2024

Draft Document

DELIVERABLE 5.1

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D5.1: Methodological Approach for Monitoring and Evaluation

This project has received funding from the European Union's Horizon Research and Innovation Actions under Grant Agreement № 101093216.

Title:	Document version:
D5.1 Methodological Approach for Monitoring and Evaluation	1.0

Project number:	Project Acronym	Project Tittle
101093216	UPCAST Project	UPCAST Project

Contractual Delivery Date:	Actual Delivery Date:	Deliverable Type*-Security*:
M16 (April 2024)	M16 (April 2024)	O-PU

*Type: P: Prototype; R: Report; D: Demonstrator; O: Other; ORDP: Open Research Data Pilot; E: Ethics.

**Security Class: PU: Public; PP: Restricted to other program participants (including the Commission); RE: Restricted to a group defined by the consortium (including the Commission); CO: Confidential, only for members of the consortium (including the Commission).

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Abstract:

Deliverable D5.1 aims to provide the UPCAST Monitoring and Evaluation (M&E) Plan, which will serve as the guideline for the development of the pilots. This plan should provide enough details for enabling a successful realization of pilots objectives.

The document is based on the work performed in the WP5 which is related to the development and validation of the selected pilots. In particular, this deliverable covers the work done in Task 5,1, which is responsible for the development of the UPCAST Monitoring and Evaluation (M&E) Plan.

The document contains all required activities for a successful realization of the pilots, focusing on a) methods and tools to be used for the continuous tracking of implementation activities, b) the flow of services planned for pilots, incl. the envisioned scenarios and c) required compliances

Keywords:

Pilot Validation

Plan for monitoring validation

Tools for continuous tracking of the progress

Compliance

REVISION HISTORY

Revision:	Date:	Description:	Author (Organization)
V0.1	22.02.2024	ToC	Nenad Stojanovic (Nissatech)
V0.4	01.04.2024	Initial contributions	All partners
V0.8	14.04.2024	Refinement	All partners
V0.8	21.04.2024	Review	Nevena Raczko (IDC)
V0.8	24.04.2024	Review	Fernando Perales (JOT)
V0.9	29.04.2024	Refinement based on reviewers comments	All partners
V1.0	30.04.2024	Preparation for the submission	Nenad Stojanovic (Nissatech)

This project has received funding from the European Union's Horizon Research and Innovation Actions under Grant Agreement Nº 101093216.

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1 INTRODUCTION

1.1 UPCAST Project

UPCAST, Universal Platform Components for Safe Fair Interoperable Data Exchange, Monetization and Trading provides a set of universal, trustworthy, transparent and user-friendly data market plugins for the automation of data sharing and processing agreements between businesses, public administrations and citizens. Our plugins will enable actors in the common European data spaces to design and deploy data exchange and trading operations guaranteeing:

- automatic negotiation of agreement terms;
- dynamic fair pricing;
- improved data-asset discovery;
- privacy, commercial and administrative confidentiality requirements;
- low environmental footprint;
- compliance with relevant legislation;
- ethical and responsibility guidelines.

UPCAST will support the deployment of Common European data spaces by consolidating and acting upon mature research in the areas of data management, privacy, monetisation, exchange and automated negotiation, considering efficiency for the environment as well as compliance with EU and national initiatives, AI regulations and ethical procedures. Four real-world pilots across Europe will operationalise a set of working platform plugins for data sharing, monetisation and trading, deployable across a variety of different data marketplaces and platforms, ensuring digital autonomy of data providers, brokers, users and data subjects, and enabling interoperability within European data spaces. UPCAST aims at engaging SMEs, administrations and citizens by providing a transferability framework, best practices and training to endow users in order to deploy the new technologies and maximise impact of the project.

Work package 5 is related to the development and validation of the selected pilots. It contains all required activities for a successful realization of the pilots.

Task 5.1 is responsible for the development of the UPCAST Monitoring and Evaluation (M&E) Plan. It will be assessed and approved by the Pilot users, platform technology providers. Based on the M&E process, the plan will provide a description of the objectives and goals of the pilot, processes, and tools to perform continuous tracking of implementation activities, description of the expected flow of services and the platforms expected output, required compliance with security constraints, standards, laws, regulations and implementation guidelines.

1.2 Purpose of the Document

This document aims to provide the UPCAST Monitoring and Evaluation (M&E) Plan, which will serve as the guideline for the development of the pilots. This plan should provide enough details for enabling a successful realization of pilots objectives.

1.3 Scope of the Document

This document is based on the work performed in the WP5 which is related to the development and validation of the selected pilots. It contains all required activities for a successful realization of the pilots. In particular, this deliverable covers the work done in Task 5,1, which is responsible for the development of the UPCAST Monitoring and Evaluation (M&E) Plan

1.4 Structure of the Document

The rest of the document is organized as follows:

- Second section provides the description of the pilots objectives, goals and KPIs
- Third section discusses about the tool for continuous tracking of implementation activities
- Fourth section describes the flow of services planned for pilots
- Fifth section discusses about required compliances
- Sixth section contains concluding remarks and next steps.

2 Description of the objectives, goal and KPIs of the pilots

In this section we provide the updates of the description of the objectives and KPIs of all pilots. The main goal is to provide a detailed view on the main characteristics of the pilots in order to understand what and why will be validated in the pilots.

The basis for this deliverable are pilots descriptions provided in D1.1 PROJECT CONCEPT REQUIREMENTS SETUP and D1.2 MVP DEFINITION AND ARCHITECTURE.

2.1 Objectives

In this subsection the updates of the pilots' objectives are presented.

2.1.1 Pilot BIOMEDICAL AND GENOMIC DATA SHARING

This pilot concerns sharing of biomedical and genomic data –in the field of cancer genomics- between NHRF and clinical or other research partners, as well as the integration of multi-sourced data (in-house generated data, data from repositories or datasets generated by different analytical pipelines). Although data sharing is well recognised as a cornerstone within cancer genomics, several barriers still retain a great amount of data unexploited. Privacy-related concerns, ownership and intellectual property issues, utilisation of different analytical pipelines and different vocabularies for data description, as well as storage of data in diverse file formats, are among the challenges that must be faced in order to facilitate integration and interpretation of data from different sources and accelerate research outcomes.

2.1.2 Pilot PUBLIC ADMINISTRATION

The availability of environmental data has the potential to change the ways in which cities are governed for sustainability and climate change mitigation and adaptation. More than ever, better environmental data is required to address urban challenges to the climate crisis. The availability of such data is critical to improve the monitoring and management of urban systems, as well as enabling robust assessments of policy and planning interventions.

The primary objective of this pilot is to streamline the process for public administration organizations to access local datasets that are not within their own collection and establish connections between these external datasets and their own or other available open datasets.

2.1.3 Pilot HEALTH AND FITNESS

The vision is to enable an easy and efficient sharing and monetarization of the data generated during various physical activities in various data sharing scenarios

This vision will be realized through several objectives:

O1: to develop an efficient system for data valuation

O2: to define and validate a system for support sharing and monetarization

O3: to apply the system on the real user data and validate the use case

Personal fitness/health data, collected during various physical activities has an extreme value not only for the data producer (trainee), but also for many service providers (fitness, healthcare, wellbeing) and product vendors (e.g. vendors of the fitness equipment, different supplements). This explains the need for sharing the data and monetarize its value properly

Data related to the usage of service: Main value is that the data is reflecting the usage of services/products and implicitly validating some of their properties/characteristics. For example, a fitness equipment vendor would be very interested in the way how a particular multifunctional fitness machine is used (which functionalities are most/least used). The data will help in the design of the new equipment.

Personal data related to the nature of service: Moreover, this data is showing also the personal characteristics of a trainee (and groups od trainees), reflecting the characteristics of the service/product usage. For example, a fitness equipment vendor would be interested in the average heart rate for a particular user group, when doing a particular exercise. This data will help in offering new services to the particular fitness club, or even a particular user/trainee.

2.1.4 Pilot DIGITAL MARKETING 1

The main goal of the pilot case is the development of a new data commercialization service thanks to the advance analysis of the marketing performance data of the digital campaigns. By means of the development of dedicated services for data request definition, query customization, analytics and the integration of pricing and contract plug-ins, JOT aims to launch this data monetization service enabling the reporting of user interests in multiple business verticals and locations.

These goals are based on the current disposal of historical data base containing full list of variables describing the performance and impact of the keywords forming the digital marketing campaigns. They do not contain any confidential or sensitive data, being JOT the owner.

Finally, with the aim of fitting the data consumer needs and expectations the delivery of this data monetization service will combine data sets with document-based report and interactive dashboard, showing main indicators and insights of the requested market.

2.1.5 Pilot DIGITAL MARKETING 2

This pilot project showcases how Cactus, a tech firm, teams up with its clients to share data. Together, they aim to create personalized digital marketing solutions that fit each client's needs perfectly. Using a rich database of client data, Cactus designs marketing plans that match the goals of its partner companies seamlessly. Beyond serving its clients, Cactus wants to extend its data-sharing approach to collaborate with both partners and competitors. By offering valuable insights like competitive intelligence reports, Cactus helps organizations spot areas for growth and innovation. This cooperative strategy not only boosts the digital marketing scene but also shows Cactus's commitment to driving progress in the industry.

2.2 Goals

In this subsection the updates of the pilots' goals are presented.

2.2.1 Pilot BIOMEDICAL AND GENOMIC DATA SHARING

Main goals are:

1) **Establish Robust Collaboration Frameworks:** The first goal is to create a comprehensive framework that enables effective collaboration between NHRF and various partners, including clinical researchers, other research institutions, and potentially commercial entities (biotechnological, pharmaceutical companies). This framework will encompass the establishment of contractual agreements that respect legal, ethical, and operational parameters. It aims to ensure clear communication, defined obligations, timelines, and a systematic review and approval process that aligns with the shared objectives of advancing cancer genomics research while safeguarding participant privacy and data integrity.

2) **Develop a Secure and Efficient Data Sharing and Integration System**: The second goal focuses on the development of a secure, user-friendly platform for data sharing and integration that adheres to the highest standards of data privacy and security. This includes creating mechanisms for controlled access to genomic data, integrating and harmonizing data from diverse sources (e.g., in-house generated data, external repositories, and datasets produced by various analytical methods), and ensuring data consistency across different formats and pipelines. The system will enable researchers to seamlessly share, access, and analyse multi-sourced genomic data, thereby accelerating cancer genomics research and discovery.

3) **Enable Exploitation of Genomic Data:** The third goal aims to establish a framework that facilitates the exploitation, or commercialization, of genomic datasets managed by NHRF. The possible commercialisation of NHRF datasets refers to selected datasets generated from *in vitro* experiments performed in NHRF or curated genomic datasets from public resources and not data derived from a clinical setting. This includes developing licensing models and access control mechanisms that allow for the commercial use of genomic data while protecting intellectual property rights. This framework will not only support the sustainability of NHRF's genomic research efforts but also ensure that genomic data is utilized in a manner that advances the research in the field of cancer genomics.

2.2.2 Pilot PUBLIC ADMINISTRATION

Main goals are:

1) Characterize the different uses of environmental data, analyze focused interventions and informing operational decision-making, to monitoring progress against policy goals of the Metropolitan Area of Thessaloniki.

2) Define the local ecosystem of various actors for capturing, maintaining and using environmental data, such as the Resilient Thessaloniki municipal office and other intermediaries such as local NGOs and civil initiatives

3) Test the organizational/governance challenges in terms of managing and presenting environmental data delivered to other actors/data consumers such as researchers, practitioners, citizens, entrepreneurs etc.

2.2.3 Pilot HEALTH AND FITNESS

The main goal is to enable an easy manageable approach for sharing the data generated during various physical activities for various data sharing scenarios and support the monetization process (data from the physical activities should be monetarized)

This requires:

to enable a proper data valuation for selected datasets

to apply in the pilot with a huge data need

to provide a comprehensive validation

to continue business activities.

2.2.4 Pilot DIGITAL MARKETING 1

The main goals to generate this data monetization service based on marketing data involve are the following:

1) Implement end-to-end data pipeline for the generation of a new data monetization service based on digital marketing campaigns performance data
2) Develop a service request web service enabling the definition of the requested data set and service delivery method
3) Automate the generation of the SQL based query to generate the required data set
4) On-demand access to pricing and contract plug-ins for commercial service generation
5) Development of document and dashboards templates for advance service delivery, facilitating the understanding of the insights generated by the data sets

2.2.5 Pilot DIGITAL MARKETING 2

This use case is dedicated to advancing digital marketing data management practices through the implementation of a suite of innovative plugins within the UPCAST framework. The first goal is to streamline the process of discovering and acquiring relevant datasets from external repositories, such as Google Analytics and Meta Analytics, maintained by other organizations. By enhancing accessibility to diverse datasets, stakeholders can enrich their digital marketing data resources and booster analytical capabilities. A key focus is on evaluating the quality and value of marketing data and RFM (Recency,Freequency,Monetary Value) tools with the aim of identifying opportunities for monetization. Through rigorous assessment processes, stakeholders can discern the potential revenue-generating capacity of their digital marketing assets, thereby informing strategic decision-making. Another crucial objective is to promote seamless integration and exchange of data across multiple sources and service providers within the digital marketing ecosystem. This goal seeks to foster collaboration and interoperability among stakeholders, fostering a more cohesive and efficient data environment. An essential aspect of this initiative is the negotiation and establishment of access control policies with partners and customers. By defining and enforcing access control mechanisms, stakeholders can safeguard the integrity and

confidentiality of digital marketing data, ensuring compliance with regulatory requirements and contractual agreements Finally, the use case aims to enhance transparency and explainability in AI-driven tools deployed for digital marketing endeavors. Through robust monitoring and auditing processes, stakeholders can ensure accountability and trustworthiness in the deployment of AI-driven tools, thereby fostering confidence among users and stakeholders.

2.3 KPIs

In this subsection the updates of the pilots' KPIs are presented.

2.3.1 Pilot BIOMEDICAL AND GENOMIC DATA SHARING

Key Performance Indicator	Measure
Datasets shareable with other clinical/research partners	≥ 3
Number of data processing workflows implemented	≥ 3
Time to assess a data processing workflow	< 1 min
Number of integrated data sources	≥ 5
Percentage of privacy flaws identified in data processing workflows	≥ 90%

2.3.2 Pilot PUBLIC ADMINISTRATION

Key Performance Indicator	Measure
Datasets shared with other public administration	≥ 8
Dataset variations anonymised and following legal constraints ready for sharing with external parties	≥ 30
Data Processing Workflows implementing decision making indicators	≥ 3 workflows
Efficiency increases in decision-making process	≥ 20% faster, measured in days to reach a data-sharing agreement and take a decision.

2.3.3 Pilot HEALTH AND FITNESS

Key Performance Indicator	Measure
Increase the amount of data shared with external stakeholders	≥ 50%
Increasing the number of users who understand what is the value of data	≥ 50%
Increase the average value/price of data	≥ 30%
Automatize the procedures for sharing data with an external stakeholder incl. ethical and legal issues	≥ 85%

2.3.4 Pilot DIGITAL MARKETING 1

Following the KPIs definition in D1.1, this is the updated table of indicators to be used in the pilot for final validation:

Key Performance Indicator	Measure
Deployment of 5 data set for different business verticals as examples	Generation of 5 examples of data sets with different business verticals and locations to be included in the UI for data consumer consultation
Generation of 3 type of reports	Definition and implementation of 3 type of reports to automate the calculation of insights and KPIs according to the service requested
Integration of plug ins for service deployment	At least 2 plug ins will be integrated in the DaaS service flow. Pricing and service contract are the prefenced ones according to the business flow,¡ and technical needs.
Generate market DaaS cases	Deploy 2 services to companies out of the consortium in different business domains.

2.3.5 Pilot DIGITAL MARKETING 2

Cactus and Jot's KPIs are the same since they are sharing the digital marketing pilot

Key Performance Indicator	Measure
Deployment of 5 data set for different business verticals as examples	Generation of 5 examples of data sets with different business verticals and locations to be included in the UI for data consumer consultation
Generation of 3 type of reports	Definition and implementation of 3 type of reports to automate the calculation of insights and KPIs according to the service requested
Integration of plug ins for service deployment	At least 2 plug ins will be integrated in the DaaS service flow. Pricing and service contract are the prefenced ones according to the business flow,¡ and technical needs.
Generate market DaaS cases	Deploy 2 services to companies out of the consortium in different business domains.

3 Processes and tools to perform continuous tracking of implementation activities

The most important issues for the development of the pilots is the selection of the tools for continuous tracking of the progress in the execution of pilots. This section provides the details about this selection process.

3.1 Requirements

In this subsection we provide the requirements for a tool which can be used to perform continuous tracking of implementation activities.

Based on the various discussions and the analysis of the literature, we define the following set of requirements:

1) Issue tracking

It is a common practice for development teams and customer support organizations.

2) Project

A project represents a collection of effort that contributes to the creation of a pre-defined product, service, or result.

3) Time tracking

Time Tracking counts the amount of time spent in some tasks/activities.

4) Gantt charts

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time.

5) Timesheets

Timesheet is a data table which an employer can use to track the time a particular employee has worked during a certain period.

6) Agile boards

Agile boards help managing issues efficiently, no matter what process (Scrum, Kanban) used

7) Reports

Reports help analyzing and managing project and team activity. Reports can be used to evaluate personal efforts.

8) Dashboard

The Dashboard is a convenient way to get an overview of the current status of tasks and monitor the progress of the team.

9) Knowledge Base

Knowledge Base is the structure for storing the knowledge (experience) related to the execution of the previous activities

3.2 Selection process

During the reoccurring WP meetings various tools used in the pilots for tracking the progress of the development were discussed, with the goal to select one of those for continuous tracking of the implementation activities. However, none of the pilots is using a tool for monitoring the execution of their own services which could be shared with other pilots.

List of the tools that were discussed as candidates for the monitoring tool:

1. Ordinary office tool: Microsoft Teams – Word document
   - Table with milestones
   - Table with risks
   - Template for weekly logging report with status indication

Comment: it is too simple process

2. Monday (https://monday.com/)
Comment: it appears bad if using a free version

3. Trello (https://trello.com/)
Comment: currently top choice, need to learn how to use all the features before educating project pilots

4. Youtrack (https://www.jetbrains.com/youtrack/)
Comment: too much development based, but perfect as we could have it onto our server, and we know all about it!

5. GitHub (https://github.com/),
Comment: maybe the best options as UPCAST already has it, and everyone will be using it, cons: we need to explore possibilities on this one and educate ourselves before we can help and guide pilots (we do have experience just not the technology insights).

Selection process was performed during WPs teleconferences. The decision was made to take YouTrack, esp. due to familiarity of partners with that tool.

YouTrack is a project management software developed by JetBrains. It's in the form of a plugin that can be attached to the JetBrains IDEs such as Intellij Idea, and helps create and assign tasks to a development team as well as track the progress of working.

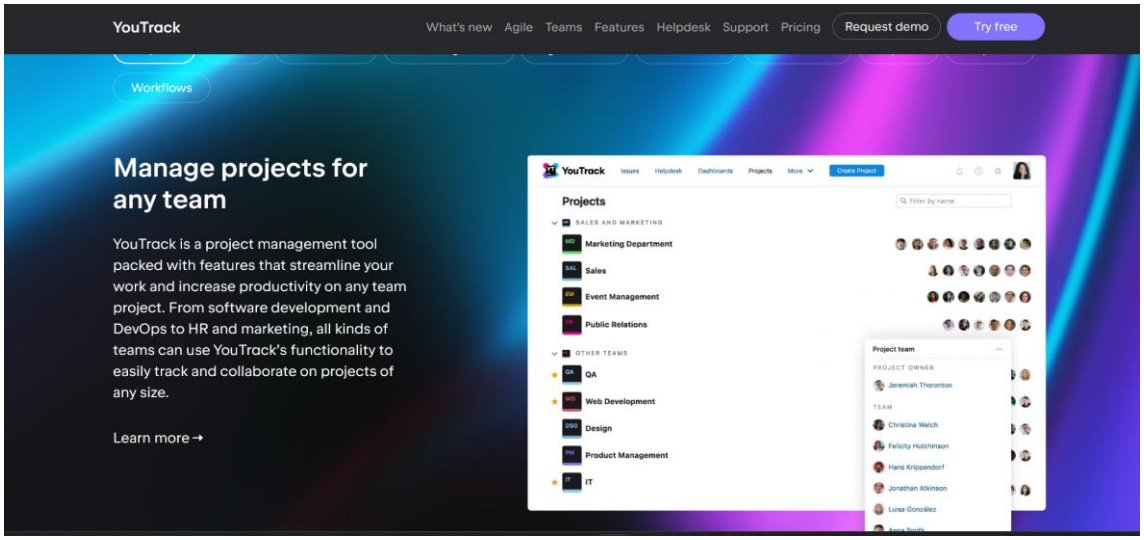

Figure 1: YouTrack web page

In the following we provide some details how YouTrack satisfies the requirements given in previous section

Issue tracking:

YouTrack helps managing an issue from the minute it is reported to the second it is resolved. As the issue moves through different stages in its lifecycle, that can track, measure, and report the progress.

Project:

In YouTrack, a project contains all the issues that are related to this effort as well as the team members who work towards the pre-defined goal.

Time tracking:

When the Time Tracking feature is enabled, it is possible to work with several tools in the project:

- team can add work items to issues.
- YouTrack calculates the time spent and progress for each issue.
- tme reports can be created for each work item

Gantt charts:

YouTrack's interactive Gantt charts enables the creation and update of project plans directly on a timeline. The Gantt chart enables also to set up a list of tasks that are required for the project on the vertical axis, then use the horizontal timeline to determine when these activities should take place.

Timesheets:

Timesheets are data tables that can be used to track work activity for all members of the team. Using timesheets can help in recording the amount of time spent working on

specific projects or for different clients. It is possible to track and measure different activities by the type of work performed.

Agile boards:

Agile boards in YouTrack are designed to help teams follow a wide range of agile project management processes.

- Teams that use a Scrum methodology can plan, visualize, and manage their work during a series of consecutive sprints.
- Teams that follow a Kanban process can monitor and measure their flow of work on the board.
- Teams that take a hybrid approach can mix and match settings to support their custom process.

Reports:

YouTrack enables the creation of private reports or configuration of reports that can be shared within the team. It is possible to export, print and share reports with other team members.P ersonal and shared reports can be added to the dashboard.

Dashboard:

The Dashboard is the default start page in YouTrack. Each user has a personal dashboard that is assigned the name My Dashboard. It is possible to edit, rename, and share personal dashboard, or keep it to as private. There is also a default dashboard that you can use to display information to guest users.

Knowledge Base:

The Knowledge Base in YouTrack enables building a collection of articles that cover a range of topics. Each article is associated with a specific project, so each team can accumulate and share bits of information that help them accomplish their project goals.

4 Description of the expected flow of services and the platforms expected output

In this section we provide the descriptions of the services workflows for each pilot. It consists of three parts: Use case diagrams, Validation scenarios and Platform Analysis

4.1 Use case diagrams

This subsection is related to the use case diagrams provided in D1.1/D1.2 and the real validation of their implementation. All use case diagrams are commented on the feasibility for being implemented and validated. Also, all barriers and risks are mentioned, to take them into consideration when starting the validation process

4.1.1 Pilot BIOMEDICAL AND GENOMIC DATA SHARING

Figure 1 shows the top-level use cases for the Biomedical and Genomic Data Sharing pilot.

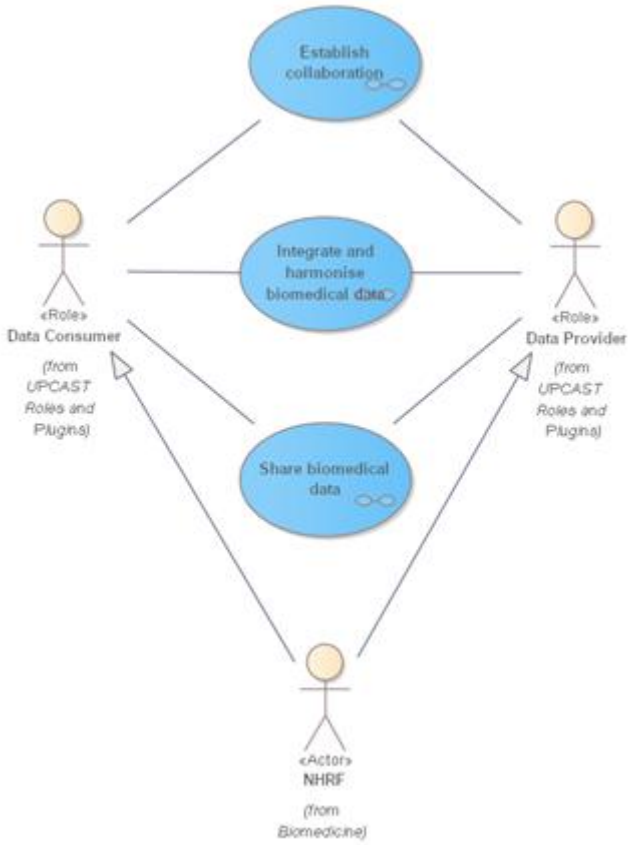

Figure 2: Top-level use case model for the Biomedical pilot.

The first use case of the Biomedical and Genomic data sharing pilot is described as the <<Establish collaboration>> use case (Figure 2): This use case is essential for NHRF and enables different stakeholders to establish contractual agreements with NHRF for collaboration, including definition of specific clauses, obligations and timelines and assurance of the compliance of legal and ethical requirements. In particular, regarding data acquired in clinical context, the UPCAST system will ensure that formal declarations

exist that patient consents are in place before contracts can be established. It also includes a review and approval process for all involved parties to reach agreements and establish contracts.

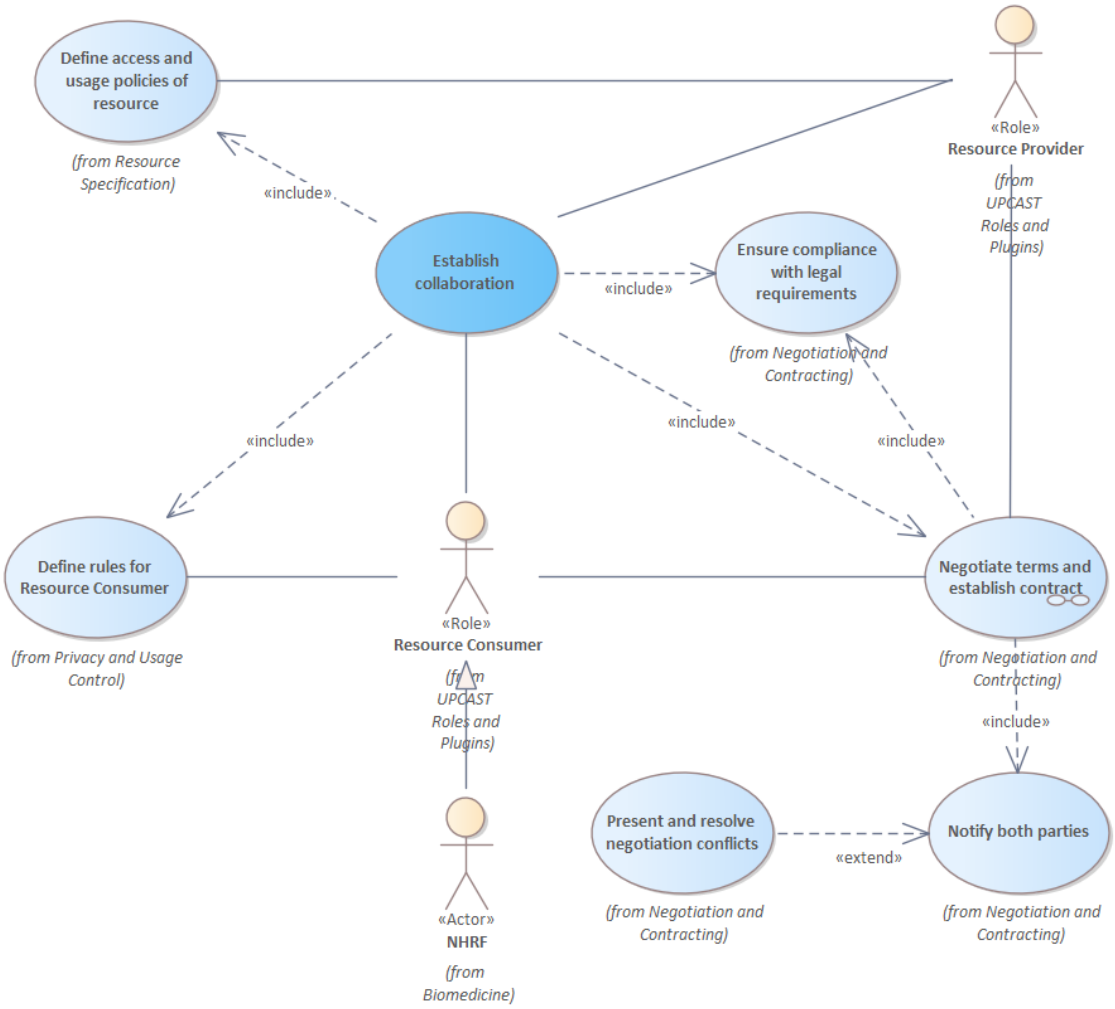

Figure 3: Establishing collaboration between NHRF and external resource providers.

(Figure 3): The <<Integrate and harmonise biomedical data>> use case concerns the integration and harmonisation of biomedical data from different sources (data repositories and/or different research/clinical parties). This use case aims to allowto define and execute data processing workflows that combine and analyse data effectively for genomics research.

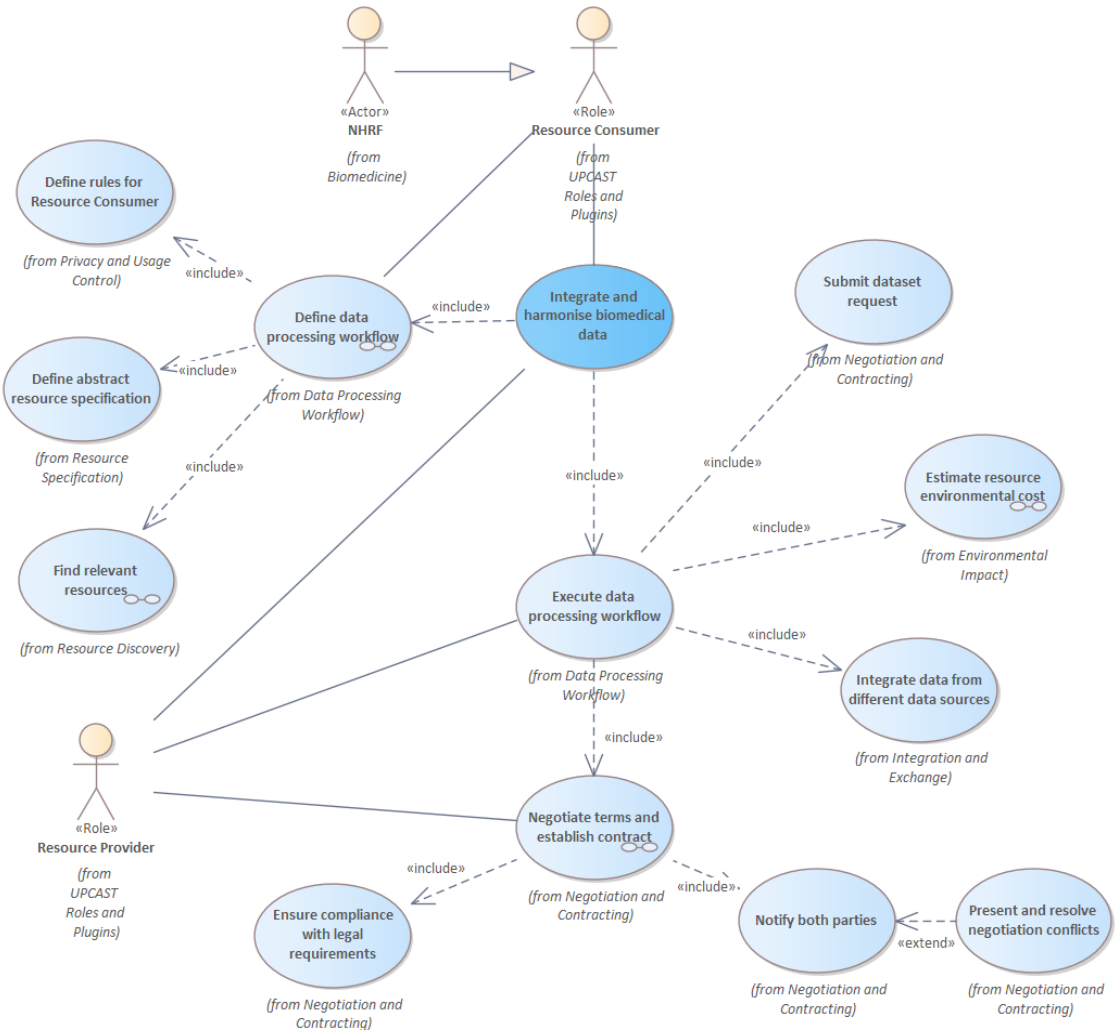

Figure 4: Integrate and harmonise biomedical data.

The <<Share biomedical data>> use case (Figure 4): offers a secure data sharing framework for NHRF to share genomic data with data consumers. It also facilitates the exploitation and putative commercialisation of NHRF proprietary or curated genomic datasets.

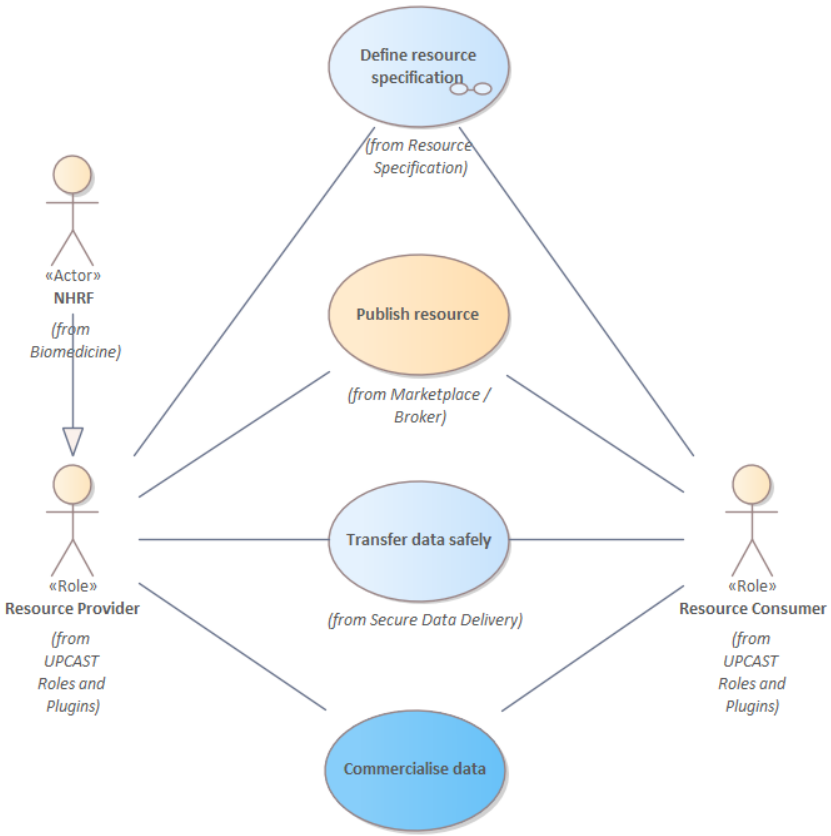

Figure 5: Sharing biomedical data.

4.1.2 Pilot PUBLIC ADMINISTRATION

Figure 6 shows the top-level use cases for the Public Administration pilot.

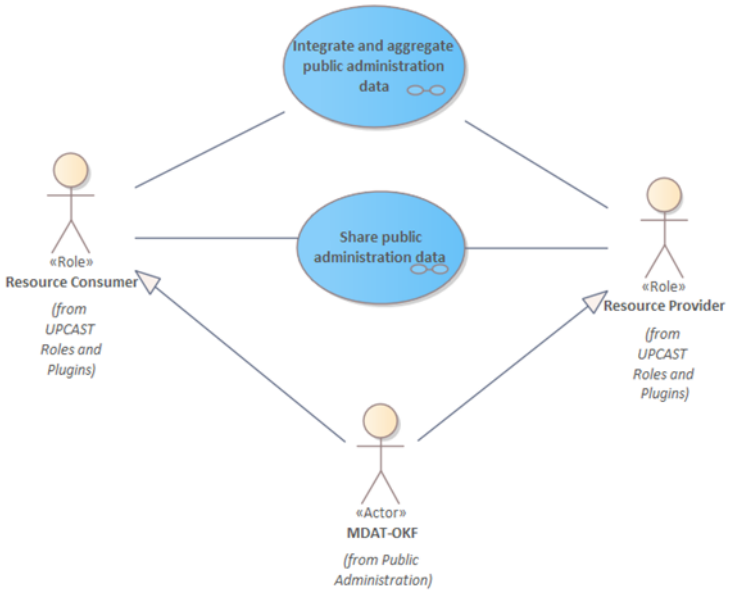

Figure 6: Top-level use case for the Public Administration pilot.

For <<Integrate and aggregate public administration data>> use case (Figure 7), MDAT-OKF acts as a resource consumer, which integrates and aggregates the data based on a defined data processing workflow. Using UPCAST plugins, MDAT-OKF can negotiate with data providers in an automated way and at the same time respect data providers' privacy conditions and requirements.

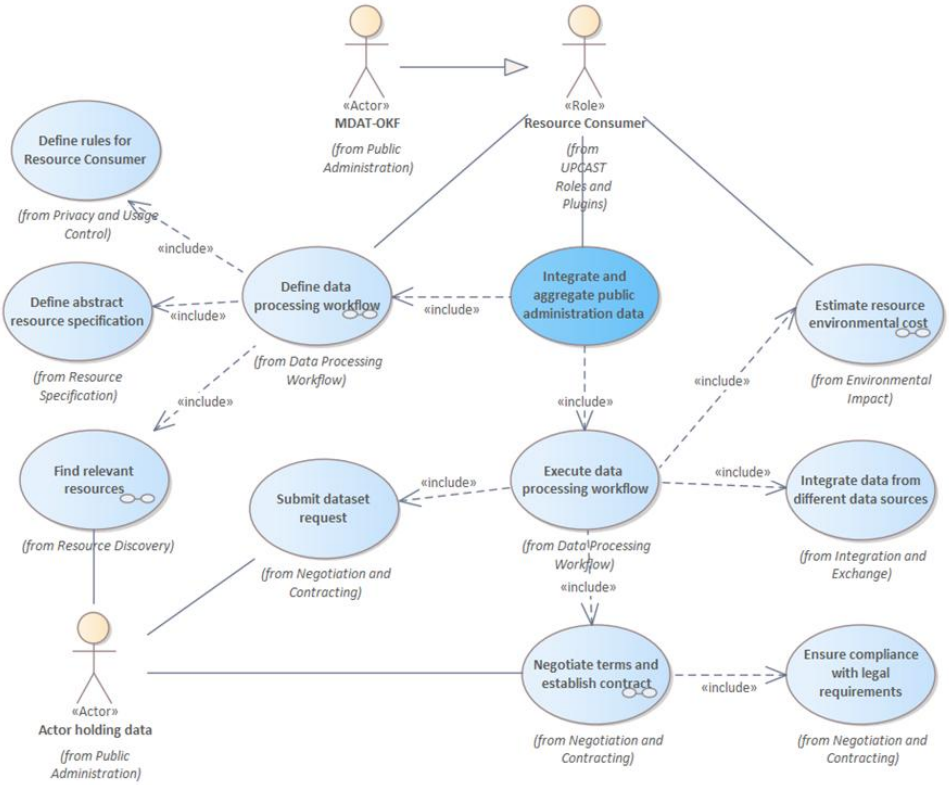

Figure 7: Integrate and aggregate public administration data.

For <<Share public administration data>> use case (Figure 8): MDAT-OKF publishes datasets specified using domain-specific vocabularies and ontologies and the datasets will be transferred securely to data users.

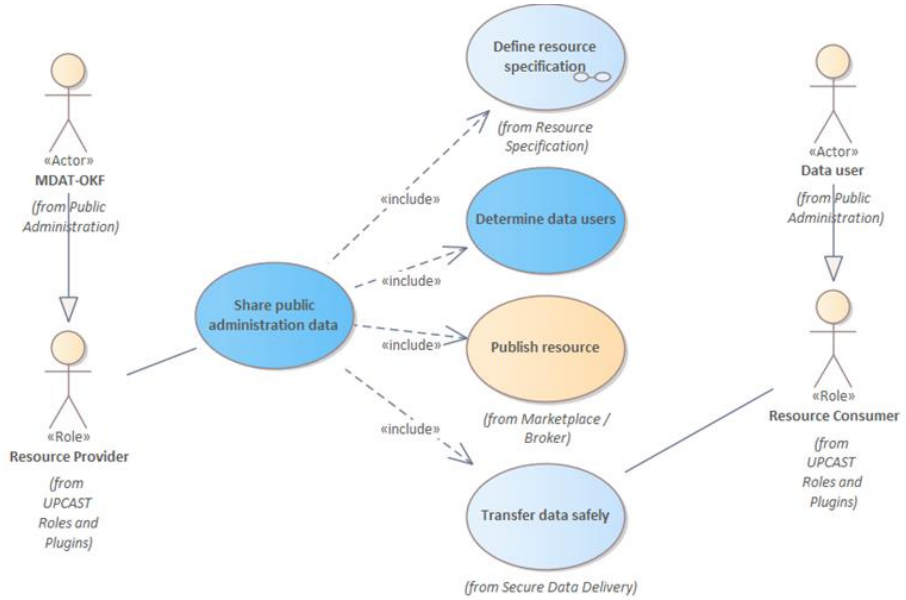

Figure 8: Share public administration data.

4.1.3 Pilot HEALTH AND FITNESS

According to the information contained in D1.2, The main use cases of this pilot are presented in the following figure.

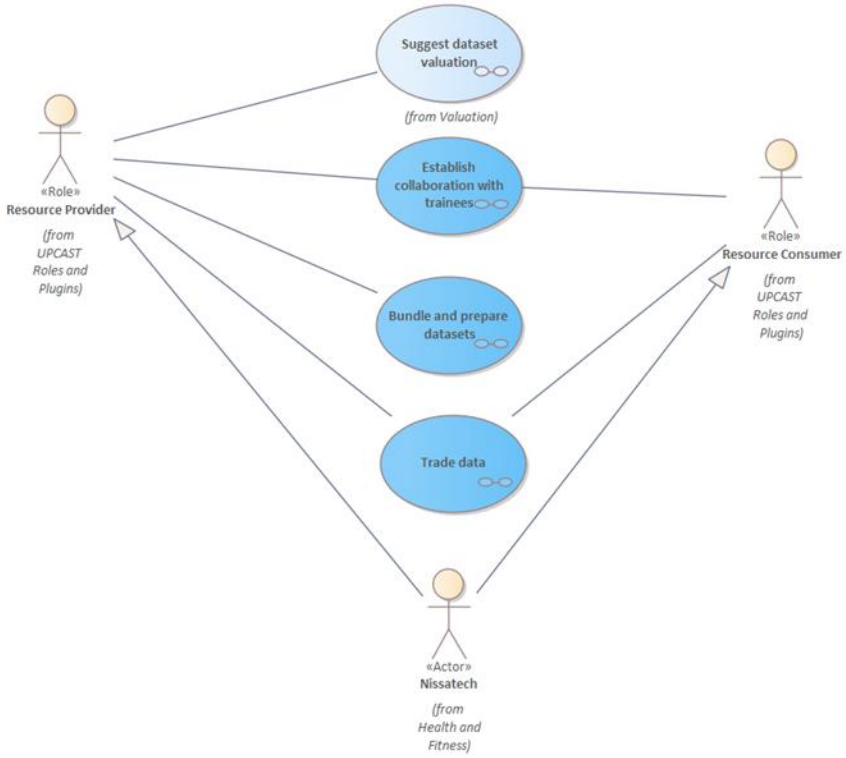

Figure 9: Top-level use case model for the Health and Fitness pilot.

For <<Establish collaboration with trainees>> use case (Figure 10): Nissatech will establish collaboration with trainees to collect and use their data. Data usage

constraints and policies will be defined and negotiated to establish contracts. This process will ensure compliance with legal requirements, e.g., consent is given by the trainees when they share data, and the data shared is compliant with GDPR.

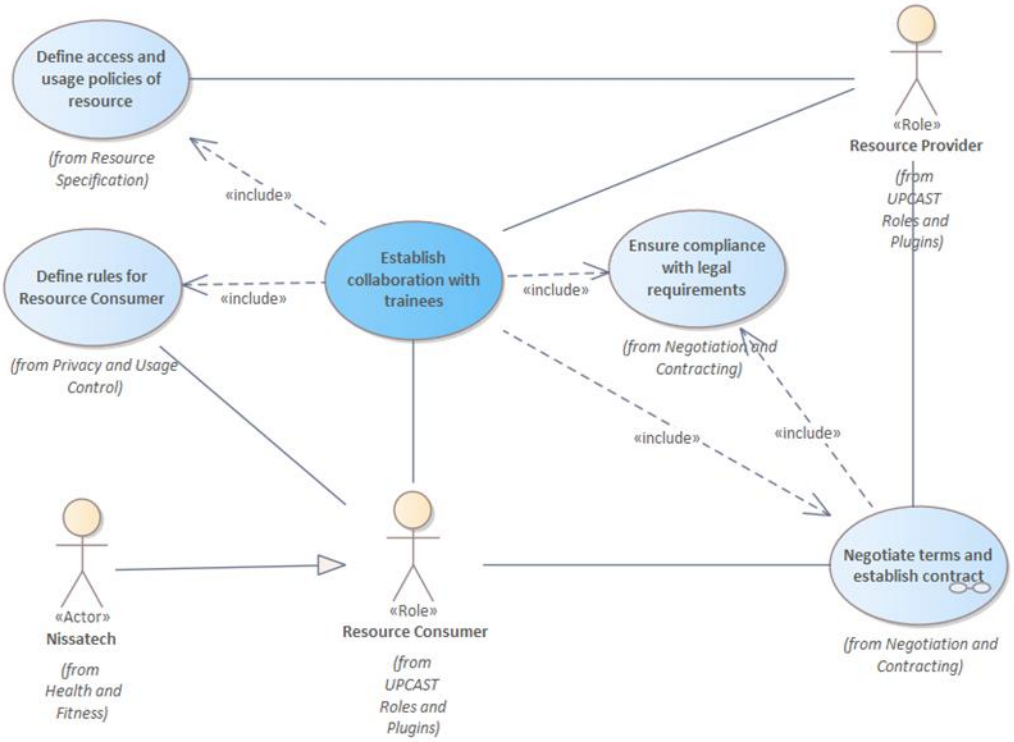

Figure 10: Establish collaboration with trainees.

For <<Bundle and prepare datasets>> use case (Figure 11): Nissatech will make some bundles of data to make a better offering. The new dataset will be described, and the environmental impact and the price of the dataset will be estimated.

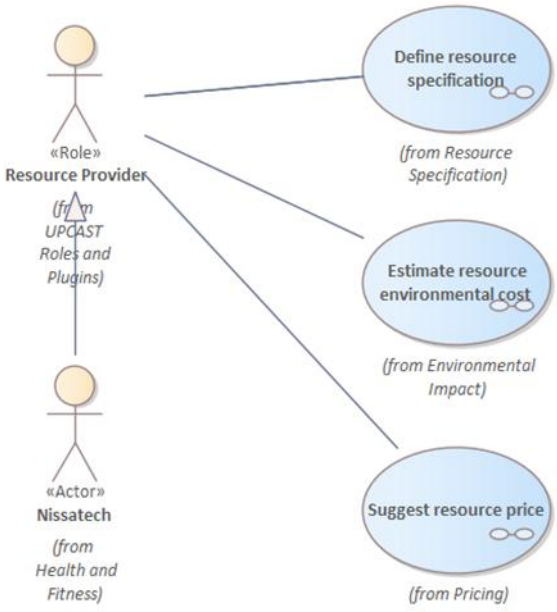

Figure 11: Bundle and prepare datasets.

For <<Trade data>> use case (Figure 12): the dataset to be traded will be published and monetised and transferred securely to the data consumer.

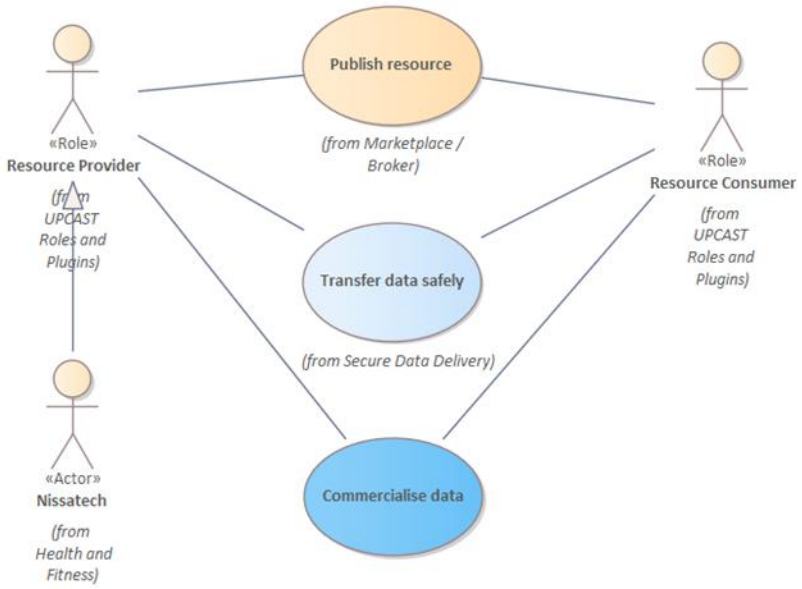

Figure 12: Trade data.

4.1.4 Pilot DIGITAL MARKETING 1

According to the information contained in D1.2, The main use cases of this pilot are presented in the following figure

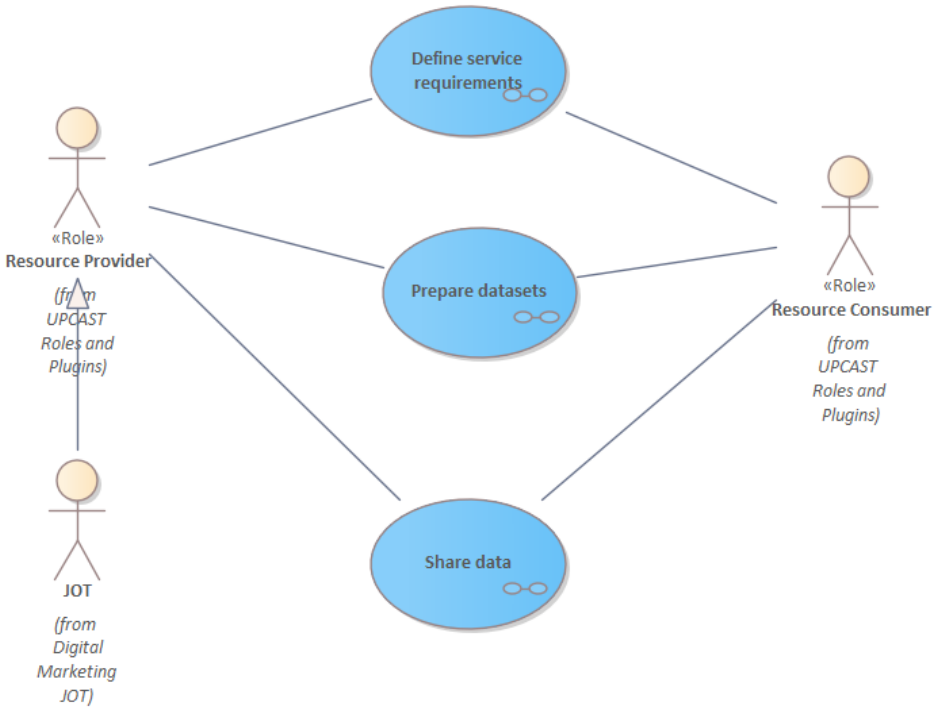

Figure 13: Top-level use case model for the Digital Marketing JOT pilot.

As show in above figure, the marketing pilot is formed by three major steps (which covers all the technical goals described in previous section, all developed by the data/resource provider but requesting interaction with the resource consumer.

1. Define service requirement: Resource consumer details what he/she is looking for as well as the delivery method needed. This information activates the rest of steps of the value chain.
2. Prepare datasets: Based on the resource consumer needs, the specific SQL query is implemented and run to generate: (i)
3. Share data: Related to the service delivery. Data sharing also implies the data set analysis and insights generation that are shared in a document and/or an interactive dashboard (PowerBI)

For <<Define service requirements>> (see Figure 14): The data consumer defines the data set requested and expected delivery method. To standardize the service request, enabling the service automation, JOT is defining the customize parameters and level of aggregation to define the datasets. In addition, the service delivery includes access and usage policies as well as rules for the data consumers. This information can be also integrated as part of the contract plug-in.

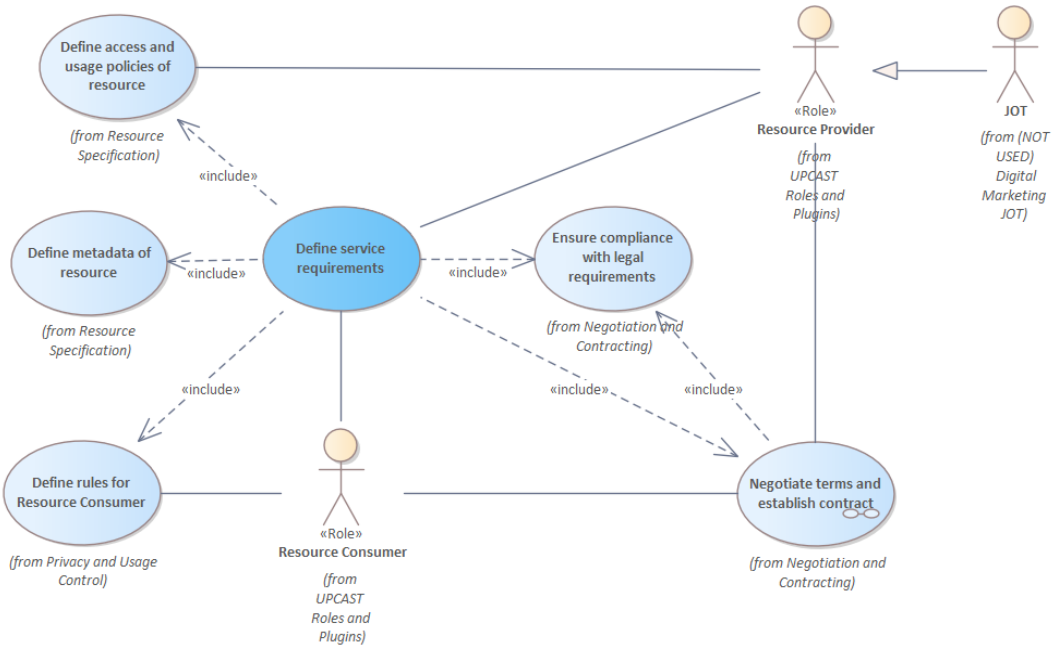

Figure 14: Define service requirements with Resource Consumer.

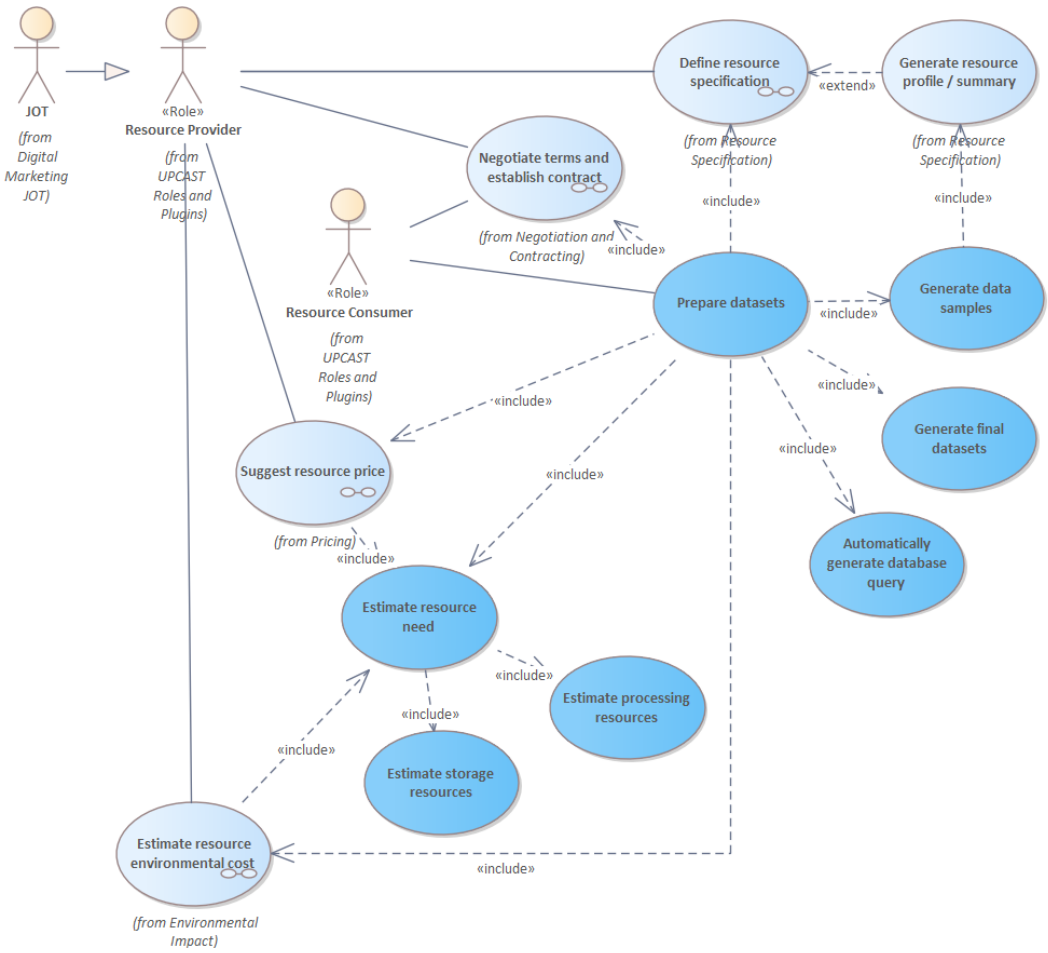

Figure 15: Prepare datasets.

For <<Prepare datasets>> (see Figure 15): JOT will generate data samples, which the Data Consumer can check description, data model and confirm the attributes and formats. This information is also shared with pricing and service contract plug-ins to sign the data commercialization service.

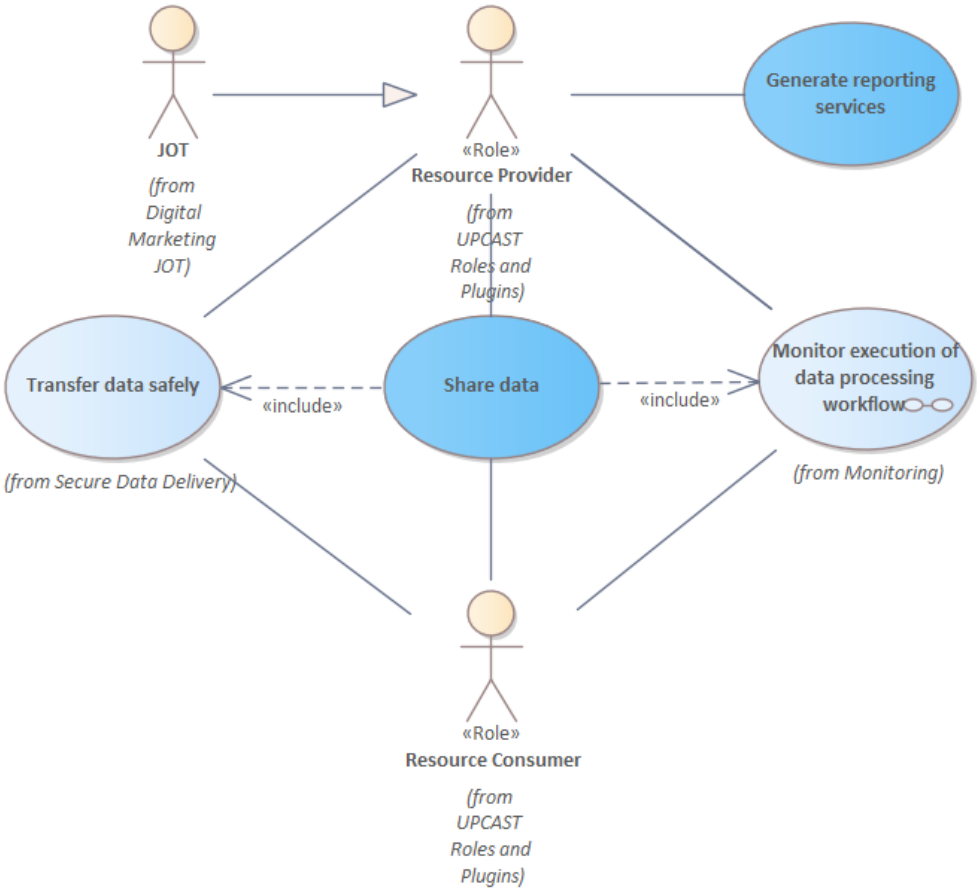

Figure 16: Share data with Resource Consumer.

For <<Share data>> (see Figure 16): According to the Resource Consumer service request, the Resource Provider (JOT) delivers both the data set and the additional services showing the main conclusions, insights and KPIs embedded in the data. Main goal is to facilitate the understanding of the data and provide initial conclusions to the resource consumer.

4.1.5 Pilot DIGITAL MARKETING 2

According to the information contained in D1.2, The main use cases of this pilot are presented in the following figure.

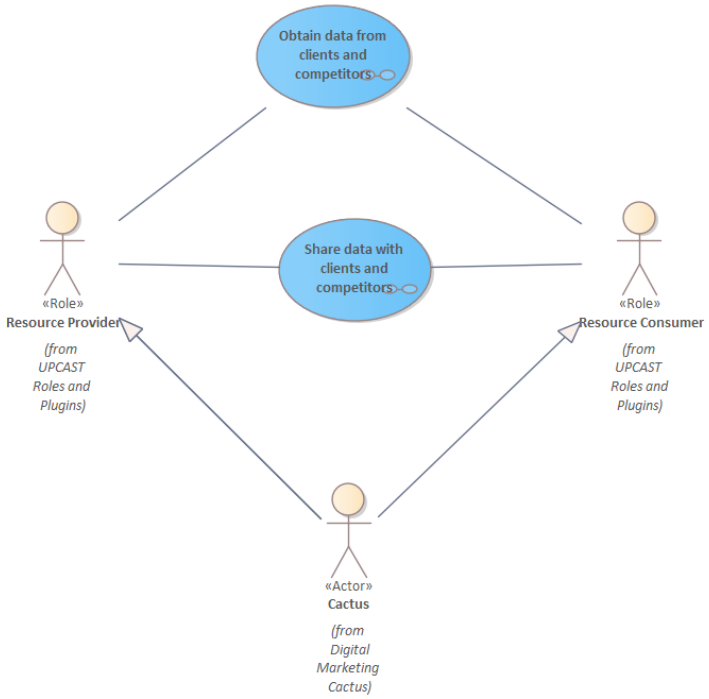

Figure 17: Top-level use case model for the Digital Marketing Cactus pilot.

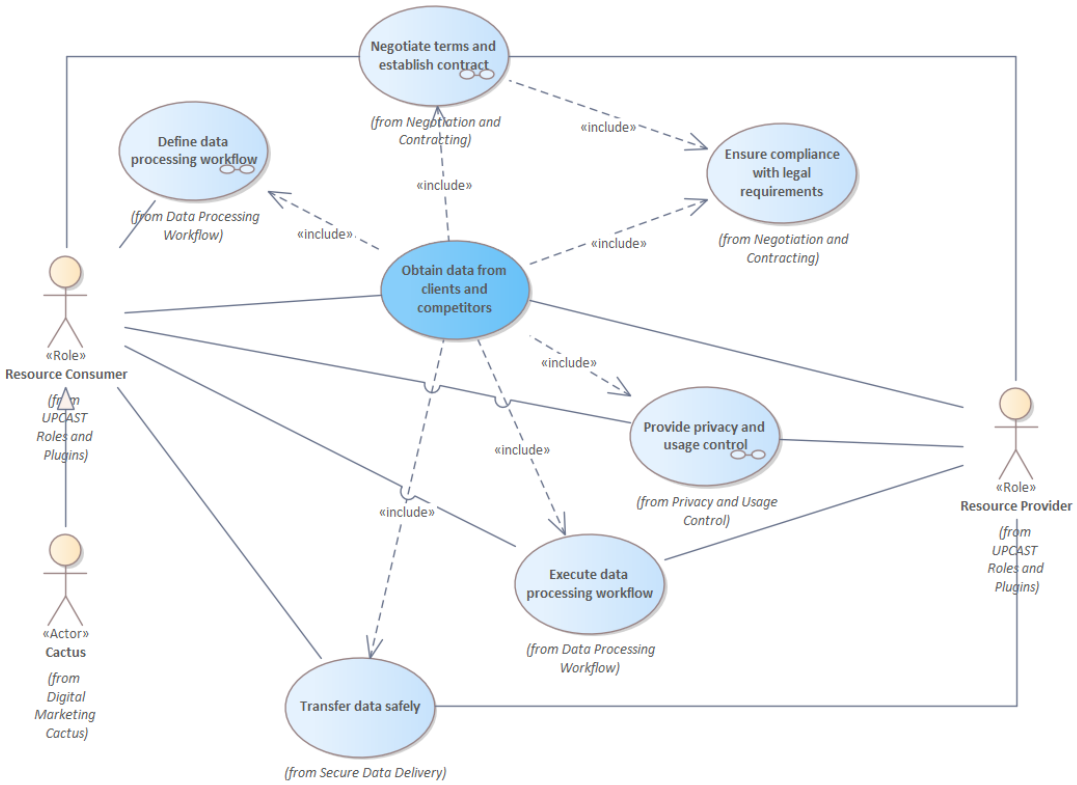

Figure 18: Obtain data from clients and competitors.

For <<Obtain data from clients and competitors>> (Figure 18): Cactus will negotiate terms with potential clients and obtain account information to gain access to the data from clients and competitors. Cactus will define data processing workflows for the digital marketing tools based on the data, negotiate the terms and establish the contracts. This process will also define the usage and access control and ensure the compliance with legal requirements. The defined data processing workflows will be executed, and secure data transfer will be implemented to share clients/competitors data with Cactus

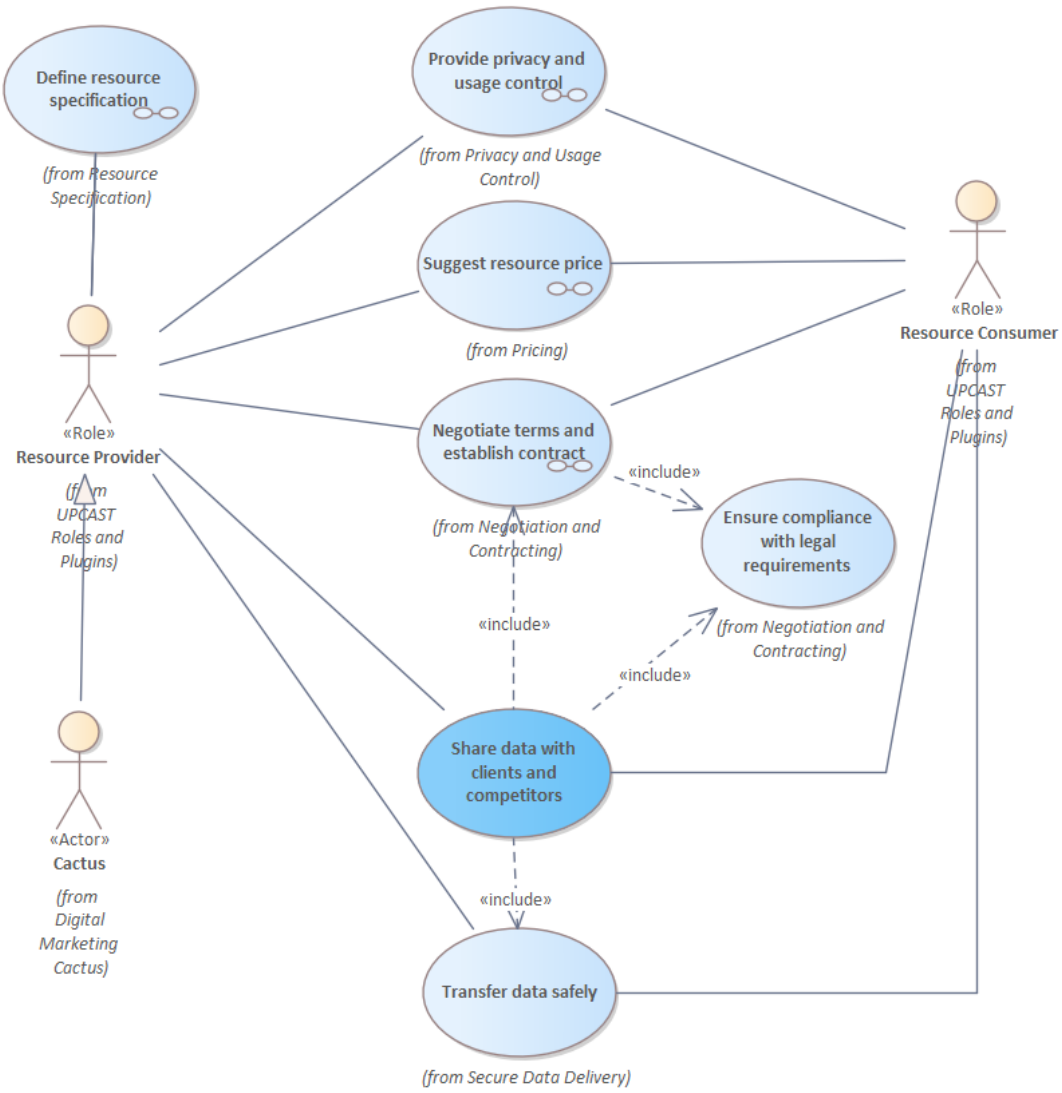

Figure 19: Share data with clients and competitors.

For <<Share data with clients and competitors>> (Figure 19): Cactus is the Resource Provider (offering data to clients and competitors). The sharing of data includes specification of the dataset to be shared, estimation of the dataset price, access and usage control, legal assessment, negotiation of contracts, and secure data transfer.

4.2 Validation scenarios

This section provides details about the validation scenarios for each pilot

Validation scenarios for one pilot can be on different levels of complexity, incorporating various services. For example, 1. Basic 2. Extended 3. Complex (see Fitness & Health Pilot)

Each validation scenario consists of:

- Name: providing a short description of the scenario
- Level: as described above
- Set of steps: detailed explanation of the realization/plan
- Timeline: time period for the realization

4.2.1 Pilot BIOMEDICAL AND GENOMIC DATA SHARING

Basic Validation Scenario: Offering Genomic datasets

Name: Offering Genomic datasets (NHRF as data provider)

Level: Basic

This scenario aims to demonstrate the efficient process of defining, uploading and advertising genomic datasets through the Data Marketplace platform (e.g. DAWEX).

Set of Steps

1. Using the Environmental Evaluation Plugin, NHRF conducts an environmental evaluation to optimize the offered datasets with consideration for ecological impact
2. Utilizing the Resource Specification Plugin NHRF creates a structured definition for the dataset. This definition ensures that the dataset's characteristics and dimensions are clearly defined and can be understood by subsequent plugins, such as those for privacy and discovery.
3. Create a data product based on the data set on the Dawex/DM platform. Set your contractual terms and conditions for the use of the data product. Define the visibility options of your data product. Publish the data product.
4. Utilizing the Discovery Plugin possible data consumers identify the dataset offered by NHRF

Timeline: To be defined

4.2.1.1 Extended Validation Scenario: Offering and Negotiating Genomic datasets to build ML models

Name: Offering and Negotiating Genomic datasets to build ML models

Level: Extended

This scenario aims to demonstrate the efficient process of defining, uploading, advertising and negotiating genomic datasets through the Data Marketplace platform (e.g. DAWEX) and the exploitation of FML Plugin

1. Using the Environmental Evaluation Plugin, NHRF conducts an environmental evaluation to optimize the offered datasets with consideration for ecological impact
2. Utilizing the Resource Specification Plugin NHRF creates a structured definition for the dataset. This definition ensures that the dataset's characteristics and dimensions are clearly defined and can be understood by subsequent plugins, such as those for privacy and discovery.
3. Upload new dataset
4. An NHRF "client" entity defines a DPW containing an ML model to run as one of its steps.
5. The entity discovers an appropriate dataset published by NHRF through the Discovery Plugin.
6. NHRF and the client agree the terms of processing through the Negotiation Plugin, resulting in the corresponding Contract
7. It is ensured that the DPW as defined by the client abides by the Contract
8. The client executes the validated DPW on the basis of its internal processing resources, in order to train the model.
   a. The FML plugin is invoked in order to run the ML model on the NHRF dataset, without the latter being acquired by the client
   b. Throughout execution, processing events are emitted to be captured by the Monitoring Plugin

Timeline: To be defined

4.2.1.2 Complex Validation Scenario: Acquiring new datasets, establishment of collaborations and data integration

Name: Acquiring new datasets, establishment of collaborations and data integration (NHRF as data consumer)

Level: Complex

This scenario aims to demonstrate the process of discovering and gaining access to new datasets either from established databases or individual research groups, both in the clinical and research setting, establishing collaborations and integrating multi-sourced data.

Set of steps

1. Define a DPW intended to serve specific processing goals of NHRF, thereby describing also datasets that need to be acquired from third data providers for this purpose. The latter will at a first stage be done in abstract terms, i.e., by defining

   a. Their type
   b. Other properties, through appropriate constraints

2. The Resource Discovery plugin is used to identify new datasets that fulfil the consumer's requirements and dynamically discover matching data sources.

3. For each of the selected datasets, NHRF interacts with potential data providers exploiting the Negotiation Plugin
   a. For each agreement reached, the corresponding Contract is formed

4. It is ensured that the DPW model abides by
   a. all NHRF-internal policies
   b. end-user preferences
   c. formed (or aborted) contracts

5. NHRF executes the validated DPW on the basis of its internal processing resources, in order to perform the intended bioinformatics analysis.
   a. Data from different sources are integrated and harmonised, while being securely delivered over the mediating platform and UPCAST overlay
   b. Throughout execution, processing events are emitted to be captured by the Monitoring plugin

6. The result of the bioinformatics analysis performed through the DPW is formulated into a publishable resource using the Resource Specification Plugin, and uploaded to the marketplace.

7. The result of the bioinformatics analysis can subsequently be located through the Discovery Plugin and consumed by interested parties

Variations:
* Apart from abstract specification of required datasets in step 1, the user might as well indicate known datasets to be accessed (concrete specification); in this case step 2 is omitted.

* For the particular case that an already acquired dataset is explicitly specified in the DPW, step 2 is again omitted, as this can be seen as a subtype of concrete specification. However, here it can be additionally assumed that a contract already exists (i.e., move directly to step 4), or, alternatively, the ability could be given to reach a new agreement for the particular DPW (perform step 3 afresh).

Timeline: To be defined

4.2.2 Pilot PUBLIC ADMINISTRATION

4.2.2.1 Basic Validation Scenario: Offering Public Administration Data

Name: Offering Public Administration Data
Level: Basic

This scenario aims to demonstrate the efficient process of defining, uploading and advertising public administration data through the Data Marketplace platform, whether it's an in-house developed platform, DAWEX, or another platform.

Set of Steps:

1. Selection of the Pilot Target Dataset Type:
   a. Develop a data processing workflow (DPW) tailored for the selected dataset type.
   b. Publish the DPW as a lead request for potential publishers.
2. Uploading New Dataset and Variations:
   a. Publishers upload a new dataset and its variations, tailored to match the specifications outlined in the request.

3. Utilizing the Data Definition Plugin:
    a. Employing the data definition plugin, publishers create a structured definition for the dataset. This definition ensures that the dataset's dimensions are clearly defined and can be understood by subsequent plugins, such as those for privacy and discovery.
4. Environmental Evaluation:
    a. Publishers conduct an environmental evaluation using the environmental cost estimation plugin.
    b. This evaluation allows publishers to optimize their datasets with consideration for ecological impact.
    c. Publishers can advertise the ecological impact score alongside the dataset, providing transparency to consumers regarding the environmental footprint associated with the data.

Timeline: To be defined

4.2.2.2 Extended Validation Scenario: Negotiating Public Administration Data

Name: Negotiating Public Administration Data
Level: Extended

This scenario aims to demonstrate the efficient process of negotiating public administration data through the Data Marketplace platform, whether it's an in-house developed platform, DAWEX, or another platform.

Set of Steps:

1. Selection of the Pilot Target Dataset Type:
    a. Develop a data processing workflow (DPW) tailored for the selected dataset type.
    b. Publish the DPW as a lead request for potential publishers.
2. Discovering Suitable Datasets:
    a. Utilize the discovery plugin to identify existing datasets relevant to public administration data (accompanied by a data definition document).
    b. The pilot consumer evaluates suggested datasets and initiates negotiations if suitable options are found.
    c. If no datasets are found, the lead request remains active for publishers to respond to and commence negotiations.
3. Negotiation Process:
    a. Initiate negotiations using the negotiation plugin.
    b. Customize the dataset variation to meet the specific requirements of the pilot consumer.
4. Optional: Pricing for Dataset Preparation:
    a. Dataset producers may propose a service price for the preparation of the dataset.
5. Dataset Purchase and Access:
    a. Upon agreement, the pilot consumer purchases the customized dataset variation and gains access to the requested data.

Timeline: To be defined

4.2.2.3 Complex Validation Scenario: Supporting a Competition around Public Administration Data

Name: Supporting a Competition around Public Administration Data

Level: Complex

This scenario demonstrates the complex process of supporting the data requirements for application development competitions centered around public climate data within the UPCAST platform or similar platforms.

Set of Steps:

1. Participant Registration and Idea Description:
    a. Participants register for the competition and outline their application ideas.
    b. Ideas must include descriptions of the required data for proper application functionality.
2. Formal Representation of Dataset Requirements:
    a. Participants, with assistance from competition technical advisors, formally represent dataset requirements through data processing workflows (DPW).
    b. Submitted DPWs are forwarded to the competition facilitator (MDAT), who publishes lead requests for potential publishers.
3. Discovering Suitable Datasets:
    a. MDAT utilizes the discovery plugin to identify existing datasets relevant to public climate data, accompanied by data definition documents.
    b. If the dataset provider is not on the platform, MDAT attempts to enroll them.
    c. MDAT evaluates offered datasets and initiates negotiations if suitable options are found but not published yet.
4. Negotiation Process:
    a. Initiate negotiations using the negotiation plugin.
    b. Customize the dataset variation to meet the specific requirements of the participants.
5. Dataset Acquisition and Access:
    a. Upon agreement, the dataset is published on the platform.
        i. Create a data product based on the data set on the Dawex/DM platform. Set your contractual terms and conditions for the use of the data product. Define the visibility options of your data product. Publish the data product
    b. The participant can access the dataset either from the publisher or the MDAT's 'data product page' in the platform
6. Transformation and Additional Value:
    a. Datasets can be transformed into data cubes and published to a public triple store, allowing the integration plugin to create links among them.
    b. Utilizing the Federated Machine Learning plugin, participants can enrich their applications with AI functionality.

Timeline:To be defined

4.2.3 Pilot HEALTH AND FITNESS

There are three types of validation scenarios

1. Basic

2. Extended

3. Complex

4.2.3.1 Basic validation scenario: offering fitness&health data

Basic validation scenario uses minimal set of services in order to demonstrate that data selected from end users (trainees) can be properly valuated and offered through Data Marketplace / Platform (DAWEX)

Name: Offering fitness&health data

Level: Basic

Set of steps:

1. Selection of the end users to be tested
    a. types and numbers depending on the characteristics of the Data Sharing Platform
    b. includes fulfilling legal requirements

2. Collecting the data in the selected period
    a. one week, depending on the characteristics of the Data Marketplace / Platform (DAWEX)

3. Preparing the data for the Data Valuation PlugIn
    a. Predefined format (PlugIn)

4. Applying the PlugIn Data Valuation
    a. Getting results in a proper format: data valuation for each selected dataset

5. Assigning the Values to the selected datasets to be published in the Data Sharing Platform
    a. Predefined format Data Marketplace / Platform (DAWEX)
    b.
6. Publishing the data with its values / valuations in the Data Marketplace
    a. OPEN
        i. Quantity (how much can be published) depends on the characteristics of the Data Marketplace / Platform (DAWEX)
        ii. Which part in Data Marketplace / Platform (DAWEX) will be used (public, private)

7. Interaction with potential buyers

Timeline: to be defined

4.2.3.2 Extended validation scenario: offering and negotiating fitness&health data

Extended validation scenario uses an extended set of services in order to demonstrate that data selected from end users (trainees) can be processed in a complex way using the Data sharing Platform

Name: Offering and negotiating fitness&health data

Level: Extended

Set of steps:

1. Selection of the end users to be tested
    a. types and numbers depending on the characteristics of the Data Sharing Platform
    b. includes fulfilling legal requirements

2. Collecting the data in the selected period
    a. one week, depending on the characteristics of the Data Marketplace / Platform (DAWEX)

3. Preparing the data for the Data Valuation PlugIn
    a. Predefined format (PlugIn)

4. Applying the PlugIn Data Valuation
    a. Getting results in a proper format: data valuation for each selected dataset

5. Assigning the Values to the selected datasets to be published in the Data Sharing Platform
    a. Predefined format Data Marketplace / Platform (DAWEX)

6. Publishing the data with its values / valuations in the Data Sharing Platform
    a. OPEN
        i. Quantity (how much can be published) depends on the characteristics of the Data Marketplace / Platform (DAWEX)
        ii. Which part in the Data Marketplace / Platform (DAWEX) will be used (public, private)

7. Interaction: Using the Negotiating PlugIn
    a. Predefined format (PlugIn)

Timeline: to be defined

4.2.3.3 Complex validation scenario: motivating trainees for offering more valuable fitness&health data

Complex validation scenario uses an extended set of services in order to demonstrate that trainees can be motivated to generate data which has more value in the context of offering that data in a Data sharing Platform

Name: Motivating trainees for offering more valuable fitness&health data

Level: Complex

Set of steps:

1. Selection of the end users to be tested
    a. types and numbers depending on the characteristics of the Data Marketplace / Platform (DAWEX)
    b. includes fulfilling legal requirements

2. Calculating/Simulating the values for particular types of data using Data Valuation PlugIn
    a. OPEN: how to provide this type of simulation

3. Providing the information to the trainees regarding the value of particular data types
    a. UI to be defined

4. Collecting the data in the selected period
    a. one week, depending on the characteristics of the Data Marketplace / Platform (DAWEX)

5. Preparing the data for the Data Valuation PlugIn
    a. Predefined format (PlugIn)

6. Applying the PlugIn Data Valuation
    a. Getting results in a proper format: data valuation for each selected dataset

7. Assigning the Values to the selected datasets to be published in the Data Sharing Platform
    a. Predefined format Data Marketplace / Platform (DAWEX)

8. Publishing the data with its values / valuations in the Data Sharing Platform
    a. OPEN
        i. Quantity (how much can be published) depends on the characteristics of the Data Marketplace / Platform (DAWEX)
        ii. Which part in the Data Sharing Platform will be used (public, private)

9. Interaction: Using the Negotiating PlugIn
    a. Predefined format (PlugIn)

Timeline: to be defined

4.2.4 Pilot DIGITAL MARKETING 1

4.2.4.1 Basic Validation Scenario: User interest Data set request

Name: Requesting specific data set about user interests
Level: Basic

This scenario aims to demonstrate the efficient process of defining, requesting and generating a data set based on the accessing to the JOT data marketplace, supported by the pricing plug in.

Set of Steps:

1. Definition of the data set requirements:
    d. Development of a user interface for data request.
    e. Definition of the degrees of freedom for data set definition
    f. Extraction of requested features to implement the query
2. Generation of the SQL query:
    a. Generation of SQL query template.
    b. Sample data set
    c. Data set attributes
3. Price request from the plug in:
    a. Sharing information about requested data set.
    b. Definition of the reference pricing
    c. Sharing price information with the customer and basic acceptance
4. Generation of the full data set:
    a. Publication of the data set in a shared space.
    b. Confirmation from the data consumer about data set acceptance.

Timeline: M20

4.2.4.2 Complex Validation Scenario: Marketing data monetization

Name: Deployment of marketing data monetization business model

Level: Complex

This scenario aims to demonstrate the full value chain enabling the generation of the data monetization model based on the service development and plug-ins integration.

Set of Steps:

1. Definition of the data service needs:
    a. Data set (as defined in scenario 1)
    b. Definition of additional services: static and dynamic reports
    c. Additional information about data updates

2. Generation of the SQL query:
    a. Generation of SQL query template.
    b. Sample data set
    c. Data set attributes
3. Service pricing:
    a. Reference price from plug in (as in scenario 1)
    b. Definition of dynamic pricing based on:
        i. additional data set attributes.
        ii. Requested service deployment features
4. Negotiation process:
    a. Price sharing
    b. Automated contract generation
    c. Contract signature
5. Service deployment:
    a. Generation of the full data set:
        i. Publication of the data set in a shared space.
    b. Generation of the reports:
        i. Sharing of the static report
        ii. Access to the dynamic dashboard
6. Data monetization service monitoring
    a. Activity control based on the monitoring plug-in

Timeline: M36

4.2.5 Pilot DIGITAL MARKETING 2

Name: Offering Digital Marketing Data

Level: Basic

Description: This scenario aims to demonstrate the efficient process of selection, evaluation, and uploading of digital marketing data through the Data Marketplace platform, whether it's an in-house developed platform, DAWEX, or another.

Set of Steps:

1. Selection of the Digital Marketing Data: Choose the specific digital marketing data that will be included in the dataset.
2. Collection of Data: Collect the data from various platforms.
3. Preparation of Data: Prepare the data to be sent to the Pricing Plugin.
4. Application of the Pricing Plugin:
5. Obtain the results in the correct format.
6. Assignment of Values: Assign values to the selected datasets that will be uploaded to the Marketplace.
7. Publication of the Dataset: Publish the dataset in the Data Marketplace.
8. Interaction with Potential Buyers: Engage with potential buyers interested in the dataset.

Timeline: M20

Name: Offering and negotiating digital marketing data

Level: Extended

Description: Extended validation scenario uses an extended set of services in order to demonstrate that data selected can be processed in a complex way

Set of Steps:

1. Selection of the Digital Marketing Data: Choose the specific digital marketing data that will be included in the dataset.
2. Collection of Data: Collect the data from various platforms.
3. Preparation of Data: Prepare the data to be sent to the Pricing Plugin.
4. Application of the Pricing Plugin:
5. Obtain the results in the correct format.
6. Assignment of Values: Assign values to the selected datasets that will be uploaded to the Marketplace.
7. Publication of the Dataset: Publish the dataset in the Data Marketplace.
8. Interaction: Using the Negotiating PlugIn

Timeline: M27

Name: Offering and negotiating digital marketing data

Level: Complex

Description: The extended validation scenario incorporates additional services that facilitate and demonstrate the negotiation processes initiated by potential buyers.

Set of Steps:

1. Selection of the Digital Marketing Data: Choose the specific digital marketing data that will be included in the dataset.
2. Collection of Data: Collect the data from various platforms.
3. Preparation of Data: Prepare the data to be sent to the Pricing Plugin.
4. Application of the Pricing Plugin:
5. Obtain the results in the correct format.
6. Assignment of Values: Assign values to the selected datasets that will be uploaded to the Marketplace.
7. Interaction: Using the Negotiating PlugIn
    a. Price sharing
    b. Automated contract generation
    c. Contract signature
8. Publication of the Dataset: Publish the dataset in the Data Marketplace.

Timeline: M36

4.3 Platform analysis

This section contains the most important information related to the platform providers DAWEX and Nokia, in the context of the scenarios defined by pilots (section 3.2).

4.3.1 DAWEX

Main characteristics are given in the following table

Key Performance Indicator	Measure
Data pricing tool used to fix the price of data	≥ 15
Number of data products re-used, in the sense of the European data strategy	≥ 25
Number of data transactions conducted	≥ 30
Increase in the number of data transactions completed through platform	Objective: minimum of +240% in the number and value between the beginning and the end of the pilots
Successful test, use or integration of UPCAST plugins within Dawex platform	At least 2

4.3.2 Nokia

The Nokia Data Marketplace platform is based on microservices and is being deployed on K8s cluster.

For UPCAST project a standalone instance will be deployed for the purpose of testing and deploying the selected plugins.

In order for the plugin to be deployed in the cluster, it should be delivered as a helm chart in which the image file being uploaded into some repository which is accessible via internet.

For any plugin the API should be explained and sample API call should be available as the other services of Nokia Data Marketplace should be able to commuinacte with this service with via http API or GRPC.

Each plugin should validate the jwt token in the header of any API call coming to it's service .

The Nokia Data Marketplace has a gui and if te plugin needs any specific ui modification it should be explained.

The integration of each plugin needs some development on Nokia Data Marketplace which needs to be evaluated based on each plugin structure.

5 Required compliance

This section is related to all nonfunctional requirements which are important for a pilot execution. The list contains the compliance with security constraints, standards, laws, regulations and implementation guidelines,

5.1 Introduction: legal view

KUL shall be in continuous dialogue with partners working on the pilots to provide assistance on ensuring legally-compliant pilot execution. From a methodological point of view, the legal framework as outlined in Task 1.4 will constitute the basis of any assessment on the legal compliance of specific pilot workflows. However, while using the framework of Task 1.4 as the basic point of reference, considerations should be made that are tailored to the specific characteristics of each pilot. To this end, the main legal challenges arising in each pilot shall be identified and, on the basis of the identified challenges, recommendations on how to comply with the relevant legal framework shall be provided. As appropriate, this assessment will be carried out in collaboration with partners working on the pilots, and based on their specific requests.

5.2 Pilot BIOMEDICAL AND GENOMIC DATA SHARING

During the Biomedical and Genomic data sharing pilot NHRF aims to establish collaboration and contract agreements with clinical partners to obtain access to clinical, genomic or biomaterial data for further experimental analysis for the generation of genomic datasets. By its nature this kind of data is considered sensitive and should be handled carefully in order to comply with all ethical and legal issues. NHRF must ensure that datasets offered by the clinical partners are covered by the correct informed consents that permit data sharing.

5.3 Pilot PUBLIC ADMINISTRATION

During the public administration pilot, OKF and MDAT will collaborate to explore the potential partnership with Greece's central statistics agency (ELSTAT). While ELSTAT is likely willing to provide valuable demographic data, they are obligated by law to adhere to a strict paper-based negotiation process for dataset provision. A crucial success metric for the Public Administration pilot is to progressively replicate the paper-based negotiation process using the UPCAST platform plugins. The objective is to empower ELSTAT to overcome legal apprehensions and feel assured in transitioning their processes to digital structures.

5.4 Pilot HEALTH AND FITNESS

The pilot is related to sharing the data created during physical exercising using Smart4Fit system. The data contains some personal information related to the heart rate of the trainees during the training, This data is treated according to GDPR.

5.5 Pilot DIGITAL MARKETING 1

In the Digital Marketing pilot, JOT is the main data owner and service delivery to the data consumers. Data and information collected from the data consumer request will be

shared, when needed, with the dedicated plug-ins for pricing and contract negotiation. No personal data, like contact details, will be exchange with external service providers, so JOT will be the only propietary of the customer contacting data. In order to ensure service data confidentiality, once the contract is signed specific log-in details will be communicated to the data consumer for data set download and access to the static and dynamic reports.

5.6 Pilot DIGITAL MARKETING 2

During the Digital Marketing data sharing pilot, Cactus will gather digital marketing data from a variety of platforms, including Google and Meta. Additionally, business data sourced from the financial statements of each client will be compiled. The resulting datasets, crafted by Cactus and housing all collected information, will be under Cactus ownership. They will be shared, as required, with the Upcast Plugins.The privacy of clients' personal data remains a top priority, and it will not be disclosed to external parties. To safeguard the confidentiality of service data, specific login credentials will be provided to data consumers upon contract execution. These credentials will grant access to download datasets and peruse both static and dynamic reports.

6 CONCLUSION AND FUTURE WORK

This deliverable provided the UPCAST Monitoring and Evaluation (M&E) Plan, which will serve as the guideline for the development of the pilots. This plan should provide enough details for enabling a successful realization of pilots objectives.

The document is based on the work performed in the WP5 which is related to the development and validation of the selected pilots. In particular, this deliverable covers the work done in Task 5,1, which is responsible for the development of the UPCAST Monitoring and Evaluation (M&E) Plan.

Main role of this deliverable is to set all activities which are required for a successful realization of the pilots.

There are three main topics:

a) selection of the tool to be used for the continuous tracking of implementation activities: YouTrack has been suggested as such a tool

b) the flow of services planned for pilots, incl. various types of envisioned scenarios for the implementation

c) required compliances, esp. related to security constraints, standards, laws, regulations and implementation guidelines

ACRONYMS

Table 1: Acronyms.

Acronyms List	
DPW	Data Processing Workflow
DSL	Domain-Specific Language
EIO	Environmental Impact Optimiser
KPI	Key Performance Indicator
PDP	Policy Decision Point
PUC	Privacy and Usage Control
RC	Resource Consumer
RP	Resource Provider
UI	User Interface