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Milestone 4.2- Assessment of Current Approaches to Alignment:

Case Study No.7- The Open Access Infrastructure for Research in Europe (OpenAIRE)

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ABSTRACT

This case study examines the key features, outputs and overall strengths and weaknesses of a specific modality that supports greater alignment of research activities across countries, namely **the Open Access Infrastructure for Research in Europe (OpenAIRE)**. This support platform promotes open access to research outputs across 33 countries from Europe and beyond, hence contributing to alignment mainly at an operational level. It provides a technical infrastructure that includes an online platform and associated services in order to centralise, harmonise, disseminate and interlink open research data. OpenAIRE also facilitates the coordination of national and transnational Open Access (OA) activities through a network of national experts in order to promote open access and spread related best practices. The case study provides **recommendations on key factors of success for public-to-public research networks (P2Ps) wishing to use such an instrument and to enhance open access to research data, publications and related project information**, in view of promoting alignment. It does however not aim to provide an in-depth assessment of OpenAIRE.

The study highlights OpenAIRE's many benefits. This initiative has facilitated the **promotion of Open Access to research data at policy and operational levels** across Europe, involving all key transnational, national and local players (i.e. European Commission, governments, data providers, research institutes, research communities). In particular, the active OpenAIRE network of experts has supported the **development and alignment of national OA policies, best practices and infrastructures** across participating countries. This has in turn allowed to improve the **standardisation and interoperability of research outputs**, especially by fostering alignment amongst data providers at operational level. As such, OpenAIRE has contributed to enhancing access to and visibility and re-use of existing research data. For instance, the online open access platform supports higher **uptake by end-users**, hence increasing the potential for return on investment. Similarly, it enhances **transparency and awareness of past and current research activities and related outcomes both at researchers' and policy levels**, which contributes to avoiding unnecessary duplication of research efforts and supporting efficient progress of research. In particular, the overall cross-linking and analysis of research outputs in various research areas can feed into future research policies and funding strategies at national and transnational levels.

Yet, OpenAIRE has also been confronted with: (i) several limitations regarding the voluntary approach towards Open Access development, including variations in partners' involvement and uptake of common OA guidelines, as well as low financial commitment of partners; (ii) the difficulty in bringing together and effectively supporting all key players and initiatives involved in Open Access issues at international, national and local levels; and (iii) the challenge to adapt to research and technological landscapes that constantly evolve according to emerging research needs and opportunities as well as technical advancements related to Open Access.

The case study builds on the ERA-LEARN 2020 Task 4.1 ("Definition and Typology of Alignment"), and relies on a review of existing literature and targeted exchanges with the Project Manager of OpenAIRE. The case is part of a series of nine short case studies that form the basis of the ERA-LEARN 2020 Task 4.2 "Assessment of Current Approaches to Alignment". The nine case studies that have been selected for this Task each rely on a different instrument (Member-State instrument or EC instrument, e.g. ERA-NET), cooperation mode (e.g. networking amongst researchers, programme integration, institutional cooperation, etc.) and approach (strategic, operational and/or financial) that promote alignment, and that are often put in place at different stages of the research programming cycle (planning, strategy, implementation, etc.). The focus of the following case study (i.e. Open Access) can also be considered as part of the Framework Conditions of Joint Programming, several of which are also analysed in the ERA-LEARN 2020 Task 2.2 ("Support for implementation of Framework Conditions for the JPI community").

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1.   Introduction

This case study examines the key features, outputs and overall strengths and weaknesses of a specific modality that fosters alignment, namely the **Open Access Infrastructure for Research in Europe (OpenAIRE)**. The study assesses how such a tool has been used for promoting greater alignment of national research outputs and activities. It also provides **recommendations on key factors of success for public-to-public research networks (P2Ps)** wishing to use such an instrument and to enhance open access to research data, publications and related project information, in view of promoting alignment.

According to the Typology of Alignment, open access to national (and transnational) research data and outputs allows their re-use by other researchers across countries and fosters their interoperability. Virtual infrastructures that allow research data sharing greatly contribute to operational alignment. Their operation relies on the engagement of all stakeholders that are involved in research data production, management, preservation, publication and policy-making: i.e. researchers, project coordinators and managers, research institutions, data providers and academic publishers, research administrators and research funding providers.

2.   Key features of OpenAIRE

2.1   Overview

The Open Access Infrastructure for Research in Europe (OpenAIRE) is a support platform for open scholarly communication. It was initially established in 2009 in order to facilitate the implementation of the Green Open Access Pilot[1] launched by the European Commission under the topic "Infrastructures" of its 7th Framework Programme. The initiative now involves partners from 33 countries across the EU and beyond[2]. It supports a coordination platform (i.e. network of national experts) in order to promote open access and spread related best practices across Europe and beyond, as well as a technical infrastructure (i.e. through an online platform[3] and associated services) in order to centralise, harmonise, disseminate and interlink open research data.

Open Access is defined as immediate, online, free availability of research outputs. It enhances the latters' visibility, dissemination, re-use and impact. As such, Open Access promotes efficient progress of research through transnational and transdisciplinary research collaboration and through knowledge exchange amongst academics. It also fosters knowledge transfer towards policy-makers, end-users and society at large, maximising the return on investment of publicly funded research activities. There are two ways of achieving Open Access:

-   "Gold" Open Access: this refers to open access publishing, which means that the costs related to the publication of an article are not covered by readers but by institutional or project funding associated to the authors, by institutional libraries or by other sources. This ensures the immediate availability of publications.

-   "Green" Open Access: this refers to self-archiving, which means that authors deposit the peer-reviewed manuscripts of their articles in repositories. This can require an embargo period in order for the publisher to recoup their investment.[4]

The European Commission's desire to effectively disseminate the outputs of its funded research projects has been supported by the implementation of several Open Access Pilots (i.e. FP7 Green Open Access Pilot, FP7 post-grant Open Access publishing funds pilot[5], H2020 Open Research Data Pilot[6]). OpenAIRE has been supporting these EC pilots and has also established links with international Open Access initiatives such as the Confederation of Open Access Repositories (COAR)[7].

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[1] http://ec.europa.eu/research/swafs/index.cfm?pg=policy&lib=pilot
[2] OpenAIRE partners include all 28 EU Member-States and five Associate and other countries (Switzerland, Norway, Iceland, Turkey and Serbia).
[3] https://www.openaire.eu/
[4] Open Access Pilot in FP7 (Leaflet)
[5] https://www.openaire.eu/postgrantoapilot
[6] https://www.openaire.eu/opendatapilot
[7] https://www.coar-repositories.org/

2.2   Mission and activities

OpenAIRE seeks to provide technical and coordination support in order to promote Open Access (OA) to research publications and other related outputs (e.g. datasets, software, services), enhance their uptake by end-users and policy-makers in decision-making processes and facilitate their efficient integration in future research strategies. In particular, this OA initiative aims to provide the overall management, analysis, manipulation, provision, monitoring and cross-linking of all research outputs across existing, planned and future repositories.

OpenAIRE's activities are carried out by a group of various experts in open access and open science, library information, information and computer science, law and research data. The initiative's current targeted objectives[8] are to:

- Support the H2020 vision of open access for scientific publications and the Open Data Pilot for H2020[9] by making OpenAIRE a central infrastructure and service in H2020;

- Build a pan-European Research Information platform to monitor OA research outputs from the EC and other funders (at national, regional and disciplinary levels) and foster the collaboration of OA repositories;

- Develop research analytics tools to promote new research metrics and support evidence-based decision-making;

- Make OpenAIRE a hub for third party providers to build innovative services that explore new forms of scholarly communication and promote alternative, competitive Open Access publishing models.[10]

OpenAire's work aims to benefit (i) individual researchers that are required to or wish to set-up open access to their research outputs; (ii) administrators of research institutions that are required to comply with EC Open Access policies or that seek to monitor their institution's open research outputs; (iii) research data providers, including scholarly literature and data repositories and CRIS systems (current research information systems), that are required to comply with EC Open Access policies or that wish to enhance open access and cross-linking of research outputs; and (iv) research funding providers and policy makers that wish to establish and monitor Open Access policies (especially in line with those of the EC) or that seek information on research trends in order to design relevant research funding strategies.

2.3   Governance structure

The OpenAIRE consortium is currently undertaking specific activities in view of establishing a legal entity and a related governance model by the spring of 2017. In particular, OpenAIRE's governance structure should allow its members to operate at the OA policy advice and implementation level as well as at the service provision level.

- Regarding policy making, OA policies are required both at the level of research performing organisations and ministries, which is why the latter should be involved in decision-making processes and actively participate in the implementation of OA policies at their respective level once these have been elaborated.

- Concerning the provision of OA services, the established governance model should also include the research performing organisations that provide core services (e.g. repository) in the decision-making processes.

- Similarly, concerning the reception of OA services, the research performing organisations that receive these services should be able to provide feedback and belong to a second-tier of membership. However, they may not necessarily be included in the decision-making processes.

In short, OpenAIRE's revised governance model should rely on a "mirrored" approach. Those elaborating and implementing OA services and policies should be part of the decision-making body, while those receiving services or applying elaborated policies should have an advisory role.

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[8] Objectives defined under the current H2020 funded project OpenAIRE2020.

[9] As of 2017, research data related to H2020 funding will be open by default: https://ec.europa.eu/research/press/2016/pdf/opendata-infographic_072016.pdf.

[10] OpenAIRE2020 Factsheet

### *2.4   Approximate resources and time needed for implementation*

OpenAIRE was launched in 2009 as a project largely funded by the EC's 7th Research and Innovation Framework Programme (i.e. OpenAIRE followed by OpenAIRE*plus*) and is now operating under Horizon 2020 (OpenAIRE2020). The OpenAIRE project's budget has significantly increased, indicating a growing interest for Open Access across Europe. Indeed, it amounted to 5 M€ for the first FP7 project (with an EC contribution of 4.2 M€ and in-kind contributions from partners) and to 5.1 M€ for the second FP7 project (with an EC contribution of 4.2 M€), while it amounts to 13 M€ for the H2020 project[11], entirely funded by the EC.

One of OpenAIRE's key aims from its onset was the establishment, coordination and operation of a network of national experts across its 33 partner countries, the National Open Access Desks (NOADs). This network has greatly supported the implementation and development of OpenAIRE activities over time (see Sections 3 and 4.1 below). About half of OpenAIRE's budget is spent on the coordination of the network and the latter's local operations. It is essentially delivered as a subsidy to national resources, as selected NOADs are organisations that serve Open Access purposes within their national jurisdiction.

As illustrated in Figure 1 below, OpenAIRE is the successor of the DRIVER project (Digital Repository Infrastructure Vision for European Research)[12]. The latter initiated a pan-European collaborative infrastructure of Digital Repositories in order to promote free online access to scientific publications and other outputs and developed related software services that served as an initial basis for the elaboration of OpenAIRE's technical infrastructure.[13]

Moreover, OpenAIRE activities have strongly supported and been influenced by the evolution of European policies regarding Open Access. In particular, after the publication of the EC's Recommendations on access to and preservation of scientific information in August 2008, OpenAIRE became an essential platform within the EC's Framework Programmes in order to **support the implementation and alignment of Open Access policies** at national level. Under Horizon 2020, open access to publications related to EC funded projects has become mandatory. In addition, two EC pilots have been implemented under the OpenAIRE project, one providing the funding for OA publications for finalized FP7 projects (i.e. FP7 Post-Grant Open Access Pilot) and the other enhancing the access to any type of research data (i.e. Open Research Data Pilot).

Figure 1. Timeline for implementation
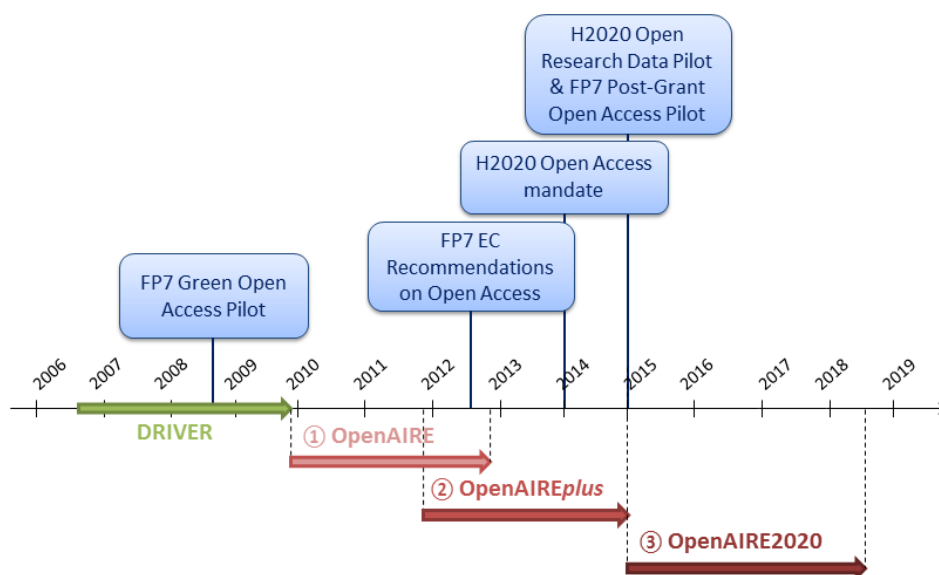
Source: Own compilation

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[11] This EC budget includes 4M€ that are delivered by OpenAIRE to publishers for Author Processing Charges as part of the FP7 Post-Grant Gold Open Access Pilot.
[12] http://cordis.europa.eu/project/rcn/86426_en.html
[13] OpenAIRE Factsheet

3.   Principal outputs to date

OpenAIRE has greatly contributed to promoting Open Access across Europe and hence strengthening the European Research Area. So far, the initiative has supported:

- The expansion of OpenAIRE's membership from 38 partners from 27 European countries in 2009 to 50 partners from 33 countries across the EU and beyond, hence supporting the development of Open Access in Europe and worldwide;

- The set-up and strengthening of a network of National Open Access Desks (NOADS) in all member countries (formerly called National Open Access Liaison Offices), which provide support for OA compliance and for the development and alignment of OA policies and infrastructures (see examples in Annex 1);

- The development of an online portal which (i) provides a gateway for deposit and dissemination of OA research data to Europe's decentralised repository network, amounting to over 17.400.000 publications and 28.000 datasets from more than 700 validated data sources up to now (i.e. repositories, journals, aggregators, databases)[14], approximately covering 60% of the entire European repository landscape; (ii) facilitates the dissemination of learning material on OA such as guidelines, factsheets, studies and online trainings; and (iii) gives access to country information on the research and open access landscape.

- The set-up of a technical infrastructure which supports the collection, harmonisation, analysis and cross-linking of OA research data thanks to a set of tools and services that aim to influence publishing practices by (i) enhancing repository interoperability, (ii) supporting a seamless exchange of information among data providers, and (iii) providing value added services for all stakeholders (e.g. monitoring of and reporting on research outputs at institutional level);

- The participation of NOADS in approximately 1000 national events during the OpenAIRE*plus* phase and the organisation of OpenAIRE workshops and a project conference in order to discuss OA issues with key players (e.g. policy support in managing research data and linking it to publications, interoperability between repositories, legal and sustainability issues for OA infrastructures and the implementation of the EC's Open Research Data Pilot);

- Broad online dissemination of OpenAIRE material with over 100K loads and 6K plays of hour workshop and webinar videos on Vimeo, about 140 presentations on Slideshare with more than 28.000 views, 3.700 registered users on the OpenAIRE portal, and about 7.000 users regularly receiving OpenAIRE newsletters;

- Solid and increasing social media presence with 5.5K twitter followers with 1.7 mi impressions, an active Facebook community of 1.125 members, and a LinkedIn community of 385 members.

4.   Overall strengths of this tool, including key achievements

The OpenAIRE initiative offers many benefits, especially contributing to operational alignment. The project has strongly promoted Open Access to scientific publications and research data, supported its implementation and hence improved the interoperability, visibility and impact of research.

4.1   *Promotion of Open Access to research at operational and policy levels and support for alignment of Open Access policies*

OpenAIRE has successfully promoted the benefits of Open Access to research amongst related broad groups of stakeholders, especially thanks to a very active involvement of OpenAIRE's National Open Access Desks (NOADS) at national level and the organisation of workshops on key OA issues (see Section 3 above). The network of NOADS brings together experts familiar with national and local developments in their specific jurisdiction, and with related cultural, governance and financing systems. They provide **support and solutions for policy implementations, aligning and transferring practices and new ideas** for research or publishing practices**.** Thanks to their continuous engagement with the research community they are key in guiding the transition to long-term

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[14] https://www.openaire.eu/

implementation of Open Access and Open Science policies. They ensure that (i) aligned and validated practices for data preservation and stewardship are followed wherever research is produced (in particular at the level of individual researchers, research projects and research institutes), and that (ii) **the research community is in charge of future developments in open scholarship**.

This **increased awareness and understanding of OA benefits** across Europe has enabled the **set-up and improvement of OA infrastructures** at national and institutional levels, especially thanks to the support provided by NOADS (see Annex 1). For instance, research institutions that have succeeded in implementing OA repositories can benefit from higher visibility on the Web by showcasing their research outputs via the use of a single online platform as a strategic marketing tool. This in turn allows institutions to monitor, keep a record of and assess their research activities in a centralised manner.[15]

To support the development of OA compliance and infrastructures, OpenAIRE has also contributed to the **elaboration and implementation of national OA policies** and to the latters' **alignment with the EC's OA policies** and recommendations (see list of national OA policy developments in Annex 1). This has been achieved thanks to diverse activities such as the set-up of working groups, the analysis of trends regarding Open Access, the take up of the EC's OA mandate by research funding organisations, the elaboration of national OA recommendations and mandates in line with the EC (i.e. not only valid for EC funded projects but also for all other projects funded nationally), etc.

As a result, OpenAIRE has become a well-recognised brand name across Europe and beyond. By strongly interacting with other OA initiatives in Europe and worldwide, OpenAIRE is now considered as the reference initiative for OA in Europe and has placed Europe in a leading position for Open Access.[16]

4.2 Improved interoperability of research outputs

By fostering the uptake of "OpenAIRE compliance" guidelines across OA infrastructures, OpenAIRE is strongly contributing to **alignment amongst existing and new research data providers** at an operational level. Indeed, in order to ensure open access to research data when appropriate and the preservation of this data, OpenAIRE has supported the adoption of common requirements by several countries on research data formats and management, for example by providing a common metadata[17] protocol and supporting the set-up of data management plans that comply with H2020 rules. Factsheets and guidelines have been elaborated and trainings have been facilitated to support capacity building with OpenAIRE compliance.[18]

This has greatly enhanced the **standardisation and interoperability of research outputs**, hence creating the optimal conditions for their **sharing with and re-use by other researchers** as they are in computer-readable form. This is especially required for datasets and research outputs other than publications, as the issue of Open Access is more recent for these types of data.

4.3 Enhanced access to and visibility of existing research data which aims to facilitate research planning and improves return on investment

OpenAIRE compliance guarantees *centralised* Open Access to research outputs. This increases the **transparency** of past and current research activities and outcomes, hence informing researchers of what has already been achieved in their field of research and how outcomes have been validated, and guiding them in their choices regarding future research questions and activities. Thus, a central platform collecting all OA research outputs and data such as OpenAIRE contributes to **avoiding unnecessary duplication** of research activities and to **improving the efficiency of research progress and the use of financial research resources**.

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[15] The OpenAIRE Guide for Research Institutions (2011)

[16] OpenAIRE*plus* Executive Report (2015)

[17] Project metadata gathers all research outputs together in one database (i.e. publications, datasets, etc.).

[18] Examples of OpenAIRE learning material: Usage Data Exchange Guidelines (2010), Factsheet on the Open Research Data Pilot in Horizon 2020, three webinars on interoperability issues.

In addition, by enhancing the visibility of research outcomes, OpenAIRE seeks to promote their effective dissemination to and uptake by end-users in order to support innovation processes, which in turn triggers **higher return on investment in public funding**.

Furthermore, OpenAIRE not only provides a gateway to OA research data, but is also in the process of cross-linking them. This allows to contextualise them and effectively make them even more visible to users. Indeed, OpenAIRE has focused on providing "Enhanced publications" by facilitating the linking of research publications to other research outputs such as datasets and software and to project/funding information. Hence, the OA initiative has contributed to building a "**linked research environment**"[19] that is more transparent and comprehensive and that provides increased visibility to all key players (i.e. researchers, research projects, research institutions, funders, countries, data providers). As such, this OpenAIRE service allows to assess the current status of Open Access across Europe and its evolution in time, and to monitor research outputs per institution/funder/country, etc.

4.4 *Increased potential for efficient impact of research data on research policies*

As indicated above, OpenAIRE provides a central record of the nature and content of research outputs. This has allowed to develop research analytics and impact metrics, for instance through the statistical processing of research output data and the identification of patterns and trends in time/per funder/per scientific area.[20] So far, OpenAIRE has especially focused on providing statistics that relate to research publications, but is aiming to include an increasing number of other research outputs. As such, OpenAIRE seeks to be able to provide a **mapping tool that identifies research objectives, outcomes and related activities covered** (e.g. per funder or per research area) by analysing research outputs, and that can hence **inform decision-making on research policies**.[21] Thus, OpenAIRE contributes to increasing the potential influence of research outcomes on future national and transnational research funding strategies and policies, enhancing strategic alignment amongst countries. As OpenAIRE wishes to embrace the global characteristic of Open Access, this mapping service could provide a strong basis for alignment of national research strategies at an international level.

5. Overall limitations with this tool, including difficulties encountered during implementation

OpenAIRE has been facing several challenges, especially as it supports a strong shift in research practices regarding research data policies and management. In addition, the initiative has to constantly adapt its objectives and services to new technical and research needs and advancements.

5.1 *Limits of the voluntary approach regarding Open Access development*

The OpenAIRE project has relied on a grassroots approach, based on a voluntary engagement of member countries and on an inclusive governance model. This has helped promoting community-building and mutual learning amongst participating partners at the local as well as (trans-)national level. However, this flexible approach has been facing several limitations. Indeed, depending on the involvement of partners, the timing and level of intensity in their uptake of OA guidelines, resulting in national OA policies or infrastructure, can differ from one stakeholder to another. Hence, OpenAIRE seeks to intensify its outreach activities in order to foster greater synchronisation of its partners and related stakeholder communities on OA issues.

Moreover, the OpenAIRE network is suffering from low financial commitment, which triggers difficulties in providing a sustainable funding model for the initiative.[22] In its current form, OpenAIRE lacks a sustainable approach to structural and financial issues, which is necessary for it to operate as a core Europe-wide information infrastructure. In order to support OpenAIRE's long-term vision, the network will soon become a legal entity and hence benefit from a structure that can potentially support OA activities in time. The development of a legal form and an appropriate governance structure (see Section 2.3) for OpenAIRE is crucial for strengthening the European Innovation Union and strongly positioning European research at a global level. More specifically, developing

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[19] OpenAIRE*plus* Executive Report (2015)
[20] https://www.openaire.eu/infra-monitoring
[21] OpenAIRE*plus* Executive Report (2015)
[22] N. Manola, Presentation "OpenAIRE – An Open Knowledge & Research Information Infrastructure", ERA-LEARN 2020, September 2015

OpenAIRE as a legal entity is necessary for the network's sustainability, credibility and reliability vis-à-vis OA key players, and flexibility in adapting its objectives and activities to new OA needs and potential developments.

5.2   Difficulty in bringing together and effectively supporting all key players involved in Open Access issues

OpenAIRE has a broad geographical coverage, which can be challenging when developing adapted tools and approaches to promote mutual learning and coordination amongst participating member countries. The project Consortium had initially been divided into four European regions (North, South, East and West), which allowed to tackle OA challenges at a more regional level. Now that OpenAIRE has significantly advanced in the implementation of OA activities in each European region, it aims to design new innovative approaches for cross-fertilisation and alignment amongst partners.

Furthermore, OpenAIRE carries out activities at various levels (i.e. national, thematic, EU and global levels). In particular, the project has mainly focused on European research outputs up to now, while Open Access consists in a global issue. Thus, in order to effectively develop Open Access, OpenAIRE partners seek to enhance their collaboration with non-European countries.[23]

Lastly, the project brings together a large number of OA stakeholder groups (i.e. research communities, institutions, data providers, ministries). OpenAIRE has hence been facing the challenge of aligning and supporting compliance with OA policies at all levels.[24] For instance, when the EC sets up a new OA policy, OpenAIRE aims to support not only governments in adopting this new policy at national level, but also all local stakeholders involved in OA. In particular, supporting the implementation of aligned OA practices by all research institutions within one country can be challenging.

5.3   Challenging adaptation to changing research and technological landscapes

Open Access issues are constantly evolving with OA and communication needs of research communities, institutions and funders. Thus, OpenAIRE partners aim to continuously assess the network and its activities in order to address these emerging needs by adapting its governance and range of expertise offered. In addition, technological advancements increase the number of potential types of research outputs, raising the complexity of the research landscape with respect to effective Open Access. They also increase the number of services that can potentially be provided by OA infrastructures and initiatives such as OpenAIRE, which means that OpenAIRE experts need to constantly update their skills and knowledge on recent developments.

As a result, OpenAIRE's activities and proposed services have greatly expanded over the last few years. The network is now facing the difficulty of providing clear messages regarding its mission and operation, and regarding Open Access in general. The challenge lies in showing the diversity of possibilities regarding Open Access, and at the same time having a clear long-term vision for OA which integrates all these possibilities as a whole.

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[23] OpenAIRE*plus* Executive Report (2015)
[24] N. Manola, Presentation "OpenAIRE – An Open Knowledge & Research Information Infrastructure", ERA-LEARN 2020, September 2015

6.   Conclusions: Suitability and key factors of success

Open access to research data is required in order to ensure the **transparency of research outcomes** by demonstrating the quality of research outputs and data that allow to validate research results. It is also the optimal pre-condition for **enhancing their exchange with and re-use by other researchers**, in particular if **data interoperability** issues are addressed. This fosters transnational and transdisciplinary research collaboration within research communities. In particular, Open Access supports **efficient advancement of research knowledge** by increasing awareness and reducing fragmentation of already existing research and related outcomes, as well as by contributing to aligning research methodologies and data collection techniques. In addition, Open Access contributes to effective and aligned dissemination of research outcomes to non-academics stakeholders and end-users, hence increasing the potential for their **uptake in driving technical and social innovations as well as policy-making** in thematic areas. Lastly, the analysis of OA research outputs can provide **guidance to decision-makers in elaborating and aligning future research priorities and related funding strategies at national as well as transnational levels**.

P2Ps can hence significantly benefit from Open Access and should seek to promote this principle amongst their members and apply it to research outputs they have supported or are planning to support.

Key factors of success:

1) At strategic level:

- **Develop a broad common vision for Open Access** (e.g. at JPI level or across several P2Ps) or clearly state the adoption of an existing one (e.g. H2020 OA guidelines): the elaborated vision should engage all P2P members in order to foster ownership and hence ensure the effective application of defined Open Access rules or guidelines.

- **Develop a joint communication and dissemination strategy** that seeks to showcase OA research outputs and promote the uptake of related research outcomes by end-users.

2) At financial level:

- **Secure sustainable funding for research data management and open access publishing/archiving activities**: a business model that financially supports long-term open access to research data should be adopted by the EC and/or by countries themselves (at national level and/or via P2Ps).

3) At operational level:

- **Promote the alignment of P2P member countries' Open Access policies** amongst them (at government and institutional level) as well as with broader policies and guidelines at the EU and global levels: the latter is particularly important as it allows to address the global aspect of the Open Access challenge.

- **Promote the implementation, use and alignment of national and transnational OA infrastructures**: for instance, promoting the implementation of OpenAIRE-compliant infrastructures at institutional level and the use of the OpenAIRE platform allows for a centralised access to OA research outputs at transnational level.

- **Design and implement an aligned data management plan** for all research projects that involves all key players in Open Access and data collection and storage: in particular, relying on data providers that have implemented aligned OA policies (e.g. that are OpenAIRE-compliant) greatly facilitates open access to research outputs.

- **Centralise and cross-link all research information** (including research data and related project/funding information): this contributes to building a comprehensive research environment and supporting research policy making (e.g. by using OpenAIRE as a mapping tool of research outputs and activities).

- **Facilitate the cooperation of member countries across P2Ps** on OA issues in order to support exchange of best practices and transnational alignment regarding transversal operational aspects such as the development of OA policies, guidelines and infrastructures, and the interoperability of research outputs.

REFERENCES

Literature

EIFL (2011). *OpenAIRE is good for global research*. Available at: https://www.openaire.eu/publications

European Commission (2012). *Commission Recommendation of 17.7.2012 on access to and preservation of scientific information*, C(2012) 4890 final. Available at: http://ec.europa.eu/research/science-society/document_library/pdf_06/recommendation-access-and-preservation-scientific-information_en.pdf

Hagerlid, J. (2010). *OpenAIRE – European Repositories jointly supports the EC Open Access Pilot*, Sciecom Info. Available at: https://www.openaire.eu/publications

Manola, N., and Manhgi. P. (2010). *An Infrastructure for Managing EC Funded Research Output – The OpenAIRE Project*. Available at: https://www.openaire.eu/publications

Manola, N., Rettberg, N., and Manghi, P. (2015). *OpenAIREplus Project Executive Report*. Available at: https://zenodo.org/record/15464/files/OpenAIREplus_Executive_report.pdf

OpenAIRE (2010). *Usage Data Exchange Guidelines* (Deliverable D4.3). Available at: https://www.openaire.eu/publications

OpenAIRE (2011). *The OpenAIRE Guide for Research Institutions*. Available at: https://www.openaire.eu/public-project-documents

OpenAIRE, LIBER and COAR (2013). *Horizon 2020 – Outline of a Pilot for Open Research Data – Joint statement by OpenAIRE, LIBER and COAR*. Available at: https://www.openaire.eu/publications

OpenAIRE (2015). *Research Impact Services* (Deliverable D8.3). Available at: https://www.openaire.eu/deliverables

OpenAIRE (2015). *Zenodo Advanced Services Specification* (Deliverable D9.3). Available at: https://www.openaire.eu/deliverables

OpenAIRE (2016). *Statistics Reporting and Visualization Services* (Deliverable D9.2). Available at: https://www.openaire.eu/deliverables

OpenAIRE (2016). *OpenAIRE Research Data Management Briefing paper – Understanding Research Data Management*. Available at: https://www.openaire.eu/dissemination-material

Factsheets

EC Open Access Pilot in FP7 (Leaflet). Available at: https://www.openaire.eu/public-project-documents

EC/OpenAIRE FP7 Post-Grant Open Access Pilot. Available at: https://www.openaire.eu/dissemination-material

Open Access and Open Data in Horizon 2020 – Factsheet for Research Administrators and Project Coordinators: https://www.openaire.eu/dissemination-material

Open Access and Open Data in Horizon 2020 – Factsheet for Repository Managers: https://www.openaire.eu/dissemination-material

OpenAIRE – Open Access Infrastructure for Research in Europe (FP7). Available at: https://www.openaire.eu/project-factsheets

OpenAIRE*plus* (FP7). Available at: https://www.openaire.eu/project-factsheets

OpenAIRE2020 – Open Access Infrastructure for Research in Europe towards 2020 (H2020). Available at: https://www.openaire.eu/project-factsheets

Presentations

Gutknecht, C. (2012). Presentation at the Meeting of the Swiss Open Access Group "*OpenAIRE and OpenAIREplus*", August 2012. Available at: http://www.slideshare.net/OpenAIRE_eu/2012-08-22openaireplusoameetingbern

Kuchma, I. (2010). Presentation "*Case study: OpenAIRE project – EU funders' mandates*", August 2010. Available at: http://www.slideshare.net/OpenAIRE_eu/o-26614271

Kuchma, I. (2010). Presentation at the Internet Governance Forum "*Open access and the evolving scholarly communication environment*", September 2010. Available at: http://www.slideshare.net/OpenAIRE_eu/openaire-open-access-and-the-evolving-scholarly-communication-environment

Kuchma, I. (2010). Presentation at the Regional Workshop (South Africa) "*Open Access policies on national level*", November 2010. Available at: http://www.slideshare.net/OpenAIRE_eu/national-oa-policies-unesco-workshop

Lossau, N. (2010). Presentation at the Berlin 8-Conference "A Pan-European Effort to Realize the OA-Pilot of the European Commission/European Research Council", October 2010. Available at: http://www.slideshare.net/OpenAIRE_eu/openaire-at-beijing2-010

Manola, N. (2015). Presentation at the ERA-LEARN 2020 Workshop on Aligment "*OpenAIRE – An Open Knowledge & Research Information Infrastructure*", September 2015. Available at: https://www.era-learn.eu/events/workshop-on-the-practical-implementation-of-alignment-learning-from-good-practice/11.Session3_BR3_OpenAIRE.pdf

Manola, N., and Manghi, P. (2013). Presentation at the OpenAIRE Interoperability Workshop "*OpenAIRE – The Open Scholarly Communication & Scientific Information Infrastructure for Europe*", February 2013. Available at: http://openaccess.sdum.uminho.pt/wp-content/uploads/2013/02/4_NataliaManola_OpenAIREworkshopUMinho.pdf

Van Nieuwerburgh, I. (2010). Presentation at the Open Access Informationstag in Vienna "*OpenAIRE - supporting Open Access for FP7 and ERC funded projects*", October 2010. Available at: http://www.slideshare.net/OpenAIRE_eu/20101022-open-airencpbrussels-2

OpenAIRE (2012). Presentation "*NOADS and OpenAIREplus*". Available at: http://www.slideshare.net/OpenAIRE_eu/openaireplus-noads

Príncipe, P., and Carvalho, J. (2012). Presentation at the OpenAIRE Online Workshop "*How to make your repository OpenAIRE compliant*", January 2012. Available at: http://www.slideshare.net/OpenAIRE_eu/openaire-making-your-repository-openaire-compliant

Schmidt, B. (2013). Presentation at the ERC Workshop "*OpenAIRE – Open Knowledge Infrastructure for Europe*", February 2013. Available at: https://erc.europa.eu/sites/default/files/content/pages/pdf/Birgit_Schmidt.pdf

Schmidt, B., Rodrigues, E. and Fuchs, W. (2011). Presentation at the EARMA Conference "*European Research in the OpenAIRE: Infrastructure & Support for Open Access to Scientific Information*", June 2011. Available at: http://www.slideshare.net/OpenAIRE_eu/openaire-at-earma-conference-june-2011

Consulted websites

OpenAIRE: https://www.openaire.eu/

COAR: https://www.coar-repositories.org/

ANNEX 1. NATIONAL OPEN ACCESS POLICIES AND INFRASTRUCTURES DEVELOPED UNDER OPENAIRE*PLUS*[25]

Country	*Advancements in Policy*	*Infrastructure Developments*
Austria	Major research funder, FWF now has an OA policy for all funded projects	OpenAIRE compliant e-Infrastructures Austria sponsored by Federal Ministry of Science, Research and Economy
Belgium	Installation of an OA working group. The representative from the federal government is also the point of reference to the EC for OA	
Bulgaria	Commission for implementation of an OA plan	National OpenAIRE compliant repository of FP7 publications
Croatia	The new Law of Science and Higher education has a mandate for OA ETDs	A national OpenAIRE compliant repository infrastructure is being set up
Cyprus		All public universities developed OA repositories OpenAIRE compliant
Czech Republic	R&D council released Recommendations on OA, in-line with the EC	OpenAIRE compliant repositories
Estonia	The Research and Innovation Policy Monitoring Program of the Estonian Ministry of Education & Research - analysing current OA trends and providing suggestions on national OA policy, in-line with the EC	
Finland	NOAD liaison with Open Science and Research Initiative (ATT), 2014-2017 by the Finnish Ministry of Education and Culture to follow OA demands of the EC	
Germany	Research Administers nation-wide very engaged with take up of EC OA mandate	
Greece	Increased awareness of OA among major stakeholders and policy makers	Its emerging national infrastructure is being OpenAIRE compliant
Hungary	HUNOR, association of Hungarian OA repositories promotes repository development	
Italy	Ministry of Education: OA mandate for publications and data, aligned with EC	IRIS information system, similar to CRIS
Latvia	OA policy drafted by major university, presented to the ministry	90% of FP7 publications integrated into repository
Lithuania	Support from research councils for OA: setting policy principles	National OpenAIRE compliant repository, eLABa

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Luxembourg		First repository established, OpenAIRE compliant
Malta		University established first institutional repository
Netherlands	Ministry of Education, Culture and Science committed to OA as of 2014	
Poland	Cooperation with Conference of Rectors of Academic Schools and Ministry of Science to initiate work on policy changes	Development of free repository package: Polish version of DSpace; 383% increase in number of OA repositories
Portugal	Major research funder releases OA policy, in line with the EC	RCAAP - OpenAIRE compliant infrastructure in place
Romania	National Strategy for Innovation sets OA for all results. Part of Open Government Partnership	
Slovakia	Government plan for OA mandate. Part of Open Government Partnership	
Slovenia	Ministry for Science, Education and Sport set up a Working Group to develop an OA policy, in line with the EC	Establishment of national OA infrastructure and a national open science portal
Spain	R&D funded projects mirror EC OA mandate	High rate of repositories are compliant
Sweden	The Swedish Research Council has been tasked by the Government to produce national guidelines for open access to scientific information	
Switzerland	Swiss Science Foundation extends OA policy to monographs	
Turkey	Council of Higher Education has started an OA project	Established many new OpenAIRE compliant repositories