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Special theme:

Advancing Open Science

Federated Infrastructures and Trustworthy Ecosystems

Editorial Information

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The OpenAIRE Graph: Enabling Open Research Intelligence Using Open Data

by Paolo Manghi (CNR-ISTI)

The OpenAIRE Graph provides an open, community-governed data infrastructure for research intelligence, enabling transparent and auditable use of scholarly data beyond proprietary systems.

The global research ecosystem is calling for a structural transition from proprietary, opaque systems for research intelligence to open, community-governed infrastructures. At the centre of this shift is the need to reclaim how scholarly data is collected, connected, and used to inform research evaluation and policy. The OpenAIRE Graph addresses this challenge by providing a large-scale, openly accessible scholarly knowledge graph that treats publications, data, and software as first-class research outputs. As a community-governed infrastructure, it establishes a transparent and auditable foundation for Open Research Intelligence.

The Lock-in of Proprietary Research Intelligence

The global research community is currently trapped in a costly and paradoxical model where public funds fuel scientific discovery while simultaneously sustaining the multi-billion-euro "drain" of commercial vendors who control a large portion of the scholarly record. Access to scientific articles, books, and critical bibliographic metadata databases, such as Scopus and Web of Science, is provided through expensive subscriptions characterized by restrictive reuse constraints and a lack of transparency. Because research intelligence, institutional evaluations, and national comparisons are grounded in these proprietary databases, the scientific community is forced to rely on "black boxes" that unilaterally decide what is measured, how it is measured, and what remains visible. These platforms use data that cannot be fully audited and methods that cannot be challenged, often driven by commercial priorities rather than the public interest. It is a profound paradox that while public funds invest in research as a "public good", scientific reviews and the critical indicators used to assess its quality and monitor its impact are provided by closed, toll-gated proprietary systems.

The OpenAIRE Graph

In this reforming scenario, the OpenAIRE Graph [L1] has emerged and matured as a fully-fledged solution to ensure a safe and incremental transition from a closed-data to an open-data scholarly communication ecosystem. Funders, countries, and institutions are adopting it for a shift to Open Research Intelligence, researchers for research on bibliometrics and science of science, and companies for commercial purposes. Its main features can be summarised as:

Global Coverage and Open Data

The OpenAIRE Graph provides a 360-degree view of the research lifecycle, embracing the diversity raised by Open Science, hence treating research data and software as first-class citizens alongside traditional articles and scientific literature at large. The Graph consists of a collection of bibliographic metadata about research outcomes, connected by semantic relationships, including citations from publications to data and software, and data-to-data links, affiliations, participation to projects, etc. To ensure open access coverage and high-quality data, the Graph aggregates metadata and relationships from over 2,100 direct metadata sources (155,000 counting indirect data sources via aggregators), including Crossref, DataCite, ROR, ORCID, PubMed, ArXiv, and thousands of repositories, CRIS systems, and OA publishers. Aggregated metadata flows through a data wrangling workflow involving data harmonisation, AI methods inference, full-text mining, and deduplication [1]. As of the latest statistics (March 2026), the OpenAIRE Graph counts ~345Mi research products (~215Mi publications, ~95Mi research datasets, ~800K research software, 33Mi other products), 368 funders, ~450K organizations, 4 Mi grants and over 7 billion relationships. The collection is accessible via open APIs and data dumps [L3].

A Community-Governed Pillar of Open Research Intelligence

Unlike commercial and non-commercial counterparts, the OpenAIRE Graph is operated by OpenAIRE AMKE [L2], a non-profit, membership-based organization established to ensure that research intelligence is sustained and steered as a public infrastructure by its members. OpenAIRE counts 53 members across 36 countries, supported by a network of experts active since 2009 whose global reach extends through collaborations in Latin America, Canada, Japan, Korea, and China. The Graph is co-designed, co-developed, and co-operated by its members, ensuring that the technical roadmap, design decisions, and sustainability are driven by community demands, ethical and political choices rather than profit motives. By treating research intelligence as infrastructure rather than a service, OpenAIRE provides a stable foundation that connects diverse research ecosystems without the risk of commercial lock-in.

Enabling Next-Generation Open Research Intelligence

As of today, the OpenAIRE Graph serve open, auditable data, as input to a rich catalogue of Research Intelligence services for policymakers and researchers [L3]. Examples are services for research discovery (OpenAIRE EXPLORE and CONNECT), for monitoring Open Science and research impact (OpenAIRE MONITOR and EOSC OSObservatory, see article by T. Szybisty in this issue on page 12), and for managing Open Science CoARA-oriented research profiles (ResearchFolio, see following article by S. Amodeo).

Conclusion

The OpenAIRE Graph leverages a shift from "intelligence as a service" (outsourced design, no transparency, no service operation) to "intelligence as infrastructure" (co-design, data transparency, service operation). Its adoption in real-case applications is a concrete example of how, by investing in a community-governed, open-data fabric and services, institutions

and ministries can move away from opaque commercial representations and ensure that the values of Open Science become a durable part of the global research landscape.

Acknowledgments: The OpenAIRE Graph is the result of research and operational efforts from Michele Artini, Claudio Atzori, Miriam Baglioni, Alessia Bardi, Michele De Bonis, Sandro La Bruzzo, and Andrea Mannocci from CNR-ISTI; Giambattista Bloisi, Ioanna Grypari, Natalia Manola, Harry Dimitropoulos, Yannis Foufoulas, Myrto Kallipoliti, Antonis Lempesis, Leonidas Pispiringas, and Giacomo Trombi from OpenAIRE AMKE; and Marek Horst, Michal Politowski, and Sebastian Tymkow from University of Warsaw.

Links:
[L1] https://graph.openaire.eu
[L2] https://www.openaire.eu
[L3] https://catalogue.openaire.eu

Reference:
[1] P. Manghi, "Challenges in building scholarly knowledge graphs for research assessment in open science." Quantitative Science Studies 5, 4 (2024): 991–1021. doi:10.1162/qss_a_00322.

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Rethinking Researcher Profiles in the Research Assessment Transition Era: The OpenAIRE Approach

by Stefania Amodeo and Zenia Xenou (OpenAIRE AMKE)

OpenAIRE introduces a new approach to researcher profiles, combining open data and narrative CVs to support responsible research assessment beyond traditional metrics.

Research assessment is undergoing a fundamental transformation. For many years, academic evaluation has heavily relied on traditional publication metrics based on journal articles, citation counts, and impact factors. This approach, however, fails to capture the full range of activities that define modern research, including software development, dataset curation, student mentorship, community engagement, and interdisciplinary collaboration. As initiatives like the Coalition for Advancing Research Assessment (CoARA) and the Barcelona Declaration on Open Research Information gain momentum, the research community is increasingly calling for more comprehensive and transparent evaluation practices that rely on open systems rather than proprietary ones.

The OpenAIRE Graph provides the open and transparent data infrastructure underpinning these developments [1].

Until recently, individual researchers remained in the background of research assessment systems, appearing only as identifiers within research output metadata. This represented a significant gap in the implementation of responsible research assessment practices.

OpenAIRE has addressed this gap by integrating researcher identities as distinct entities within the OpenAIRE Graph. This enhancement will be included in the April 2026 Graph release. Researchers with ORCID profiles become first-class entities

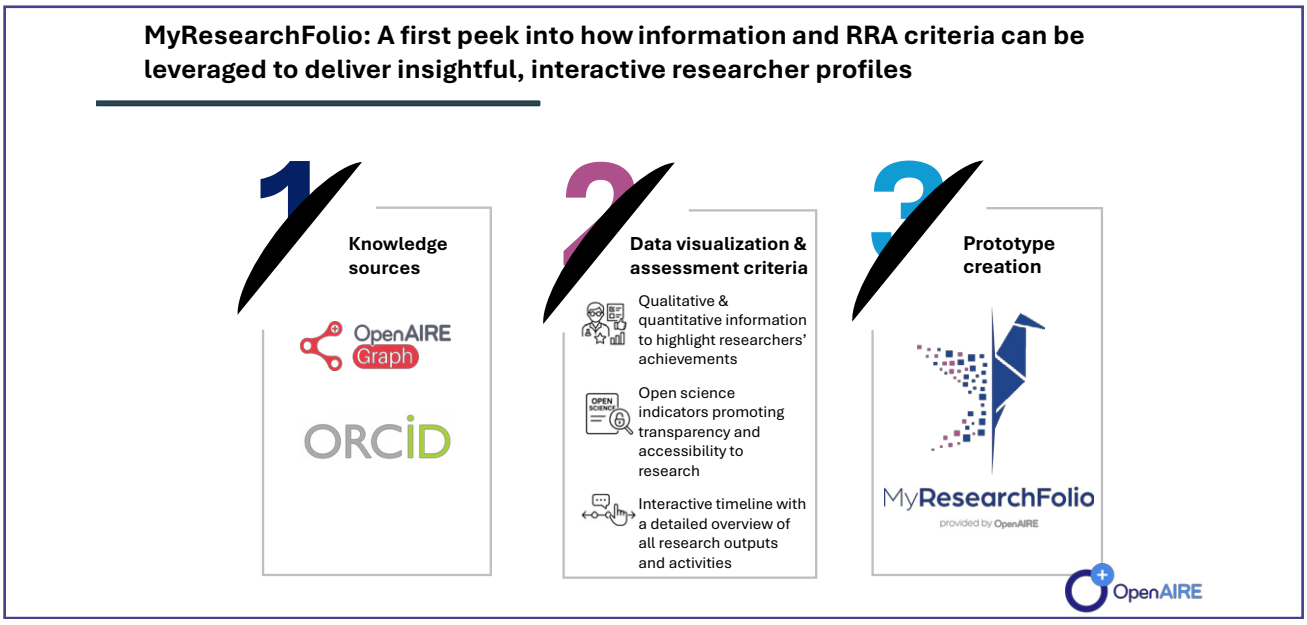

Figure 1: MyResearchFolio concept: researcher profiles are built on OpenAIRE Graph and ORCID data, combining qualitative and quantitative information with responsible research assessment (RRA) criteria, Open Science indicators, interactive visualizations, and a timeline of research outputs and activities.