D5.1 ‘Pilot planning and operational management report I’

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TRUSTS Trusted Secure Data Sharing Space

D5.1 'Pilot planning and operational management report I'

Document Summary Information

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Glossary of terms and abbreviations used

Abbreviation / Term	Description
AI	Artificial Intelligence
AML	Anti-money Laundering
API	Application Programming Interface
Application(s)	A piece of software that is executed on the consumer's infrastructure.
CRM	Customer Relationship Management
D	Deliverable
DMA	The Data Market Austria project is a pioneer of the data services ecosystem in Austria aimed to provide a data innovation environment by improving technology for secure data marketplaces and cloud interoperability[1].
DoA	Description of Action
E2E	End to End
EC	European Commission
ER	Evaluation Result
ERP	Enterprise Resource Planning
EU	European Union
Federation	TRUSTS can enter agreements with third-party operated marketplaces so that the assets listed in said marketplaces be tradable in TRUSTS and vice-versa, to the extent possible by technical means. Each such marketplace is said to be a Marketplace federated with TRUSTS.
FR(s)	Functional Requirement(s)
GA	Grant Agreement
GDPR	General Data Protection Regulation
GRID	Global Regulatory Information Database
GUI	Graphical User Interface
HCI	Human-Computer Interaction
IDS	The International Data Spaces Association aim is to unlock the data economy of the future by providing the blueprint for secure, self-determined data exchange among trusted partners.

[1] *Höchtl and Lampoltshammer, 2017*

KDC	Key Distribution Centre
KPI(s)	Key Performance Indicator(s)
KYC	Know Your Customer
Metadata	Metadata is "data that provides information about other data". In other words, it is "data about data". Many distinct types of metadata exist, including descriptive metadata, structural metadata, administrative metadata, reference metadata and statistical metadata.
ML	Machine Learning
MVP	Minimum Viable Product
NDA	Non-Disclosure Agreement
NGO	Non-Governmental Organisation
On-Boarding	The action of integrating new apps/services into the platform
PDCA	Plan–Do–Check–Act
PEP	Politically Exposed Person
PSI	Private Set Intersection
QoS	Quality of Service
SaaS	Software as a Service
SAR	Suspicious Activity Report
Service(s)	A piece of software that is executed on the provider's infrastructure and that answers requests by the consumer.
SLA	Service Level Agreement
SME(s)	Small Medium Enterprise (s)
Subscription	Selling a product or service to receive monthly or yearly recurring subscription revenue, to pay money to an organization in order to receive a product or use a service regularly.
SUS	System Usability Scale
T	Task
TBD	To Be Declared
TRUSTS	Trusted Secure Data Sharing Space
TRUSTS Platform	A fully operational and GDPR-compliant European Data Marketplace for personal related data and non-personal related data targeting both personal and industrial use platform based on the experience of two large national projects (DMA and

	IDS), enriching them with new functionalities and services, while allowing the integration and adoption of future platforms. The TRUSTS platform will act independently and as a platform federator.
UC(s)	Use Case(s)
UI	User Interface
UX	User Experience
VH	Value Hypothesis
WP	Work Package

1 Executive Summary

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

This is the first version of the Project's Deliverable D5.1 ''Pilot planning and operational management report I'', addressing the Task 5.1 "Planning, setup and operational management", along with the work that has been performed under WP2 (T2.2 "Testing framework and benchmarking", T2.3 "Testing Framework"), and WP3 accordingly (T3.1 "Infrastructure set-up and technical operations", and T3.5 "Platform Development and Integration").

The purpose of this deliverable is to set up the procedure for the implementation and testing plan for the UCs which will be continuously updated and reported at the end of each demonstration phase. In the following sections, a description is given with regard to the preparation of the first phase of the trials, which starts in April 2021, according to the Grant Agreement (GA).

This deliverable's goal 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 and best practices. These procedures were structured, and validated by all project partners before the actual implementation, in order to check their feasibility and applicability of the UCs and maximize its efficiency.

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 Deliverable 2.4 and describes an overall plan of the trials; in which sequence will these activities take place to achieve their objectives.

This was done by following the Plan–Do–Check–Act (PDCA)[2] cycle model as detailed throughout the report. The PDCA is a helpful tool and a key element of lean management that is being used to accompany the exploring and testing of the TRUSTS solutions in a controlled demonstration stage while developing or continually improving the process[3]. 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 key tasks and responsibilities of the project and all the relatable WPs, not only WP5, is also indicated in this Deliverable, along with the different interactions within this process.

The process described in this Deliverable will be continued within the lifetime of the project, and all the activities, implementation, deployment and testing of the UC's will be monitored, alongside the two upcoming and updated periodical reports, D5.2 and D5.3 to be submitted on M25 (January 2022) and M33 (September 2022) respectively.

[2] *The W. Edwards Deming Institute https://deming.org/explore/pdsa/*
[3] *Lucidchart https://www.lucidchart.com/blog/plan-do-check-act-cycle*

2 Introduction

TRUSTS 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.

TRUSTS will ensure 'trust' in the concept of data markets as a whole via its focus on developing a platform based on the experience of two large national projects, while allowing the integration and adoption of future platforms. The TRUSTS platform will act both independently and as a platform federator, while investigating the legal and ethical aspects that apply on the entire data valmorification chain, from data providers to consumers.

The project includes three UCs in total, involving the processing of aggregated personal (e.g., name, surname, nationality) and public data (e.g., RDC[4]) for the testing and validation of the TRUSTS platform. Depending on the particularities and specific characteristics of the UCs, described within this deliverable, the appropriate guidance towards compliance with the Horizon 2020 (H2020) ethical guidelines and the European Union (EU) data protection framework will be provided before the start and during the carrying out of the trial.

D5.1 "Pilot planning and operational management report" is the first 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 Use Cases" and its purpose is to give a detailed analysis of the planning and operational procedures to be followed by the three business-oriented use cases (UCs).

The objectives of this first version of the deliverable are essentially to set-up the plan, processes and the monitoring of the UCs progress and implementation. It accommodates the implementation and testing plan of the UCs for the first phase of the trials starting in April 2021, and summarizes the actions taken so far. Additionally, the business and functional requirements (FRs) are acknowledged as defined in D2.2. It details the three UCs and the methodology selection of using the PDCA model in managing, planning and monitoring this achievement and its progression.

It also refers to the functionalities required for the planning and execution of the first phase of the trials. These results add to the overall work done by WP2 "Requirements Elicitation and Specifications" and WP3 "TRUSTS Platform Implementation".

The TRUSTS technology and UCs will be accompanied by business, legal and ethical considerations, which will ensure that the results of the project are sustainable beyond its duration.

This document will be updated at the end of each demonstration phase considering any updates and recommendations arising from them, during the life cycle of the project. A second version, D5.2 will be produced in month 25 of the project (January 2022) endorsing the first phase of the trials (April 2021-December 2021), while focusing on the second phase of the UC's trials preparation. An updated third and final version of this report will be submitted as well after the end of the second UC's trials phase (August 2022), in month 33 (September 2022) as D5.3 "Pilot planning and operational management report III".

Briefly this deliverable reports the status of WP5 and T5.1 "Planning, setup and operational management" and summarizes the efforts taken thus far in the interrelated WPs (WP2 and WP3).

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

2.1 Mapping Projects' Outputs

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 below, relates the information included in the Deliverable to the information required for the Deliverable and the Task addressed, T5.1.

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*	*Section 3,* *Section 4,* *Section 5,* *Section 6,* *Section 7,* *Section 8*	In the formation of the report, an overall Project and WP abstract is offered. The interconnection with the rest of the WPs is highlighted, summarizing their effort throughout the first year of the project. These sections are exclusively related to the planning and the operational management of the three UC's first phase trials, the framework for testing the TRUSTS solution, including the UCs objectives and the expected outputs, challenges, risks, assumptions, requirements, and KPIs along with the data management and future exploitation of each UC are discussed.

	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 Manager, FNET, 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 FNET). 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.		
TRUSTS Deliverable			
D5.1 'Pilot planning and operational management report I' The deliverable contains the implementation and testing plan for the pilots, updated at the end of each demonstration phase period.			

2.2 Deliverable Overview and Report Structure

The document is part of the T5.1, a management and monitoring task for the series of the three UCs. Based on the objectives and the work carried out under T5.1, D5.1 reports on the project's three business-oriented UCs execution planning, setup and operational management with respect to their implementation and accomplishment.

Section 1 is the Executive Summary.

Section 2 is serving as the introduction of the report by describing its objectives, the overview and its structure. Section 2 provides a detailed description of the TRUST's goals and Task description as well

as the mapping to the deliverables' output with information on how these are addressed in the report's different sections.

The rest of the document is organized as follows:

In Section 3, a synopsis is shared of the TRUSTS project and its objectives, as a foundation to this report and provides the related Work Package (WP) overview along with an outline explanation of the three UC's. Section 3 also offers a description of the activities and task allocation as well as the responsibilities within WP5 with specification to T5.1.

Section 4 allows an interconnection with the rest of the WPs, highlighting and summarizing their effort throughout the first year of the project.

Section 5 describes the Pilot planning and presents the Gantt Chart prepared for the UC's trials under this task and the related WP effort. Section 5 also covers the methodology developed and used for the first phase of the UC trials as well as the functionalities required.

Section 6, Section 7 and Section 8 describe the three UCs covering:

- UC concept, objectives and outcomes,
- TRUSTS functionalities required,
- UC Scenarios and flow,
- Envisioned Architecture,
- Challenges, risks and assumptions,
- KPI's overview,
- Data management,
- Future Exploitation.

Section 9 concludes on the findings of the report along with its outcomes combined with the planned next actions.

Section 10 shares the bibliography used.

Finally, three Annexes are added to the Deliverable namely:

- Annex I: TRUSTS Generic Initial Gantt Chart (as per the GA)
- Annex II: TRUSTS GA Objective 1
- Annex III: Initial version of the TRUSTS functional requirements as defined in D2.2.

3 TRUSTS and WP5 overview

This section delivers a synopsis of the TRUSTS project and its objectives, as a foundation to this report and then it offers a WP5 overview along with an analysis of the three UC's. It also includes a description of the activities and task allocation within WP5 with specification to T5.1.

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. **This is why TRUSTS will make the difference in the sphere of data technology and data innovation while the data market is empowering in Europe and worldwide.**

3.1 TRUSTS objectives

The main objective of TRUSTS is to ensure 'trust' in the concept of data markets as a whole, via its focus on developing a platform that will act independently as a platform federator, while investigating the legal and ethical aspects that apply on the entire data valorisation chain, from data providers to consumers.

TRUSTS will:

1. Set up a fully operational and GDPR compliant European Data Marketplace, targeting individual and industrial use.
2. Demonstrate and realize the potential of the TRUSTS Platform in three UCs targeting the industry sectors of corporate business data in the financial and operator industries while ensuring it is supported by a viable, compliant and impactful governance, legal and business model.

3.2 Demonstration of the TRUSTS platform, Work Package 5 Overview

This integration will be tested in practice by three different UCs, identified as most promising by the consortium. WP5, according to the GA is designed to focus on demonstrating and validating the TRUSTS Platform, by:

- Setting up the test environment and performing the relevant planning and pilot operational management for trials in three pilots;
- Conducting advanced field trials within the following sectors: Financial Institutions, Telecom Operators, Corporate data providers, etc.;
- Using the test results and data to deliver impact analysis and impact assessment reports to systematically address the pilots' stakeholder perspectives.

3.2.1 TRUSTS objective associated to WP5

As summarized on the table below (Table 2), the 4th objective of the project is consistent with this deliverable and its focus is on the demonstration of the TRUSTS Platform in three business-oriented UCs.

Table 2: TRUSTS objective associated to WP5

Objective 4	**WP 5 Demonstration of the TRUSTS platform in 3 business-oriented use cases**
To demonstrate the added value of the TRUSTS Platform in **3 business-oriented UCs** which showcase the sharing, trading, (re)use of data and services and result in added value generated through innovative applications built on multiple open and proprietary data sources.	
Achieving this objective will require the implementation of the following three UCs: **UC1** "The Anti-Money Laundering compliance use case": Smart big-data sharing and analytics for Anti-Money Laundering (AML). **UC 2** "The agile marketing through data correlation use case": Agile marketing activities through correlation of anonymized banking and operators' data. **UC 3** "The data acquisition to improve customer support services use case": Data processing and visualisation services for Big Financial Data, specifically to advance new ways of human-computer interaction (e.g., chatbots).	
Measurable outcomes: 1. Implementation and testing plan for the pilots, ready by M14 (February 2021) for the first demonstration phase and updated by M25 (January 2022) for the second demonstration phase; 2. First phase of UC trials completed by M24 (December 2021); 3. Second phase of UC trials completed by M32 (August 2022); 4. 360° performance evaluation and lessons learned report produced in its first version by M25 (January 2022) and in its second version by M33 (September 2022), thus providing a critical evaluation of the findings from the pilots, lessons learned, the degree the KPIs have been met and suggestions for improvements.	

3.3 TRUSTS WP5 Activities and Tasks allocation

This section lists the actions and tasks that oblige to be completed under WP5 aligned with the Gantt chart (Figure 2) of the related activities. The activities allocation for each Task of WP5 is presented in the table below, as per the GA commitments.

Table 3: WP5 Activities and Tasks Allocation

WP5 tasks	
T5.1	**Planning, setup and operational management**
Provides 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.	
Provides the overall planning as well as the setup activities for the deployment and testing of the three UCs.	

Also includes 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.	
Prepares the evaluation of the pilot as per methodology defined in T2.3.	
Prepared a Gantt chart of the expected tests, analysis and feedbacks loops.	
T5.2	**Use case demonstration execution**
Pilot actors will perform actual testing and validation activities in cooperation.	
ST5.2.1	***Smart big-data sharing and analytics for Anti-Money Laundering (AML) compliance.***
The aim is to establish and validate 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 these enriched data can be securely brokered/traded via the Platform to interested customers who need to perform AML checks. Parties interested in the functionalities validated in this UC include: financial institutions, internal corporate audit departments, fiduciaries and corporate service providers, as well as tax advisors, automotive dealers, estate agents.	
ST5.2.2	***Agile marketing activities through correlation of anonymized banking and operators' data.***
The aim is to establish and validate how big data analytics techniques applied on data shared via the TRUSTS Platform can provide timely and meaningful information towards targeting profitable customers at a local level.	
ST5.2.3	***Buying data from a data marketplace to improve Natural Interaction.***
The aim is to advance new ways of human-computer interaction such as chatbots that can act as automated assistants which allow customers to converse about the management of their debt at their own pace and with a personalized experience. The TRUSTS Data Marketplace vision is to create an out-of-the-box analytics solution for the anonymisation and visualisation of Big Financial Data.	
T5.3	**Performance evaluation and lessons learned**
The performance of each UC will be evaluated, particularly from the KPI perspective to illustrate how the TRUSTS platform capabilities can be leveraged for different applications in each UC. The monitoring exercise of T5.1 will feed into the performance evaluation and lessons learned tasks.	
According to the results received from each UC in every agile-based iteration, the task will provide requirements and suggestions to further improve both functional and non-functional capabilities of TRUSTS. Results will be analysed both quantitatively and quantifiably.	
It will also provide and establish systematic feedback loops to WP3 and WP4 for continuous refinement.	
Conclusions and recommendations will be drawn including recommendations for further trial validations.	

Knowledge and findings will be documented in deliverable D5.5/D5.6 together with evaluation reporting and impact assessment for the UCs, and extracting lessons learned for internal dissemination among the consortium, capacity building and external dissemination as appropriate.

3.3.1 TRUSTS Task 5.1

As per the GA and Table 1 of this document, T5.1 focuses on the management and monitoring of the activities for the successful establishment of the three UCs trials in order to validate the TRUSTS platform.

3.3.2 TRUSTS Task 5.2

The actual execution of the three UCs that will start in April 2021, is chiefly under T5.2 'Use case demonstration execution', where the pilot actors will perform the tangible testing and validation activities in cooperation, and their results and effectiveness will continuously assist in improving the Platform.

3.3.2.1 TRUSTS Use Cases

TRUSTS solutions and business aspects will be efficiently tested via a wide range of UCs involving actors that represent all targeted sectors (industry sectors of corporate business data in the financial and operator industries).

The three UCs are:

1. The **'Smart big-data sharing and analytics for Anti-Money Laundering compliance'** UC, aims to demonstrate the capabilities of the TRUSTS platform in providing faster and more accurate detection of financial crime and showcase how enriched data can be securely brokered via the Platform to interested customers who need to perform AML checks.
2. The '**Agile marketing activities through correlation of anonymized banking and operators' data'** UC, whose intention is to validate how big data analytics techniques applied on data shared via the TRUSTS Platform can provide timely and meaningful information towards targeting profitable customers at a local level.
3. The '**Buying data from a data marketplace to improve Natural Interaction'** UC objective is to create an out-of-the-box analytics solution for the anonymisation and visualisation of Big Financial Data.

Further analysis of the three UCs is established in their corresponding section of this report, Section 6 (UC1), Section 7 (UC2) and Section 8 (UC3).

3.3.3 TRUSTS Task 5.3

Final task of this WP, T5.3, will evaluate the performance of each UC from a KPI perspective to illustrate how the TRUSTS platform capabilities can be for diverse applications in each UC. The monitoring exercise will feed into the performance evaluation and lessons learned under this task. Lastly, according to the results received from each UC in every iteration, this task will provide requirements and suggestions to further improve both functional and non-functional capabilities of the TRUSTS platform.

Overall, the project's technical development team will support the operation of the UC's by addressing all technical issues related to the operations of the TRUSTS Platform for Data sharing and trading along with the technology innovations and progress so far in WP3 and WP4 that are effectively adopted in WP5.

4 Modelling, Setup and Implementation of the TRUSTS UCs

The below table lists the tasks involved during the modelling, setup and implementation of the TRUSTS UCs, along with the expected commitments. It is clear that almost all the partners, especially the technical ones are involved in this development. This can be identified in the below Table 4, which lists the tasks that need to be implemented affecting the progress and effort of WP5 and the UCs trials while being aligned with the initial Generic Projects' Gantt Chart which is also included in Annex I: "TRUSTS Initial Generic Gantt Chart, as in the GA"of this document.

4.1 Related WPs, Tasks and Deliverables

This section offers a recap of the related WPs and Deliverables.

Table 4: Tasks in related WPs

Tasks in related Work Packages	
WP2	**Requirements Elicitation and Specification**
T2.2	**Industry-specific functional requirements elicitation and analysis**
(a)	Systematic compilation of current data marketplace initiatives, industry related needs, features and capabilities as well as regulatory trends, legislation and standardisation.
(b)	Requirement's analysis and E2E service definition.
(c)	Establishment of the targeted data marketplace functions for the financial and operators' sector and the vertical and cross functional UCs aiming at demonstrating and benchmarking the E2E data marketplace operation and value added to the industry.
T2.3	**Testing framework and benchmarking**
(a)	Methodology definition and toolset for a comprehensive and robust analysis of the data marketplace technologies and the vertical UCs.
(b)	A suite of test cases to measure the functionality and performance.
(c)	A detailed set of metrics parameters considered for the business validation of each UC.
T2.4	**Architecture design and technical specifications**
(a)	The specification of an architectural design of the TRUSTS platform.
(b)	Technologies and methods to actually implement the architecture.
WP3	**TRUSTS platform Implementation**
T3.1	**Infrastructure set-up and technical operations**
(a)	A stable and secure environment for developing and hosting the project's components.
(b)	Employ DevOps and all the state-of-the-art mechanisms to support the architecture and specifications defined in T2.4.
(c)	Setup, administration and security.
(d)	Components of the platform for the integration of external datasets and platforms can be deployed, updated and maintained easily in production and test environments.
T3.5	**Platform Development & Integration**
(a)	Implementation, testing and deployment of the TRUSTS platform components.

(b)	Assets from existing platforms (IDS[5], DMA[6]) will be reused, enhanced and adapted to cover the specifications of T2.4.
(c)	General functionality (e.g., dataset and participant registrations)
WP4	**Privacy Preserving Technologies**
T4.1	**Privacy Preserving Data Analytics**
(a)	Cryptographically secure techniques that enable us to perform analysis on privacy-sensitive data.
(b)	Lose coordination with the UCs, investigate the design, security and efficiency of the cryptographic primitives involved in building such a system.
(c)	A clear recommendation on the choice of algorithms to perform data analysis suitable for the UCs.
T4.2	**Privacy Preserving Transfer Learning and Classification**
(a)	Considers ML algorithms with an emphasis on classification methods.
(b)	A clear guideline, which algorithmic approaches for classification, making use of transfer learning, will be most promising and suitable for the context of the project and which will be further developed.

The information provided in D5.1 is closely related to that provided in the deliverables D1.6, D2.2, D2.4, D2.6, D3.1, D3.9 and to the activities and work performed in their respective tasks and other pertinent WPs as described below.

- WP1, comprises activities related to the management of this project.

D1.6 'Data Management Plan' shares details on data characteristics, privacy preserving security plans and authorisations and answers to data security and privacy challenges, such as where the data will be physically processed and what physical security protection features and privacy protocols will be implemented throughout the project.

- WP2, involves activities related to the elicitation of requirements and the definition of specifications for the TRUSTS Platform.

The first release of the D2.2 'Industry specific requirements analysis, definition of the vertical E2E data marketplace functionality and UCs definition' consists of the detailed analysis of the initial version of the 44 functional requirements (FRs) for the TRUSTS platform ranging from the functionality to the operation of the service and the UCs definition including the target KPIs that sets the benchmarking for the actual measurements[7].

The E2E platform functionality, processes and operation will be tested through the UC trials in order to assure that they will establish a unified, comprehensive, viable, expandable and future proof data marketplace service.

D2.4 "Methodologies for the technological/business validation of use case results I" sets the framework of commercial value testing and user experience (UX) fulfilling the T2.3 objective, by validating the business viability of the three UC's and developing business plans with the highest

[5] *IDS: The International Data Spaces Association aim is to unlock the data economy of the future by providing the blueprint for secure, self-determined data exchange among trusted partners.*

[6] *DMA: The Data Market Austria project is a pioneer of the data services ecosystem in Austria aimed to provide a data innovation environment by improving technology for secure data marketplaces and cloud interoperability.*

[7] *FNET D2.2 'Industry specific requirements analysis, definition of the vertical E2E data marketplace functionality and use cases definition I'* [D2.2-Industry-specific-requirements-analysis-definition-of-the-vertical-E2E-data-marketplace-functionality-and-use-cases-definition-I.pdf (trusts-data.eu)]

commercial potential. Moreover, information on the TRUSTS data marketplace with respect to business and technological validation was analysed and presented[8].

Furthermore, D2.6 "Architecture design and technical specifications document I" is the first version of the periodically reported TRUSTS platform specification that is based on the results communicated in the previously mentioned D2.2. The document describes the architectural decisions taken and their rationale. Furthermore, D2.6 [9] reports on the application of the testing and benchmarking framework provided by T2.3 and D2.4.

- WP3, implements the requirements and specifications as defined in WP2.

D3.1 'Infrastructure set-up and technical operations' was submitted in month 3 (March 2020). This deliverable provided an overview of the infrastructure and guidelines on how to manage the environment set up in the TRUSTS context, so that the development team can use the most crucial services at an early stage of the project[10]. The goal was to have a development environment ready from the beginning of the project for the technical partners to be able to initiate development. The design provided was an initial version, which was improved and updated in the second version of this deliverable, D3.2 "TRUSTS Infrastructure II" submitted in M12 (December 2020).[11]

Additionally, D3.9 supported deliverable, D5.1, since it is reporting on the current state of the platform regarding its functionality and operational parameters[12].

- WP4 overall results give a clear recommendation and guidelines on the choice of algorithms to perform data analysis suitable for the three UCs. These recommendations include algorithmic approaches for classification, making use of transfer learning, most promising and others suitable for the context of the project. This research reinforces this deliverable as they were considered throughout the planning of the UCs environments and the technology innovations of WP3 and WP4 that are effectively adopted in WP5.
- WP6 identifies relevant legal rules and ethical principles, and provides guidance for their implementation in the course of the project's development as well as guidance to the partners in order for the UCs to be carried out and be compliant with the principles of research ethics. WP6 analyses the European laws and regulations relevant to TRUSTS, for the UCs to define a set of legal and ethical requirements and identify potential legal and ethical obstacles.

[8] *EBOS D2.4 Methodologies for the technological / business validation of use case results I* D2.4-Methodologies-for-the-technological-and-business-validation-of-use-case-results-I.pdf (trusts-data.eu)
[9] *D2.6 Architecture design and technical specifications document I* DELIVERABLES - TRUSTS (trusts-data.eu)
[10] *LST D3.1 Infrastructure set-up and technical operations* https://www.trusts-data.eu/wp-content/uploads/2020/10/D3.1-TRUSTS-Infrastructure-I.pdf
[11] *LST D3.2 TRUSTS Infrastructure II* D3.2-TRUSTS-Infrastructure-II.pdf (trusts-data.eu)
[12] *REL D3.9 Platform Status Report I* DELIVERABLES - TRUSTS (trusts-data.eu)

Figure 1 below illustrates the above-mentioned relationships of the related documentation and WP expected outcome with the current state of D5.1 report that should be read in conjunction and not in isolation.

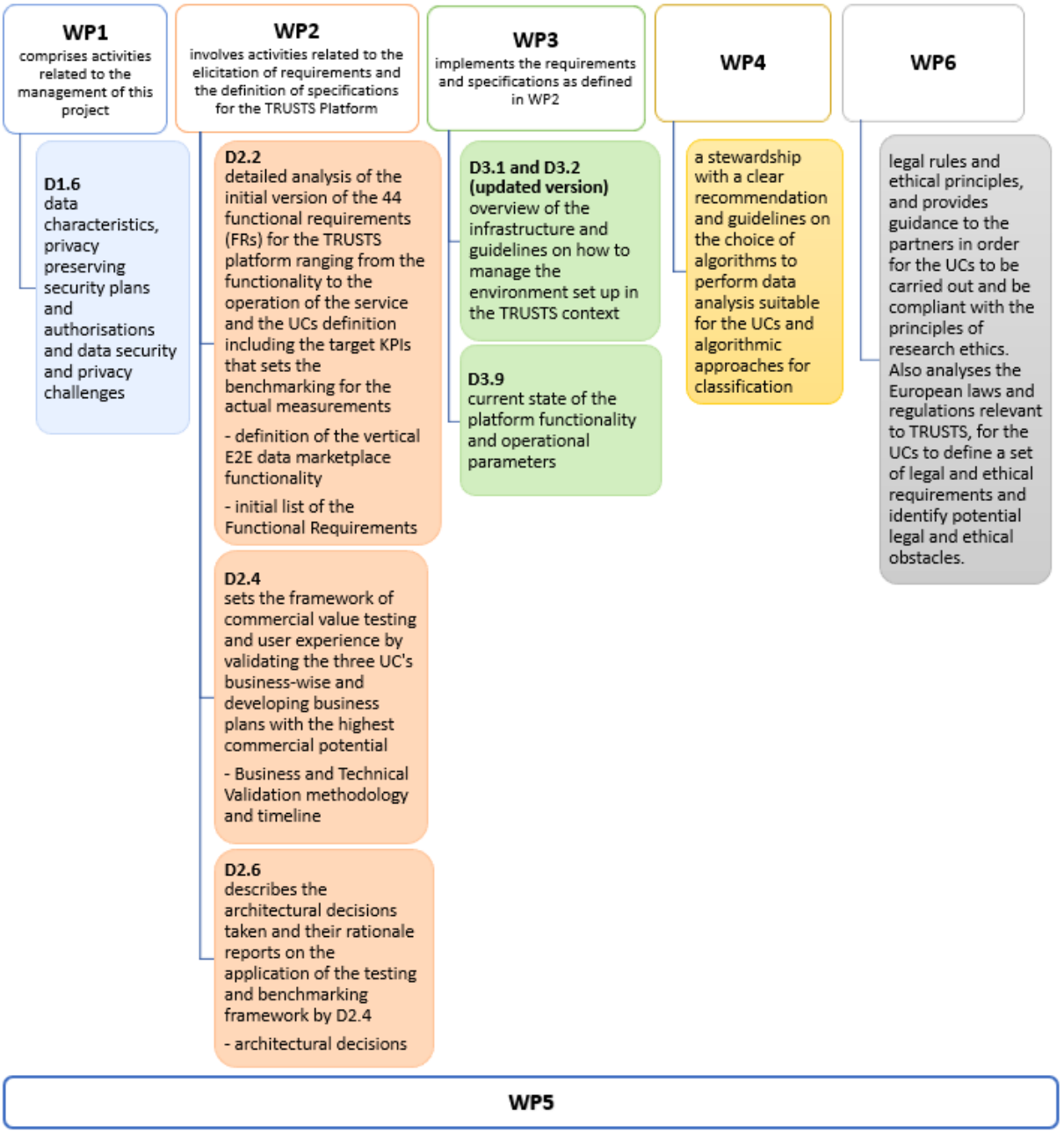

Figure 1: Illustration of the relationship between D5.1 and related TRUSTS documentation.

These preparation tasks and activities were performed and will keep performing and improving their outcomes, with the involvement of WP5 and the connection and contribution from both the three UCs and the technical partners of the project.

5 Pilot Planning

This section refers to a detailed description of the planning and operational information of the three business-oriented UCs. The set-up procedure is being described for the implementation and testing plan. Based on the three UCs, a requirements elicitation process was set up in WP2, to ensure that TRUSTS results are applicable in day-to-day business.

This section also refers to the minimum viable product (MVP) classification regarding the execution of the UCs trials starting in April 2021 and its required functionalities. A MVP is a product with enough features to attract early-adopters and validate the idea early in the product development cycle. In industries such as software engineering, the MVP can help the product team receive user feedback as quickly as possible to iterate and improve the product[13]. A detailed definition with the available components and the MVP roadmap, are described in D2.6.

It is in the project's scope that the E2E platform functionality, processes and operation will be tested through the UC trials in order to assure the establishment of a unified, comprehensive, viable, expandable and future proof data marketplace service. The scenarios defined for each UC are in dept described in the following sections (6,7,8) will be performed and are devoted to test the platform E2E functionality and usability.

5.1 Managing and Monitoring, T5.1

The following section describes the approach followed within T5.1 to manage and monitor the tasks under WP5, which aims to demonstrate through field trials that the TRUSTS Platform is capable of supporting the KPI requirements defined for TRUSTS.

The process in planning, setting-up and managing the demonstration pilots and the three UCs is and will continue advancing, with a constant interaction cycle of progress that will be delivering the results.

Figure 2 below, 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 Technological Validation stages as defined and reported in D2.4. Figure 2 shows the WP5 duration along with its three tasks (T5.1, T5.2 and T5.3) and the alignment with the evaluation methodology of T2.3, performing three Business Validations and two Technical Validations.

The objective of the Business Validation 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 objective of the Technological Validation is to validate the three UC's technical wise and develop user acceptance test's templates for the UC's so as to provide the potential highest commercialization.

The T5.1 duration illustrates the ongoing monitoring and planning of the UCs trial environment, aligned with T5.2 which includes the two trial phases, with the first, which is the focus of this deliverable, starting in April 2021 and finishing by December same year. The preparation and planning for the second phase will then occur and the second phase will start by January 2022 and finish by September 2022.

The figure also offers the resulting deliverables due month and author, reporting under this WP, on the planning of the first and second phase of the trials and the outcome and evaluations of each UC

[13] *ProductPlan* https://www.productplan.com/glossary/minimum-viable-product/

accordingly, as well as the final evaluation of the TRUSTS platform at the end of the project. The figure is aligned with the initial Generic Gantt Chart of the project which is declared in Annex I: "TRUSTS Initial Generic Gantt Chart, as in the GA".

	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 (FNET) D5.8 (REL) D5.10(FNET)*	*D5.2 (eBOS)*							*D5.5 (eBOS) D5.7 (FNET) D5.9 (REL)*	*D5.3 (eBOS)*	*D5.11(FNET)*		

Figure 2: TRUSTS WP5 and UCs execution trials Gantt Chart

The essential first step of T5.1 was to decide on the framework of the action plan in regards to the planning of the UC environment and the steps forward. The Plan-Do-Check-Act (PDCA) model was used defining the procedures to be applied to support a smooth operation of the Tasks hence project objectives.

5.1.1 Plan-Do-Check-Act

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 can be used when exploring and testing multiple solutions in a small controlled trial while developing or continually improving a process[14].

Following the PDCA model, the process improvements were broken into smaller steps (as shown in the Figure 3 below):

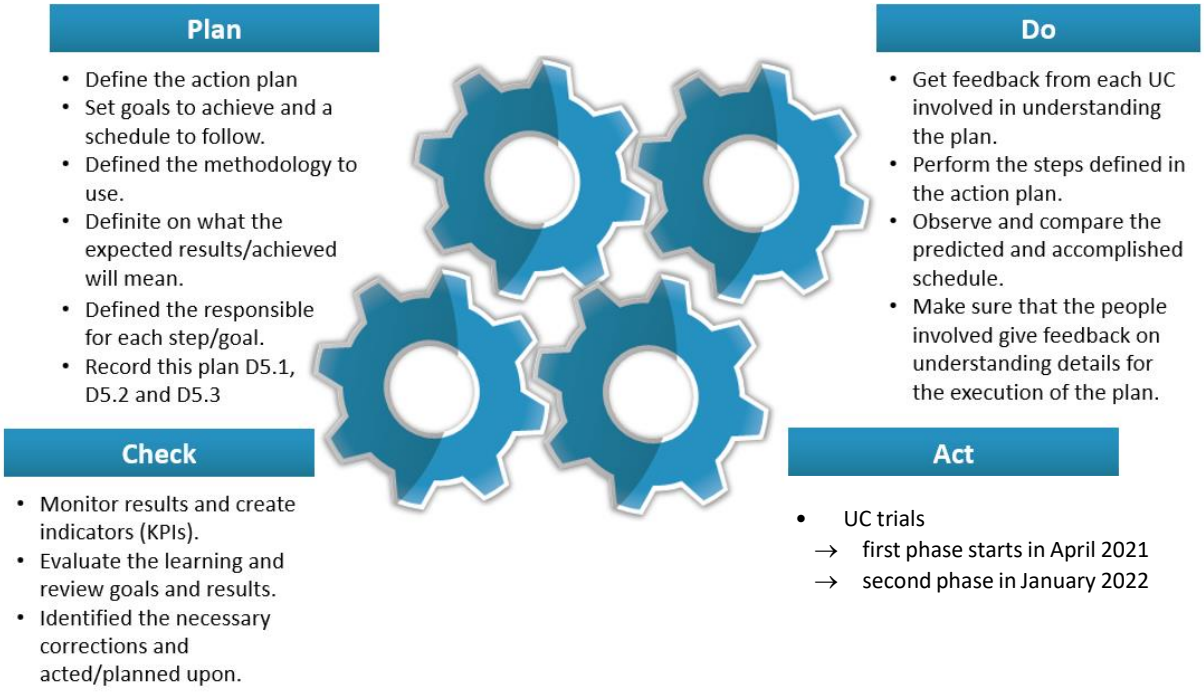

Figure 3: Plan Do Check Act Model (PDCA)

1. The 'Plan': The planning period is mapping out the objectives, identifying the goal and purpose, formulating a theory, defining success metrics and putting a plan into action[15].

During this step, the goal of TRUSTS and the opportunity was identified, as well as the hypotheses developed for what the underlying issues are, and decided on one hypothesis/solution to test first. Overall, this step:

[14] *Lucidchart, "Lucidchart," 20 01 2021. [Online]. Available: https://www.lucidchart.com/blog/plan-do-check-act-cycle.*

[15] *T. W. E. Deming, "The W. Edwards Deming Institute," 20 01 2021. [Online]. Available: https://deming.org/explore/pdsa/.*

a. Defines the action plan.
b. Sets the goals to achieve and the schedule to follow (Gantt Chart Figure 2)
c. Defines the methodology to use (PDCA)
d. Defines what the expected results will mean.
e. Defines the responsible partner for each goal (**Error! Reference source not found.**)
f. Specifies the way to record this plan through the deliverables D5.1, D5.2 and D5.3.
g. Creates KPIs

2. The 'Do': this step is the actual testing of the hypothesis/solution. This step will:
   a. Perform the action plan steps defined above
   b. Receive feedback from each UC involved
   c. Observe and compare the proposed schedule
3. The 'Check': Once the test phase is performed/completed, this step will review and analyse the results. This step is important since it allows the evaluation and revision of the action plan, answering some important questions, like:
   - Did the plan actually work?
   - What steps could be improved or need to be eliminated from the second phase of trials?

   This step will then:

   a. Monitor the results and the KPIs
   b. Evaluate the learning, and review goals and results
   c. Identify the necessary corrections and act/plan upon.

   The evaluation at this stage will guide our decisions in the next step.
4. The 'Act': Finally, if all went according to the plan, it is time to act and implement the TRUSTS commitment by closing the PDCA cycle.

If the plan does not pan out as expected, a cycle back to the planning stage will be done to make adjustments and prepare for the new trial phase. These four steps can be repeated over and over as part of a never-ending cycle of continual learning and improvement, if needed[16].

In D5.1 the focus is on the planning and set-up activities of the first phase of the UC trials and it is an ongoing, continuous process and therefore requires commitment from all the involved partners to achieve the GA obligations.

The following sections document additional analysis of the three UCs established in their corresponding sections of this report, Section 6 (UC1), Section 7 (UC2) and Section 8 (UC3).

5.1.2 TRUSTS requirements and validation

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.

The requirements were retrieved from financial institutions, telecom operators and corporate data providers/users, as well as from industrial stakeholders. Their capture involves the documentation of

[16] *T. W. E. Deming, "The W. Edwards Deming Institute," 20 01 2021. [Online]. Available: https://deming.org/explore/pdsa/.*

industrial and regulatory needs and opinions about new innovative data marketplace service verticals, which set the baseline for conducting the actual measurements during the UCs trials.

Requirement's collection has been performed under T2.2 initially 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 European legal framework relating to privacy and data protection, would be a very useful tool in their daily work operations. The findings that emerged were summarized in the defined FRs list in D2.2 [4] as well as Table 39.

Moreover, as previously presented in the Figure 2 of this report, three sets of business validation and two sets of technological validations have been identified, allowing the interaction between the business needs, business models and the technological enablers, over the projects' lifecycle. More details on what it is validated and how these validations will be performed along with the involved partners and templates to be used, is presented in D2.4 and will be updated after the first phase of the trials in D2.5 by December 2021.

The validation plan is in alignment with the project, where the implementation and testing plan for the pilots should be ready by M14, February 2021 for the first demonstration phase and updated by M25, January 2022, for the second demonstration phase. The first phase of UC trials should be completed by M24, December 2021 and the second phase by M32, September 2022. Moreover, part of the business validation is also the validation of the KPIs, as those were defined in the GA, specific for each UC and are presented in their detailed sections followed.

5.2 Demonstration of the TRUSTS UCs and Test Plan

This section offers the plan as of February 2021, of the Platform evolution in regards to the UC trials. A work done mainly by WP2 and WP3 to feed and assist the significant work of WP5 and the UC trials as well as WP4 direction.

Developing innovative software technology requires early testing of customer related hypotheses. To make these possible, experimental objects, such as product prototypes, need to be created[17].

Building a product iteratively based on the needs of early customers could lead to reduced market risks such as expensive product launches and failures[18]. In conclusion, in order to finalise and market the TRUSTS product, a need to validate the product concept before beginning its production is essential, to test the TRUSTS idea with real users before committing a large budget 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 shape a MVP prior to the ultimate development and integration of the platform.

Value-related feedback is needed during software development and maintenance, and decision-making should be increasingly based on empirical evidence acquired through experiments[19]. The goal is to identify strengths and weaknesses while providing practical recommendations for improvement.

In addition to allowing the TRUSTS project to validate the idea and the expected product without having to build the entire product, a MVP can also help minimize the time and resources that might otherwise commit to building a product that won't succeed [10]. Furthermore, it must allow the UCs

[17] *Basili, V.R., Selby, R.W., Hutchens, D.H. "Experimentation in software engineering", 1986 (pgs. 749-799)*
[18] *Valentina Lenarduzzi, Davide Taibi, Faculty of Computer Science, "MVP Explained: A Systematic Mapping Study on the Definitions of Minimal", 2016, (pg.9)*
[19] *Jurgen Munch, Fabian Fagerholm, Patrik Johnson, Janne Pirttilahti, JuhaTorkkel and Janne Jarvinen, "Creating Minimum Viable Products in Industry-Academia Collaborations", 2014 (pg.16)*

to complete an entire task or functionality, and it must provide a high-quality UX. It must be a working product that TRUSTS UCs to execute tests.

Therefore, the product development requires the work and input of many teams across TRUSTS, including:

- Development
- Design
- Testing

The UCs communicate the big-picture goals and plans for the product (via the product roadmap), to the teams with the corresponding responsibilities.

5.2.1 MVP in TRUSTS

According to Basili et al.[20], experimentation is performed to help us better evaluate, predict, understand, control, and improve the software development process and product. As with any other experimental procedure, experimentation in software engineering follows a cycle of building models for development processes or products, defining and testing related hypotheses, and refining models and hypotheses based on experimental results.

The UC trials in TRUSTS were well-defined and will be executed to test this idea with real users before committing to the product's full development. In TRUSTS the MVP versions should be seen as a clearly specified hand-off point, at which WP3 hands a specific initial version of the platform to WP5. Part of the MVP will be the required functionalities of each UC presented in their corresponding following Sections.

Figure 4 below illustrates a learning cycle according to Basili et al., as the Product Owner defines a Value Hypothesis (VH), which is used as input for the Software Factory to create a MVP. The MVP is used to evaluate the VH in a customer test, resulting in an evaluation result (ER) that is fed back to refine or redefine the VH for the next cycle [11].

The TRUSTS vision is to be tested via the two demonstration phases by potential End-users (listed in the following sections for each of the UCs), by creating a MVP of the platform. The MVP will be used to evaluate the "VH" = the TRUSTS concept, and along with the feedback from each of the UCs, will be

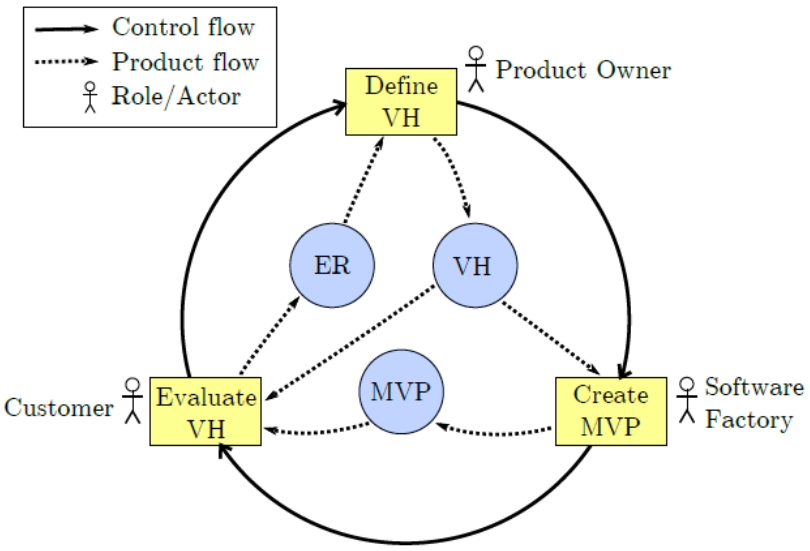

Figure 4: MVP learning cycle

[20] *V. S. R. H. D. Basili, "Experimentation in software engineering," IEEE Trans. Softw. Eng.12(7), pp. 799-749, 1986.*

constantly improved to result in the final version of the product = TRUSTS datamarket, by the end of the project.

5.2.2 TRUSTS functionalities

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 39, while they are expected to be updated through the project lifetime and over the UCs feedback and should all be tested and hence evaluated.

The MVP version to be available for the first evaluation period of the TRUSTS UCs should have some if not all the required functionalities defined and required so far. The MVP is in depth described in its corresponding D2.6.

An initial idea is expected to be able to:

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

6 The Anti-Money Laundering compliance, TRUSTS Use Case 1

Fighting money laundering contributes to global security, integrity of the financial system and sustainable growth. Anti-Money Laundering (AML) seeks to prevent criminals by making it harder for them to hide illegal money. The European AML directives are intended to prevent money laundering or terrorist financing, and establish a consistent regulatory environment across the EU. The EU AML framework has rapidly evolved during the last years and was several times amended by the European Union. Member States must transpose into their national laws various reporting and due diligence obligations, e.g., the requirement to:

(i) verify the identity of customers and the beneficial owners;
(ii) assess and, as appropriate, obtain information of the purpose and intended nature of the business relationship;
(iii) conduct ongoing monitoring of the business relationship including scrutiny of transactions undertaken throughout the course of that relationship to ensure that the transactions being conducted are consistent with the obliged entity's knowledge of the customer, the business and risk profile[21].

Financial institutions, banks, the professional industry, stock exchanges, real estate etc., are required to follow these directives, and perform these actions and procedures against money laundering, to comply with and to monitor customers' transactions and report any suspicious financial activity.

Data sharing and trading platforms such as the TRUSTS Platform represent an opportunity to securely share and trade data for AML purposes and results in maximizing operational effectiveness while maintaining or reducing costs.

Acknowledging the significance of Artificial intelligence (AI), Machine Learning (ML) and smart analytics in providing better efficiency in combating money laundering, the purpose will be to securely share closed-loop data so as to feed a next generation advanced AI/ML-based AML solution, benchmarked against the current state-of-the-art (i.e., traditional rules-based). New AI/ML techniques will be developed, which will be integrated with EBOS' existing WiseBOS Enterprise Resource Planning (ERP) AML rule-based model, to enable finer grained resolution at the scale needed to detect money laundering activities, thus evolving it into a next generation AML data-driven model.

6.1 TRUSTS Use Case 1 Objectives and Expected Outcome

The key purpose of this UC is to develop a new data-driven approach to AML. The AI and ML techniques and algorithms are used to enhance EBOS's existing WiseBOS Risk Intelligence Scoring and Compliance (RiSC) & AML rule-based model. AI and ML algorithms will evolve this rule-based solution into a next generation AML data-driven model that will allow improved analysis to detect money laundering activities, to increase fraud detection and reduce false positives.

Part of this AML approach is also the Screening process, as the customers background check and the Transaction Monitoring (TRM) which is based on financial transactions and it is a vital part of preventing money laundering and terrorist financing. TRM will also be evolved with AI and this new AI software will 'read' customers suspicious transactions (in terms of their sequence or behavioural patterns) as a more complex pattern and will automatically initiate red flags. The red flag indicates that

[21] *"Article 13 of the 4th AML Directive (EU) 2015/849"*

a transaction may be suspicious, so the compliance officer will check the specific transaction in detail. If it's legitimate or reasonable, if it matches with the 'customers' behavioural pattern of his so far transactions, its sequence, or even if the origin is high risk etc.

Figure 5 below, illustrates the TRUSTS Platform 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.

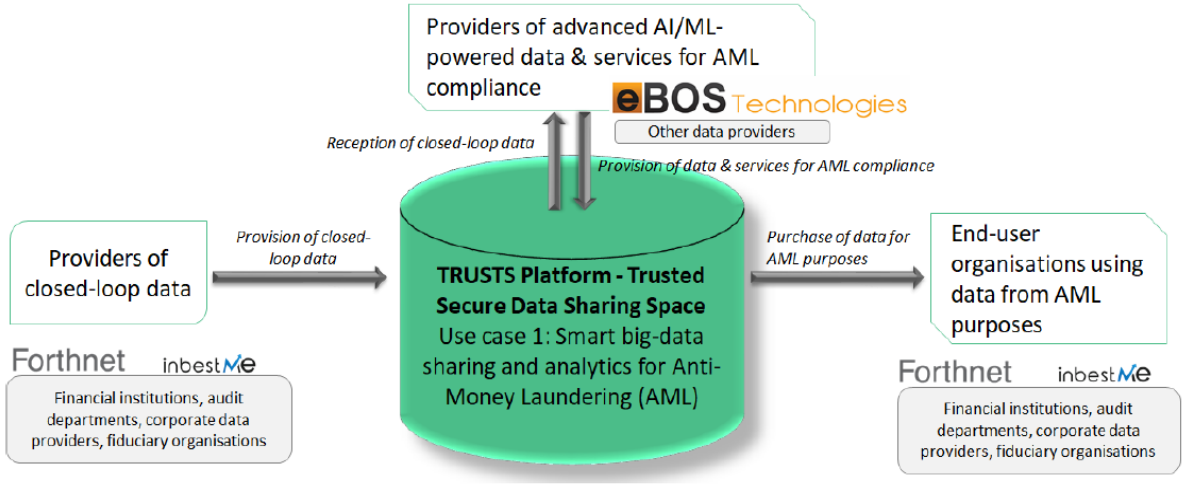

Figure 5: TRUSTS Data sharing for AML compliance, TRUSTS UC1

6.1.1 TRUSTS UC1 required services to be included in TRUSTS

EBOS WiseBOS ERP is a state-of-the-art comprehensive software suite specifically designed to effectively adapt to the ever-changing business needs of companies of all sizes. Having under its umbrella nine modules that can work either independently as stand-alone solutions or as an integrated Suite.

Based on data sharing, UC1 proposes a new data-driven approach to AML and an innovative solution based on AI and ML technologies to increase fraud detection and reduce false positives and false negatives. Data sharing and trading platforms such as the TRUSTS Platform indeed represent an opportunity to securely share and trade data for AML purposes and thus to maximize operational effectiveness whilst maintaining or reducing costs.

Three of its modules (AML Screening, AML Risk Assessment and AML Transaction Monitoring) will be integrated to TRUSTS platform to support UC1, with RiSC and TRM, enhanced with AI and ML algorithms.

6.1.1.1 AML Screening *Service*[22]

WiseBOS Screening is an automated sophisticated screening module. This is the critical first step/process that a user (i.e.: fiduciary, law firm, etc.) must take before the onboarding of clients (or potential clients) regardless of them being physical persons or legal entities. Also known as the customers background check. The core purpose of the screening is to identify a client's (or potential client's) risk profile in order to find out if for example, they are subject to international sanctions. This service is capable of screening customers against Politically Exposed People (PEP) lists, Sanctions lists,

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

Adverse/Negative Media reports, etc., via the Regulatory Data Corporation (RDC) database[23] (also explained below in section 6.1.2), in order to identify and eliminate any efforts of money laundering (Figure 6).

This service uses the "*Know Your Customer (KYC)"*[24] input data from the end-user in order to check an entity (a person/company), in reference with the data provided by a third-party data provider RDC.

As a result, this service will provide a report with the profile of the checked entity.

Figure 6: Screening against PEPs, Sanctions lists etc., TRUSTS UC1

6.1.1.2 AML RiSC - Risk Assessment *application*[25]

This solution allows enterprises to determine the risk level of their clients. This makes the RiSC solution the 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.

Normally, this service follows the above-mentioned AML screening process. It uses the KYC input data that the end-user will provide upon the screening process, as well as the screening report/result for the aforementioned entity (as this can be extracted from the AML Screening service) and a rule-based questionnaire in order to perform the risk assessment - of customers - to identify their risk level.

6.1.1.3 AML Transaction Monitoring *application*

Transaction monitoring (TRM) is based on financial transactions and it is a vital part of preventing money laundering and terrorist financing.

This solution uses - again - the KYC input data from the end user, acting on behalf of its customer by uploading documents such as agreements and the relevant financial transaction information. Based on engine rules, this service checks if the transactions are in conflict with the input data (i.e., greater

[23] *https://rdc.com/*

[24] *KYC input data cases: business activities of the customer, country of incorporation, destination of funds, country of origin of funds, etc. This input data is sensitive and private and therefore ideally, we wouldn't like to have direct access to them. (It should remain in customers' infrastructure, or work on encrypted versions of the data). These enriched data can be securely brokered/traded via the Platform to interested customers who are bound by law to perform AML checks*

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

than the limit of the customers daily basis), or if are valid (relevant to the agreement) and identifies any possible frauds or anomalies on those transactions.

Transaction data is private and sensitive so again we should not have direct access to the data. Private data will not leave the end-users premises. Regarding the open-source data collected in the scope of this UC, TRUSTS will confirm that all the publicly available data to be processed in the first UC are indeed publicly available and can be freely used for the project.

6.1.2 Roles within TRUSTS UC1

- **EBOS** is the application and service provider, on-boarding to the TRUSTS data marketplace the WiseBOS AML services (Risk Assessment, Screening and Transaction Monitoring). These services must be deployed in the consumer's premises, and we therefore refer to them as Applications. EBOS is also a data provider, by utilising data from a 3rd party data provider (RDC) under a signed agreement in order to have access to the data as part of the AML Screening Service.
- **InBestMe** is a securities agency providing personalized and automatized investment services and portfolio management, that acts as a transaction provider data (that will not be sold/shared/advertised in TRUSTS, but solely used for UC1 trials) and an end-user (application/service consumer). InBestMe will provide input data about physical and legal entities information in order to perform AML checks. InBestMe, as an end-user will search for the AML services either directly or with key words through the search engine of the platform and will proceed with smart contract billing in order to be able to use the AML services through the TRUSTS data marketplace (detailed scenarios presented in the following section 0).
- **FNET** is an end-user (application/service consumer) via the TRUSTS Platform, in view of validating the effectiveness of the Platform for ensuring high levels of AML Compliance. FNET will also search for the AML services through the TRUSTS search engine and will proceed with smart contract billing in order to be able to use the AML services through the TRUSTS data marketplace.
- **TRUSTS** is the user administrator allowing the subscription and user enrolment of companies (i.e., InBestMe and FNET above), standalone marketplace and federated marketplace.

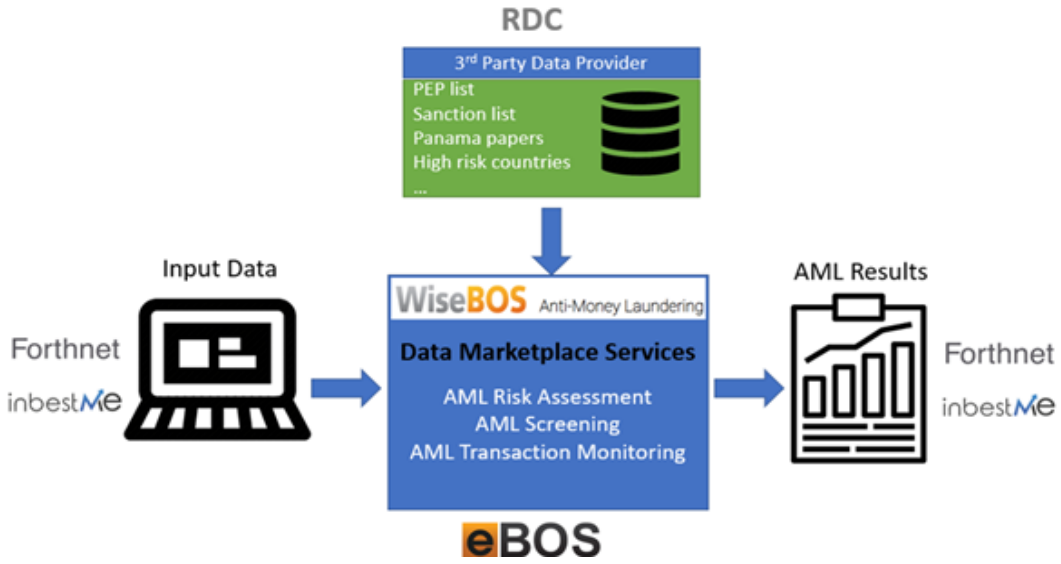

Figure 7: TRUSTS UC1 Partners Roles

6.1.3 TRUSTS UC1 Expected Outcomes

The TRUSTS Platform will sit at the centre of data exchange between actors and facilitate 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.

The above models (AML Screening, AML RiSC and AML TRM) have as a goal to complement and support Compliance Officers, for improved, faster and more accurate decisions. Achieving this goal, for both areas, modelling frameworks were followed that are explainable and do not only predict the risk tier of each entity or if a transaction is fraudulent, but also give an actionable explanation of these predictions.

The need for digitalized solutions and provision of efficient and a more effective risk-based compliance capability is assisting institutions to:

- Maintain & fulfil regulatory compliance;
- Determine the risk level & mitigating risks associated with the onboarding & monitoring of their customers/users;
- Minimize exposure to financial fraud;
- Maximize operational effectiveness while maintaining or reducing costs.

As previously mentioned, the AML UC vision is to evolve the existing eBOS's rule-based model into a next generation AML data-driven model using AI and ML algorithms. The platform also assures better man-power management, with more efficient investigations through advanced AML customer monitoring techniques using TRUSTS platform. The risk of non-compliance with the regulations will decrease and all interested businesses will be fully compliant to the AML regulations and will therefore help them remain competitive. In addition, their increasingly improving service will gain competitive advantage.

The expected benefits are twofold, to:

1. Provide better evaluation of the risk score/assessment, better man-power management and more efficient investigations through intelligent advanced AML customer monitoring techniques and,
2. Reduce the number of *false positives*[26] and *false negatives*[27] through better detection accuracy.

The AI and ML techniques and algorithms are expected to make a significant difference. They will provide a more detailed analysis and checks on data and transactions, by automating to a higher degree of data collection and analysis. The AI and ML techniques may well lead to reduced compliance costs, improving the quality of alerts and accelerating their handling, therefore allowing Compliance Officers to:

1. Focus on the most relevant, high-risk cases and,
2. Maintain the rules in the AML system with a reduced effort.

[26] *a false positive is a test result which wrongly indicates that a particular condition or attribute is present. In AML processes, a false positive result in flagging a customer or a transaction as suspicious or fraudulent when it is actually legitimate.*

[27] *a false negative is an error in which a test result improperly indicates no presence of a condition (the result is negative), when in reality it is present. In AML processes, a false negative result in not flagging as suspicious or fraudulent a customer or a transaction which pose high risks of financial crime. It is a failure to comply with AML regulations and legislations.*

The new techniques and highly developed self-learning models focused on AML suspicious activity detection were developed to detect real-time transaction-based on KYC anomalies. They will particularly be useful in UC1, in detecting even unknown behavioural patterns, which can lead to the detection of more complex money laundering patterns, and through better detection accuracy will be reducing the false positives hence increasing the true positives results. KYC digital solutions transform regulatory compliance by centralising all the key KYC functions of Document Collection, Data Extraction & Assessment, Case Management, Continuous Monitoring, and Reporting within one automated solution[28].

Nevertheless SMEs (Small Medium Enterprises) will gain access through TRUSTS platform to an affordable dedicated solution for AML compliance.

6.2 Mapping of TRUSTS UC1 with TRUSTS functionalities

TRUSTS will be able to provide advanced functionalities, such as product-user matchmaking and recommendations, rather than basic search functionalities, which are necessary and welcome as well. This section lists the suitably required functionalities intended for UC1 concept and services.

Table 5: TRUSTS UC1 required functionalities

UC1 TRUSTS onboard Applications/Service	Functionalities	Additional Explanations
AML Screening, **AML RiSC,** **AML Transaction Monitoring.**	**Application/ Service on-boarding process:**	AML application/services to be onboarded to the TRUSTS data marketplace via the functionality offered by the marketplace for uploading applications. The on-boarding process should be secured via a login authorization functionality. This on-boarding process should also include a testing process, to ensure that the application/service can be functional.
	Data on-boarding process:	TRUSTS data marketplace shall allow the on-boarding of data, by choosing the appropriate application/service to be used for. The process again should be secured.
	Application/ Service/data catalogue and search:	All applications/services and data on-boarded in TRUSTS, shall be available through a search functionality across all the federated nodes. This means the end-user can search for them directly through the Platform's search engine.
	Subscription management/ Company and end-user enrolment:	TRUSTS data marketplace as mentioned above should be secured via a login authorization functionality. It should allow the subscription and user enrolment of companies with specific roles among the subscribed companies' users/employees.

[28] *Know Your Customer, 2021, https://knowyourcustomer.com/*

	Security and GDPR compliant procedures:	Securing users' data on subscription and during the marketplace usage (purchase, smart contract, billing etc.) following GDPR rules. Accept policies option should also be provided to the user (during subscription, login, and purchase).
	Purchase Process assurance/ QoS:	Transactions related to the purchase of a service should be transparent and secure following the global transaction policies and GDPR. Transactions logs should also be kept by the marketplace to be used in case of a transaction issue occurred. The option to the user to validate the application/service (after purchasing and using it) should also be provided.
	Revenue assurance:	TRUSTS data marketplace should provide a mechanism to assure the revenue of the AML application/service provider for each purchase based on the Billing of involved parties in the value chain.
	Marketplace Federation	UC1 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.

6.3 TRUSTS Use Case 1 Scenarios

Following the above Table 5, UC1 established some scenarios in order to test this capacity. The detailed high-level scenarios are listed in the following subsections defining the scenario steps practice UC1 envisage in terms of the application/service provider as well as the end-user.

In order to test the E2E product and provide valuable feedback towards improving both technological and business aspects of the TRUSTS data marketplace, trials will follow the following 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).

The reference to the corresponding FRs defined and listed in D2.2 is available as well in Annex III of this report, as well as it is also offered per below scenarios (*Requirements Reference*).

TRUSTS UC1 Scenario 1

Table 6: TRUSTS UC1 Scenario 1

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 1	**Application/Service onboarding**		
REQUIREMENTS REFERENCE	**FR1**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
On board of the 3 AML applications/service ● *RiSC* ● *Screening* ● *TRM* *and verify that are properly on-boarded and are accessible via the platform.*	Successful on-boarding of the 3 AML *applications/ services*	TBD after trials	3 *applications/service* will be deployed on the TRUSTS federated infrastructure.

TRUSTS **UC1 - Scenario 1** flow:

1. The *application/service provider* (eBOS) visits the TRUSTS website[29] and accesses the TRUSTS portal/UI.
2. The *application/service provider* reads the portal information and informative text.
3. The *application/service provider* reads the terms and conditions that the TRUSTS marketplace complies with and the privacy policies.
4. The *application/service provider* accesses the registration area of the portal and selects the appropriate application upload subscription.
5. The *application/service provider* selects the smart contract which suits their needs and electronically pays and signs it. (price is set by the platform operator)
6. The *application/service provider* uploads the application/service in the TRUSTS application area, where terms of usage of the application are included in the application description.
7. TRUSTS operators check the request quality and security issues.
8. TRUSTS, accepts the *applications/service*.
9. TRUSTS, introduces the *application/service* in the catalogue to be available to all federated nodes.
10. TRUSTS verifies that it is properly on-boarded and accessible via the platform.

TRUSTS UC1 Scenario 2

Table 7: TRUSTS UC1 Scenario 2

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**
SCENARIO 2	**Application/Service search on catalogue**

[29] *TRUSTS Trusted Secure Data Sharing Space, https://www.trusts-data.eu/*

REQUIREMENTS REFERENCE	FR5, FR6, FR27, FR28, FR29		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
Search for the application/service (as an end-user/consumer) and check if they are available and listed in the catalogue (by key words or directly for the adequate AML application/service).	• Return adequate response in < 1sec. • User task success > 90% • User satisfaction, SUS score > 70	TBD after trials	The UC1 end-users (InBestMe and FNET) will search for the 3 AML applications/service either directly or with key words through the search engine. (This supports the scenarios and its functionality: search, subscribe, smart contracts, results etc.)

TRUSTS **UC1 - Scenario 2** flow:

1. The *end-user* (FNET & InBestMe) visits the TRUSTS website[30].
2. The *end-user* then accesses the TRUSTS portal/UI.
3. The *end-user* reads the portal information and the informative text.
4. The *end-user* reads standards/terms and conditions that the TRUSTS marketplace complies to and the privacy policies.
5. The *end-user* uses the search engine to search keywords on preferred application/service.
6. The search/recommender's engine responds and proposes *applications/services*.

TRUSTS UC1 Scenario 3

Table 8: TRUSTS UC1 Scenario 3

TRUSTS UC1	'Smart big-data sharing and analytics for Anti-Money Laundering compliance'		
SCENARIO 3	**End-user's purchase of AML applications/services**		
REQUIREMENTS REFERENCE	**FR10, FR11, FR12, FR13**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
End-Users (FNET & InBestMe) subscription (selection of plan, subscription, signing the contract/smart contract, company representative's definition and roles, logs existence).	Successful selection and subscription	TBD after trials	Then the end-users will proceed with selection of smart contract billing in order to then be able to use the adequate AML application/service through the TRUSTS data marketplace.

TRUSTS **UC1 – Scenario 3** flow:

1. The *end-user* accesses the registration area of the portal and selects the contract for the AML *application/service* they desire to use.

[30] [30] *TRUSTS Trusted Secure Data Sharing Space, https://www.trusts-data.eu/*

2. The *end-user* installs the necessary components to execute the AML applications/service purchased on their premises and be billed accordingly.
3. The *end-user* selects the appropriate smart contract (per-use, per-month etc.).

TRUSTS UC1 Scenario 4

Table 9: TRUSTS UC1 Scenario 4

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 4	**Contract fulfilment**		
REQUIREMENTS REFERENCE	**FR10, FR11, FR12, FR13**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
Ensure smart contract fulfilment	Successful smart contract fulfilment.	TBD after trials	

TRUSTS **UC1 - Scenario 4** flow:

1. Appropriate billing is issued according to the subscribers' contract and compensation is achieved according to the *application/service provider* contract.
2. Subscription and payment are done.

TRUSTS UC1 Scenario 5

Table 10: TRUSTS UC1 Scenario 5

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 5	**Billing and Payment**		
REQUIREMENTS REFERENCE	**FR14, FR15, FR16, FR17**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
Completion of the billing and payment cycles. Marketplace keeps tracking (logs) of the transactions.	Successful Completion of the billing and payment.	TBD after trials	All transactions will be logged to ensure quality and traceability and to keep track of i.e., payment cycles/transactions etc.

TRUSTS **UC1 - Scenario 5** flow:

1. The *end-user* is forwarded to download on premises the application/service.
2. The *end-user* is then required to login.
3. The TRUSTS operator verifies remotely the identity and security of the installation, credentials and validity of subscription.

4. The system automatically checks the logs for contract fulfilment and any quality issues that may need to be manually catered. Tests are made to ensure adequate and secure communication between the end-user's premises and the rest of the TRUSTS platform.

TRUSTS UC1 Scenario 6

Table 11: TRUSTS UC1 Scenario 6

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 6	**Data onboarding and services execution**		
REQUIREMENTS REFERENCE	**FR18 - FR26, FR38 – FR43**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
End-users on board input data, execute the 3 different AML applications/services and verify that are properly running. *The AML applications/service can be executed with the applicability of the ML/AI.*	Successful onboarding of data as per the specific file type.	TBD after trials	Successful use of the AML application/service through the TRUSTS data marketplace.

TRUSTS **UC1 - Scenario 6** flow:

1. The *end-users* input data is on premises.
2. The *end-users* start using the desired application/service.
3. The *end-users* can offer to share/sell their data models.
4. The *end-users* execute the different services and verify that they are properly running.

TRUSTS UC1 Scenario 7

Table 12: TRUSTS UC1 Scenario 7

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 7	**Service usage**		
REQUIREMENTS REFERENCE	**FR3, FR14, FR18, FR19, FR44**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
Schedule service usage, use the service, and evaluate the service results.	• Customer loyalty NPS > 8 [0-10] • User satisfaction, SUS score > 70 • Detailed results analysis, score > 85 • Service excellence, SUS score > 80	TBD after trials	All transactions will be logged to ensure quality and traceability.

TRUSTS **UC1 - Scenario 6** flow:

1. All the transactions above (*service provider* and *end-user*) are logged to ensure quality and traceability.
2. Application/service usage, use the service, and evaluate the applications results.

TRUSTS UC1 Scenario 8

Table 13: TRUSTS UC1 Scenario 8

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 8	**Marketplace Federation**		
REQUIREMENTS REFERENCE	**FR2, FR5**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL 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.	TBD after trials	

TRUSTS **UC1 - Scenario 8** flow:

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. Federation contracts are signed including compensation agreement for each transaction.
4. Catalogues are merged.

TRUSTS UC1 Scenario 9

Table 14: TRUSTS UC1 Scenario 9

TRUSTS UC1	**'Smart big-data sharing and analytics for Anti-Money Laundering compliance'**		
SCENARIO 9	**Service quality evaluation**		
REQUIREMENTS REFERENCE	**FR14, FR18, FR19, FR44**		
SCENARIO TEST PROCEDURE	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**ADDITIONAL NOTES**
Collect users' evaluation and if needed to improve operations.	• At least 2 contracts are fulfilled.	TBD after trials	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate

	• Operation completeness, SUS score > 80		complete process by the TRUSTS operations in order to improve performance existence.

TRUSTS **UC1 - Scenario 9** flow:

1. Collect users' evaluation and if needed to improve operations.

6.4 TRUSTS UC1 envisaged functional architecture

The below Figure 8 illustrates the TRUSTS E2E platform usage for UC1 in an envisaged functional architecture.

Based on the terms of the subscription, the end users of the AML Screening will be able to use the service provided by EBOS to perform background checks for their customers (or potential clients), before onboarding them or conducting business with them. The end-user will be sharing with EBOS via a secure connection (through a TRUSTS client), the minimum information needed for the screening results to be generated. EBOS will return back to the end user, via a secure connection the required information. EBOS will be using its automated sophisticated screening module that is capable of screening customers against PEP lists, Sanction lists, Adverse/Negative Media reports etc.

The other two AML solutions (RiSC and TRM) that will be provided as part of the UC1, will be deployed on end-users' premises, after the relevant subscriptions and contracts are signed.

The idea of these applications is the training of ML models based on the data provided by the end user, and by using these trained models to provide predictions to new data for the risk level of an entity or if a new transaction is fraudulent. The end user, by using its internal data (if available) that are compatible with the two solutions, or by searching and buying relevant data that will be available in the TRUSTS Platform, will follow the instructions on how to configure the connection with the solutions deployed on its premises, to start using the models.

In addition, the end-user will be able to announce their train model that they are willing to offer/sell to the TRUSTS platform.

In the federated UC1 scenario 8, *Table 13* the two end-users i.e., FNET and InBestMe, are subscribed to different marketplaces which are federated. TRUSTS federation functionality and processes are used in this respect towards providing a unified ecosystem to the users

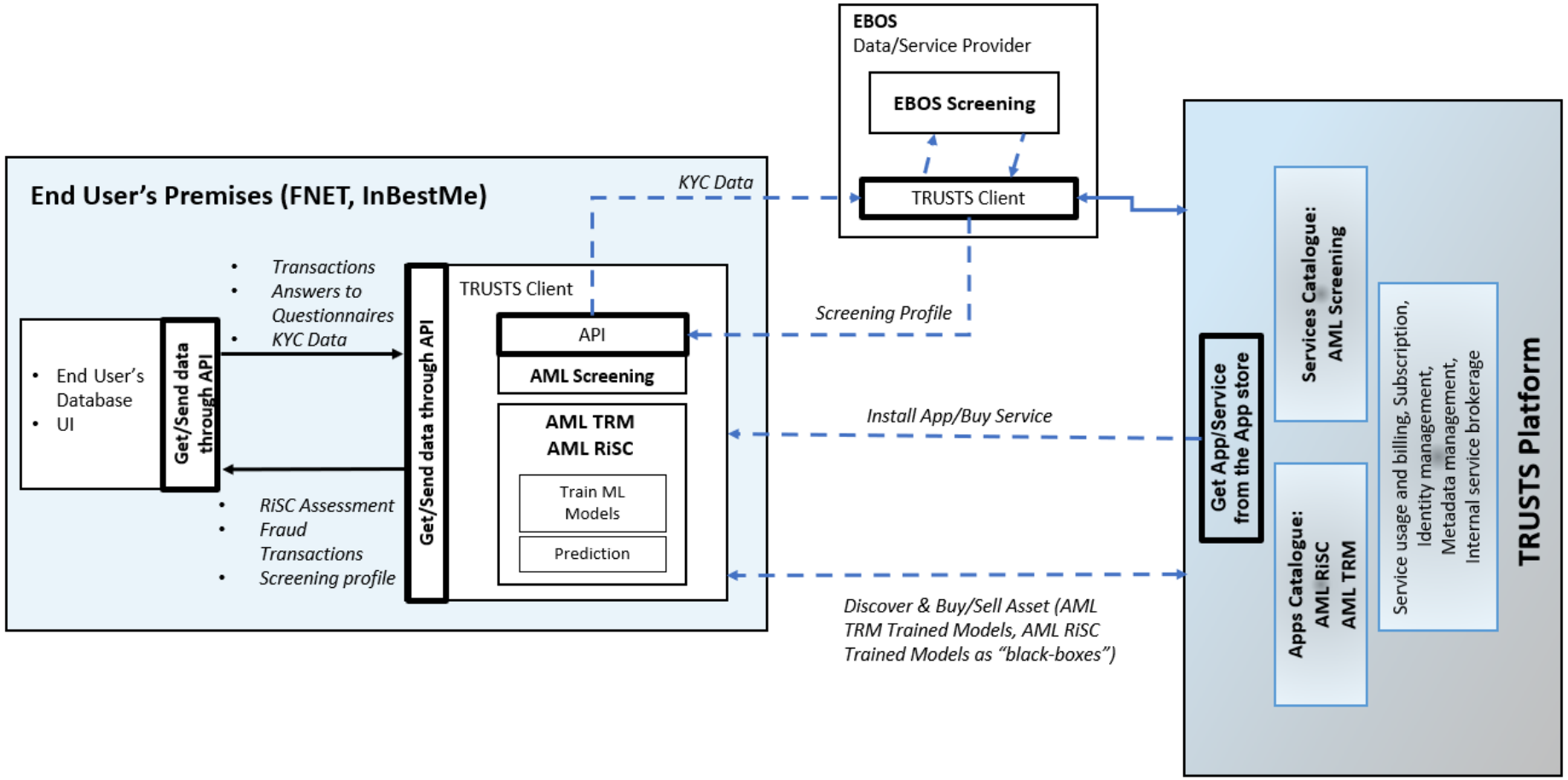

Figure 8: TRUSTS UC1 envisaged functional architecture

6.5 TRUSTS Use Case 1 Challenges, Risks and Assumptions

This section describes what challenges, risks and assumptions have been identified that might occur under TRUSTS UC1.

1. T5.1 is mainly affected by the other technical WPs as WP2, WP3 and WP4 and the platform implementation/development tasks.
2. Any limitations in order to connect and integrate EBOS products into the TRUSTS platform is also an important risk.
3. InBestMe and FNET are the UCs end-users. In order to be able to train UC1 product models and test them to evaluate their accuracy, UC1 needs data that InBestMe and FNET should provide (i.e., transaction data, KYC data). However, not sufficient/adequate data will result in a significant risk of not reaching UC1 expectations.

The key challenge is to be able to evaluate and demonstrate the E2E operation/functionalities of the TRUSTS industrial platform.

6.6 Key Performance Indicators (KPIs) Overview of TRUSTS UC1

The table below lists the high level KPIs defined in the GA and also documented in D2.4 [5] in regards to the UC1 product. These will demonstrate how effectively the AML UC is achieving the key objectives and outcomes established. 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.

Table 15: Key performance indicators (KPI's) of TRUSTS UC1

KPI	Baseline Value	Target Value (M36)	Calculation Method	Validation Method
Number of alerts per scenario	Number of alerts per scenario issued.	Decreased by 50% from baseline.	Predefined Scenarios before and after AI will be executed to validate these values.	After AI is applied the number of alerts meet the target value.
Detection accuracy	Detection accuracy.	Increased by 50% from baseline.	Predefined Scenarios before and after AI will be executed to validate these values.	After AI is applied the number of alerts meet the target value.
Number of false positives	The number of false positives flagged.	Reduced by 30% from baseline.	Predefined Scenarios before and after AI will be executed to validate these values.	After AI is applied the number of alerts meet the target value.
Number of false negatives	The number of false negatives flagged.	Increase by 30% from baseline.	Predefined Scenarios before and after AI will be executed to validate these values.	After AI is applied the number of alerts meet the target value.

SAR (Suspicious Activity Report) capture	70%	> 95%	Predefined Scenarios before and after AI will be executed to validate these values.	After AI is applied the number of alerts meet the target value.
Losses due to fraud	As per self-assessment from end-users.	Reduced by 30% from baseline.	Predefined Scenarios before and after AI will be executed to validate these values.	After AI is applied the number of alerts meet the target value.
Number of data providers interacting with the Platform	2 at the start of the use case.	Minimum 10 by M36 (+400%)	2 data providers for UC trials (RDC & InBestMe).	The project needs to involve additional data providers using dissemination activities.
Number of end-users interacting with the Platform	1 at the start of the use case.	Minimum 10 by M36 (+400%)	(FNET & InBestMe)	The project needs to involve additional data providers using dissemination activities.

6.6.1 TRUSTS UC1 longer term business KPIs

TRUSTS UC1 platform functionality performance KPIs are also listed in the table below focusing on the overall performance of the TRUSTS marketplace used for UC1.

Table 16: TRUSTS UC1 platform functionality performance KPIs

Process	Description	KPIs
Application/Service on-boarding	E2E service & testing data onboarding process to be fulfilled.	The AML applications are successfully on-boarded on TRUSTS nodes.
Companies' subscription	User friendliness, clear processes, ability to verify and modify, logs existence.	Successful subscription of EBOS, FNET and InBestMe. Successful definition of roles. Successful enrolment of FNET and InBestMe, representatives.
Service catalogue usage	Search in catalogue using keywords throughout all federated nodes. (search data & service)	● Return adequate response in < 1sec. ● User task success > 90% ● User satisfaction, SUS score > 70
Service Usage	Well-structured, defined modules deployment, if necessary, process.	● Customer loyalty NPS > 8 [0-10] ● User satisfaction, SUS score > 70 ● Detailed results analysis, SUS score > 85 ● Service excellence, SUS score > 80
Contract fulfilment, service performance	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS	● At least 2 contracts are fulfilled. ● Operation completeness, SUS score > 80

tracking, quality evaluation	operations in order to improve performance existence.	

6.7 TRUSTS UC1 Data Management

The Regulation 2016/679, GDPR that entered into force on the 25th of May 2018, regulates the protection of individuals on the processing of personal data and the free movement of such data[31] [17]. This section lists how the enriched data of UC1 can be securely dealt with, or traded via the TRUSTS Platform to interested customers or businesses who need to perform AML checks.

Insofar as the legal basis is the legitimate interest of the controller, balancing tests will be conducted between said interest and the fundamental rights and interests of the data subjects. To the extent that previously collected personal data will be processed, the source will be clearly identified, and permission will be secured before any processing activity takes place. In particular, personal data collected by the end-user internal audit division will be further processed for carrying out the research and will not leave the end-users premises. It will not be shared via the TRUSTS platform as long as the end-user doesn't offer its dataset.

In addition, the UC will entail the use of data from global (e.g., PEP lists, sanctions list, Panama papers, adverse media sources, etc.) via a signed NDA with RDC's Global Regulatory Information Database (GRID) that contains over 10 million profiles built on tens of millions of records, continuously updated risk data archive on known or suspected corrupt private-and public-sector figures, fraudsters, illicit financiers, money launderers, organized crime figures and groups, terrorist figures, PEP, and dozens of other risk relevant categories of persons and organizations. Approximately 7,000 quality-reviewed, structured records are updated or added to GRID each day. New risk information sources are continuously incorporated into the database. It contains hundreds of regulatory and disciplinary authority and government lists from around the world, continuously updated. Media is derived from 120,000 individual sources of public-source newspapers, magazines, television and radio transcripts, trade specialty publications, geographic special interest publications, and academic journals. Sources are global, and include small, low-circulation local newspapers as well as widely known newspapers and magazines. RDC's data team conducts a daily search of global news using targeted Internet searches to mine information from supplemental sources that may not be available through our media aggregators and ensures that key events related to risks that are included in our media feed are correctly aggregated.

UC1 involves the processing of personal data. The following table summarizes the lawful ground for which data were initially collected, in the case where such data are 're-used' for the purpose of TRUSTS research. Finally, to the extent that it is necessary, information sheets and/or informed consent forms will be provided according to the procedures set below.

Table 17: TRUSTS UC1 data collection

Data category	Lawful ground for the data collection

[31] *GDPR REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 119/1, L, "Official Journal of the European Union" 2016*

Know your customer (KYC) data, (name, surname, nationality) from clients using TRUSTS, AML applications/service.	Processing is necessary for the assessment of AML risks by a TRUSTS client (fiduciary etc.) prior to entering into a contract with a customer. Financial institutions and similar entities perform an assessment of AML risks as part of their AML obligations and based on the EU AML Directive.
"Third party data", namely data provided under a contract with a third-party data provider, 'RDC'. Such data include PEP lists, sanction lists, Panama Papers data, high risk countries, adverse media coverage, Fraud, Scams, Swindles, Conviction, etc.	UC1 will be mainly processing data collected from a third-party data provider (RDC). This data is not open source accessible and in order have access to this data as part of the AML Screening Service, a contract/agreement between the two parties (EBOS and RDC) was undertaken, in order to have access to this data as part of the AML Screening Service and coherent with the AML Directive.
Transaction Monitoring Data, Transaction relevant information, agreements etc.	The dataset will be processed according to the requirements by encoding them and at the end, the end-user will receive a table containing the transactions that will be fraudulent with the relevant information such as Transaction date, Amount, Transaction ID etc. In addition, the main reasons that the transaction Label became 'fraud', will be given.

Both public and private-personal data is required for accurate results under UC1. The collected data will be on the end-user's premises and will be stored and used for the purposes of the ML and in order for the models to be trained. The customers' data that will be used by the envisaged algorithms, will be in an anonymized and aggregated format, originated from customers who have already given their consent by subscribing to the UC1 services and being investigated under the AML Directive. All data will be deleted over time (as soon as UC1 trials are completed), but also upon the completion of the project.

Moreover, the clients involved will have already provided their informed consent that their data will be used for the purpose of research. Under no circumstance will FNET nor InBestMe provide data that can lead to the monitoring of the behaviour of an identified person, all personal information will be omitted.

If, nonetheless, at any stage of the project or the trials, there is a need to process special categories of personal data, UC1 commits itself to establish the legal basis in accordance with art.6 and art.9 GDPR and follow the necessary procedures in order to be fully compliant with the respective legal rules and ethical principles in advance of any processing activity.

6.8 TRUSTS UC1 Future Exploitation

The above processes and some of the interim checks are intended to help the UC to achieve the desired targets. The rest of this section outlines some of the exploitation conclusions planned and expected by the UC1 after the successful and official ending of the project.

- An important aspect is that companies will find an innovative solution to differentiate from competitors and acquire their market share.

- Even more important, Data sharing and trading platforms such as TRUSTS Platform, represent an opportunity to securely share and trade data for AML purposes and therefore maximize operational effectiveness whilst maintaining and reducing costs.
- It is an opportunity for compliance teams to strategically invest in new technologies in order to enable banks or related institutions to become more future ready.
- Advance Data sharing and data securely traded via the TRUSTS Platform to interested customers or businesses who need to perform AML checks.
- It helps increase the quality of interaction with customers and third parties, besides improving collaboration between different business areas inside the company itself.
- The continued development of AI will radically transform the front and back-office operations of financial institutions.

6.8.1 TRUSTS UC1 illustration of the expected outcome

This section summarizes an example of the existing AML process and outcome compared with the expected envisaged evolved TRUSTS AML process. The below figure presents a basic illustration of the comparison of the existing rule-based AML process and the evolved vision of TRUSTS UC1 expected outcome.

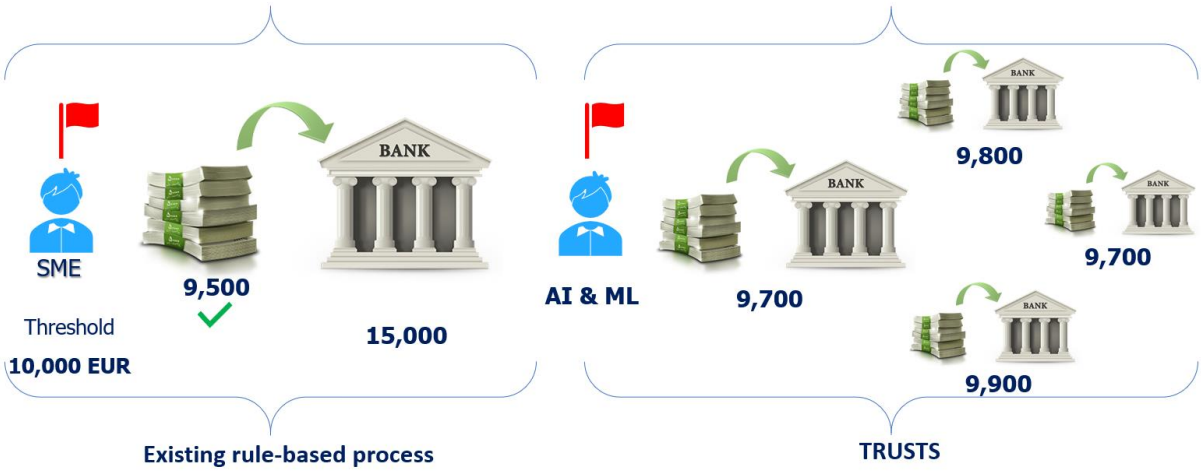

Figure 9: Existing rule-based AML Vs TRUSTS UC1 evolved solution

In a case where a customer (an SME) has a cash transaction threshold (limit) of 10,000EUR this means that if he performs a transaction of less than 10.000EUR, for example 9500EUR, nothing will happen since this suggests it is a typical/usual transaction for him. No further checks will be made in terms of AML.

Nevertheless, for every transaction over 10,000EUR the existing AML solution initiates a **red flag**. The red flag indicates that this transaction may be suspicious, so the compliance officer will check the transaction in detail. If it's legitimate or reasonable, if it matches with the 'customers' behavioural pattern of its so far transactions, sequence, or even if the origin is high risk etc.

However, the new evolved expected AML model, with the addition of AI and ML techniques under TRUSTS platform, the system will become, let's say smarter. The same customer with the threshold of 10,000EUR, whose sequence/pattern is to normally have one transaction (or transfer to the bank) of 9,700EUR per month, he then performs 1-2-3-4 transactions with an amount less than his threshold but in 4 different bank branches. Each bank representative only serviced him once and the existing software will think this is legit since the threshold was not exceeded. But the new smarter innovative

software must initiate red flags even for these transactions that are less than the customers threshold but in terms of their sequence or behavioural patterns these 4 transactions together are suspicious and a red flag must be initiated in order to alert the compliance officer to check the transactions in depth.

The new AI software will 'read' its suspicious behaviour (their sequence) as a more complex pattern and will initiate automatically the red flag. And then the officer will check these transactions one by one if they are fraudulent or not. And if indeed the transactions are suspicious will then be necessary for the officer to report them and possibly to the UC objective of fighting money laundering while contributing to global security, integrity of the financial system and sustainable growth.

This procedure will be undertaken under the TRUSTS platform as per the UC1 scenarios listed in section 6.3. Outcomes of this were also described in section 6.1.3.

All the above mentioned in section 6 of this report consists of UC1 detailed work that has been developed so far (within Year 1 of the project) and the expected progress and outcome throughout the project's lifetime.

7 The agile marketing through data correlation, Use Case 2

7.1 TRUSTS Use Case 2 Objectives and Expected Outcome

TRUSTS will constitute a European Digital Marketplace platform, which will enable FNET and PB to increase their digital transformation 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 FNET 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 have to start each time from the beginning.

Nevertheless, both FNET and PB understand that such collaboration will be beneficial for both the companies and the clientele since it will lead to better products targeting real subscriber/client needs. The whole economy will be benefited as well since innovative process and product production value chains will be established. Such innovative processes will be tested through UC2 trials for their user friendliness, completeness and business effectiveness.

The envisaged operation and the respective trial definition are illustrated in Figure 10 below.

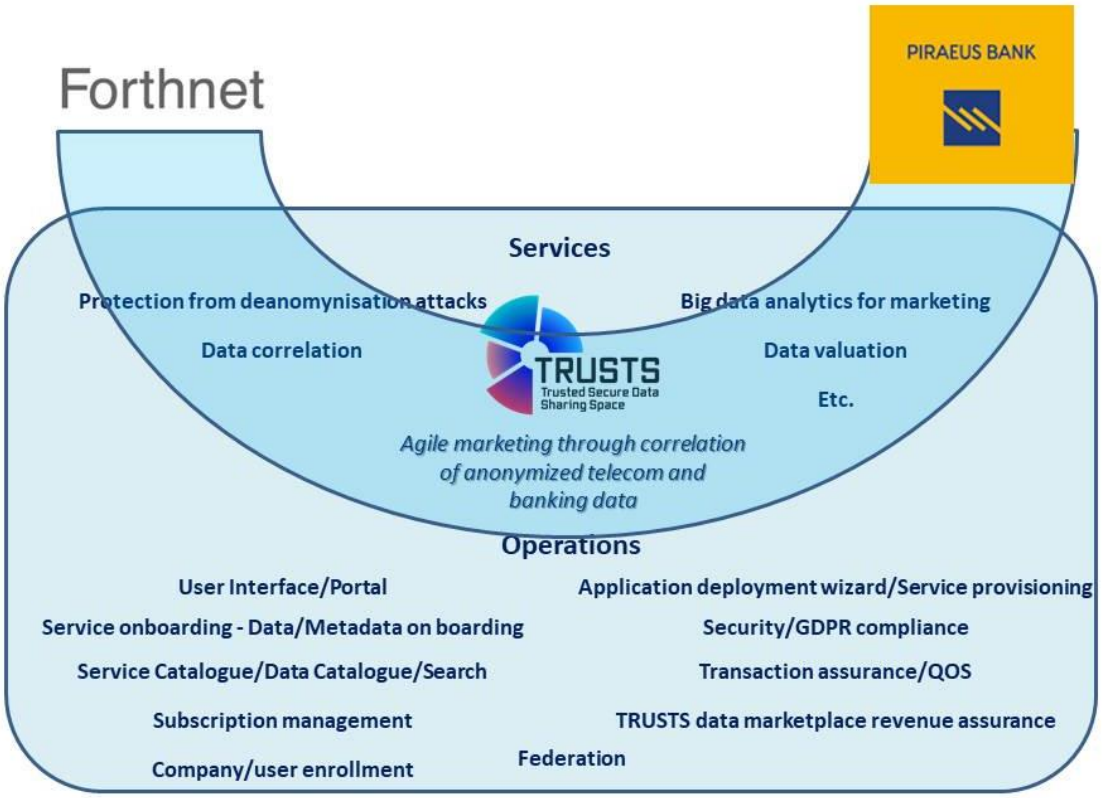

Figure 10: TRUSTS UC2 agile marketing trial architecture

UC2 envisages TRUSTS as an E2E environment able to offer quality processes and services to meet the UC2 trial needs.

Specifically, TRUSTS should have a coherence set of operational functionalities providing the ability to offer business services and datasets.

It is very important to note that the trials aim at proving that TRUSTS implements a viable business environment. Business environments have significantly different operational requirements than platforms tested in the lab. TRUSTS aims at providing services that will bridge, setup and enable data exchange potentials between demanding industries such as telco operators and banks.

7.1.1 TRUSTS functionalities that are required by UC2

The required TRUSTS functionalities for UC2 trials are:

- All the basic TRUSTS platform functionalities i.e., subscriber management, on-boarding of datasets/metadata, services/applications, etc., provisioning system e.g., when a service has to be deployed to accommodate a certain transaction, smart contracting, transaction logging, quality assurance and reporting, catalogue search for datasets, metadata and subscribers, billing, federation, recommender engine, user friendly interaction e.g., portal with appropriate GUI, etc.
- Anonymization: Anonymization in the trial will be done prior to data entering TRUSTS.
- Deanonymization risk analysis: All data must be checked for potential risks.
- Private Set Intersection (PSI): secure intersection of data without having access to the other party data.

The above-mentioned services will be built on the TRUSTS federated infrastructure, employing the necessary components so as to enable the secure data exchange, to safeguard the private information under a technical and legal perspective, but also preserve the capability to deliver reliable results and insights. Furthermore, these services will be made available to FNET and PB through TRUSTS to participate in the overall assessment of the platform with regard to data and services discovery and brokerage.

7.1.2 Roles within TRUSTS UC2

Figure 10 depicts the conceptual architecture of the TRUSTS UC2, highlighting the contribution of each participating partner as well as the actions that need to be performed during the UC2 execution.

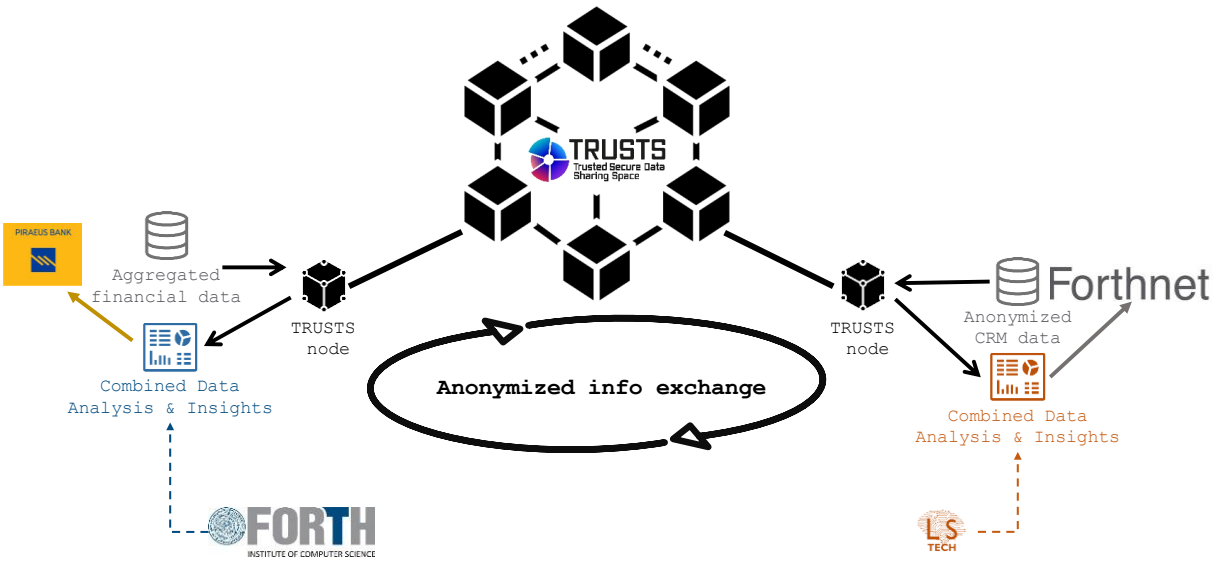

Figure 11: High-level conceptual architecture of TRUSTS UC2

Specifically:

- TRUSTS data marketplace operators (WP3 & WP4) which will provide all the necessary functionalities with adequate quality.
- Application providers i.e., KNOW will provide PSI and RSA will provide the de-anonymization risk analysis.
- Application consumer and data provider **FNET** will provide anonymized CRM data and define the detailed business scenario. FNET will analyse the trial outcome.
- **LST** will technically support FNET to install and use TRUSTS services (e.g., PSI) in their premises as needed in order to intersect FNET and PB datasets.
- **PB** will offer aggregated and anonymized financial data.
- **FORTH** will technically support PB to install the required TRUSTS services (e.g., PSI) in their premises as needed in order to intersect FNET and PB datasets. In addition, FORTH will provide Smart dashboards and big-data analytics and Customers' economic behaviour insights.

7.2 TRUSTS UC2 operational functions

In order to sustain its operation TRUSTS should support at least the following operational functionality:

Table 18: TRUSTS UC2 Required Functionalities

Functionality, processes & services	UC2 trials
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 that 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 application on-boarding process will be tested using the **PSI application**
Data/Metadata on-boarding: The process includes: Data descriptors, data management lifecycle support, smart contract, inclusion in the catalogues and search engine.	In UC2 the metadata on boarding process will be tested for the **FNET** and **PB metadata**
Subscription management and contracting with client companies and user's subscription with specific roles within the subscribed companies	In UC2 FNET and PB will **enrol** and **purchase** a **subscription (potentially through a smart contract)** from a list of alternative subscriptions that TRUSTS offers. Then FNET 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 FNET & PC, the compensation that the PSI owner has to 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** functions properly. The **catalogue should include services, datasets, subscribers** and applications. The **search should be transparent throughout all federated nodes.**
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 and able to analyse the transaction logs, KPIs and other related parameters to illustrate the quality of the E2E operational environment. In the quality assurance system, the use 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.

7.3 TRUSTS Use Case 2 Scenarios

Please note that the scenarios relation with the planned MVPs and the associated MVP delivery plan is analysed in the D2.6.

Note: The Functional Requirements (FRs) in the D2.2 deliverable are referred.

TRUSTS UC2 Scenario 1

Table 19: TRUSTS UC2 Scenario 1

TRUSTS UC2	**Agile Marketing through Data Correlation**				
SCENARIO UC2-SC1	**Application Onboarding**				
REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR10, FR11, FR12, FR13, FR14, FR36, FR37				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS /FAIL**	**ADDITIONAL NOTES**
On boarding of PSI (uploading of executable application, smart contract, inclusion to the application *catalogue, quality test).* *Federation issues should be tested e.g.,* application *onboarding in different federated nodes.*	At least **PSI and deanonymization risk analysis applications** are successfully on-boarded on TRUSTS nodes.	The PSI service is successfully checked for security and malfunction issues and on-boarded to TRUSTS using the provided UI. A respective smart contract between the application provider and the TRUSTS operator is issued and the service usages rules are defined.	TBD after trials	See KPIs below	E2E application onboarding process to be fulfilled.

TRUSTS **UC2 - Scenario 1 flow:**

1. Step 1. The application provider accesses the TRUSTS portal.
2. Step 2. The application provider reads the portal information and informative text.
3. Step 3. The application provider reads standards that the TRUSTS marketplace complies with and privacy policies.
4. Step 4. The application provider accesses the registration area of the portal and selects the appropriate application upload subscription service.
5. Step 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. Step 6. The application provider uploads the application in the TRUSTS application introduction area. Alternatively, the application can be externally linked.
7. Step 7. TRUSTS operators check the application quality and security issues. This could be done manually and offline by TRUSTS operators.
8. Step 8. TRUSTS accepts the application.
9. Step 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. Step 10. All transactions above are logged to ensure quality and traceability.

TRUSTS UC2 Scenario 2

Table 20: TRUSTS UC2 Scenario 2

TRUSTS UC2	**Agile Marketing through Data Correlation**				
SCENARIO UC2-SC2	**Companies' subscription**				
REQUIREMENTS REFERENCE	FR30, FR31, F36, FR37				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS /FAIL**	**ADDITIONAL NOTES**
FNET and PB 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 FNET, PB, FORTH and LST. Successful definition of roles. Successful enrolment of FNET, PB, FORTH and LST representatives.	FNET, PB, FORTH and LST are subscribed to a specific subscription service using the UI provided by TRUSTS. FNET and PB users are subsequently enrolled according to the rules of the subscription that each company chose.	TBD after trials	See KPIs below	User friendliness Clear processes, ability to verify and modify, logs existence

TRUSTS **UC2 - Scenario 2 flow:**

1. Step 1. The subscriber (FNET, PB, FORTH, LST) accesses the TRUSTS portal.
2. Step 2. The subscriber reads the portal information and informative text.
3. Step 3. The subscriber reads standards that the TRUSTS marketplace complies to and privacy policies.
4. Step 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. Step 5. The subscriber selects the appropriate contract and electronically signs it.
6. Step 6. The subscriber enrols its representative and respective roles.
7. Step 7. The subscriber verifies if he/she wants to be included in the catalogues.
8. Step 8. The TRUSTS platform system activates the contract and introduces the subscriber into the catalogue to be visible in all federated nodes.
9. Step 9. All transactions above are logged to ensure quality and traceability.

TRUSTS UC2 Scenario 3

Table 21: TRUSTS UC2 Scenario 3

TRUSTS UC2	**Agile Marketing through Data Correlation**
SCENARIO UC2-SC3	**Metadata uploading / announcement**

REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR10, FR11, FR12, FR13, FR14, FR36, FR37				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS /FAIL**	**ADDITIONAL NOTES**
FNET 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.	TBD after trials	See KPIs below	User friendliness, Clear processes, ability to verify and modify, logs existence.

TRUSTS **UC2 - Scenario 3 flow:**

1. Step 1. The subscriber representatives (FNET, PB) access the TRUSTS portal and login
2. Step 2. The platform verified credentials and validity of subscription
3. Step 3. The subscribers reach the metadata upload area and describe the appropriate information about their datasets, including the fact that they are only to be made available through the PSI service.
4. Step 4. TRUSTS platform automatically checks if the information is complete and introduced to the metadata to the catalogues in order to be discovered in all federated marketplaces
5. Step 5. All transactions above are logged to ensure quality and traceability.

TRUSTS UC2 Scenario 4

Table 22: TRUSTS UC2 Scenario 4

TRUSTS UC2	Agile Marketing through Data Correlation				
SCENARIO UC2-SC4	**Service catalogue usage**				
REQUIREMENTS REFERENCE	FR5, FR6, FR7				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS /FAIL**	**ADDITIONAL NOTES**
Search in service catalogue by FNET 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	FNET 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.	TBD after trials	See KPIs below	Search in service catalogue using keywords across all federated nodes.

TRUSTS **UC2 - Scenario 4 flow:**

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

TRUSTS UC2 Scenario 5

Table 23: TRUSTS UC2 Scenario 5

TRUSTS UC2	**Agile Marketing through Data Correlation**				
SCENARIO UC2-SC5	**Service usage**				
REQUIREMENTS REFERENCE	FR10, FR11, FR12, FR13, FR14, FR15, FR16, FR17				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/ FAIL**	**ADDITIONAL NOTES**
Schedule service usage (PSI, De-anonymization risk analysis, E2E TRUSTS service), deploy any necessary modules, use the service, evaluate the outcome.	• Customer loyalty NPS > 8 [0-10] • User satisfaction, SUS score > 70	The involved parties purchase the service usage and use it according to the contract. Transactions are logged. At the end of the transaction the respective billing is issued.	TBD after trials	See KPIs below	Well defined applications (i.e., PSI, deanonymization risk analysis, TRUSTS E2E service, etc.), modules deployment, if necessary, process.

TRUSTS **UC2 - Scenario 5 flow:**

1. Step 1. The subscriber representatives (FNET, PB) electronically sign a smart contract to use the PSI service having read a priori the services usage T&Cs and agreed with them.
2. Step 2. The TRUSTS provisioning system deploys automatically the PSI service to both FNET & PB designated premises and data correlation starts.
3. Step 3. When data correlation is finished the PSI, installation is automatically suspended for the FNET & PB premises.
4. Step 4. Appropriate billing is issued according to the subscribers' contract and compensation is achieved according to the application provider contract.
5. Step 5. The transaction is rated by all parties.
6. Step 6. All transactions above are logged to ensure quality and traceability.

TRUSTS UC2 Scenario 6

Table 24: TRUSTS UC2 Scenario 6

TRUSTS UC2	**Agile Marketing through Data Correlation**				
SCENARIO UC2-SC6	**Contract fulfilment, service performance tracking, quality evaluation**				
REQUIREMENTS REFERENCE	FR14, FR33, FR44				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS /FAIL**	**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.	TBD after trials	See KPIs below	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations in order to improve performance existence.

Note: According to the TRUSTS GA:

A Federated Data Market at European level shall provide:

1. 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,
2. hierarchical layers of certification for data services in order to foster trust in the market actors,
3. the fully flexible combination of data and services available at different providers in order to create a new data product or service,
4. an automatic brokerage system, enabling the identification and recommendation of data and services to be used for a specific use-case,
5. tooling for a human broker to create customized 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.

TRUSTS **UC2 - Scenario 6 flow:**

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

TRUSTS UC2 Scenario 7

Table 25: TRUSTS UC2 Scenario 7

TRUSTS UC2	**Agile Marketing through Data Correlation**
SCENARIO UC2-SC7	**Federation**

REQUIREMENTS REFERENCE	FR2, FR5				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/ FAIL**	**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 contracts are fulfilled.	Transactions are logged and validated. Users are rated. Compliance to law is confirmed.	TBD after trials	See KPIs below	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations in order to improve performance existence.

TRUSTS **UC2 – Scenario 7 flow:**

1. Step 1. TRUSTS federates with external marketplace and privacy are agreed.
2. Step 2. Smart federation contract is signed including a compensation agreement for each transaction.
3. Step 3. Catalogues are merged.

TRUSTS UC2 Scenario 8

Table 26: TRUSTS UC2 Scenario 8

TRUSTS UC2	**Agile Marketing through Data Correlation**				
SCENARIO UC2-SC8	**Dataset's announcement, recommendation and matching**				
REQUIREMENTS REFERENCE	FR5, FR6, FR7, FR8, FR9				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS /FAIL**	**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 FNET and PB requests with available datasets is successfully performed.	TBD after trials	See KPIs below	Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations in order to improve performance existence.

TRUSTS UC2 – Scenario 8 flow:

1. Step 1. The users will announce dataset and related attributes e.g., dataset that they cannot upload (e.g., CRM). Such an announcement will be entered in the datasets catalogue.
2. Step 2. The users will announce their needs. Such announcements will enter a needed catalogue.
3. Step 3. Recommendation and matchmaking will be automatically offered by the TRUSTS platform.

7.4 TRUSTS UC2 envisaged architecture using TRUSTS functionalities

The envisaged UC2 architecture illustrating the required TRUSTS functionalities is illustrated in the figure below:

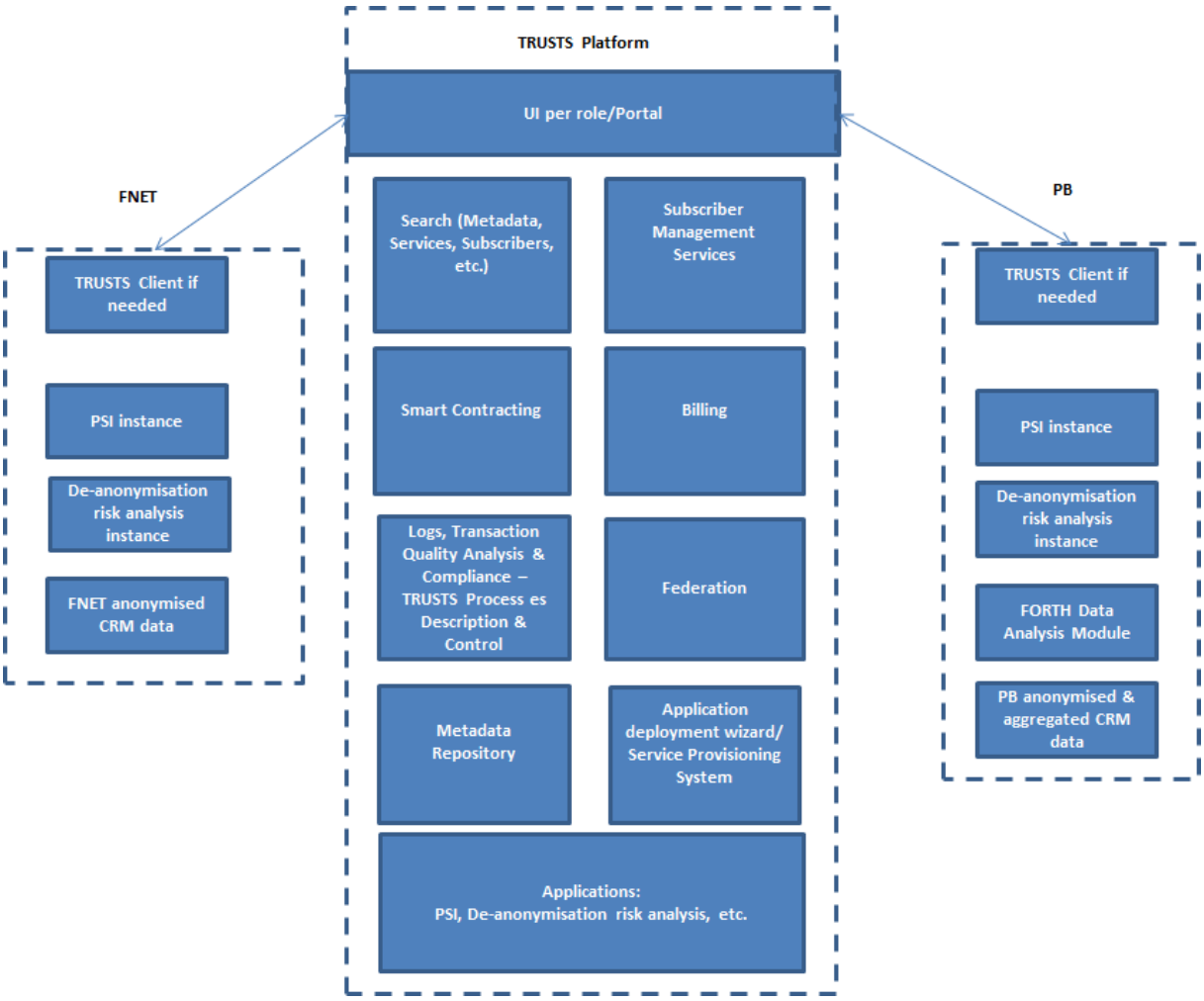

Figure 12: TRUSTS UC2 envisaged architecture based on TRUSTS functionalities

The architecture in Figure 12, illustrates the key TRUSTS E2E platform functionalities usage in UC2.

At the end state, we envisage that all functionalities will be transparent to the users. All interactions are achieved through the portal/UI provided by the TRUSTS environment. Should deployment on site

is required e.g., PSI instance deployment in FNET and PB sites, respective TRUSTS processes will be scheduled in a user friendly as well as regulatory and subscription policy compliant manner.

In UC2 we envisage that the two large organisations i.e., FNET and PB aim at having a long-term relationship with the TRUSTS marketplace. To this end, they consent at deploying locally services/applications provided by TRUSTS to ensure secure and full functioned data and services exchange.

Following their enrolment and subscription selection, both FNET and PB announce their data that they are willing to offer for analysis without leaving the owner premises. A match making process is achieved following the inclusion of such data description in the TRUSTS catalogue. In addition, both organisations find the PSI application in the TRUSTS catalogue which is able to perform such a local analysis of data without breaching owners' privacy terms and policies.

The E2E process is achieved through TRUSTS.

In Figure 13 below the federated architecture proposed for UC2 trials is presented:

In order to demonstrate TRUSTS federation, proposition the deployment of multiple TRUSTS platform nodes are proposed. To imitate real life scenarios, each federated node will have different policies (e.g., subscription products, registration procedures, etc.), different dataset catalogues and different application catalogues, among others. The aim is to demonstrate that, following a consistent federation process to interconnect the different marketplace nodes, the overall environment will be transparent to all end users while policies and contracts are fulfilled.

In the federated UC2 demonstration it is assumed that the two organisations i.e., FNET and PB, are subscribed to different marketplaces which are federated. TRUSTS federation functionality and processes are used in this respect towards providing a unified ecosystem to the users. The subsequent TRUSTS marketplaces actions are deployed as above.

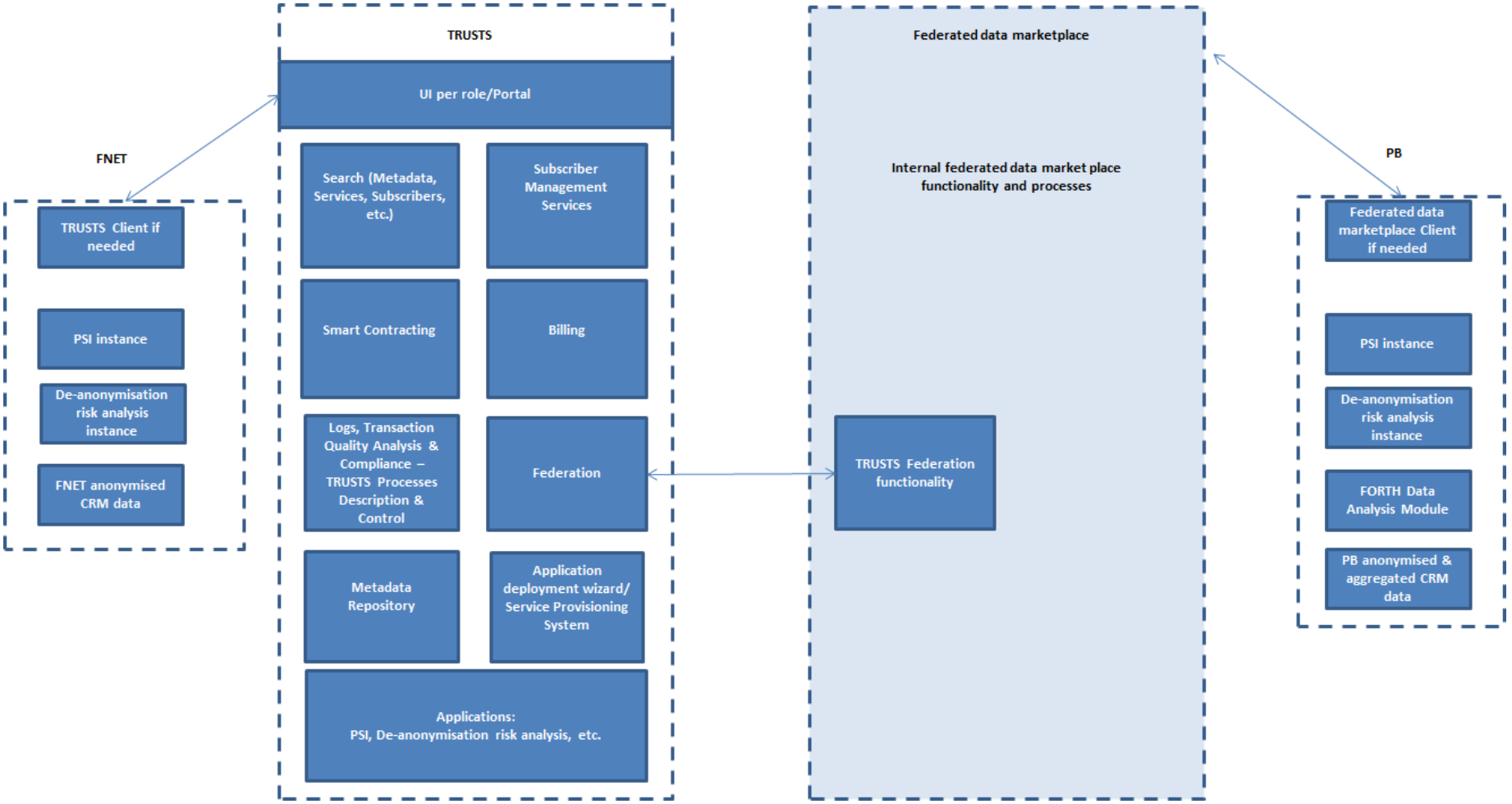

Figure 13: The TRUSTS federated architecture proposed for the UC2 trials

Please note that the above architecture is indicational. The extra-TRUSTS federated nodes will maintain their own architecture and policies. TRUSTS will create the necessary packages that will be deployed in/use by the third-party data marketplaces in order to achieve transparent federation.

7.5 TRUSTS Use Case 2 Challenges, Risks and Assumptions

The scope of the trials is to contribute the TRUSTS development process and verify that the produced environment complies with the project scope:

"TRUSTS will ensure 'trust' in the concept of datamarkets as a whole via its **focus on developing a platform based on the experience of two large national projects, while allowing the integration and adoption of future platforms.** The **TRUSTS platform will act independently and as a platform federator**, while **investigating the legal and ethical aspects** that apply on the entire data valmorification chain, from data providers to consumers, i.e., it will:

a. **Set up a fully operational and GDPR-compliant European Data Marketplace for personal related data and nonpersonal related data targeting both personal and industrial use** by leveraging existing data marketplaces (International Data Space and Data Market Austria) and enriching them with new functionalities and services.
b. **Demonstrate and realise the potential of the TRUSTS Platform in 3 UCs targeting the industry sectors of corporate business data, specifically in the financial and telecom operator industries** while ensuring it is supported by available, compliant and impactful governance, legal and business models.

To create a European Data Market based on secure and trustworthy data exchanges, the TRUSTS consortium brings together technology providers that are already deeply involved in major national data market projects. This integration will be tested in practice by 6 companies, including 2 data providers, addressing 3 different UCs. The **TRUSTS technology and use-cases will be accompanied by business and legal and ethical considerations**, which will ensure that the **results of the project are sustainable beyond its duration**."

The key challenge is to be able to evaluate and demonstrate the E2E operation of the TRUSTS industrial platform i.e.

- A unified technical implementation hiding complexities for the users and assisting human friendly operation.
- A set of consistent processes that support TRUSTS platform operations in order to instil industrial partners willingness to use the platform services.
- Standards and regulations compliance.

The aim is to define evolutionary test scenarios in compliance to the respective MVPs maturity evolutions towards the delivery of the complete operational TRUSTS platform at the end of the project.

7.6 Key Performance Indicators (KPIs) Overview of TRUSTS UC2

UC2 trials will be evaluated using the T2.3 methodology. In particular UC2 will set the following KPIs:

Table 27: TRUSTS UC2 performance and process KPIs

Process	KPIs
Service Onboarding	**Description:** E2E service onboarding process to be fulfilled. **KPI:** At least **PSI, deanonymization risks analysis applications** are successfully on-boarded on TRUSTS nodes.
Companies' subscription	**Description:** User friendliness, Clear processes, ability to verify and modify, logs existence **KPI:** Successful subscription of FNET, PB, FORTH and LST. Successful definition of roles. Successful enrolment of FNET, PB, FORTH and LST representatives.
Service catalogue usage	**Description:** Search in service catalogue using keywords across all federated nodes. **KPIs:** • Return adequate response in < 1sec. • User task success > 90% • User satisfaction, SUS score > 70
Service usage	**Description:** Well defined applications (i.e., MPC, PSI, deanonymization risk analysis, TRUSTS E2E service, etc.), modules deployment, if necessary, process. **KPIs:** • Customer loyalty NPS > 8 [0-10] • User satisfaction, SUS score > 70
Contract fulfilment, service performance tracking, quality evaluation	**Description:** Contract fulfilment, transaction logs existence, user evaluation existence, process to evaluate complete process by the TRUSTS operations in order to improve performance existence. **KPIs:** At least 3 contracts are fulfilled.

7.6.1 TRUSTS UC2 longer term business KPIs

The KPIs defined in the GA and the process to meet them is outlined below: [32] [33]

[32] *Usability Gov, 2020, https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html*
[33] *Systems, Satmetrix, 2017, https://www.netpromoter.com/know/*

Table 28: TRUSTS UC2 longer term business KPIs

Key performance Indicator	Baseline value	Target value (M36)	Process to meet the target KPIs
Number of target marketing analysis	2 per month	>10 per month	Perform adequate number of trials
Data readiness for correlation	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 valuations	2 per month	>10 per month	Perform adequate number of trials
Data anonymization/ deanonymization	<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	In order to achieve this the project needs to involve additional data providers using dissemination activities
Number of end-users interacting with the Platform	2	>10	In order to achieve this the project needs to involve additional data providers using dissemination activities

7.7 TRUSTS UC2 Data Management

We will leverage the power of the TRUSTS Platform in view of securely sharing data between institutions, applying (de-)anonymization services and smart big data analytics for marketing analysis. The UC will entail collecting financial data and telecommunications customers' data from the respective Banking and Telecommunication enterprises participating in TRUSTS. Data will be anonymized according to the principles established in the GDPR and company compliance policies, ensuring their robustness and tolerance to potential de-anonymization attacks.

The next step will involve data synchronization, correlation and analysis to identify profitable targeted base groups for marketing activities for each one of the individual enterprises participating in the trials. This could result in the identification of potential common marketing activities.

TRUSTS platform operation will constantly monitor data exploration attributes to maintain validity of the analysis at the requested time frame. TRUSTS platform operator will have to look in a GDPR compliant manner the logs as well as the evaluation and complaints of the transaction participants. All actions should be done in a lawful manner and aim at increasing the liability and quality of the offered service. Like telecom operators do.

7.8 TRUSTS UC2 Future Exploitation

In an important sense, the data marketplace is simply a name for a new data management paradigm required to keep up with the growing amount of data that has become available. Companies can choose to ignore new data or manage it with older, bottlenecked processes. But that is equivalent to

giving up. Those who choose to find a way to be in control of this issue must face certain realities. Success depends on finding a way to:

- Allow new data to be captured, profiled, described, and be found by users
- Shape data into the most usable forms
- Enable all the most popular data to be found by or recommended to those who might find it valuable
- Get more people involved with this whole process

The data marketplace vision makes all of this happen. It is an excellent start on solving a problem of frightening complexity. The data marketplace transforms the problem of managing the onslaught of new data to an opportunity to deliver more value to the business. If you don't feel that way when new data arrives, perhaps it is time to consider building a data marketplace.

All industrial partners participate in UC2 envisage that the establishment of a fully operational, standards and regulations (e.g., GDPR, etc.) compliance will stimulate internal processes towards promoting activities for data knowledge exchange and exploitation.

Currently the lack of standardised platform and processes impede data knowledge exchange between different industrial entities since the decision making and approval process has to be repeated for each individual case. TRUSTS platform aims at providing a robust solution in this direction.

It is very important to note that the trials aim at proving that TRUSTS implements a viable business environment. Business environments have significant different operational requirements than platform tested in lab. TRUSTS aims at provided services that will bridge, setup and enable data exchange potentials between demanding industries such as telco operators and banks.

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

The TRUSTS Data Marketplace vision would enable participants to create an out-of-the-box analytics solution for the anonymization and visualisation of big data, specifically to advance new ways of human-computer interaction (HCI) currently in their infancy, e.g., chatbots that can act as automated assistants to allow customers to converse about the management of their debt at their own pace and with a personalized experience, through the integration of Big Data.

The integration of cognitive computing will transform the debt collection industry in a variety of ways, from stimulating new ways to interact with customers (including some that, paradoxically, feel more human) to automating recurring tasks or helping detect patterns in data. TRUSTS UC3 will combine advanced natural language processing capabilities with the insights of Big Data as the basis for the development of tailored wealth management services. Big Data plays a significant role by enabling sophisticated personalization services that allow to classify each customer over a set of "customer types" based on their activity (thus giving the bot the ability to offer options for debt management tailored per customer case), and also by enabling a personalized interaction with respect to the tone and feel of the conversation by using sophisticated real-time metrics (e.g., emotion detection), making the experience as pleasant as possible for the customer.

8.1 TRUSTS Use Case 3 Objectives and Expected Outcome

The purpose of this demonstrator is the development of a ground-breaking offering in the field of debt collections – that is a fully automated debt collections call centre, leveraging the power of the TRUSTS Platform. The idea is that through enhanced analytics, AI and the integration of bots, a customer will be able to run a full operation around debt collection without needing to employ agents to follow-up with customers.

The piloting activity around this will be performed in a small scale and with a controlled set of data and customer entries. Relational Romania in collaboration with Debt Servicer will generate anonymised benchmark datasets using data management procedures that include anonymization and cryptographic protocols that will be set up to transmit all the data. Relational Romania through the TRUSTS Platform will improve its chatbot's application for the Debt Collection System and to provide the following two pilot applications through using data from Debt Servicer:

1. Debt Servicer: piloting debt collection with no employees. Everything is done through HCI. For the debt collection call centres (large in terms of personnel and cost), the bots could eventually enable the "agent-less collection centre".
2. Incorporation of a chat-bot to act as an automated assistant that allows customers to converse about the management of their debt at their own pace and with a personalized experience.
3. Piloting chatbot at website and mobile application users via both secure and unsecure channels respectively. The aim of the chatbot would be to market new offerings and increase usage ratios, offering proper type of new offerings based on transaction history of the customer.
4. REL will have access to large, complex and realistic data of consumer data from Debt Servicer that will be combined with the existing data that the company has from the Point of Sales with Banking and Debt Collection Industry, transactions and consumer social activity. The new communication channel (hereafter referred as Chat Service), will be uploaded to the TRUSTS Data Marketplace, will be used by FNET.

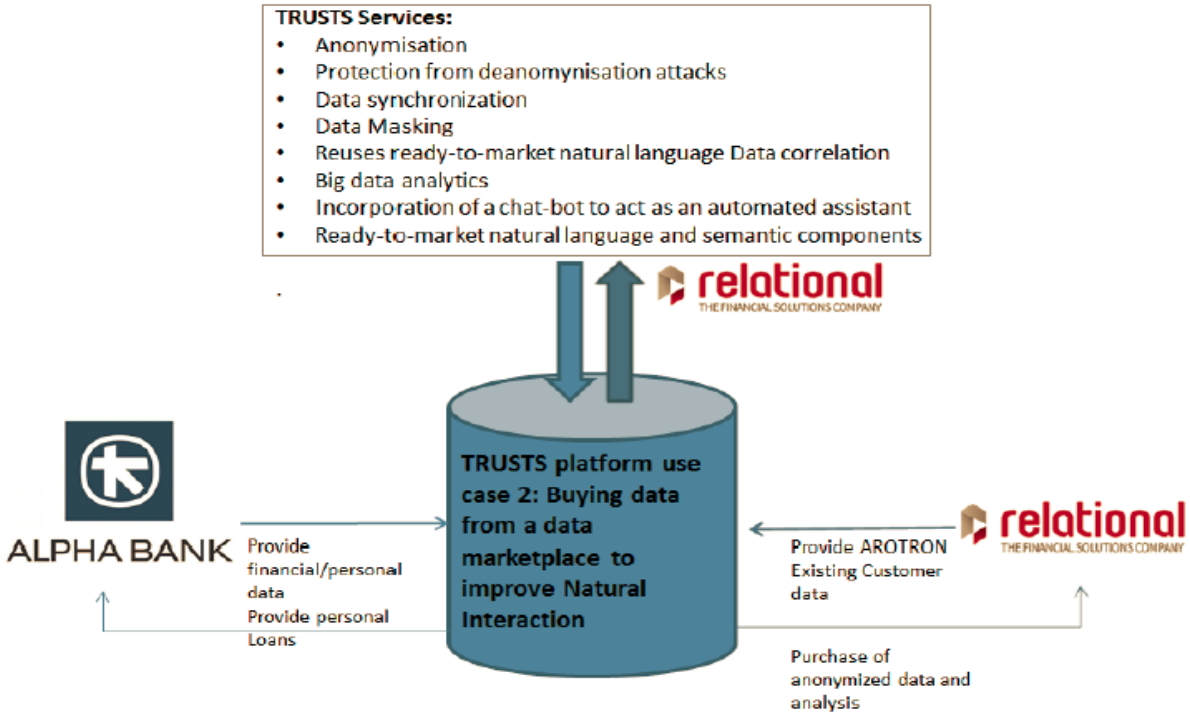

Figure 14: Buying data from a data marketplace to improve Natural Interaction, TRUSTS UC3

8.1.1 TRUSTS UC3 required services to be included in TRUSTS

TRUSTS operational functions/operations:

In order to sustain its operation TRUSTS should support the following operational functionality:

- On-boarding of external data
- Services on-boarding
- Metadata discovery (catalogue) and maintenance (descriptions, tags etc.)
- Service usage and billing
- GDPR related certifications
- Logging and auditing

8.1.1.1 TRUSTS Use Case 3 specific services:

The required TRUSTS services for UC3 are:

- Actors on-boarding and maintenance
- Metadata catalogue for data and services
- On-boarding of data and maintenance
- Services on-boarding and maintenance
- Monitoring of service performance/performance metrics
- Service usage analysis and billing (service inclusion in the marketplace)
- Data Quality/Data Enrichment/Data Cleansing/Anonymization verification
- Feedback mechanism for users for usage/service delivery, quality, Service Level Agreement (SLA) performance, enhancements etc.

8.1.2 Roles within TRUSTS UC3

The actors involved in UC3 are:

- **Alpha Bank: as a Data Provider/End User (Banking Organization/Creditor):** Alpha Bank will act as a provider of financial/personal data, will use anonymised telecommunication customer data and targeted marketing analysis.
- **REL is the leader of UC3 and will also act as a Service Provider:** Extraction of key data from core banking systems, REL main contribution is to provide and advance their products. Relational Romania will bring the AroTRON Collection & Recoveries to test and validate improved and more natural ways of communications and debt collection for banks.
- **FNET** will test the service by providing a communication channel from web customers that will allow agents to handle many conversations with end-customers at the same time.
- **FORTH** will contribute to the improvement of the conversational UI's usability by conducting evaluation sessions with UX experts. FORTH will also provide anonymization services for the data to be provided by FNET.

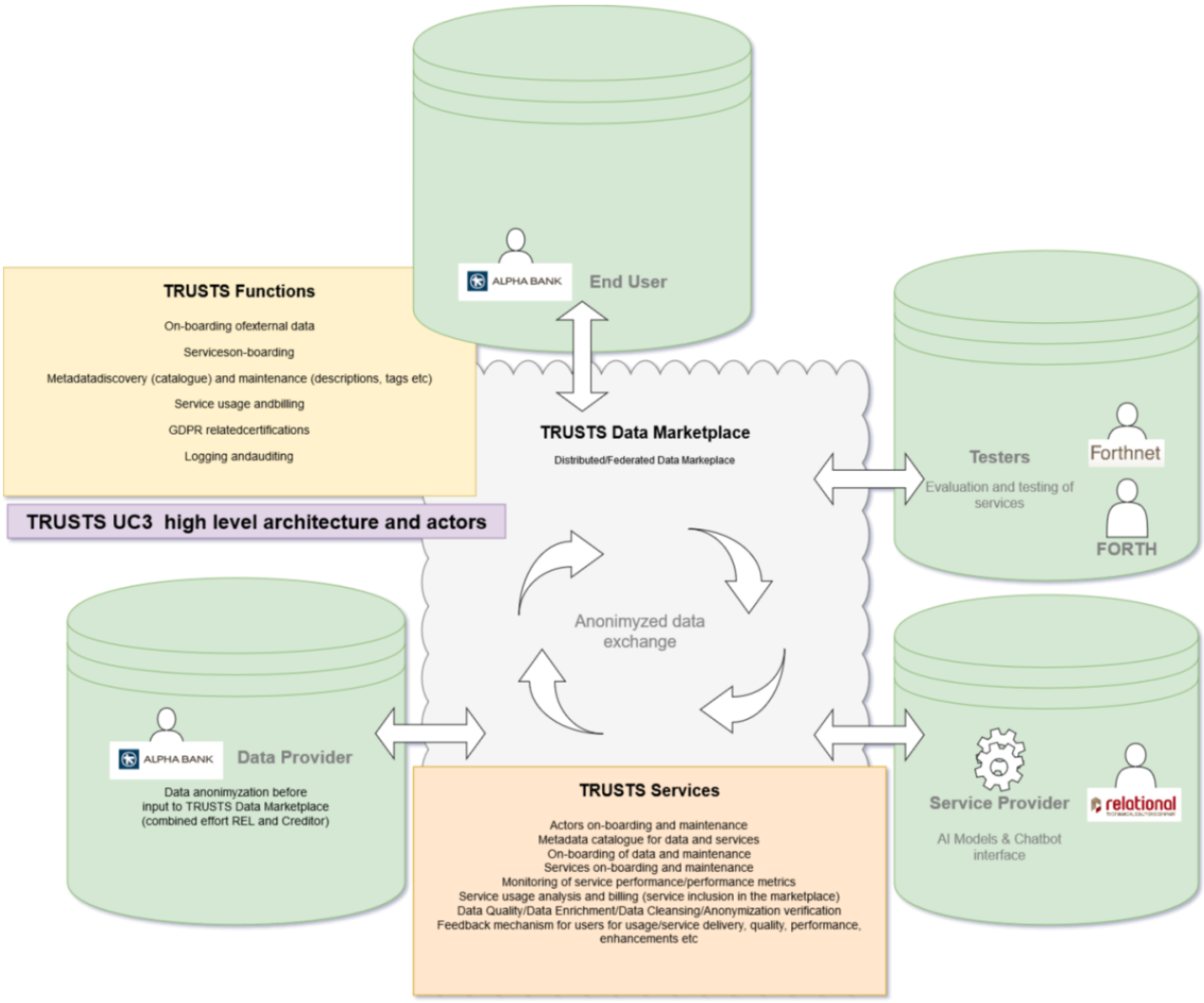

Figure 15: TRUSTS UC3 Actors

The figure above is an illustration of the overall architecture for TRUSTS UC3 that includes all actors involved in the UC as well as the execution flow diagram.

8.1.3 TRUSTS UC3 Expected Outcomes

The services listed above will be implemented on and will benefit from the TRUSTS federated infrastructure, by the following ways:

- Multiple data providers will offer their data, so, especially for UC3 this will be very important for the quality of the results (the more data, the better AI models can be trained).
- Change of business model that will transform an on premise-based service to the model of Software as a Service (SaaS).
- Standardization of metadata.
- Common services re-use (anonymization, secure data exchange, data correlation, data cleansing/validation/enhancements/standardization etc.).

The table below offers the automated Debt Collection outcome for UC3 designed for financial institutions/debt collectors' agencies.

8.2 Mapping of TRUSTS UC3 services with the TRUSTS functionalities

This section and the table below present the TRUSTS functionalities needed for the successful execution of UC3.

Table 29: TRUSTS UC3 required functionalities

UC3	Functionalities	Additional Explanations
Automated Debt Collection Service (with Chat service)	**Actors on-boarding**	Alpha Bank, REL, FNET and FORTH actors are successfully on-boarded. Roles are created successfully. Verification of contract fulfilment is done properly.
	Actors' maintenance	Add representative/disable representative; add new property/update property etc. Example: disable Alpha Romania, add Alpha Cyprus etc.
	On-boarding of data	Data sets are on-boarded and configured. Example: Alpha Bank uploads data: financial data sets etc.
	Data maintenance	Example: Alpha Bank updates some data sets; deletes other data sets etc.
	Services on-boarding	Services are successfully on-boarded and configured. REL is able to provide the 2 services for UC3. (AI Models and Chabot).
	Services maintenance	Example: REL adds new service component; uploads new version of services etc.

	Catalogue search for data and services	Example: Alpha Bank, end user, searches for Automated Debt Collection service to acquire and for Chabot; return REL provided services.
	Download/Consume data	Example: REL downloads data for the development of the models.
	Consume services	Example: Alpha Bank, end user, receives AI and analysis results.
	Service usage analysis and billing (service inclusion in the marketplace)	Example: Alpha Bank, REL can get reports/statics, service usage analysis from the data marketplace.

8.3 TRUSTS Use Case 3 Scenarios

REL infrastructure will be used for the technical setup of Use Case 3 scenarios. REL will operate and manage all Use Case 3 trials in order to secure and properly execute all Use Case 3 defined scenarios, as described in the sub-sections below.

The detailed description of UC3 scenarios is listed below.

TRUSTS UC3 Scenario 1

Table 30: TRUSTS UC3 Scenario 1

TRUSTS UC3	**'Buying data from a data marketplace to improve Natural Interaction'**				
SCENARIO 1	**Actors Onboarding and maintenance**				
REQUIREMENTS REFERENCE	**FR32, FR36, FR31, FR30, FR44**				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/ FAIL**	**ADDITIONAL NOTES**
Actors' enrolment and verifications for these organizations; actor types: data owners/providers etc; user access management.	*Actors' maintenance according to their organization rights.*	Alpha Bank, REL, FNET and FORTH actors are successfully on-boarded. Roles are created successfully. Verification of contract fulfilment is done properly.	TBD after trials	See KPIs below	Tests: add representative/ disable representative; add new property/ update property etc. Example: disable Alpha Romania, add Alpha Cyprus etc.

TRUSTS **UC3 - Scenario 1** flow:

1. Bank User and REL User connect to TRUSTS UI to request new accounts and Partner Certificates.
2. TRUSTS administrator redirects the Bank and REL requests to get certificates.
2. TRUSTS's administrator receives certificates, opens the accounts for Bank and REL are and sends them certificates and account info.
3. Bank Admin User and REL Admin User create additional users and grant them access rights (roles).
4. Bank Admin User can change some Users rights (roles).

TRUSTS UC3 Scenario 2

Table 31: TRUSTS UC3 Scenario 2

TRUSTS UC3	**'Buying data from a data marketplace to improve Natural Interaction'**				
SCENARIO 2	**Onboarding of data and data maintenance**				
REQUIREMENTS REFERENCE	**FR1, FR2, FR3, FR4, FR18, FR19, FR20, FR23, FR24, FR32, FR36, FR44**				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/ FAIL**	**ADDITIONAL NOTES**
Data sets on-boarding; privacy options: public/private (restricted) etc; auditing and logging	*Load new versions of data, incremental loads, deletes etc, structure changes*	Data sets are on-boarded and configured. Example: Alpha Bank uploads data: financial data sets etc.	TBD after trials	See KPIs below	Example: Alpha Bank updates some data sets; deletes other data sets etc.

TRUSTS **UC3 - Scenario 2** flow:

1. Bank User, with rights to create Datasets, connects to UI portal, defines new dataset metadata, uploads datasets to storage, and pushes metadata to Broker.
2. Bank User with rights to maintain Datasets connects to UI portal, changes dataset definition, uploads new version of dataset, and pushes metadata to Broker.
3. Notification will be sent as messages to Dataset's consumers, if exist.
4. Actions 1,2,3 are repeated for REL User to define Collateral service result Datasets.

TRUSTS UC3 Scenario 3

Table 32: TRUSTS UC3 Scenario 3

TRUSTS UC3	**'Buying data from a data marketplace to improve Natural Interaction'**
SCENARIO 3	**Services onboarding and maintenance**

REQUIREMENTS REFERENCE	FR1, FR2, FR3, FR18, FR19, FR20, FR36, FR37, FR44				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/ FAIL**	**ADDITIONAL NOTES**
Service on-boarding; terms and conditions associated to the service; contract management	*Load new versions for services; disable older versions; new/disable service announcements etc.*	Services are successfully on-boarded and configured. REL is able to provide the 2 services for UC3. (AI Models and Chatbot).	TBD after trials	See KPIs below	Example: REL adds new service component; uploads new version of services etc.

The steps 1,2,3 of Scenario 2 above, are suitable as well for Scenario 3.

TRUSTS UC3 Scenario 4

Table 33: TRUSTS UC3 Scenario 4

TRUSTS UC3	'Buying data from a data marketplace to improve Natural Interaction'				
SCENARIO 4	Catalogue search for data and services				
REQUIREMENTS REFERENCE	FR5, FR6, FR7, FR8, FR44				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/ FAIL**	**ADDITIONAL NOTES**
Discovery of required data and/or services throughout all the federated nodes	Response time: less than 1s User task success > 90% User satisfaction SUS score>90	Example: Alpha Bank, end user, searches for Automated Debt Collection service to acquire and for Chabot; return REL provided services.	TBD after trials	See KPIs below	

TRUSTS UC3 - Scenario 4 flow:

1. Bank user connects to UI portal, searches for REL Service and service results as datasets.
2. Bank user selects REL Service and Initiates contract.

TRUSTS UC3 Scenario 5

Table 34: TRUSTS UC3 Scenario 5

TRUSTS UC3	'Buying data from a data marketplace to improve Natural Interaction'

SCENARIO 5	Download/Consume data				
REQUIREMENTS REFERENCE	**FR18, FR24, FR29, FR36, FR44**				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS/FAIL**	**ADDITIONAL NOTES**
Access data according to the respective smart contract provisions		Example: REL downloads data for the development of the models.	TBD after trials	See KPIs below	

TRUSTS **UC3 - Scenario 5** flow:

1. REL offers a Service and it is authorized by KDC (Key Distribution Centre)
2. Bank requests access to the REL Service that REL offers.
3. Bank sends input dataset to REL Service
4. REL receives datasets and processes them (this can be done in an async manner if the process is very long, e.g., by using call back URLs/webhooks, etc.).
5. Bank receives result of service.

TRUSTS UC3 Scenario 6

Table 35: TRUSTS UC3 Scenario 6

TRUSTS UC3	'Buying data from a data marketplace to improve Natural Interaction'				
SCENARIO 6	**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**	**ACTUAL RESULTS**	**PASS/ FAIL**	**ADDITIONAL NOTES**
Evaluate service usage analysis tools; billing and contract; SLA; logging		Example: Alpha Bank, REL can get reports/statics, service usage analysis from the data marketplace	TBD after trials	See KPIs below	

TRUSTS **UC3 - Scenario 6** flow:

1. REL starts the service at contracted start date.
2. REL service records its activities results into datasets.
3. Bank in contracted period requests the result datasets from REL.
4. REL checks authentication of request and sends datasets to the Bank.
5. REL sends transactions info.
6. Bank receives datasets and stores them.
7. Bank sends transactions info.
8. Requests for payment from the Bank.

9. Bank pays the bill and sends information back.
10. Notification is sent to REL and the transaction closes.
11. After contract expiration REL stops Collateral service for the Bank.

TRUSTS UC3 Scenario 7

Table 36: TRUSTS UC3 Scenario 7

TRUSTS UC3	**'Buying data from a data marketplace to improve Natural Interaction'**				
SCENARIO 7	**Security Auditing**				
REQUIREMENTS REFERENCE	**FR21, FR22, FR25, FR29, FR36**				
SCENARIO TEST PROCEDURE	**ASSUMPTIONS & CONSTRAINTS**	**EXPECTED RESULTS**	**ACTUAL RESULTS**	**PASS / FAIL**	**ADDITIONAL NOTES**
View audit trails of user's activity and data and services' access		Get valid audit reports	TBD after trials	See KPIs below	

TRUSTS **UC3 - Scenario 7** flow:

1. Authorized users connect to portal UI and search transaction information.
2. Authorized users can rate a single transaction or parties participating in transactions.
3. Authorized users can view rating reports.

8.4 TRUSTS UC3 envisaged functional architecture

The following Figure 16 illustrates the TRUSTS E2E platform usage for UC3 in an envisaged functional architecture.

The provided external services are highlighted in yellow. UC3 source datasets, needed for UC3 services will reside on the Corporate Node (Bank) in anonymized format. For security reasons these will be anonymized prior to manipulation in TRUSTS. UC3 provided services can also manage and manipulate anonymized source data. The datasets are needed for the use of UC3 services, in order to train the chatbot, the input datasets will be used for the training of the UC3 cognitive model.

UC3 services provided by REL will process the input data and return as a result to the Bank a cognitive model (in the form of a dataset e.g., an XML or JSON). The result dataset will be used later on in the same process, in order to automate the debt collection process, with the use of the UC3 chatbot. The cognitive model sent as a result could contain debt collection related KPIs, analytics and statistics, which will be sent together as a response to the Bank. The result datasets and benchmarks will be returned in anonymized format back to the Bank.

The debt collection process described above and the flow of datasets manipulated in UC3 are illustrated in green in Figure 16. The flow of data coming from the Bank and that is going to be processed by the above-described external provided services (illustrated in yellow) is visible in green. The input datasets are processed by the UC3 provided services, the services return back as result the model and optionally the related debt collection analytics and statistics datasets. The resulting

datasets flow is illustrated in Figure 16 in purple colour. KPIs will include metrics of the expected chatbot efficiency e.g., percentage of automated replies, percentage of full conversions (get a promise to pay by the customer) etc.

UC3 provided services (in yellow colour in Figure 16) can manipulate information as accounts, customers, debts, related parties, collaterals and can provide, for example, scoring of each case based on automated dynamic rules, segmentation and risk classification of each case (low, medium, high risk) and of course strategy definition:

- friendly collection – amicable solutions, inform customer/related parties (by email, SMS, letter);
- judicial collection – litigation (phone call, denouncement, payment order, prenotation, foreclosure, auction etc).

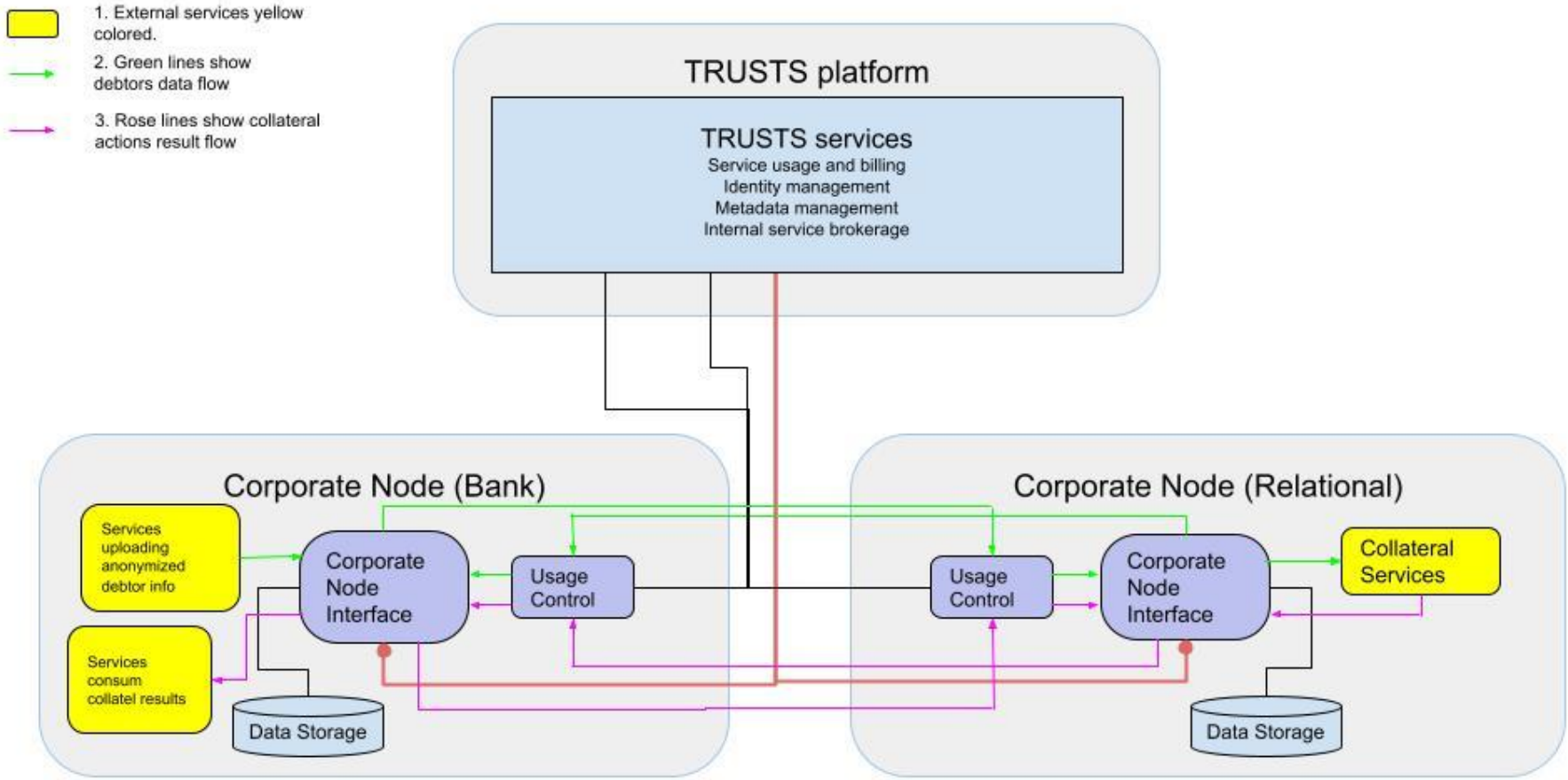

Figure 16: TRUSTS UC3 envisaged functional architecture

8.5 TRUSTS Use Case 3 Challenges, Risks and Assumptions

The main challenges of UC3 can be summarized here:

1. Use of AI to adapt human-computer interaction (HCI) services to customers demands and needs.
2. Personalized approach: Demonstrate the impact of being aware of and responsive to users' context and human emotions.
3. Demonstrate the impact of more natural ways of communications (natural language, speech, facial expressions).
4. Seamless integrated data interconnection among a variety of end-user devices and applications.
5. Demonstrate in real field the outcomes of more natural online interaction mechanisms to demonstrate the expected impact.

8.6 Key Performance Indicators (KPIs) Overview of TRUSTS UC3

The below table presents the KPIs of UC3 successful execution and platforms performance.

Table 37: TRUSTS UC3 long term KPIs

KPI	Baseline Value	Target Value (M36)	Process to meet the target KPIs
Decrease (X%) operational cost for the same collectability	Decrease (estimated at 5%) operational cost for the same collectability	Decrease (estimated at 20-25%) operational cost for the same collectability	A final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.
Increase (X%) efficiency and productivity	The overall contact centre efficiency will be increased by 5% with the help of the Virtual Assistant.	The overall contact centre efficiency will be increased 15% with the help of the Virtual Assistant.	Final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.
Cost reduction (X%) for process costs on debt management services	Decrease in debt management operational costs (through a 20% increase in process automation).	Decrease in debt management operational costs (through a 40% increase in process automation).	Final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.
Complaints Rate KPI	Decrease of 5 to 10%	Decrease of 5 to 10%	Final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.

Process automation increased (X%)	Estimated increase in efficiency and productivity by over 15%	Estimated increase in efficiency and productivity by over 25%	Base line will be taken during analysis phase from the Creditor, to register current KPI metrics (as is) and to be able to compare with new results (to be). Final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.
Increase (X%) collectability of debt	Estimated increase in collectability of debt by 10%	Estimated increase in collectability of debt by 20%	Final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.
Improve (X%) default event predictability	Foreseeing the end-customer's probability to default in at least 20% of the cases.	Foreseeing the end-customer's probability to default in at least 60% of the cases.	Final measurement of KPI needs the solution to be installed at production and run for a period in order to fine-tune and afterwards measure the KPIs.
Number of data providers interacting with the platform	1 at the start of the use case	Minimum 3 by M36	In order to achieve this the project needs to involve additional data providers using dissemination activities.
Number of end-users interacting with the Platform	1 at the start of the use case	Acquisition 3 customers by M36	In order to achieve this the project needs to involve additional data providers using dissemination activities.

8.7 TRUSTS UC3 Data Management

In the context of UC3, data, in the form of data sets, will be on-boarded and maintained following all the described privacy restrictions and compliance rules. Datasets collected by Alpha Supporting Services regarding financial transactions will be further processed for carrying out the research UC. Should it be concluded that the UC processing activities would result in a high risk for the data subjects, all information regarding the UC and the mitigation measures will be communicated to the according national Data Protection Authority and its consultation will be sought.

8.8 TRUSTS UC3 Future Exploitation

The TRUSTS Data Marketplace vision is to create an out-of-the-box analytics solution for the anonymisation and visualisation of Big Financial Data, specifically to advance new ways of HCI currently in their infancy, e.g., chatbots that can act as automated assistants to allow customers to converse about the management of their debt at their own pace and with a personalized experience, through the integration of Big Data.

9 Conclusions and Next Actions

This section summarizes the insights gained throughout the current phase of Task 5.1 and the planning of the execution of the three business-oriented Use Cases of TRUSTS.

This Deliverable describes how under Task 5.1, the setting up of the framework for the implementation of the Use Cases was performed, including defining the methodology for the Use Cases validation, the planning and monitoring of the activities, and the consequent learning process. It includes a description of the general context and detailed information regarding the current state of physical setup, integration along with the preparatory actions and activities. A detailed description of the planning and operational information of each of the three business-oriented use cases is specified with a devoted section. As a management and monitoring task, Task 5.1 will keep monitoring the implementation progress of the use cases to guarantee the compliance with the project objectives.

Deliverable 5.1 focuses on the planning and set-up activities of the first phase of the UC trials and as it is an ongoing, continuous process, it requires commitment from all the involved partners to achieve the desirable Grant Agreement obligations. Indeed, not all aspects and parameters of the Platform development are known, decided or implemented so far but certainly it's a work in progress and all TRUSTS Consortium are well-versed of the progress and are contributing to the project's objectives. That is to develop a platform that will act independently as a platform federator, while investigating the legal and ethical aspects that apply on the entire data valorisation chain, from data providers to consumers. In addition to advance a fully operational and GDPR compliant European Data Marketplace, targeting individual and industrial use enriching the two existing data marketplaces (IDSA and DMA) with new functionalities and services to scale out.

Furthermore, the next action of the work of WP5 is the actual deployment of the first demonstration phase of the Use Cases based on the requirements and conditions that are highlighted in this document along with the available MVP version to be delivered by Work Package 3. Then, the UCs during the first testing phase, will test all obtainable functionalities, evaluate and document the results accordingly. These findings will be taken into consideration during the new development cycle. The defined agile framework will be followed if applicable, with recurrent sub-cycles of testing and incrementally delivering new evidence and results following the Plan – Do – Check – Act pattern as defined in this report. This approach guarantees the replicability and the comparability of the generated results in order to effectively validate the outcomes of the development phase.

The E2E platform functionality, processes and operation will be tested through the UC trials in order to assure that will establish a unified, comprehensive, viable, expandable and future proof data marketplace service. The execution of the three UCs is under Task 5.2 'Use case demonstration execution', of the project's WP5, where the pilot actors will perform testing and validation activities in cooperation, and their results and effectiveness will continuously assist in improving the Platform.

The following reviewed and updated periodical reports will include the implementation and testing plan for the pilots, updated at the end of the first demonstration phase (M25) and the final phase (M33). The experience gained in the performance of the testing/pilots will be reported in the D5.2 "Planning, monitoring and continuous learning (second version)". The monitoring exercise will feed into the performance evaluation and lessons learned tasks T5.3. The results will be compared to the preliminarily defined KPIs in order to assess the performances of the TRUSTS solution, provide interim feedback for refinements and, eventually, final recommendations.

Table 38: Following 'Pilot planning and operational management Reports'

D#	Deliverable name	Lead	Due date
D5.2	Pilot planning and operational management reports II	eBOS	M25 (January 2022)
D5.3	Pilot planning and operational management reports III	eBOS	M33 (October 2022)

During the whole implementation of the project T5.1 will continue to interact with:

- WP2, which contributes to the requirements elicitation and specifications, as well as the Business and Technological Validations and the Architecture design and technical specifications of the platform,
- WP3, which will contribute to the TRUSTS Platform components, development and integration,
- WP4, which will provide Privacy Preserving Technologies.

The aim is to systematically assess the input from all involved parties in order to fulfil the objective of T5.1 and WP5, to demonstrate and validate the TRUSTS platform and along with WP2 to validate the three UC's business wise and develop business plans with the highest commercial potential that will result to the overall projects commitments.

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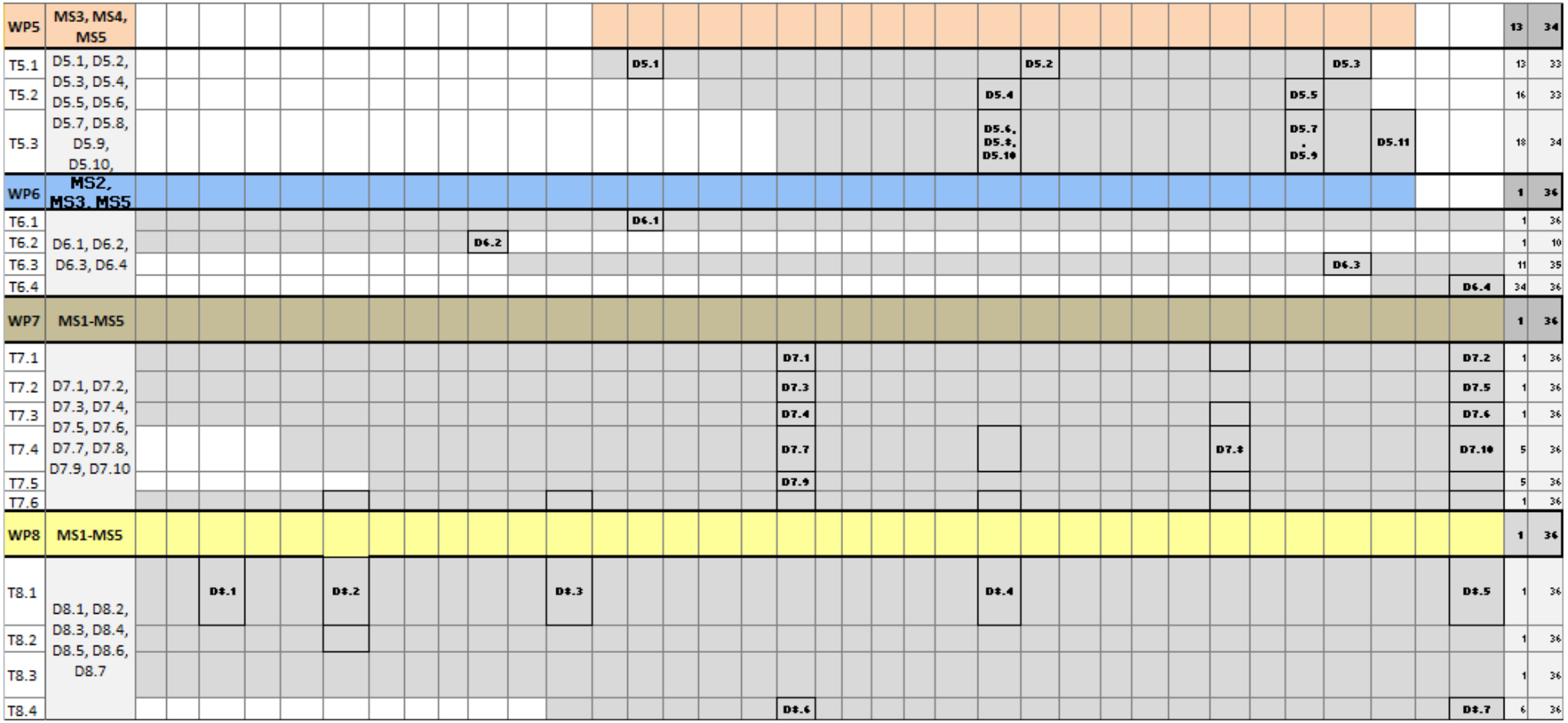
Annex I: "TRUSTS Initial Generic Gantt Chart, as in the GA"

	Deliverables & Milestones	Months 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	Start-End (month)	
	Milestones						MS1						MS2						MS3						MS4														MS5		
WP1	MS1, MS2,																																					1	36
T1.1	D1.1, D1.2,			D1.1			D1.5																															1	36
T1.2	D1.3, D1.4,						D1.6																															1	36
T1.3	D1.5, D1.6												D1.2												D1.3												D1.4	1	36
WP2	MS1-MS5																																					1	24
T2.1	D2.1, D2.2, D2.3, D2.4, D2.5, D2.6, D2.7																		D2.1																			1	24
T2.2							D2.2																		D2.3													1	24
T2.3							D2.4																		D2.5													1	24
T2.4													D2.6												D2.7													1	24
WP3	MS2, MS4, MS5																																					1	36
T3.1	D3.1, D3.2, D3.3, D3.4, D3.5, D3.6, D3.7, D3.8, D3.9, D3.10, D3.11, D3.12, D3.13			D3.1									D3.2																									1	36
T3.2																																				D3.3	1	36
T3.3													D3.4												D3.5					D3.6							6	30
T3.4																			D3.7											D3.8							6	30
T3.5													D3.9												D3.10											D3.11	3	36
T3.6																			D3.12																	D3.13	18	36
WP4	MS3, MS5																																					1	36
T4.1	D4.1, D4.2																																					1	18
T4.2																																						1	18
T4.3																			D4.1																			6	32
T4.4																														D4.2							18	36
T4.5																																						18	36

Figure 17: TRUSTS initial Generic Gantt Chart, as per the GA


WP5
MS3, MS4, MS5
T5.1
T5.2
T5.3
D5.1, D5.2, D5.3, D5.4, D5.5, D5.6, D5.7, D5.8, D5.9, D5.10,
D5.1
D5.2
D5.3
D5.4
D5.5
D5.6, D5.8, D5.10
D5.7 . D5.9
D5.11
WP6
MS2, MS3, MS5
T6.1
T6.2
T6.3
T6.4
D6.1, D6.2, D6.3, D6.4
D6.1
D6.2
D6.3
D6.4
WP7
MS1-MS5
T7.1
T7.2
T7.3
T7.4
T7.5
T7.6
D7.1, D7.2, D7.3, D7.4, D7.5, D7.6, D7.7, D7.8, D7.9, D7.10
D7.1
D7.3
D7.4
D7.7
D7.9
D7.8
D7.2
D7.5
D7.6
D7.10
WP8
MS1-MS5
T8.1
T8.2
T8.3
T8.4
D8.1, D8.2, D8.3, D8.4, D8.5, D8.6, D8.7
D8.1
D8.2
D8.3
D8.4
D8.6
D8.5
D8.7

Annex II: "TRUSTS Grant Agreement Objective 1"

Objective 1	**WP 2 Requirements Elicitation & Specification**
To analyse the EU & worldwide challenges and trends for **data-sharing** and define the requirements for the provision of a **multi**, **concurrent** and **cross-domain**, **secure** and **scalable end-to-end (E2E) data marketplace service**.	
Achieving this objective will require capturing and eliciting **end-user requirements**, as well as a detailed analysis of end-user needs in view of transforming these into specific functional requirements and an architectural design.	
Measurable outcomes: 1. Detailed **industry-specific functional specifications** appropriate for a data marketplace linked to specific target **KPIs** considering and bridging the vertical user point of view (PoV) with the analytics/solution provider PoV and the data marketplace platform provider PoV produced by M6; 2. Set of KPIs and methodologies to enable **demonstration** and **validation** of the TRUSTS Platform (M6); 3. **Architectural design** and **technical specifications** document of the TRUSTS Platform ready by M12, indicating the technical assets from existing data marketplaces (**IDS** and **DMA**) to be leveraged.	
Objective 2	**WP 3 TRUSTS Platform implementation**
To leverage **existing data markets technologies** and **components** (Industrial Data Space and the Data Market Austria) and **integrate** them in the innovative TRUSTS Platform.	

Figure 18: TRUSTS Grant Agreement Objective 1

Annex III: "Initial version of the TRUSTS functional requirements as defined in D2.2"

Table 39: Initial version of the TRUSTS functional requirements as defined in D2.2

Req. ID	Description
Datasets and services on boarding functionality and processes	
1.	The system should provide standardized API descriptions for enabling providers to on board their datasets and services.
2.	The system should provide APIs that enable its interoperability/federation with other industrial marketplaces and external sources.
3.	The system should be able to provide datasets and services descriptions.
4.	The system should provide reference mechanisms to open data from 3rd sources, so as to make available as an option through its data exploration, profiling and provision mechanisms.
Intelligent data/service exploration and correlation functionality and processes	
5.	The system should provide rich search mechanisms across all federated nodes for available datasets and services.
6.	The system should be able to provide datasets and services recommendations to its' users pertaining to their profile and needs.
7.	The system should employ matchmaking mechanisms through which hosted datasets are matched with hosted services (e.g., suitable for their analysis) and vice versa.
8.	The system should identify and match related datasets so as to provide combined and enriched data.
9.	The system should be able to improve datasets and services profiles based on extracted information originating from the available data .
Purchasing and billing	
10.	The system should provide smart contract mechanisms as a validation means of sellers/buyer's agreements.
11.	The system should ensure the integrity and authenticity of the smart contracts signed by its users.
12.	The system should provide a human friendly representation of smart contracts (e.g., natural language).
13.	Signed smart contracts should be legally valid, enforceable and interpretable.
14.	The system should encompass mechanisms for keeping transactions performed ensuring that they cannot be infringed.
15.	The system should provide billing mechanisms for enabling consumers to pay providers according to the agreed smart contract.

16.	The system must provide alternative and flexible pricing models taking into consideration the diversity of the available datasets and services.
17.	The system should provide brokerage mechanisms for addressing the offerings and demands of the hosted datasets and services.
(Meta-)Data Governance	
18.	The system should provide explicit metadata information for each dataset or service is accommodated in the platform.
19.	The system should incorporate models, ontologies and taxonomies for the classification and semantic representation of the accommodated datasets and services in the platform.
20.	The system should be able to incorporate well established or standardized ontologies from different scientific, industrial and business domains for the description of the semantic representation of the hosted datasets and services.
21.	The system should provide mechanisms capable to identify the provenance of the hosted datasets.
22.	The system should provide mechanisms capable to identify the lifecycle of the hosted datasets.
23.	The system should harvest metadata extraction from external datasets.
24.	The system should be able to provide semantic information even for unstructured datasets.
25.	The system should be able to keep continuously updated profiles of the hosted datasets and services based on related interactions performed with the system.
26.	Dataset discovery should be based on the FAIR principle.
Data as a Service and Subscribers management	
27.	TRUSTS datasets and services should be provided to the users on demand, regardless of geographic or organizational separation between provider and consumer taking into account all potential territorial legislation/regulatory restrictions.
28.	TRUSTS should be able to be deployed as a federation of distributed, interconnected and interoperable nodes.
29.	The system should enable its users to explore data and services openly, providing public descriptions. However, purchased data and services need to be exchanged point-to-point, between the seller and the buyer. Users should be rated for their quality of transactions.
30.	The system should support mechanisms for users' (producers/consumers) subscription opting different schemes (e.g., annual, monthly, etc.) and authentication.
31.	The system should support corporate accounts that fall under one subscription/enrolment per organization.
32.	The system should enable users to create, read, update, and delete (withdraw or make unavailable) datasets, services and user profile records.

33.	The system should provide validation criteria for the new enrolled users, as well as, reputation schemes with regard to available datasets and services.
34.	The system should allow consumers to announce their need for specific datasets / services if there are not any available, already.
35.	The system should provide notifications regarding datasets / services updates to users that have granted access to them.
36.	The system should provide easy to use UIs (ensuring effectiveness, efficiency and user satisfaction) that will help users to accomplish their tasks effectively and prevent them from committing errors.
37.	TRUSTS UIs and workflows have to follow a business-wise rational (e.g., one stop shop), for coherently mapping the market's needs.
Data protection	
38.	The system must provide cryptographic and secure protocols for the analysis of sensitive data as required by the respective stakeholders.
39.	The system should provide de-anonymization attack assessment and risk analysis for the private / sensitive datasets to be on board.
40.	The system should employ anonymization tools and guidelines for data anonymization
41.	The system should provide means for converting algorithms that might compromise the data privacy into safe privacy preserving ones without harming their functionality.
Advanced data analysis based on Machine Learning	
42.	The system should incorporate well established ML algorithms that can be used by the TRUSTS customers for data analysis and classification.
43.	The system must incorporate a secure infrastructure for the distributed analysis of data based on ML approaches.
Trusted and legitimate data flows	
44.	Mechanisms provided by the TRUSTS platform regarding personal data, non-personal data and services exploration, exchange agreements and purchase, should be compliant with the following regulations (when applicable): • General Data Protection Regulation • e-Privacy regulation, for electronic communications • Free Flow of Non-Personal Data Regulation, for data exchange between the TRUSTS platform and subscribers • Platform-to-Business Regulation, for safeguarding TRUSTS' operational transparency and fairness.