OpenAIRE-Connect: Open Science as a Service for repositories and research communities

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Abstract

OpenAIRE-Connect fosters transparent evaluation of results and facilitates reproducibility of science for research communities by enabling a scientific communication ecosystem supporting exchange of artefacts, packages of artefacts, and links between them across communities and across content providers. To this aim, OpenAIRE-Connect will introduce and implement the concept of **Open Science as a Service** (OSaaS) on top of the existing OpenAIRE infrastructure[1], by delivering out-of-the-box, on-demand deployable tools in support of Open Science. OpenAIRE-Connect will realize and operate two OSaaS services. The first will serve research communities to (i) publish research artefacts (packages and links), and (ii) monitor their research impact. The second will engage and mobilize content providers, and serve them with services enabling notification-based exchange of research artefacts, to leverage their transition towards Open Science paradigms. Both services will be served on-demand according to the OSaaS approach, hence be **re-usable** by different disciplines and providers, each with different practices and maturity levels, so as to favor a shift towards a **uniform cross-community and cross-content provider scientific communication ecosystem**.

Conference Themes

- Supporting Open Scholarship, Open Data, and Open Science
- Managing Research Data, Software, and Workflows

Keywords

Open Science, repositories, Open Science workflows, repositories networks, reproducibility.

Audience

Repository managers and administrators, data producers, librarians, research managers.

Background

Everyone is talking about Open Science. Scientists and organizations see it as a way to speed up, improve quality, and more effectively reward research activities, while funders and ministries see it as a means to optimize cost of science and leverage innovation. Open Science is an emerging vision, a way of thinking, whose challenges always gaze beyond its actual achievements. Today, the effective implementation of Open Science calls for a scientific communication ecosystem capable of addressing enabling **Open Science publishing principles**. The ecosystem should allow **research communities** to share (for "discovery" and

[1] Open Access/Open Science European infrastructure http://www.openaire.eu

"transparent evaluation") and re-use (for "reproducibility") their scientific results by publishing all intermediary and final **research artefacts**, beyond scientific literature. Artefacts can be **research data** and **research methods** (e.g. software, workflows, protocols, scripts, algorithms, etc.), should be deposited in **content providers for scientific communication** (e.g. institutional repositories, data archives, software repositories, CRIS systems), and should be published together with the **semantic links** between them. To complete the picture, such ecosystem should support publishing of **packages of artefacts** (e.g. research objects, enhanced publications, RMap) to allow discovery, evaluation, and reproducibility of aggregations of artefacts (e.g. workflows or experiments with input datasets).

Presentation content

Today's scientific communication landscape is far from supporting this vision, mainly due to its inability to (i) support **publishing of all kinds of research artefacts**: for example, research methods publishing workflows are generally not best practice, i.e. no research method repositories, no PIDs for methods, no scientific reward; (ii) keep a **complete and up-to-date record of research artefacts relationships**: for example, publication, data, software repositories and publishers do not keep bi-lateral links between each other's artefacts, and the links they keep are not in-sync with the evolution of science (e.g. links to new versions of the data, obsolete links); and (iii) find agreements on how to **share and publish packages of artefacts**: solutions exists (e.g. research objects, enhanced publications, RMap) but are specific to rather small communities of scientists and, as research methods, are not regarded as first-class citizens in the scientific communication domain. De facto, today's scientific communication ecosystem lacks tools and practices for **engaging research communities** at adopting the aforementioned novel Open Science publishing principles, even when researchers are already in the position of publishing interlinked artefacts and/or artefact packages.

OpenAIRE-Connect fosters transparent evaluation of results and facilitates reproducibility of science for research communities by enabling a scientific communication ecosystem supporting exchange of artefacts, packages of artefacts, and links between them across communities and across content providers. To this aim, OpenAIRE-Connect will introduce and implement the concept of **Open Science as a Service** (OSaaS) on top of the existing OpenAIRE infrastructure[2], by delivering out-of-the-box, on-demand deployable tools in support of Open Science. OpenAIRE-Connect will realize and operate two OSaaS services. The first will serve research communities to (i) publish research artefacts (packages and links), and (ii) monitor their research impact. The second will engage and mobilize content providers, and serve them with services enabling notification-based exchange of research artefacts, to leverage their transition towards Open Science paradigms. Both services will be served on-demand according to the OSaaS approach, hence be **re-usable** by different disciplines and providers, each with different practices and maturity levels, so as to favor a shift towards a **uniform cross-community and cross-content provider scientific communication ecosystem**.

To achieve its objectives, OpenAIRE-Connect involves key stakeholders of scientific communication:

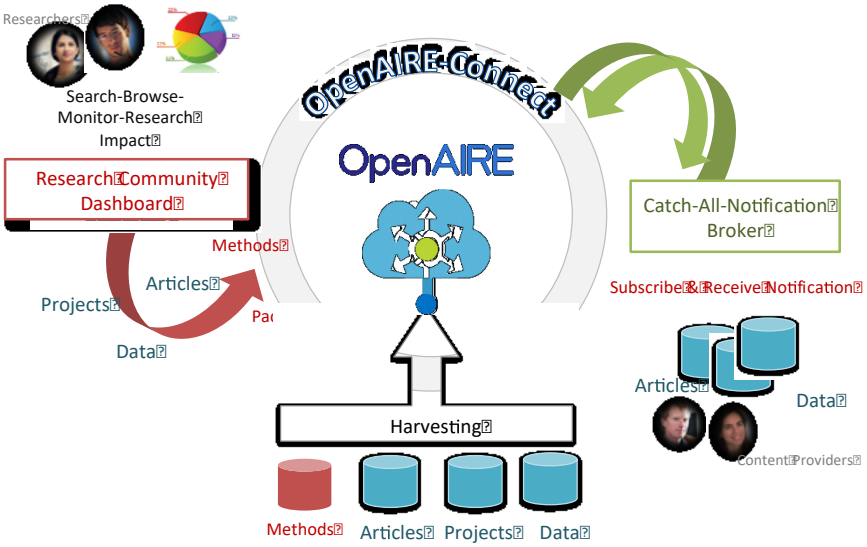
- A pool of forward-looking research communities, today publishing or in the need of publishing research data and methods: Earth and Environmental Sciences (Pangaea

[2] Open Access/Open Science European infrastructure http://www.openaire.eu

and Atlas community), Cultural Heritage and Digital Humanities (the PARTHENOS research infrastructure), Neuroinformatics (France Life Imaging national infrastructure), Fisheries and aquaculture management (the BlueBridge and MARBEC infrastructures), Environment & Economy (national/EU node of the United Nations Sustainable Development Solutions Network)

- International representatives of Open Access publishers (Jisc and COAR), publication repositories (COAR and OpenAIRE NOADs), and data archives (ICSU World Data Systems/WDS), willing to support and benefit from such a change.

Participating research communities and providers will drive the design and development of general-purpose services, will test and assess these services in a number of pilots to reach the desired production-quality and enrich the OpenAIRE infrastructure's services portfolio. The adoption of these services, eased by the OSaaS approach aim at incepting Open Science publishing within the existing scholarly communication landscape.



Conclusion

OpenAIRE-Connect is an exciting new opportunity for open repositories to help unify the distributed tools that scholars use, in order to promote reproducible science and open innovation and knowledge. OpenAIRE-Connect will realize, operate, and leverage the uptake of two new services that build on and extend the existing OpenAIRE technical and networking infrastructure, to stimulate a technical and cultural shift towards a scholarly communication ecosystem supporting more effective/transparent evaluation and reproducibility of research results. The services will be conceived to contribute to the realization of a common scientific communication ecosystem in support of Open Science publishing principles. As such, this effort will strongly ground on (i) an end-user driven approach, to deliver services that bring immediate benefits to real demanding users and can therefore be appealing to others; and (ii) align and liaise with other similar efforts at the global level, to re-use and promote valuable results in the field and maximize the effectiveness and usefulness of the services. Such forward-thinking services are vital to keep the Open Repository community at the forefront of developments, sharing knowledge, and working as an enabler of scholarship and Open Science.

References

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