTS introduces the applications/service in the catalogue to be available to all federated nodes. Terms of usage of the application are also included in the application/service description. 10. All transactions above are logged to ensure quality and traceability.			
UC1-SCENARIO 3	**Applications/Service search on catalogue**		
REQUIREMENTS REFERENCE	FR4, FR5, FR6, FR7, FR8, FR9, FR18, FR19, FR20, FR23, FR24, FR25, FR26, FR27, FR28, FR31, FR33B, FR37, NFR4, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Applications/service search on catalogue. Search for the UC1 applications/service (as an end-user) and check if they are available and	• Return adequate response in <1sec. • User task success > 90%	AML application should be available to be searched. The UC1 end-users (EBOS, NOVA, InBestMe) search for	The search/ recommender's engine responds and proposes applications/services,

listed in the catalogue (by key words or directly for the adequate AML application/service).	• User satisfaction, SUS score > 70	the three AML applications/service either directly or with key words through the search engine.	across all federated nodes.

1. The subscriber (EBOS, NOVA, InBestMe) accesses the TRUSTS portal.
2. The subscriber (EBOS, NOVA, InBestMe) uses the search engine to search keywords on preferred applications/service in a user-friendly manner.
3. The subscriber (EBOS, NOVA, InBestMe) searches the "*AML*" keyword in the catalogue.
4. The subscriber (EBOS, NOVA, InBestMe) searches the "*AML RiSC*" application in the catalogue.
5. The subscriber (EBOS, NOVA, InBestMe) searches the "*AML Screening*" application in the catalogue.
6. The subscriber (EBOS, NOVA, InBestMe) searches the "*AML Transaction Monitoring*" application in the catalogue.
7. The search/recommender's engine responds and proposes applications/services as well as metadata.
8. All transactions above are logged to ensure quality and traceability.

UC1-SCENARIO 4	**Contract fulfilment**		
REQUIREMENTS REFERENCE	FR4, FR10, FR11, FR12, FR13, FR14, FR15, FR16, FR17, NFR1, NFR3, FR26, FR27, FR28, FR30, FR33A, FR33B, FR37, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure smart contract fulfilment. Completion of the billing and payment cycles.	The UC1 end-users will proceed with the selection of a smart contract to be able to use the adequate AML applications/service through the TRUSTS data marketplace.	Successful smart contract fulfilment.	Marketplace keeps tracking (logs) of the transactions.

1. The UC1 end-users access the registration area of the portal and select the contract for the AML application/service they desire to use.
2. Appropriate billing is issued according to the subscribers' contract and compensation is achieved according to the application/service provider contract (per-use, per-month etc.).
3. Subscription and payment are done.
4. The UC1 end-user is forwarded to download on premises the adequate application/service.
5. The end-user is then required to login.
6. The TRUSTS operator verifies remotely the identity and security of the installation, credentials, and validity of subscription.
7. The system automatically checks the logs for contract fulfilment and any quality issues that may need to be manually catered.

8. Tests are made to ensure adequate and secure communication between the end-user's premises and the rest of the TRUSTS platform.
9. All transactions above are logged to ensure quality and traceability.

UC1-SCENARIO 5	**Dataset's uploading / announcement**		
REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR7, FR8, FR9, FR10, FR11, FR12, FR13, FR14, NFR2, NFR3, FR18, FR19, FR20, FR21, FR22, FR23, FR24, FR32, FR35, FR36, FR37, NFR4, NFR5, NFR6, FR42, FR43, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
UC1 end-users onboard Dataset's only to be made available through the adequate AML application.	Successful upload of Dataset's and introduction to the catalogue.	The Dataset's upload process is successfully performed, their lifecycle is defined, and they are discoverable in the catalogue.	

1. The subscriber representatives (EBOS, NOVA, InBestMe) access the TRUSTS portal and login.
2. The platform verified credentials and validity of subscription.
3. The subscribers reach the Dataset's upload area and describe the appropriate information about their datasets, including the fact that they are only to be made available through the adequate AML application.
4. TRUSTS platform automatically checks if the dataset's information is complete and introduced to the catalogues to be discovered in all federated marketplaces.
5. All transactions above are logged to ensure quality and traceability.

UC1-SCENARIO 6	**Federation**		
REQUIREMENTS REFERENCE	FR2, FR4, FR5, FR7, FR13, FR14, FR17, FR23, FR26, FR27, FR28, FR37, FR38		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure that federation is achieved with neighbouring marketplaces in terms of metadata/service/ subscriber's catalogue, smart contract, privacy policies.	Transactions are logged and validated. Users are rated. Compliance to law is confirmed.	Transactions are logged and validated from different marketplaces.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance.

1. TRUSTS federates with external marketplace and privacy is agreed.
2. A process of connection which involves exchange of information (e.g., IP addresses,

3. certificates) between the end-users and TRUSTS operator.
4. Federation contracts are signed including compensation agreement for each transaction.
5. Catalogues are merged.
6. Transactions are logged and validated from different marketplaces.

3.4 Scenarios update for the UC1 applications/service

This section offers three defined scenarios intended for the second demonstration phase of TRUSTS UC1 detailing the scenario steps UC1 envisages to practise, in terms of evaluating the UC1 applications/service focusing on the provider as well as the end-user experience.

Table 3: UC1 Scenarios update for the UC1 applications

TRUSTS UC1	**Smart big-data sharing and analytics of Anti-Money Laundering compliance**		
UC1-SCENARIO 7	**AML Screening service execution**		
REQUIREMENTS REFERENCE	FR1, FR3, FR4, FR7, FR8, FR9, FR10, FR14, FR17, NFR3, FR18, FR22, FR27, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
UC1 end-users execute the AML Screening service and verify that it is properly running.	Completion of the agreement/contract as well as the successful download of the adequate service UI (locally) on premises.	Successful use of the AML service through the TRUSTS data marketplace.	All transactions will be logged to ensure quality and traceability.
1. The UC1 end-users access the adequate AML Screening service UI. 2. The UC1 end-users successfully searches/screens a person (an entity) or an organisation and successfully receives input/outcome/results based on the adequate UC1 service execution/requirements. 3. The UC1 end-users start using the AML Screening service and verify that it is properly running. 4. All the transactions above (service provider and end-user) are logged to ensure quality and traceability.			
UC1-SCENARIO 8	**AML RiSC application execution**		
REQUIREMENTS REFERENCE	FR1, FR3, FR4, FR7, FR8, FR9, FR10, FR14, FR17, NFR3, FR18, FR22, FR27, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43		

SCENARIO TEST PROCEDURE	ASSUMPTIONS & CONSTRAINTS	EXPECTED RESULTS	ADDITIONAL NOTES
UC1 end-users execute the AML RiSC application and verify that it is properly running.	Completion of the agreement/contract as well as the successful download of the adequate application (locally) on premises.	Successful onboarding of data as per the specific file type. Successful use of the AML application through the TRUSTS data marketplace.	The AML application can be executed with the applicability of the ML/AI. All transactions will be logged to ensure quality and traceability. The tab 'Export/Download' can be used to download the data models, the training data, and some metadata. This information can be uploaded/offered/traded/sold through the TRUSTS platform.

1. The UC1 end-users access the adequate AML RiSC application UI.
2. The UC1 end-users input data on premises based on the adequate UC1 application execution/requirements.
3. The UC1 end-users start using the AML RiSC application and verify that it is properly running.
4. The UC1 end-users successfully train data models ('Model Training').
5. The UC1 end-users execute successful prediction of the trained model.
6. The UC1 end-users successfully upload a second dataset (i.e., perhaps bought from TRUSTS) for the ensemble model training.
7. The UC1 end-users execute successful training of the ensemble model (with the applicability of the ML/AI).
8. The UC1 end-users execute successful prediction of the ensemble model (with the applicability of the ML/AI).
9. The UC1 end-users can download/export and offer to share/sell their trained models through the TRUSTS platform.
10. All the transactions above (service provider and end-user) are logged to ensure quality and traceability.

UC1-SCENARIO 9	AML Transaction Monitoring execution		
REQUIREMENTS REFERENCE	FR1, FR3, FR4, FR7, FR8, FR9, FR10, FR14, FR17, NFR3, FR18, FR22, FR27, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**

UC1 end-users execute the AML Transaction monitoring application and verify that it is properly running.	Completion of the agreement/contract as well as the successful download of the adequate application (locally) on premises.	Successful onboarding of data as per the specific file type. Successful use of the AML application through the TRUSTS data marketplace.	The AML application can be executed with the applicability of the ML/AI. All transactions will be logged to ensure quality and traceability. The tab 'Download Main Files' can be used to download the model, the training data and some metadata. This information can be uploaded/offered/traded/sold through the TRUSTS platform.
1. The UC1 end-users access the adequate AML Transaction Monitoring application UI. 2. The UC1 end-users successfully inputs/uploads data on premises based on the adequate UC1 application execution/requirements. 3. The UC1 end-users successfully train a model using the input data. 4. The UC1 end-users successfully predict the potential suspicious transactions and got some. 5. The UC1 end-users successfully train an ensemble model. 6. The UC1 end-users successfully making predictions with the Ensemble model. 7. The UC1 end-users start using the AML TRM application and verify that it is properly running. 8. The UC1 end-users can offer to share/sell their data models through the TRUSTS platform. 9. All the transactions above (service provider and end-user) are logged to ensure quality and traceability.			

3.5 Functional Requirements per UC1 scenario

Significant effort was made in order that all revised and new FRs defined in the D2.3[11] deliverable, are evaluated through the UC1 scenarios defined above. The FRs per UC1 scenario are mapped and offered in the below Table 4:

[11] *D2.3 Industry specific requirements analysis, definition of the vertical E2E data marketplace functionality and use cases definition II, submitted December 2021*

Table 4: Functional Requirements per UC1 scenario

UC1-SC	1	2	3	4	5	6	7	8	9		1	2	3	4	5	6	7	8	9		1	2	3	4	5	6	7	8	9
FR1		√			√		√	√	√	**FR23**			√		√	√				**NFR1**	√			√					
FR2		√			√	√				**FR24**			√		√					**NFR2**		√			√				
FR3		√			√		√	√	√	**FR25**	√		√							**NFR3**				√	√		√	√	√
FR4			√	√		√	√	√	√	**FR26**			√	√		√				**NFR4**	√	√	√		√				
FR5			√			√				**FR27**	√		√	√		√	√	√	√	**NFR5**	√	√	√		√		√	√	√
FR6			√							**FR28**	√		√	√		√				**NFR6**		√			√		√	√	√
FR7			√		√	√	√	√	√	**FR29**							√	√	√										
FR8			√		√		√	√	√	**FR30**	√			√															
FR9			√		√		√	√	√	**FR31**	√		√				√	√	√										
FR10		√		√	√		√	√	√	**FR32**					√		√	√	√										
FR11		√		√	√					**FR33A**	√			√			√	√	√										

FR12		√		√	√					**FR33B**			√	√																
FR13		√		√	√	√				**FR34**							√	√	√											
FR14		√		√	√	√	√	√	√	**FR35**					√		√	√	√											
FR15				√						**FR36**	√	√			√		√	√	√											
FR16				√						**FR37**	√	√	√	√	√	√														
FR17				√		√	√	√	√	**FR38**			√			√	√	√	√											
FR18			√		√		√	√	√	**FR39**			√				√	√	√											
FR19			√		√					**FR40**			√				√	√	√											
FR20			√		√					**FR41**			√				√	√	√											
FR21					√					**FR42**			√		√		√	√	√											
FR22					√		√	√	√	**FR43**			√		√		√	√	√											
										FR44	√	√	√	√	√															

3.6 UC1 scenarios applicability per MVP release

The UC1 scenarios set be followed in the second cycle of TRUSTS trials along with the platform releases are presented in the below Table 5.

Table 5: UC1 Scenarios applicability per MVP release

UC1 Scenarios	MVPv.2	MVPv.3
UC1-SC1: Companies' subscription	√	√
UC1-SC2: Applications/service onboarding	√	√
UC1-SC3: Applications/Service search on catalogue	√	√
UC1-SC4: Contract fulfilment	√	√
UC1-SC5: Dataset's uploading/announcement	√	√
UC1-SC6: Federation		√
UC1-SC7: AML Screening service execution	√	√
UC1-SC8: AML RiSC application execution	√	√
UC1-SC9: AML Transaction Monitoring execution	√	√

3.7 UC1 evaluation KPIs

This section and the Table 6 below list the revised and updated high level KPIs defined in the GA and documented in D2.4 and D5.1 regarding the UC1 product. This revised version will demonstrate how effectively the UC1 is achieving the key objectives and outcomes established following the maturity of the project and the respective UC as per the submission of this report.

They focus on the overall performance of the UC that will measure the success versus a set of targets and objectives. As the KPIs are defined, the process to meet them is also outlined, along with the baseline and target value for M36 evaluation while performing adequate number of trials.

Table 6: UC1 evaluation KPIs

KPI	Baseline Value	Target Value (M36)	Process to meet the target KPIs
Detection accuracy.	Detection accuracy.	>90%	Predefined Scenarios before and after AI will be executed to validate these values.
Number of false positives.	The number of false positives flagged.	<30%	Predefined Scenarios before and after AI will be executed to validate these values.
Number of false negatives.	The number of false negatives flagged.	<30%	Predefined Scenarios before and after AI will be executed to validate these values.
F1 score (accuracy metric)	0-1	>/= 0.5	Predefined Scenarios before and after AI will be executed to validate these values along by a mathematical process.
Number of data providers interacting with the Platform.	Two data providers at the start of the UC.	Minimum 10 by M36 (+400%)	Two data providers for the start of the UC1 trials (RDC & EBOS). To meet this target by M36 the project needs to involve additional data providers using dissemination activities.
Number of end-users interacting with the Platform.	One end-user at the start of the UC.	Minimum 10 by M36 (+400%)	NOVA & InBestMe at the start of the UC1 trials. To meet this target by M36 the project needs to involve additional end-users using dissemination activities.
Ensure GDPR and other regulations compliance.	GDPR compliance by design.	GDPR compliance by design.	TRUSTS admin operation and respective technical support (e.g., logs maintenance and analysis ensure compliance and quality). Perform adequate number of trials.

4 The agile marketing through data correlation, Use Case 2

This section covers the UC2 overall plan and setup activities for the second demonstration cycle of TRUSTS trials that envisages to follow.

4.1 UC2 scope and Objectives

TRUSTS aims at constituting an E2E operational European Digital Marketplace platform, which will enable NOVA and PB to increase their digital transformation level and respective entrepreneurship activities towards being pioneers in the Greek Telecom and Banking sectors.

The challenging envisioned business process of correlating external data sources in a manner compatible with GDPR and other respective regulations e.g., anonymised, and aggregated CRM data of NOVA and PB, has been chosen as a base evaluation scenario. Current practices e.g., absence of a unified and commonly acceptable technological and business framework able to assist such business collaboration, make it difficult to explore such business opportunities since all respective negotiations must start each time from the beginning.

Thanks to advances in data-sharing technologies, enterprises can buy and sell potentially valuable information assets in highly efficient data marketplaces. Combine this data with a new array of privacy-preserving technologies, such as homomorphic encryption and private set intersection, one can now share encrypted data and perform computations on it without having to decrypt it first. This provides the best of all potential worlds: sharing data while preserving security and privacy.

All of this has fuelled a promising new trend. Stores of sensitive data lying in servers around the globe due to privacy or regulatory concerns are starting to generate value across enterprises in the form of new business models and opportunities. Gartner™ predicts that by 2023, organizations that promote data-sharing will outperform their peers in most business metrics[12].

Though currently in an early stage, this data-sharing trend is picking up steam. In a recent survey, Forrester Research found that more than 70% of global data and analytics decision-makers are expanding their ability to use external data, and another 17% plan to do so within the next 12 months[13].

Moreover, the global homomorphic encryption market alone is growing at an annual rate of 7.5% and is expected to reach US$437 million in value by 2028. Currently, the health care and finance sectors are leading most FHE explorations[14].

According to[15] as part of a growing trend, organisations are unlocking more value from their own sensitive data while leveraging enormous volumes of externally sources data that has traditionally been off limits. This can open new arena of data driven opportunities. The ability to share secured data with others within an ecosystem or value chain is giving rise to new business models and products.

[12] *Laurence Goasduff, "Data sharing is a business necessity to accelerate digital business," Gartner, May 20, 2021. GARTNER is a registered trademark and service mark of Gartner, Inc. and/or its affiliates in the U.S. and internationally and is used herein with permission. All rights reserved.*

[13] *Jennifer Belissent, Chief Data Officers: Invest in your data sharing programs now, Forrester, March 11, 2021.*

[14] *Data Bridge Market Research, Global fully homomorphic encryption market – Industry trends and forecast to 2028, March 2021.*

[15] *Deloitte's Tech Trends 2022 https://www2.deloitte.com/content/dam/insights/articles/US164706_Tech-trends-2022/DI_Tech-trends-2022.pdf*

Following the initial cycle of trials where a subset yet core functionalities were evaluated, it is envisaged that the end-to-end operational nature of the TRUSTS platform will be trialled in the forthcoming cycles.

The key evaluation goals are:

- Become a fully operational European Data Marketplace, providing Intellectual Property management for personal and non-personal related data.
- Act as a platform Federator, laying the groundwork for an ecosystem that will enable federation of independent data marketplaces.
- Create framework conditions to facilitate the emergence of an ecosystem of an ever-increasing number of companies around TRUSTS.

UC2 vision for the TRUSTS marketplace is that it is designed for the everyman. Businesses of all sizes and with any level of experience can use TRUSTS offerings for rewarding and efficient data procuring/staring experiences. TRUSTS data assets offerings will be granular, powerful, and actionable without having to undergo complex processes.

4.2 UC2 elements

The goal set by UC2 with respect to the TRUSTS environment is firm throughout the project being illustrated in Figure 2.

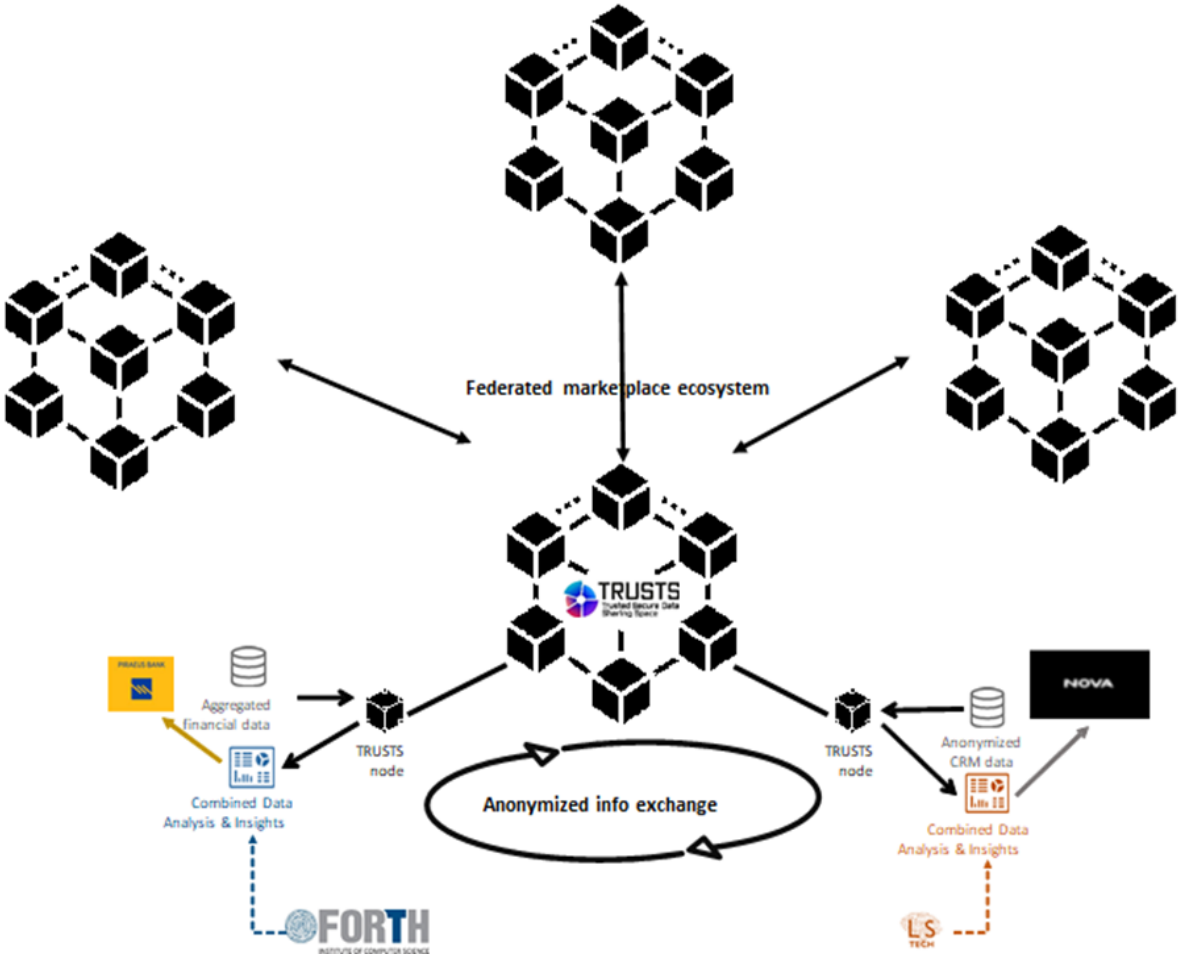

Figure 2: UC2 high level architecture and stakeholders

UC2 stakeholders and roles are:

- TRUSTS data marketplace operator i.e., WP3 and WP4 partners, which will administer the platform and provide all the necessary services with adequate quality and compliance.
- Federated data marketplace operator i.e., WP3 and WP4 partners or third-party data marketplace operator, which will administer the platform and provide all the necessary services with adequate quality and compliance.
- Application providers:
    - KNOW provides the PSI.
    - RSA provides the de-anonymization risk analysis.
    - FORTH provides the Banking application with smart dashboards, big-data analytics, and customers' economic behaviour insights.
- NOVA provides anonymized CRM data and define the detailed business scenario. NOVA also analyses the trial outcome.
- LST installs and uses TRUSTS services (e.g., PSI) to intersect NOVA and PB datasets.
- PB offers aggregated and anonymized financial data.
- FORTH installs the required TRUSTS services (e.g., PSI) to intersect NOVA and PB datasets.

In the forthcoming trials towards delivering the final product, UC2 will be able to evaluate the functionalities defined in Table 7 from the business user perspective.

Table 7: TRUSTS functionalities to be evaluated under UC2 trials

Functionality, processes & services	**UC2 trials**
Usability: User friendly user interface adequate to meet the needs of the everyday business user of the TRUSTS services.	In UC2 usage if the TRUSTS services and offering will be evaluated for their friendliness, robustness, performance, and compliance.
Applications/services on-boarding: Software applications or online services can be published and made available for purchasing in the TRUSTS data marketplace offering adequate meta-data such as functionality description, owner, running environment, API specification, etc. The on-boarding process should provide a testing environment for the published services/applications so as their technical, performance and security assessment to be feasible, smart contract support mechanisms as well as mechanisms for updating its catalogues and search engine with the new applications/services that have been published.	In UC2 the service on boarding process will be tested using the **PSI application, the Banking Application and the De-anonymisation risk analysis application.**
Data/Metadata on-boarding: The process includes: Data descriptors, data management lifecycle support, smart	In UC2 the metadata on boarding process will be tested for the **NOVA** and **PB metadata.**

contract, inclusion in the catalogues and search engine.	
Subscription management and contracting with client companies/user's subscription with specific roles within the subscribed companies.	In UC2 NOVA and PB will **enrol** and **purchase a preferred subscription (potential through a smart contract)** from a list of alternative subscriptions that TRUSTS offers. All subsequent transactions will perform within the framework of the respective transactions. Then NOVA and PB will **enrol** their **representatives** with the respective roles.
Privacy and **GDPR processes.**	In UC2 scenarios, the TRUSTS operator will ensure that **GDPR processes** will be adopted. Of course, in UC2 aggregated and anonymised data will be used. To this end maybe GDPR is not applicable. Nevertheless, GDPR processes will be applicable to the "Transactions logs" process below.
Billing, compensation of involved parties in the value chain, Revenue assurance.	UC2 will check that **each transaction will be automatically checked against the smart contract** e.g., the subscription status of both NOVA & PB, the compensation that the PSI owner must receive according to the respective smart contract, etc.
Transaction logs	UC2 will check that **each transaction is logged in a GDPR compliant manner** for quality assurance, transaction proof, billing, etc. purposes.
Catalogue/Beyond the state-of-the-art search engine (e.g., matchmaking, recommendation, etc.) for services, data/metadata, etc.	UC2 will check that the **user-friendly catalogue search and recommendation engine** function properly. The **catalogue should address services, datasets/metadata, subscribers**, etc. The **search should be transparent throughout all federated marketplaces.**
Federation	UC2 will check that **all the above will be applicable for both a standalone TRUSTS marketplace and federated marketplaces**, e.g., subscribers, data, and applications reside in different federated marketplaces.
Quality assurance services	UC2 will check that a **quality assurance system is implemented able to analyse the transaction logs, KPIs and other related parameters to illustrate the quality of the E2E operational environment. In the quality system the user should be able to rate the transaction.** The quality assurance system will be given by TRUSTS and will be applicable for all UCs i.e., it is not a functionality that will be implemented within the UC2 scope.

4.3 UC2 scenarios update for the TRUSTS platform

This section lists the defined scenarios UC2 is set to follow in the second demonstration cycle of TRUSTS trials to evaluate the TRUSTS platform. The functionalities covered, the steps and the expected results are mentioned.

Table 8: UC2 Scenarios update for the TRUSTS platform

<table>
<tr><td>TRUSTS UC2</td><td colspan="3">Agile Marketing through Data Correlation</td></tr>
<tr><td>UC2-SC1</td><td colspan="3">Service Onboarding</td></tr>
<tr><td>REQUIREMENTS REFERENCE</td><td colspan="3">FR1, FR2, FR3, FR10, FR11, FR12, FR13, FR14, NFR2, FR36, FR37, NFR4, NFR5, NFR6, FR44</td></tr>
<tr><td>SCENARIO TEST PROCEDURE</td><td>ASSUMPTIONS & CONSTRAINTS</td><td>EXPECTED RESULTS</td><td>ADDITIONAL NOTES</td></tr>
<tr><td>On boarding of applications (onboarding, smart contract, inclusion to the service catalogue, quality test). Federation issues should be tested e.g., service onboarding in different federated nodes.</td><td>At least the PSI, the Banking application and deanonymization risks analysis applications are successfully on-boarded on TRUSTS nodes.</td><td>The applications are successfully checked for security and malfunction issues and on-boarded to TRUSTS using the provided UI. A respective smart contract is issued, and the service usages rules are defined.</td><td>End to end service onboarding process to be fulfilled.</td></tr>
<tr><td colspan="4">1. The application provider accesses the TRUSTS portal.
2. The application provider reads the portal information and informative text.
3. The application provider reads standards that the TRUSTS marketplace complies to and privacy policies e.g., GDPR, etc.
4. The application provider accesses the registration area of the portal and selects the appropriate application upload subscription service.
5. The application provider selects the appropriate contract (price is set by the application provider, TRUSTS compensation scheme is defined as a standard term in the contract) and electronically signs it.
6. The application provider uploads the application in the TRUSTS application introduction area. Alternatively, the application can be externally linked.
7. TRUSTS operators check the application quality and security issues. This could be done manually and offline by TRUSTS operators.
8. TRUSTS accepts the application.
9. TRUSTS introduced the application in the catalogue to be available to all federated nodes. Terms of usage of the application are included in the application description as well.
10. All transactions above are logged to ensure quality and traceability.</td></tr>
<tr><td>UC2-SC2</td><td colspan="3">Companies' subscription</td></tr>
</table>

REQUIREMENTS REFERENCE	NFR1, FR25, FR27, FR28, FR30, FR31, FR33A, FR36, FR37, NFR4, NFR5, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Companies' subscription (selection of plan, subscription, signing the contract/smart contract, companies' representative's definition, and roles). Federation issues should be tested e.g., companies subscribed in different federated nodes.	Successful subscription of NOVA, PB, FORTH, LST, KNOW and RSA. Successful definition of roles. Successful enrolment of NOVA, PB, FORTH, LST, KNOW and RSA representatives.	NOVA, PB, FORTH, LST, KNOW and RSA are subscribed to a specific subscription service using the UI provided by TRUSTS. Companies' users are subsequently enrolled according to the rules of the subscription that each company chose.	User friendliness, Clear processes, ability to verify and modify, logs.
1. The subscriber (NOVA, PB, FORTH, LST, KNOW, RSA) accesses the TRUSTS portal. 2. The subscriber reads the portal information and informative text. 3. The subscriber reads standards that the TRUSTS marketplace complies to and privacy policies e.g., GDPR, etc. 4. The subscriber accesses the registration area of the portal and selects the appropriate subscription service (the trial should be done on both standalone TRUSTS installation and federated mode where the subscribers will enrol in different federated marketplaces). 5. The subscriber selects the appropriate contract and electronically signs it. 6. The subscriber enrols its representative and respective roles. 7. The subscriber verifies if he/she wants to be included in the catalogues. 8. The TRUSTS platform system activates the contract and introduces the subscriber into the catalogue to be visible in all federated nodes. 9. All transactions above are logged to ensure quality and traceability.			
UC2-SC3	**Metadata uploading**		
REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR7, FR8, FR9, FR10, FR11, FR12, FR13, FR14, NFR2, NFR3, FR18, FR19, FR20, FR21, FR23, FR24, FR32, FR35, FR36, FR37, NFR4, NFR5, NFR6, FR42, FR43, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
NOVA and PB onboard the metadata. Federation issues should be tested e.g., companies subscribed in different federated nodes.	Successful upload of metadata and introduction to the catalogue.	The metadata upload process is successfully performed, their lifecycle is defined, and they are discoverable in the catalogue.	User friendliness, Clear processes, ability to verify and modify, logs.
1. The subscriber representatives (NOVA, PB) access the TRUSTS portal and login.			

2. The platform verified credentials and validity of subscription.
3. The subscribers reach the metadata upload area and describes the appropriate information.
4. TRUSTS platform automatically checks if the information is complete and introduced to the metadata to the catalogues to be discovered in all federated marketplaces.
5. All transactions above are logged to ensure quality and traceability.

UC2-SC4	**Service catalogue usage**		
REQUIREMENTS REFERENCE	FR4, FR5, FR6, FR7, FR8, FR9, FR18, FR19, FR20, FR23, FR24, FR25, FR26, FR27, FR28, FR31, FR33B, FR37, NFR4, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Search in service catalogue by NOVA and PB for discovering the appropriate metadata, the adequate PSI, deanonymization risk analysis, etc. services. Federation issues should be tested e.g., transparently searching to all federated nodes.	• Return adequate response in <1sec. • User task success > 90% • User satisfaction, SUS score > 70	NOVA and PB search through the catalogue for the required service transparently to all federated nodes. In addition, they may see the T&Cs of the services usage.	Search in service catalogue using keywords across all federated nodes.

1. The subscriber representatives (NOVA, PB) access the TRUSTS portal and login (both standalone and federated marketplaces trials will be scheduled).
2. The platform verified credentials and validity of subscription.
3. The subscribers access the catalogues and searches for appropriate metadata and PSI application in a user-friendly manner.
4. The search/recommender's engine responds and proposes metadata and services.
5. NOVA and PB select the appropriate metadata and service and initiate the usage process.
6. All transactions above are logged to ensure quality and traceability.

UC2-SC5	**Contract fulfilment, service performance tracking, quality evaluation**		
REQUIREMENTS REFERENCE	FR4, FR10, FR11, FR12, FR13, FR14, FR15, FR16, FR17, NFR1, NFR3, FR26, FR27, FR28, FR30, FR33A, FR33B, FR37, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure smart contract fulfilment, evaluate transaction logs, collect users' evaluation, improve operations if necessary.	At least 3 contracts are fulfilled.	Transactions are logged and validated. Users are rated. Compliance to law is confirmed.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate, complete process by the TRUSTS

			operations to improve performance.
1. The system automatically checks is the logs for contract fulfilment and any quality issues that may need to be manually catered. 2. Compensation is attributed to all parties according to their contracts.			

Note: According to the TRUSTS GA:

A Federated Data Market at European level shall provide:

- Hierarchical levels of privacy, that allow a data owner full control not only over who is able to access the data and at which granularity, but also who is able to view the metadata,
- Hierarchical layers of certification for data services to foster trust in the market actors,
- The fully flexible combination of data and services available at different providers to create a new data product or service,
- An automatic brokerage system, enabling the identification and recommendation of data and services to be used for a specific use-case,
- Tooling for a human broker to create customised offers for their customers, opening a new business field in the industry (i.e., the data broker).

These services are designed to lower the barrier to entrance on the data market by actors ranging from private entrepreneurs and innovators, SMEs, or NGOs, to large, multinational enterprises.

UC2-SC6	**Federation**		
REQUIREMENTS REFERENCE	FR2, FR4, FR5, FR7, FR13, FR14, FR17, FR23, FR26, FR27, FR28, FR37, FR38		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure that federation is achieved with neighbouring marketplaces in terms of metadata/service/ subscriber's catalogue, smart contract, privacy policies.	At least 3 transactions from federated marketplaces are fulfilled.	Transactions are logged and validated from different marketplaces.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance.
1. TRUSTS federates with external marketplace and privacy are agreed. 2. Smart federation contract is signed including compensation agreement for each transaction. 3. Catalogues are merged.			
UC2-SC7	**Dataset's announcement, recommendation, and matching**		
REQUIREMENTS REFERENCE	FR2, FR4, FR5, FR6, FR7, FR8, FR9, FR17, NFR2, NFR3, FR18, FR19, FR20, FR21, FR22, FR23, FR24, FR25, FR26, FR27, FR29, FR33B, FR34, FR35, FR37, NFR4, FR42, FR43, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**

Ensure that the users will be able to announce datasets and their characteristics.	At least 3 datasets announcements will be included in the catalogue. At least 3 matchmaking successes will be performed. At least 3 relevant recommended datasets are proposed.	Dataset's announcements are successfully performed. Matchmaking of NOVA and PB request with available datasets is successfully performed	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance existence.
1. The users will announce dataset and related attributes e.g., dataset that they cannot upload (e.g., CRM). Such announcement will be entered the datasets catalogue. 2. The users will announce their needs. Such announcements will enter a need catalogue. 3. Recommendation and matchmaking will be automatically offered by the TRUSTS platform.			

4.4 Scenarios update for the UC2 applications

This Table 9 below lists the updates UC2 scenarios for the evaluation of the business applications supporting UC2.

Table 9: UC2 Scenarios update for the UC2 applications

TRUSTS UC2	**Agile Marketing through Data Correlation**		
UC2-SC8	**PSI usage**		
REQUIREMENTS REFERENCE	FR1, FR3, FR4, FR7, FR8, FR9, FR10, FR14, FR17, NFR3, FR18, FR27, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure that the users can correlate datasets using PSI.	At least one dataset will be uploaded by NOVA and one by PB. The PSI application is installed in the NOVA and PB corporate nodes.	Datasets of various sizes are successfully correlated using PSI.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance existence.
1. The users will announce dataset and related attributes e.g., dataset that they cannot upload (e.g., CRM). Such announcement will be entered the datasets catalogue. 2. The PSI application will be on-boarded to the TRUSTS platform. 3. NOVA and PB procure PSI usage. 4. NOVA and PB download from TRUSTS PSI and install it to the corporate node. 5. NOVA and PB successfully correlate datasets through PSI.			
UC2-SC9	**Banking application usage**		

REQUIREMENTS REFERENCE	FR1, FR3, FR4, FR7, FR8, FR9, FR10, FR14, FR17, NFR3, FR18, FR27, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure that the users have correlated data through PSI. Then the banking application analyses the outcome.	At least 1 dataset will be uploaded by NOVA and 1 by PB. The PSI application is installed in the NOVA and PB corporate nodes. The Banking application is installed in PB.	Datasets of various sizes are successfully correlated using PSI. Then the outcome is used by the Banking application.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance existence.
1. The users will announce dataset and related attributes e.g., dataset that they cannot upload (e.g., CRM). Such announcement will be entered the datasets catalogue. 2. The PSI application will be on-boarded to the TRUSTS platform. 3. NOVA and PB procure PSI usage. 4. NOVA and PB download from TRUSTS PSI and install it to the corporate node. 5. NOVA and PB successfully correlate datasets through PSI. 6. The banking application is on-boarded to the TRUSTS platform. 7. PB procures the Banking Application usage. 8. PB uses the Banking application to analyse the PSI correlation outcome.			
UC2-SC10	**De-anonymisation risk analysis application usage**		
REQUIREMENTS REFERENCE	FR1, FR3, FR4, FR7, FR8, FR9, FR10, FR14, FR17, NFR3, FR18, FR27, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, NFR5, NFR6, FR38, FR39, FR40, FR41, FR42, FR43		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
The de-anonymisation risk analysis application is available to the TRUSTS platform.	The de-anonymisation risk analysis application is available to the TRUSTS platform.	Various datasets will by analyse for de-anonymisation risk by the De-anonymisation risk analysis application.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance existence.
1. The de-anonymisation risk analysis application will be on-boarded to the TRUSTS platform. 2. NOVA and PB procure de-anonymisation risk analysis usage. 3. NOVA and PB use the de-anonymisation risk analysis application in various anonymised datasets.			

4.5 Functional Requirements per UC2 scenarios

Significant effort was made in order that all FRs defined in the D2.3 deliverable are evaluated through the UC2 scenarios defined above. The FRs per UC2 scenario are included below, in Table 10:

Table 10: Functional Requirements per UC2 scenario

UC2-SC	1	2	3	4	5	6	7	8	9	10		1	2	3	4	5	6	7	8	9	10		1	2	3	4	5	6	7	8	9	10
FR1	√		√					√	√	√	**FR23**			√	√		√	√				**NFR1**		√			√					
FR2	√		√			√	√				**FR24**			√	√			√				**NFR2**	√		√				√			
FR3	√		√					√	√	√	**FR25**		√		√			√				**NFR3**			√		√		√	√	√	√
FR4				√	√	√	√	√	√	√	**FR26**				√	√	√	√				**NFR4**	√	√	√	√			√			
FR5				√		√	√				**FR27**		√		√	√	√	√	√	√	√	**NFR5**	√	√	√	√				√	√	√
FR6				√			√				**FR28**		√		√	√	√					**NFR6**	√		√	√				√	√	√
FR7			√	√		√	√	√	√	√	**FR29**							√	√	√	√										
FR8			√	√			√	√	√	√	**FR30**		√			√															
FR9			√	√			√	√	√	√	**FR31**		√		√				√	√	√										
FR10	√		√		√			√	√	√	**FR32**			√					√	√	√										
FR11	√		√		√						**FR33A**		√			√			√	√	√										
FR12	√		√		√						**FR33B**				√	√		√													

FR13	√		√		√	√					**FR34**							√	√	√	√											
FR14	√		√		√	√		√	√	√	**FR35**			√				√	√	√	√											
FR15					√						**FR36**	√	√	√					√	√	√											
FR16					√						**FR37**	√	√	√	√	√	√	√														
FR17					√	√	√	√	√	√	**FR38**				√		√		√	√	√											
FR18			√				√	√	√	√	**FR39**				√				√	√	√											
FR19			√				√				**FR40**				√				√	√	√											
FR20			√	√			√				**FR41**				√				√	√	√											
FR21			√				√				**FR42**			√	√			√	√	√	√											
FR22							√				**FR43**			√	√			√	√	√	√											
											FR44	√	√	√	√	√		√														

4.6 UC2 scenarios per MVP release

The UC2 scenarios set be used in the trials following the platform releases are presented in Table 11.

Table 11: UC2 Scenarios applicability per MVP release

UC2 Scenarios	MVPv.2	MVPv.3
UC2-SC1: Service Onboarding	√	√
UC2-SC2: Companies subscription	√	√
UC2-SC3: Metadata uploading	√	√
UC2-SC4: Service catalogue usage	√	√
UC2-SC5: Contract fulfilment, service performance tracking, quality evaluation	√	√
UC2-SC6: Federation		√
UC2-SC7: Dataset's announcement, recommendation, and matching	√	√
UC2-SC8: PSI usage	√	√
UC2-SC9: Banking application usage	√	√
UC2-SC10: De-anonymisation risk analysis application usage	√	√

4.7 UC2 evaluation KPIs

The below Table 12 offers the UC2 evaluation KPIs.

Table 12: UC2 evaluation KPIs

Key performance Indicator	Baseline value	Target value (M36)	Process to meet the target KPIs
Satisfaction from the use of the operational TRUSTS environment.	• Customer loyalty NPS > 5 [0-10]	• Customer loyalty NPS > 8 [0-10]	Perform adequate number of trials with extra-project users.

	• User satisfaction, SUS score > 50	• User satisfaction, SUS score > 70	
Ability of TRUSTS to create a federated data marketplace ecosystem.	None	Federation ability of the platform with external marketplaces. Business models building on federation potential.	Perform adequate number of trials.
Different types of subscriber types are serviced.	None	Corporate users access TRUSTS services via a specific interface. Non-corporate users (ad-hoc users) access the TRUSTS platform through a specific interface.	Perform adequate number of trials.
Ensure GDPR and other regulations compliance.	GDPR compliance by design.	GDPR compliance by design.	TRUSTS admin operation and respective technological support (e.g., logs maintenance and analysis ensure compliance and quality. Perform adequate number of trials.
Ensure easy scalability	Scalability by design	Scalability by design	Perform trials ensuring that a large number of corporate nodes (e.g., >50) are seamlessly deployed. Each node will upload a significant number of assets (e.g., >10).
Number of target marketing analysis (Banking application).	2 per month	>10 per month	Perform adequate number of trials.

Data readiness for correlation (PSI).	Low (1 week for data to become ready)	High (1 day for data to become ready)	UC data providers should provide adequate datasets for the trials.
Data anonymization/de-anonymization.	<1 per month	>10 per month	UC data providers should provide adequate datasets for the trials.
Number of data providers interacting with the Platform.	2	>10	To achieve this the project needs to involve additional data providers using dissemination activities.
Number of end-users interacting with the Platform.	2	>10	To achieve this the project needs to involve additional data providers using dissemination activities.

5 The data acquisition to improve customer support services, Use Case 3

This section covers the UC3 overall plan and setup activities for the second demonstration cycle of TRUSTS trials that envisages to follow.

5.1 UC3 Scope and Objectives

TRUSTS main objective is to create a European Digital Marketplace platform, providing the dataset trading among business stakeholders.

The UC3 "The data acquisition to improve customer support service", to be specific, REL's aim is to test these services between REL NODE and BANK NODE, to increase their digital transformation and respective entrepreneurship activities as pioneers in their appropriate fields of work.

During the UC3 trials, a variety of next-generation processes were used to test the platform's user friendliness, completeness, and business effectiveness. Accordingly, TRUSTS federated infrastructure is thus tested on providing the required components to enable this safe exchange of data, with the final point being to protect the private information under the wing of a technical and legal area, but also maintain the ability to send reliable results and insights. This will end up in an overall ranking of the platform with regards to the search of data and services of the overall marketplace.

5.2 UC3 elements

The following trial stakeholders participate in this UC:

Relational Romania: REL is the leading partner of UC3 and is offering the AroTRON Collection & Recoveries to test and validate improved and more natural ways of communications and debt collection for banks via the Trusts platform.

ALPHA Bank Group: ALPHA is providing financial/personal data, anonymised telecommunication customer data and targeted marketing analysis to support UC3.

The services that UC3 provide are the following:

5.2.1 ChatBot Model

In the case of the ChatBot, the customer sends a model that contains dialogue between users and gets back a trained model. This trained model can then be used to supply an AI powered robot that replies to normal users.

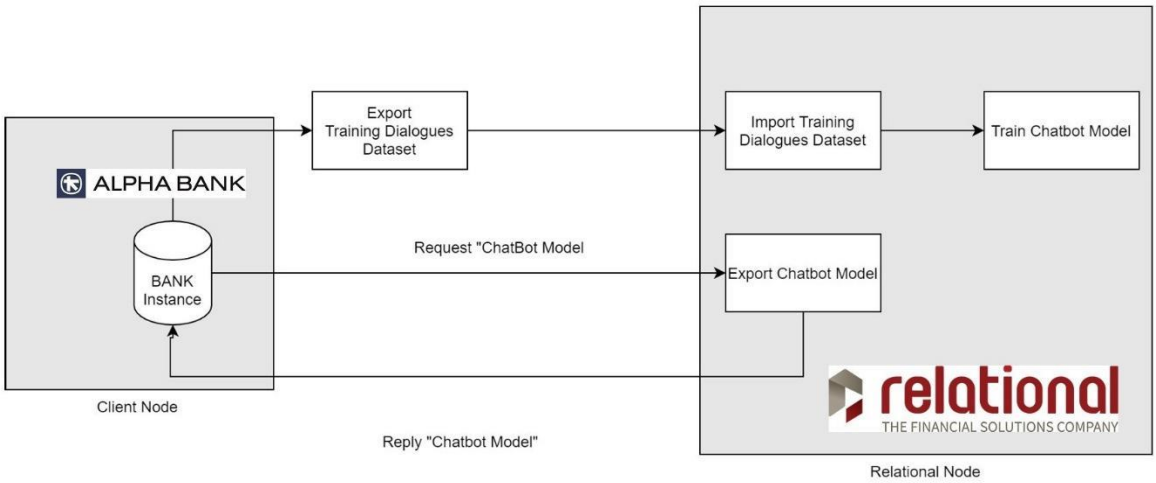

Figure 3: UC3 ChatBot Model

5.2.2 Next-Best-Action (NBA) Model

In the case of NBA, the customer also sends a model, but it contains metadata based on a user's relation to the customer's NODE (in this case, a bank) with metadata that defines if the user should be trusted for paying back a loan, therefore a dataset comes back whether the person should be granted a loan or not (aka what is the Next Best Action).

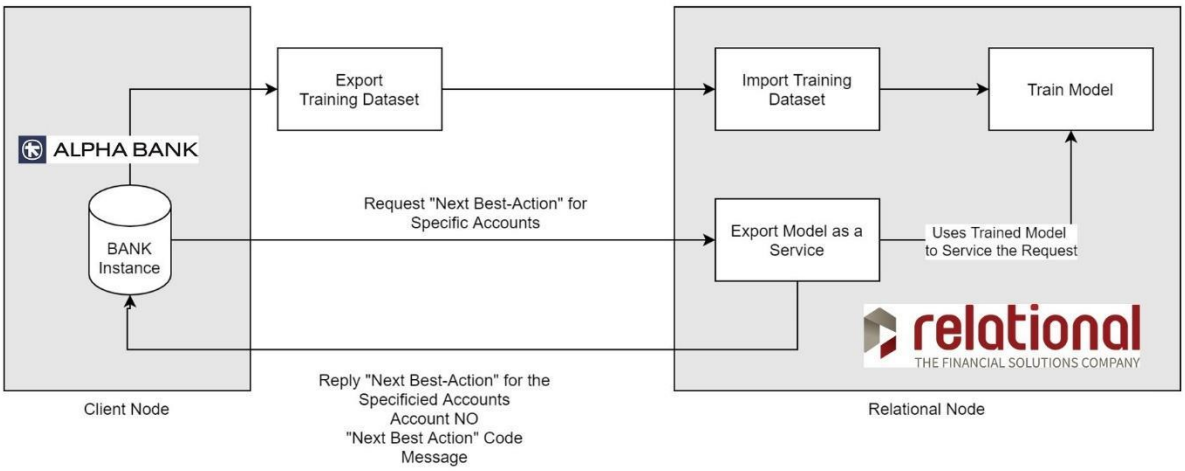

Figure 4: UC3 Next-Best-Action (NBA) Model

After the appropriate configuration, a customer NODE (in our example, BANK NODE) can send metadata to the service and once the actions that the customer paid for are fulfilled, the customer can request from the service once again to have the edited metadata back, and as a part of the response.

5.3 UC3 scenarios update for the TRUSTS platform

This section lists the UC3 scenarios intended to evaluate the TRUSTS platform.

Firstly, the REL user registers an account. Afterwards, a REL administrator user, grants the appropriate role to the user, so the user can create a service. The REL user logs in, then clicks on Services and fills in the data and continues to upload the required files and clicks finish. Once this is complete, and the service is part of the TRUSTS platform, the consumer (in our case, the BANK user) can search and the

service, the BANK user can go ahead and download the resource files for creating the NODE. Once ready, the BANK user can make a call to the service and get the appropriate results back.

Table 13: UC3 scenarios update for the TRUSTS platform

TRUSTS UC3	**"The data acquisition to improve customer support service"**		
UC3-SC1	**Actors Onboarding and maintenance**		
REQUIREMENTS REFERENCE	FR32, FR36, FR31, FR30, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Service Provider onboarding to TRUSTS platform, in our case BANK (Customer) and REL (Service Provider) connect to the TRUSTS UI, make new accounts and each user gets the appropriate rights/roles.		Registration is successfully completed and both parties can self-register new users. Rights/Roles assignment from both NODE administrators is also tested to function properly, the customer and the service provider can proceed and perform maintenance.	
1. BANK user and REL user connect to the TRUSTS UI. 2. BANK user and REL user request new accounts and partner certificates. 3. IDS administrator fulfils the requests for the certificates and fills the appropriate account information. 4. BANK administrator user and REL administrator user create additional users with the appropriate rights. 5. BANK administrator user changes the rights of other users by changing their roles.			
UC3-SC2	**Services onboarding and maintenance**		
REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR4, FR18, FR19, FR20, FR23, FR24, FR32, FR36, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Create a service, define the description for the service, upload packages and send metadata to the broker. Notifications to the service consumer		REL can create a service, upload the required packages to provide the service. Metadata is sent to and from the customer. Notifications should be sent to the service consumer.	

are not yet implemented.			

1. REL user with the appropriate rights creates services at REL's premises.
2. REL user connects to the UI portal.
3. REL user defines new service description.
4. REL user uploads packages for the services.
5. REL user sends the metadata to the broker.
6. REL user updates a service by uploading a new version of it.
7. Notifications are being sent with the form of messages to any consumer of the services.

UC3-SC3	**Catalogue search for data and services**		
REQUIREMENTS REFERENCE	FR5, FR6, FR7, FR8, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
The BANK user can connect to the CENTRAL NODE and search for a service, a service can be selected, and the user can choose to sign a contract with the partner to buy their services. Contract payment and signing is not yet implemented.		The BANK user should be able to connect successfully on the CENTRAL NODE and be able to search for a service. Once a service is selected, the user can choose to sign a contract with the partner for the service provider to provide their services.	

1. BANK user connects to UI portal.
2. BANK user searches for REL's service.
3. BANK user selects REL's service.
4. BANK user gets the result of the service in the form of a package.
5. BANK user initiates a contract.

UC3-SC4	**Download/Consume data**		
REQUIREMENTS REFERENCE	FR18, FR24, FR29, FR36, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
REL provides a service. BANK requests from the service provider the		REL can successfully provide a service on the TRUSTS platform. The BANK can	

result of the service. BANK receives the processed result from the service provider (REL).		request the result from the service provider and successfully receive back their result.	
1. REL offers a service. 2. BANK issues a request for a service. 3. BANK receives the result of the service.			

5.4 UC3 scenarios update for the TRUSTS platform

This section lists the UC3 scenarios intended to evaluate the UC3 applications.

Table 14: UC3 scenarios update for the UC3 applications

TRUSTS UC3	**"The data acquisition to improve customer support service"**		
UC3-SC5	**Service Usage Analysis and Billing (service inclusion in the marketplace)**		
REQUIREMENTS REFERENCE	FR10, FR11, FR12, FR13, FR14, FR15, FR16, FR17, FR33, FR36, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
REL receives payment from BANK user, a contract is established for the allowance of the service and the history of transactions is provided to them.		REL successfully receives payment from BANK user, a contract is established for the allowance of the service and the history of transactions is provided to them.	
1. REL launches the availability of the service on the date mentioned in the contract. 2. The TRUSTS platform records all activity between BANK and REL. 3. BANK requests the history of transactions from TRUSTS that REL provided within the period of the contract. 4. TRUSTS checks the authentication of the request. 5. TRUSTS sends transaction information. 6. BANK receives the information and stores them. 7. REL requests payment from the BANK. 8. BANK pays the bill and sends the payment information to TRUSTS and REL. 9. A notification is sent to REL and the transaction closes. 10. After the expiration of the contract REL stops providing the service to the BANK.			
UC3-SC6	**Security Auditing**		

REQUIREMENTS REFERENCE	FR21, FR22, FR25, FR29, FR36		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Authorized users connect to the TRUSTS portal, search for a transaction and view rating reports.		Authorized users can successfully connect to the TRUSTS portal, search for a transaction and view rating reports.	
1. Authorized users connect to the portal UI. 2. Authorized users search for transaction information. 3. Authorized users rate a single transaction or any party that participated in the transactions. 4. Authorized users view rating reports.			

5.5 Functional Requirements per UC3 scenario

Significant effort was made in order that all FRs defined in the D2.3 deliverable are evaluated through the UC3 scenarios defined above. The FRs per UC3 scenario are included below, in Table 15:

Table 15: Functional Requirements per UC3 scenario

UC3-SC	1	2	3	4	5	6		1	2	3	4	5	6		1	2	3	4	5	6
FR1		V					**FR23**		V					**NFR1**						
FR2		V					**FR24**		V		V			**NFR2**						
FR3		V					**FR25**						V	**NFR3**						
FR4		V					**FR26**							**NFR4**						
FR5			V				**FR27**							**NFR5**						
FR6			V				**FR28**							**NFR6**						
FR7			V				**FR29**				V		V							
FR8			V				**FR30**	V												
FR9							**FR31**	V												
FR10					V		**FR32**	V	V											
FR11					V		**FR33A**					V								

FR12					V		**FR33B**					V							
FR13					V		**FR34**												
FR14					V		**FR35**												
FR15					V		**FR36**	V	V		V	V	V						
FR16					V		**FR37**												
FR17					V		**FR38**												
FR18		V		V			**FR39**												
FR19		V					**FR40**												
FR20		V					**FR41**												
FR21						V	**FR42**												
FR22						V	**FR43**												
							FR44	V	V	V	V	V							

5.6 UC3 scenarios applicability per MVP release

The UC2 scenarios set to be used in the trials following the platform releases are presented in Table 16 below.

Table 16: UC3 Scenarios applicability per MVP release

UC3 Scenarios	MVPv.2	MVPv.3
UC3-SC1 - Actors Onboarding and maintenance	√	√
UC3-SC2 - Services onboarding and maintenance	√	√
UC3-SC3 - Catalogue search for data and services	√	√
UC3-SC4 - Download/Consume data	√	√
UC3-SC5 - Service Usage Analysis and Billing (service inclusion in the marketplace)	√	√

UC3-SC6 - Security Auditing	√	√

5.7 UC3 evaluation KPIs

The below Table 17 presents the UC3 evaluation KPIs.

Table 17: UC3 evaluation KPIs

KPI	Baseline Value	Target Value (M36)	Process to meet the target KPIs
Ability of TRUSTS to create a federated data marketplace ecosystem.	None	Federation ability of the platform with external marketplaces. Business models building on federation potential.	Perform adequate number of trials.
Ensure GDPR and other regulations compliance.	GDPR compliance by design	GDPR compliance by design	TRUSTS admin operation and respective technological support (e.g., logs maintenance and analysis ensure compliance and quality. Perform adequate number of trials.
Number of data providers interacting with the Platform.	2	>10	To achieve this the project needs to involve additional data providers using dissemination activities.
Number of end-users interacting with the Platform.	2	>10	To achieve this the project needs to involve additional data providers using dissemination activities.

6 Second Evaluation phase planning

This section documents the overall planning of the second demonstration phase of TRUSTS, following a more mature progress through the project.

6.1 Objectives of Cycle 2 of TRUSTS UCs trials

The trials designed and executed in the first evaluation cycle of TRUSTS were well defined to address all aspects of the implementation and produced sound results. Nevertheless, an agreement occurred that augmenting the trials in a way that demonstrates the multi-subscriber's platform usage, as discussed during the project's review (September 2021), could be significant towards proving and disseminating the advanced TRUSTS technical and business proposition. To this end, WP5 aims at adapting the trials design of the subsequent cycles in this direction.

Each of the three business-oriented UCs demonstrated different abilities of the unified platform. WP5 aims at augmenting the trial scenarios in a way that they clearly demonstrate the platforms' ability to trade data assets, collaborate and fulfil stringent business requirements in a unified environment including a significant number of assets and stakeholders. In this way the ability of the operational platform to support efficiently and in a trustworthy manner multiparty usage towards creating a federated data ecosystem will be clearly evaluated and demonstrated.

The vision for the second demonstration phase is to follow the subsequent direction:

- User Experience testing,
- Functional Testing (to ensure that users can use features and functionality without any issues),
- System testing and unit testing,
- Performance Testing,
- Security Testing,
- Device and platform Testing (able to handle the load and perform well even when usage spikes).

6.2 Implementation and testing to project end

The TRUSTS vision is to be tested via the two demonstration phases by potential end-users. The second demonstration phase will primarily verify that an operational marketplace has been provided with characteristics of an operational marketplace being able to be used by "common users" via incorporating the mock-up designed under WP3, in the platform liaising the functionality with the UI.

In Cycle 2 trials and beyond TRUSTS must safeguard that most of the D2.3 FRs have been implemented.

Beyond the trials that each UC will perform on its own, all 3 UCs intend to perform common trials to imitate real life transactions testing scalability as well. Multiple corporate nodes will be created, and each node will upload several assets to populate the platform.

Enriching the feedback with more responses to questionnaires from more stakeholder's engagement and trials session popularity, supplementary external stakeholders will be employed to use the platform in the second demonstration cycle (from January 2022) to have the evaluation before implementing the final version of the platform, such as:

i. More stakeholders.
ii. All partners from the Consortium.
iii. SAB members involvement.

iv. Universities and institutes that participate in the consortium (TUD, FhG, LUH, FORTH, KUL) to organise code sprints.

The core goal of the UC trials is that the final version of the TRUSTS platform will cover all the essential functionalities as per Table 19, besides being updated through the project lifetime and over the UCs evaluation feedback, all FRs should be tested and hence evaluated.

The MVP version to be available for the second evaluation period of the TRUSTS UCs should have some if not all the required functionalities defined and required so far. The MVP architecture and status is in depth described in its corresponding D2.7 and D3.10.

An initial idea is expected to be able to:

i. Test the fundamental business hypothesis.
ii. Meet the needs of early adopters (TRUSTS UCs).
iii. Allow the product/UC services/apps to be deployed.
iv. Allow to test the platform initial functionalities.
v. Bring added value to the UCs concepts.
vi. Collect the maximum amount of validated learning about the UCs.
vii. Allow early adopters, the three TRUSTS UCs, feedback.

An internal milestone was also set by WP5 and WP3 where the second version of the TRUSTS platform MVP v.2 will be tested between January and April 2022 and a third (perhaps final) version will be provided by WP3 and tested by WP5 between May and July 2022.

Second demonstration cycle (January 2020 – July 2022):

- MVP v.2 trials between January – April 2022
- MVP v.3 trials between May – July 2022

6.2.1 MVP v2

Towards finalising and marketing the TRUSTS product, the need to validate the product concept before beginning its production is essential, to test the TRUSTS idea with real users before committing to the product's full development. WP5 and the demonstration of the TRUSTS UCs is primarily behind this task in collaboration with WP3 that initially shaped a MVP prior to the ultimate development and integration of the platform.

Following MVP v.1 used for the first demonstration phase of the UCs, a new version (MVP v2) was developed for the second demonstration phase where its full status and development aspects are reported in the corresponding deliverable D3.10 submitted December 2021.

The tests will follow the below key facet:

- UI evaluation.
- Scalability / Usage measurement.
- Security and compliance assessment.
- Platforms administrator's/operator's view.
- Federation.
- Open access.
- Service quality evaluation.

6.2.2 MVP v3

The core goal of the UC trials is that the final version of the TRUSTS platform will cover all the essential functionalities as per the updated FRs of D2.3, that should all be tested and hence evaluated.

An internal milestone was set, for a next version of the platform (MVP v3.) by April 2022, where new functionalities and technical/operational enhancements will be available to be tested by the three UCs, in the remaining second demonstration phase duration concluding July 2022.

The tests will follow the below key facet:

- UI evaluation.
- Scalability / Usage measurement.
- Security and compliance assessment.
- Platforms administrator's/operator's view.
- Federation.
- Open access.
- Service quality evaluation.

It is in the project's scope that the E2E platform functionality, processes and operation will be tested through the UC trials to assure the establishment of a unified, comprehensive, viable, expandable, and future proof data marketplace service.

6.3 Second Demonstration E2E platform evaluation scenarios

Enterprise marketplaces provide many tangible benefits to both B2C and B2B companies. TRUSTS Quality Policy is based on four fundamental principles:

- The definition of quality is conforming to requirements, having specified very carefully the needs and expectations of Subscribers, Asset providers and own processes.
- The quality management system concentrates on prevention, looking at TRUSTS service provision processes, identifying the opportunities for error and taking the necessary action to eliminate them.
- The service quality standard is to ensure everyone understands service levels, job roles and responsibilities, and implications of actions.
- The measurement of quality is the cost of non-conformity and the eventual benefit of getting it right.

The below table describes the set of five communal evaluation scenarios, all three TRUSTS UCs will follow in terms of testing and evaluating the TRUSTS platform for:

- Scalability.
- Security and compliance assessment.
- Platforms administrator's/operator's view.
- Federation.
- Open access.
- Service quality evaluation.

Table 18: End to End platform evaluation common scenarios

Common SC1	**Scalability**
REQUIREMENTS REFERENCE	FR1, FR3, FR5, FR6, FR7, FR8, FR9, FR18, FR19, FR20, FR21, FR25, FR27, FR28, FR29, FR31, FR32, FR33A, FR34, FR35, FR36, FR37, NFR4, NFR5, NFR6

SCENARIO TEST PROCEDURE	ASSUMPTIONS & CONSTRAINTS	EXPECTED RESULTS	ADDITIONAL NOTES
To determine the user limit for the TRUSTS platform and ensure end user experience, under a high load, and being able to efficiently handle more and more requests per minute (RPM). Deploy large number of corporate nodes Onboard large numbers of assets	TRUSTS can be accessed in a timely fashion with a limited delay in response, increased demand. At least 50 nodes are deployed. At least 10 assets are deployed per node.	To accommodate growth seamlessly and efficiently, able to handle an increase in users and load, without disrupting the end users.	
Common SC2	**Security and compliance assessment**		
REQUIREMENTS REFERENCE	FR4, FR10, NFR3, FR21, FR22, FR26, FR32, FR33A, FR38, FR39, FR40, FR41, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
To test TRUSTS security preparedness, including checks for vulnerabilities in the systems and business processes. security controls identifying exploitable flaws in the security architecture, detective controls, and preventative controls. *Ensure compliance and operational quality.*	The operator should have the means to observe transaction logs for potential compliance violation (e.g., GDPR) and operational performance and intervene when necessary. The areas considered include, among others: • Trust domains (between federated partners in particular). • Key and certificate management. • Traffic routing. • Authentication of application providers, clients, and applications.	Successful compliance and quality TRUSTS platform operation.	Align IT risk management with business goals, to lower the risk of future attacks. Ensure GDPR compliance.
Common SC3	**Platforms administrator's/operator's view**		
REQUIREMENTS REFERENCE	FR14, FR21, FR22, FR30, FR31, FR32, FR35, FR36, NFR4, NFR6		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure from the operator's point of view compliance and operational quality	The operator should have the means to observe transaction logs and operational	Successful and quality TRUSTS platform operation	

	performance and intervene when necessary. To support the proposed management functionality requirements, need to be included on things like: • trouble ticketing in both directions between operator and platform provider, • support of portals that enable the management and administration tasks of the operator and application provider, • Support for a security framework that allows verifying the onboarded applications, • Support for order management.		
Common SC4	**Federation**		
REQUIREMENTS REFERENCE	FR2, FR4, FR5, FR8, FR10, FR11, FR12, FR13, FR14, FR15, FR16, FR17, NFR1, NFR2, FR27, FR28, FR29, FR37, FR38, FR39, FR40, FR41		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure that federation is achieved with neighbouring marketplaces in terms of metadata/service/ subscriber's catalogue, smart contract, privacy policies.	Each federated system is unique. There are three major players in a federation scenario: an identity provider, a federation provider, and a relying party. At least 3 transactions from federated marketplaces are fulfilled.	To check that all the above will be applicable for both a standalone TRUSTS marketplace and federated marketplaces, (e.g., subscribers, data, and applications reside in different federated marketplaces).	Transactions through federated marketplaces are logged and validated from different marketplaces. Compliance to law is confirmed.
1. TRUSTS federates with external marketplace and privacy is agreed. 2. A process of connection which involves exchange of information (e.g., IP addresses, certificates) between the end-users and TRUSTS operator. 3. The end-users (i.e., NOVA, InBestMe, FORTH) are subscribed to different marketplaces which are federated.			

4. TRUSTS federation functionality and processes are used in this respect towards providing a unified ecosystem to the users. 5. Catalogues are merged.			
Common SC5	**Open Access**		
REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR4, FR6, FR7, FR9, NFR1, NFR3, FR18, FR19, FR20, FR21, FR22, FR23, FR24, FR25, FR26, FR30, FR32, FR33B, FR34, FR37, NFR4, NFR5, FR42, FR43		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Ensure that everyday users can be benefited seamlessly from the TRUSTS services	At least 10 extra-project users use adequately TRUSTS and federated services	At least 10 extra-project users use successfully TRUSTS and federated services	
Common SC6	**Service quality evaluation**		
REQUIREMENTS REFERENCE	FR1, FR3, FR5, FR6, FR10, FR11, NFR1, NFR2, NFR3, FR18, FR19, FR20, FR27, FR28, FR29, FR30, FR31, FR32, FR33B, FR34, FR35, FR36, FR37, NFR4, NFR5, NFR6, FR42, FR43, FR44		
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ADDITIONAL NOTES**
Collect users' evaluation and if needed to improve operations.	At least 100 contracts are fulfilled.	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations to improve performance existence.	Collect users' evaluation and if needed to improve operations.

6.4 Functional Requirements per Common Scenarios

The common scenarios supplement the UC scenarios aiming at evaluating the E2E operational features of the TRUSTS platform. Similar to the respective UCs scenarios, significant effort was made to address the final FRs defined in the D2.3 deliverable. Table 19 below outlines the FRs per common scenario.

Table 19: Functional Requirements per Common Scenario

Common scenario:	1	2	3	4	5	6		1	2	3	4	5	6		1	2	3	4	5	6
FR1	√				√	√	**FR23**					√		**NFR1**				√	√	√
FR2				√	√		**FR24**					√		**NFR2**				√		√
FR3	√				√	√	**FR25**	√				√		**NFR3**		√			√	√
FR4		√		√	√		**FR26**		√			√		**NFR4**	√		√		√	√
FR5	√			√		√	**FR27**	√			√		√	**NFR5**	√				√	√
FR6	√				√	√	**FR28**	√			√		√	**NFR6**	√		√			√
FR7	√				√		**FR29**	√			√		√							
FR8	√			√			**FR30**			√		√	√							
FR9					√		**FR31**	√		√			√							
FR10		√		√		√	**FR32**	√	√	√		√								
FR11				√		√	**FR33A**	√	√											
FR12				√			**FR33B**					√	√							

FR13				√			**FR34**	√				√	√						
FR14			√	√			**FR35**	√		√			√						
FR15				√			**FR36**	√		√			√						
FR16				√			**FR37**	√			√	√	√						
FR17				√			**FR38**		√		√								
FR18	√				√	√	**FR39**		√		√								
FR19	√				√	√	**FR40**		√		√								
FR20	√				√	√	**FR41**		√		√								
FR21	√	√	√		√		**FR42**					√	√						
FR22		√	√		√		**FR43**					√	√						
							FR44		√				√						

6.4.1 Scenarios applicability per MVP release

The below Table 20 shows the correlation of the defined scenarios and the different TRUSTS platform versions developed and are set to be evaluated within the second evaluation phase of TRUSTS.

Table 20: Common scenarios applicability per TRUSTS MVP release

Scenarios	MVP v.2	MVP v.3
SC-Common-1: Scalability	√	√
SC-Common-2: Security and compliance assessment	√	√
SC-Common-3: Platforms administrator's/operator's view	√	√
SC-Common-4: Federation		√
SC-Common-5: Open access	√	√

6.5 Monitoring of the UCs progress

The detailed approach, on how the UCs are monitored, was initially described in D5.1. However, for the purpose of the current report a summary of the key areas addressed to offer a coherent review of the management endeavour.

The PDCA model is a supportive tool used for WP5 and T5.1 regarding the planning of the UC trials. It is a systematic process for gaining valuable learning and knowledge for the continual improvement of a product, process, or service, also known as the Deming Wheel. In general, it is a helpful tool and a key element of lean management that is used when exploring and testing multiple solutions in a small, controlled trial while developing or continually improving a process[16]. Following the PDCA model, the process improvements were broken into smaller steps as it was documented in more detail in D5.1.

Figure 1 of this report, presents the overall WP5 time plan throughout the lifetime of the project, involving the UCs trials and partly the correlated WP2 tasks, in respect to the Business and Technical Validation periods defined and reported in D2.4, later updated in D2.5. It also demonstrates the WP5 duration along with its three tasks (T5.1, T5.2 and T5.3) and the T5.1 duration illustrates the ongoing monitoring and planning of the UCs trial environment, aligned with T5.2 which includes the two trial execution cycles.

6.6 TRUSTS validation and lessons learnt

The alignment with the evaluation methodology of T2.3 is also given, by performing the three BVs and the two TVs. The objective of the BV as per D2.4, is to validate the three UC's business wise and develop business plans for the UCs with the highest commercial potential. As a must in view of the essential risks related with entering the market without knowing if you have got it right since the beginning, the first BV was performed by October 2020. The first TV was performed by October 2021 with the objective to validate the three UC's technical wise using user acceptance tests for the UCs to provide the potential highest commercialization. Both validations gave valuable feedback back to WP2, WP3 and WP5 as per the planning of the second demonstration phase of the UCs.

[16] Lucidchart, [Online] https://www.lucidchart.com/blog/plan-do-check-act-cycle.

Moreover, as presented in Figure 1, following the defined sets, the second BV and TV set is being performed focusing on the second demonstration phase of TRUSTS with the BV performed prior the start of the second cycle of trials, between November and December 2021 that gave input to this report as per the planning of the second cycle of the project's trials, as well as to the respective deliverables of each UC reporting on the actual field trials and environment of the second cycle of trials, concluding in August 2022.

The second TV is planned to be performed between January 2022 (M25) and May 2022 (M29), allowing the validation of the Marketplace versions delivered by WP3 and the provided services during the second set of trials by utilising the defined test procedures and the reporting structure, and validation of results regarding technology. This validation will be aligned with the milestone's timeline since it is initiated right after Milestone 4 "End of second period" (M24) and performed by the UC participants during the second set of UCs trials, allowing them to check and validate the outcome of the technical implementation and document the results using the defined templates reported in D2.5. This last round of TV will evaluate the complete environment from a technical, performance, expandability perspective and define the quality of the operation. The output will be an input back to WP3 for the refinement of the implemented solution.

The third and final round of the BV is set to be performed between July and October 2022 (M30 to M33) and will allow the evaluation of the complete environment from a performance and business point of view, via the measurement of the UCs KPIs and validation of their results, to define the gap towards commercialising the environment.

7 Conclusions and Next Actions

The deliverable D5.2 has provided the planning and monitoring aspects of the UCs intended for the second demonstration cycle of TRUSTS trials, to be performed between January 2022 and July 2022, and as well an overview of the previous version of this deliverable, as a bottom line that was based on the first demonstration cycle.

The report in its first version provided the overall UCs plan and emphasis on the activities and the time schedule for implementation, the monitoring of each UC and the workflow to be followed, the KPIs set and how the measurements will be carried out at the end of the demonstration phases.

The report gives confidence that the testing phase which initiated in M16 (May 2021), generated results and measurable KPIs that provided a clear insight on the UCs performance as well as validated the value of the TRUSTS platform and services in their business cases.

D5.2 laid out the methodology set to be used by the three UCs regarding the second demonstration cycle of trials and each UCs three sets of scenarios to be followed:

1. UCs scenarios to evaluate the TRUSTS platform
2. UCs scenarios to evaluate each UCs applications and business aspects
3. UCs common scenarios for the E2E platform evaluation

The scenarios and steps defined and documented to be followed by the three UCs will evaluate, as per the project's scope, that the E2E platform functionality, processes and operation through the UC trials guaranteeing the establishment of a unified, comprehensive, viable, expandable, and future proof data marketplace service.

The outcome of the second demonstration cycle will give feedback mainly back to WP3 for further and final iterations till the end of the project.

The final and latest version of this report, D5.3, will provide an insight to the UCs conclusions drawn and will be submitted by the end of the second cycle of trials and just about the end of the project as per the following Table 21, in M33 (September 2022). The report will conclude the insights gained throughout the Task 5.1 and the TRUSTS implementation regarding the planning of the execution of each of the three business-oriented UCs following the two demonstration cycles defined for TRUSTS.

Table 21: Following 'Pilot planning and operational management Reports'

D#	Deliverable name	Lead	Due date
D5.3	Pilot planning and operational management reports III	eBOS	M33 (September 2022)