



EUCAIM
CANCER IMAGE EUROPE

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D4.14. Final End-user guide to the system

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Table of contents

1. Introduction.....	3
2. End User's Guide	3
3. Data Holder's Handbook.....	4

Abbreviations

Terms	Definitions
AAI	Authentication and Authorisation Infrastructure
API	Application Programming Interface
DCAT-AP	Data Catalogue vocabulary Application Profile
DICOM	Digital Imaging and Communication In Medicine
EUCAIM	European Federation for Cancer Images
FAIR	Findable, Accessible, Interoperable, Reusable
FDP	FAIR Data Point
Guacamole	A clientless remote desktop gateway
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
OpenID	Open standard and decentralised authentication protocol
PACS	Picture Archiving and Communication System
QUIBIM	Spanish company on AI applied to Image Biomarkers
RIS	Radiological Information System
UPV	Universitat Politècnica de València (Valencia University of Technology)
VO	Virtual Organisation, referring to the EUCAIM Virtual Organisation in the LS-AAI

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1. Introduction

This report contains a summary and the links to the two main User Guide documents: The Data User Guide and the Data Holders' Handbook. Both documents are complemented with the Software Developer Guidelines developed in WP6, whose links are also provided in this document. The document does not include the full guides, which are in continuous revision and improvement, but points out to the sources of information and guides the different profiles through the different documents.

The itineraries for the different types of user profiles are the following:

- Data Users: Refer directly to the User's Guide in <https://eucaim.gitbook.io/enduserguide>.
- Data Holders: Refer to the Data Holders Handbook in <https://eucaim.gitbook.io/handbook> for understanding the steps and the actions that have to be performed for sharing data either as a federated node or by transferring the data to a reference node. The handbook includes the links to the additional documentation, but mainly refer to three important documents:
 - The legal handbook in <https://drive.eucaim.cancerimage.eu/s/Bg45XnFE7HZJEyd>.
 - The EUCAIM Hyperontology CDM in <https://hyperontology.eucaim.cancerimage.eu/>
 - Section 6 of the Data User's Guide in <https://eucaim.gitbook.io/enduserguide>.
- Software developers: Refer for the adaptation of your tools to https://dashboard.eucaim.cancerimage.eu/eucaim_software_packaging_guide.pdf and for the interactions with the Core Services of EUCAIM to Section 5 of the Data User's Guide in <https://eucaim.gitbook.io/enduserguide>.

The next two sections summarise the content of the two main documents (End User's Guide and Data Holder's Handbook). Both documents are coded in markdown language and stored in a GitHub repository, to facilitate the collaborative development of the guides.

2. End User's Guide

The End User's Guide (<https://eucaim.gitbook.io/enduserguide>) describes the functionality of the applications in EUCAIM, for the three types of user profiles (Data User, Software Developer and Data Holder). It includes 8 sections, covering the following aspects:

1. Introduction, which describes the purposes of the document and the platform, introducing the different sections.
2. Architecture. This section provides a brief description of the architecture, covering the federated model and the central hub services. An extensive description can be found in D4.11 and in <https://eucaim.gitbook.io/architecture-of-eucaim>.
3. Components of the Platform. It describes briefly each one of the main components of EUCAIM's central Hub.
4. User Guide for Researchers, introducing the user's journey for searching and accessing the data, covering the process of data discovery, data access request and data access through the Secure Processing Environments and the Federated Processing.
5. User Guide for Software Providers, which describes the requirements of the applications to run in the EUCAIM's environment and how the software should be adapted. Specific guides are available with extensive details.
6. User Guide for Data Holders. This section briefly describes how to contribute to the infrastructure as a data holder. Extensive description is provided in the EUCAIM's Data Holder handbook <https://eucaim.gitbook.io/handbook>.

Annex I. Registration of Users in the VO. It explains the process of registering a user to the EUCAIM's environment.

Annex II. Dataset Access Request Template, which includes the main template for data access.

The GitHub repository that hosts the information of the document is accessible in the link <https://github.com/EUCAIM/End-User-Guide>. Changes can be requested by means of pull requests.

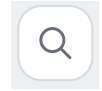
3. Data Holder's Handbook

The Data Holder's Handbook describes the functionality of the applications in EUCAIM, for the three types of user profiles (Data User, Software Developer and Data Holder). It includes sections covering the following functionality:

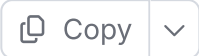
1. Introduction, describes the purpose of the handbook and provides an overview of the EUCAIM Data Federation and the Data Holder's onboarding workflow
2. Governance which covers data governance.
3. Onboarding Process for data holders, which covers the initial requirements and commitments that Data Holders must consider and a brief description of the legal documents needed to form the federation.
4. Support and communication, which describes the communication channels and the supporting teams that will help on the integration of the data holder's services and data, as well as the Helpdesk and the EUCAIM training platform, including an overview of courses and access instructions.
5. Data Preparation process, including the inventory and description of the Data Preparation tools and the procedures for the preparation of Tier 1 to Tier 3 data.
6. Transferring data to a reference node. This section describes the reference nodes and the process and tools required to transfer data to those nodes.
7. Set up of a Federated Node. This section describes the requirements and process of setting up a node, including the security and privacy considerations and the expected Service Level Agreement. It describes the requirements to achieve Tier 1 to Tier 3 compliance and provides guidelines to set up a minimal reference node.

The document includes two annexes that include a checklist for the Data Holders that want to transfer data to a reference node or set up a federated node.

The GitHub repository that hosts the information of the document is accessible in the link <https://github.com/EUCAIM/handbook>. Changes can be requested by means of pull requests.



1. Introduction



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Cancer Image Europe is a research infrastructure established by the EUCAIM project, a flagship action of the European Cancer Imaging Initiative. This project is co-funded by the European Union under Grant Agreement 101100633.

1. Introduction

EUCAIM is a federated digital infrastructure for the management of medical images in the scope of oncology. EUCAIM aims at addressing the challenges of the European Cancer Imaging Initiative. There are imaging datasets for different types of cancer, but they are widely distributed and they are not easily accessible. EUCAIM aims at addressing the following challenges:

- Foster the use of digital technologies for developing better diagnosis, treatment and prediction in cancer.
- Integrate resources, data and tools in an open infrastructure of cancer imaging for the development and validation of new tools and strategies.
- Guarantee privacy, security and trustworthiness in the access and usage of medical images.
- Contribute to the implementation of the European Health Data Space (EHDS) and the European Open Science Cloud (EOSC).

The benefits of EUCAIM are expected at four levels:

- Researchers will be able to access a digital infrastructure to access, share and process cancer medical imaging and associated data in a pan-European scope.
- Innovators will be provided with a reference framework with standardised data and state-of-the-art tools to facilitate the benchmarking and certification of new products.
- Physicians will be able to experiment and clinically validate new tools for diagnosis, prognosis and treatment of cancer.
- Citizens' quality of life will be improved by means of early diagnosis, more accurate and personalised treatments.

The platform provides a set of components that facilitate preserving, sharing, accessing and processing medical images, especially in the context of AI development. EUCAIM offers a flexible model for supporting data holders with different levels of maturity, as well as reference storages for those data holders who cannot set up a dedicated federated node, but are able to transfer the data to a reference storage.

This document constitutes the first end-user guide to the platform, especially dedicated to the data users, researchers or innovators who would be interested in accessing the platform to browse and search for data, request access to it and process it.

Abbreviations

Terms	Definitions
AAI	Authentication and Authorisation Infrastructure
AI4HI	AI4HI AI for Health Imaging Network
API	Application Programming Interface
Auth	Authentication
BBMRI-ERIC	European Infrastructure for Biobanking - European Research Infrastructure Consortium
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
EGI	European Grid Infrastructure
ELK	Elasticsearch, Logstash, Kibana
EOSC	European Open Science Cloud
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
Guacamole	A clientless remote desktop gateway

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
PV	Persistent Volume object
PVC	Persistent Volume Claim
QUIBIM	Spanish company on AI applied to Image Biomarkers
RIS	Radiological Information System
UPV	Universitat Politècnica de València (Valencia University of Technology)
VAULT	Hasihcorp identity-based secrets and encryption management system
VO	Virtual Organisation
WP	Work Package

References

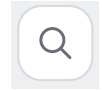
1. <https://lifescience-ri.eu/ls-login/> ↗ ↑
2. https://aarc-20240213064542.local/wp-content/uploads/2019/05/AARC2-DJRA1.4_v2-FINAL.pdf ↗ ↑
3. <https://github.com/chameleon-eu/jobman> ↗ ↑
4. <https://ohif.org/> ↗ ↑
5. <https://lifescience-ri.eu/ls-login/policy-on-the-processing-of-personal-data-of-the-ls-aai-service.html> ↗ ↑

6. <https://lifescience-ri.eu/ls-login/ls-aa-aup.html> ↗ ↑
7. https://signup.aa.lifescience-ri.eu/fed/registrar/?vo=lifescience&group=communities_and_projects:EUCAIM ↗ ↑
8. <https://dashboard.eucaim.cancerimage.eu/privacy-policy> ↗ ↑
9. https://dashboard.eucaim.cancerimage.eu/eucaim_usage_policy.pdf ↗ ↑

Next

2. Architecture

Last updated 1 month ago



2. Architecture

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The EUCAIM architecture focuses on a federated model in which nodes connect to the central core services but which also keep a reasonable degree of independence and autonomy. The technical requirements for the integration in the federated infrastructure relies on the model of tiers:

- Tier 1: Compliance with the metadata model for the datasets.
- Tier 2: Compliance with the data model for searching purposes, considering the use of a mediator component that translates the queries to the specific format of the data holder.
- Tier 3: Direct (through adoption) or indirect (through a mediator component) compliance with the data model for processing purposes.

[Figure 1](#) shows a simplified diagram of the architecture explaining the interactions among the components according to the tier model.

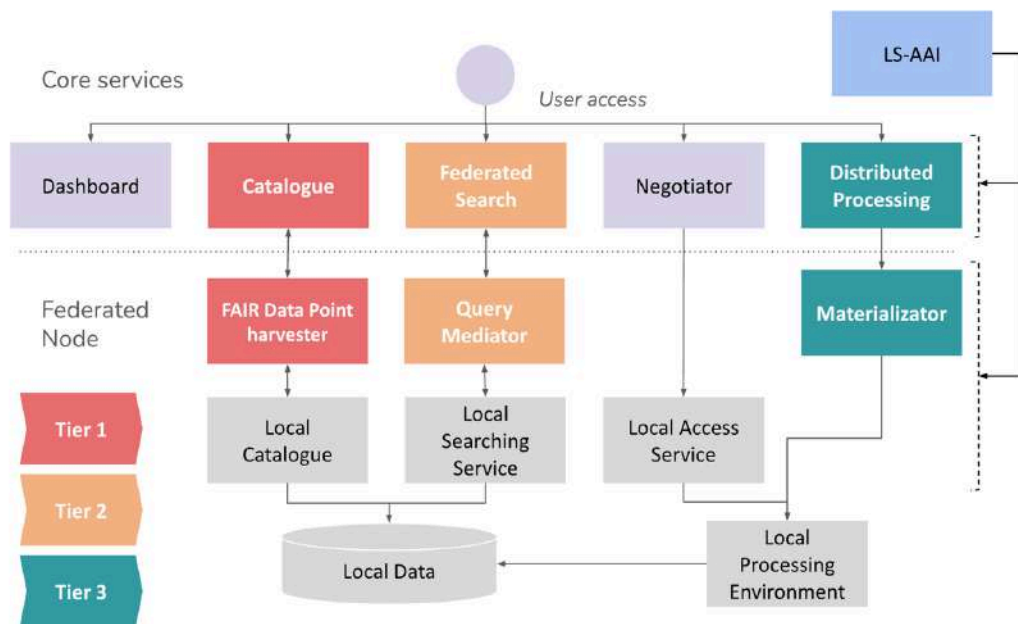


Figure 2-1. Simplified architecture diagram of EUCAIM.

The core services for the federation are shown in the upper part of the figure. The lower part represents a node that connects to the federation. The three tier levels described above are related to the following federation concepts:

- Tier 1: The datasets hosted by the federated node are registered in the central catalogue. Ideally, this is done through the exposure of FAIR Data Points that are used by the central catalogue to harvest the dataset's metadata, although manual registration is also feasible for tier 1. Users can explore the metadata of the datasets registered in EUCAIM's platform.
- Tier 2: The data of the federated node is searchable through its local searching service, which is queried by the federated search system through a Query Mediator component that transforms the query from EUCAIM's model to the local model and vice-versa for the results. In case the local model already complies with EUCAIM's one, the mediator component is still necessary for transforming the results and utilising the network communication middleware. The users can explore the actual number of studies fulfilling the search criteria defined by the user.
- Tier 3: The federated node has a materialisation component that makes the data available to the federated processing, according to EUCAIM's model. The user will be able to run processing actions on the actual data, if the access to them is granted.

Components in grey relate to the node local services and components. Components in purple are tier-independent components of EUCAIM core services, and the LS-AAI component is an external entity that manages the common authentication model.

The following URLs forward to the EUCAIM Platform services

- Dashboard (dashboard.eucaim.cancerimage.eu ↗)
- Catalogue (catalogue.eucaim.cancerimage.eu ↗)
- Federated Search (explorer.eucaim.cancerimage.eu ↗)
- Negotiator (negotiator.eucaim.cancerimage.eu ↗)
- Helpdesk (helpdesk.eucaim.cancerimage.eu ↗)
- Federated Processing Dashboard ([fedcomp.eucaim.cancerimage.eu])

- Hyperontology service ([https://hyperontology.eucaim.cancerimage.eu/])
- PID resolver ([https://pid.eucaim.cancerimage.eu/dataset-id])
- Document server ([https://drive.eucaim.cancerimage.eu/])
- OCI registry ([https://harbor.eucaim.cancerimage.eu/])
- LS-AAI ([https://lifescience-ri.eu/ls-login/]) and EUCAIM VO group ([https://signup.aai.lifescience-ri.eu/fed/registrar/?vo=lifescience&group=communities_and_projects:EUCAIM])
- Reference Node at UPV (eucaim-node.i3m.upv.es ↗)

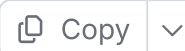
Previous
1. Introduction

Next
3. Components of the Platform

Last updated 14 days ago



3. Components of the Platform



This section briefly describes the components of the platform, updating the descriptions provided in deliverables D5.1 Early release of the Data Federation Framework and D4.3: First rules for participation report. These deliverables are not extensive descriptions of the architecture. This is kept continuously updated in an online document [Architecture of EUCAIM ↗](#).

3.1. The Dashboard

The Dashboard is the entrypoint to the platform and contains the general information about the statistics, the available datasets and the links to the different services of EUCAIM's architecture. The Dashboard includes the main information and the links to the different services and applications. A detailed description of the functionality of the Dashboard is provided in Deliverable D4.8 Final EUCAIM Dashboard.

3.2. The Catalogue

The catalogue contains the metadata of the datasets within EUCAIM. Through the filtering of and the browsing through the public catalogue entries, a user can freely look for datasets that are relevant to their research. Only after they have found a suitable dataset, a request can be made to access the actual data through the Negotiator.

3.3. The AAI

Some services in EUCAIM allow anonymous access (Dashboard and the Catalogue). Those services provide access to general information, onboarding processes and aggregated data. Finer-grain searching and data access require authentication and authorisation.

Authentication and Authorisation in EUCAIM relies on the [Life Sciences AAI ↗](#). LS AAI is the commonly agreed AAI framework for Life Sciences Research Infrastructures. It relies on the [AARC blueprint ↗](#) and supports the EDUGain Federation (which serves most academic and research organisations in Europe), as well as other public Identity Providers. The process of registering in EUCAIM involves two steps:

Creating an account on the LS-AAI environment. This enables linking your institutional or public credentials to an LS-AAI account so you can use your institutional IdP for authenticating.

Enrolling in the EUCAIM VO Group. Federated search and negotiator services of the EUCAIM platform are available only to the members of the EUCAIM VO group.

The instructions for the sign up and enrollment of users are described in Annex I of this document.

3.4. The Federated Search

Federated search enables users to retrieve the number of subjects that fulfil a specific criteria. The federated search provides a user interface that interacts with a broker that distributes the query to the different providers registered. The federated search results are linked to the catalogue through hyperlinks. Figure 3-1 shows a schema of the interaction among the three above components.

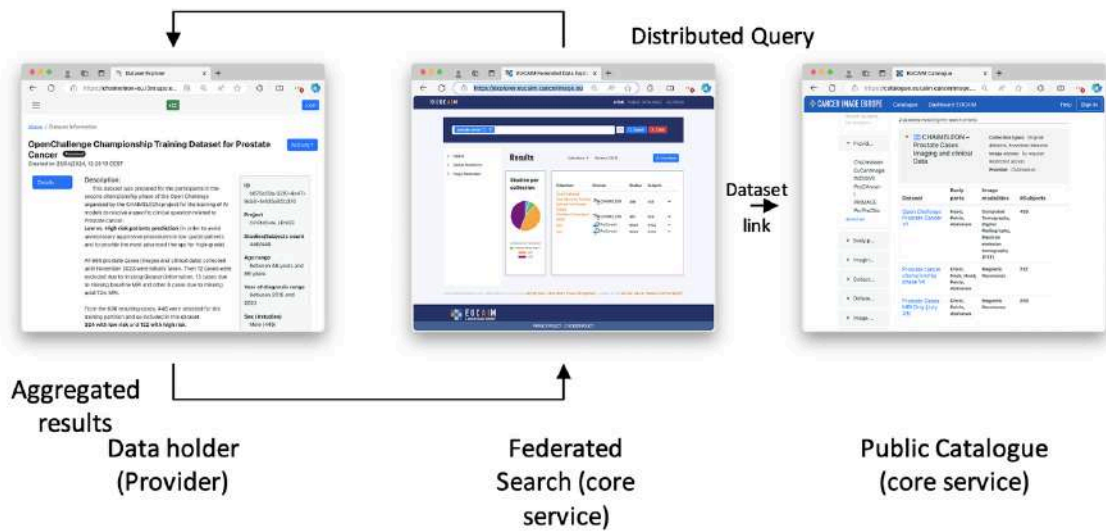


Figure 3-1. Schema of interactions among the components of the Federated Search.

The Federated Search cores services sends the queries to the registered data holders and retrieve the aggregated results from them. The results are shown in the federated search GUI which links the results to the additional information on the datasets available in the catalogue. The federated search will incorporate progressively more providers and datasets, as well as more searching criteria.

3.5. The Access Request

Access request is initiated from the catalogue and it is managed by the negotiator component. Information about the datasets that a user would like to access is transferred from the catalogue to the negotiator tool, where the data requester can submit an application, which is processed by the EUCAIM manager and the dataset responsible, on behalf of the access committee who is the body that effectively performs the evaluation of the application. Information is exchanged through the negotiator communication system, including the access link to the dataset. Figure 3-2 shows the interactions among the components.

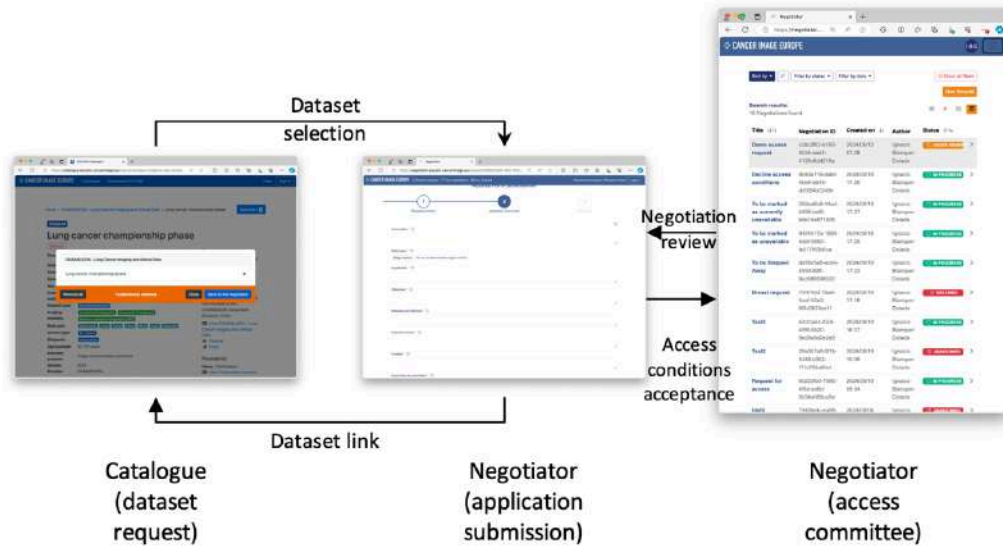


Figure 3-2: Interactions in the access request process.

Access request starts from the catalogue, which triggers the connection to the negotiator passing all the information needed through. Interactions between the dataset responsible (on behalf of the Access Committee) and the data requester are performed through the negotiator, ending up with the transfer of the access link to the dataset in the data holder.

3.6. Access to data

EUCAIM provides secure environments where the data can be processed and a federated processing service. Some nodes provide a secure and user friendly environment with GUIs where users can explore and process the data (CHAIMELEON, EUCAIM UPV, XXXX). Federated processing allow to send processing jobs to the nodes without directly accessing to them.

3.6.1. Accessing to data in a secure environment

The nodes with processing environments are mainly intended for Data Scientists and supports in-situ processing of the data. Each node may have different access features and conditions, and precise information will be given in the access request.

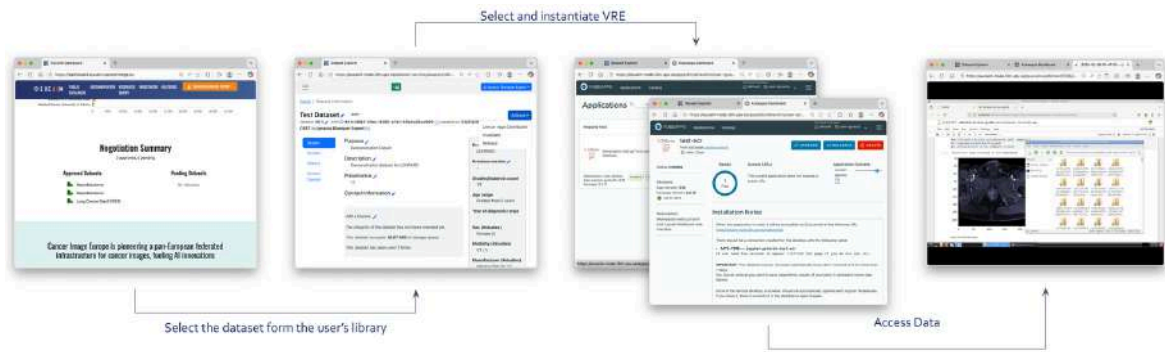


Figure 3-3: Interactions in the access to one of the Secure Environments.

Previous figure shows the process of accessing data in one of the Secure Environments, which consist on selecting the dataset from the User's Library, choosing the rightmost Virtual Research Environment from a catalogue, instantiating it and accessing the data through a remote desktop.

3.6.2. Accessing to data through the Federated Processing

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3.7. Other services for Software Developers and Data Holders

The Plataform offers other services to Software developers to register and upload their binaries and additional documentation, as well to create persistent identifiers of the Datasets, the services are:

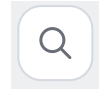
- A service with the Hyperontology ([<https://hyperontology.eucaim.cancerimage.eu/>]), which has the linked data information from all the terms in the EUCAIM Hyperontology
- A PID resolver service ([<https://pid.eucaim.cancerimage.eu/dataset-id>]), that forwards to the Catalogue entry of a dataset by providing its UUID. This provides uniquely resolvable identifiers to the datasets information similar to a DOI.

- A document server ([https://drive.eucaim.cancerimage.eu/]), where users can find the applications and documents and Software Developers can upload their binaries and additional documents.
- An OCI registry ([https://harbor.eucaim.cancerimage.eu/]) to store and download containerised applications.

Previous
2. Architecture

Next
4. User Guide for Researchers

Last updated 14 days ago




4. User Guide for Researchers



This guide is designed to help researchers navigate the platform, access data, and understand the procedures in place. The EUCAIM platform facilitates data sharing, reuse, and collaborative research within a governed framework to ensure transparency and compliance.

4.1. Platform access

The access to the platform is managed through the dashboard component, exposed in the URL <https://dashboard.eucaim.cancerimage.eu/>, which can be opened in a browser on your computer or mobile device (tablet or smartphone). You can also access the dashboard through the EUCAIM project main website by clicking on "Visit the dashboard" button on cancerimage.eu . Figure 4-1 shows a snapshot of the dashboard landing page and the cancerimage.eu main page.

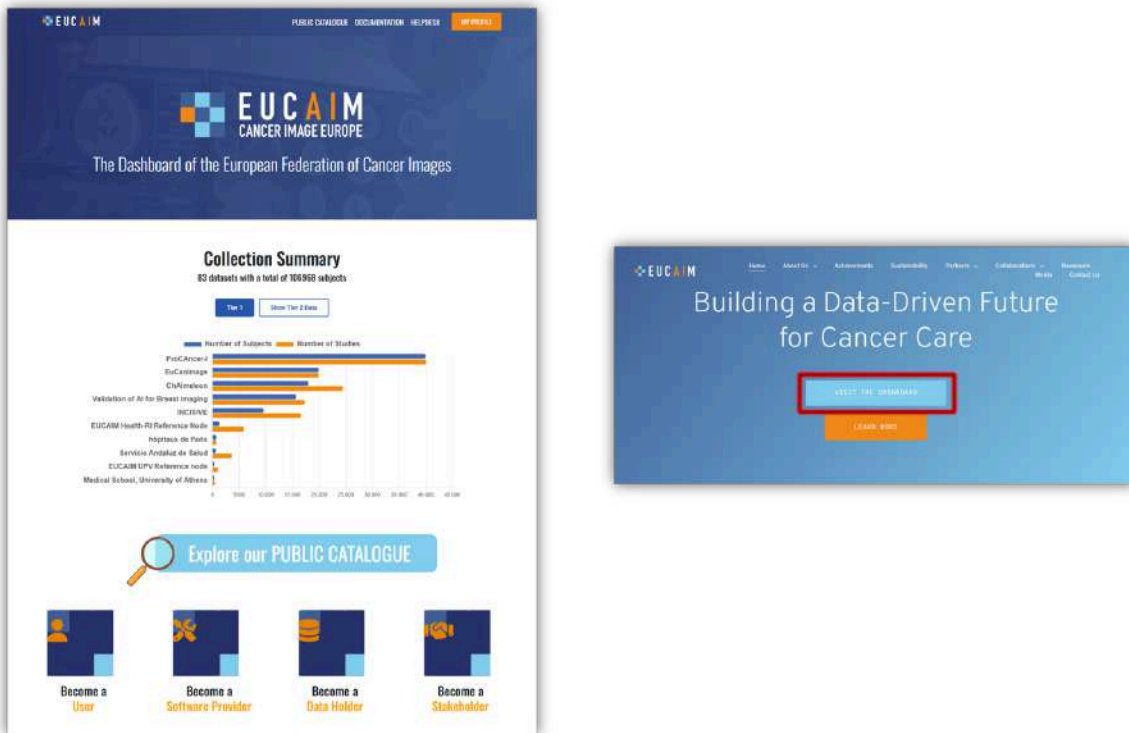


Figure 4-1. EUCAIM Dashboard, anonymous access (left) and EUCAIM project main webpage (right).

4.2. Anonymous Users

4.2.1. Collection Summary

As soon as you access the dashboard, you will find some summary diagrams that allow you to monitor the EUCAIM data population in real time. By hovering over each diagram, you can see information about the available datasets and subjects in each one, the number of studies for each imaging modality, and details of the main body parts to which the images correspond. Figure 4-2 shows a snapshot of those dynamic graphs.

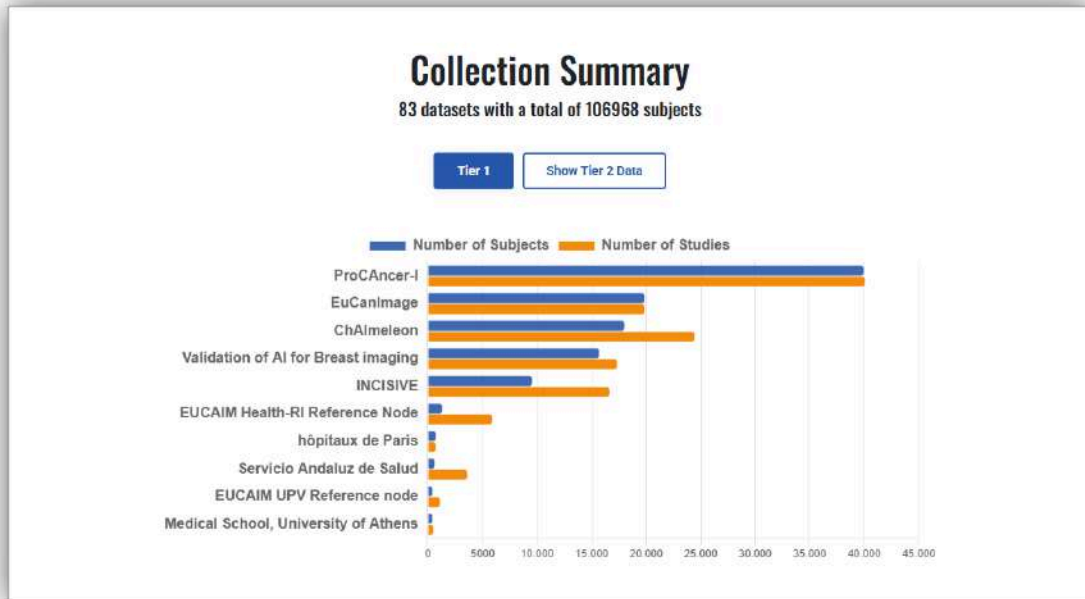


Figure 4-2. EUCAIM Dashboard, collection summary.

4.2.2. Roles information

If you continue browsing the dashboard, you will find different 'Become a' sections corresponding to the four main roles that can be part of EUCAIM (see figure 6):

Users are researchers or innovators with a clinical scientific or clinical question wishing to develop, train, benchmark or validate AI algorithms.

Software providers are researchers or innovators who want to contribute with image processing tools to the marketplace of solutions of EUCAIM.

Data holders are data providers who would like to contribute with data either through a Data Transfer Agreement, depositing the data in a reference node of EUCAIM or through a Data Sharing Agreement setting up a federated node at the data holder's premises.

Members are organisations, institutions, or companies interested in collaboration with the EUCAIM consortium which are not yet an official partner. Members will have the opportunity to participate in the observational project calls.

This user guide is centred on the role of the users. Therefore, by choosing the “Become a User icon”, you will obtain detailed information on which data EUCAIM provides, how the data request process is, the rules of participation and how to log in the platform.



Figure 4-3. EUCAIM Dashboard, collection summary.

4.2.3. Public Catalogue

As a user of the platform, even before registering, you can browse our Public Catalogue, where you will find information about all the available datasets, without requiring authentication. As shown in figure 4-4, you have two options to access the Public Catalogue:

Click the “PUBLIC CATALOGUE” button in the top right corner of the header

Select the "Explore Public Catalog" Highlighted link

Click the "Public Catalogue" button in the top right corner

Select the "Explore Public Catalogue" highlighted link

Collection Summary
83 datasets with a total of 106968 subjects

Year 1 Show Year 2 Data

Number of Subjects Number of Studies

Dataset	Number of Subjects	Number of Studies
ProCancer-1	~40,000	~40
EuCanImage	~20,000	~20
ChAlmeleon	~15,000	~15
Validation of AI for Breast Imaging	~10,000	~10
INCISIVE	~5,000	~5
EUCAIM Health-RI Reference Node	~2,000	~2
hôpitaux de Paris	~1,000	~1
Servicio Andaluz de Salud	~1,000	~1
EUCAIM UPV Reference node	~1,000	~1
Medical School, University of Athens	~1,000	~1

Explore our PUBLIC CATALOGUE

Become a User Become a Software Provider Become a Data Holder Become a Stakeholder

Figure 4-4. EUCAIM Dashboard, how to explore the public catalogue.

Both options will replace the current page with the Public Catalogue site. You can always return back to the dashboard main page by clicking on "Dashboard EUCAIM" option on the header. Figure 4-5 shows a snapshot of the catalogue landing page.

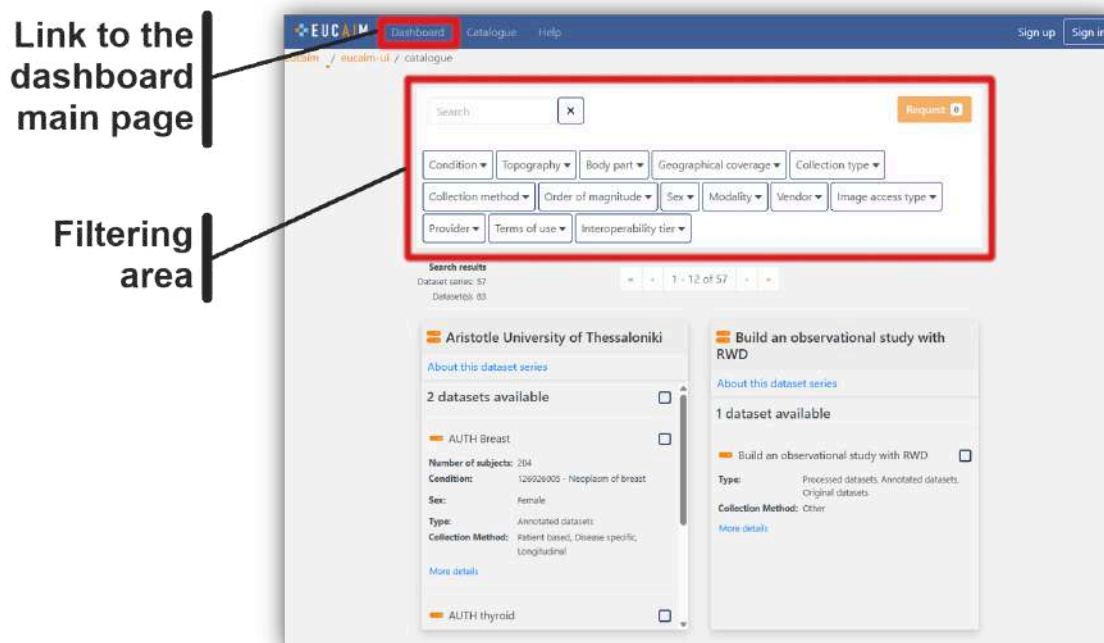


Figure 4-5. EUCAIM Public Catalogue, anonymous view.

The Public Catalogue offers basic search and filtering options to help you find relevant datasets that align with your research interests and objectives. Filters are available in the panel on the left side of the screen. When applying filters, the datasets meeting your criteria will be displayed, as shown in figure 4-6,

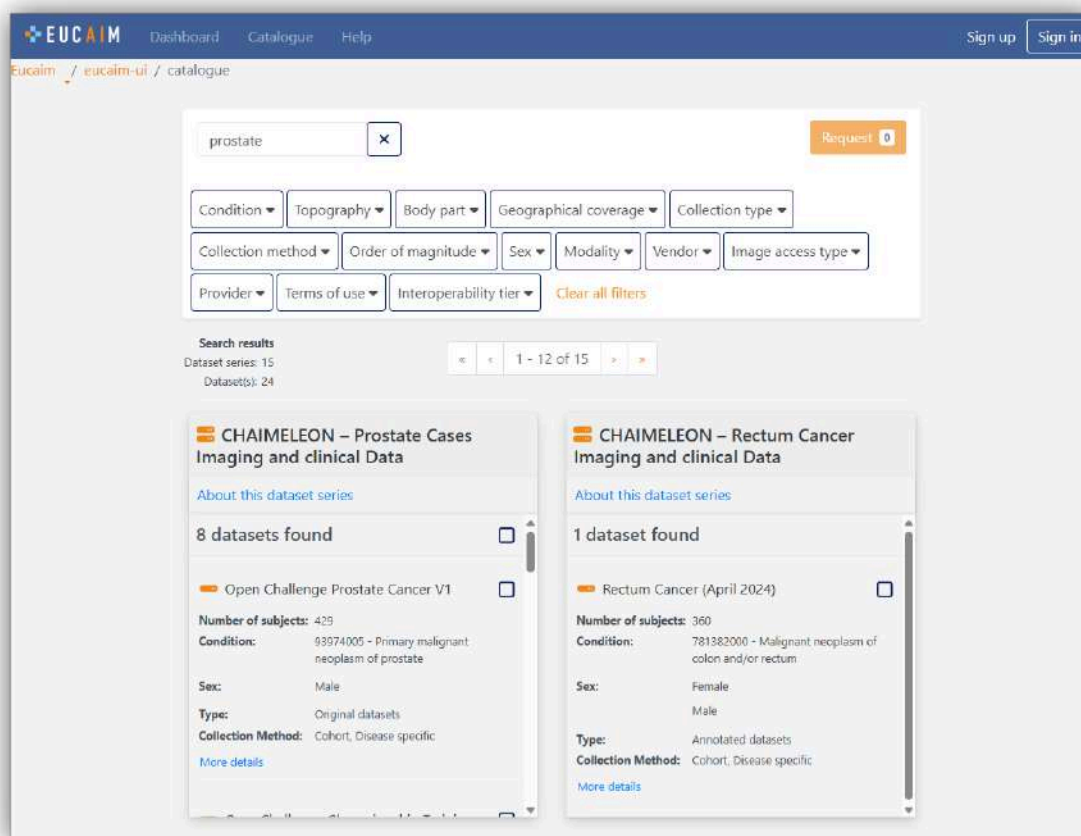


Figure 9. EUCAIM Public Catalogue, how to perform filters.

By selecting a dataset, clicking on its name, you can view all its relevant information, helping you understand it better. Although you cannot access or visualise the data at this point, thanks to the Public Catalogue, you will be able to see relevant metadata that provides significant information about them. Figure 4-7 shows a snapshot of the dataset metadata.

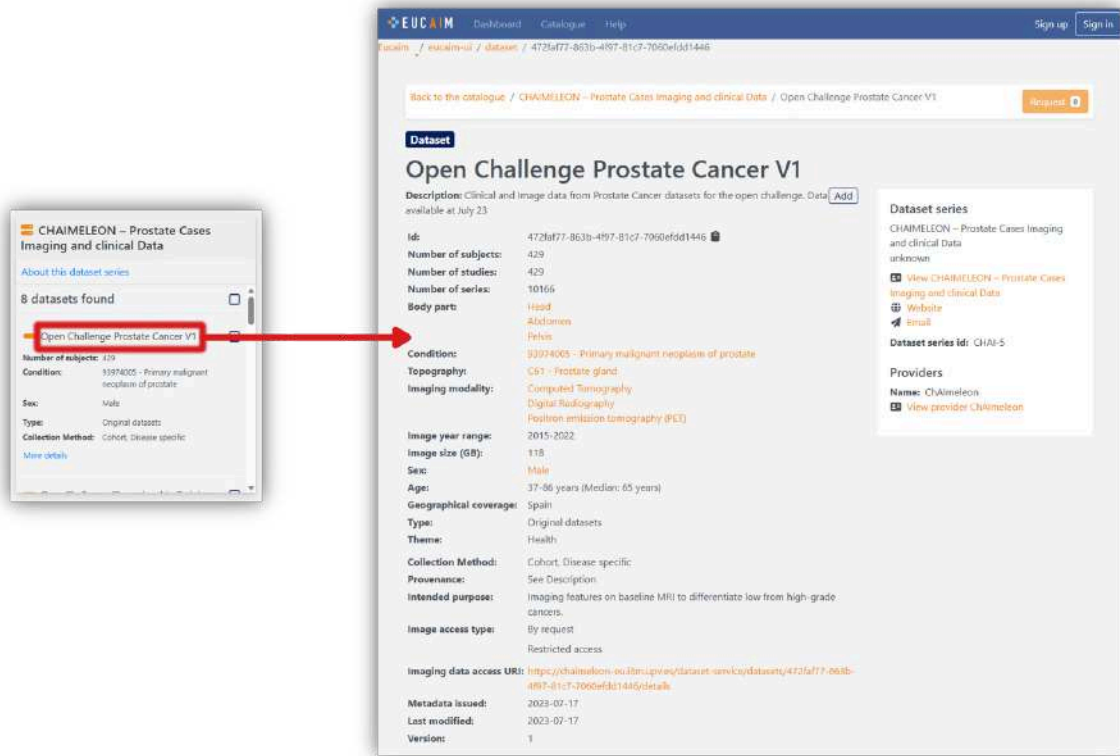


Figure 4-7. EUCAIM Public Catalogue, dataset metadata overview.

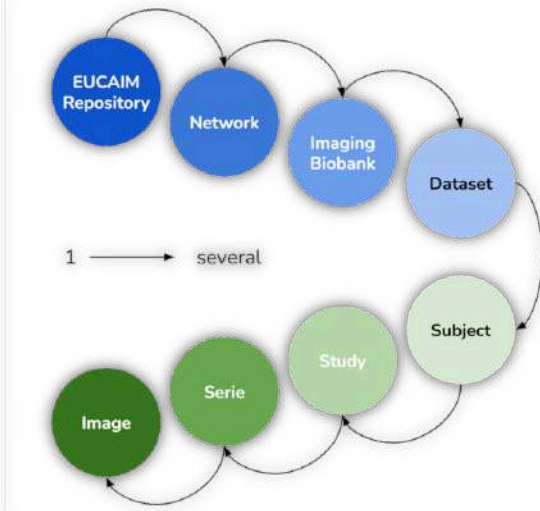


Figure 4-8. EUCAIM Public Catalogue, datasets overview (left) and data relations (right).

The repository has several networks, each network has several imaging biobanks, each imaging biobank can have several datasets, and so on. This structure allows you to efficiently explore the resources and understand the potential of the platform before committing to the registration process. Research datasets are organised according to the minimal units in which they can be accessed. In some cases, datasets correspond to all the data in a repository related to a specific cancer type. In other cases, datasets correspond to individual data holders, depending on the conditions of the data transfer or data sharing agreements.

3.2.4 Other relevant information

Additionally, in the dashboard main page (see figure 4-10), you can watch our latest platform webinar, held in March 2024, which provides a comprehensive tutorial on how to use the platform and access the components, as well as addresses several interesting questions from participants.

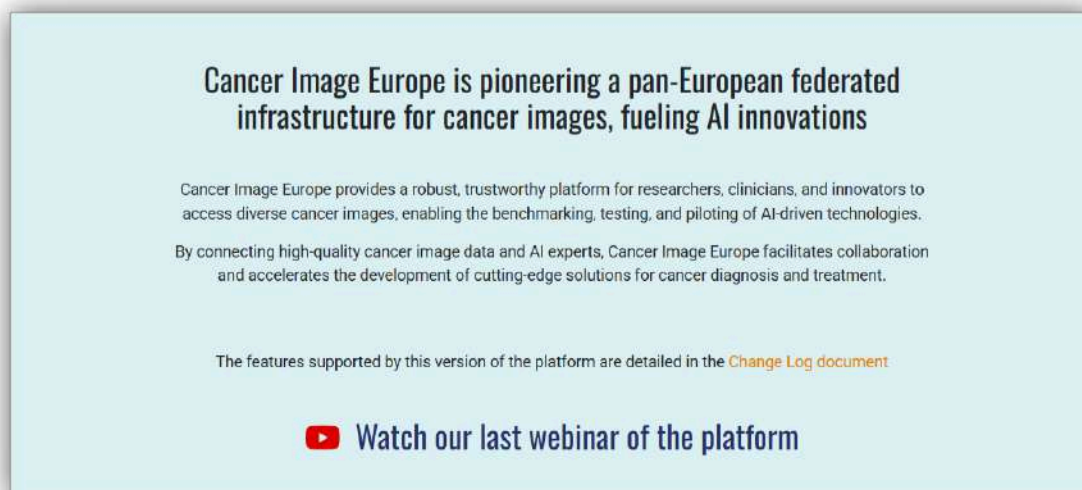


Figure 4-10. EUCAIM Dashboard's webinar.

It is important to state that EUCAIM is a federation that uses several applications and services from a widespread community. As shown in figure 4-11, you can explore and learn more about the technologies our platform relies on, by clicking on each logo. These technologies are developed by key collaborations as well as by third parties.

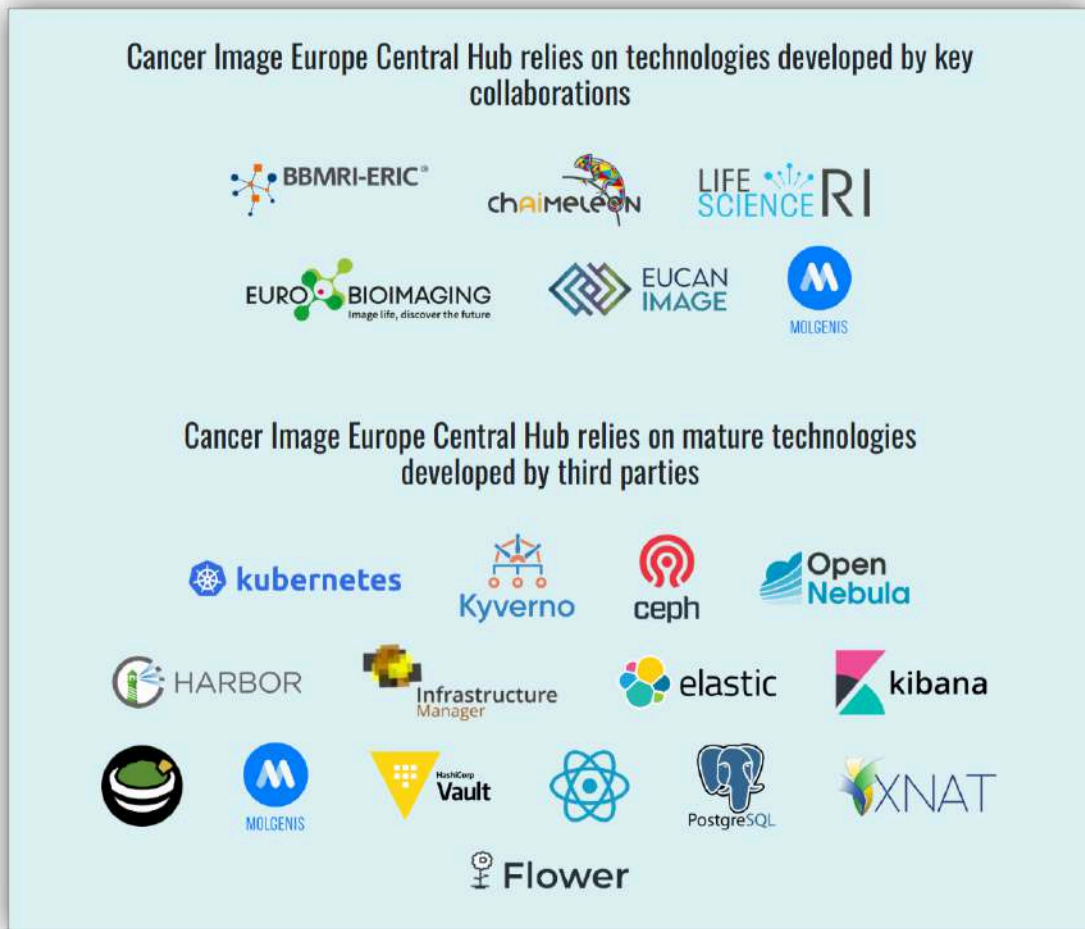


Figure 4-11. EUCAIM Dashboard, anonymous access.

4.3. User's registration

After exploring the Dashboard and the Public Catalogue, you can proceed to the login screen to register, to get access to all the components available at the platform. There are three ways to do so (see figure 4-12):

1. Access the "My Profile" area of the Dashboard
2. Scroll to the bottom of the "Become a User" section and click on the "Become a User now" button.

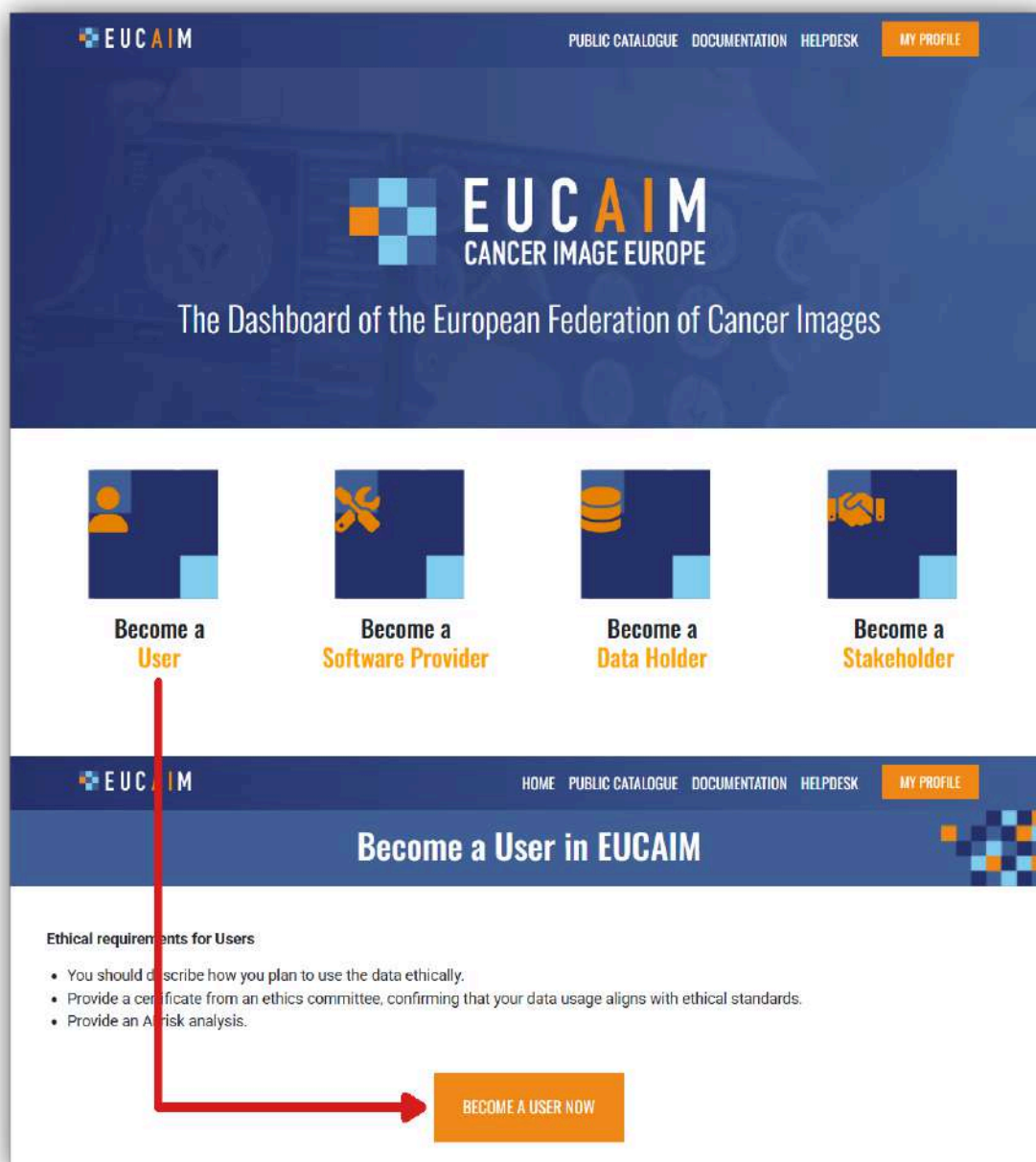


Figure 4-12. EUCAIM Dashboard, user's registration through "My Profile" area (top) and from "Become a User" area (bottom).

Annex I. Registration of Users in EUCAIM shows how to create an account in the AAI system in EUCAIM through the EUCAIM Dashboard. It describes in detail the process of creating a Life Science AAI account and the request for membership in the EUCAIM Group.

4.4. Accessing the components

As an authenticated user, you can now access all the components available in the platform, from the header of the dashboard (see figure 4-13).



Figure 4-13. EUCAIM Dashboard, authenticated access.

4.5. Searching data

As an authenticated user, a deeper search of the data can be done using the Federated Query component. This component allows for an advanced search across multiple sources.

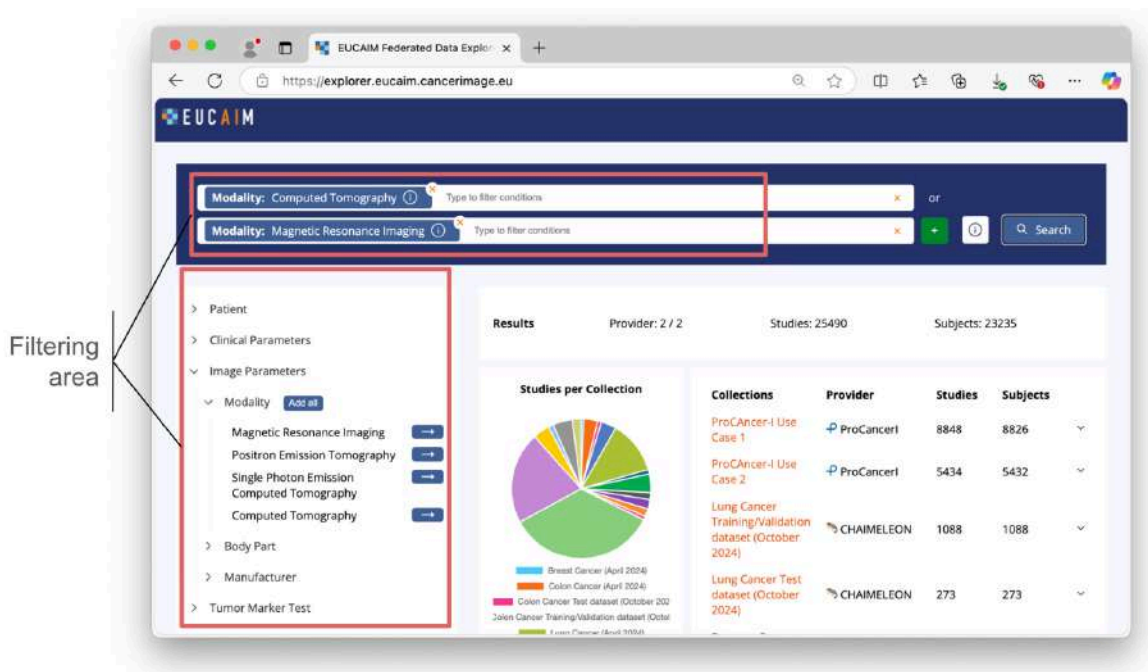


Figure 4-14. EUCAIM Federated Query.

The Federated Query component provides various filters to refine your search (see figure 4-14). These filters are available at the right panel and include:

- Patient information
 - Gender
 - Age at diagnosis
- Clinical Parameters
 - Diagnosis
 - Year of diagnosis
- Image Parameters
 - Modality
 - Body Part
 - Manufacturer

As a result, you will obtain the collections with the total amount of studies and subjects fulfilling your search criteria. Additionally, clicking on the name of the dataset, you will be redirected to its entry in the Public Catalogue, where you will be able to request access to it (see figure 4-15).

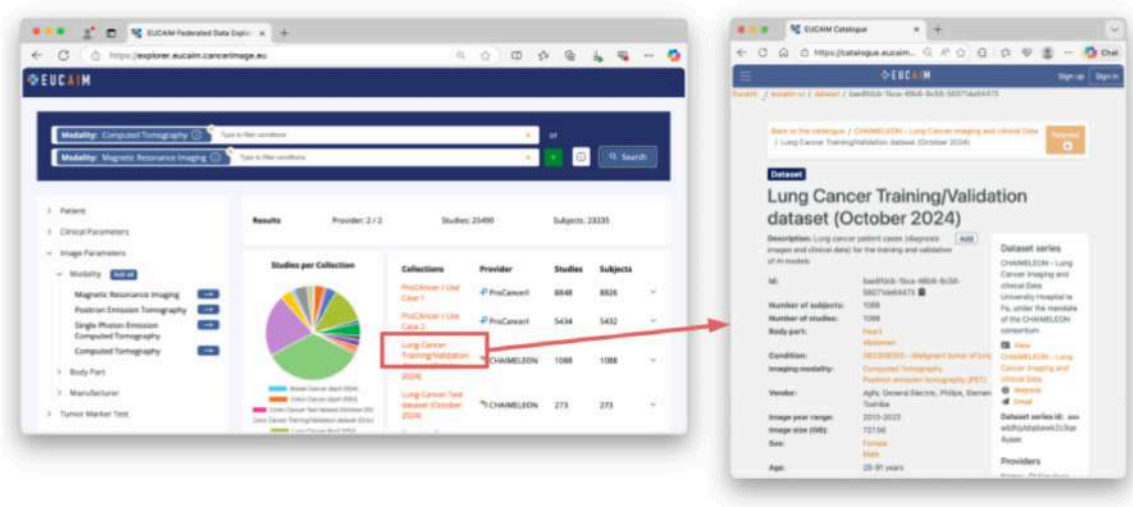


Figure 4-15. How to access the EUCAIM Public Catalogue information from the federated query.

So once you have found the datasets that meet your search criteria for your study, you can download a report of the results by clicking on the download button and then return to the Public Catalogue to initiate the data access request. This report contains the details of the query and the results obtained, and it will be used to narrow down the details of the access request. Data is coded into JSON format.

4.6. Requesting Access

Now that you have identified the datasets valuable for your project, you can start the negotiation process to request access to them. Here's how:

1. Return to the Public Catalogue (see figure 4-16):
 - Go back to the Public Catalogue and add the selected datasets as shown in the figure, by clicking on the 'Add' button.
2. Review Your Selection (see figure 4-17):
 - After selecting all desired datasets, review your selection in the menu located at the top right. You can select as many datasets as desired for your Research project, under the same proposal.
 - Ensure your selection is accurate and remove any dataset if needed.
3. Send selection for negotiation:
 - Once satisfied with your selection, click on the "Send to the negotiator" button to initiate the negotiation process.

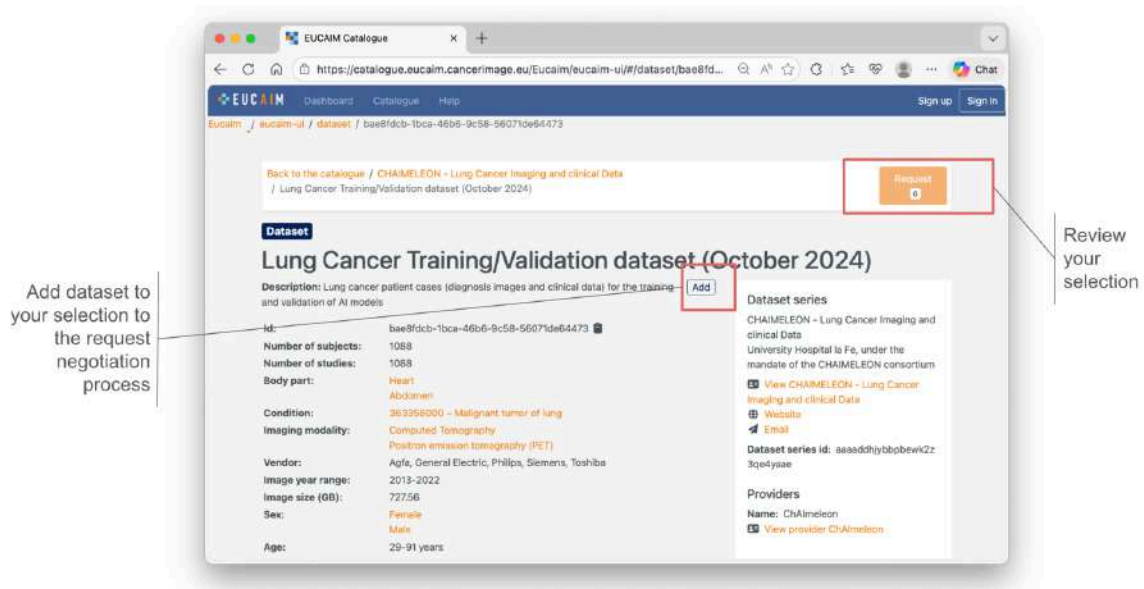


Figure 4-16. How to add datasets for requesting access to them.

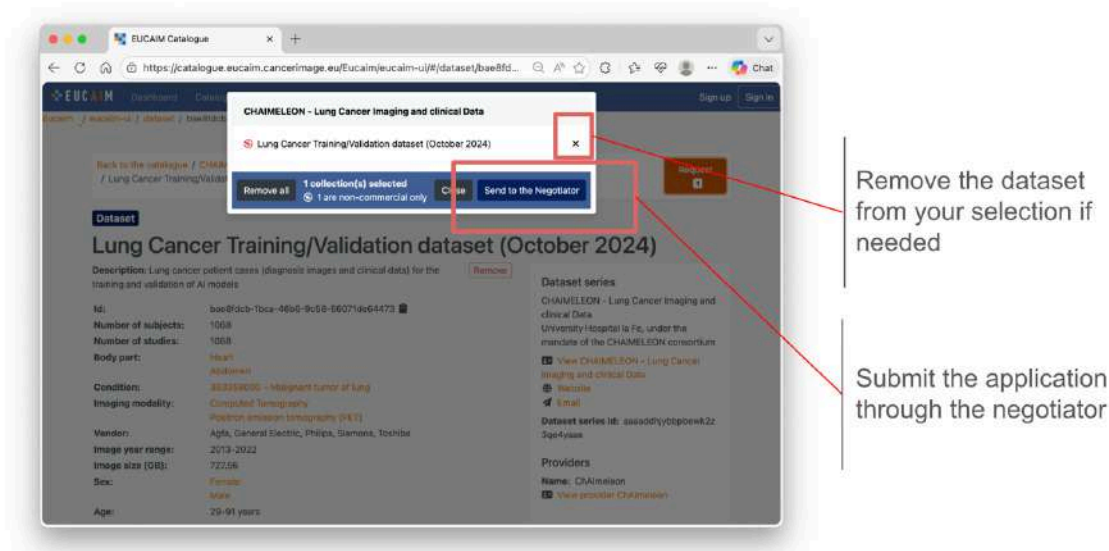


Figure 4-17. How to start the negotiation process.

After sending your selection to the negotiator, you will be redirected to the Negotiator component webpage, where you can complete your submission by preparing and providing all the required documents and information about your R&D project.

First, a brief summary of your request will be displayed (see Figure 4-18). By clicking "Next," you can start filling out the mandatory information and uploading the required documents.

The screenshot shows a web browser window with the URL <https://negotiator.eucaim.cancerimage.eu/requests/d6f59c81-b72f-4564-a67d-95ee95944289>. The page header includes the 'CANCER IMAGE EUROPE' logo and navigation links for 'Your negotiations' and 'Documentation'. The main content area is titled 'Access Form Submission' and contains a progress indicator with six steps. Step 1, 'Request summary', is currently active. Below the progress bar, the 'SEARCH PARAMETERS' section is displayed, which includes a 'RESOURCE (1)' section listing 'CHAIMELEON – Lung Cancer Imaging and clinical data (1)' and 'Lung Cancer Training/Validation dataset (October 2024)'. At the bottom right of the form, there are 'Save Draft' and 'Next' buttons.

Figure 4-18. Negotiator Access Form.

The information required for an application is included in 6 subsections:

1. Request summary, which presents a summary of the datasets requested.
2. Contact Details, which asks the applicant to provide the organization name and acronym, and the details of the Principal Investigator, including title, name, surname, phone and role in the organization.
3. Scientific Relevance, which covers the application Title, Description (objectives, methodology, expected results and impact), project timeline, the expected benefits of using EUCAIM data and AI Algorithms, the period in which the data should be made available, and additional comments.
4. Ethical and legal requirements, which consists on a set of checklists related to the availability of an ethical approval, the law obligations, the means to demonstrate due diligence in the compliance with the regulation, the interest on applying for certification of software as medical device, AI compliance and the confirmation of collecting the information exposed.
5. The confirmation of the consent to use the personal data provided by the applicant for the evaluation of the proposal.
6. Overview

An overview of the Access Form submission is shown before you submit the request. Once submitted, it will undergo an evaluation process. First, the application will undergo an administrative review to ensure all information is valid. Then, it will be reviewed by the Access Committee, which will conduct a technical and scientific evaluation.

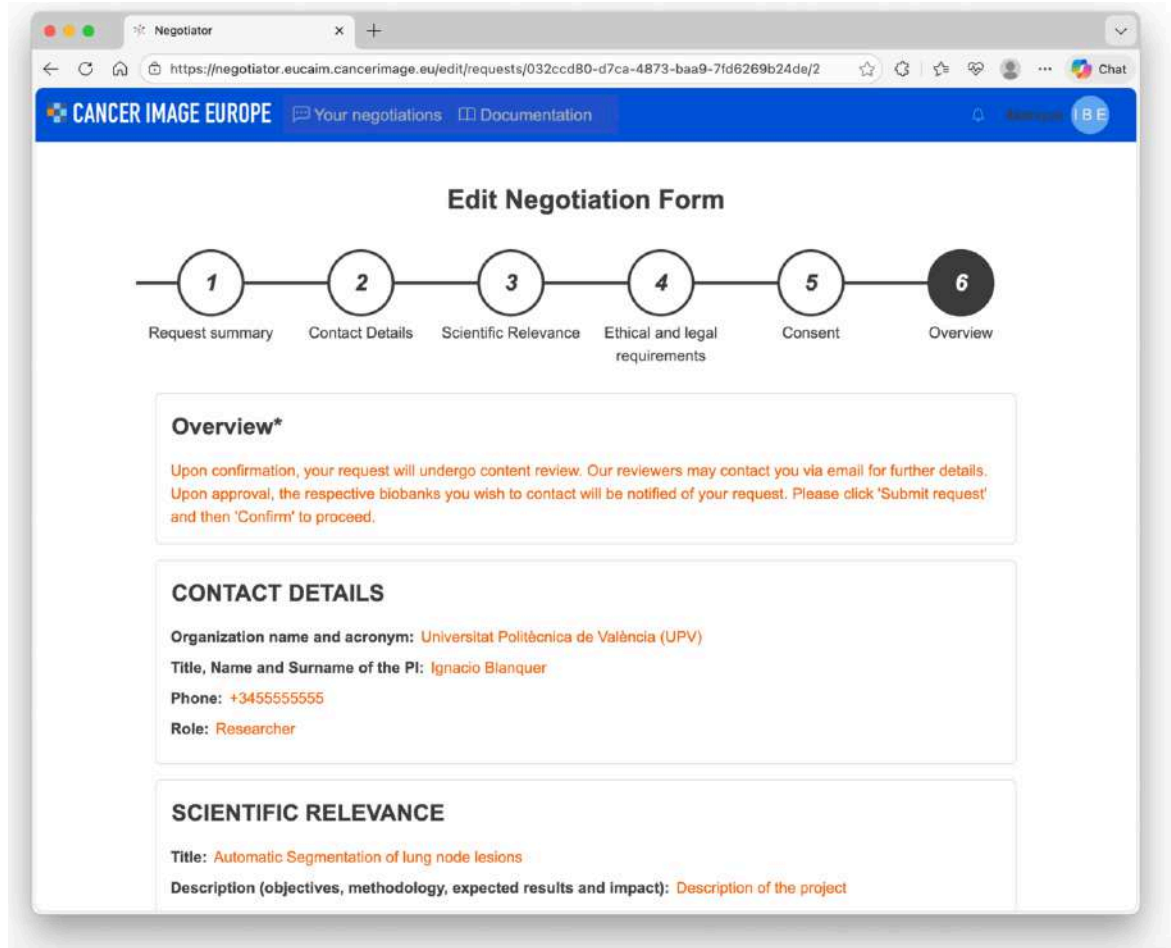


Figure 4-21. Negotiator application overview before submitting.

Finally you can review your requests and check your open negotiations, tracking their status and modifications (see Figure 4-22). The EUCAIM team will respond to your submitted requests as soon as possible, enabling a smooth negotiation process to grant you access to the valuable selected datasets and allowing you to start your project.

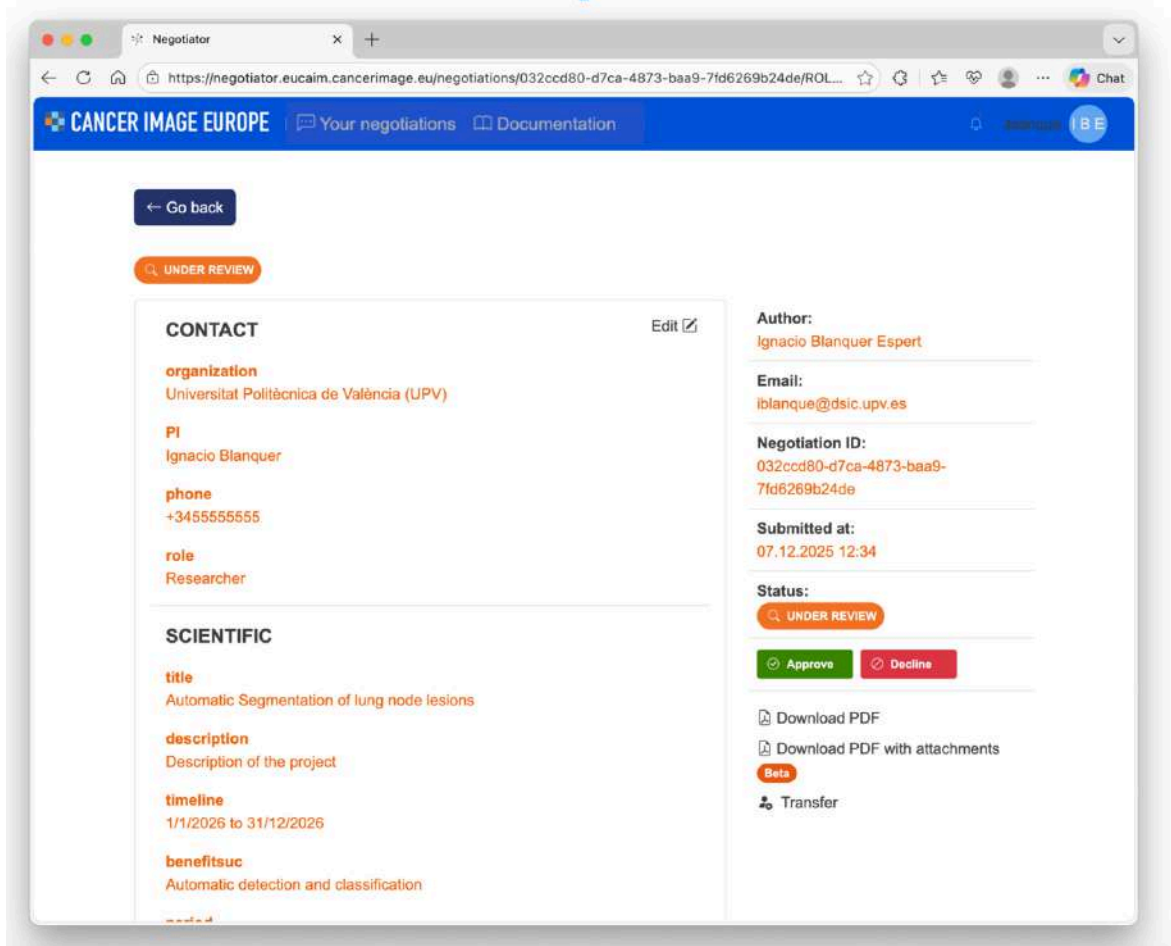


Figure 4-22. Overview of a submitted application.

The lifecycle of negotiations is described in figure 4-23, and comprises the following statuses:

- Under Review. The application proposal has been submitted and the eligibility is being evaluated by the Access Committee.
- In Progress. The application proposal has entered in the full review process. Scientific, technical, legal aspects will be analysed, as well data availability will be checked. The positive progressing sub-statuses that the application goes through are:
 - Resource Available: The dataset manager for each one of the datasets requested have verified that the data requested is available. If changes have to be applied to the request, they will appear in the messaging system of the negotiator. The actual evaluation starts at this point and the ethical, technical and scientific evaluation reports will be shared in the messaging system.

- **Checking Availability:** The application has been approved and the process of access management starts. This status means that the actual data is being collected, minimised and prepared for being shared. If issues in the data collection appear, messages can be exchanged through the negotiator with the specific dataset manager.
- **Access conditions indicated:** The applicant receives the package of documents for safely accessing the data requested. They must be completed and signed, and returned back through the same messaging channel.
- **Access conditions met:** The Legal team has verified that the legal information is complete and correct.
- **Resource Made Available:** This sub-status is the final one of the "In-progress" status and indicates that the access to the data has been granted. The dataset representative will send the access procedure and will ensure that the user account in LS-AAI is valid for accessing the data. This is an intermediate status triggered by the dataset responsible.
- **Concluded:** This status indicates that the application evaluation has been completed for all the datasets requested.
- **Abandoned or declined:** Both statuses lead to the termination of the data access request application process. Abandoned status is triggered by the user and Declined status is triggered by the EUCAIM side.

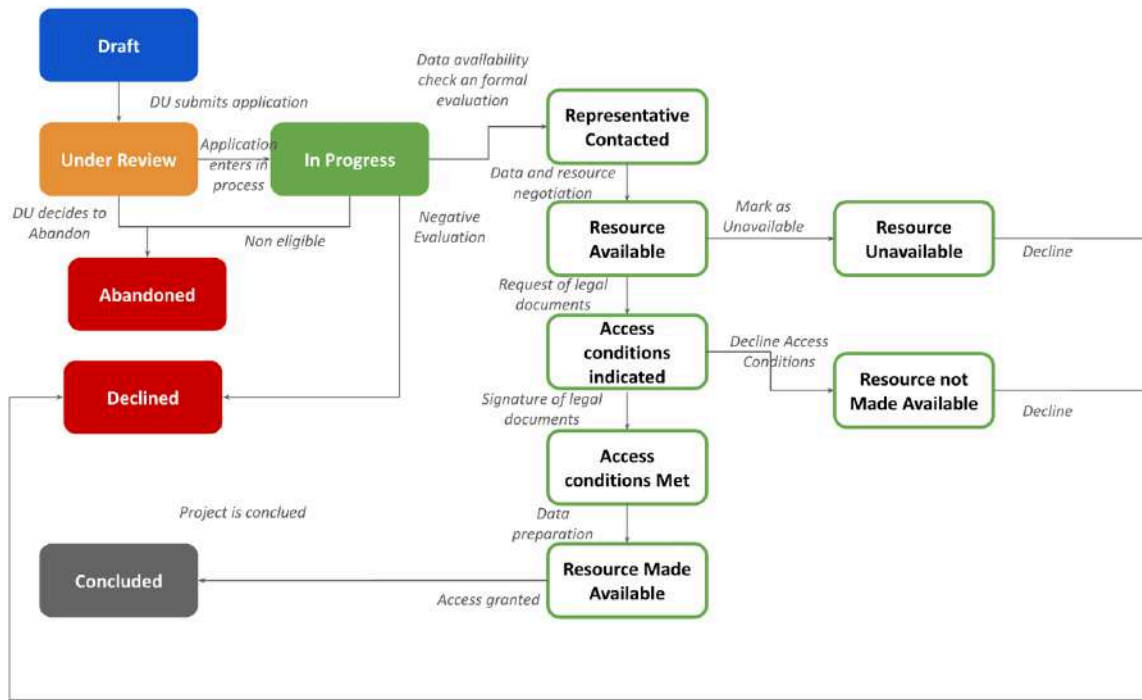


Figure 4-23. Application workflow.

Additionally, there are three sub-statuses of the “In progress” status that holds or terminates the process due to different conditions:

- Resource unavailable, when the data requested does not match the data available. For example, the data request may include clinical information that is not available.
- Resource not made available, triggered by the data requester when the access conditions for the data cannot be accepted.

The information exchange among the different actors for each one of the stages is shown in detail in the negotiation application and through e-mail. Figure 4-24 shows a snapshot of the user requester and admin panels.

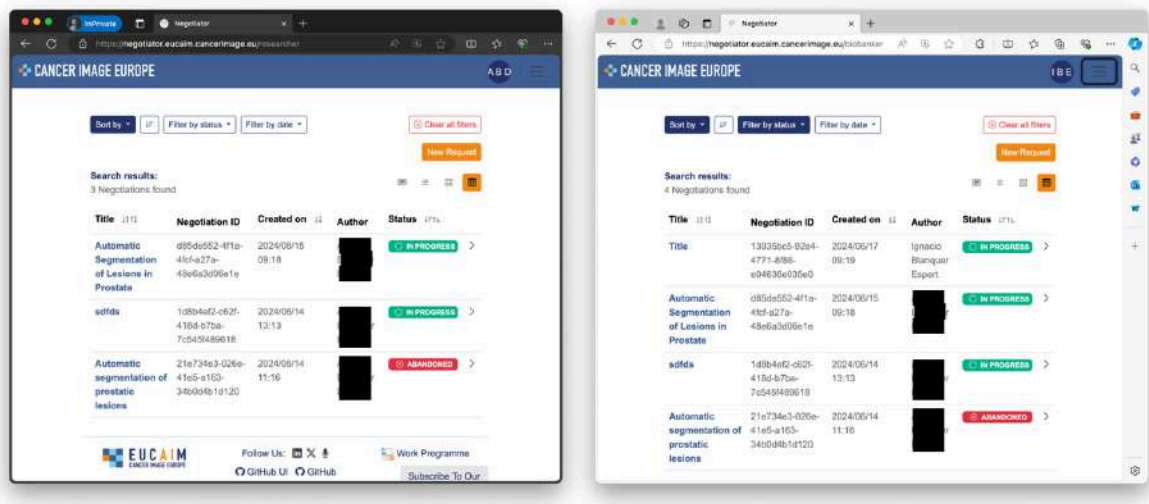


Figure 4-24. Overview of all submitted applications from a user (left) and control panel from the dataset responsible person.

4.7. Accessing Data

Data can be accessed under different conditions, depending on the licence and traceability requirements of the data. In this context, EUCAIM differentiates among three models:

1. Datasets can be downloaded for off-line processing. This is only possible for datasets with low traceability restrictions, as EUCAIM cannot trace the data beyond the boundaries of the platform.
2. Datasets that cannot be downloaded but data can be visualised and processed using on-site Virtual Research Environments. Users will access the data remotely and major interactions (data visualisation, access, processing and release) are monitored by the EUCAIM platform.
3. Data that cannot be visualised and can only be processed remotely through batch jobs. In this case EUCAIM will provide an interface to run processing jobs on the data available in the providers of the federation. In this case, EUCAIM will register all the interactions with data.

This guide covers mainly the first two cases, as the federated processing will be ready later in the project.

The access to the data is performed through the nodes of the federation. Two reference nodes have been set up to store data from the centres who cannot implement a federated node and area allowed to transfer the data to the reference nodes, as well as to provide computing resources. Each reference node is based on a different technology to maximise flexibility. This document contains two subsections, each one for a different reference node.

4.8. Reference Node at UPV

The UPV reference node is based on an evolution of a technology developed in the CHAIMELEON <https://chaimoleon.eu/> project. This technology has been enhanced in three directions:

- To provide multi-tenant support, allowing multiple projects and a finer granularity of the access permissions through Access Control Lists.
- Integrated with a totally renewed image workstation software from QUIBIM (QP-Insights).
- Supporting the federated core services of EUCAIM (LS-AAI, FAIR Data points, federated search mediator and a materialisation component for distributed processing).

The UPV reference node is mainly intended for Data Scientists and supports both in-situ and federated processing.

The entry point to the UPV reference node is the local catalogue. The local catalogue describes the datasets stored in the reference node and feeds the EUCAIM platform repository. Figure 4-25 shows the view of this catalogue with the information of one of the subprojects of CHAIMELEON.

Dataset (ID)	Flags	Author	Project	Created	Studies	Subjects
OpenChallenge Championship Training Dataset for Rectum Cancer (73736488-69a9-4c8c-a995-64e9cad376dd)	Published	Ana Jimenez-Pastor	OPENCHALLENGE	23/04/2024, 12:32:46 CEST	231	231
OpenChallenge Championship Training Dataset for Colon Cancer (f90ab277-9f66-448e-a996-f55a7866580b)	Published	Ana Jimenez-Pastor	OPENCHALLENGE	23/04/2024, 12:30:14 CEST	408	408
OpenChallenge Championship Training Dataset for Prostate Cancer (b875a59a-32f0-4e47-9da6-1e635a85b370)	Published	Ana Jimenez-Pastor	OPENCHALLENGE	23/04/2024, 12:28:13 CEST	446	446
OpenChallenge Championship Training Dataset for Breast Cancer (b66781db-8b21-4a30-ac0d-8eaa2a4c0ecc)	Published	Ana Jimenez-Pastor	OPENCHALLENGE	23/04/2024, 12:25:51 CEST	411	411
OpenChallenge Championship Training Dataset for Lung Cancer (5e8a4b13-8c92-40dd-9d4c-04124440f43a)	Published	Ana Jimenez-Pastor	OPENCHALLENGE	23/04/2024, 12:13:39 CEST	559	559

Figure 4-25: Reference UPV node, view of the CHAIMELEON OpenChallenge project.

The aggregated information is publicly available and it is stored in Zenodo too. Figure 4-26 shows a snapshot of the details page of one of the datasets, accessed by clicking on the “More” link.

zenodo

Planned intervention: On Wednesday June 26th 05:30 UTC Zenodo will be unavailable for 10-20 minutes to perform a storage cluster upgrade.

Published June 3, 2024 | Version v1

OpenChallenge Championship Training Dataset for Prostate Cancer

CHAIMELEON Consortium

Selection of studies for dataset. ID: [10.5281/zenodo.11464910](https://doi.org/10.5281/zenodo.11464910)

Files

description.pdf

Cite this dataset as <https://doi.org/10.5281/zenodo.11464910>

This dataset is offered under the following license: [CHAIMELEON Consortium 1.0](#)

Figure 4-26: Reference UPV node, view of the aggregated data from the reference node catalogue (left) and Zenodo (right).

The access to the dataset requires valid credentials. Users that have received a positive evaluation of the data access request will have access granted through her LS-AAI account. Once logged in (see figure 4-27), the user will see more information on the dataset and will be able to use the data on the Application Dashboard.

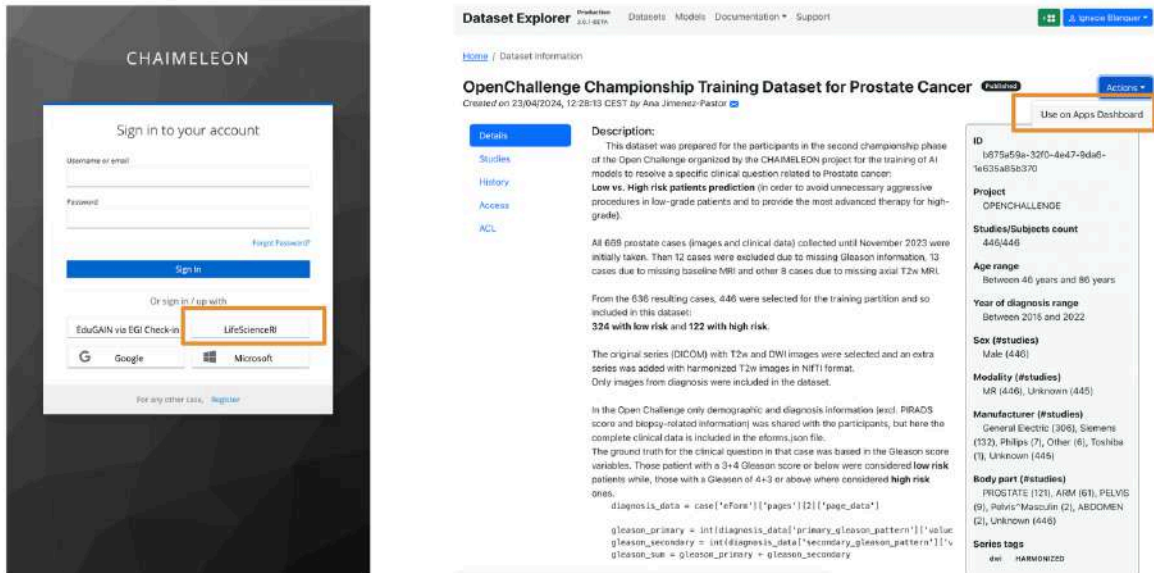


Figure 4-27: Reference UPV node, view of the aggregated data from the reference node catalogue (left) and Zenodo (right).

The user can deploy a Virtual Research Environment (VRE) through the App Dashboard. Four environments are provided with two different AI frameworks (Pytorch and Tensorflow) each one with or without a Jupyter notebook server (see figure 4-28). Users can find a previously deployed VRE environment or deploy a new one.

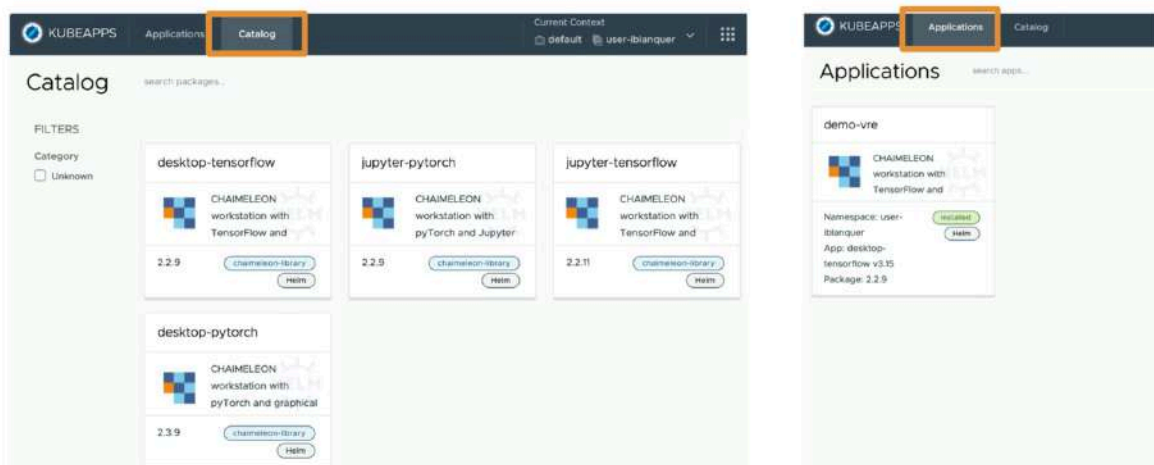


Figure 4-28: Catalogue of VRE applications (left) and applications deployed by the user (right).

The deployment of a VRE from the catalogue provides the user the way to visualise and process the data. The deployment of a VRE through the catalogue only requires providing a valid name for the environment (only lower letters, a hyphen and numbers). The access to the VRE is performed through a reverse proxy in the platform. Figure 4-29 shows both actions.

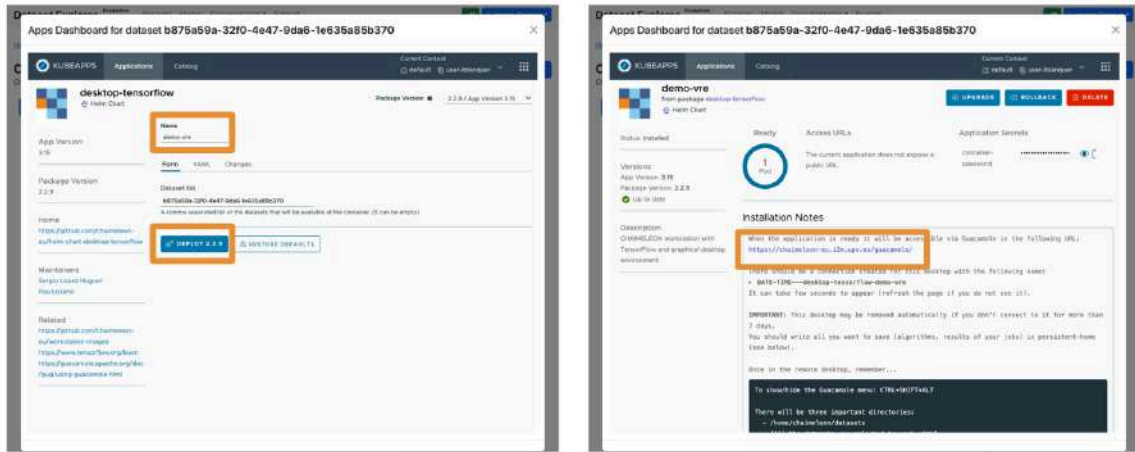


Figure 4-29: Deploying a VRE (left) and accessing the VRE link through the Reverse proxy (right).

Access to the data is performed through the GUI of the VRE. The VREs are based on Ubuntu 22.04 LTS workstations with LXDE as GUI. This environment is provided with tools, services and software libraries, as well as batch queues for non-interactive jobs. Detailed information on the usage of the job queues is provided in the platform documentation[3]. Figure 4-30 shows a snapshot of an instance of a VRE environment with access to the prostate data. This is accessed through a web browser, minimising the requirements of the user.

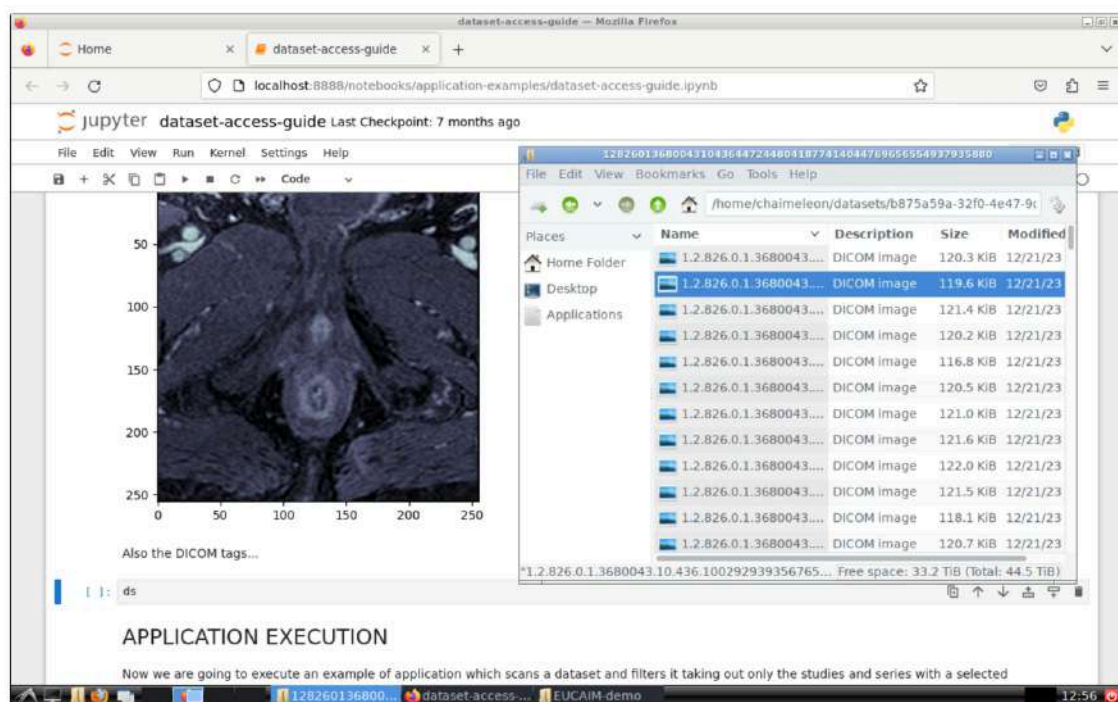


Figure 4-30: GUI of the UPV reference node, showing a Jupyter notebook and a fileserver window.

The user is provided with three directories:

- Persistent home, restricted to the user, and where the user can store the data that she would like to preserve.
- Dataset, read-only folder with the information on the datasets, stored following the hierarchical model of the data shown in the green bubbles of figure 4-8.
- Persistent-shared-folder.

Any other folder is considered as volatile and data stored on it will disappear once the job has finished or the VRE is deleted. Data stored in the persistent home directory will remain available across the lifetime of the applications.

4.9. Reference Node at the Euro-BioImaging Medical Imaging Repository

The Euro-BioImaging Medical Imaging Repository (a reference node in EUCAIM) focussed on storing data for Data Holders. The Euro-BioImaging Medical Imaging Repository service is an XNAT instance operated by Health-RI. To access the data that is on the Euro-BioImaging Medical Imaging Repository, the first step that you should do is to request an account for the Euro-BioImaging XNAT (<https://xnat.health-ri.nl> ↗). This can be done at the EUCAIM Helpdesk (Section 3.9) who will forward the request to the Health-RI helpdesk at <https://trait.topdesk.net/> ↗. You will receive an email asking to agree with the Health-RI data access policy and will receive your credentials. The Euro-BioImaging XNAT is currently in the process of implementing single sign-on which will allow using the same credentials as the ones used in EUCAIM in the future.

Before the access is granted, the responsible person of the dataset has to update the profile in the XNAT to give access to the specific dataset. They can also contact the Health-RI helpdesk for further assistance.

4.9.1 Accessing data through the web-interface

You will need to be logged in to the Euro-BioImaging XNAT to access most image datasets. If you are not logged in or do not have access granted to your account, figure 4-31 shows it up, indicating there is no access to the project data:

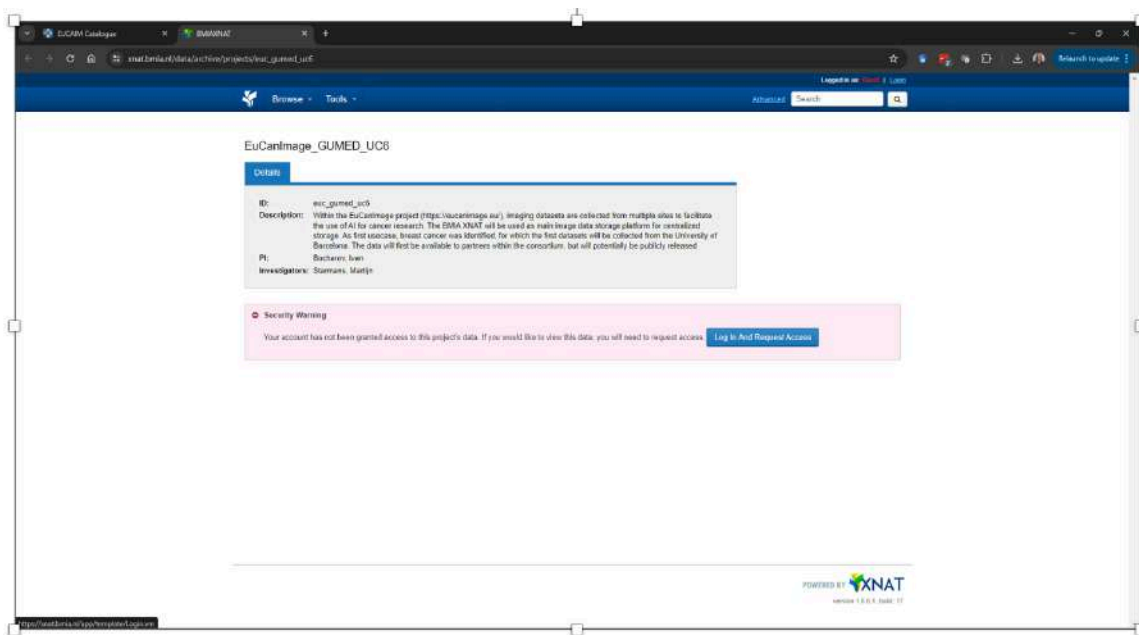


Figure 4-31: Access denial.

Logging in can be done at the homepage, or by clicking “Login” at the top-right corner of the screen. Use your Euro-Biolmaging XNAT credentials to log in (see figure 4-32).

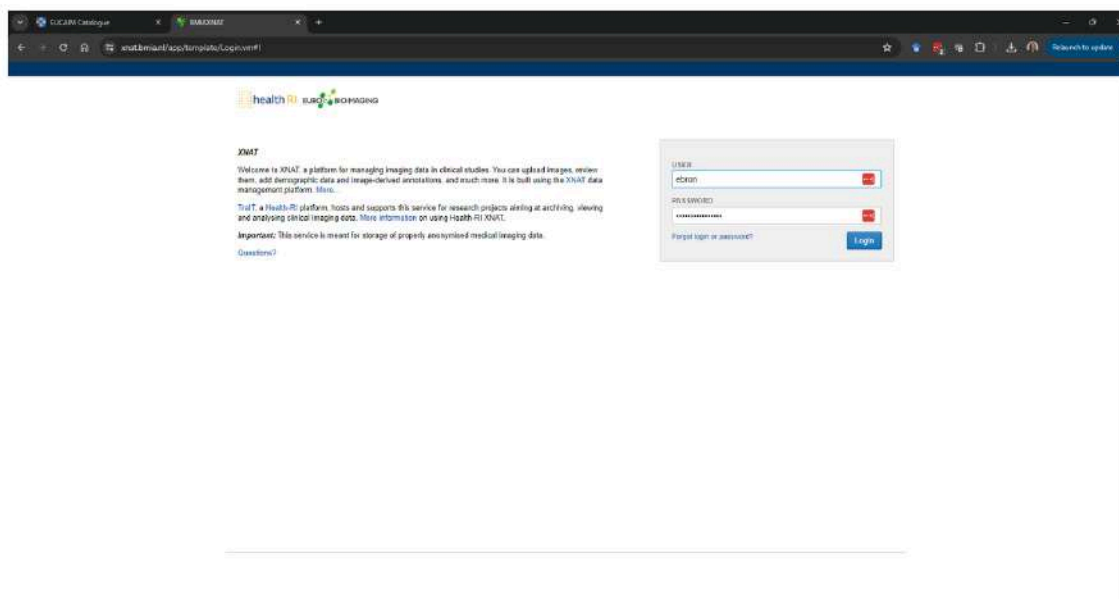


Figure 4-32: Logging the platform.

Once logged in, you can access the project data. The top grey box displays generic information about the project, like the description and investigators working on it. The bottom table shows a list of subjects, with each row containing information about the data contained in them. This information can be different for each dataset, but generally includes the number of imaging sessions per modality. (figure 4-33)

The screenshot shows the EuCanImage web interface. At the top, there is a navigation bar with 'Browse', 'New', 'Upload', 'Tools', and 'Help'. Below this, the page title is 'EuCanImage_GUMED_UC8'. The main content area is divided into two sections: 'Details' and 'Subjects'.

The 'Details' section contains the following information:

- ID:** eur_gumed_uc8
- Description:** Within the EuCanImage project (https://eucanimage.eu/), imaging datasets are collected from multiple sites to facilitate the use of AI for cancer research. The ENMA XNAT will be used as main image data storage platform for centralized storage. In first instance, breast cancer was selected for which the first datasets will be collected from the University of Barcelona. The data will first be available to partners within the consortium, but will potentially be publicly released.
- PI:** Bochen, Ivan
- Investigators:** Soriano, Marip

The 'Subjects' section displays a table with the following columns: Subject, Age, Race, YOB, Race, Sex, Vol, and Sessions. The table shows 17 rows of data, with the first few rows being:

Subject	Age	Race	YOB	Race	Sex	Vol	Sessions
ECLGUM_50001	U					True	1
ECLGUM_50004	U					True	1
ECLGUM_50004	U					True	1
ECLGUM_50005	U					True	1
ECLGUM_50005	U					False	1
ECLGUM_50007	U					True	1
ECLGUM_50008	U					True	1
ECLGUM_50009	U					True	1
ECLGUM_50040	U					True	1
ECLGUM_50041	U					False	1
ECLGUM_50042	U					False	1
ECLGUM_50043	U					False	1
ECLGUM_50074	U			Normal		False	1
ECLGUM_50075	U			Normal		False	1
ECLGUM_50077	U			Unsig		True	1
ECLGUM_50078	U			Unsig		False	1
ECLGUM_50079	U			Unsig		True	1

Figure 4-33: Information per dataset.

Clicking on the subject ID reveals a screen with additional information on the subject. For example, it shows the date the subject was added to the Euro-Biolmaging XNAT data repository, as well as all imaging sessions (called "Experiments"), modalities and their dates associated with the subject (see figure 4-34).

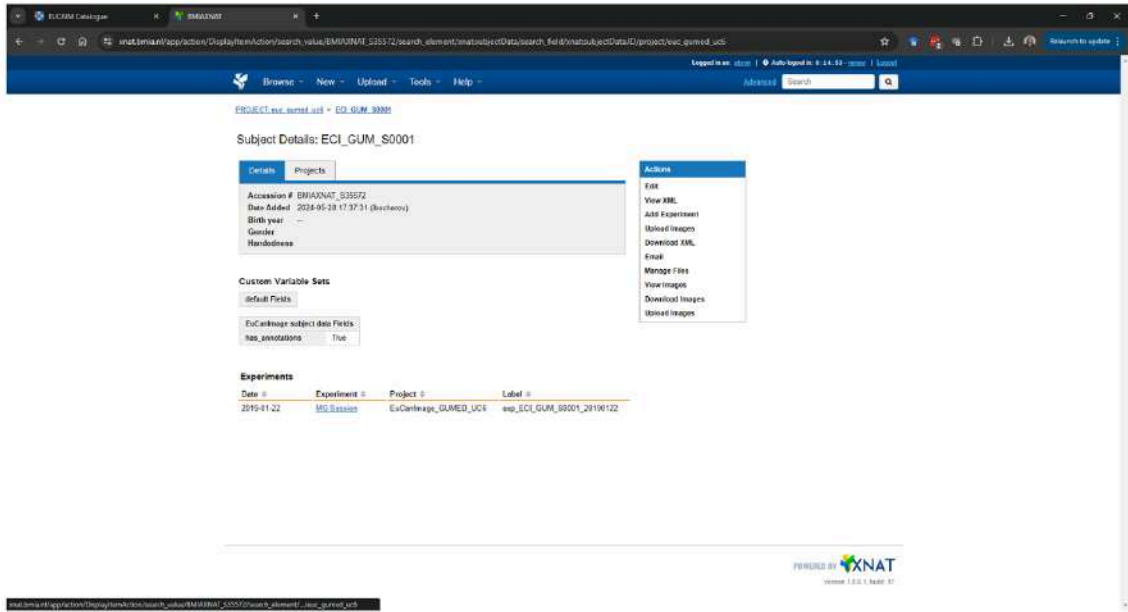


Figure 4-34: Detailed information of a subject.

By clicking on an experiment, more information will show up, like the time and date of acquisition and a summary of the DICOM headers. Depending on the degree of anonymization, the gender and age of the subject could also be shown.

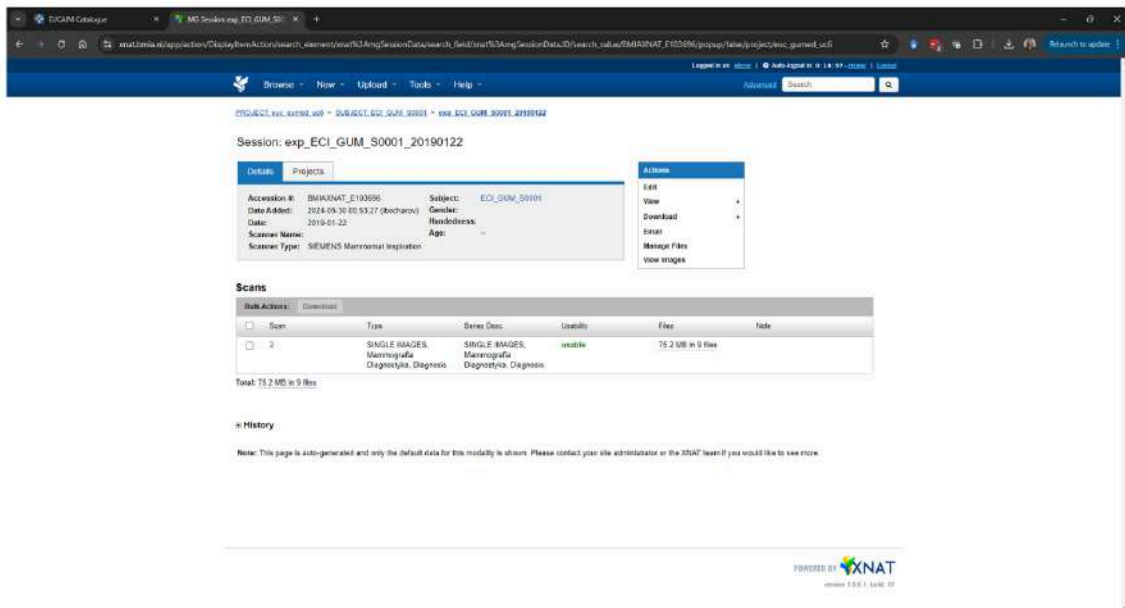


Figure 4-35: Detailed information of a study.

From here, there are many things you can do. The “Download” button gives you access to raw DICOM files, if present. You will be asked to select the series you would like to download, after which you can click “Download”. The images will first be combined on the server into a zip file before being downloaded onto your local hard drive.

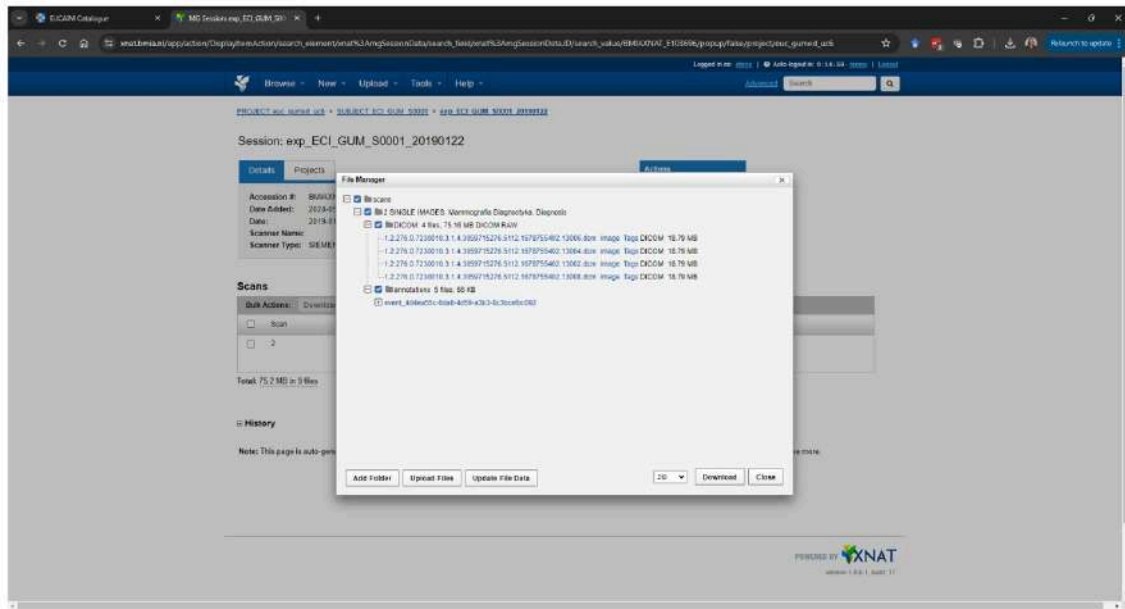


Figure 4-36: Downloading data from the platform.

XNAT also has a built-in DICOM viewer, i.e. the OHIF viewer by the Open Health Imaging Foundation[4]. Note: this viewer is not certified for clinical use and is meant for investigational and research purposes only. The viewer can be accessed by clicking “View Images” on the right-hand side. The first time an image is viewed by anyone, the viewer will need to do some preparing. This can take some time (multiple minutes) and it may seem like nothing is happening. After these minutes, the image will show up.

By default, holding the left mouse button can be used to adjust the window width and level. The scroll wheel can be used to scroll through slices, holding the right mouse button is for zooming in/out. At the menu bar you can select multiple controls, for example to change the left mouse button to “stack scroll” instead of “window” akin to a radiological PACS. In the left column, multiple series are shown of the same experiment (if available).

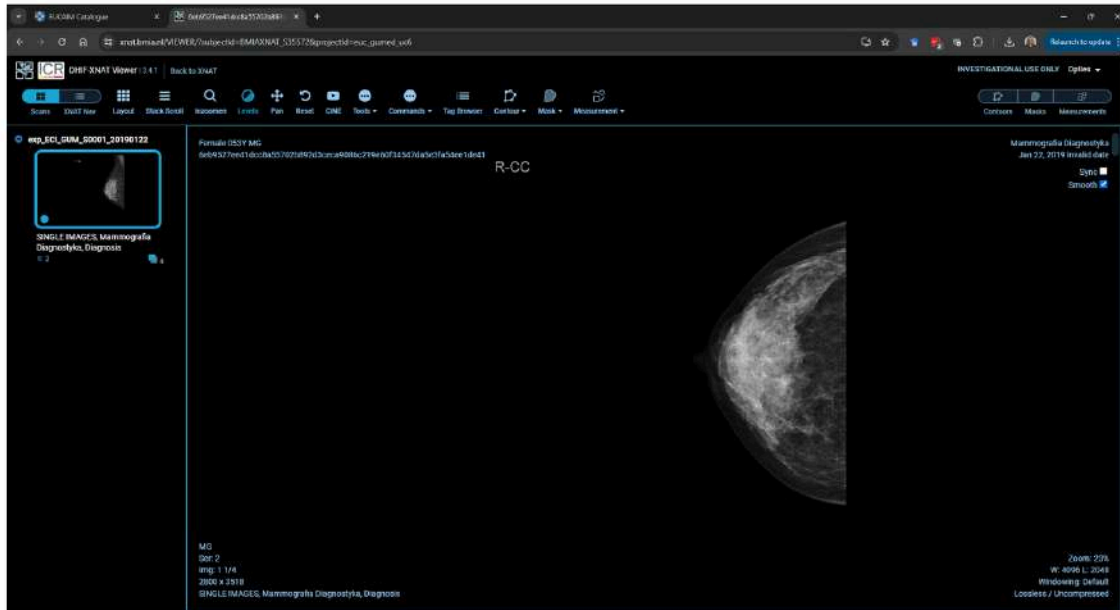


Figure 4-37: visualisation of images in the EuroBioImaging reference node.

4.9.2 Using python to download data

It is also possible to access data through the API this can be done using the python package [xnatpy](#) ↗. It can, among other thing, be used to loop over subjects/studies and to download data.

To download the entire projects for e.g. processing, a helper tool was developed, which is called [datmat](#) ↗.

4.9.2.1 Getting started

Install `datmat` from PyPI:

```
pip install datmat
```

In `datmat` you can interface with multiple data sources and storage solutions through a plugin system. By linking together different plugins you can move data from one place to another. A set of plugins is already installed when installing the package, but the program is set up to support development of custom plugins. The plugins can be called by using a URL scheme to preface the path or URL to your file. For example, by using `file:///home/user/file.txt` you can access the local file `/home/user/file.txt`, or by using `xnat+https://xnat.health-ri.nl/projects/sandbox` you can access the XNAT project `sandbox` on `xnat.health-ri.nl` over HTTPS.

See below examples of various use cases.

4.9.2.2 Downloading from XNAT into EUCAIM directory structure

Through the use of the `xnat+https://` plugin it is possible to download files from an XNAT instance. The `eucaimdir://` plugin will store the files in the destination folder in the following nested folder structure:

```
/dest_folder/project_name/subject_label/experiment_label/{scan_id}
_{scan_type}/file
```

The path `/dest_folder` needs to be supplied with the starting `/`, so the URL will be `eucaimdir:///dest_folder`.

4.9.2.3 Download dicoms

```
import datmat

datmat.materialize('xnat+https://xnat.health-ri.nl/projects/sandbox',
                  'eucaimdir:///dest_folder',
                  tempdir='/temp_directory')
```

By default only the 'DICOM' resource is downloaded per scan. To download all resources a query can be added to the input URL:

4.9.2.4 Download NIFTI's

```
import datmat

datmat.materialize('xnat+https://xnat.health-ri.nl/projects/sandbox?resources=NIFTI',
                  'eucaimresdir:///dest_folder',
                  tempdir='/temp_directory')
```

4.9.2.5 Download all resources

```
import datmat

datmat.materialize('xnat+https://xnat.health-ri.nl/projects/sandbox?resources=NIFTI',
                  'eucaimresdir:///dest_folder',
                  tempdir='/temp_directory')
```

By using the `eucaimresdir:///` output URL scheme, a folder will be created for each of the resources, like this:

```
/dest_folder/project_name/subject_label/experiment_label/{scan_id}
_{scan_type}/resource_name/files/file
```

4.9.2.6 A single subject

```
import datmat

datmat.materialize('xnat+https://xnat.health-ri.nl/search?
projects=sandbox&subjects=TEST01&resources=DICOM',
                  'eucaimdir:///dest_folder',
                  tempdir='/temp_directory')
```

The `datmat` package is based on the IOPlugin system of Fastr. See the documentation for the [XNATStorage IOPlugin ↗](#) for more information on querying XNAT.

4.10. Federated Processing

The execution of federated jobs is performed through the Federated Processing dashboard (**FP Dashboard**). It supports three main interactions: (A) Monitoring the federated network, (B) Launching a federated experiment, and (C) Monitoring Job and Inspecting Results.

4.10.1. Monitoring the Federated Network

The **FP Dashboard** provides a dedicated view for monitoring the EUCAIM Federated Network to assess network readiness prior to launching federated analyses. It is accessible from the main navigation menu under "EUCAIM Network". This view lists all participating nodes (*aka* Data Holders) and presents their current operational status.

Information displayed on this page is obtained from the real-time monitoring endpoints exposed by the **FEM Orchestrator** (see [6. Real time Data holders monitoring ↗](#)). To ensure responsiveness, cached monitoring data is displayed immediately upon page load and refreshed at the beginning of each user session. A manual Reload action is also available to request an on-demand update. To avoid necessary delay, resources endpoint is only executed after a successful heartbeat call (online/offline).

The monitoring view reports the following information for each Data Holder:

- Online/offline status of Data Holders
- Data Holder response time
- Resource summary, including CPU, RAM, GPU, and Docker version
- Tool readiness checks, including Docker image availability and checksum validation
- SSL/TLS certificate validity

The screenshot displays the EUCAIM Network dashboard. At the top, there is a navigation bar with a home icon, a breadcrumb trail (Home > Get Data > From Repository > Repository Name), and a user profile icon labeled 'Joanp'. Below the navigation bar is the EUCAIM Network logo and a 'Refresh' button. The main content area is titled 'EUCAIM sites. Status and available resources' and features a search bar and a table of site records. The table has columns for Site Id, Full Name, Status, Resources Check, and Installation Check. The table lists 9 sites, with the first 8 being online and the 9th being offline. The Resources Check column provides details on CPU count, CPU Percent, Memory Available, Memory Total, and GPU count. The Installation Check column provides details on IP, Docker version, and Data Paths.

Site Id	Full Name	Status	Resources Check	Installation Check
AUTH	Aristotle University of Thessaloniki	Online Last checked: 2025-08-25 14:07:27 Last response time: 815.02 ms	<ul style="list-style-type: none"> CPU count: 12 CPU Percent: 0 Memory Available: 60.66 GB Memory Total: 62.80 GB GPU count: 0 	<ul style="list-style-type: none"> IP: 155.207.88.13 Docker: Docker version 28.2.2, build e6534b4 Data Paths: Sandbox: 1, Data: 1
BSC	Barcelona Supercomputing Center (test site)	Online Last checked: 2025-08-25 14:07:25 Last response time: 496.34 ms	<ul style="list-style-type: none"> CPU count: 8 CPU Percent: 1 Memory Available: 28.94 GB Memory Total: 31.34 GB GPU count: 0 	<ul style="list-style-type: none"> IP: 212.128.226.71 Docker: Docker version 28.3.2, build 578ccf5 Data Paths: Sandbox: 1, Data: 1
CHAMELEON	CHAMELEON PROJECT	Online Last checked: 2025-08-25 14:07:26 Last response time: 729.09 ms	<ul style="list-style-type: none"> CPU count: 8 CPU Percent: 4.7 Memory Available: 28.20 GB Memory Total: 30.62 GB GPU count: 0 	<ul style="list-style-type: none"> IP: 158.42.105.79 Docker: Docker version 28.3.2, build 578ccf5 Data Paths: Sandbox: 1, Data: 1
FORTH	Foundation for Research and Technology - Hellas (test site)	Online Last checked: 2025-08-25 14:07:23 Last response time: 926.1 ms	<ul style="list-style-type: none"> CPU count: 4 CPU Percent: 1.3 Memory Available: 6.86 GB Memory Total: 7.75 GB GPU count: 0 	<ul style="list-style-type: none"> IP: 139.91.210.80 Docker: Docker version 28.2.2, build e6534b4 Data Paths: Sandbox: 1, Data: 1
HULAFE	Instituto de Investigación Sanitaria La Fe (test site)	Offline		
HUU	Umeå universitet Hospital	Offline		
HVR	Hospital Virgen del Rocío	Offline		
INCISIVE	INCISIVE project	Offline		
UB	University of Barcelona (test site)	Online Last checked: 2025-08-25 14:07:28 Last response time: 640.62 ms	<ul style="list-style-type: none"> CPU count: 12 CPU Percent: 0.4 Memory Available: 26.81 GB Memory Total: 31.25 GB GPU count: 1 	<ul style="list-style-type: none"> IP: 161.116.72.233 Docker: Docker version 28.2.2, build e6534b4 Data Paths: Sandbox: 1, Data: 1

Showing 1 to 9 of 9 entries

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Figure 4-40: Interfaz de usuario gráfica, Aplicación, Teams.

Figure 4-40. The EUCAIM federated network as seen at the FP Dashboard.

4.10.2. Launching a Federated Experiment

Login via Life Sciences AAI

The user authenticates through the EUCAIM Virtual Organisation using OIDC. The OpenVRE frontend redirects to the LS-AAI login page, and upon success, identity and access tokens are stored in the backend for subsequent calls to integrated EUCAIM services (e.g. **FEM-orchestrator**, Negotiator).

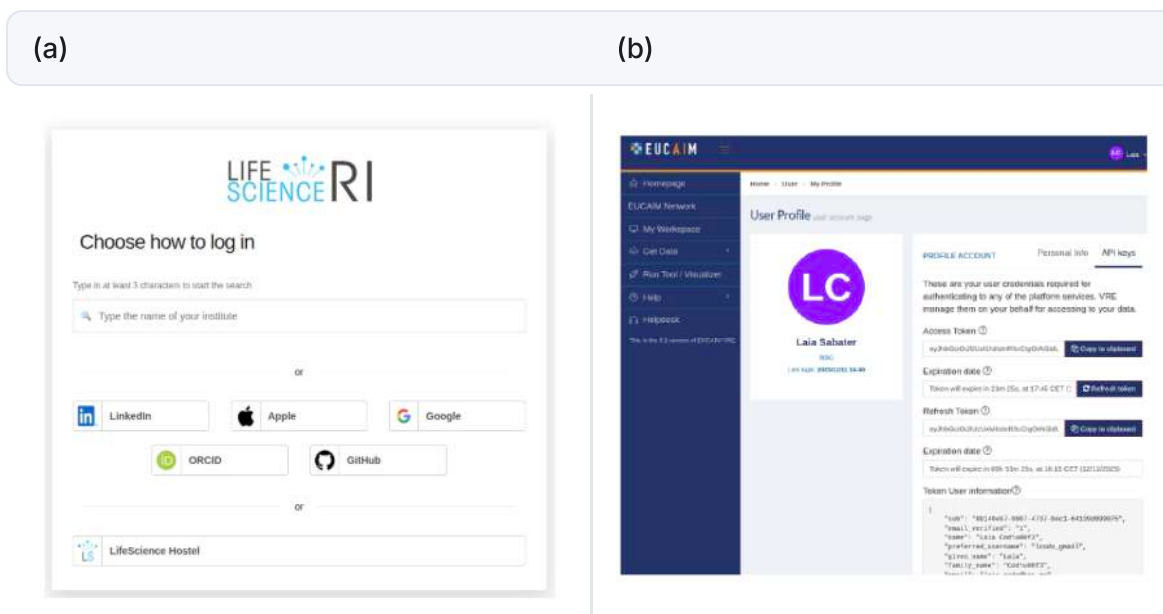


Figure 4-41. (a) FP Dashboard login via Life Science AAI; (b) FP Dashboard profile page displaying OIDC issued tokens

Home page

After login, the homepage displays the list of federated software (FEM Workflows and FEM Bundles) as tiles. Each tile offers a brief description of the tool as well as two shortcuts for either running the software (directly opening the configuration form) or learning more about it by opening the software-specific documentation.

The left navigation menu provides access to:

- **My Workspace:** user's input files, results, and available operations
- **Get Data:** mechanisms to upload or register data
- **Run Tool / Visualizer:** searchable list of all available tools
- **Helpdesk:** dashboard documentation and ticket-based support
- **Admin:** admin-only features



Figure 4-42. FP Dashboard home

page

Dataset selection

Input data must be available in the user workspace before it can be bound to a software:

- User-provided files can be uploaded via Get Data → Upload Data.
- Federated datasets from EUCAIM appear under Get Data → My Datasets after successful negotiations in the Negotiator. Selecting a dataset registers its URI (node_id:node/dataset/path) into the workspace so it can be used as input.

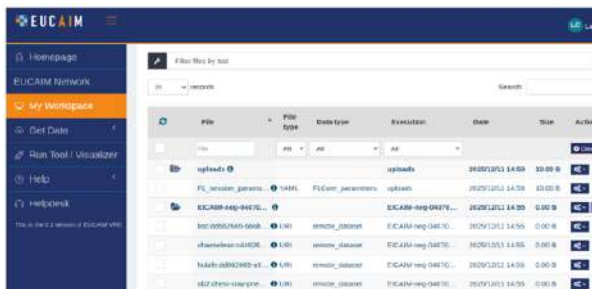


Figure 4-43. Remote dataset

references (URIs) imported at the FP Dashboard workspace ready to be used in a federated run

Tool Selection

Tools can be selected in multiple ways:

- From the homepage (tiles).
- From the searchable list under Run Tool / Visualiser.
- From the Workspace: when users have already selected specific inputs, the Dashboard filters the available tools and presents only those compatible with the metadata of the selected files (file type, format, etc.)

Federated Run configuration

The FP Dashboard presents a structured configuration form with three blocks:

- **Project Settings.** Includes FP Dashboard's specific metadata such as "Execution Name". A dedicated workspace folder is created for the run, storing all generated files and logs.
- **Execution Settings.** Allows configuration of FEM-related parameters, including:
 - Generic execution parameters (e.g. job timeout).
 - Task- or container-specific arguments (only whitelisted parameters are exposed for security).
 - FDN selector: choose participating nodes (aka, *Data Holders*). The selector dynamically enables only nodes that are currently online, approved for the selected software, and have the required container (version and consistency check) available.
- **Input Settings.** Lets the user select which workspace files or dataset URIs will be bound to the tool inputs.

Interfaz de usuario gráfica, Aplicación

Figure 8. Generic FEM execution parameters as displayed in the Execution Box of the FP Dashboard

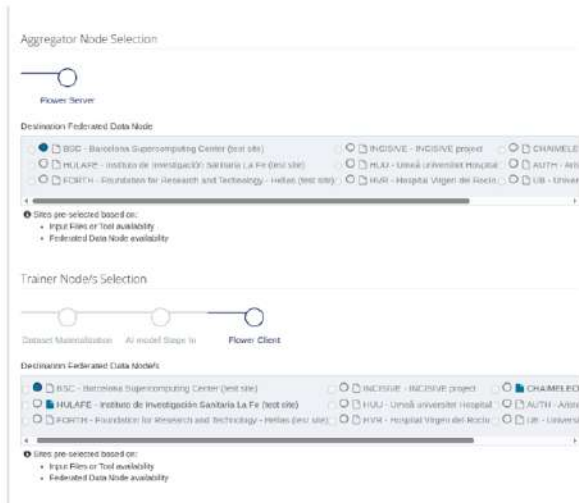


Figure 9. FDN selectors associated

to each FEM task as displayed in the Execution Box of the FP Dashboard

Execution submission

Once the form is validated, OpenVRE triggers the FEM-RUNNER (see [7.2. User Journeys ↗](#)). While the user is redirected to the monitoring view (see user journey B), FEM-RUNNER and the **FEM-orchestrator** perform the workflow resolution, role assignment, and task dispatching across nodes participating in the federated experiment.

4.10.3. Monitoring jobs and retrieving Results

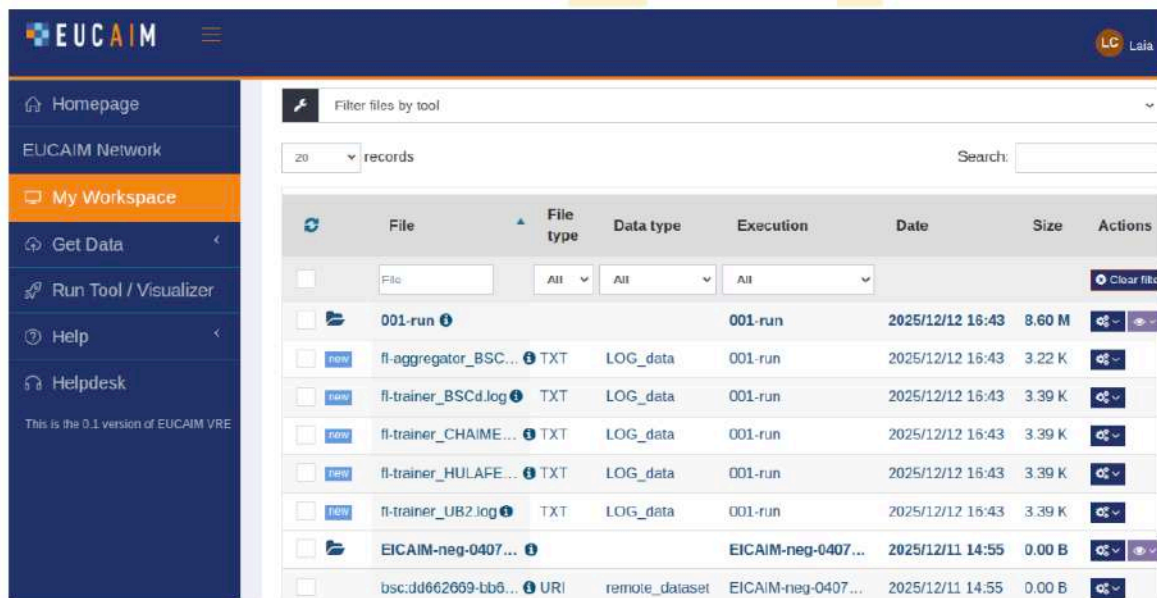
Once a federated experiment has been submitted, the user is redirected to the Workspace, where the Dashboard provides a consolidated and real-time representation of the experiment's lifecycle. This journey covers the period from submission to final retrieval of results.

Job status

The **FP Dashboard** periodically queries the polls **FEM-orchestrator** for job state changes (pending, running, completed) and the user can see the progress on the Workspace under the corresponding run folder.

Logs Retrieval

When the execution of an experiment ends, allowed output artifacts (e.g., derived datasets, metrics, etc) are shown. Currently, only "Log files" are automatically fetched from each node participating in the federated experiment and displayed to the end user. Error traces are also displayed in the FEM-orchestrator to support debugging. Users can display or download the files.



The screenshot shows the EUCAIM workspace interface. On the left is a navigation menu with options: Homepage, EUCAIM Network, My Workspace (highlighted), Get Data, Run Tool / Visualizer, Help, and Helpdesk. The main area displays a table of files with columns: File, File type, Data type, Execution, Date, Size, and Actions. The table contains several log files from a federated run, including '001-run' and 'EUCAIM-neg-0407...'. Each row has a checkbox, a file icon, and a 'Clear filter' button.

File	File type	Data type	Execution	Date	Size	Actions
001-run			001-run	2025/12/12 16:43	8.60 M	Clear filter
fi-aggregator_BSC...	TXT	LOG_data	001-run	2025/12/12 16:43	3.22 K	
fi-trainer_BSCd.log	TXT	LOG_data	001-run	2025/12/12 16:43	3.39 K	
fi-trainer_CHAIME...	TXT	LOG_data	001-run	2025/12/12 16:43	3.39 K	
fi-trainer_HULAFE...	TXT	LOG_data	001-run	2025/12/12 16:43	3.39 K	
fi-trainer_UB2.log	TXT	LOG_data	001-run	2025/12/12 16:43	3.39 K	
EUCAIM-neg-0407...			EUCAIM-neg-0407...	2025/12/11 14:55	0.00 B	
bsc:dd662669-lb6...	URI	remote_dataset	EUCAIM-neg-0407...	2025/12/11 14:55	0.00 B	

Interfaz de usuario gráfica, Aplicación

Figure 10. Log Files generated by a federated run as displayed in the workspace of the FP Dashboard

4.11. Helpdesk

The EUCAIM helpdesk is a single point of contact to collect and reply to questions, incidents, requests, etc. The software responsible for the EUCAIM helpdesk is Zammad and an independent instance has been provided for the project.

Currently, only authenticated/authorised users can access the helpdesk system. Therefore, it is necessary to authenticate yourself at the system so you can be authorised to use the helpdesk.

This is done through LS AAI (Authentication and Authorization system), clicking at this link: <https://help.cancerimage.eu/#login>.

The first page that appears is this:

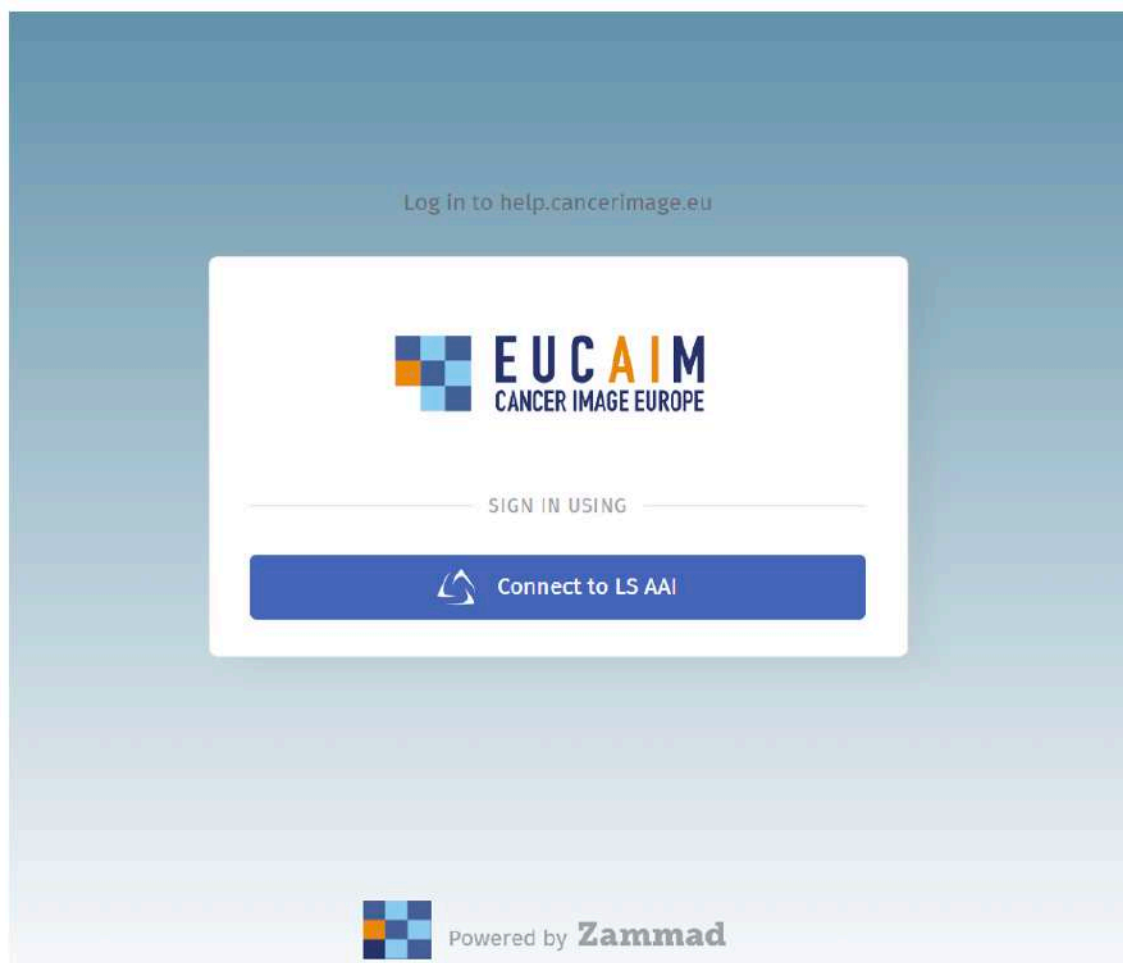


Figure 4-38: Helpdesk access page.

You have to click at the “Connect to LS AAI” in order to authenticate yourself. That will lead you towards the page where you should choose the company/institute/account you are linked to.

This is a “new” Authentication/Authorization technology where it is not necessary anymore to have your personal/individual certificate, instead of this, the institute you work with or your account in several providers, will identify yourself into the system with an individual token.

The process of logging in is quite similar to the rest of the EUCAIM core services. If you do not have a valid account you should check it with your account provider, registration is described in Annex I.

You have to choose the institute you are related with or an account at several service providers, as shown in this page. There is also an option for "LifeScienceHostel".

After choosing the institute or account you will be taken to the proper authentication place where you can provide your username and password. Of course, only valid credentials at institutes and accounts will be accepted.

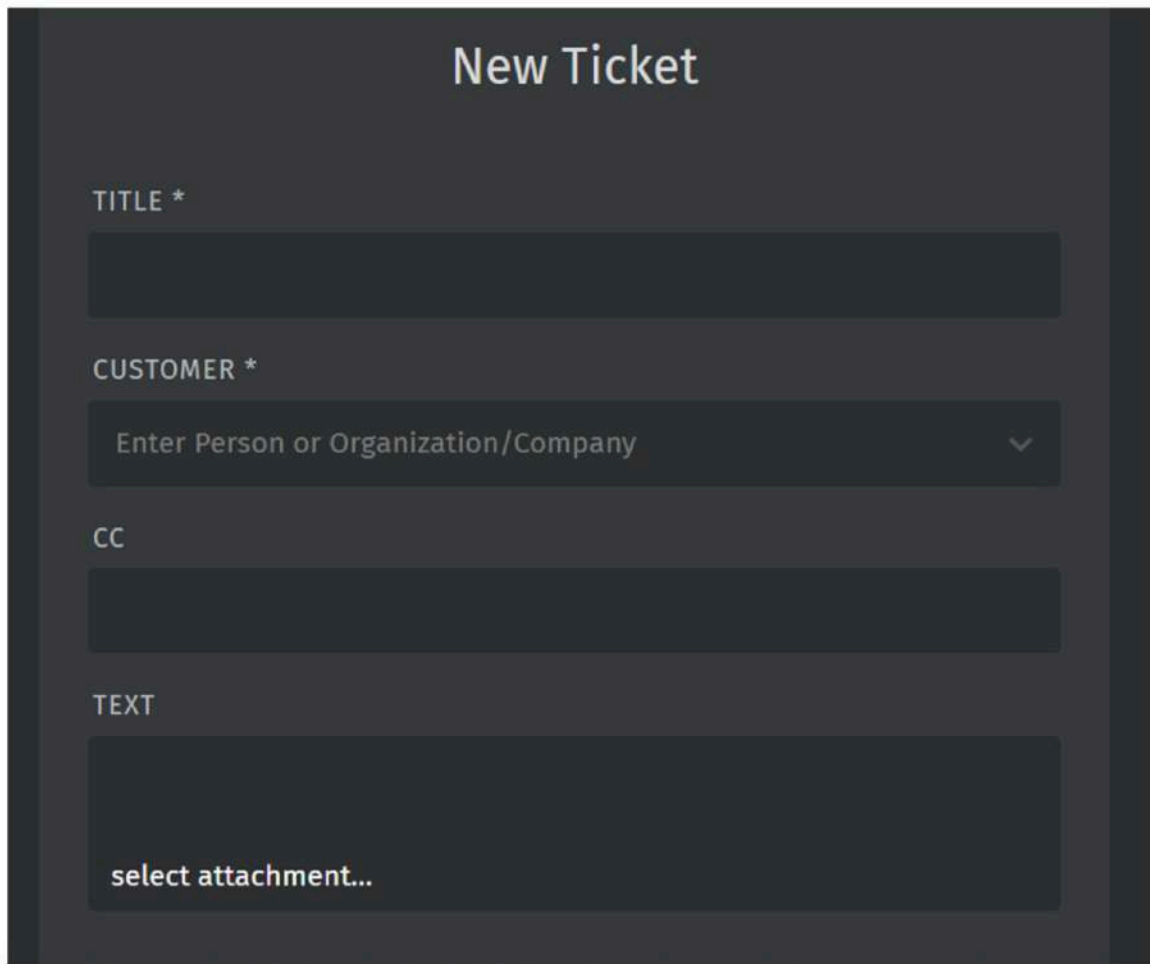
Once you are authenticated, the next times you access the system, you will have your institute shown at the page shown above. You still can use another institute/account if you want. When entering your institute name you can search for it using a partial entry for its name. Before going ahead, you should read the AUP (Acceptable Policy Usage) document, which can be found at the link in your screen as [Privacy policy for the service EUCAIM Helpdesk](https://docs.google.com/document/d/1dM3ms0oeCfiIBw0R08WxS1uP_nHT0__biMbK0_-Jn4w/edit), as described in figure 4-39.



Figure 4-39: Privacy policy for the Helpdesk.

You will be prompted to see and confirm your information, sent from your institute to the EUCAIM Helpdesk. If the data displayed is your data and is correct, you can click at the end of the page "YES, Continue", which will lead you to the EUCAIM Helpdesk system. You can also "cancel" this access operation. After confirming, you will be at the EUCAIM Helpdesk instance provided by Zammad.

You can create/add a new ticket to the system by clicking at the green “plus” button, at the left bottom of the page, where you will be prompted to fill in the content for each corresponding field. Ticket fields (see figure 4-40) with an asterisk (“*”) are mandatory. To conclude the creation of a new ticket you should click at the create button.



The image shows a 'New Ticket' form with the following fields:

- TITLE ***: A text input field.
- CUSTOMER ***: A dropdown menu with the placeholder text 'Enter Person or Organization/Company'.
- CC**: A text input field.
- TEXT**: A large text area with the text 'select attachment...'.

Figure 4-40: Form for the creation of a ticket.

Every ticket has a unique identification number, displayed on the top left of the ticket. You can also use the URL for this ticket.

Every new ticket is assigned to the First Level Support Unit Team. This EUCAIM First Line SU is a group of people who may:

1. reply to you requesting for more information or,
2. Solve this ticket, replying with the solution for the ticket or,

3. Assign your ticket to another Support Unit. Each assigned [SU ↗](#) has specialised people on the matter your ticket is related to. They will reply to you in the ticket.

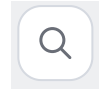
For every reply you have in each ticket you will get an email from the EUCAIM Helpdesk system, informing you of all new activities related to each ticket. In order to leave the system, click in your initials icon, at the bottom left corner and in the "Sign out" button.

For more information about EUCAIM Helpdesk, please refer to the EUCAIM Helpdesk End-User Guidelines at <https://confluence.eji.eu/display/EUCAIM/EUCAIM+Helpdesk+End-User+Guide/display/EUCAIM/EUCAIM+-+Helpdesk> ↗.

Previous
3. Components of the Platform

Next
5. User Guide for Software Providers

Last updated 5 days ago



5. User Guide for Software Providers



5. User guide for Software providers

5.1. Enrolment

This guide is designed to help Software providers navigate the platform and understand the procedures in place. If you keep browsing the dashboard, you will find different 'Become a' sections corresponding to the four main roles that can be part of EUCAIM.

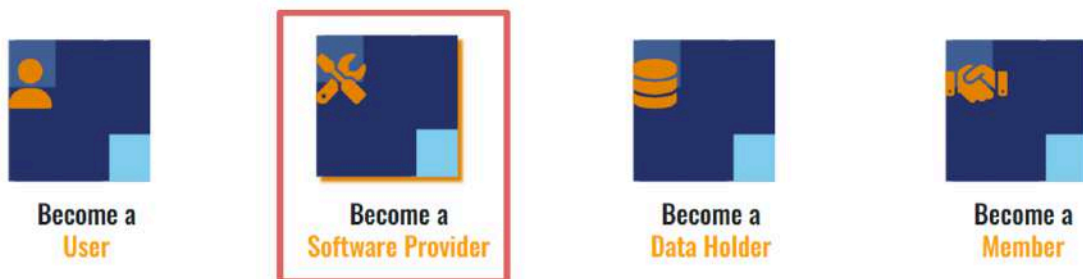


Figure 5-1. EUCAIM Dashboard, user roles information.

By choosing the Become a Software Provider icon, you will obtain detailed information about EUCAIM software specifications and the rules of participation.

Finally, at the end of the page, you will have the opportunity to start the process of becoming a Software provider by fulfilling the Expression of Interest for new Stakeholders.

3. Rules of Participation

To become a Software Provider with EUCAIM, entities must adhere to the following rules of participation:

- **Infrastructure and Technical Requirements:** Software must be provided as containerized images, typically using technologies such as Docker, to ensure compatibility with the central node and federated nodes via container orchestrators like Kubernetes.
- **EUCAIM Terms of Usage:** Software must comply with technical guidelines and terms of usage provided by EUCAIM, including data handling and documentation requirements.
- **User Support and Software Maintenance:** Software Providers must offer user support and commit to long-term maintenance to ensure secure and stable functionality.
- **Minimum Documentation Required:** Provide essential documentation, including user manuals, license agreements, data usage policies, security information, and technical support details.
- **Traceability Mechanisms:** Software must register relevant user actions and provide logs to monitor usage and identify incidents.
- **Monitoring Capabilities:** Software should offer monitoring capabilities to enable EUCAIM to track their status and performance.
- **Benchmarking:** Software Providers must communicate essential information about their software, including descriptions, training datasets, software types, performance metrics, input requirements, and more.
- **Quality Control:** Implement quality control measures, including code-related quality controls, functional validation, and external assessments if applicable.
- **Compliance with Security and Privacy Requirements:** Software handling sensitive data must comply with GDPR guidelines and other legal and ethical requirements related to data protection.
- **Compliance with Applicable Legislation:** All software must comply with current European and national legislation, as well as upcoming regulations that may come into force during the EUCAIM Project.

Becoming a Software Provider with EUCAIM offers a unique opportunity to contribute to groundbreaking cancer research while adhering to essential guidelines and standards for software development and deployment. Join us in our mission to transform cancer management through innovation and collaboration.

BECOME A SOFTWARE PROVIDER NOW

Figure 5-2. EUCAIM Dashboard, how to become a Software Provider

EUCAIM
HOME PUBLIC CATALOGUE MY PROFILE

Expression of Interest from new Stakeholders

This form asks for your contact details, and for more specific information on your capabilities, experience and how your organization could join the EUCAIM project.

Date

Contact person for the work/project, full name
Gender

Email address **Telephone number**

Job title **Organization, full legal name** **Department name**

Street **Town** **Post code** **Country**

Main interest (select one or more)

- 1. Data Holder (Primary Use Clinical Repository and Hospital, Data Warehouse architecture)
- 2. Repository (Secondary Use Research Repository)
- 3. Technical Resources and Expertise (Storage / Computation / Services / Interoperability)
- 4. AI Tools and Solutions
- 5. ELSI - EHDS
- 6. Dissemination and Communication

Capabilities and functionalities

Figure 5-3. EUCAIM Dashboard, Expression of Interest.

Once you have expressed the interest to become a software provider, you will be invited to submit an application that will be reviewed by the access committee. Additional information about the requirements of applications running in the EUCAIM platform can be found in <https://github.com/chameleon-eu/workstation-images>. The Technical Team will contact you, by means of the Helpdesk, to assist you in the preparation and validation of your tools.

5.2. Software Integration

The normal procedure to integrate an application is creating a Docker image containing the main binary or script file and all the dependencies/libraries required to execute it. But there are some conditions that the image must be considered concerning security and data access. Detailed instructions on software packaging are provided in the [Software Packaging Guide ↗](#).

Those instructions do not apply to applications that are expected to be downloaded by the data holders to prepare the data, and refer only to those applications to run inside the EUCAIM platform.

5.4. EUCAIM Software registry

EUCAIM provides a software registry for those applications that has to be updated to work in the context of EUCAIM. The software registry is based on a Harbor registry of artifacts, and it is deployed in <https://harbor.eucaim.cancerimage.eu> ↗. The registry can store OCI-compatible software containers, helm charts and other artifacts. Non-OCI compliant artifacts can be encoded through a tool such as ORAS (<https://oras.land/> ↗) or (preferably) can be uploaded to EUCAIM's dedicated drive (see next subsection).

The EUCAIM Software Registry is restricted to users in the Harbor subgroup of the EUCAIM VO (<https://perun.aai.lifescience-ri.eu/organizations/3345/groups/43153> ↗). Enrolment to this subgroup can be requested on the first access to the registry. A valid LS-AAI account is needed. Next figure shows the page that will be shown at the first access time and the form to be filled in to request access to the subgroup.

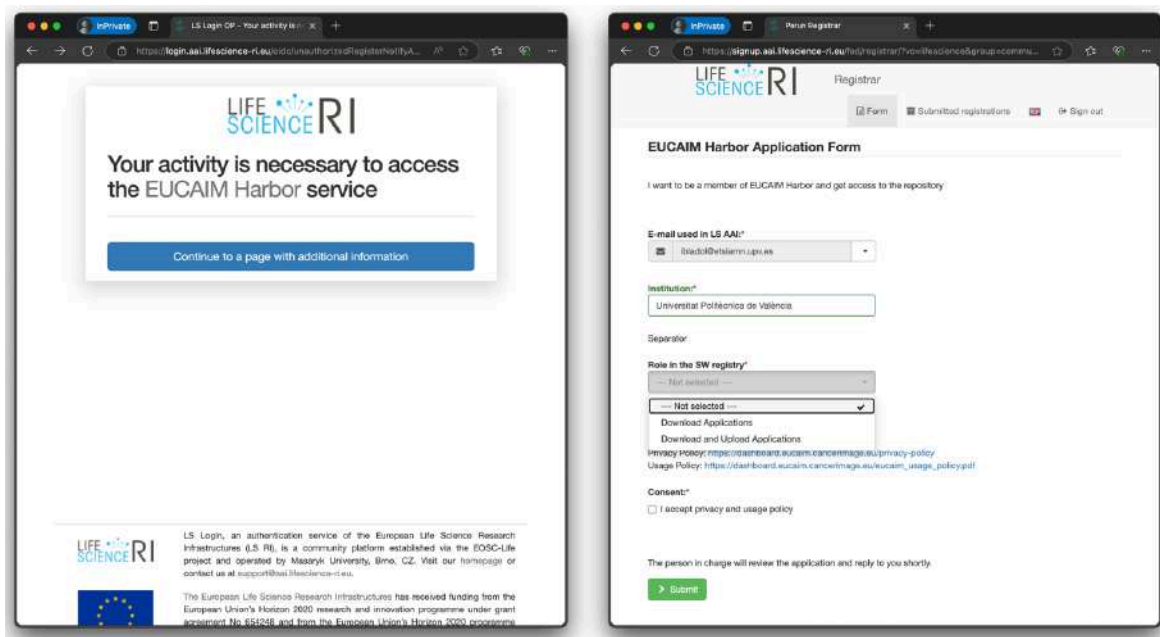


Figure 5.4. Landing page when you access the harbor registry for the first time (left) and registration in the harbor subgroup (right).

Data holders can grant access to pull software artifacts once they register in the platform through the specific section in the Dashboard (see section 6). Only Software developers can push SW artifacts in the repository, which have to be validated by the technical committee. Software developers register through the form indicated at the beginning of this section.

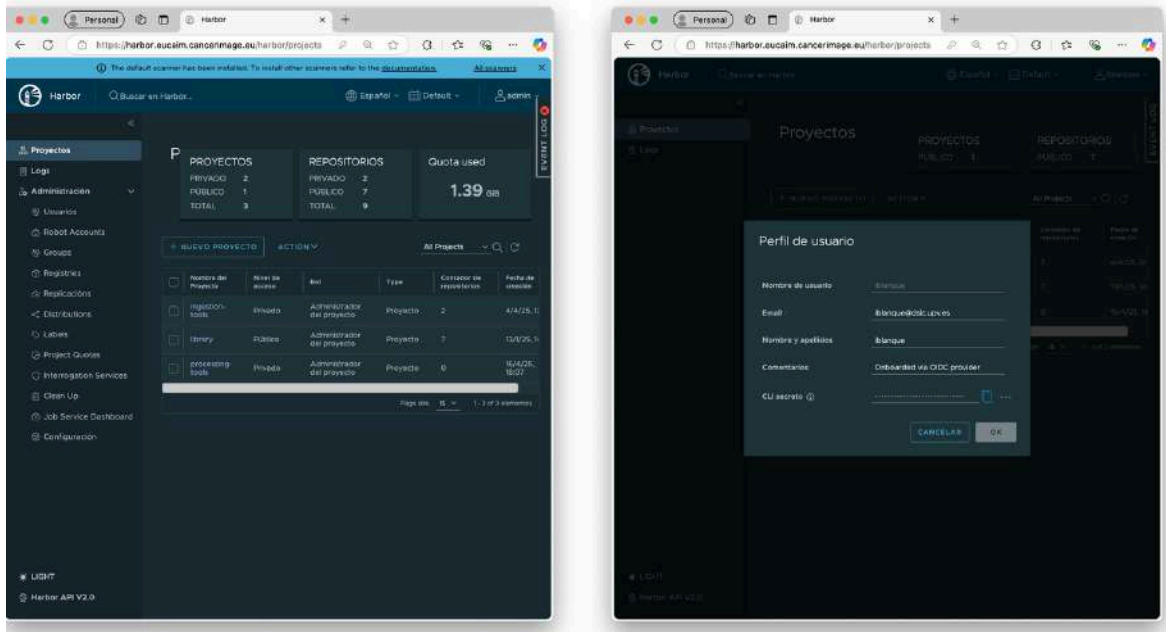


Figure 5.5. View of the user profile option (left) and the information on the user profile (right) in the SW registry of EUCAIM.

Two subrepositories (projects in the harbor jargon) are available:

- ingestion-tools, for tools developed to prepare or upload the data by the data holders. These tools would be downloadable and could be used by the Data Holders in their own premises, once they have access granted.
- processing-tools, for tools developed to process the data. The tools in processing-tool project will be mainly used in the processing environment. Tools cannot be downloaded outside of the Processing environment boundaries.

The procedure for pulling or pushing an OCI-compliant artifact (e.g. a Docker container) is the following:

- Retrieve the user and access token through the harbor registry user profile (see figure 5.1)
- Open a terminal on a computer with Docker installed (version 25 or higher).
- Login through `docker login harbor.eucaim.cancerimage.eu -u <<user>> -p <<token>>`, replacing <> and <> by the values obtained in the user's profile.

- Push an image using the standard Docker command: `docker push harbor.eucaim.cancerimage.eu/<<project>>/<<image_name>>:<<tag>>`, replacing `<<project>>` by one of the two projects available: ingestion-tools if the tool is related to data preparation and uploading or eucaim in case of a processing tool. Replace `<<image_name>>` and `<<tag>>` by the appropriate values.
- Pull an image using the Docker command: `docker pull harbor.eucaim.cancerimage.eu/<<project>>/<<image_name>>:<<tag>>`. Replace the values into curly brackets by the appropriate values.

In the case that you want to upload a binary file that cannot be (or shouldn't be) containerised (such as Windows/MacOs native tool for data preparation with its own Graphical User Interface), binaries can be embedded in an OCI package or (preferrably) upload it to the drive repository of EUCAIM (see next subsection). The next steps describe how to convert a binary into an OCI package and upload it in the harbor repository. Additionally, you instructions to download it and unpack the binaries is provided. In this case, we suggest to provide the `docker pull harbor.eucaim.cancerimage.eu/<<project>>/<<image_name>>:<<tag>>` as the download link.

- The procedure for pulling or pushing non OCI-compliant artifacts (e.g. a zip file) is the following:
- Retrieve the user and access token through the harbor registry user profile (see figure 5.1)
- Install ORAS tool ([https://oras.land/docs/installation ↗](https://oras.land/docs/installation)).
- Login in the registry using the command `oras login harbor.eucaim.cancerimage.eu`, and provide a username and a token (see figure 5.1).
- Push an artifact (e.g. a zip file) with the command `oras push harbor.eucaim.cancerimage.eu/<<project>>/<<artifact-name>>:<<tag>> --artifact-type application/zip ./myfile.zip`. The artifact-type option is a descriptive string. Replace `<>>`, `<>` and `<>` as described in the previous case.
- Pull an artifact with the command: `oras pull harbor.eucaim.cancerimage.eu/<<project>>/<<artifact-name>>:<<tag>>`

In this case, we suggest to provide the `oras pull` `harbor.eucaim.cancerimage.eu/<<project>>/<<artifact-name>>:<<tag>>` as the download link.

5.5. EUCAIM Drive

A repository has been deployed to upload and download other type of objects, such as non-containerised applications or documents. The repository is available in the URL <https://drive.eucaim.cancerimage.eu/> and it has two main areas:

- **General Documents:** An area where the general documents of the project are stored and linked. This area is restricted to admin users for uploading and public links to those documents are available in the Document section of the Dashboard.
- **Applications:** An area where the documentation and the binaries of the applications can be uploaded and downloaded.

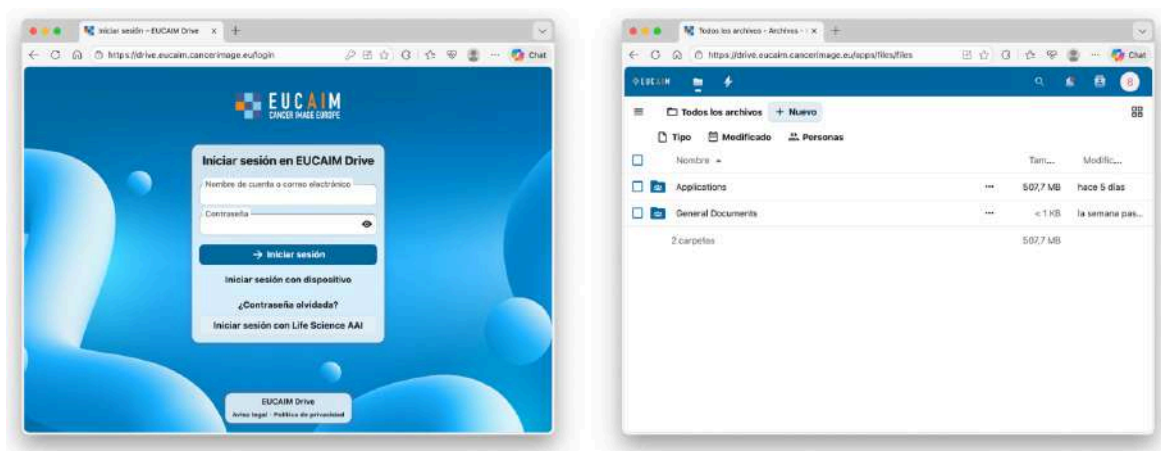


Figure 5.6. EUCAIM's drive, Logging in the applicaton (left) and view of the two main folders (right).

Only users in the "pull" or "push" subgroups of the harbor group in EUCAM LS-AAI VO can access the documents through the interface. Users in the "push" subgroup can create folders and store documents in the Application area. Software developores who want to upload binaries and documents for their tools should create a folder with the tool name and store the data there, creating public links to make the objects accessible.

To create a symbolic public link, a user with write permissions can click on "Details" and copy the public URL created by the system. Figure 5.7 illustrates a screen shot of the process.

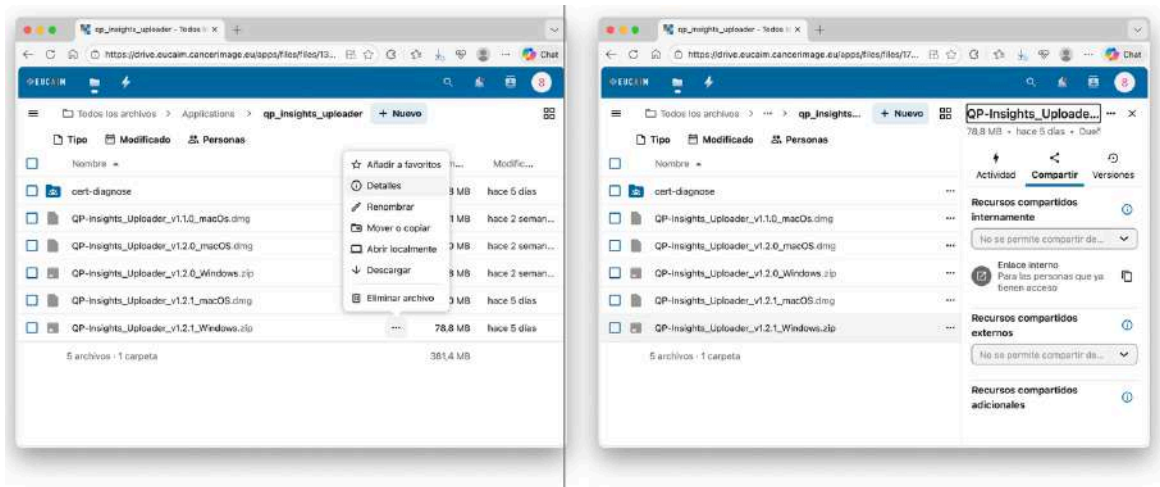


Figure 5.7. EUCAIM's drive, Details on a file from the applications folder (left) and obtaining a public link (right).

5.6. Software Registration in the catalogue

Once you have the Dockerfile describing your image, you have to make it available (with all the files needed for building the image) to us in a public or private repository, in Github or any other source code repository provider. And finally create a request in the HelpDesk, under the category "Technical Support Team". We will review the application and eventually come back with suggestions and changes. Once approved, you can proceed with the registration in the catalogue.

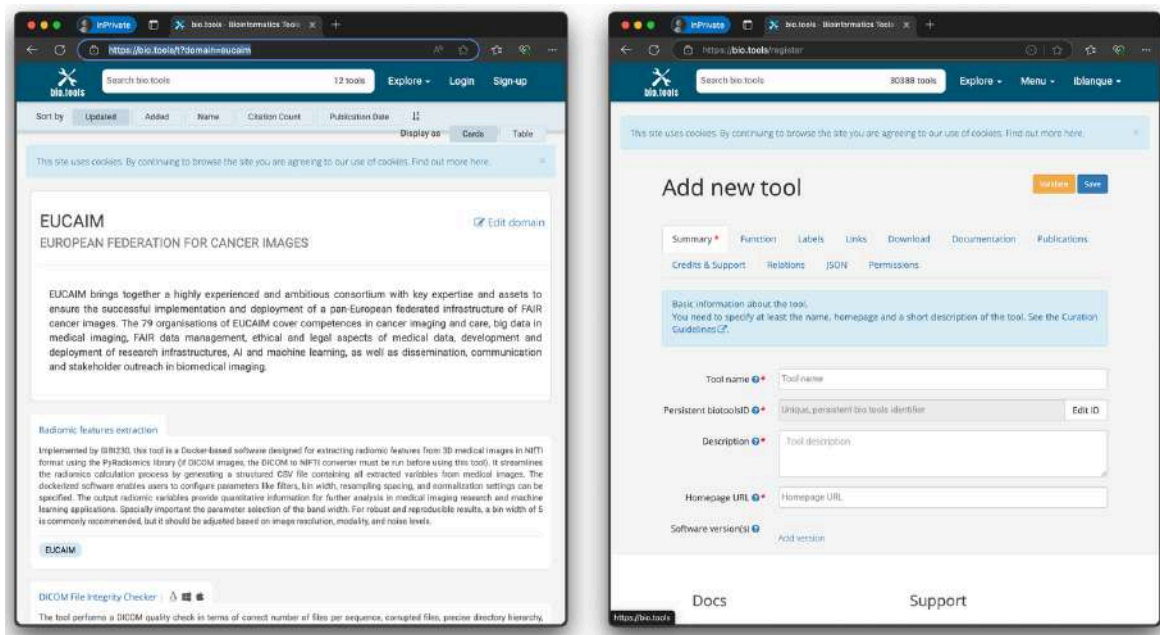


Figure 5.8. EUCAIM domain in Bi.tools (left) and registration of a tool (right).

EUCAIM manages a catalogue of descriptions of the applications and a registry where the binaries of the applications can be deposited. The catalogue is available in the EUCAIM domain of the ELIXIR bi.tools (<https://bio.tools/t?domain=eucaim> [↗](#)). You should create an account and create a tool under this group. Once you have created an account, you can register your tool in the "Menu" / "Add a tool" option. It is important that you fill in as much information as possible. You can use the downloading URLs of the registry described in the previous section as the download URLs. The inclusion of the tool in the EUCAIM domain can be requested by inserting the value "eucaim" in the "collections" field of the "Labels" panel. The inclusion in the group has to be validated by the domain manager.

Previous
4. User Guide for Researchers

Next
6. User Guide for Data Holders

Last updated 20 days ago



6. User Guide for Data Holders



This guide is designed to help users wishing to become a new member to navigate the platform and understand the procedures in place. The EUCAIM platform facilitates data sharing, reuse, and collaborative research within a governed framework to ensure transparency and compliance. If you keep browsing the dashboard, you will find different *'Become a'* sections corresponding to the four main roles that can be part of EUCAIM.



Figure 6-1. EUCAIM Dashboard, user roles information

EUCAIM defines two ways of participating as data holders, each with unique capabilities and contributions in both research and clinical environments:

- Data holders transferring data to a Reference Repository Data Holders: If you have completed research projects and aim to maintain your datasets for long-term research availability but need support, EUCAIM offers a solution. By contributing to one of our Reference Nodes, you will ensure that data remains accessible to other researchers. The process involves signing a Data Transfer Agreement (DTA) and sharing information about your project, metadata catalogue, and software. We will guide you through data de-identification, making your contribution hassle-free.

- **Federated Data Holders:** If you manage active repositories and want to maintain your datasets within a federated node, EUCAIM provides the platform. As a Federated Holder, you'll collaborate with us through a Data Sharing Agreement (DSA). Share details about your research project, metadata catalogue, and software, along with information about your local computational and storage capabilities.

6.1. Data Preparation

EUCAIM defines three interoperability layers:

- Tier 1: Interoperability at the level of the Catalogue.
- Tier 2: Interoperability at the level of the Federated Search.
- Tier 3: Interoperability at the level of the Processing.

A detailed description of these interoperability levels is provided in section 2 of this document.

6.2. Contribution through Data Transfer

Data Holders can choose between transferring their data or setting up a federated node. The setup of a federated node requires the provision of storage and computing resources, as well as the setup of the federation services and the development of the adaptors. Details on the federation services and components are given in section 2 of this document.

This section describes the case of Data Holders that opt to transfer their data to one of the reference nodes.

6.2.1. 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.

EUCAIM has set up two reference nodes to host data transferred from the data holders. These two reference nodes are complementary and use compatible but different technologies.

- The UPV node <https://eucaim-node.i3m.upv.es/> ↗ uses an open-source platform developed in the CHAIMELEON project <https://github.com/chaimoleon-eu> ↗ for providing a fully integrated Data Lake, a Registry and a Virtual Research Environment powered by 10 dedicated physical nodes, with a total of 960 cores, 7,5TB of RAM and 25 NVIDIA GPUs with 24GB RAM each. QP-Insights is an imaging data storage and management platform with an integrated DICOM Viewer which supports the upload of DICOM studies and associated clinical data in CSV or XLS formats.
- The Euro-BioImaging Medical Imaging Repository (<https://xnat.health-ri.nl> ↗) is a platform operated by Health-RI (<https://www.health-ri.nl/en/services/xnat> ↗) for storing and managing imaging provided as a service through the Euro-BioImaging ERIC. XNAT is an extensible open-source imaging platform that simplifies common tasks in imaging data management. The Imaging Data should be stored in DICOM format if that is available, but can be also stored in other formats like NIfTI, and derived data and clinical data can also be stored in appropriate file formats as described in the Data Management Plan [REF].

Details on the features supported by each Reference node are provided in Annex III.

6.2.2. Data Transfer to the UPV reference node using QP-Insights

QP-Insights supports the ingestion of DICOM Images and associated clinical data to the UPV reference node using two pathways:

- **Batch upload via QP-Insights Uploader App.** Recommended for retrospective or large-scale repositories as this method enables the simultaneous transfer of multiple studies.
- **Manual upload via QP-Insights Web Interface.** This is a case-by-case upload, ideal for observational studies where individual case handling is preferred.

Important: Before uploading any data, an administrator must **manually create a new project and link it to the EUCAIM profiles who will upload data.** To request this open a ticket in <https://help.cancerimage.eu>, select the "Reference nodes" group (or "Technical support team" if unavailable) and submit a request with the title: "Create a data ingestion imaging biobank" providing a name for the biobank, the username in EUCAIM who will manage it and an URL if available. You will receive a response shortly after submission..

6.2.2.1 Batch upload via QP-Insights Uploader (Desktop App):

The [QP-Insights Uploader](#) ↗ desktop application can be downloaded from the EUCAIM [harbor registry](#) ↗. Guidance on how to download softwares is provided in Section 5.4.

First, log in using your **UPV reference node credentials**. If you previously accessed the platform using LS-AAI, you may need to manually set up a password. You can do this under:

[Main page](#) ↗ → User Account → Account security → Signing in → Add a password.

Once logged in, select the type of data you intend to upload first: imaging or clinical.

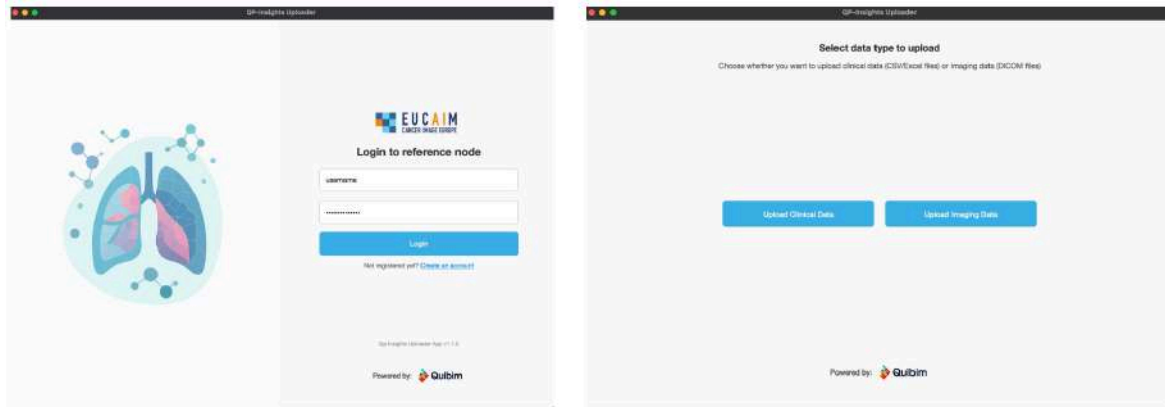


Figure 6.2. (Left) Log in menu. (Right) Selection of data type.

Upload of images

After selecting **upload of image data**, choose the project and timepoint for your upload in the dropdown menu. Timepoints (e.g. Diagnosis, follow-up...) are defined during the project creation and are associated to a given project. Then, select the folder that contains the images that you want to upload to the project by clicking "Select folder".

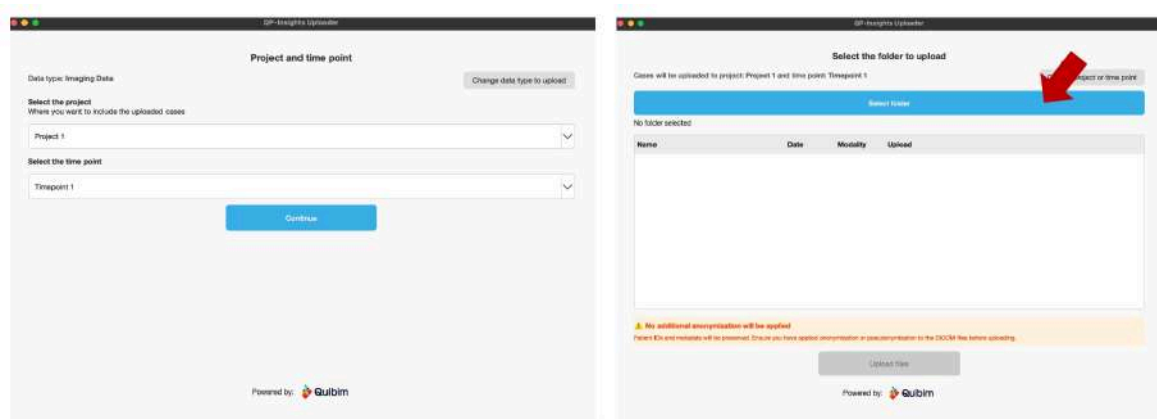


Figure 6.3. Upload of image data. (Left) Select the project and timepoint in a dropdown menu. (Right) Select folders where data is located.

The application will scan all patients, studies, and series present in the selected folder. Select the items you want to upload and start the process. The upload status updates dynamically. When complete, each item will be marked as uploaded or uploaded with errors. If an error occurs, a downloadable file describing the issue will be automatically generated.

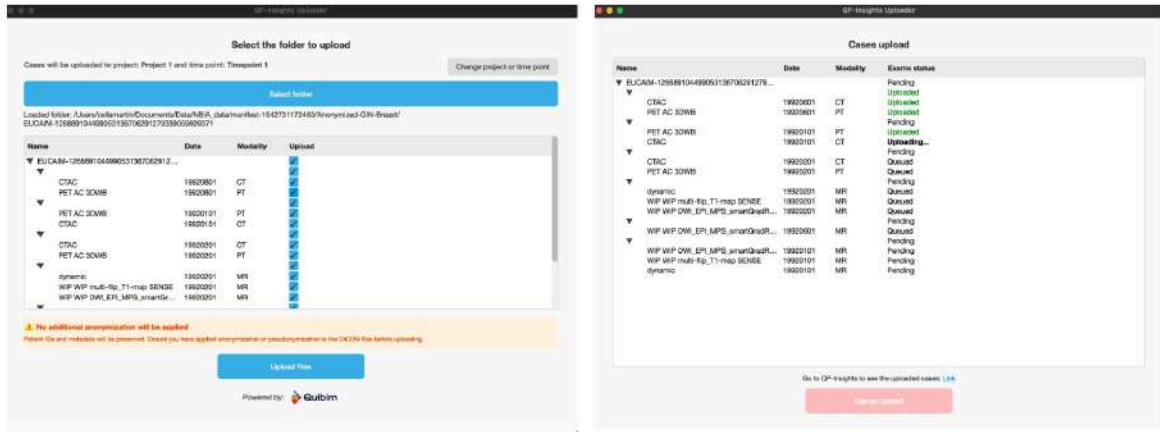


Figure 6.4. Upload of image data. (Left) Select patients to upload. (Right) Status of the upload.

Upload of clinical data

After selecting **upload of clinical data** select the target project. Then, upload the file containing the clinical data. Both Excel and CSV formats are supported. Please ensure that **the first column is labeled PatientID** and the values in this column **match the DICOM PatientID tag (0010, 0020)** of your image data. This will ensure your clinical data is correctly linked to the image data. As with image uploads, any errors will generate a downloadable tabular report.

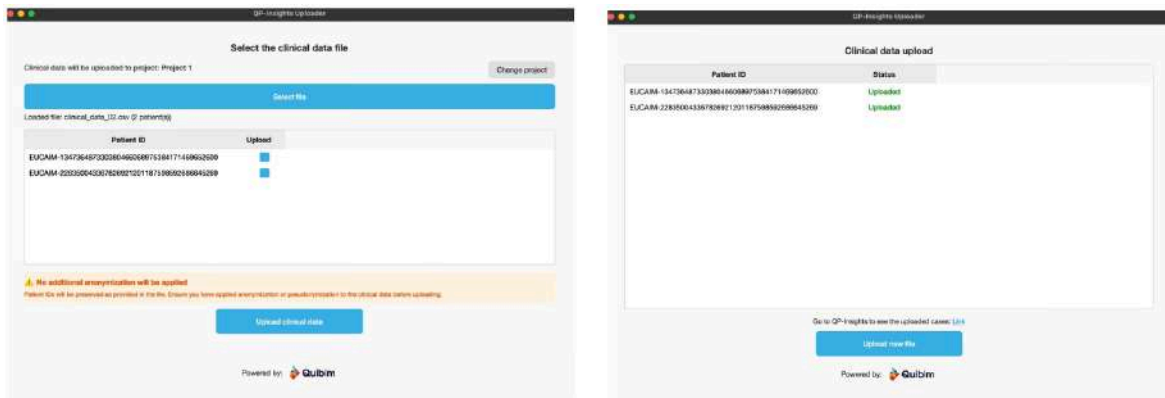


Figure 6.5. Upload of clinical data. (Left) Select the patients which clinical data you want to update. (Right) Upload status.

Accessing Uploaded Data

Once uploaded, the exams can be accessed through the QP-Insights platform at: <https://qpinsights.eucaim-node.i3m.upv.es/cases/subjects>. Uploaded images can be viewed using the integrated **DICOM Viewer**. The DICOM Viewer **supports the annotation of data** in the reference node, offering tools to extract ROI measurements and generate segmentation masks. Annotations can be created **manually from scratch or semi-automatically**. In the latter case, AI tools can be executed to produce preliminary annotations that clinicians can then refine and correct, thereby accelerating the annotation workflow.

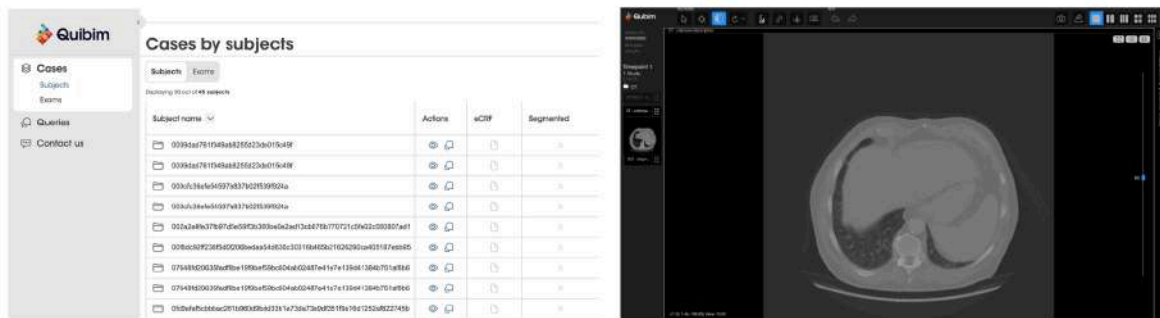


Figure 6.6. (Left) Uploaded subjects view in the QP-Insights platform. (Right) Integrated DICOM Viewer.

6.2.2.2 Case-by-case upload via QP-Insights Web Interface:

To upload data using the web interface (no installation required), access <https://qpinsights.eucaim-node.i3m.upv.es/cases>.

To begin importing a new imaging exam, click the "Import exam" icon located in the upper-right corner of the workspace.

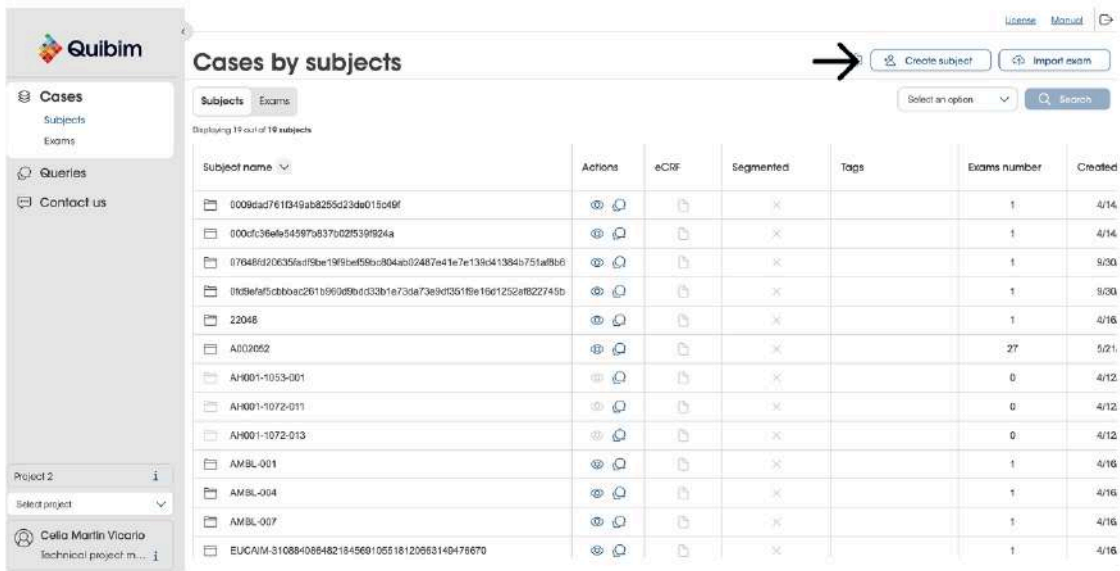


Figure 6.7. (Left) To import a new imaging exam, click on the icon "Import exam" in the upper right corner of the workspace.

You will be prompted to select the project in which you want to upload the exam. Next, choose the subject from the drop-down list. If the subject does not yet exist, type the desired subject name. A button will appear to the right of the search field allowing you to create the new subject when no match is found. After that, select the appropriate timepoint from the drop-down menu.



Figure 6.8. (Left) Project selection. (Center) Subject selection. (Right) Timepoint selection.

To add imaging data, click inside the upload box to browse for your DICOM files or drag and drop them directly into the window. Once selected, the interface will display the list of exams identified in the upload. All series are automatically checked for upload, but you may deselect any series you do not wish to include by unticking the corresponding boxes in the "Included" column.

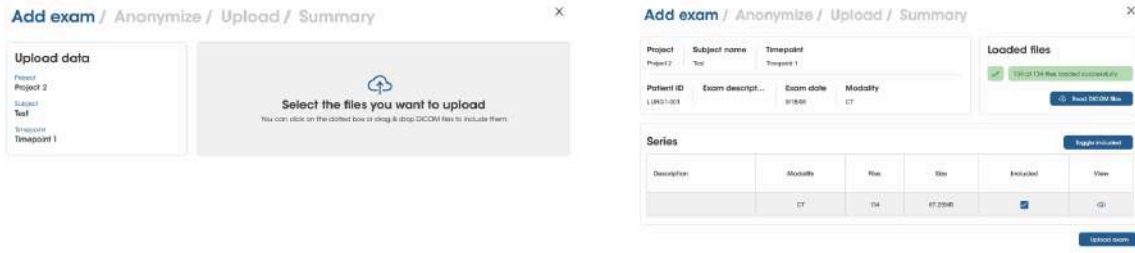


Figure 6.9. (Left) Add exam menu. (Right) List of exams loaded.

During the upload, you will see live progress updates. When the process completes, a summary of the import results will appear. Select "Go to Cases" to close the summary and return to the Cases view.

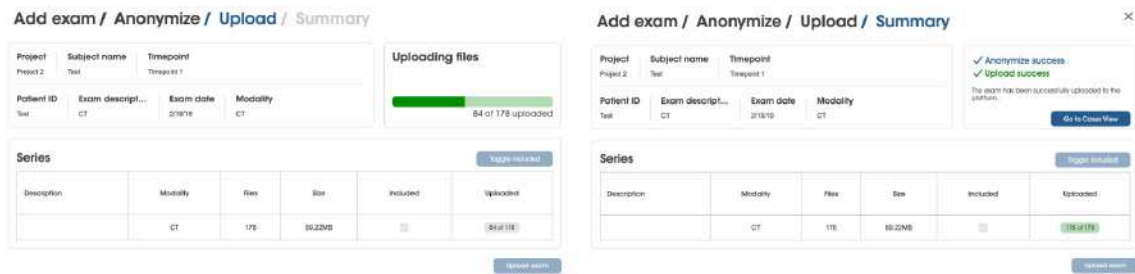


Figure 6.10. (Left) Upload progress. (Right) Summary of the exam import process.

If your project includes an electronic Case Report Form (eCRF), you can fill it out manually for each subject. Open the eCRF by clicking the file icon in the Cases view. An eCRF template must be uploaded for the project beforehand. The form will then be displayed and can be completed directly within the interface.

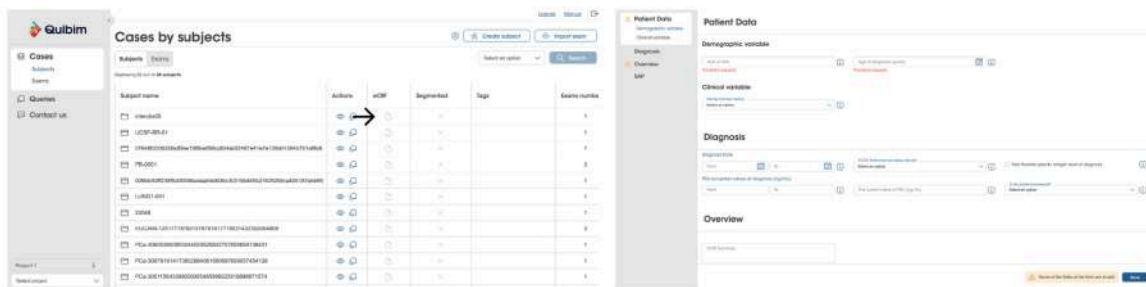


Figure 6.11. (Left) Open the eCRF of a subject. (Right) Example of an eCRF template of a subject.

Additionally, the QP-Insights application includes a set of DICOMWeb standards-based functionalities for working with DICOM files via API.

6.2.2.3. Creating the dataset:

Datasets uploaded to UPV reference node won't be immediately published, it is necessary first to create a dedicated dataset from the data that was uploaded to the platform. QP-Insights 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 name, description and purpose, along with the dataset type and method as shown in Figure 6.12. The dataset creation will later be reflected in the dataset explorer.

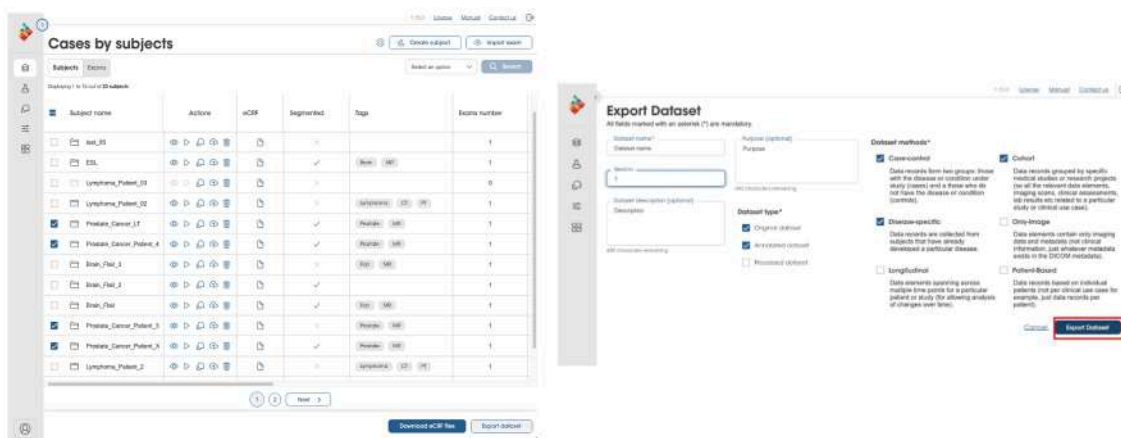


Figure 6.12. (Left) Manually select the cases that will be part of a dataset. (Right) Complete dataset details and configuration before exporting it.

6.2.2.4. Upload metadata

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

1. **Release the dataset** in the catalogue of the node. To do it you have to access the [catalogue of the node](#), look for the dataset (initially with the flag "draft", only visible to you) and enter the details page (Figure 6.13). Here verify that the draft of dataset is correct, review all the properties, ensure all of them are filled in, including the contact information and license. You can even create a Virtual Environment following the instructions given in Section 4 to explore the contents. Then you can "release" the dataset, there is an option for that in the "Actions" button.

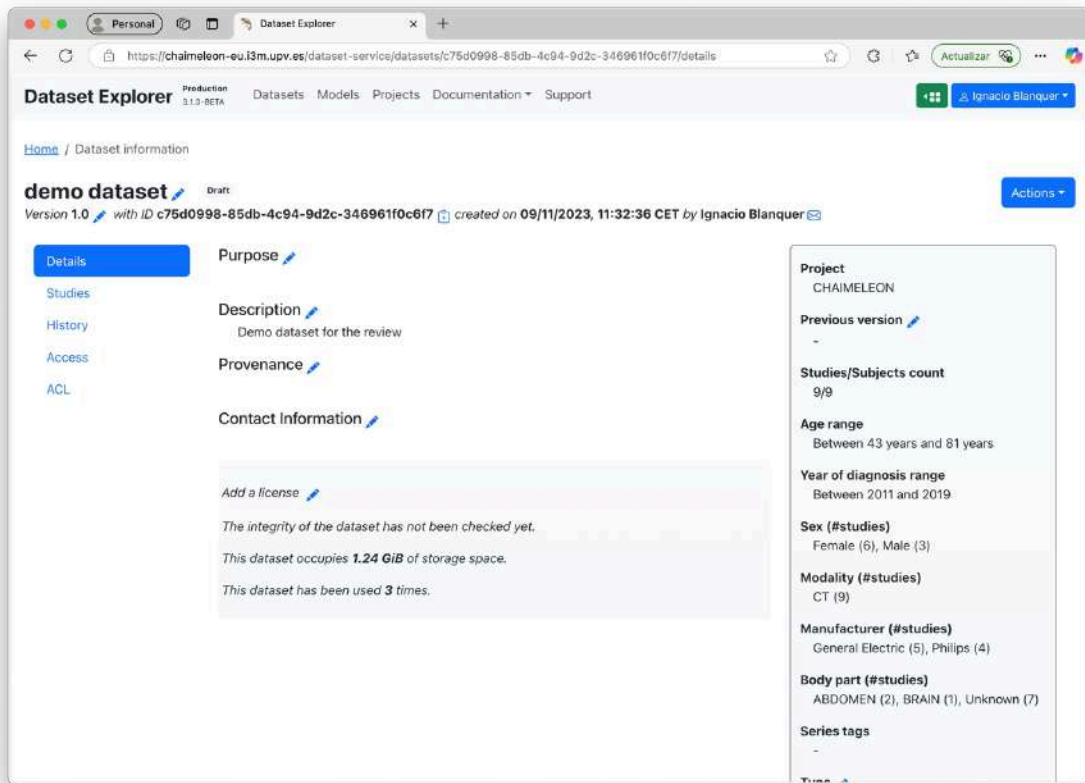


Figure 6.13. Dataset metadata update.

2. **Register the dataset in the EUCAIM's catalogue.** This is required for all datasets, including those in Tier 1. The process of registration will be automated but it is manual for the current time being. The dataset schema can be downloaded from this [link](#) \rhd . In case of doubts with the terminology, use textual descriptions. It is very important that the Identifier matches the id that the federated search will provide for this dataset, as it is the only field that cannot be changed afterwards. For example, in Figure 6.13 the id would be `c75d0998-85db-4c94-9d2c-346961f0c6f7`. Once you have filled in all the information, create a ticket on the [helpdesk](#) \rhd under the category "catalogue", providing the spreadsheet file with the metadata information. The helpdesk team will contact you back informing if the dataset has been properly registered or requesting more information. Once it is created, you can access the registry in the catalogue at the URL: <https://catalogue.eucaim.cancerimage.eu/#/collection/<>> \rhd . Additionally the flag "Published" will be added to the dataset in the catalogue of the node and so it will be included in the [EUCAIM UPV Reference node community in Zenodo](#) \rhd acquiring a DOI. And finally the dataset will be discoverable through the Federated Search (required for Tier 2 and above).

6.2.2.5. Dataset tracing

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.

6.2.3. Data Transfer to the HealthRI reference node

Please make sure you fulfill the requisites before continuing with uploading your data to the [Health-RI XNAT](#) ↗

6.2.3.1 Uploading Dicom data

Data requirements

Please make sure the DICOM files are de-identified and contain properly formatted headers.

At a minimum, the following headers need to be present:

Attribute	DICOM Tag	Requirement	Example
Patient ID	(0010,0020)	Mandatory	X123456
Image modality	(0008,0060)	Mandatory	CT
Image body part	(0018,0015)	Mandatory	Chest
Image manufacturer	(0008,0070)	Mandatory	Siemens
Data of image acquisition (YYYYMMDD)	(0008,0022)	Mandatory	20241230

For uploading dicom data using CTP is recommended. Please use [this guide](#) to upload your data.

6.2.3.2 Uploading Nifti data

Data requirements

When uploading nifti's you need to supply required dicom headers in json format. Follow the [DICOM specifications for formatting this json](#) file. [This is an example](#) on how such a file should be formatted.

Uploading

Here is an example how to upload nifti files:

https://gitlab.com/radiology/infrastructure/xnatpy/-/blob/master/examples/upload_nifti.py

Here is an example how to upload the dicom json files:

<https://gitlab.com/radiology/infrastructure/xnatpy/-/snippets/4831410>

See detailed instructions on how to use the Clinical Trial Processor (CTP) in [this guide](#).

6.3. Contribution through a Federated Node

The setup of a federated node requires the provision of storage and computing resources, as well as the setup of the federation services and the development of the adaptors. The federated node implies the following actions, according to each interoperability layer:

- Tier 1: (Optional) Set up a local catalogue and federate it to the central catalogue.
- Tier 2: Set up a mediator component to adapt the API of the federated search explorer to the local search API, matching the format defined in the hyperontology for the searching terms.
- Tier 3: Set up a processing environment and a materialisator for the federated processing.

The recommendations for the hardware of the federated node at tier 2 are the following:

Hardware	Minimum
<i>CPU</i>	4 Cores /8 Threads
<i>RAM</i>	32 GB
<i>Operating System Drive</i>	160+ GB SSD
<i>Data Storage</i>	1x (Dataset size) Drives

The recommendations for the hardware of the federated node at tier 3 are the following:

Hardware	Option 1	Option 2	Description
<i>CPU</i>	Minimum Cores: 16 >=1.8GHZ	Minimum Cores: 12 >=3.0Ghz	<ul style="list-style-type: none"> • If a GPU is not present, a server-grade, high core-count CPU is necessary for the Second Prototype. • If not comparable by cores, the ideal thread count is 24+.
<i>RAM</i>	64GB		<ul style="list-style-type: none"> • DDR5 is ideal. • ECC memory is highly recommended for stability.
<i>Motherboard</i>	4+ RAM Slot		<ul style="list-style-type: none"> • Make sure to double check the compatibility of selected CPUs with the Chipset of the motherboard. • In the case of DDR5, double check motherboard compatibility with DDR5.
			<ul style="list-style-type: none"> • M.2, NVMe, Gen4 Drives are suggested for the OS

<p><i>Storage</i></p>	<ul style="list-style-type: none"> • 521 GB SSD Drive for Operating System (Either NVMe M.2 PCI Gen4 or SATA III) • 1TB++ SATA III Drive (SSD or HDD) for local storage of medical data 		<ul style="list-style-type: none"> • For data storage size, Data Holders (DH) are expected to plan their purchase depending on the size of the Data they will provide. 1TB is a minimum, with some DHs already planning for 2 TB + datasets. • For data storage, SSD are preferred for speed but are not mandatory.
<p><i>Graphics card</i></p>	<p>NVIDIA Quadro</p>	<p>NVIDIA RTX 3XXXi</p>	<ul style="list-style-type: none"> • 12GB RAM+ is preferred. • Maximizing the amount of Tensor Cores is a priority, most recent GPUs will generally have higher Tensor Core counts. • Ampere and Volta architectures are preferred.

<i>Operating System</i>	Linux		<ul style="list-style-type: none">• The latest version of any mainstream Linux distribution is acceptable: Ubuntu, Alpine or other.• Windows is NOT acceptable, unless absolutely impossible for a DP to setup a Linux environment.
<i>Power Supply</i>			<ul style="list-style-type: none">• Each DH must make calculations depending on the hardware setup that will be selected to make sure that needed Wattage is covered and ideally exceeded to prepare for any future upgrades to the machine.

<i>Internet</i>	100mbps (baseline)		<ul style="list-style-type: none"> Each DH must make best efforts to provide the best possible connection to their Node. Network performance will directly affect node stability and can invalidate AI training or prevent successful demonstrations of the platform.
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6.3.1 Setting up a local node with Mini-node

Data holders that do not have a local node could easily deploy a minimal node capable of providing access to data to data users and link to the EUCAIM federation by means of the EUCAIM mini node (<https://github.com/EUCAIM/mini-node> ↗). The mini node currently features:

- A local catalogue to organize the data provided by the Data Holder.
- An AAI service based on Keycloak, with scripts to automatically configure the permissions.
- An environment to deploy secure Virtual Research Environments for Data Users to access the data securely.
- An Application Manager to manage a catalogue of applications to be deployed in the VREs.
- An endpoint to expose the data to the Federated Search service of EUCAIM.

The mini node will be extended with the capability of running batch jobs and the materialisator component to integrate with the Federated Processing.

6.3.1.1 Requirements

Mini node works on top of a Kubernetes cluster and users scripts in Python. If the expected workload is limited (in the order of 5 concurrent users as a maximum), the whole node can be setup in a single computer, following the Tier 2/3 hardware requirements described at the beginning of the section. Linux is preferable, but the setup of Kubernetes provides a virtualization layer that could overcome this requirement. With respect to the Kubernetes release, despite that the mini node manifests could work with any compatible distribution, we encourage the usage of (minikube) [<https://minikube.sigs.k8s.io/docs/>]. The installation of minikube is well described in the documentation available in the previous link.

Additionally, the host computer must have:

- Python 3.8+ to run the configuration scripts.
- Kubernetes minikube installed and configured with the addons ingress and Helm.
- Kubectl and Helm shortcuts available in your PATH.
- GitHub SSH key configured.

The (<https://github.com/EUCAIM/mini-node>) repository contains the scripts and configuration files to automate the deployment of a mini EUCAIM node using Kubernetes and Minikube. It includes automated installation for Keycloak, Guacamole, and the Dataset Service, with all secrets and configuration injected from a single YAML file.

6.3.1.2 Minikube customisation

The mini node expects that the Data Holder deposits the imaging data on a directory accessible by its dataset service. By default, Minikube's default hostPath provisioner stores PersistentVolume data inside the Minikube VM/container. When using the Docker driver, this means that the data lives inside the ephemeral Minikube container and will be lost if the cluster is deleted or recreated.

To ensure data is stored on the host machine and survives Minikube restarts, we should configure a host directory mount at startup so that `/var/hostpath-provisioner` in Minikube points to a persistent directory on your host.

Example (Linux and macOS host):

```
minikube start --driver=docker --addons ingress \
               --cpus 8 --memory 32g \
               --mount --mount-string="/home/ubuntu/minikube-
data:/var/hostpath-provisioner"
```

Example (Windows host):

Important: For the mount to work on Windows, the host path must be inside a directory that Docker Desktop has shared with the internal Linux VM. This is configured in Docker Desktop → Settings → Resources → File Sharing.

```
minikube start --driver=docker --addons ingress \
               --cpus 8 --memory 32g \
               --mount --mount-
string="C:/Users/<username>/minikube-data:/var/hostpath-
provisioner"
```

Additionally, it is important to have shortcuts for the `kubectl` (the command that interacts with minikube) and `helm` (the command that interacts with the Helm chart manager, as the automated scripts will expect them to be available in the `PATH`). For this purpose, the following commands can be run:

```
alias 'kubectl=minikube kubectl --'
alias 'helm=minikube helm --'
```

6.3.1.3. Mini node installation

For the installation of mini node, the repository provides the Data Holder with three files:

- `install.py` – Main Python script to deploy all services and inject configuration.
- `config.py` – Configuration loader and validation logic.
- `config.yaml` – Example configuration file for secrets, domains, and service parameters.

The steps that should be followed are:

1. Clone this repository:

```
git clone https://github.com/EUCAIM/mini-node.git
```

```
cd mini-node
```

2. Edit `config.yaml` Fill in your domain, passwords, and other required values.
3. Run the installer with `python install.py`:
 - `micro`: Installs Keycloak, Dataset Service, and Guacamole.
 - `mini`: Installs KubeApps, K8s Operator and Federated Search. (In progress).

6.3.2. Tier 1 compliance

The compliance at the Tier 1 level implies that the metadata of the datasets follow the EUCAIM DCAT-AP specification. In this case, the data holder can decide to register the datasets directly on the EUCAIM public catalogue or to set up its own federated registry. At this moment in time, we recommend the former, as the harvester will be released soon. The registration of the dataset on the public catalogue. has been described in section 6.2.2.4. The set up of a local catalogue is optional and comprise the following actions:

- Dataset metadata preparation. This implies identifying the data to be shared and packaged into a dataset, the extraction of the metadata and the appropriate coding into the EUCAIM DCAT-AP terminology and vocabularies. This has been covered in section 6.2.2.3 of this document.
- Setup of a local instance of the catalogue. We recommend using Molgenis and the Catalogue application developed by ErasmusMC. Deployment can be done through a Docker container or a Kubernetes manifest. The catalogue implies a molgenis instance, a postgres database and a catalogue application. The catalogue code is available in [GitLab ↗](#), including the [Dockerfile ↗](#) of the catalogue container and the [Docker Compose ↗](#) file.
- Population of the data following the IM interoperability schema. This [sample file ↗](#) can be used to fill-in the information of the datasets and to create the schemas on the database.
- In the coming future, we will support the federation of datasets through a pull model in which datasets' metadata is harvested by the central catalogue. This will require deploying a local registry and populating it with the information of the DH's datasets.

6.3.3. Tier 2 compliance

The Tier 2 compliance implies that the data that is hosted at the federated node can be searched according to the searching variables defined in the CDM. At this point it is assumed that:

- The Data Holder has set up a repository with the imaging and clinical data.
- The repository has a searching endpoint that can be accessed to retrieve the number of subjects and studies that fulfil a specific filtering criteria, preferably in FHIR.

The steps to perform are:

1. *Metadata mapping.* A mapping of the searchable items described in Tables 14 and 15 in D5.6 to the local variables should be defined. If the data is already transformed to the EUCAIM CDM (see Section 5.2), then this step is not required.

2. *Mediator component development.* If you are not exposing the data following the FHIR Standard, you should develop your own component to adapt the queries. An example of such component can be found in D5.6 "Section 5.2.1 Dataset in a Federated Node, subsection "Guidelines for creating a mapping component".
3. *Request registration in the explorer.* Once the components are deployed, a ticket in the helpdesk, under the category "federated search" should be created with the request "register a new federated search provider".
4. *Mediator component deployment.* The deployment of a mediator component can be done as a Docker container. Section 5.2.1 Dataset in a Federated Node of D5.6 shows an example. Detailed instructions are provided next.

6.3.3.1. Node Registration and Deployment

After submitting and having your registration request accepted, perform the following steps:

A. Generate and Submit a CSR

Create a Certificate Signing Request (CSR) with the Common Name (CN) set to your provider's ID plus the domain broker.eucaim.cancerimage.eu:

```
openssl req -key $REPO_ID.priv.pem -new \  
            -subj \  
            "/CN=$REPO_ID.broker.eucaim.cancerimage.eu/C=X/L=Y" \  
            -out $REPO_ID.csr
```

Where:

- `$PROVIDER_ID.priv.pem`: Name of the private key file to be generated.
- `CN`: Should be `{your_id}.broker.eucaim.cancerimage.eu`. The value of `{your_id}` should have been provided as a reply to the registration.
- `C=`, `L=`: Country and locality codes as needed. Then, submit the resulting `.csr` file to the central node managers through the helpdesk, as a reply to the opened ticket.

B. Receive the Root CA

The central node manager will sign your CSR and return your certificate and provide you with the Root CA certificate file (e.g., root.crt.pem). Save the Root CA file in a secure location (it will be referenced later on).

C. Deploy Beam Proxy and Focus

Use the Docker image `samply/beam-proxy:main` for the Beam and configure the following environment variables (those which are in red are compulsory):

```

version: '3.8'
services:
  beam-proxy:
    image: samply/beam-proxy:main
    environment:
      - BROKER_URL=https://broker.eucaim.cancerimage.eu
      - PROXY_ID=${PROVIDER_ID}.broker.eucaim.cancerimage.eu
      - APP_FOCUS_KEY=${APP1_KEY}      # Randomly generated focus
key
      - PRIVKEY_FILE=/run/secrets/proxy.pem      # Your proxy
private key
      - BIND_ADDR=0.0.0.0:8081      # Listening address
      - http_proxy=${HTTP_PROXY}    # If needed
      - https_proxy=${HTTPS_PROXY}  # If needed
    secrets:
      - proxy.pem      # Proxy private key
      - root.crt.pem  # Root CA certificate
    networks:
      - beam-network

secrets:
  proxy.pem:
    file: ./secrets/proxy.pem
  root.crt.pem:
    file: ./secrets/root.crt.pem

networks:
  beam-network:
    driver: bridge

```

This proxy will handle communications between your node and the central Beam Broker. You may include the Focus service in the same `docker-compose.yml`. Focus will dispatch and translate incoming Beam tasks to your local endpoints and return results via the Beam Proxy.

```

focus:
  image: samply/focus:latest
  environment:
    - BEAM_PROXY_URL=http://beam-proxy:8081      # URL of BEAM
Proxy
    - ENDPOINT_URL=http://mediator-service:8089/ # Your local
Mediator endpoint
    - API_KEY=${APP1_KEY}                       # Same key as
APP_FOCUS_KEY
    - BEAM_APP_ID_LONG=app1.broker.eucaim.cancerimage.eu
# e.g., focus.{provider}.broker.eucaim.cancerimage.eu
  depends_on:
    - beam-proxy
    - mediator-service
  networks:
    - beam-network

```

The variables required are:

- `BEAM_PROXY_URL`
- `ENDPOINT_URL`
- `API_KEY`
- `BEAM_APP_ID_LONG`

For additional optional configuration, see the Focus README:

<https://github.com/samply/focus?tab=readme-ov-file#optional-variables>

C. Final Checks and Deployment

Once you have your metadata mapping, your Mediator component operational, the Root CA certificate included, your CSR signed, and your Docker Compose correctly configured with BEAM Proxy and Focus, proceed to deploy everything and verify that your node has been correctly added to the Explorer.

6.3.4. Tier 3 compliance

The following is the usual “step-by-step” procedure to deploy FEM-client, the component responsible for connecting a node to the EUCAIM’s federated network.

Clarifying Key Points

1. Instructions assume that the software will be installed in a single host (or Virtual machine), isolated from the internal network at the site, able to run Docker containers. Other setups will require a specific adaptation.
2. The FEM-client requires only outbound connections to RabbitMQ message broker and to FEM-Orchestrator. Connections are encrypted using node-specific credentials.
3. No inbound connections or connection to other nodes are required.
4. Data never leaves your host machine. Only results (e.g., model weights) are shared.
5. During installation, you’ll be required to define a read-only `$DATA_PATH` that will hold to your local datasets (formatted according to EUCAIM requirements), and a writable `$SANDBOX_PATH` that tools will use for temporary and final outputs.
6. Tools will be executed as docker containers. Docker Images will be available from EUCAIM central registry, and will follow EUCAIM agreed security requirements.

Procedure

1. Express Your Interest
 - Start by sending an email to the FEM technical team expressing your interest in joining the federated system.
2. Initial Guidance
 - A member of the UB/BSC team will respond with a link to the FEM-client repository: <https://gitlab.bsc.es/fl/fem-client>

- The README includes key information, especially in the "Prerequisites" and "Getting Started" sections.

3. Credentials Delivery

- Once you're ready to deploy, confirm with the team.
- Technical team will then send you a separate email containing your FEM-client credentials.

4. Final Setup & Testing

- After setup, we'll run some tests to verify: 1) Network connectivity; 2) FEM-client's ability to access local infrastructure and trigger container executions; and 3) materialization of data for EUCAIM.

[Previous](#)

[5. User Guide for Software Providers](#)

[Next](#)

[Annex I. Registration of Users in the VO](#)

Last updated 20 days ago

Annex I. Registration of Users in the VO



This annex shows briefly how to create an account in the AAI system in EUCAIM through the EUCAIM Dashboard. It describes the process of creating a Life Science AAI account and the request for membership in the EUCAIM Group. The annex has been extracted from the document Registration of Users in EUCAIM v0.2 11/06/2024, available in <https://drive.google.com/file/d/1EsFYxbzqpyYKgggyeKrKKw3FkVecDby8P/view>.

7.1. Introduction

EUCAIM services have public (anonymous) and restricted (requiring authorisation) services. Public services can be accessed without an account. Access to restricted services requires valid and duly authorised credentials.

The Authentication and Authorisation Infrastructure (AAI) used in EUCAIM uses the Life Sciences AAI (LS-AAI) developed in the frame of the EOSC Life project. The LS-AAI is described in detail in <https://lifescience-ri.eu/ls-login/> and uses institutional Identity Providers from the EduGAIN (<https://technical.edugain.org/status>) federation to authenticate the users.

The authentication consists of the process of verifying that a user is who declares to be. The authorisation is the process of granting the authenticated user the access to a resource according to a policy. Users in EUCAIM will need a valid LS-AAI account and the membership in the EUCAIM Group to get access to the restricted area of the services.

7.2. The Procedure

A user in EUCAIM will need to create a LS-AAI account and to request membership to the EUCAIM group. This process is performed only once and can be initiated through the EUCAIM Platform Dashboard (<https://dashboard.eucaim.cancerimage.eu>). The steps are described in the following subsections.

7.2.1. Creation of a LS-AAI account

LS-AAI accounts can be associated with the user institutional IdP. This is the preferred approach, as the user will not need to create a new user and password and it relates a user to an institution. However, some institutions are not included in the LS-AAI set of trusted Identity Providers, which will require creating a user and a password or to use a personal account, which will require additional verifications when the data access request is performed. The steps are the following:

Access the "My Profile" area of the Dashboard (figure A-1).

Search for the institutional IdP and log in using the institutional credentials (figure A-2). Alternatively, a user account can be created or other personal accounts can be used.

Proceed to the registration of the user in the LS Login (figure A-3). Provide with your name, email, and a username, read the Privacy Policy[5] and the Acceptable User Policy[6] of the LS-AAI service and click on the boxes confirming so.

The account's email needs to be verified (figure A-4). Once the email has been verified, the user holds a valid LS-AAI account.

The details of the account can be modified in <https://profile.aai.lifescience-ri.eu/profile>.

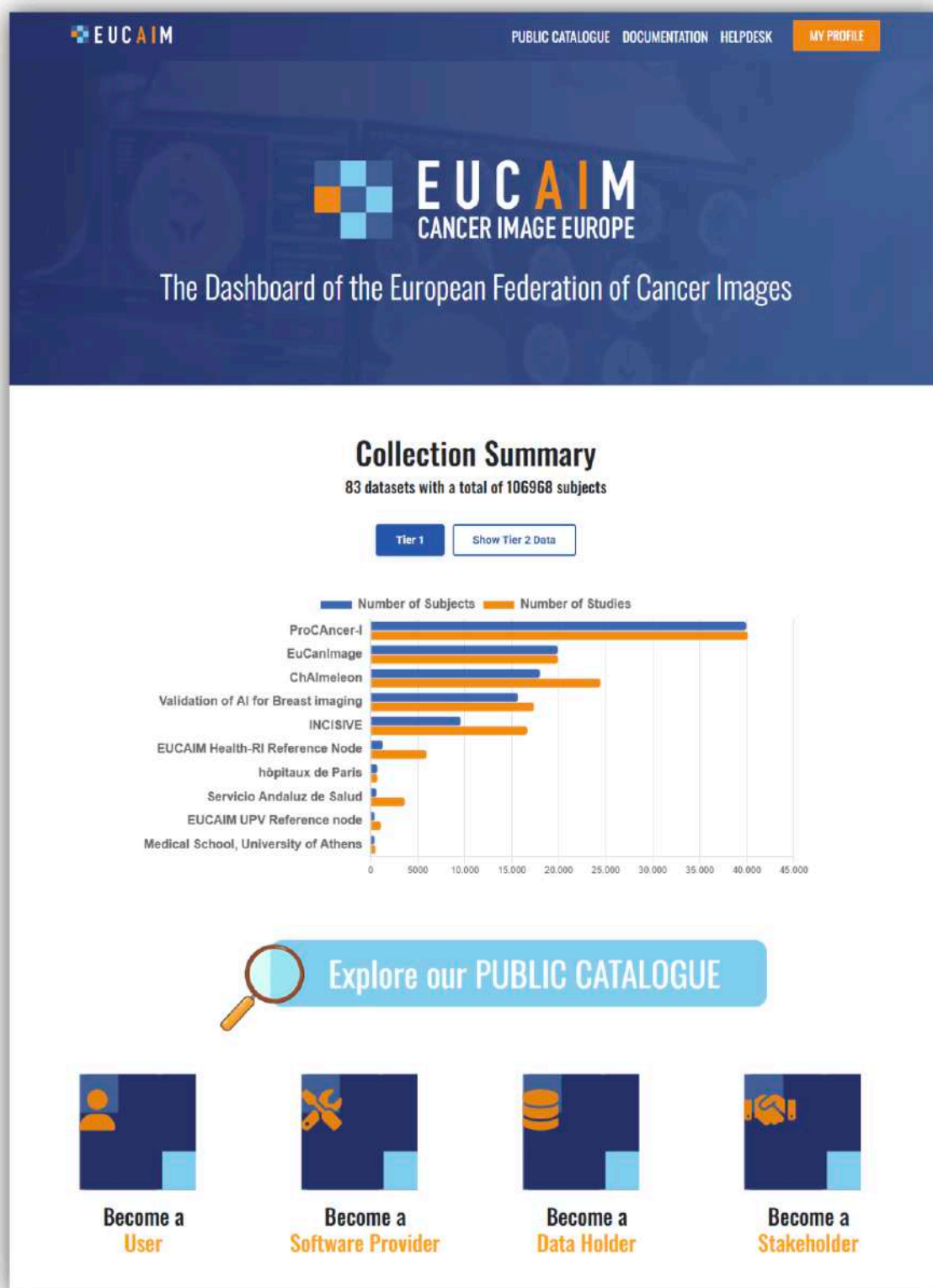


Figure A-1. Dashboard (<https://dashboard.eucaim.cancerimage.eu>), anonymous access.

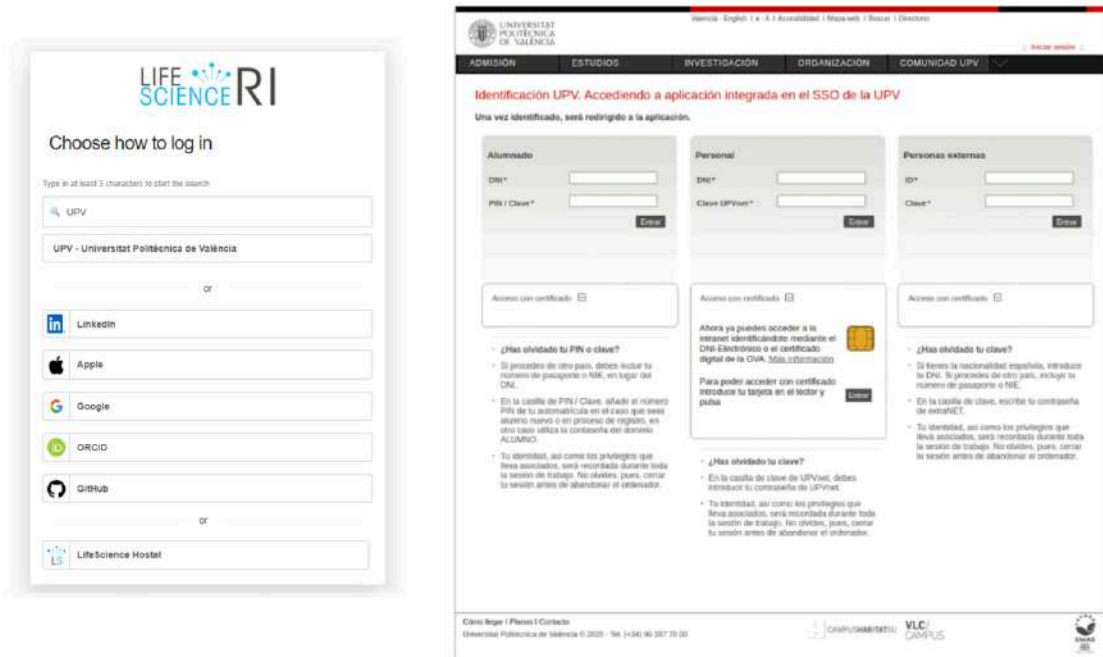


Figure A-2. Find your Identity Provider (Left) and Authenticate through it (right).



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Figure A-3. Proceed to the registration of the user in the LS Login. Provide Name, email and username.



Figure A-4. Request for email verification (left) and Account verified (right).

7.2.2. Membership to the EUCAIM Group

The creation of a LS-AAI account is a prerequisite to access EUCAIM restricted resources, but it does not grant access to them. In order to access the EUCAIM restricted resources, the user has to request membership to the EUCAIM Group. This process is manually verified by the security team of the platform, checking that the account requests are not fake and requesting any additional information if needed. Requests will be registered in the LS-AAI platform.

It is important to outline that users in the EUCAIM Group will only have access to the aggregated data. They will not be able to access actual data. This process will be granted through the negotiator service.

The request of membership goes through the following steps:

Access the "My profile" area of the Dashboard. It will require the authentication through the LS-AAI, and it will present the enrollment form (figure A-5). The enrollment form[7] is prefilled with the user's email and requests the user to provide the institution. Additionally, the user has to read and accept the privacy policy[8] and the user's acceptable policy[9] for the platform.

A membership to the EUCAIM group will have been created (figure A-6). This should be manually verified and accepted or rejected (figure 7) by the administrator of the EUCAIM group (NOTE: these screenshots are not available for the user, just for the group administrator).

Once this request has been approved, the user will be able to access the restricted area through the "My profile" button of the Dashboard. When the user accesses, the system requests to confirm the acceptance of the privacy policy (figure A-8). This can be done for a single access or for six months.

Then, access to the restricted services will be granted (figure A-9).

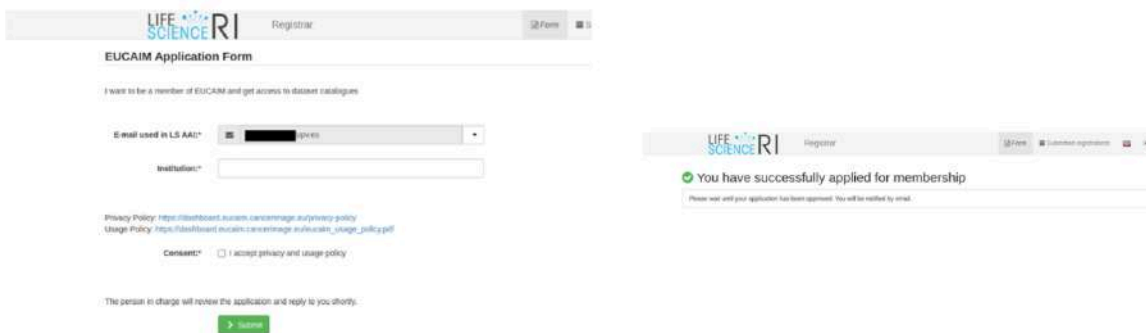


Figure A-5. Return to the Dashboard “My profile” area, where the Dashboard will show the enrollment page to the EUCAIM Group, pre-filled in with the email.

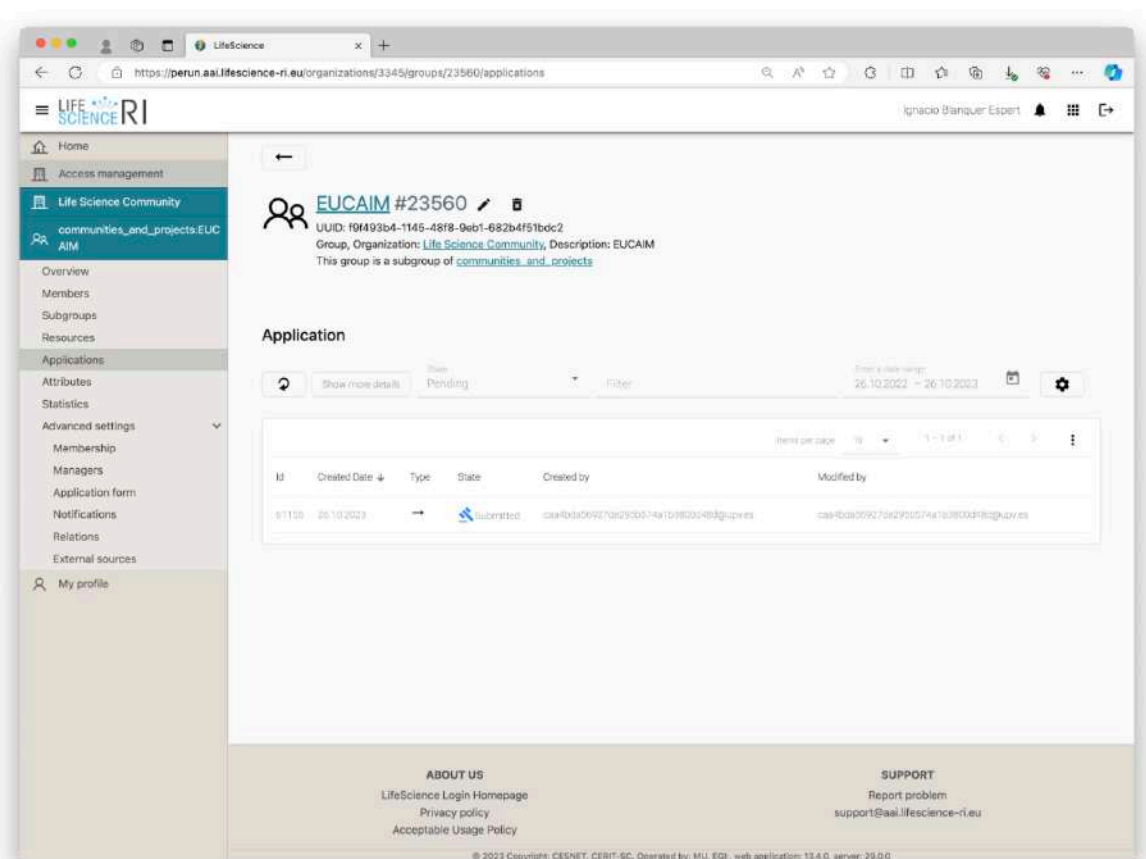


Figure A-6. Administrative Dashboard. Request received.

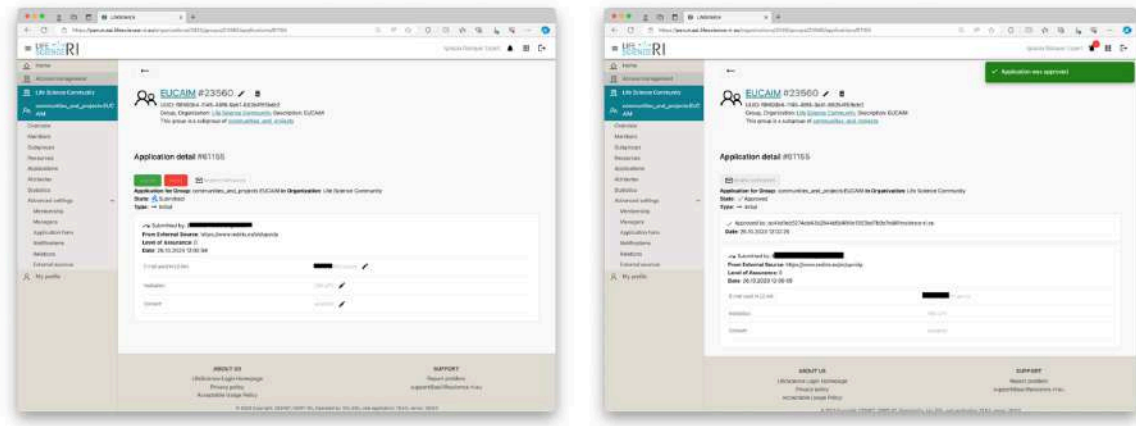


Figure A-7. Administrative Dashboard. Approval of the request.

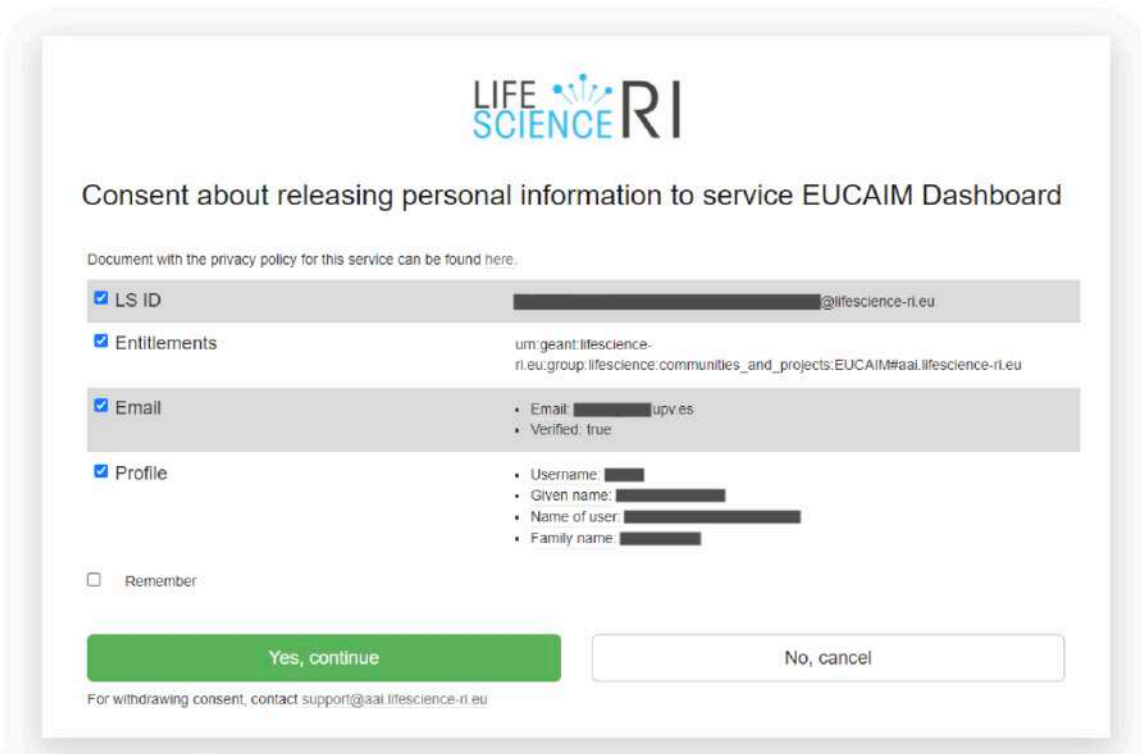


Figure A-8. Return to the Dashboard "My profile" area. First time requires confirming the acceptance of the Privacy Policy.

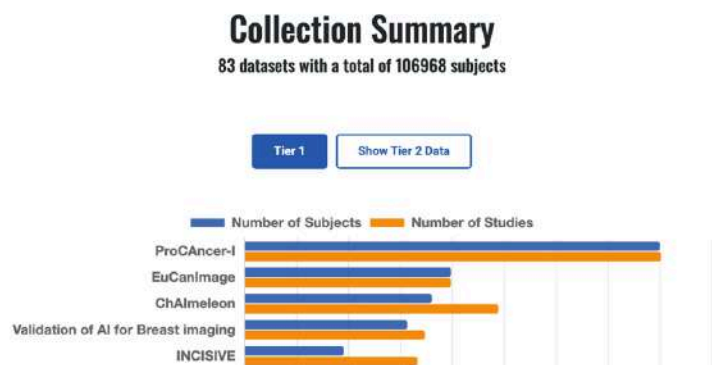


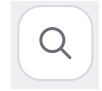
Figure A-9. Dashboard Fully authenticated.

5. <https://lifescience-ri.eu/ls-login/policy-on-the-processing-of-personal-data-of-the-ls-aai-service.html> ↗ ↑
6. <https://lifescience-ri.eu/ls-login/ls-aai-aup.html> ↗ ↑
7. https://signup.aai.lifescience-ri.eu/fed/registrar/?vo=lifescience&group=communities_and_projects:EUCAIM ↗ ↑
8. <https://dashboard.eucaim.cancerimage.eu/privacy-policy> ↗ ↑
9. https://dashboard.eucaim.cancerimage.eu/eucaim_usage_policy.pdf ↗ ↑

Previous
6. User Guide for Data Holders

Next
Annex II. Dataset Access Request Template

Last updated 7 minutes ago



Annex II. Dataset Access Request Template

 Copy 

This annex shows the details of the documents required by the negotiator when requesting access to existing datasets, which are already exposed in the catalogue.

APPLICATION DOCUMENTS (Data User-Researcher, Innovators, Members):

The documents has 6 main sections

1. *Request summary*, automatically filled with the dataset requested.
2. *Contact Details*. This section
 - Organization name and acronym (Applicant organization name and acronym).
 - Title, Name and Surname of the Principal Investigator.
 - Expected timeline for the realization of the use case (maximum 2 years)
 - Phone Number (including the country code)
 - Role of the applicant in the organisation.
3. *Scientific Relevance*
 - Title of the use case
 - General description of the use case, including main objectives, expected results, expected technical and/or clinical impact, methodology (max 600 words)
 - Expected timeline for the realization of the use case (maximum 2 years)
 - Please provide a description of the intended use and expected benefit related to the use of the EUCAIM data, including a description of the AI algorithm(s) you wish to train/validate (max 600 words)

- Please provide an estimation of the period during which the electronic health data is needed for processing in secure environment
- Additional comments

4. *Ethical and legal requirements*

- Available (or not) ethical approval, selecting one of the following options:
 - A certificate of ethics approval by an ethics committee is available for your Project
 - You have already applied for an ethics approval from an ethics committee
 - No action has been taken yet to obtain an ethics approval from an ethics committee
 - o need for approval of an Ethics Committee according to national law
- Law Obligations, selecting one of the following options:
 - You are able to demonstrate the due diligence in complying with the GDPR.
 - You are currently not yet able to demonstrate the due diligence in complying with the GDPR, but are working towards it.
 - You are not able to demonstrate the due diligence in complying with the GDPR and have not started working on it yet.
 - Use case not subjected to specific obligations related to GDPR.
- Due diligence, selecting one or more of the following options:
 - A certification or statement issued by your Data Protection Officer
 - A Data Protection Impact Assessment report or independent Audit.
 - Membership of codes of conduct or certification schemes or equivalent documentation.
- Medical Device Regulation, selecting one of the following options:
 - Yes
 - No
 - N/A
- AI tools validation, selecting one of the following options:

- An AI risk analysis (preferably using the ALTAI tool) for assessing AI-based technologies is already available.
 - An AI risk analysis (preferably using the ALTAI tool) for assessing AI-based technologies is not available yet, but you are working towards it
 - An AI risk analysis (preferably using the ALTAI tool) for assessing AI-based technologies is not available.
 - N/A
- Legal compliance. Confirm the acceptance that you will be committed to provide further information and documents about the compliance with the legal and ethical requirements and to sign all the relevant agreements.
 - Additional comments
 - Confidentiality clause, confirmation of the confidentiality clause, which indicates that the information disclosed by the applicants will be kept confidential, shall be exclusively used for participation in EUCAIM. IPR developed by the applicants is exclusively owned by the applicants.
5. *Confirmation*, which confirms that by submitting the form, the personal data of the user will be electronically processed for the purpose of the Data Access application, confirming the applicant allow EUCAIM to share this information with other partners for this purpose.

[Previous](#)

[Annex I. Registration of Users in the VO](#)

Last updated 4 minutes ago