
Platforms and Tools for Open Science



PLATFORMS AND TOOLS FOR OPEN SCIENCE

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01

Context and principles

Build a strong research community
following FAIR principles

Objective

At Ulyseus European University we hold a strong commitment to Open Science not only at institutional partner level but also at the alliance level as well.

During the initial phase of the European University program, we have released an **Open Science Handbook** that describes our commitments and good practices toward open-science.

Later, we have implemented several services within our Open-Science digital platform to boost collaboration within the alliance. Among them are an **Open Science repository and a research digital network**.

This document aims at sharing how we **collaboratively built this platform** and aims at giving insights **on how to reproduce this platform** in a successful and efficient way.

OPEN EDUCATION AND SCIENCE HANDBOOK

Deliverable 3.11.





We respect FAIR principles for Open Science

As stated in our Open Science handbook, we are highly committed to respect FAIR principles for open-science. Those principles are very good guides to design a useful and efficient Open Science platform.

The fair principles that characterize open-science outcome state that those outcomes shall be:

- Findable
- Accessible
- Interoperable
- Reusable

This applies to data, metadata and infrastructure. Equipped with those principles, we started a specification phase to find out with our users what our open-science platform should be.

02

Design with researchers

Involve researchers during design
to have a higher impact

Build a specification

As part of building Ulyssus Digital Platform, we delivered the Digital Platform Specification document. This document has been the fruit of a long process summarized below.

First, we **held 6 workshops** among which 2 dedicated to **research** and 2 dedicated to **innovation**. The audience of these workshops were coming from **all our institutions** from **all backgrounds**, ranging from Researchers, to Librarians, Lecturers, Non-academic staff, students, PhD candidates, etc.

From those workshops we described what we **collectively think the Ulyssus Digital Platform should do** and more specifically around Open Science.



Build a specification

Here is an **excerpt of a table summarizing our findings** during the specification phase regarding open-science tools. In light pink are all the aspects linked to the open-science repository, in light blue all the aspects linked to the digital research network.

Once we had benchmarked the different needs and expectations, we conducted a survey to prioritize those requirements.

EPIC	DESCRIPTION
Research for an article across the collection of subject databases available in the alliance	Run a search of publications and articles based on a set of criteria
Search publications through the open database of Ulyssus	The users should be able to search by DOI, structure reference, faculty...
Access a publication	Select a publication, preview, download.
Identify where the publication is available	See the reference of the publication and access the link to the platform where the publication is available (web of science, Scopus)
Create a referencing of publications available on other platforms	Crawl other open access databases to collect publication's metadata and create a referencing. The data should be transferred to a pipeline that will clean it and value it (deduplication...)
Publish my article on Ulyssus shared repository platform	Upload my article

Survey users

We **surveyed all the aspects of the Ulyseus Digital Platform**, not only those related to Open Science.

306 persons from all background replied and helped us at defining priorities.

Here are the outcomes related to Open Science:

01

Need for a digital network for calls for project

- Search for researchers across the Ulyseus network based on their field of research or their specialization.
- Identify and onboard researchers or partner research teams on a proposal outside of my existing network ahead of the call
- Easily find a call for project for my research topics or be notified when it is called or when partner wish to submit a proposal
- Participate and access to a library of research proposal templates and historical successful submissions within Ulyseus community

02

Even though the development of an Open Science Repository was not among the most demanded items, **some institutions were lacking solutions to publish their scientific results**. The core team decided to deepen this topic to be aligned with Open Science best practices and our overall commitments.

Based on this feedback, we **opened two separate discussions within our community**, one around the value we must create to have a successful common open-science repository and another one on the construction of a research digital network.

Technical principles

● Use open source software

Try to use open source software rather than vendor-based solutions.

● Proven track record

Chose solutions that have a proven track record for organizations of our size.

Use, when possible, solutions that are already used within Ulyssus



● Maintainable solutions

Choose solution that the Digital Platform team can maintain.

● Contribute to open-source

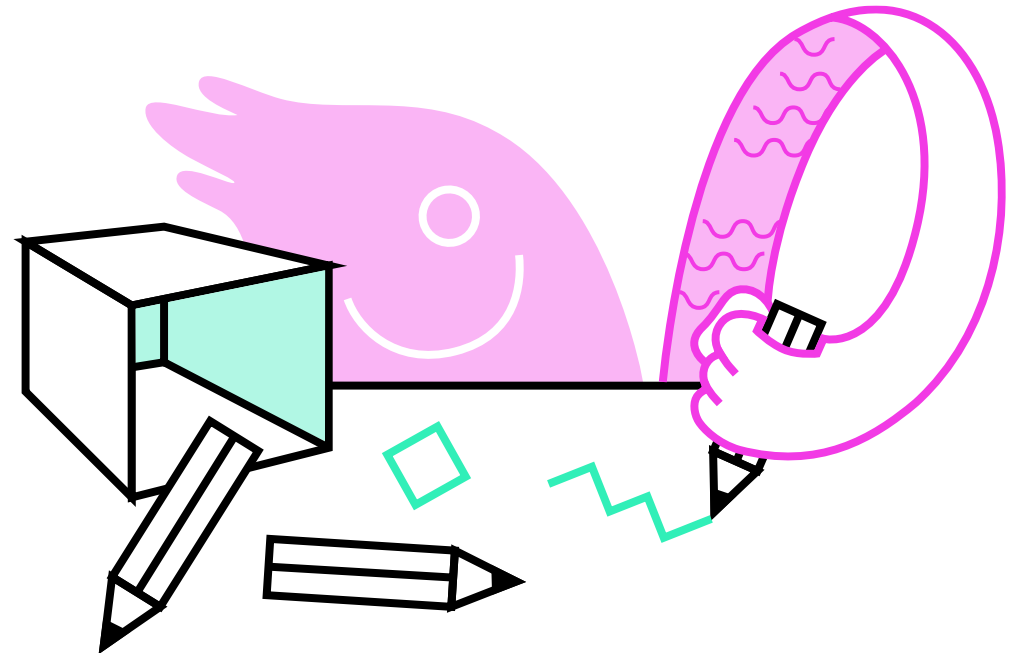
Contribute to the open-source projects we use to help other alliances to reuse our tools.

Prototype and iterate

Knowing the technical solution is not enough.

To have a good idea of **how our user want to interact** with the platform, we made rapid prototypes using the **open-source platform PenPot.**

It allowed us to decide in a matter of few sessions how our platform should look like.



03

Research Digital Network

From scoping to delivery

Scoping

TINDER FOR RESEARCH AND INDUSTRIES	DIGITAL NETWORK FOR CALL FOR PROJECTS
<ul style="list-style-type: none">• Initialize network with public meta-data on researchers: Advertise content based on proximity in research, and differently research vs company• Simplified registration (just ask consent)• Simple invite (from search and suggestions – local communities)• Simplified search (ask for consent to have a profile on the platform)• Match-making to augment network	<ul style="list-style-type: none">• Publisher create and share a call for projects (automatic + curation/simple URL feed)• Researcher or Publisher share a won project• Researcher search through call for projects• Match people with people and projects (keywords are pre-filled when possible)

Technical solution

We chose to use Mastodon, the widest spread open-source social network used as a backbone.

Its implementation is **highly federative**, meaning that if another institution or alliance wishes to implement a similar network, both would be easily interoperable. It has all the feature of traditional social networks such as profile, timelines, privacy level, rich content sharing.

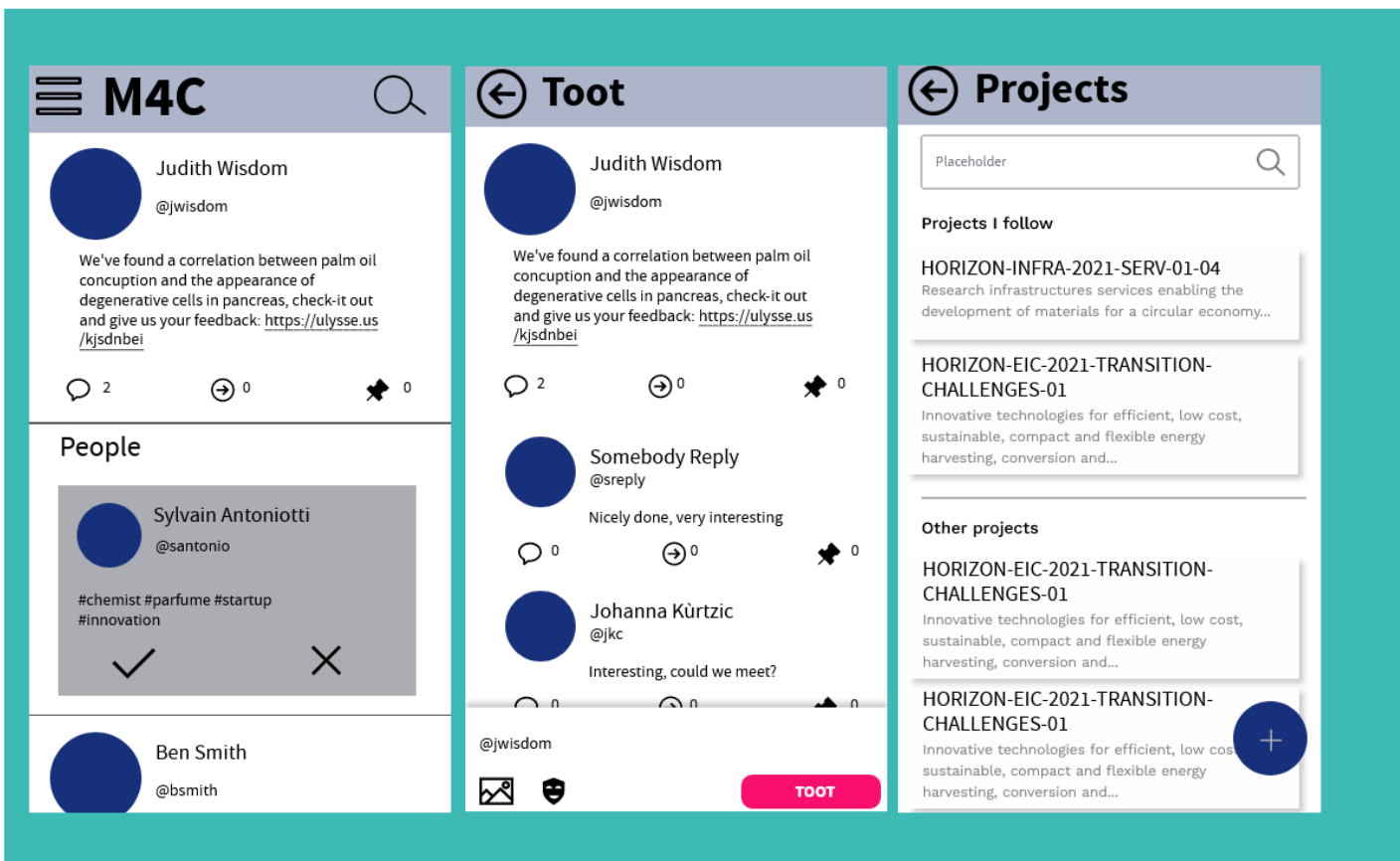
As it was lacking features around groups and research specific profile fields such as **scientific keywords**, we enriched it with research centric **dedicated NodeJS services**.

To make it accessible from mobile devices without maintaining two different code bases, we enhanced an open-source **application made with React native** framework.



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USER EXPERIENCE



User experience

We wanted our digital network to be **at par with existing research networks** (Twitter, Web of Science, etc.).

On top of that we had to **design new screens** to handle groups.

Here are few examples of screens we designed for the research digital network.

Pilot

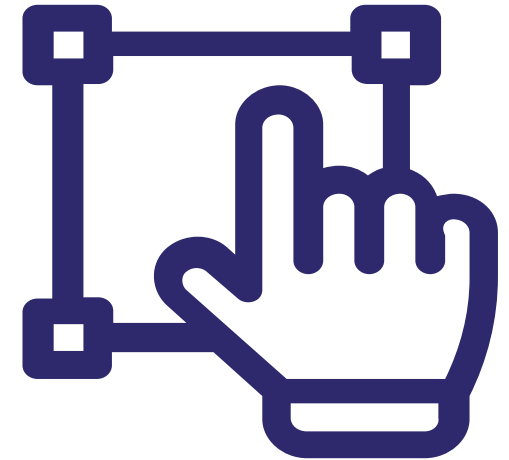
We wanted to make sure our platform fits the needs before disseminating massively.

Therefore, we **started pilots** with smaller engaged communities to capture feedback and iterate.

We chose to target **one of Ulyssus Innovation Hubs** community around "Ageing and Wellbeing" led by UCA.

The mobile application has been disseminated during a physical event (UCA Ulyssus Researcher days) and roughly 2/3 of the guests installed the application and registered to the network.

Following the event, **community management** was endorsed by both the Innovation Hub coordination team and the Digital Unit, leading to a high growth of interactions on the platform.

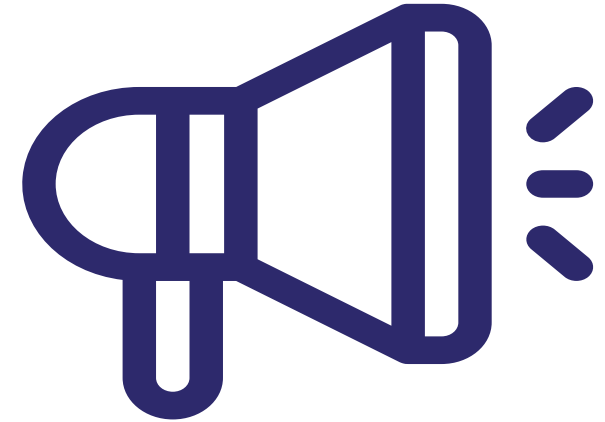


Dissemination

Our first pilots allowed us to identify flaws in the process and bugs in the interaction that we fixed quite rapidly.

At the same time, communities are learning how to get organized on this new research digital network especially in terms of community management.

We plan to disseminate within all Ulyssus Innovation Hubs in the first half of 2023 and to the global Ulyssus community in the second half of 2023.



04

Open Science Repository

From scoping to delivery

Scoping

We did scoping workshops to decide what our open-science platform should be.

The workshops were organized remotely to favor inclusiveness and overall participation. We carefully selected our audience to **represent all types of users** involved in open-science (Researchers, Librarians, Students, PhD candidates and Non-academic staff).

Together we **reviewed current open-science practices** within each institution ranging from uses to technical platforms used to operate open-science policies. We established that research intensive institutions were already equipped with such open-science repositories, may they be at Institution level (Universidad de Sevilla, Università di Genova) or at state level (Université Côte d'Azur , Haaga-Helia). Some others only had private repositories (TUKE) or no formal repository at all (MCI).

FUNCTIONALITIES OF SUCH A PLATFORM SHOULD ENCOMPASS

- Find researchers for any topic and any location
- Find open publications from those researchers
- Access to statistics regarding publications within Ulyssus
- Start building Ulyssus Open Science community
- Have an Open-science data, software and dataset repository

Scoping

On the other hand, **no institution had clearly setup an open dataset and software repository** and we found out that a common solution would really bring and added-value.

Consequently, we decided that Ulyseus should **build a Current Research Information System (CRIS)** that allow open-science publication but as well benefit from all existing repositories in each institution by harvesting them using OAI-PMH protocol. This way we would have in one place all the open-science from Ulyseus community and the concrete capability to deposit publications, data, datasets and software for all member institutions.

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Technical solution

For the open-science repository, we conducted a study of existing open-source frameworks.

Our study shortlisted InvenioRDM and DuraSpace which are the most widespread solutions within higher education and research institutions.

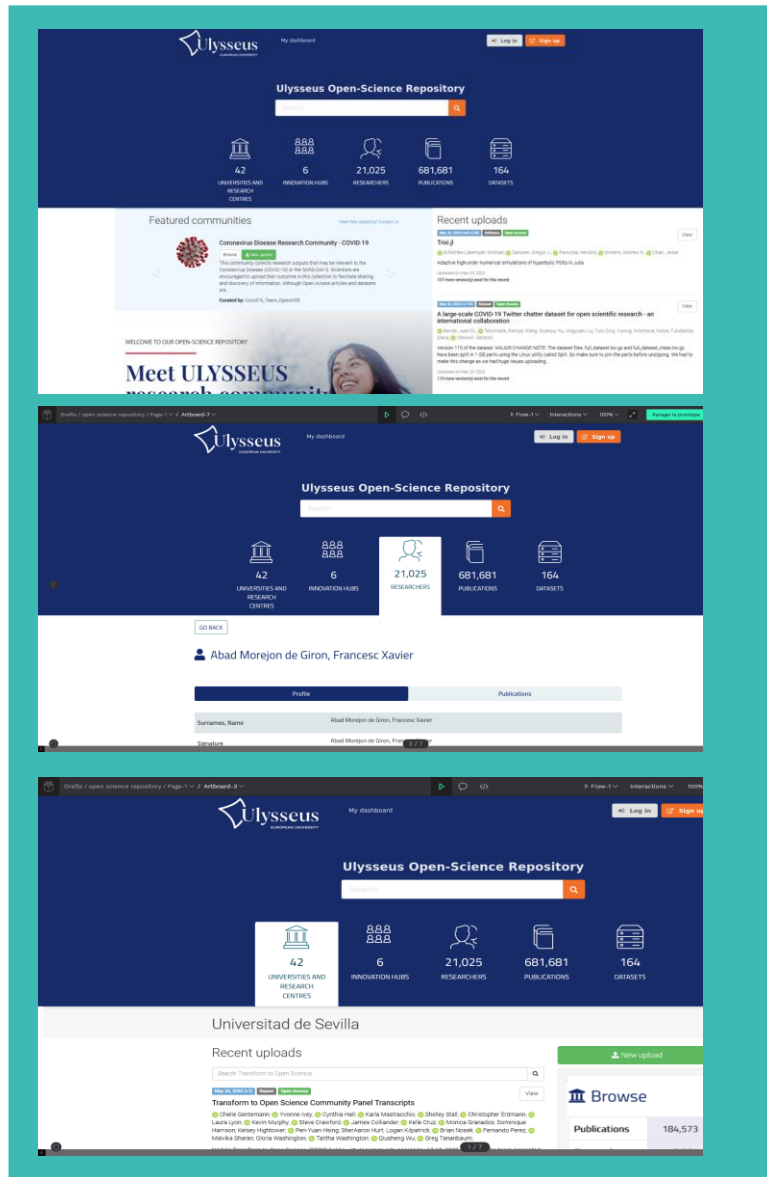
They feature **compatibility with DataCite standards, API access, OAI-PMH** server for public harvesting, custom vocabularies and customizable interface.

Our recommendation is InvenioRDM as its conception is more modern, it is written in Python meaning that we can contribute and it's easily operable, scalable and customizable.



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OPEN SCIENCE REPOSITORY



User experience

In term of design, the basic version of **InvenioRDM** is **very lean** whereas the base version of Duraspace was really appealing to reinforce discoverability.

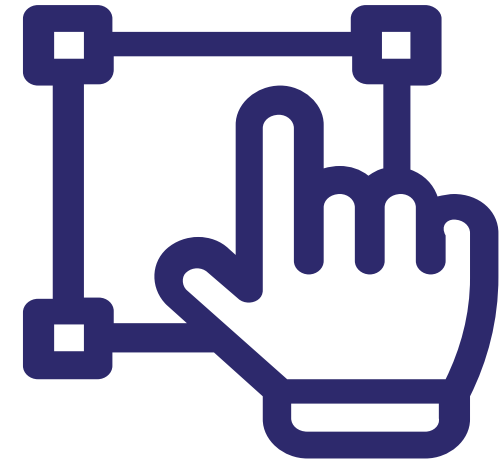
Therefore, we have worked on starting from InvenioRDM user experience and augment it with discoverability screens such as Institution page or Researcher page.

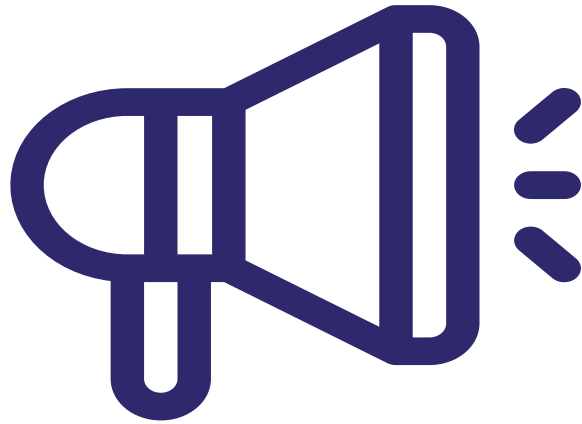
Pilot

We have made sure with our workgroup that all basic functionalities are working correctly.

We'll **pursue the experimentation** especially within institution that lack a repository.

At the same time, **we continue improving** the solution so that the repository becomes a full-fledged open research information system with institution profiles as well as researcher profiles. A new delivery is planned in the first quarter of 2023 including those features.





Dissemination

We've **kicked-off an internal dissemination** starting with non-equipped institutions, and in the second half of 2023 we'll disseminate to all our audiences, and especially the **general public and external research communities.**

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CONCLUSION

Conclusions

Collaboration in design is key.

The collaborative work allowed Ulyssus to be equipped with **fully functioning open-science digital services** that allow our researchers to **efficiently collaborate and share** their open-science with one another.

We would like to thank all the people from various backgrounds that played a role at any stage of the process.



Thank you

The logo features a teal outline of a compass rose on the left. To its right, the word "Compass" is written in a bold, dark blue sans-serif font. Below "Compass", the word "Ulysseus" is written in a teal, lowercase sans-serif font.

Compass

Ulysseus

