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D4.10 Technical evaluation of the Platform

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Abbreviations

Terms	Definitions
AAI	Authentication and Authorisation Infrastructure
AI4HI	AI4HI AI for Health Imaging Network
API	Application Programming Interface
Auth	Authentication
DCAT-AP	Data Catalogue vocabulary Application Profile
DICOM	Digital Imaging and Communication In Medicine
DNS	Domain Name System
EduGain	Global interfederation service that interconnects multiple identity federations
EU	European Union
EUCAIM	European Federation for Cancer Images
FAIR	Findable, Accessible, Interoperable, Reusable
FDP	FAIR Data Point
GDPR	GDPR General Data Protection Regulation
GPU	Graphics Processing Unit
GUI	Graphical User Interface
IdP	Identity Provider
LS-AAI	Life Sciences Authentication and Authorisation Infrastructure
MOLGENIS	A modular web application for scientific data, initially focused on molecular genetics research (molecular genetics information system) but expanded to other disciplines.
Negotiator	BBMRI-ERIC service for structured negotiator for biomedical resources
VO	Virtual Organisation
WP	Work Package

Disclaimer

1. Introduction

The validation of the platform implies two dimensions, the technical validation of the use cases and requirements and the usability validation. As the platform was just released in M18, this deliverable focuses on the technical validation of the requirements and defines the procedure for the validation of the usability of the platform.

The technical validation evaluates the degree of fulfilment of the different user stories and requirements using either programmatic tests or operations through the GUI. In this sense, 29 of the 33 user actions defined in deliverable D4.1 First EUCAIM Operational Platform have been completely validated and 2 have been partially validated. The missing ones refer to the federated processing service being implemented in WP6. In 16 cases, a programmatic test has been defined, so it can be automated through the monitoring platform.

The procedure for the end-user validation has defined 7 questionnaires to evaluate the five components involved (dashboard, catalogue, federated search, negotiator, reference node) from different user profiles, and 23 User Actions. The User Actions not included in the usability evaluation relate to procedures that do not fully involve interactions from the platform.

2. Approach to validation

The validation will be based on the user stories defined in D4.1 First EUCAIM Operational Platform and the architecture document https://eucaim.gitbook.io/architecture-of-eucaim. Technical evaluation of the use cases implies performing the actions verifying the completion of the use case, using programmatic tests whenever possible. The end-user validation defines a set of representatives of the different profiles who will follow the instructions in D4.13 and fill out a usability questionnaire.

The section includes a summary of the User Stories and their relation with the different components of the EUCAIM Platform. The User Stores are grouped into User Actions in Deliverable D4.1 and are analysed in section 3, which describes the actions performed to validate the User Actions. The usability is also defined at the level of the User Actions.

#	Name	Dashboard	AAI	Catalogue	Federated Search	Collection Explorer	Access Negotiator	Processing Service	Reference Node	Local Services
usDH1	Application to join the federation	X	X							
usDH2	Setup of the data node to connect to the federation									X
usDH3	Quality control (legal / technical) and data preparation from a provider (on premises)	X	X							X
usDH4	Apply pre-processing tools to on-premises data	X	X							X
usDH5	Uploading metadata to the Dashboard	X	X	X					X	X
usDH6	Ingest data on the Central Storage	X	X						X	X
usDH7	Monitoring the access of data dataset	X	X						X	
usSP1	Application of a tool to the federation marketplace	X	X							
usSP2	Monitoring the access of tools	X	X					X		
usDU1	Exploration of collections from the public catalogue	X		X						
usDU2	Federated search of aggregated data in the datasets	X	X	X	X					
usDU3	Request access to the datasets from the User’s Catalogue	X	X	X		X	X			
usDU4	Get an overview of the datasets to which they have been granted access	X	X	X		X				

usDU5	Select the data to be used from the accessible data datasets	X	X		X	X				
usDU6	Exploring the tools available in the federation and their provenance	X	X					X		
usDU7	Configure tool settings and computation and storage requirements for data processing	X	X					X		
usDU8	Process (distributed) the data from the federation by using a tool of the catalogue	X	X					X		
usDU9	Run a Federated AI model training	X	X					X		
usDU10	Monitoring job status in the processing	X	X					X		
usDU11	Retrieve and review obtained results	X	X					X		
usGB1	Evaluate and accept/reject data datasets from Data Holders	X	X							
usGB2	Evaluate and accept/reject tools from Software Providers	X	X							
usGB3	Evaluate and accept/reject a data access request application	X	X				X			
usPM1	Uploading of a tool to the federation marketplace		X					X	X	X
usPM2	Platform services administration	X	X	X	X	X	X	X	X	

Table 1: User Stories and the relation to the different components.

3. Technical validation

Technical validation focuses on understanding if the requirements were successfully achieved. In some cases, the requirements can be validated through a programmatic test that interacts with the service. In other cases, end-user interactions on an interface are needed. In the latter, the section will describe the actions to validate the requirement.

The endpoints of the services are:

- Dashboard: https://dashboard.eucaim.cancerimage.eu
- Catalogue: https://catalogue.eucaim.cancerimage.eu
- Explorer (Federated Search): https://explorer.eucaim.cancerimage.eu
- Negotiator (Access management). https://negotiator.eucaim.cancerimage.eu
- UPV Reference node: https://eucaim-node.i3m.upv.es/

The validation of the requirements is performed by analysing the degree of completion of the User Actions described in D4.1: First EUCAIM Operational Platform. A brief summary is presented in each subsection. More information can be found on this deliverable.

3.1. Common User actions

Common user actions relate to actions performed by four profiles (Users/Researchers who access the data; Data Holders/Stakeholders who provide data; Software providers who provide tools; and Platform managers/Access committee, who operate the platform). User actions are described in Table 2 and are analysed in the following subsections.

User Action	**Description**	**User Story**
UAC1: Understand the processes	Find instructions and documentation, as well as links to use the platform depending on the user role	usDHx, usSPx, usDUx, usGBx, usPMx
UAC2: Register into the platform	Register and log into the platform through the LS-AAI (Life Sciences Authentication and Authorisation Infrastructure)	usDHx, usSPx, usDUx, usGBx, usPMx
UAC3: Authenticate into the platform	Use LS-AAI to authenticate users in the Dashboard	usDHx, usSPx, usDUx, usGBx, usPMx

Table 2. *User Actions enabled to all Roles.*

3.1.1. UAC1: Understand the processes

This user action relates to the capability of finding instructions and documentation, as well as links to use the platform depending on the user role. The information is displayed in the dashboard in the corresponding pages:

- https://dashboard.eucaim.cancerimage.eu/become-a-user

- https://dashboard.eucaim.cancerimage.eu/become-a-software-provider
- https://dashboard.eucaim.cancerimage.eu/become-a-data-holder
- https://dashboard.eucaim.cancerimage.eu/become-a-member

3.1.2. UAC2: Register into the platform

The first interaction of a user with respect to the AAI will be related to the registration. The process for registration is described in the Dashboard, “become a user” section[1].

Registration is performed through the “My Profile” button of the Dashboard and it is implemented through LS-AAI. By the integration of LS-AAI we achieve the following requirements:

- LS-AAI enrolment URL: https://profile.aai.lifescience-ri.eu/login
- Support of Institutional IdPs: Most of the ones in the EduGain federation (https://edugain.org/)
- Support of public IdPs: LinkedIn, GoogleId, Apple, Orcid and GitHub.
- Privacy policy acceptance required at registration:

Once the LS-AAI account is registered, users must enrol to get access granted. The enrollment is embedded during the registration process through the same “My Profile” button of the Dashboard.

- EUCAIM Group enrolment URL: https://signup.aai.lifescience-ri.eu/fed/registrar/?vo=lifescience&group=communities_and_projects:EUCAIM
- EUCAIM Group management URL: https://perun.aai.lifescience-ri.eu/organizations/3345/groups/23560
- User’s account inspection and management: through https://profile.aai.lifescience-ri.eu/profile.

The EUCAIM Group administration privileges are limited to the users in the managers subgroup
https://perun.aai.lifescience-ri.eu/organizations/3345/groups/23560/settings/managers

Currently there are 62 users registered, using the following IdPs:

- Institutional IdPs: 27
- Orcid: 16
- Google Id: 10
- Life Science Hostel: 9

There is no need for additional sign up of the user in the rest of the services.

3.1.3. UAC3: Authenticate into the platform

The authentication in the platform is performed through the LS-AAI and membership to the EUCAIM group. The behaviour of the different services is the following:

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[1] https://drive.google.com/file/d/1EsFYxbzqpyYKggyeKrKKw3FkVecDby8P/view

- Dashboard: The user can log in through the “My-profile” button. If the user has been authenticated already, the dashboard automatically recognizes it. Anonymous access to general information is enabled.
- Catalogue: The user can log in through the “Sign in” button and specify “With Lifesciences RI”. Login is only for users who want to contribute with new datasets. Anonymous access to general information is enabled.
- Federated Search: Access is granted to authenticated EUCAIM users only. An OAuth proxy prevents anonymous users from accessing the federated search. If the user is not authenticated, it will forward the user to the login page.
- Negotiator: Anonymous access is limited to the landing page. Users should login by clicking on the “LS login” button or when forwarded from the catalogue.

Table 3 describes the degree of fulfilment of the different features related to the authentication.

Feature	**Dashboard**	**Catalogue**	**Explorer**	**Negotiator**
Anonymous access	Yes to partial information	Yes for most of the operations	No	Only landing page
Login request	Yes, through “my profile” button	Yes, through the “Sign in” button	Yes, by default	Yes, through the “LS Login” button
Previous login remembered	Yes, in the same session	Yes, in the same session	Yes, in the same session	Yes, in the same session
Transfer of token among services	No	No	No	No

Table 3: Features implemented in the services with respect to Authentication and Authorisation.

3.2. User actions Related to Data Holders

User actions related to the registration and preparation of datasets are described in Table 4 and are analysed in the following subsections.

User Action	**Description**	**User Story**
UAH1: Join the federation	Submit an application to join the federation	usDH1, usDH2, usDH3
UAH2: Request dataset registration	Submit an application to be authorised by the Governing Body (Access Committee) to register datasets in the Federated Catalogue	usDH2, usDH3, usGB1

User Action	Description	User Story
UAH3: Prepare (meta)data	Prepare the (meta)data of the dataset following EUCAIM's specification	usDH3, usDH4
UAH4: Create a dataset	Upload their already prepared data to the Central Storage and create a dataset	usDH5
UAH5: Upload metadata	Make their data discoverable, by pushing the metadata of the datasets into the Public Catalogue	usDH6
UAH6: Trace a dataset	See information about the usage of their datasets	usDH7

Table 4. *User Actions enabled to Data Holders.*

The User Actions are described in the way that should be performed through the following subsections.

3.2.1. UAH1: Join the federation

The submission of an application is performed through the https://dashboard.eucaim.cancerimage.eu/expression-of-interest form in the dashboard. This form collects the necessary information for the evaluation by the Access Committee.

3.2.2. UAH3: Prepare (meta)data

The preparation of the data and metadata is an action performed locally at the data holder premises and it is not supported by the platform itself. Datasets must be adapted to the EUCAIM Common Data Model described in the hyperontology (https://zenodo.org/records/12583826).

3.2.3. UAH2: Request dataset registration

After extracting the metadata from the dataset and adapting them to the specific model of EUCAIM, datasets can be registered through a special application in the import wizard of the catalogue (https://catalogue.eucaim.cancerimage.eu/menu/importdata/importwizard). The data should be provided as an Excel spreadsheet file, with a tab using the name "EUCAIM_collection_registration", a first row with the data categories and one row per dataset to be registered. A sample file is provided in https://dashboard.eucaim.cancerimage.eu/EUCAIM-ingestion-sample.xlsx and can be used as a template. The list of terms used for the specification is also available in https://dashboard.eucaim.cancerimage.eu/EUCAIM-attributes-and-terms.xlsx.

The fields that should be included in the request are the following (details are available in https://zenodo.org/records/12583826):

- id
- biobank
- name
- country
- acronym
- description
- network
- collection_method
- type
- order_of_magnitude
- size
- number_of_studies
- number_of_series
- image_size
- parent_collection
- sub_collections
- head_title_before_name
- head_firstname
- head_lastname
- head_title_after_name
- head_role
- contact
- diagnosis_available
- topography
- body_part_examined
- imaging_modality
- image_year_range
- image_access_type
- image_access_fee
- image_access_description
- image_access_uri
- publication_uri
- non_image_data_access_uri
- biobank_label
- commercial_use
- age_high
- age_low
- age_median
- terms_of_use
- sex
- intended_purpose
- metadata_issued
- last_modified
- version
- provider
- vendor

Once the request has been approved by the Access Committee, the application can be copied into the official catalogue.

Certified catalogues will automatically make the data discoverable through the federation of the catalogue using FAIR Data endpoints. This is provided only at experimental level at this moment by running a publication command that converts and creates the FAIR Data Point entries in the FDP Table at the development site of EUCAIM. Then, datasets can be queried through the URLs generated, providing the information in DCAT format (see example in the Annex II, section 6).

3.2.4. UAH4: Create a dataset

This User Action deals with the uploading of the data in a Reference Node and the creation of a dataset to make the dataset usable in the reference node. This User Action involves three operations:

- Uploading the DICOM images
- Uploading the clinical associated data.
- Creating the dataset.

The operations mentioned above can be done via the QP-Insights user interface integrated in the Reference Node or via API.

Uploading DICOM images through QP-Insights:

QP-Insights allows data ingestion via a manual upload through a visual interface in which the user is able to:

- Set the information related to the data such as the project in which the data has to be included and the subject (patient) and timepoint associated with the data.
- Add via drag and drop the files that include the data (either DICOM or zip files).
- Perform the upload of the data. The application previously triggers an anonymization process over it before any of the data leaves the user's browser.
- See live updates of the upload process progress.

This process is shown below in figure 1 and Figure 2:

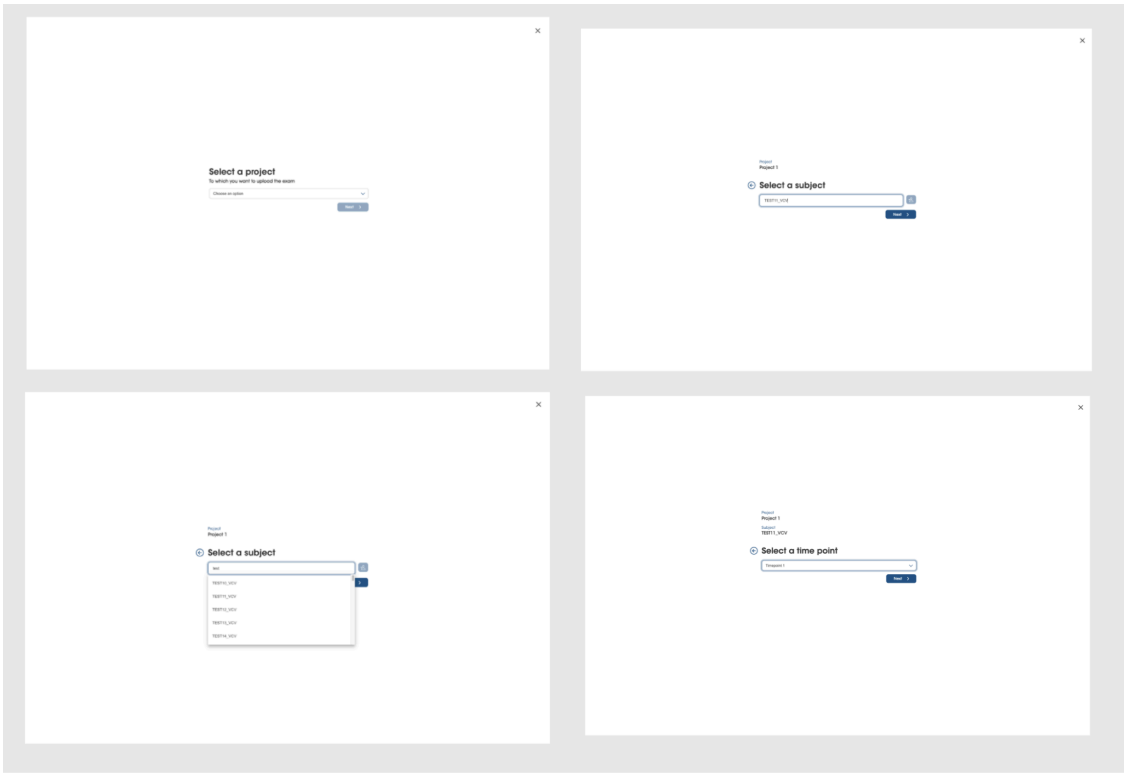

Figure 1. Selecting a project, a subject and a timepoint.

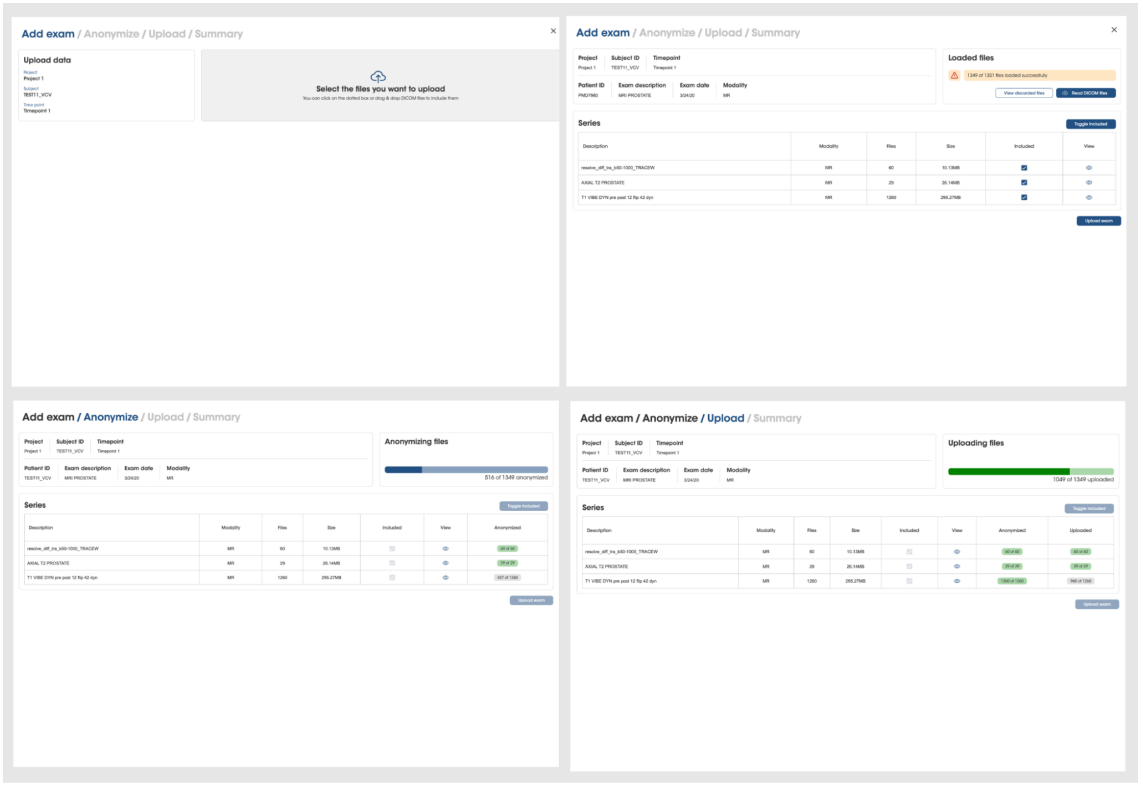

Figure 2. Adding imaging data in the browser, anonymizing and uploading it.

Additionally, the QP-Insights application includes a set of DICOMWeb standards-based functionalities for working with DICOM files via API. Specifically, it provides the STOW-RS API for uploading DICOM images. In this way, users can choose to upload images via the web interface or via the API, depending on their needs and permissions. An example of a STOW-RS API call is shown in the section 5.1.2 in the annexes..

Uploading clinical data through QP-Insights:

QP-Insights also supports the ingestion of clinical data.

By using the user interface, an eCRF(electronic Case Report Form) template defined in an excel file can be uploaded to the platform and assigned to a single project, as shown in the figure 3 and figure 4 :

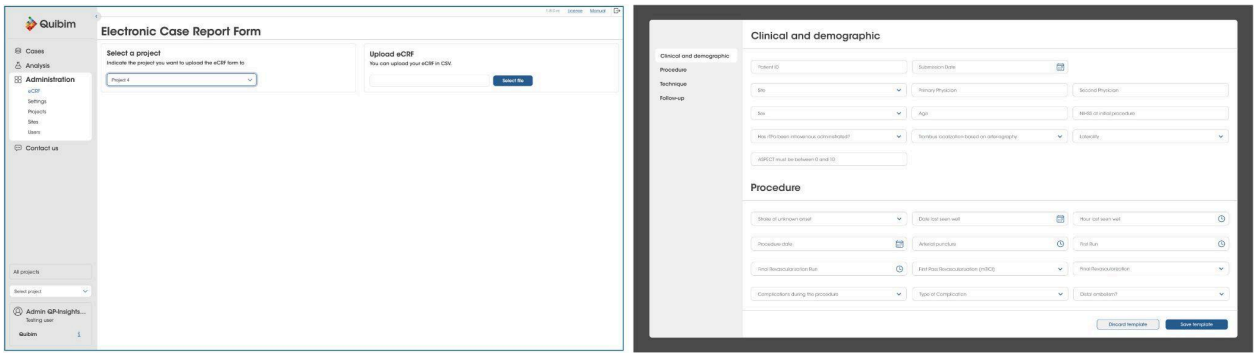

Figure 3. Adding an eCRF template to a project in QP-Insights platform.

Once the template is uploaded, the variables specified by the eCRF template can be filled in for each subject of the project. By clicking in the icon of the eCRF file, an editable form corresponding to the eCRF template can be edited as shown in the following pictures. The status of the eCRF (incomplete, completed or validated) is shown by different colours of the file icon.

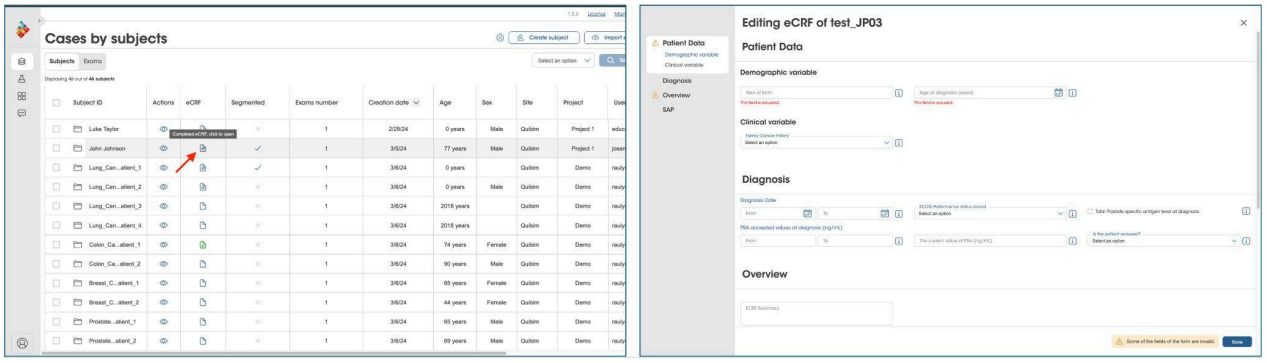

Figure 4: Filling in the eCRF for a subject

In addition, QP-Insights supports the ingestion of clinical data through a set of APIs that allows verified users to interact directly with it without the need for a user interface. Uploading and editing eCRF (electronic Case Report Form) is possible via API.

This API transaction is described in the annexes (5.1.2. Calls related to UAH4).

Creating the dataset:

QP-Insights also implements a dedicated workflow to create datasets from the data previously uploaded to the platform. The user will be able to select subjects or cases of a project, and create a dataset specifying the dataset name, description and purpose, along with the dataset type and method as shown in Figure 5. The dataset creation will later be reflected in the dataset explorer. This is performed through the call to a POST operation to the dataset service API (https://eucaim-node.i3m.upv.es/dataset-service/api/datasets), with all the details of the datasets (see the annexes for examples on the API call in section 5.1.2, annex I).

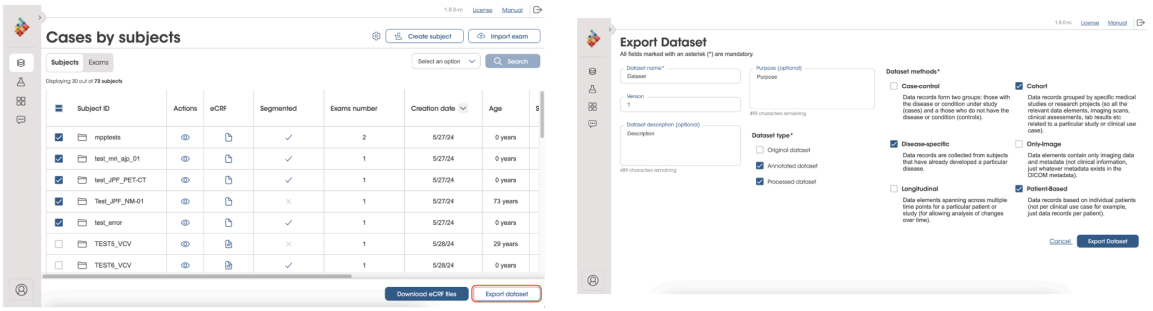

Figure 5. Creation of a dataset.

3.2.5. UAH5: Upload metadata

The description of this user action refers to the release of a dataset as a discoverable one. This implies two steps:

1. Register the dataset in the catalogue, as described in UAH2. This is required for all datasets, including those in Tier 1.
2. Make the dataset discoverable through the Federated Search (required for Tier 2 and above). If the dataset is uploaded to the reference node, it can be made discoverable by setting the status of the dataset as “published”, which triggers the publication of the metadata in Zenodo. This step is performed through the GUI and through the https://eucaim-node.i3m.upv.es/dataset-service/api-doc#tag/datasets/operation/modifyDataset, using the PATCH operation and changing the property “public” to “true”.

3.2.6. UAH6: Trace a dataset

The operations of creation, access and batch processing to a specific dataset are registered on a Blockchain Database. These operations are supported by the tracer service in the UPV reference node. This service logs any action performed on the datasets hosted in the reference node, but it has a REST API for any other service to register additional actions.

The information on the access history is available through the UPV reference node dashboard in https://eucaim-node.i3m.upv.es/dataset-service, and can be queried to the REST API using the GET operation on the endpoint https://eucaim-node.i3m.upv.es/tracer-service/tracer/api/v1/traces?datasetId=dataset-id, provided that the user has the proper credentials.

3.3. User Actions related to Data Access and Processing

User actions related to the registration and preparation of datasets are described in Table 5 and are analysed in the following subsections.

User Action	**Description**	**User Story**
UAD1: Browse and filter datasets	Browse datasets in the public catalogue from different repositories and filter the datasets of interest	usDU1
UAD2: Federated query to filter datasets	Search for datasets of the federated catalogue. Query will be expressed in a structured language. The query will be run on the repositories of different providers, returning the number of studies that match the search criteria	usDU2
UAD3: Add dataset references to the data user-researcher library	Add the references of datasets selected from the public catalogue (either filtered using the federated query mechanism or not) to the user library	usDU1, usDU2, usDU3
UAD4: Request access to datasets	Requests access to the datasets by providing a project description, the institutional endorsement of the project, external ethical review (where applicable) and a specification of resources requested	usDU3
UAD5: Follow-up on the status of the application	Retrieve information about the status of the request through the request tracking mechanisms integrated in the Dashboard.	usDU3
UAD6: Browse the datasets to which the user has access	List and filter the datasets to which the data user-researcher has been granted permissions	usDU4, usDU5
UAP1: Browse tools in the marketplace	Inspect, filter and select the available tools to be executed by the federated processing service	usDU6
UAP2: Federated processing	Once the proposal is accepted, the researcher gets access to the processing service which will orchestrate the execution of the chosen tools over the authorised and selected datasets (either in the central node or in a federated node)	usDU5, usDU8, usDU9
UAP3: Define the job parameters	Configure the computation and storage needs and the settings of the tools that are going to be executed	usDU8, usDU9
UAP4: Monitor job status	Monitor the progress of a federated processing job and eventually cancel it	usDU10

User Action	Description	User Story
UAP5: Retrieve the results of the execution	Review the charts and tables containing the results of the federated processing and export them as a CSV/XLSX file	usDU11

Table 5. *User Actions enabled to Data Users-Researchers.*

3.3.1. UAD1: Browse and filter datasets

The user action consists of browsing datasets in the public catalogue from different repositories and filtering the datasets of interest. This can be done from the user interface or programmatically.

The filtering criteria supported is:

- Key words in the descriptions.
- Data holders.
- Attributes of the data: Body parts, Imaging Modalities, collection methods, Dataset types, Image access types, Sex and Vendor

The programmatic access to the filtering is performed through the Molgenis API[2]

- Retrieve the list of Providers
    - GET https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_networks
- Retrieve the list of collections
    - GET https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_biobanks
- Retrieve the list of and attributes from all datasets
    - GET https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_collections
- Retrieve an attribute from a specific dataset
    - GET https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_collections/a96b56cd-59d4-444a-8e59-32a7fb0d7dea?attrs=size

The list of attributes is: id-col; Biobank_col; Collection name; Country; Collection acronym; Description; Network; Collection method; Dataset type; Order of magnitude; Number of subjects; Number of studies; Number of series; Image size (GB); parent collection; sub collections; Head, title before name; Head, first name; Head, last name; Head, title after name; Head, role; Contact; Diagnosis; Topography; Body part; Imaging modality; Image year range; image_access_type; Image access fee; Image access description; Image access URI; Publication URI; Non image data access uri; Biobank label; Available for commercial use; Age, high; Age, low; Age, median; Terms of use; Sex; Intended purpose; Date metadata issued; Date last modified; Version; Provider; Vendor.

Calls to the previous APIs are included in Annex I, subsection 1.

[2] https://molgenis.gitbooks.io/molgenis/content/guide-api-rest2.html

3.3.2. UAD2: Federated query to filter datasets

The federated query enables searching for the number of cases fulfilling a specific criteria. This feature is implemented through the explorer component in the EUCAIM Platform. The searching criteria will support a wide range of the hyperontology terms, but currently it supports searching for the following criteria:

- Patient: Gender (SNOMEDCT263495000) and Age at Diagnosis (SNOMEDCT423493009).
- Clinical Parameters: Diagnosis (SNOMEDCT439401001) and Year of Diagnosis (SNOMEDCT432213005).
- Image Parameters: Modality (RID10311), Body Part (SNOMEDCT123037004) and Manufacturer (C25392)

The terms are coded using the SNOMED, DICOM andRADLEX terminology, according to D5.1 Early release of the Data Federation Network

Current version allows searching for several terms at the same time. Figure 6 shows the results for the query SNOMEDCT439401001 equals 'SNOMEDCT399068003' and SNOMEDCT263495000 in ['SNOMEDCT248153007']. The number of studies that fulfil the criteria are displayed in the interface.

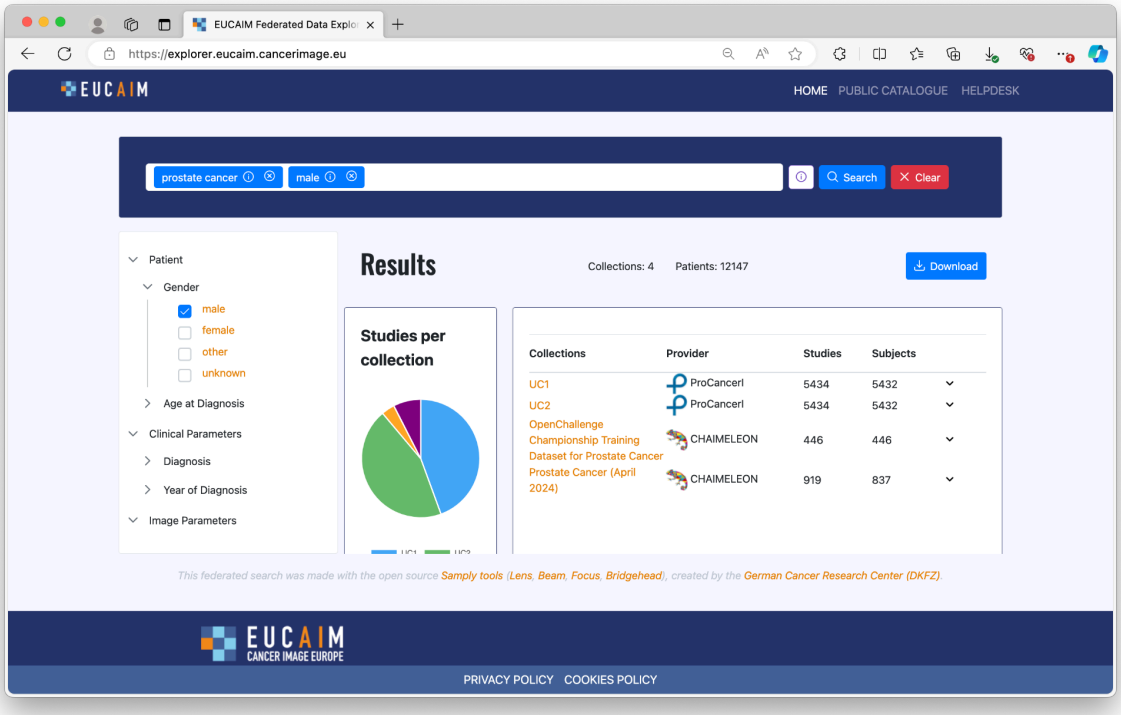

Figure 6: Federated search validation. Usage of multiple searching criteria.

The interaction with the backend is based on posting jobs to the federated search distributed queue, which dispatches the searching request across the federation and collects the results. This is done through a POST to the tasks API (https://explorer.eucaim.cancerimage.eu/backend/tasks?sites=chaimeleon,procanceri). The result of the operation is the id of the task {“id: "0ed31071-3126-4365-b3db-9dbf81eef6ea"}, whose results are queried through the GET API:

https://explorer.eucaim.cancerimage.eu/backend/tasks/0ed31071-3126-4365-b3db-9dbf81eef6ea?wait_count=1

3.3.3. UAD3: Add dataset references to the data user-researcher library

This user action is linked to User Action UAD4 and constitutes the first part of the request. This is performed directly through the “add” button in the catalogue interface and there is no API associated with it.

3.3.4. UAD4: Request access to datasets

Requests access to the datasets is triggered from the catalogue and completed in the negotiation by providing a project description, the institutional endorsement of the project, external ethical review (where applicable) and a specification of resources requested, as well as other additional fields, according to the access forms specified by the access committee for existing datasets[3] and observational studies[4] . The API of the negotiator is described in swagger[5]. The actions involved in the verification of this user action are:

- Retrieve the list of accessible resources (GET https://negotiator.eucaim.cancerimage.eu/api/v3/resources?page=0&size=50), which retrieves the resources that are accessible and should be equal to those available in the catalogue.
- Submit an application of access request. This is performed through the catalogue, as described in the EUCAIM platform user manual, which triggers the call POST https://catalogue-eucaim.grycap.i3m.upv.es/plugin/directory/export, with a payload that includes the reference to the dataset for which the user is requesting access. It returns the URL for starting the request (https://negotiator-eucaim.grycap.i3m.upv.es/requests/request-id)
- Check the application form. Access forms are coded into the Negotiator database and can be retrieved through a GET operation on https://negotiator.eucaim.cancerimage.eu/api/v3/access-forms
- Submit a negotiation application. This is performed through a POST operation to the https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations API, providing a json payload with the information on the request, the form field values and references to the attachments. The result of the operation is a summary of the negotiation application and the negotiation id.

As in other cases, sample calls to the above operations are shown in the annexes of this document. All the previous actions can be performed through the catalogue and negotiator user interfaces.

3.3.5. UAD5: Follow-up on the status of the application

A user can retrieve information about the status of the request through the request tracking mechanisms integrated in the Negotiator. The status of the application follows the state machine described in figure 7. The status involves two elements:

[3] https://drive.google.com/file/d/1F-DFw7-PXlBh29sQ2C0qjM_BYnRdO9Yx/view
[4] https://drive.google.com/file/d/1pmWyMfoVCVfS5ZHBJ7aOdKwXqlsog3cp/view
[5] https://negotiator.eucaim.cancerimage.eu/api/swagger-ui/index.html

- Status of the negotiation (SUBMITTED, APPROVED, DECLINED, IN_PROGRESS, PAUSED, CONCLUDED, ABANDONED), which can be obtained through the interface and by calling GET https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/negotiation-id
- Status of the resource access request (CONTACT, MARK_AS_UNREACHABLE, RETURN_FOR_RESUBMISSION, MARK_AS_CHECKING_AVAILABILITY, MARK_AS_AVAILABLE, MARK_AS_UNAVAILABLE, MARK_AS_CURRENTLY_UNAVAILABLE_BUT_WILLING_TO_COLLECT, STEP_AWAY, INDICATE_ACCESS_CONDITIONS, ACCEPT_ACCESS_CONDITIONS, DECLINE_ACCESS_CONDITIONS, GRANT_ACCESS_TO_RESOURCE), which can be obtained through the interface and by calling GET https://negotiator.eucaim.cancerimage.eu/api/v3/negotiations/negotitation-id/resources/resource-id/lifecycle

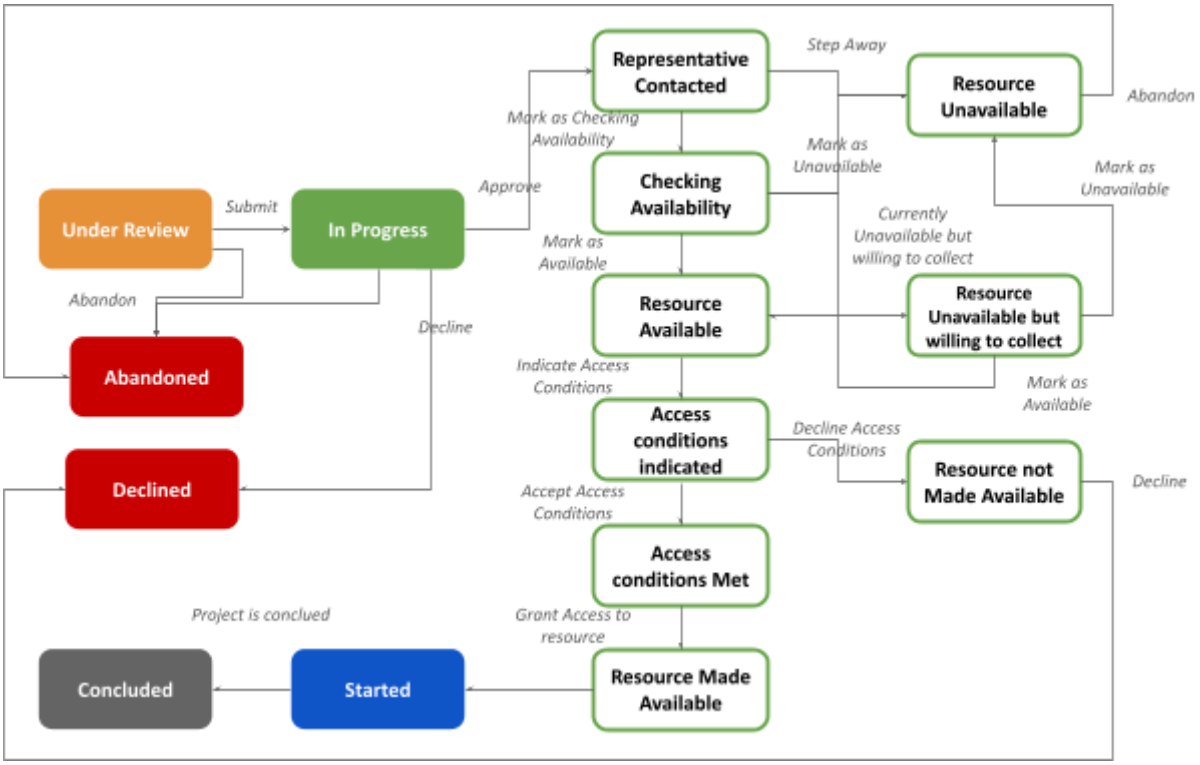

Figure 7: Application workflow.

Sample calls are included in the section 5.2.3 of annex I to this document.

3.3.6. UAD6: Browse the datasets to which the user has access

List and filter the datasets to which the data user-researcher has been granted permissions

The negotiations that reached the status of “GRANT_ACCESS_TO_RESOURCE” are those that have access to the dataset granted. The list of the datasets that the user has access granted are displayed in the “my negotiations” area of the negotiator.

They can be queried through the negotiator API by calling GET ‘https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/users/userid/negotiations?role=author&cr

eatedAfter=&createdBefore=&sortBy=creationDate&sortOrder=DESC&page=0. The status is available in the “status“ attribute.

3.4. User Actions related to Data processing

These user actions validate the functionality of the UPV reference node with respect to the processing. Federated processing services will be validated in the frame of WP6.

The reference node supports two types of jobs: interactive applications that run securely on the platform and are accessible through a terminal remote client and a reverse proxy and batch jobs, which run unattended and whose output can be persisted on the storage area of the interactive applications or by the API interface.

The endpoints for the UPV reference node with respect to the execution of jobs and applications are the following:

- https://eucaim-node.i3m.upv.es/, base URL of the reference node.
- https://harbor.eucaim-node.i3m.upv.es/, Harbor catalogue for storing the manifests of the applications and the Docker container images.
- https://eucaim-node.i3m.upv.es/apps/#/c/default/ns/**namespace**/apps. KubeApps application server (where **namespace** is the namespace created for each user).
- https://eucaim-node.i3m.upv.es/guacamole/#/, remote server client running on a proxy, used to access the GUI interactive applications.
- Batch jobs execution service is managed through the jobman command (https://github.com/chaimeleon-eu/jobman/blob/main/Dockerfile) which submits jobs in the reference node Kubernetes endpoint. This endpoint is not exposed to the exterior for security reasons.

3.4.1. UAP1: Browse tools in the marketplace

The tools available for execution are uploaded as Docker images into a Harbor repository at https://harbor.eucaim-node.i3m.upv.es/. Harbor exposes an API to interact with the repostory in https://harbor.eucaim-node.i3m.upv.es/devcenter-api-2.0. In particular, the call to https://harbor.eucaim-node.i3m.upv.es/api/v2.0/projects/library/repositories returns all the repositories (Docker container images) uploaded in the platform.

3.4.2. UAP2: Federated processing

The federated processing service is being implemented at the level of WP6 and will be integrated in the EUCAIM Platform soon. Execution is implemented at the level of the reference nodes, through secure processing environments.

The processing of data in the reference node is available through two different approaches:

- Deployment of interactive processing environments, through a POST command to the KubeApps API service https://chaimeleon-eu.i3m.upv.es/apps/apis/kubeappsapis.core.packages.v1alpha1.PackagesService/GetInstalledPackageDetail API, providing the details of the application and returning a textual information with the details of the application.
- Submission of batch jobs through the jobman interface, using the “submit” operations (https://github.com/chaimeleon-eu/jobman/tree/main?tab=readme-ov-file#submit-jobs).

3.4.3. UAP3: Define the job parameters

Jobs executed as described in the previous subsections can be customized. Interactive applications can be customized using the GUI provided by the KubeApps service in https://eucaim-node.i3m.upv.es/apps/, and also through the payload of the API call, as described in the previous subsection.

The status of batch jobs run through jobman can be retrieved using the "list" operation (https://github.com/chaimeleon-eu/jobman/tree/main?tab=readme-ov-file#list-existing-jobs).

3.4.4. UAP4: Monitor job status

The status of active jobs and applications in the reference node can be explored through the GUI and the API.

- Information about interactive applications is retrieved as a response of a POST command to the https://chaimeleon-eu.i3m.upv.es/apps/apis/kubeappsapis.core.packages.v1alpha1.PackagesService/GetInstalledPackageSummaries API in KubeApps.
- Information about the batch jobs is richer. The API offers the possibility to list active jobs through "jobman list" and to retrieve the status of each one of the jobs through "jobman detail -j {job-id}"

3.4.5. UAP5: Retrieve the results of the execution

The output of the interactive jobs can be directly browsed through the GUI interface when accessing the jobs. Batch jobs output can be retrieved through the jobman API "jobman log -j {job-id}".

3.5. User Actions related to the Governing Body

User actions related to the governing body are described in Table 6 and are analysed in the following subsections.

User Action	**Description**	**User Story**
UAG1: Ethical and legal review of applications	Review that data access requests meet the appropriate ethical and legal conditions	usGB3
UAG2: Decide on the concession of permissions to access the data	Depending on the type of agreement with the Data Holder and the location of the data (federated node or central repository) the Governing Body will approve or reject the data access request	usGB3
UAG3: Forward the request to the Data Holder Access Committee	If the data datasets are located at federated nodes (not the central repository), the Governing Body, using the Negotiator tool, will forward the request to the Access Committee of the correspondent Data Holder	usGB3
UAG4: Interact with the	The applicants are informed about the status	usGB1,

User Action	Description	User Story
applicant	of the request through the request tracking mechanisms integrated in the Dashboard, which could be used by the Governing Body to provide feedback about the application	usGB2, usGB3

Table 6. *User Actions enabled to the Governing Body - Access Committee.*

3.5.1. UAG1: Ethical and legal review of applications

The Access Committee can retrieve the information from an access request directly from the negotiation submission by means of a GET operation in the API 'https://negotiator.eucaim.cancerimage.eu/api/v3/negotiations/**{negotiation_id}**'. This information on the Ethical and legal approval is included in item 8. Once the the id of the document that contains the information on the legal approval is retrieved, a GET operation in the API 'https://negotiator.eucaim.cancerimage.eu/api/v3/attachments/**{attachment_id}**' will retrieve the document.

The documents can also be downloaded from the interface, provided that the user has the manager privileges for the collection of the dataset.

3.5.2. UAG2: Decide on the concession of permissions to access the data

The approval of the request will start the process of negotiation is started by setting the "APPROVED" status to the negotiation submission, by means of a POST action to the API https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/**{negotiation_id}**/lifecycle/APPROVE' or using the GUI. The approval puts the request in the stage of analysing the request of data and resources.

3.5.3. UAG3: Forward the request to the Data Holder Access Committee

The involvement of the Data Holder Access Committee can be performed through the designation of a "Biobank representative" Role to a user in the LS-AAI EUCAIM group. Each dataset has a representative person who could be a delegated member of the Access Committee or a representant of the data holder organization. These roles are available in https://perun.aai.lifescience-ri.eu/organizations/3345/groups/38662/subgroups and can be granted only by the administrators of the EUCAIM LS-AAI group.

3.5.4. UAG4: Interact with the applicant

The applicants are informed about the status of the request through the request tracking mechanisms integrated in the Negotiator, which could be used by the Governing Body to provide feedback about the application. The information is exchanged through the messaging service available in the GUI and also through the API, using the 'https://negotiator.eucaim.cancerimage.eu/api/v3/negotiations/**{negotiaton-id}**/posts?type={**MSGTYPE}**', being the message type either "PUBLIC" or "PRIVATE". A message can be posted by means of a "POST' operation on the same URL (https://negotiator.eucaim.cancerimage.eu/api/v3/negotiations/**{negotiaton-id}**/posts) and providing the details of the message in the payload.

Sample calls to the API are provided in the annexes.

3.6. Use cases related to the EUCAIM Platform Manager

User actions related to the EUCAIM Platform Manager are described in Table 6 and are analysed in the following subsections.

User Action	Description	User Story
UAM1: Integrate new tools accepted into the platform	Upload the tools supplied by the Software Providers to the platform, configuring them and integrating them with the rest of the services	usPM1
UAM2: Maintain services and monitor jobs	Monitor the services and federated processing jobs	usPM2
UAM3: Manage platform permissions	Register users in the platform and assign permissions based on the input of the Governing Body	usPM2

Table 7*. User Actions enabled to the EUCAIM Platform Manager.*

User actions UAM1 and UAM2 are not done automatically and require interaction with the platform, so they are not validated in this document.

3.6.1. UAM3: Manage platform permissions

Access to the data has to be set up at the hosting service level. In the case of the UPV reference node, the permission is defined through the PUT operation on the https://chaimeleon-eu.i3m.upv.es/dataset-service/api/datasets/**{id}**/acl/**{username}** API. Permission can be revoked by using the DELETE operation on the same URL. Note that permission is given on an individual basis (datasets and users).

3.7. Use cases related to Software Providers

User actions related to the Software Providers are described in Table 8. These User Actions will be available in the further version of the platform.

User Action	Description	User Story
UAS1: Request tool registration	Request approval of the Governing Body to upload the tool to the platform, accepting the terms and conditions	usSP1
UAS2: Upload the tool to the platform	Upload the developed tool following the EUCAIM guidelines and recommendations to the platform, along with the related usage documentation	usSP1

User Action	Description	User Story
UAS3: Track the usage of the tool	Review the usage of the tool and some metrics about it	usSP2

Table 8*. User Actions enabled to Software Providers.*

4. End User Validation

The platform has just been released for internal validation. A procedure for analysing the usability and end-user satisfaction is presented in this document. The procedure considers the components and the following User Actions:

- UAC1 (Understand the processes)
- UAC2 (Register into the platform)
- UAC3 (Authenticate into the platform)
- UAD1 (Browse and filter datasets)
- UAD2 (Federated query to filter dataset)
- UAD3 (Add dataset references to the data user-researcher library)
- UAD4 (Request access to datasets)
- UAD5 (Follow-up on the status of the application)
- UAD6 (Browse the datasets to which the user has access)
- UAG1 (Ethical and legal review of applications)
- UAG2 (Decide on the concession of permissions to access the data)
- UAG3 (Forward the request to the Data Holder Access Committee)
- UAG4 (Interact with the applicant)
- UAH1 (Join the federation)
- UAH2 (Request dataset registration)
- UAH3 (Prepare [meta]data)
- UAH4 (Create a dataset and upload the already prepared data to the Central Storage)
- UAH5 (Make dataset discoverable)
- UAH6 (Trace the usage of a dataset)
- UAP2 (Federated processing)
- UAP3 (Define the job parameters)
- UAP4 (Monitor job status)
- UAP5 (Retrieve the results of the execution)

The end-user validation is performed through a set of questionnaires based on the CSUQ (Computer System Usability Questionnaire) and considers the evaluation using an evaluation scale (from 1 to 5, being 1 the lowest score) of 9 dimensions:

1. PERFORMANCE: Evaluate the Performance of the service with respect to your expectancies.
2. ERROR MANAGEMENT: Evaluate the way the service manages errors.
3. SCALABILITY: Evaluate if the service can scale up or down the resources to deal with different workloads.
4. COMPLETION: The functionality of the service is complete.
5. INTEROPERABILITY: Evaluate the interoperability of the service with other relevant services or data in the field.
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the service.
7. CONVENIENCE: Evaluate the way the features of the service are implemented.
8. ROBUSTNESS: Evaluate the resilience of the service.
9. OVERALL ASSESSMENT: Evaluate the service as a whole.

The assessment will cover these 9 dimensions per each one of the services, considering the different profiles, as well as the user actions implemented through the service. Not all the

dimensions are relevant for all the User Actions, and answers on the likert scale have been adapted to the specific question and functionality. In total, 7 questionnaires have been prepared:

- Dashboard, considering the User Actions UAC1 (Understand the processes), UAH1 (Join the federation), UAC2 (Register into the platform) and UAC3 (Authenticate into the platform). The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSeGsTrgyN9gDeDAUallqxK_BbBKEcTOBDrAFHAdVSq4_1GZwA/viewform.
- Catalogue, considering the User Actions: UAD1 (Browse and filter datasets), UAH2 (Request dataset registration and UAH3 upload metadata), UAD3 (Add dataset references to the data user-researcher library) and UAD4 (Request access to datasets). The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSdThoDFBe5ePfl1T1DYgTBsvkTCpSFl4YNI5dv9dXgXFUsz-A/viewform.
- Federated Search, considering the User Action UAD2 (Federated query to filter dataset). The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSf-yYBTzkkY1o6_MCj2M5RJGXE6WhGb9Z_8KbUgnmUwcJ9inQ/viewform.
- Negotiator, from the point of view of the Access Committee, and considering the User Actions: UAG1 (Ethical and legal review of applications), UAG2 (Decide on the concession of permissions to access the data), UAG3 (Forward the request to the Data Holder Access Committee) and UAG4 (Interact with the applicant). The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSd2p6rO5lSQDH5e_5hvyZdfe459-kUpaf6pQaIGdaVORbUvGw/viewform.
- Negotiator, from the point of view of the Researcher, and considering the User Actions: UAD4 (Request access to datasets), UAD5 (Follow-up on the status of the application) and UAD6 (Browse the datasets to which the user has access). The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSfFGByD-b2hY65Nb4c2URUEnd-44n-b1Pm95REDKep2TH3kKw/viewform.
- UPV Reference node, from the point of view of the Data Holder, and considering the User Actions: UAC3 (Authenticate into the platform), UAH2 (Request dataset registration), UAH3 (Prepare [meta]data), UAH4 (Create a dataset and upload the already prepared data to the Central Storage), UAH5 (Make dataset discoverable), and UAH6 (Trace the usage of a dataset. The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSfKcZPaaxUk02i2bHh7P6JvYPXk2kagJKdcthzKcv2a4RSaOg/viewform
- UPV Reference node, from the point of view of the Data User, and considering the User Actions: UAC3 (Authenticate into the platform), UAD6 (Browse the datasets to which the user has access), UAP2 (Federated processing), UAP3 (Define the job parameters), UAP4 (Monitor job status), and UAP5 (Retrieve the results of the execution). The questionnaire can be seen in https://docs.google.com/forms/d/e/1FAIpQLSeRbNR9TJeGQh5FzI7H6XEe-abAjwCps9-83ifk0HTv-lY22w/viewform

Not all the questions apply to every service, so the questions are removed from the questionnaire, but numbering is kept coherent across all the evaluation forms.

4.1. Dashboard end-user analysis questionnaire

The specific questions and answers related to the dashboard are the following:

1. PERFORMANCE: Evaluate the Performance of the Dashboard with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage
    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the Dashboard manages errors
    1. No error messages when it crashes
    2. Very general error messages
    3. Clear Error messages for the diagnosis
    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
4. COMPLETION: The functionality of the Dashboard is complete
    1. The service misses key features that makes it useless to me
    2. There are important features missing but the service is still useful for me
    3. There are only some desirable features that are not implemented
    4. The service has all the features needed
    5. The service also offers additional unexpected features
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the Dashboard
    1. The dashboard is too complex that I stopped using it
    2. The dashboard is not intuitive but it has some documentation
    3. The dashboard is reasonable complex and documentation is useful
    4. The dashboard is easy to use and well documented
    5. The dashboard is intuitive and the training material and documentation is excellent
7. CONVENIENCE: Evaluate the way the features of the Dashboard are implemented
    1. The way the dashboard is implemented makes it useless to me
    2. The way the dashboard is implemented made me change my working approach
    3. I had to adapt my working procedures to use the dashboard but the implementation is useful
    4. The way the dashboard is implemented is convenient
    5. The way the dashboard is implemented improved the way I work
8. ROBUSTNESS: Evaluate the resilience of the Dashboard
    1. The dashboard fails frequently

2. The dashboard sometimes fails, loosing progress or results
3. Despite that there have been failures, the dashboard is normally working properly
4. No unplanned dashboard interruptions had happened
5. The dashboard has been always up and running

9. OVERALL ASSESSMENT: Evaluate the Dashboard as a whole
    1. The dashboard is useless
    2. The dashboard is not useful for me but it could be useful for others
    3. The dashboard is partially useful for most people in the field
    4. The dashboard is useful and relevant
    5. The dashboard is very useful and I will use it regularly

10. FREE TEXT COMMENTS

11. UAC1: Understand the processes (Information about the roles and the operational processes).
    1. The information is poor or key parts are missing
    2. Some convenient information is missing
    3. Instructions are reasonable although difficult to follow
    4. Main actions are properly described
    5. The information is complete and well-detailed.

12. UAH1: Join the federation
    1. I could not complete the process of applying to join the federation
    2. I could not find all the information for applying to join the federation
    3. Instructions are reasonable although difficult to follow
    4. The process of joining the federation is reasonable according to the limitations.
    5. The process of joining the federation is complete and adequate.

13. UAC2: Register into the platform (Process of creation of an account)
    1. I cannot create an account
    2. I can create an account but the process is cumbersome for me
    3. I can create an account but I would prefer another process
    4. I can create an account and the process fit mainly my needs
    5. The process of creating an account is the most appropriate one.

14. UAC3: Authenticate into the platform
    1. I cannot login into the platform
    2. I can login into the platform but with difficulties
    3. I can log into the platform, but I would prefer another process
    4. I can log into the platform, but I would suggest improvements
    5. The login process fits perfectly my needs.

20. Comments on User Actions. A text-free comment related to the User Actions (mandatory if an answer in any of the questions 11-13 is lower than 4)

4.2. Catalogue end-user analysis questionnaire

The specific questions and answers related to the catalogue are the following:

1. PERFORMANCE: Evaluate the Performance of the Catalogue with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage
    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the Catalogue manages errors
    1. No error messages when it crashes
    2. Very general error messages
    3. Clear Error messages for the diagnosis
    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
4. COMPLETION: The functionality of the Catalogue is complete
    1. The service misses key features that makes it useless to me
    2. There are important features missing but the service is still useful for me
    3. There are only some desirable features that are not implemented
    4. The service has all the features needed
    5. The service also offers additional unexpected features
5. INTEROPERABILITY: Evaluate the interoperability of the Catalogue with other relevant services or data in the field
    1. The catalogue has its own format for data and it is not properly described
    2. The catalogue uses only its own data formats, which are somehow described
    3. The catalogue uses standard and own data formats reasonably described
    4. The catalogue uses standard data formats and interacts with the other services, although with some restrictions
    5. The catalogue fully integrates with the other services and standards in the field
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the Catalogue
    1. The catalogue is too complex and I was unable to find data.
    2. The catalogue is not intuitive, but it has some documentation
    3. The catalogue is reasonable complex and documentation is useful
    4. The catalogue is easy to use and well documented
    5. The catalogue is intuitive and the documentation is excellent
7. CONVENIENCE: Evaluate the way the features of the Catalogue are implemented
    1. The way the catalogue is implemented makes it useless to me

2. The way the catalogue is implemented is useful, but I rather suggest a different approach

3. I had to adapt my working procedures to use the catalogue but the implementation is useful according to the restrictions of the data

4. The way the catalogue is implemented is convenient

5. The way the catalogue is implemented improved the way I work

8. ROBUSTNESS: Evaluate the resilience of the Catalogue

1. The catalogue fails frequently

2. The catalogue sometimes fails, loosing progress or results

3. Despite that there have been failures, the catalogue is normally working properly

4. No unplanned catalogue interruptions had happened

5. The catalogue has been always up and running

9. OVERALL ASSESSMENT: Evaluate the Catalogue as a whole

1. The catalogue is useless

2. The catalogue is not useful for me but it could be useful for others

3. The catalogue is partially useful for most people in the field

4. The catalogue is useful and relevant

5. The catalogue is very useful and I will use it regularly

10. FREE TEXT COMMENTS

11. UAD1: Browse and filter datasets

1. I could not find appropriate data in the catalogue

2. I could find data but filtering and browsing is not adequate

3. Filtering and browsing capabilities are working but I would suggest other criteria

4. The filtering and browsing of data is adequate according to the restrictions of data access

5. The filtering and browsing of data fits my needs

12. UAH2: Request dataset registration and UAH3 upload metadata.

1. I could not register a dataset in the platform.

2. I could register a dataset but the process discourages sharing data.

3. The registration process works but it should be improved.

4. The registration process is convenient with slight modifications.

5. The registration process fits my needs.

13. UAD3: Add dataset references to the data user-researcher library

1. I could not select the datasets for requesting access

2. I could select the datasets for requesting access but the information was limited

3. I could select the datasets for requesting access, but the process could be improved.

4. I could select the datasets for requesting access, and the process is adequate according to the limitations of data

5. The process of selecting datasets for requesting access meets my requirements.

14. UAD4: Request access to datasets
    1. I could not start the process of the data access request or it failed.
    2. I managed to initiate the request for access to data, but I found the process cumbersome.
    3. I started the process of the access request, but I found limitations
    4. I started the process of access request by selecting the desired datasets, and I considered the process reasonable for the access restrictions imposed.
    5. I started the process of access request by selecting the desired datasets, and the process fits my needs
20. Comments on User Actions. Add a comment related to the User Actions (mandatory if an answer in any of the questions 11-13 is lower than 4)

4.3. Federated search end-user analysis questionnaire

The specific questions and answers related to the federated search are the following:

1. PERFORMANCE: Evaluate the Performance of the Federated Search with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage
    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the Federated Search manages errors
    1. No error messages when it crashes
    2. Very general error messages
    3. Clear Error messages for the diagnosis
    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
4. COMPLETION: The functionality of the Federated Search is complete
    1. The federated search misses key features that makes it useless to me
    2. There are important features missing but the federated search is still useful for me
    3. There are only some desirable features that are not implemented
    4. The federated search has all the features needed
    5. The federated search also offers additional unexpected features
5. INTEROPERABILITY: Evaluate the interoperability of the Federated Search with other relevant services or data in the field
    1. The federated search has an inconvenient format for data querying
    2. The federated search uses only its own data formats, which are somehow described

3. The federated search uses standard and own data formats reasonably described

4. The federated search uses standard data formats and interacts with the other services, although with some restrictions.

5. The federated search fully integrates with the other services and standards in the field

6. LEARNING CURVE: Evaluate the complexity on learning the usage of the Federated Search
    1. The federated search is too complex and I was unable to find data
    2. The federated search is not intuitive, but it has some documentation
    3. The federated search is reasonable complex and documentation is useful
    4. The federated search is easy to use and well documented
    5. The federated search is intuitive, and the documentation is excellent
7. CONVENIENCE: Evaluate the way the features of the Federated Search are implemented
    1. The way the federated search is implemented makes it useless to me
    2. The way the federated search is implemented is useful, but I rather suggest a different approach
    3. I had to adapt my working procedures to use the federated search but the implementation is useful
    4. The way the federated search is implemented is convenient
    5. The way the federated search is implemented improved the way I work
8. ROBUSTNESS: Evaluate the resilience of the Federated Search
    1. The federated search fails frequently
    2. The federated search sometimes fails, losing progress or results
    3. Despite that there have been failures, the federated search is normally working properly
    4. No unplanned service interruptions had happened
    5. The federated search has been always up and running
9. OVERALL ASSESSMENT: Evaluate the Federated Search as a whole
    1. The federated search is useless
    2. The federated search is not useful for me but it could be useful for others
    3. The federated search is partially useful for most people in the field
    4. The federated search is useful and relevant
    5. The federated search is very useful and I will use it regularly
10. FREE TEXT COMMENTS
11. UAD2: Federated query to filter datasets
    1. I could not find appropriate data in the federated search
    2. I could find data but filtering and searching is not adequate
    3. Filtering and browsing capabilities are working but I would suggest other criteria

4. The filtering and browsing of data is adequate according to the restrictions of data access
5. The filtering and browsing of data fits my needs

20. Comments on User Actions. Add a comment related to the User Actions (mandatory if the answer to the question 11 is lower than 4)

4.4. Usability Evaluation - Negotiator (Access Committee POV)

The specific questions and answers related to the negotiator, from the point of view of the access committee user, are the following:

1. PERFORMANCE: Evaluate the Performance of the Negotiator with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage
    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the Negotiator manages errors
    1. No error messages when it crashes
    2. Very general error messages
    3. Clear error messages for the diagnosis
    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
4. COMPLETION: The functionality of the Negotiator is complete
    1.
    1. The negotiator misses key features that makes it useless to me
    2. There are important features missing but the negotiator is still useful for me
    3. There are only some desirable features that are not implemented
    4. The negotiator has all the features needed
    5. The negotiator also offers additional unexpected features
5. INTEROPERABILITY: Evaluate the interoperability of the Negotiator with other relevant services or data in the field
    1. The negotiator poorly interoperates with other tools and services
    2. The negotiator interoperates with other tools and services but in an inconvenient way
    3. The negotiator interoperates well with other services but misses the interoperability with other external key tools
    4. The negotiator interoperates seamlessly with other services, considering the limitations of the data access process
    5. The federated search seamlessly integrates with the other internal and external services
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the Negotiator

1. The negotiator is too complex so I was unable to request access to data
2. The negotiator is not intuitive, but it has some documentation
3. The negotiator is reasonably complex and documentation is useful
4. The negotiator is easy to use and well documented
5. The negotiator is intuitive, and the documentation is excellent

7. CONVENIENCE: Evaluate the way the features of the Negotiator are implemented
    1. The way the negotiator is implemented makes it useless to me
    2. The way the negotiator is implemented is useful, but I rather suggest a different approach
    3. I had to adapt my working procedures to use the negotiator but the implementation is useful
    4. The way the negotiator is implemented is convenient
    5. The way the negotiator is implemented improved the way I work
8. ROBUSTNESS: Evaluate the resilience of the Negotiator
    1. The negotiator fails frequently
    2. The negotiator sometimes fails, loosing progress or results
    3. Despite that there have been failures, the negotiator is normally working properly
    4. No unplanned service interruptions had happened
    5. The negotiator has been always up and running
9. OVERALL ASSESSMENT: Evaluate the Negotiator as a whole
    1. The negotiator is useless
    2. The negotiator is not useful for me but it could be useful for others
    3. The negotiator is partially useful for most people in the field
    4. The negotiator is useful and relevant
    5. The negotiator is very useful and I will use it regularly
10. FREE TEXT COMMENTS
11. UAG1: Ethical and legal review of applications
    1. I could not find the legal and ethical information of an application
    2. I could find the information but the way it was provided was inadequate
    3. I could find the information reasonably, but I suggest a more efficient way to handle it
    4. The information was available appropriately, according to the limitations of the platform
    5. The information was available as I would have expected.
12. UAG2: Decide on the concession of permissions to access the data. According to the process for managing the access granting
    1. It does not work properly
    2. It works, but it is inadequate
    3. It works, but it has limitations

    4. It is adequate according to the conditions
    5. It fits my needs
13. UAG3: Forward the request to the Data Holder Access (delegated) Representative. According to the process for involving the data holder access delegated representative
    1. It does not work properly
    2. It works, but it is inadequate
    3. It works, but it has limitations
    4. It is adequate according to the conditions
    5. It fits my needs
14. UAG4: Interact with the applicant. According to the process for involving the data holder access delegated representative
    1. It does not work properly
    2. It works, but it is inadequate
    3. It works, but it has limitations
    4. It is adequate according to the conditions
    5. It fits my needs

20. Comments on User Actions. Add a comment related to the User Actions (mandatory if the answer to any of the questions 11-14 is lower than 4)

4.5. Usability Evaluation - Negotiator (Researcher POV)

The specific questions and answers related to the negotiator, from the point of view of the researcher, are the following:

1. PERFORMANCE: Evaluate the Performance of the Negotiator with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage
    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the Negotiator manages errors
    1. No error messages when it crashes
    2. Very general error messages
    3. Clear error messages for the diagnosis
    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
4. COMPLETION: The functionality of the Negotiator is complete
    1. The negotiator misses key features that makes it useless to me
    2. There are important features missing but the negotiator is still useful for me
    3. There are only some desirable features that are not implemented

    4. The negotiator has all the features needed
    5. The negotiator also offers additional unexpected features
5. INTEROPERABILITY: Evaluate the interoperability of the Negotiator with other relevant services or data in the field
    1. The negotiator poorly interoperates with other tools and services
    2. The negotiator interoperates with other tools and services but in an inconvenient way
    3. The negotiator interoperates well with other services but misses the interoperability with other external key tools
    4. The negotiator interoperates seamlessly with other services, considering the limitations of the data access process
    5. The federated search seamlessly integrates with the other internal and external services
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the Negotiator
    1. The negotiator is too complex so I was unable to request access to data
    2. The negotiator is not intuitive, but it has some documentation
    3. The negotiator is reasonably complex and documentation is useful
    4. The negotiator is easy to use and well documented
    5. The negotiator is intuitive, and the documentation is excellent
7. CONVENIENCE: Evaluate the way the features of the Negotiator are implemented
    1. The way the negotiator is implemented makes it useless to me
    2. The way the negotiator is implemented is useful, but I rather suggest a different approach
    3. I had to adapt my working procedures to use the negotiator but the implementation is useful
    4. The way the negotiator is implemented is convenient
    5. The way the negotiator is implemented improved the way I work
8. ROBUSTNESS: Evaluate the resilience of the Negotiator
    1. The negotiator fails frequently
    2. The negotiator sometimes fails, loosing progress or results
    3. Despite that there have been failures, the negotiator is normally working properly
    4. No unplanned service interruptions had happened
    5. The negotiator has been always up and running
9. OVERALL ASSESSMENT: Evaluate the Negotiator as a whole
    1. The negotiator is useless
    2. The negotiator is not useful for me but it could be useful for others
    3. The negotiator is partially useful for most people in the field
    4. The negotiator is useful and relevant
    5. The negotiator is very useful and I will use it regularly
10. FREE TEXT COMMENTS

11. UAD4: Request access to datasets
    1. I could not submit an access request application
    2. I could submit an access request application, but I was unable to add the proper information
    3. I could submit an access request application, although the process was unclear
    4. I could submit an access request application, and the process was adequate according to the limitations of the data access.
    5. I could submit an access request application, and the process was clear and adequate
12. UAD5: Follow-up on the status of the application
    1. I could not find the status of my application
    2. The information about the status of my application is not useful
    3. The information about the status of my application is not well documented but there are ways to request for information
    4. I can find accurate information about the status my application but I would prefer other ways to receive feedback
    5. The information about the progress of my application fits my needs
13. UAD6: Browse the datasets to which the user has access
    1. I cannot find the information about the datasets I have access granted
    2. I can find the information but it is unclear and not very useful
    3. I can find the information, but I will need additional information
    4. I can find the information in the application and by e-mail, but I would prefer to have them integrated
    5. The information about the datasets I can access meets my needs
20. Comments on User Actions. Add a comment related to the User Actions (mandatory if the answer to any of the questions 11-13 is lower than 4)

4.6. Usability Evaluation - UPV Reference Node (Data Holder POV)

The specific questions and answers related to the UPV Reference Node, from the point of view of the data holder, are the following:

1. PERFORMANCE: Evaluate the Performance of the UPV Reference Node with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage
    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the UPV Reference Node manages errors
    1. No error messages
    2. Very general error messages
    3. Clear Error messages for the diagnosis

    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
3. SCALABILITY: Evaluate if the UPV Reference Node can scale up or down the resources to deal with different workloads
    1. Service has a fixed scale
    2. Service resources can be defined at deployment time but not changed
    3. Service can be manually scaled up or down after deployed
    4. Service adapt to the workload automatically but takes time to react
    5. Service seamlessly adapt to the workload
4. COMPLETION: The functionality of the UPV Reference Node is complete
    1.
    1. The service misses key features that makes it useless to me
    2. There are important features missing but the service is still useful for me
    3. There are only some desirable features that are not implemented
    4. The service has all the features needed
    5. The service also offers additional unexpected features
5. INTEROPERABILITY: Evaluate the interoperability of the UPV Reference Node with other relevant services or data in the field
    1. The service has its own format for data and resources
    2. The service uses standard data formats but it uses its own resources
    3. The service manages the data types needed and integrates with some infrastructures
    4. The service can use different infrastructures and integrates external authentication
    5. The service fully integrates with the standards of the field
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the UPV Reference Node
    1. The service is too complex that I stopped using it
    2. The service is not intuitive but it has some documentation
    3. The service is reasonable complex and documentation is useful
    4. The service is easy to use and well documented
    5. The service is intuitive and the training material and documentation is excellent
7. CONVENIENCE: Evaluate the way the features of the UPV Reference Node are implemented
    1. The way the service is implemented makes it useless to me
    2. The way the service is implemented made me change my working approach
    3. I had to adapt my working procedures to use the service but the implementation is useful
    4. The way the service is implemented is convenient
    5. The way the service is implemented improved the way I work
8. ROBUSTNESS: Evaluate the resilience of the UPV Reference Node

1. The service fails frequently
2. The service sometimes fails, losing progress or results
3. Despite that there have been failures, the service is normally working properly
4. No unplanned service interruptions had happened
5. The service has been always up and running

9. OVERALL ASSESSMENT: Evaluate the UPV Reference Node as a whole
    1. The service is useless
    2. The service is not useful for me but it could be useful for others
    3. The service is partially useful for most people in the field
    4. The service is useful and relevant
    5. The service is very useful and I will use it regularly
10. FREE TEXT COMMENTS
11. UAC3: Authenticate into the platform
    1. I was unable to authenticate on the platform.
    2. I could authenticate but I had to follow an inconvenient procedure.
    3. I could authenticate but the procedure should be improved.
    4. The procedure is adequate according to the limitations of the system.
    5. The authentication procedure fits my needs.
12. UAH2: Request dataset registration
    1. I could not request the registration of a dataset in the platform.
    2. I could request the registration of a dataset in the platform, but I was unable to provide most of the information requested.
    3. I could request the registration of a dataset and complete the information, but the procedure is cumbersome.
    4. I could request the registration of a dataset and complete the information, and the procedure is adequate considering the limitations of the platform.
    5. The procedure for requesting the registration of a dataset fits my needs.
13. UAH3: Prepare (meta)data
    1. I could not collect and adapt to the EUCAIM's common data model most of the metadata information for requesting a dataset.
    2. I could collect and adapt to the EUCAIM's common data model most of the metadata information for requesting a dataset, but it was cumbersome and complex.
    3. I could collect and adapt to the EUCAIM's common data model most of the metadata information for requesting a dataset and I miss important fields.
    4. In general, I managed to prepare the data and metadata for EUCAIM's common data model, considering the limitations of the platform.
    5. The information and tools for preparing the data and metadata are clear and fit my needs.
14. UAH4: Upload the data already prepared to the UPV reference storage and create a dataset.

1. I could not upload the data to the reference storage or create a dataset.
2. I could upload the data to the reference storage but I was unable to create a dataset.
3. I could upload the data to the reference storage and create a dataset, although the procedure is complex and cumbersome.
4. I consider the process for data uploading and dataset creation adequate according to the limitations of the platform.
5. The procedure for uploading the data and creating a dataset in the reference storage fits my needs.

15. UAH5: Make the dataset discoverable, by pushing the metadata of the datasets into the Public Catalogue.
    1. I could not make a dataset created in the reference node discoverable.
    2. I could make a dataset created in the reference node discoverable but the procedure is inadequate for my data.
    3. I could make a dataset created in the reference node discoverable but I miss important information to be added.
    4. The procedure for making a dataset created in the reference node discoverable is appropriate according to the limitations of the platform.
    5. The procedure for making a dataset created in the reference node discoverable fits my needs.
16. UAH6: Trace the access to a dataset.
    1. I could not find the information about the usage of a dataset.
    2. I could find the information about the usage of a dataset, but the procedure is inadequate for my data.
    3. I could find the information about the usage of a dataset, but I miss important information.
    4. The procedure for obtaining information about the usage of a dataset created in the reference node discoverable is appropriate according to the limitations of the platform.
    5. The procedure for obtaining information about the usage of a dataset created in the reference node discoverable fits my needs.
20. Comments on User Actions. Add a comment related to the User Actions (mandatory if an answer in any of the questions 11-13 is lower than 4)

4.7. Usability Evaluation - Negotiator (Researcher POV)

The specific questions and answers related to the UPV Reference Node, from the point of view of the researcher, are the following:

1. PERFORMANCE: Evaluate the Performance of the UPV Reference Node with respect to your expectancies
    1. Very Low
    2. Lower than expected
    3. Reasonable for the conditions of usage

    4. Higher than expected
    5. Very high
2. ERROR MANAGEMENT: Evaluate the way the UPV Reference Node manages errors
    1. No error messages
    2. Very general error messages
    3. Clear Error messages for the diagnosis
    4. Very helpful error messages
    5. Errors are automatically solved or no errors appeared
3. SCALABILITY: Evaluate if the service can scale up or down the resources to deal with different workloads
    1. Service has a fixed scale
    2. Service resources can be defined at deployment time but not changed
    3. Service can be manually scaled up or down after deployed
    4. Service adapt to the workload automatically but takes time to react
    5. Service seamlessly adapt to the workload
4. COMPLETION: The functionality of the UPV Reference Node is complete
    1. The service misses key features that makes it useless to me
    2. There are important features missing but the service is still useful for me
    3. There are only some desirable features that are not implemented
    4. The service has all the features needed
    5. The service also offers additional unexpected features
5. INTEROPERABILITY: Evaluate the interoperability of the UPV Reference Node with other relevant services or data in the field
    1. The service has its own format for data and resources
    2. The service uses standard data formats but it uses its own resources
    3. The service manages the data types needed and integrates with some infrastructures
    4. The service can use different infrastructures and integrates external authentication
    5. The service fully integrates with the standards of the field
6. LEARNING CURVE: Evaluate the complexity on learning the usage of the UPV Reference Node
    1. The service is too complex that I stopped using it
    2. The service is not intuitive but it has some documentation
    3. The service is reasonable complex and documentation is useful
    4. The service is easy to use and well documented
    5. The service is intuitive and the training material and documentation is excellent
7. CONVENIENCE: Evaluate the way the features of the UPV Reference Node are implemented
    1. The way the service is implemented makes it useless to me

2. The way the service is implemented made me change my working approach
3. I had to adapt my working procedures to use the service but the implementation is useful
4. The way the service is implemented is convenient
5. The way the service is implemented improved the way I work

8. ROBUSTNESS: Evaluate the resilience of the UPV Reference Node
    1. The service fails frequently
    2. The service sometimes fails, loosing progress or results
    3. Despite that there have been failures, the service is normally working properly
    4. No unplanned service interruptions had happened
    5. The service has been always up and running
9. OVERALL ASSESSMENT: Evaluate the UPV Reference Node as a whole
    1. The service is useless
    2. The service is not useful for me but it could be useful for others
    3. The service is partially useful for most people in the field
    4. The service is useful and relevant
    5. The service is very useful and I will use it regularly
10. FREE TEXT COMMENTS
11. UAC3: Authenticate into the platform
    1. I was unable to authenticate in the platform.
    2. I could authenticate but I had to follow an inconvenient procedure.
    3. I could authenticate but the procedure should be improved.
    4. The procedure is adequate according to the limitations of the system.
    5. The authentication procedure fits my needs.
12. UAD6: Browse the datasets to which the user has access
    1. I could not find the datasets I am authorised to access.
    2. I could find them but I was unable to access them.
    3. I could find and access them, although the procedure should be improved.
    4. The procedures for browsing and accessing the datasets is adequate considering the limitations.
    5. The procedures for browsing and accessing the datasets fit my needs.
13. UAP2: Federated processing
    1. I could not run a process.
    2. I could run a process after a huge effort.
    3. I could run a process, but the procedure must be improved.
    4. The processing procedure is adequate according to the limitations of the platform.
    5. The processing procedure fits my needs.
14. UAP3: Define the job parameters

1. I could not custom the job parameters.

2. I could define the job parameters, although not completely.

3. I could define the job parameters but forced me to change my working procedures.

4. I could define the job parameters fully, but some minor improvements are needed.

5. The procedure for customizing job parameters fit my needs.

15. UAP4: Monitor job status

    1. I could not monitor the status of a job.

    2. I could monitor the status but the procedure is inadequate.

    3, I could monitor the status of a job, but the procedure is complex and costly.

    4. The procedure for monitoring the status of a job is adequate according to the limitations of the platform.

    5. The procedure for monitoring the status of a job fit my needs.

16. UAP5: Retrieve the results of the execution

    1.I could not retrieve the result of an execution.

    2. I could retrieve the result of an execution but the procedure is inadequate.

    3, I could retrieve the result of an execution, but the procedure is complex and costly.

    4. The procedure for retrieving the result of an execution is adequate according to the limitations of the platform.

    5. The procedure for retrieving the result of an execution fit my needs.

20. Comments on User Actions. Add a comment related to the User Actions (mandatory if an answer in any of the questions 11-13 is lower than 4)

5. Annex I: Sample calls to the APIs

This section shows example calls to the APIs to validate the performance of the services. The output of some of the calls have been collapsed for readability purposes.

5.1. Calls of to user actions related to Data Holders

5.1.1. Calls related to UAH2

The query to FAIR Data Point for the publication of the dataset's metadata in DCAT format (only available in the development catalogue).

```
$ curl
https://catalogue-eucaim.grycap.i3m.upv.es/api/fdp/fdp_Dataset/aaaadedy5amajvxematnxliaae
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix dcat: <http://www.w3.org/ns/dcat#> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix dct: <http://purl.org/dc/terms/> .
@prefix lang: <http://id.loc.gov/vocabulary/iso639-1/> .
@prefix fdp-o: <https://w3id.org/fdp/fdp-o#> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix orcid: <http://orcid.org/> .
@prefix sio: <http://semanticscience.org/resource/> .
@prefix datacite: <http://purl.org/spar/datacite/> .
@prefix mlga: <http://molgenis.org/audit/> .
@prefix ldp: <http://www.w3.org/ns/ldp#> .

<https://catalogue-eucaim.grycap.i3m.upv.es/api/fdp/fdp_Dataset/aaaadedy5amajvxematnxliaae>
  a dcat:Dataset, dcat:Resource;
  dct:title "Breast Cancer – Dataset 4";
  rdfs:label "Breast Cancer – Dataset 4";
  dct:publisher [ a foaf:Agent;
      foaf:name "EuCanImage"
    ];
  dct:hasVersion "0.1";
  dct:description """This dataset contains basal MRI of patients with breast cancer.
""";
  dct:modified "2024-07-03T16:03:12Z"^^xsd:dateTime;
  fdp-o:metadataModified "2024-07-03T16:03:12Z"^^xsd:dateTime;
  fdp-o:metadataIssued "2024-07-03T16:03:12Z"^^xsd:dateTime;
  dct:issued "2024-07-03T16:03:12Z"^^xsd:dateTime;
  dcat:theme <https:/theme_ontology.placeholder.nl>;
  fdp-o:metadataIdentifier [ a datacite:Identifier;
                                                                    dct:identifier
<https://catalogue-eucaim.grycap.i3m.upv.es/api/fdp/fdp_Dataset/aaaadedy5amajvxematnxliaae>
    ] .
```

5.1.2. Calls related to UAH4

Sample of a DICOMWeb request for uploading a DICOM study (STOW-RS API):

```
curl -X POST "https://qpdiscovery.eucaim-node.i3m.upv.es/aets/eucaim/rs/studies" \ -H "Accept: application/dicom+json" \ -H "Content-Type: multipart/related; type=application/dicom" \ -H "Authorization: Bearer $QPI_TOKEN" \ -F "file=@$PATH/example.dcm;type=application/dicom"
```

Sample call for the creation of clinical data associated with a subject. The subject is created in case it does not previously exist.

Endpoint: /projects/:project-id/subjects/:subject-code/update-ecrf

```
curl                                                                                --location
https://qpdiscovery.eucaim-node.i3m.upv.es/care'https://qpdiscovery.eucaim-node.i3m.upv.es/care/
projects/6436b7ce0011ce501f0aa4fd/subjects/test-subject/update-ecrf' \
--header 'Content-Type: application/json' \
--header 'Authorization: Bearer $QPI_TOKEN' \
--data '{
    "data": {
        "birthyear": "1940",
        "examDate": "2022-12-31T23:00:00.000Z",
        "age": "2024-05-02T00:00:00.000Z",
        "familyCancerHistory": null,
        "diagnosisDate": {
            "from": "2000-12-31T23:00:00.000Z",
            "to": "2001-12-30T23:00:00.000Z"
        },
        "ecogPerformanceStatus": null,
        "totalAntigenLevel": false,
        "acceptedPsaValue": {
            "min": 1.25,
            "max": 3.75
        },
        "minPsaValue": 0.5,
        "psaValue": null,
        "isReviewed": null,
        "summary": "This is a summary"
    },
    "status": "complete"
}'
```

Sample call for the creation of a dataset from data previously ingested in the platform

```
$ curl -i -X POST -H "Authorization: bearer $DSS_TOKEN" -H "Content-Type: application/json" \
-d '{"name": "TestDataset3", "description": "This is a dataset for testing.",
"studies":  [ {
     "studyId": "5e57a4356af19d299c17026d",
     "studyName": "GMIBG2DECUERPOENTERO",
     "subjectName": "17B76FEW",
     "pathInDatalake": "project/17B76FEW_Neuroblastoma/GMIBG2DECUERPOENTERO20160225",
     "series": [{"folderName": "serie1", "tags":[]},
                {"folderName": "serie2", "tags":[]},
                {"folderName": "serie3", "tags":[]}],    "url": ""   },
   { "studyId": "5e5629835938d32160636353",
     "studyName": "RM431RMRENAL",
     "subjectName": "17B76FEW",
     "pathInDatalake": "project/17B76FEW_Neuroblastoma/RM431RMRENAL20130820",
     "series": [{"folderName": "serie1", "tags":[]}],   "url": ""   },
   { "studyId": "5eeba960903aec091076c180",
     "studyName": "RM815RMDORSAL",
     "subjectName": "1GB90F75",
     "pathInDatalake": "project/1GB90F75_Neuroblastoma/RM815RMDORSAL20121123",
     "series": [{"folderName": "serie1", "tags":[]}],   "url": ""   }
   ],
   "subjects": [
      {"subjectName": "17B76FEW", "eForm": {}},
      {"subjectName": "21N56F7T", "eForm": {}},
      {"subjectName": "1GB90F75", "eForm": {}}
    ]
}" \
https://eucaim-node.i3m.upv.es/dataset-service/api/datasets
```

```
{"url": "/api/datasets/efa2cba6-4a17-4612-8074-7e9eb9c9d7ca"}
```

5.1.3. Calls related to UAH5

Sample call to make a dataset discoverable in Zenodo and the Federated Search.

```
$ curl -i -X PATCH \
       -H "Authorization: bearer $DSS_TOKEN" \
       -H "Content-Type: application/json" \
       -d '{"property": "public", "value": true}' \
"https://eucaim-node.i3m.upv.es/dataset-service/api/datasets/00e821c4-e92b-48f7-a034-ba2df547e2bf"
```

```
HTTP/1.1 200 OK
Content-Length: 0
Content-Type: text/html; charset=UTF-8
```

5.1.4. Calls related to UAH6

Tracing a dataset API sample call.

```
$ curl -X 'GET'
https://eucaim-node.i3m.upv.es/tracer-service/tracer/api/v1/traces?datasetId=2d87741d-77ba-45da-bdc1-71edc82ac557&skipTraces=0&limitTraces=30' -H 'accept: */*' -H "Authorization: Bearer ${TOKEN}"
```


```
{
   "traces":[
      {
         "blockchain":"BESU_PRIVATE",
         "traces":[
            {
               "version":"V1",
               "id":"16d12e56-42d9-44a5-b8c0-2ed7e3f43915",
               "timestamp":"2024-07-15T08:26:59.949Z",
               "userId":"2b6c4f6d-4f93-44f2-ab3c-5966dce1373e",
               "callerId":"e78734b5-5141-4087-9a0f-c8ca67e9b1af",
               "userAction":"USE_DATASETS",
               "details":"jupyter-tensorflow 2.2.12"
            },
            {
               "version":"V1",
               "id":"06710157-b4f3-4151-8c77-3b04fa4e45c1",
               "timestamp":"2024-05-31T12:13:55.948Z",
               "userId":"105b93ab-36a2-4064-a6ed-18132d6441c7",
               "callerId":"e78734b5-5141-4087-9a0f-c8ca67e9b1af",
               "userAction":"UPDATE_DATASET",
               "details":"PUBLISH"
            },
            { },
            { },
            { },
            { },
            { },
            { },
            { }
         ],
         "countAllTraces":9
      }
   ]
}
```

5.2. Calls of to user actions related to Data Access

5.2.1. Calls related to UAD1

List the networks (data holders) in the federation.

$ curl https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_networks


```
{
  "href":"/api/v2/EUCAIM_networks",
  "meta":{
    "href":"/api/v2/EUCAIM_networks",
    "hrefCollection":"/api/v2/EUCAIM_networks",
    "name":"EUCAIM_networks",
    "label":"X. Networks",
    "description":"Overview of networks",
    "attributes":[ ],
    "labelAttribute":"name",
    "idAttribute":"id",
    "lookupAttributes":[ ],
    "isAbstract":false,
    "writable":false,
    "languageCode":"en",
    "permissions":[
      "AGGREGATE_DATA",
      "COUNT_DATA",
      "READ_DATA",
      "READ_METADATA"
    ]
  },
  "start":0,
  "num":100,
  "total":7,
  "items":[
    {
      "_href":"/api/v2/EUCAIM_networks/CHAIMELEON",
      "id":"CHAIMELEON",
      "name":"ChAImeleon",
      "acronym":"CHAI",
      "url":"https://chaimeleon.eu/",
      "juridical_person":"unknown",
      "contact":{ },
      "parent_network":[ ]
    },
    {
      "_href":"/api/v2/EUCAIM_networks/ECI",
      "id":"ECI",
      "name":"EuCanImage",
      "acronym":"ECI",
      "url":"https://eucanimage.eu/",
      "juridical_person":"unknown",
      "contact":{ },
      "parent_network":[ ]
    },
    { },
    { },
    { },
    { },
    { }
  ]
}
```


List the datasets in EUCAIM catalogue.

$ curl https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_biobanks


```
{
  "href":"/api/v2/EUCAIM_biobanks",
  "meta":{
    "href":"/api/v2/EUCAIM_biobanks",
    "hrefCollection":"/api/v2/EUCAIM_biobanks",
    "name":"EUCAIM_biobanks",
    "label":"2. Imaging biobank",
    "description":"Overview of imaging biobanks",
    "attributes":[ ],
    "labelAttribute":"name",
    "idAttribute":"id",
    "lookupAttributes":[ ],
    "isAbstract":false,
    "writable":false,
    "languageCode":"en",
    "permissions":[
      "AGGREGATE_DATA",
      "COUNT_DATA",
      "READ_DATA",
      "READ_METADATA"
    ]
  },
  "start":0,
  "num":100,
  "total":40,
  "items":[
    {
      "_href":"/api/v2/EUCAIM_biobanks/CHAI-1",
      "id":"CHAI-1",
      "name":"CHAIMELEON – Colon Cancer Imaging and clinical Data",
      "acronym":"CHAI-1",
      "description":"CHAIMELEON collection comprises several datasets of imaging and clini
      "url":"https://chaimeleon.eu/",
      "juridical_person":"unknown",
      "country":{ },
      "contact":{ },
      "collections":[
        {
          "_href":"/api/v2/EUCAIM_collections/2c7e2d8b-5279-4155-9b9b-4f827c7dff6f",
          "id":"2c7e2d8b-5279-4155-9b9b-4f827c7dff6f",
          "name":"Colon Cancer CT Only (July 23)"
        },
        {
          "_href":"/api/v2/EUCAIM_collections/2d87741d-77ba-45da-bdc1-71edc82ac557",
          "id":"2d87741d-77ba-45da-bdc1-71edc82ac557",
          "name":"Colon Cancer (April 2024)"
        },
        { },
        { }
      ],
      "network":[
        {
          "_href":"/api/v2/EUCAIM_networks/CHAIMELEON",
          "id":"CHAIMELEON",
          "name":"ChAImeleon"
        }
      ]
    },
    { },
    { },
    { }
  ]
}
```


List the datasets in EUCAIM catalogue.

$ curl https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_collections

```
{
  "href":"/api/v2/EUCAIM_collections",
  "meta":{
    "href":"/api/v2/EUCAIM_collections",
    "hrefCollection":"/api/v2/EUCAIM_collections",
    "name":"EUCAIM_collections",
    "label":"3. Imaging collection",
    "description":"Overview of imaging collections in biobanks",
    "attributes":[ ],
    "labelAttribute":"name",
    "idAttribute":"id",
    "lookupAttributes":[ ],
    "isAbstract":false,
    "writable":false,
    "languageCode":"en",
    "permissions":[ ]
  },
  "start":0,
  "num":100,
  "total":57,
```

```
"items":[
  {
    "_href":"/api/v2/EUCAIM_collections/05674e3a-596e-40e8-97a5-21846fef19a3",
    "id":"05674e3a-596e-40e8-97a5-21846fef19a3",
    "biobank":{
      "_href":"/api/v2/EUCAIM_biobanks/CHAI-5",
      "id":"CHAI-5",
      "name":"CHAIMELEON – Prostate Cases Imaging and clinical Data"
    },
    "name":"Prostate Cancer (April 2024)",
    "country":{ },
    "acronym":"CHAI-PROSTATE-2404",
    "description":"All Patient Cases (images and clinical data) collected until 23/04/2024 i
    "network":[ ],
    "collection_method":[ ],
    "type":[ ],
    "order_of_magnitude":{ },
    "size":909,
    "number_of_studies":991,
    "image_size":407.29,
    "sub_collections":[ ],
    "diagnosis_available":[ ],
    "topography":[ ],
    "body_part_examined":[ ],
    "imaging_modality":[ ],
    "image_year_range":"2010-2022",
    "image_access_type":[ ],
    "image_access_uri":"https://chaimeleon-eu.i3m.upv.es/dataset-service/datasets/05674e3a-5
    "publication_uri":"https://doi.org/10.5281/zenodo.11401851",
    "biobank_label":"CHAIMELEON – Prostate Cases Imaging and clinical Data",
    "age_high":96,
    "age_low":46,
    "terms_of_use":[ ],
    "sex":[ ],
    "intended_purpose":"Harmonization of images",
    "provider":"CHAIMELEON",
    "vendor":[ ]
  },
  { },
  { },
```


List the information about one datasets in EUCAIM catalogue.

$ curl https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_collections/a96b56cd-59d4-444a-8e59-32a7fb0d7dea


```
{
  "_meta":{
    "href":"/api/v2/EUCAIM_collections",
    "hrefCollection":"/api/v2/EUCAIM_collections",
    "name":"EUCAIM_collections",
    "label":"3. Imaging collection",
    "description":"Overview of imaging collections in biobanks",
    "attributes":[ ],
    "labelAttribute":"name",
    "idAttribute":"id",
    "lookupAttributes":[ ],
    "isAbstract":false,
    "writable":false,
    "languageCode":"en",
    "permissions":[ ]
  },
  "_href":"/api/v2/EUCAIM_collections/a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
  "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
  "biobank":{
    "_href":"/api/v2/EUCAIM_biobanks/aaaaddhjybbpbewk2z3qe4yaae",
    "id":"aaaaddhjybbpbewk2z3qe4yaae",
    "name":"CHAIMELEON - Lung Cancer Imaging and clinical Data"
  },
  "name":"Lung cancer championship phase",
  "country":{ },
  "acronym":"CHAI-Lung-OC24",
  "description":"Lung Cancer dataset for openchallenge championship phase",

  "network":[ ],
  "collection_method":[ ],
  "type":[ ],
  "order_of_magnitude":{ },
  "size":816,
  "number_of_studies":2149,
  "parent_collection":{ },
  "sub_collections":[ ],
  "diagnosis_available":[ ],
  "topography":[ ],
  "body_part_examined":[ ],
  "imaging_modality":[ ],
  "image_access_type":[ ],
  "image_access_fee":false,
  "image_access_uri":"https://chaimeleon-eu.i3m.upv.es/dataset-service/datasets/a96b56cd-59d4-44
  "biobank_label":"CHAIMELEON - Lung Cancer Imaging and clinical Data",
  "age_high":91,
  "age_low":32,
  "terms_of_use":[ ],
  "sex":[ ],
  "intended_purpose":"Image harmonization purposes",
  "version":"2024",
  "provider":"CHAIMELEON",
  "vendor":[

  ]
)
```


List a specific attribute from a dataset in EUCAIM catalogue.

$ curl https://catalogue.eucaim.cancerimage.eu/api/v2/EUCAIM_collections/a96b56cd-59d4-444a-8e59-32a7fb0d7dea?attrs=size

```
{
   "_meta":{
      "href":"/api/v2/EUCAIM_collections",
      "hrefCollection":"/api/v2/EUCAIM_collections",
      "name":"EUCAIM_collections",
      "label":"3. Imaging collection",
      "description":"Overview of imaging collections in biobanks",
      "attributes":[
         {
            "href":"/api/v2/EUCAIM_collections/meta/size",
            "fieldType":"INT",
            "name":"size",
            "label":"Number of subjects",
            "description":"Number of subjects whose images populate the collection",
            "attributes":[

            ],
            "auto":false,
            "nillable":true,
            "readOnly":false,
            "labelAttribute":false,
            "unique":false,
            "visible":true,
            "lookupAttribute":false,
            "isAggregatable":false,
            "tags":[

            ]
         }
      ],
      "labelAttribute":"name",
      "idAttribute":"id",
      "lookupAttributes":[
         "name",
         "age_high",
         "age_low",
         "age_median"
      ],
      "isAbstract":false,
      "writable":false,
      "languageCode":"en",
      "permissions":[
         "AGGREGATE_DATA",
         "COUNT_DATA",
         "READ_DATA",
         "READ_METADATA"
      ]
   },
   "_href":"/api/v2/EUCAIM_collections/a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
   "size":816
}
```

5.2.2. Calls related to UAD4

Initiate a data access request.

```
$ curl -X 'POST' 'https://catalogue-eucaim.grycap.i3m.upv.es/plugin/directory/export' -d {"URL":"https://catalogue.eucaim.cancerimage.eu/#/collection/OBS-RWD","entityId":"EUCAIM_collections","humanReadable":"#1: No filters used.","nToken":null,"rsql":"id=in=(OBS-RWD)"} -H "Authorization: Bearer ${TOKEN}"
```

[https://negotiator.eucaim.cancerimage.eu/requests/0171353a-45fb-4c92-ab2b-b23b58b034b3]

Retrieve information about the access request form.

```
$ curl -X 'GET'  -H 'accept: application/hal+json' 'https://negotiator.eucaim.cancerimage.eu/api/v3/access-forms'
```


```
{
  "_embedded":{
    "negotiations":[
      {
        "resources":[
          {
            "_embedded":{
              "access-forms":[
                {
                  "id":1,
                  "name":"EUCAIM Dataset Request Template",
                  "sections":[
                    {
                      "id":1,
                      "name":"project",
                      "label":"Application Documents",
                      "description":"Information and documents required to requests access to data/software",
                      "elements":[
                        {
                          "id":10,
                          "name":"title",
                          "label":"Title",
                          "description":"Give a title",
                          "type":"TEXT",
                          "required":true,
                          "_links":{ }
                        },
                        {
                          "id":1,
                          "name":"cover-letter",
                          "label":"Cover letter",
                          "description":"Provide a cover letter for your application (no more than 500 words)",
                          "type":"TEXT",
                          "required":true,
                          "_links":{ }
                        },
                        {
                          "id":2,
                          "name":"work-team",
                          "label":"Work team",
                          "description":"list of centres, researchers per centres and short CV per researcher (no more than 50 words per CV)",
                          "type":"TEXT_LARGE",
                          "required":true,
                          "_links":{ }
                        },
                        {
                          "id":3,
                          "name":"hypthesis",
                          "label":"Hypothesis",
                          "description":"Hypothesis to be developed with its clinical impact (no more than 300 words)",
                          "type":"TEXT_LARGE",
                          "required":true,
                          "_links":{ }
                        },
                        { },
                        { },
                        { },
                        { },
                        { },
                        { }
                      ],
                      "_links":{ }
                    }
                  ],
                  "_links":{ }
                },
                {
                  "id":2,
                  "name":"EUCAIM RWD Request Template",
                  "sections":[ ],
                  "_links":{
                    "access-forms":{
                      "href":"https://negotiator.eucaim.cancerimage.eu/api/v3/access-forms"
```

Submit a negotiation.

```
$ curl -X 'POST'  -H 'accept: application/hal+json' \
'https://negotiator.eucaim.cancerimage.eu/api/v3/access-forms'
'https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations' \
  -H 'accept: application/json' \
  -H 'Content-Type: application/json' \
   -H "Authorization: Bearer  ${TOKEN}" \
  -d
'{"requests":["4083fcc0-6962-46ca-84e5-6c04769b2987"],"payload":{"project":{"cover-lette
r":"dfsadf","title":"fdfdsa","proponents":"C:\\fakepath\\my-work-team.pdf","consortium":
"C:\\fakepath\\my-consortium.pdf","hypthesis":"fd","objectives":"fdfd","material-and-met
hods":"C:\\fakepath\\my-work-team.pdf","expected-results":"fdfd","research-call":"fdfd"}
},"attachments":[]}'
```


```
{
  "resources":[
    {
      "id":"822ad0bd-02d1-4932-a8b2-7d5679c3d4f0",
      "name":"Lung Cancer (April 2024)",
      "organization":{
        "id":39,
        "externalId":"aaaaddhjybbpbewk2z3qe4yaae",
        "name":"CHAIMELEON - Lung Cancer Imaging and clinical Data"
      }
    }
  ],
  "id":"815aa4a7-1d3b-4669-9d3e-9a507759b989",
  "author":{
    "id":"10002",
    "subjectId":"ac4bd1eb5274eb43b2844d6d490e1353bd7b9e7e@lifescience-ri.eu",
    "name":"Ignacio Blanquer Espert",
    "email":"iblanque@dsic.upv.es",
    "representativeOfAnyResource":true
  },
  "requests":[
    {
      "id":"0171353a-45fb-4c92-ab2b-b23b58b034b3",
      "url":"https://catalogue.eucaim.cancerimage.eu/#/collection/822ad0bd-02d1-4932-a8b2-7d5679c3d4f0",
      "humanReadable":"#1: No filters used.",
      "resources":[
        {
          "id":"822ad0bd-02d1-4932-a8b2-7d5679c3d4f0",
          "name":"Lung Cancer (April 2024)",
          "organization":{
            "id":39,
            "externalId":"aaaaddhjybbpbewk2z3qe4yaae",
            "name":"CHAIMELEON - Lung Cancer Imaging and clinical Data"
          }
        }
      ],
      "redirectUrl":"https://negotiator.eucaim.cancerimage.eu/requests/0171353a-45fb-4c92-ab2b-b23b58b034b3",
      "negotiationId":"815aa4a7-1d3b-4669-9d3e-9a507759b989"
    }
  ],
  "payload":{
    "project":{
      "title":"sdfds",
      "cover-letter":"fgfg",
      "work-team":"gfg",
      "hypthesis":"fgf",
      "objectives":"fgf",
      "material-and-methods":"fgf",
      "expected-results":"gf",
      "funding":"Yes",
      "supporting-documentation-ethics":"dsfds",
      "supporting-documentation-project":"dfsdf"
    }
  },
  "status":"SUBMITTED",
  "publicPostsEnabled":true,
  "privatePostsEnabled":false,
  "creationDate":"2024-07-22T10:15:15.937012062",
  "modifiedDate":"2024-07-22T10:15:16.060258239"
}
```

5.2.3. Calls related to UAD5

Retrieve information about the status of a negotiation.

```
$ curl -X 'GET'
'https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/1a72b74c-c2bd-4ebd-b0e9-203d344
b97d7'  -H 'accept: */*' -H "Authorization: Bearer  ${TOKEN}"
```


```
{
  "resources":[
    {
      "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
      "name":"Lung cancer championship phase",
      "organization":{
        "id":39,
        "externalId":"aaaaddhjybbpbewk2z3qe4yaae",
        "name":"CHAIMELEON - Lung Cancer Imaging and clinical Data"
      }
    }
  ],
  "id":"1a72b74c-c2bd-4ebd-b0e9-203d344b97d7",
  "author":{
    "id":"101",
    "subjectId":"api-check",
    "name":"api-check",
    "email":"null2@null.eu",
    "representativeOfAnyResource":true
  },
  "requests":[
    {
      "id":"d43793f1-21b6-477f-a0f3-4a52b1f81aa5",
      "url":"https://catalogue.eucaim.cancerimage.eu/#/collection/a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
      "humanReadable":"#1: No filters used.",
      "resources":[
        {
          "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
          "name":"Lung cancer championship phase",
          "organization":{
            "id":39,
            "externalId":"aaaaddhjybbpbewk2z3qe4yaae",
            "name":"CHAIMELEON - Lung Cancer Imaging and clinical Data"
          }
        }
      ],
      "redirectUrl":"https://negotiator-eucaim.grycap.i3m.upv.es/requests/d43793f1-21b6-477f-a0f3-4a52b1f81aa5",
      "negotiationId":"1a72b74c-c2bd-4ebd-b0e9-203d344b97d7"
    }
  ],
  "payload":{
    "project":{
      "title":"Title",
      "funding":"dfdfd",
      "hypthesis":"dfdsdf",
      "work-team":{
        "id":"901f1933-3e53-4df5-aea8-60fb47811ee3",
        "name":"my-work-team.pdf",
        "size":9104,
        "contentType":"application/pdf",
        "organizationId":null
      },
      "objectives":"fdsfd",
      "cover-letter":"cover letter",
      "expected-results":"fdfd",
      "material-and-methods":"fdfd",
      "supporting-documentation-ethics":{
        "id":"9f65d5d9-a869-418a-b9ee-fcb68664c16b",
        "name":"my-supporting-doc.pdf",
        "size":10212,
        "contentType":"application/pdf",
        "organizationId":null
      },
      "supporting-documentation-project":"fdfd"
    }
  },
  "status":"SUBMITTED",
  "publicPostsEnabled":true,
  "privatePostsEnabled":false,
  "creationDate":"2024-05-29T13:07:44.575345",
  "modifiedDate":"2024-05-29T13:07:44.637735"
}
```


Retrieve information about the status of a negotiation (II).

```
$ curl -X 'GET'
https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/056b72cd-dd32-4e2c-8681-80f4297f
22da/resources/a092a929-ef5b-41f2-93ee-9231c56beeb6/lifecycle -H 'accept: */*' -H
"Authorization: Bearer ${TOKEN}"
```


```
["INDICATE_ACCESS_CONDITIONS”]
```


5.2.4. Calls related to UAD6

Retrieve information about the negotiations submitted by a user.

```
$ curl -X 'GET'
'https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/users/10002/negotiations?role=author&created
After=&createdBefore=&sortBy=creationDate&sortOrder=DESC&page=0' -H 'accept: */*' -H
"Authorization: Bearer ${TOKEN}"
```

```
{
  "_embedded": {
    "negotiations": [
      {
        "resources": [
          {
            "id": "a092a929-ef5b-41f2-93ee-9231c56beeb6",
            "name": "Prostate cancer championship phase V4",
            "organization": {
              "id": 4,
              "externalId": "CHAI-5",
              "name": "CHAIMELEON – Prostate Cases Imaging and clinical Data"
            },
            "status": "RESOURCE_AVAILABLE"
          }
        ],
        "id": "056b72cd-dd32-4e2c-8681-80f4297f22da",
        "author": {
          "id": "10002",
          "subjectId": "ac4bd1eb5274eb43b2844d6d490e1353bd7b9e7e@lifescience-ri.eu",
          "name": "Ignacio Blanquer Espert",
          "email": "iblanque@dsic.upv.es",
          "representativeOfAnyResource": true
        },
        "requests": [
          {
            "id": "28928f09-b06b-46d3-bcb0-7a1bccc5adc4",
            "url": "https://catalogue.eucaim.cancerimage.eu/menu/main/app-molgenis-app-biobank-explorer-eucaim/#/collection/a092a929-ef5b-41f2-93ee-9231c56beeb6",
            "humanReadable": "#1: No filters used.",
            "resources": [
              {
                "id": "a092a929-ef5b-41f2-93ee-9231c56beeb6",
                "name": "Prostate cancer championship phase V4",
                "organization": { }
              }
            ],
            "redirectUrl": "https://negotiator-eucaim.grycap.i3m.upv.es/requests/28928f09-b06b-46d3-bcb0-7a1bccc5adc4",
            "negotiationId": "056b72cd-dd32-4e2c-8681-80f4297f22da"
          }
        ],
        "payload": {
          "project": {
            "title": "Automatic segmentation of prostate gland",
            "funding": "National and European",
            "hypthesis": "AI can automatically extract the shape of the prostatic glande",
            "work-team": { },
            "objectives": "Train algorithms for segmentation",
            "cover-letter": "Very relevant for data annotation",
            "expected-results": "A trained AI algorithm for segmentation with higher accuracy",
            "material-and-methods": "Data, GPUs and storage",
            "supporting-documentation-ethics": { },
            "supporting-documentation-project": "Approved proejcts"
          }
        },
        "status": "IN_PROGRESS",
        "publicPostsEnabled": true,
        "privatePostsEnabled": true,
        "creationDate": "2024-05-31T11:41:11.038813",
        "modifiedDate": "2024-05-31T11:43:20.094866",
        "_links": {
          "negotiations": {
            "href": "https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations"
          },
          "self": {
            "href": "https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/056b72cd-dd32-4e2c-8681-80f4297f22da"
          }
        }
      }
```


5.3. Calls of to user actions related to Data Processing

5.3.1. Calls related to UAP1:

Sample calls to browse tools in the marketplace of UPV's reference node.

```
$ curl -X 'GET' \
'https://harbor.eucaim-node.i3m.upv.es/api/v2.0/projects/library/repositories?page=1&page_size=10' -H 'accept: application/json'
```


```
[
  {
    "artifact_count": 6,
    "creation_time": "2024-07-18T12:44:21.202Z",
    "id": 132,
    "name": "library/ubuntu-python-pytorch-desktop-jupyter",
    "project_id": 4,
    "pull_count": 20,
    "update_time": "2024-07-22T11:38:20.712Z"
  },
  { },
  { },
  { }
]
```

5.3.2. Calls related to UAP2:

Sample calls to browse tools in the marketplace of UPV's reference node.

```
$ curl -X 'GET' 'https://harbor.eucaim-node.i3m.upv.es/api/v2.0/projects/library/repositories'
```


```
[ {
  "artifact_count":1,
  "creation_time":"2024-07-13T23:23:29.868Z",
  "id":1,
  "name":"library/alpine",
  "project_id":1,
  "pull_count":0,
  "update_time":"2024-07-13T23:23:29.868Z"
} ]
```


5.3.3. Calls related to UAP3

The service is managed through the jobman command line interface (https://github.com/chaimeleon-eu/jobman/blob/main/Dockerfile) which submits jobs in the reference node Kubernetes endpoint. Three examples are provided, with different complexity in the arguments

```
$ jobman submit -i alpine -r no-gpu -- ls -l /
Using image 'harbor.eucaim-node.i3m.upv.es:5000/library-batch/alpine'
 [SUCCESS] Job named 'jobman-998e215a-33d4-428d-b6de-cec03190c767' created successfully by
user 'inClusterUser'

$ jobman submit -i ubuntu_python_tensorflow:3.1cuda11 -r small-gpu -- sh -c 'nvidia-smi -L'

$ jobman submit -i ubuntu_python_tensorflow:3.1cuda11 -r large-gpu -- python3 -c
"exec(\"from tensorflow.python.client import
device_lib\ndevice_lib.list_local_devices()\")"
```

The three commands return the id of the job, which is needed to retrieve additional information on the job. As a sample, the output of the first execution is included.

5.3.4. Calls related to UAP4

As in the case of UAP3, the monitoring of the job status is performed through the jobman command

```
$ jobman list
```

Job Name	Flavor	Status	Launch Date
jobman-998e215a-33d4-428d-b6de-cec03190c767	no-gpu	Pending	23/07/2024, 11:08:32 UTC
jobman-e8c5cd8c-6eb7-42e0-aafe-1fe97873e828	no-gpu	Failed	21/07/2024, 11:28:58 UTC
jobman-76a3d4e1-d288-4d25-b23d-dd2e2f5b0548	no-gpu	Succeeded	20/07/2024, 10:51:44 UTC
jobman-7a222180-825d-4f2b-b269-df83d261c7e5	no-gpu	Succeeded	20/07/2024, 10:49:50 UTC

```
$ jobman -j 998e215a-33d4-428d-b6de-cec03190c767
```


```
V1Job {
  apiVersion: 'batch/v1',
  kind: 'Job',
  metadata: V1ObjectMeta {
    annotations: { ... }
    creationTimestamp: 2024-07-23T11:08:32.000Z,
    deletionGracePeriodSeconds: undefined,
```

```
    deletionTimestamp: undefined,
    finalizers: [ Acopf.zalando.org/KopfFinalizerMarker. ],
    generateName: undefined,
    generation: 1,
    labels: {
      'controller-uid': 'fb65e16f-6547-44df-8ac2-7821bdc96f7d',
      'job-name': 'jobman-998e215a-33d4-428d-b6de-cec03190c767'
    },
    managedFields: [ ... ],
    name: 1jobman-998e215a-33d4-428d-b6de-cec03190c767',
    namespace: 'user-iblanquer',
    ownerReferences: undefined,
    resourceVersion: '276440255',
    selfLink: undefined,
    uid: 'fb65e16f-6547-44df-8ac2-7821bdc96f7d'
  },
  spec: V1JobSpec { ... },
  suspend: false,
  template: V1PodTemplateSpec { ... },
    spec: V1PodSpec {
      containers: [
        V1Container {
          args: [ 'ls' , '-l', '/' ],
          command: undefined,
          env: [ ],
          envFrom: undefined,
          image: 'harbor.eucaim-node.i3m.upv.es:5000/library-batch/alpine',
          imagePullPolicy: 'Always',
          name: 'container-998e215a-33d4-428d-b6de-cec03190c767',
          resources: V1ResourceRequirements {
            limits: { cpu: '8', memory: 160G1' },
            requests: { cpu: '7', memory: '60Gi' }
          },
          volumeMounts: [ ,
            V1VolumeMount {
              mountPath: '/home/eucaim/datasets/b875a59a-32f0-4e47-9da6-1e635a85b370',
              mountPropagation: undefined,
              name: 'b875a59a-32f0-4e47-9da6 1e635a85b370',
              readOnly: undefined,
              subPath: undefined,
              subPathExpr: undefined
             }
          ],
        }
      ]
    },
    nodeSelector: { 'eucaim.eu/target': 'no-gpu' },
    priorityClassName: 'processing-applications',
    ...
  },
},
status: VflobStatus {
  active: 1,
  completedIndexes: undefined,
  completionTime: undefined,
  conditions: undefined,
  failed: undefined,
  ready: 0,
  startTime: 2024-07-23T11:08:32.000Z,
  succeeded: undefined,
  uncountedTerminatedPods: VlUncountedTerminatedPods { failed: undefined, succeeded: undefined }
}
```

5.3.5. Calls related to UAP5

As in the case of UAP3 and UPA4, the retrieval of the results of the execution of a job can be performed through the jobman client. The log command retrieves the stdout and stderr of the execution. Other results should be persisted in files stored in the reference node.

```
$ jobman log -j 998e215a-33d4-428d-b6de-cec03190c767
```

```
Total 20
drwxr-xr-x  2 eucaim   eucaim 4096 Jul 23 11:05 Desktop
drwxr-xr-x  2 eucaim   eucaim 4096 Jul 23 11:35 Downloads
drwxr-xr-x  1 eucaim   eucaim 4096 Jul 23 11:35 application-examples
drwxr-xr-x  1 eucaim   eucaim 4096 Jul 23 11:35 datasets
drwxr-xr-x  6 eucaim   eucaim   19 Jul 23 11:37 persistent-home
drwxr-xr-x  2 root     root      9 Jul 23 11:35 persistent-shared-folder
```

5.4. User Actions related to the Governing Body

5.4.1. Calls related to UAG1

Ethical and legal review of applications

```
$ curl -X 'GET' \
'https://negotiator.eucaim.cancerimage.eu/api/v3/negotiations/1a72b74c-c2bd-4ebd-b0e9-203d344b97
d7'   -H 'accept: */*' -H "Authorization: Bearer ${TOKEN}"
```


```
{
  "resources":[
    {
      "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
      "name":"Lung cancer championship phase",
      "organization":{ },
      "status":"REPRESENTATIVE_CONTACTED"
    }
  ],
  "id":"1a72b74c-c2bd-4ebd-b0e9-203d344b97d7",
  "author":{ },
  "requests":[
    {
      "id":"d43793f1-21b6-477f-a0f3-4a52b1f81aa5",
      "url":"https://catalogue.eucaim.cancerimage.eu/#/collection/a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
      "humanReadable":"#1: No filters used.",
      "resources":[
        {
          "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
          "name":"Lung cancer championship phase",
          "organization":{ }
        }
      ],
      "redirectUrl":"https://negotiator.eucaim.cancerimage.eu/requests/d43793f1-21b6-477f-a0f3-4a52b1f81aa5",
      "negotiationId":"1a72b74c-c2bd-4ebd-b0e9-203d344b97d7"
    }
  ],
  "payload":{
    "project":{
      "title":"Title",
      "funding":"dfdfd",
      "hypthesis":"dfdsdf",
      "work-team":{ },
      "objectives":"fdsfd",
      "cover-letter":"cover letter",
      "expected-results":"fdfd",
      "material-and-methods":"fdfd",
      "supporting-documentation-ethics":{
        "id":"9f65d5d9-a869-418a-b9ee-fcb68664c16b",
        "name":"my-supporting-doc.pdf",
        "size":10212,
        "contentType":"application/pdf",
        "organizationId":null
      },
      "supporting-documentation-project":"fdfd"
    }
  },
  "status":"SUBMITTED",
  "publicPostsEnabled":true,
  "privatePostsEnabled":true,
  "creationDate":"2024-05-29T13:07:44.575345",
  "modifiedDate":"2024-07-22T17:07:28.648337"
}
```


Once the id of the object with the ethics approval document is obtained, the document can be retrieved by means of the

```
$ curl -X 'GET' \
'https://negotiator.eucaim.cancerimage.eu/api/v3/attachments/9f65d5d9-a869-418a-b9ee-fcb68664c16
b'  -H 'accept: application/octet-stream'
```

Which triggers the downloading of the file.

5.4.2. Calls related to UAG2

Decide on the concession of permissions to start evaluating the negotiation request.

```
$ curl -X 'PUT' \
'https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/1a72b74c-c2bd-4ebd-b0e9-203d344
b97d7/lifecycle/APPROVE'  -H 'accept: */* '-H 'accept: */*' -H "Authorization: Bearer ${TOKEN}"
```


```
{
   "resources":[
      {
         "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
         "name":"Lung cancer championship phase",
         "organization":{ },
         "status":"REPRESENTATIVE_CONTACTED"
      }
   ],
   "id":"1a72b74c-c2bd-4ebd-b0e9-203d344b97d7",
   "author":{
      "id":"102",
      "subjectId":"check-api",
      "name":"check-api",
      "email":"null2@null.eu",
      "representativeOfAnyResource":false
   },
   "requests":[
      {
         "id":"d43793f1-21b6-477f-a0f3-4a52b1f81aa5",
         "url":"https://catalogue.eucaim.cancerimage.eu/#/collection/a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
         "humanReadable":"#1: No filters used.",
         "resources":[
            {
               "id":"a96b56cd-59d4-444a-8e59-32a7fb0d7dea",
               "name":"Lung cancer championship phase",
               "organization":{ }
            }
         ],
         "redirectUrl":"https://negotiator-eucaim.grycap.i3m.upv.es/requests/d43793f1-21b6-477f-a0f3-4a52b1f81aa5",
         "negotiationId":"1a72b74c-c2bd-4ebd-b0e9-203d344b97d7"
      }
   ],
   "payload":{
      "project":{
         "title":"Title",
         "funding":"dfdfd",
         "hypthesis":"dfdsdf",
         "work-team":{ },
         "objectives":"fdsfd",
         "cover-letter":"cover letter",
         "expected-results":"fdfd",
         "material-and-methods":"fdfd",
         "supporting-documentation-ethics":{ },
         "supporting-documentation-project":"fdfd"
      }
   },
   "status":"IN_PROGRESS",
   "publicPostsEnabled":true,
   "privatePostsEnabled":true,
   "creationDate":"2024-05-29T13:07:44.575345",
   "modifiedDate":"2024-07-23T16:47:20.438212"
}
```

5.4.3. Calls related to UAG4

Retrieving the messages for a negotiation

```
$ curl -X 'GET' \
'https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/1a72b74c-c2bd-4ebd-b0
e9-203d344b97d7/posts?type=PRIVATE' -H "Authorization: Bearer ${TOKEN}"
```

```
[
  {
    "id": "4a23242b-a10a-4eb3-87e3-566583ee505e",
    "status": "CREATED",
    "text": "Private message ",
    "creationDate": "2024-07-22T17:07:52.426112",
    "createdBy": {
      "id": "10002",
      "subjectId": "ac4bd1eb5274eb43b2844d6d490e1353bd7b9e7e@lifescience-ri.eu",
      "name": "Ignacio Blanquer Espert",
      "email": "iblanque@dsic.upv.es",
      "representativeOfAnyResource": false
    },
    "organizationId": "aaaaddhjybbpbewk2z3qe4yaae",
    "type": "PRIVATE"
  }
]
```

Posting a message in a negotiation thread

```
$ curl -X 'POST' \
'https://negotiator-eucaim.grycap.i3m.upv.es/api/v3/negotiations/1a72b74c-c2bd-4ebd-b0
e9-203d344b97d7/posts'   -H 'accept: application/json'  -H 'Content-Type:
application/json' -H "Authorization: Bearer ${TOKEN}" \
  -d '{
    "id": "d9d1750b-b184-4a1a-95cb-e875cb2bd2ad",
    "status": "CREATED",
    "text": "Another test message",
    "creationDate": "2024-07-22T18:29:29.583841412",
    "createdBy": {
        "id": "102",
        "subjectId": "check-api",
        "name": "check-api",
        "email": "null2@null.eu",
        "representativeOfAnyResource": false
    },
    "organizationId": "eucaim",
    "type": "PUBLIC"
}'
```

```
{
  "id": "5de42486-5cfb-4329-a986-35fdd78142d3",
  "status": "CREATED",
  "text": "Another test message",
  "creationDate": "2024-07-22T17:34:49.908983979",
  "createdBy": {
    "id": "102",
    "subjectId": "check-api",
    "name": "check-api",
    "email": "null2@null.eu",
    "representativeOfAnyResource": false
  },
  "type": "PUBLIC"
}
```

5.5. User Actions related to the Platform Management

5.5.1. Calls related to UAM3

Sample calls for adding (removing is equivalent, changing the ‘PUT’ operation by the ‘DELETE’ operation) access permission to a user to a dataset.

```
$ curl -X PUT \
'https://eucaim-node.i3m.upv.es/dataset-service/api/datasets/2d87741d-77ba-45da-bdc1-71edc82ac557/acl/iblanque \
 -H 'accept: application/json' -H 'accept: */*' -H "Authorization: Bearer ${TOKEN}"
```

6. Annex II: Sample dataset import file

This section shows an example of a file for importing a dataset. The file has been created from the template[6]. The following table shows the content of the first two rows splitted in several lines. The name of the tab in the excel file must be “EUCAIM_collection_registration”. The names of the headers in the first row must be exactly the same. The values follows the coding of the terminology in the catalogue[7]. The order should be preserved too.

Information about the meaning of the different fields can be found in Deliverable D5.2 (The EUCAIM CDM and hyper-ontology for data interoperability: initial version)

id	biobank	name	country	acronym	description	network	collection_method	type	order_of_magnitude	size
PRIMAGE-1a	PRIMAGE-1	Neuroblastoma	EU	PRIMAGE-1	Collection of retrospectively collected cases from patients with already diagnosed neuroblastoma. The dataset includes, for each patient clinical and molecular data together with imaging studies at diagnosis. For some patients, follow-up scans are also available.	PRIMAGE	COHORT,DISEASE_SPECIFIC	ANNOTATED_DATASETS,PROCESSED_DATASETS	2	1148

collection_method	type	order_of_magnitude	size	number_of_studies	number_of_series	image_size	parent_collection	sub_collections	head_title_before_name	head_firstname
COHORT,DISEASE_SPECIFIC	ANNOTATED_DATASETS,PROCESSED_DATASETS	2	1148	3245	39350	974				

[6] https://dashboard.eucaim.cancerimage.eu/EUCAIM-ingestion-sample.xlsx
[7] https://dashboard.eucaim.cancerimage.eu/EUCAIM-attributes-and-terms.xlsx

head_last name	head_title_after_name	head_role	contact	diagnosis_available	topography	body_part_examined	imaging_modality	image_year_range	image_access_type
				432328008		38266002,421060004,43799004,45048000,69536005,76752008,80891009,816092008,818981001	CT,MR,PT	2002-2022	BY_REQUEST,RESTRICTED_ACCESS

image_access_fee	image_access_description	image_access_uri	publication_uri	non_image_data_access_uri	biobank_label	commercial_use	age_high	age_low	age_median	image_access_fee
							20	0	2	

terms_of_use	sex	intended_purpose	metadata_issued	last_modified	version	provider	vendor
	8507,8532	Build algorithms for neuroblastoma quantificatication and in-silico modelling together with AI-based models for the prediction of patient overall survival and even-free-survival.			1	PRIMAGE	adac,agfa,elscint,esaote,ge,hitatchi,marconi,mediso,mie,philips,picker_international,shimadzu,siemens,toshiba