

# JA1 Service Integration

From the architecture and service point of view, the goal of this activity is to support the publishing of research/scientific products (research data, research software, experiments, research objects, etc.) in a FAIR way so as to lower the barriers for scientific communities to make research products more findable and discoverable to a larger scientific community, and to increase the uptake of open science by enabling the use and reuse of a wider range of scientific outputs. Service Integration will also facilitate the adoption of data management plans.

The objectives are to:

- facilitate the adoption of data management plans
- foster and facilitate sharing and reuse of all products of science and support reproducibility of science and transparent evaluation of the scientific process, and
- enable fully-fledged scientific reward mechanisms.

The high level goals can be broken down into the following use cases, which will drive the technical work detailed below:

1. Researchers and communities can adopt good data management practices via Data Management Plans according Horizon 2020 guidelines, including OpenAIRE and EOSC-hub services.
2. Researchers depositing publications in OpenAIRE can include references to datasets and application services within the papers, pointing to datasets and services stored in EOSC-hub.
3. Communities share scientific output with a high level of FAIRness via OpenAIRE services to broader audiences.
4. Enabling OpenAIRE users to collect and visualise research impact data about the use of data and application services that are federated via EOSC-hub.
5. Providing coherent, integrated information and support for RDM for researchers and projects, irrespectively whether they contact OpenAIRE or EOSC-hub.

## JA1.1 Machine-consumable Data Management Plans

EOSC-hub coordination: **Adil Hasan** Coordinator of T5.3 Integrated Business and Operations Support Systems (SIGMA2)

OpenAIRE-Advance coordination: **George Kakalettris**, Athena RC

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A DMP describes the data management life cycle for data to be collected, processed and/or generated. It is key in good data management practices, and mandatory in Horizon 2020 projects. In order to support better the process of defining DMPs that comply with the H2020 guidelines, a DMP tool will be jointly developed by EOSC-hub and OpenAIRE-Advance. The DMP tool will be integrated (i.e. registered) with both project catalogues: EOSC-hub Service Catalogue and OpenAIRE-Advance service catalogue. The Order Management tool (where the customer is the entity placing the order and the provider the receiving one) is going to provide an efficient way to manage the provisioning of services and resources coming from DMPs.

**Benefits.** Horizon 2020 projects will have an easy way to define DMPs that comply with the H2020 guidelines for DMPs, and to find and request services offered via the Hub.

**Services involved.** OpenAIRE/EUDAT DMP tool, EOSC-hub Marketplace and order management tool.

### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
JA1.1.1	Collaboration with RDA DMP Common Standards WG	Experts from OpenAIRE-Advance and EOSC-hub will participate actively within the RDA Common Standards WG.	T10.1, T5.3	T5.5
JA1.1.2	Pilot DMP service with communities	In the context of the RDA Common Standards WG, the ongoing developments of the DMP tool will be continued by OpenAIRE and EUDAT and a pilot will be performed with relevant communities to provide feedback on the usability of the DMP tool.	T5.3, WP7, WP8	T2.1, T2.2, T2.3, T8.1, T9.1
JA1.1.3	Offer DMP service in production	The jointly developed DMP tool will be offered as an official service to Communities and H2020 beneficiaries.	T5.3	T8.1, T9.1
JA1.1.4	Explore publishing of DMPs as documents	To relate DMPs and data and service requests from DMPs to other sources, the DMPs are going to be published within OpenAIRE Zenodo and findable via OpenAIRE Research Community Dashboard (RCD). The RCD can relate content from DMPs to other sources.	T5.3, T11.2	T2.1, T2.2
JA1.1.5	Integration of the DMP service with EOSC-hub Service Catalog and Order Management tool	To ease the process of finding and requesting services and resources via the Hub, the DMP tool will be integrated with the EOSC-hub Marketplace and the Order Management tool.	T5.2, T5.3	T2.1, T2.2

## Joint Activity Milestones

JAM	Description	Timeline [PM01-PM36]
JAM1.1	Pilot DMP service with communities	M18
JAM1.2	Offer DMP service in production (definition of service provisioning model, business model and policies)	M24
JAM1.3	Enabling publishing DMPs in OpenAIRE Zenodo	M30
JAM1.4	Integration of the DMP service in the OpenAIRE service catalogue and the EOSC-hub Marketplace and Order Management tool	M36

## JA1.2 Interoperability across EOSC services for Open Science

EOSC-hub Coordination: **Giacinto Donvito**, Coordinator of WP10 Technology Coordination (INFN)

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Common practices to expose, access and define citation metadata and link metadata for literature, datasets, and software in a FAIR way, are crucial for communities and researchers to enable sharing and discovery of scientific outcome and possible reproducibility of science.

The aim of this activity is to define and promote common guidelines for scientific product content providers in order to facilitate the publishing and exchange of scientific products.

This activity is crucial to enable definition of new citation/quality indexes for science and come up with Open Science-flavoured research impact.

### JA1.2.A Define and promote common guidelines

Common guidelines for content providers and scientific products are necessary in order to support the efficient exchange of information and descriptions of and references to scientific products. OpenAIRE already defines and fosters guidelines for scholarly content providers and recommendations on the exchange and harvesting of metadata relative to publications, datasets[1], software[2], and "other scientific products"[3]. The guidelines establish metadata formats for specific kinds of providers (publication repositories, data repositories, software repositories, CRIS systems) on how to express and export descriptions of the scientific products they contain.

This task will:

- Endorse and foster adoption of OpenAIRE guidelines.
- Assess and refine OpenAIRE guidelines for the definition and exchange of descriptions of "other scientific products" (i.e. products different from publications, datasets, and software)
- Investigate the possibility of introducing new guidelines for specific classes of "other products" (e.g. services, protocols, workflows, virtual appliances). This activity will be conducted in the context of existing RDA groups.
- Define a framework for identifying and describing scientific communities. This activity will be conducted in the context of RDA groups.

Joint Activity JA2 (communication, engagement, support and training) will support this task to promote and technically support the resulting EOSC-defined guidelines.

**Benefits.** Content providers (data providers, software providers, publishers) can expose metadata about their scientific products in a uniform and broadly accepted format, thereby maximizing their accessibility, interoperability, and findability, ultimately improving visibility of products and content providers, and a high level of FAIRness.

**Services involved.** This activity concerns endorsing of existing and establishing new guidelines; therefore no services are directly involved in this activity.

### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
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JA1.2.A.1	Endorse/Foster OpenAIRE guidelines for Data Archives and Research Software repositories	EOSC-hub endorsement of OpenAIRE guidelines for Data Archives and Research Software Repositories.  EOSC-hub promotion of guidelines to EOSC-hub service providers and research community content providers.	T2.4, WP7, WP8, T10.1	T6.1
JA1.2.A.2	Assess and refine OpenAIRE guidelines for other scientific products and investigate the possibility of introducing new specific guidelines for specific classes of "other products" (e.g. services, protocols, workflows, virtual appliances)	Collaborate with existing RDA working groups and H2020 projects (e.g. eInfraCentral) in refining and establishing new guidelines for other scientific projects (e.g. services, protocols, workflows, virtual appliances), with the involvement of content provider experts from OpenAIRE and EOSC-hub.	T5.2, T5.6, T10.1	T6.1
JA1.2.A.3	Define framework for identifying/describing scientific communities	Collaborate with existing and future RDA working groups in defining a common framework for scientific communities with the involvement of experts from OpenAIRE, EOSC-hub and communities.	T5.3, WP7, WP8, T10.1	T6.1, WP6, WP8
JA1.2.A.4	Pilot of OpenAIRE Brokering Service with EOSC-hub services	The OpenAIRE Brokering Service provides feedback on discovered relations between scientific products across different sources. Content and service providers can benefit from the brokering service to enrich metadata on available content. EOSC-hub will perform 2 pilots (e.g. B2SHARE, EOSC-hub Marketplace) in assessing the usability of the OpenAIRE brokering service.	T5.2, T6.4	T10.2

#### Joint Activity Milestones

JAM	Description	Timeline [PM01-PM36]
JAM1.5	Report on OpenAIRE guidelines for Data Archives and Research Software Repositories	M6
JAM1.6	New guidelines for specific classes other scientific products (e.g. services, protocols, workflows, virtual appliances)	M18
JAM1.7	Proposal of a framework to describe and identify scientific communities	M30
JAM1.8	Pilot with OpenAIRE Brokering Service in EOSC-hub services (EUDAT B2SHARE and EGI Marketplace)	M36

#### JA1.2.B Facilitating publishing and exchanging information on scientific products in EOSC

This activity deals with the adaptation of EOSC-hub services dealing with the management of the different scientific products to the guidelines promoted and defined in the previous activity, JA1.2.A. Purposes are the enabling of metadata harvesting and the support of the exchange of metadata from scientific products to the OpenAIRE Research Community Dashboard.

**Benefits.** Researchers while performing their scientific process using EOSC-Hub services can (i) implicitly/automatically publish and report their scientific products to the funders while (ii) sharing their products within their community).

**Services involved.** EUDAT B2FIND, EUDAT B2SHARE, EGI DataHub, EGI AppDB, EOSC-hub Marketplace, OpenAIRE Research Community Dashboard (RCD).

#### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
JA1.2.B.1	Adapt EUDAT B2 services to support OpenAIRE Guidelines for Data Archives and enabling harvesting by OpenAIRE RCD	The minimum metadata templates and guidelines for the B2FIND and B2SHARE services will be brought in-line with the guidelines for Data Archives and the B2FIND service will be made harvestable by the OpenAIRE RCD service. This activity will be support by experts from OpenAIRE.	T6.2, T6.4	T7.2, T7.3
JA1.2.B.2	Adapt EGI AppDB to support OpenAIRE guidelines for software and other scientific products and enabling harvesting by OpenAIRE RCD.	The metadata templates in which services, software and virtual appliances are being described in the EGI AppDB will be brought in-line with the new defined guidelines and the AppDB will be made harvestable by the OpenAIRE RCD. This activity will be support by experts from OpenAIRE.	T5.6	T7.2, T7.3
JA1.2.B.3	Adapt EGI DataHub to support guidelines for Data Archives and enabling harvesting by OpenAIRE RCD	In the EGI DataHub support for metadata templates will be implemented, the supported metadata templates will be defined according to the guidelines for Data Archives and the EGI DataHub will be made harvestable by the OpenAIRE RCD service. This activity will be support by experts from OpenAIRE.	T6.1	T7.2, T7.3

JA1.2.B.4	Adapt EOSC-hub Marketplace to support new guidelines for other scientific products and enabling harvesting by OpenAIRE RCD	The metadata templates in which services are being described within the EOSC-hub Marketplace will be brought in-line with the new defined guidelines and the Marketplace will be made harvestable by the OpenAIRE RCD. This activity will be support by experts from OpenAIRE.	T5.2	T7.2, T7.3
JA1.2.B.5	Adapt OpenAIRE Research Community Dashboard for the harvesting of EOSC-hub services	To support the new defined guidelines for scientific products and the harvesting of EOSC-hub services, the OpenAIRE RCD will be adapted where needed.	T5.2, T5.6, T6.1, T6.2, T6.4	T7.2, T7.3

#### Joint Activity Milestones

JAM	Description	Timeline [PM01-PM36]
JAM1.9	B2FIND and B2SHARE adapted to support guidelines for Data Archives and enabling harvesting by OpenAIRE RCD	M18
JAM1.10	EGI AppDB adapted to support OpenAIRE guidelines for software other scientific products and enabling harvesting by OpenAIRE RCD	M18
JAM1.11	EGI DataHub adapted to support guidelines for Data Archives and enabling harvesting by OpenAIRE RCD	M24
JAM1.12	EOSC-hub Marketplace adapted to support new guidelines for other scientific products and enabling harvesting by OpenAIRE RCD	M24
JAM1.13	OpenAIRE RCD adapted to support harvesting of EOSC-hub services	M24

### JA1.3 Towards Open Science-oriented Scientific Impact

EOSC-hub Coordination: **Adrian Coveney**, Coordinator of T5.4 Monitoring, Accounting, Messaging, Security Tools (STFC)

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#### Internal working document

For all stakeholders involved in enabling, conducting and funding research and to the public in general, it is mandatory to determine the scientific impact of outputs produced and of the research conducted. The basis for measuring and evaluating the scientific impact is the measurement of usage and re-usage of scientific products (literature, datasets, software, services, tools) and between scientific products, scientific organisations, to content and service providers and funding agencies. The objective of this task is to define guidelines for measuring the exchange of usage statistics, adapting EOSC-hub and OpenAIRE services to support these new guidelines and enabling the exchange and aggregation of these usage statistics within the OpenAIRE Usage Stats service. To come to new guidelines for measuring and exchanging usage statistics, this task will collaborate with the RDA WG Make Data Count.

#### Benefits.

- Researchers can access scientific products together with their usage statistics.
- Researchers authoring scientific products different from literature can benefit from new impact measures.
- Service providers can define quality metrics and relative tools for open science (taking into account all products and their usage).
- Scientific communities and funding agencies have quality metrics on scientific impact on research done and funded. These metrics can be used within the decision-making process for the long-term preservation of scientific products.

**Services involved.** EUDAT B2SHARE, EUDAT B2SAFE, EGI APEL accounting, OpenAIRE Zenodo, OpenAIRE Usage Stats service, OpenAIRE Brokering Service

#### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
JA1.3.1	Contribute to the definition of guidelines for the measurement and exchange of usage statistics	Contribute to relevant RDA groups and standardization bodies (e.g. RDA and OGF) in defining and establishing new guidelines for measuring and the exchange of usage statistics, with the involvement of experts from OpenAIRE and EOSC-hub.	T10.1, T5.4	T10.2
JA1.3.2	Pilot guidelines for data usage statistics in EOSC-hub and OpenAIRE services	In the context of the RDA WG, OpenAIRE and EOSC-hub will pilot and implement the new guidelines for measuring usage statistics in the EGI APEL accounting service, EUDAT B2SHARE, OpenAIRE Zenodo and Usage Stats service.	T5.4, T6.1	T10.2
JA1.3.3	Adapt EOSC-hub and OpenAIRE service for measuring and exchanging usage statistics	After the new guidelines on measuring usage statistics have been endorsed as RDA guidelines, the EOSC-hub and OpenAIRE services are being adapted to support these new guidelines.	T5.4, T6.1, T6.4	T10.2

#### Joint Activity Milestones

JAM	Description	Timeline [PM01-PM36]
JAM1.14	Definition of guidelines for measuring and the exchange of usage statistics (in collaboration with RDA and other standardization bodies as applicable)	M18
JAM1.15	Pilot with usage of the new guidelines to measure usage statistics in EOSC-hub and OpenAIRE services	M20
JAM1.16	Adapt EOSC and OpenAIRE service for measuring and exchanging usage statistics in OpenAIRE Usage Stats service	M30

## JA1.4 Enabling Services Integration in support of EOSC

### JA1.4.A AAI Integration

EOSC-hub Coordination: **Nicolas Liampotis**, Coordinator of WP5.1 Identification, Authentication, Authorisation and Attribute Management (GRNET)

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The OpenAIRE AAI infrastructure and services will be integrated with the EOSC-hub federated AAI infrastructure. Purpose of this is to allow customers to have seamless access across OpenAIRE and EOSC-hub services.

To assess the extent of the needed integration, first an exemplar use case will be documented in which cross usage of the OpenAIRE and EOSC-hub services will be described. To demonstrate cross-infrastructure usage, a pilot will be conducted to implement the documented use case. After a successful pilot, the realized AAI integration will be rolled out to the OpenAIRE and EOSC-hub production AAI infrastructure. Following to this, OpenAIRE services will be gradually enabled via the integrated federated AAI infrastructure.

#### Benefits

- Seamless access for users to OpenAIRE and EOSC-hub services with own institute and/or community credentials, without having to register for each individual service.
- Service providers can more easily support a larger user base.

**Services involved.** EGI Check-In, EUDAT B2ACCESS, OpenAIRE AAI and services

#### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
JA1.4.A.1	Document use case for the OpenAIRE AAI integration with the EOSC-hub federated AAI	Describe an exemplar use case involving user communities for the AAI integration between OpenAIRE services and user domain with EOSC-hub services. Within this task OpenAIRE and EOSC-hub services are selected according to the use case requirements. The output is documentation.	T5.1	T9.1

JA1.4.A.2	Pilot the use case for the AAI integration between OpenAIRE and EOSC-hub Federated AAI and Services	This is an enabling task between OpenAIRE and EOSC-hub AAI and service experts in which the described use case will be implemented and tested.	T5.1	T9.1
JA1.4.A.3	Integration of the OpenAIRE AAI with the EOSC-hub Federated AAI	This is also an enabling task in the piloted AAI integration between OpenAIRE and EOSC-hub will be put into production.	T5.1	T9.1
JA1.4.A.4	Enabling OpenAIRE services via the integrated OpenAIRE en EOSC-hub Federated AAI infrastructure	Upon completion of the AAI integration, OpenAIRE services will be gradually enabled via the integrated AAI infrastructure.	T5.1	T9.1

#### Joint Activity Milestones

JAM	Description	Timeline [PM01- PM36]
JAM1.17	Use case documented for integrating the OpenAIRE AAI with the Federated AAI of EOSC-hub	M9
JAM1.18	Pilot the use case for AAI integration between OpenAIRE and EOSC-hub	M15
JAM1.19	The AAI integration between OpenAIRE and EOSC-hub is completed	M30

#### JA1.4.B Annotation

EOSC-hub Coordination: **Yann Le Franc**, Coordinator of T6.4 Data and Metadata management (CINECA)

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The ability to annotate scientific products (add properties, values or tags to their metadata) and sharing such annotation is key to capture the dynamic and evolving facets of science and make them useful input for researchers. EUDAT – via EOSC-hub – provides the B2NOTE service to be used across EOSC-hub and OpenAIRE services as a mean to share annotations across different repository services. This task focuses on investigating the possibility of enabling annotation functionality in OpenAIRE services (e.g. OpenAIRE Research Community Dashboard, Zenodo). Since such services were developed independently, this task will first carry out a feasibility study of technological integration, followed by an implementation phase in accordance to the identified expectations.

#### Benefits

- Researchers share annotations and can benefit from other's;
- Service providers can benefit from such content to provide advanced services for scientists. This will enrich the value of scientific products and will enlarge their re-usability.

**Services involved.** EUDAT B2NOTE, OpenAIRE Research Community Dashboard, OpenAIRE Zenodo.

#### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
JA1.4.B.1	Feasibility study of B2NOTE integration in OpenAIRE services	EUDAT provides a central annotation service (B2NOTE) that can be easily integrated within web-portals. To assess the usability and the level of integration of the B2NOTE service in OpenAIRE services (e.g. Research Community Dashboard and Zenodo) a feasibility study will be performed.	T6.4	T7.2, T7.3, T10.4
JA1.4.B.2	Enabling annotations within OpenAIRE Zenodo	Based on the result of task JA1.4.B.1 (if positive), the B2NOTE service will be integrated within Zenodo.	T6.4	T10.4
JA1.4.B.3	Enabling annotations within OpenAIRE Research Community Dashboard (RCD)	Based on the result of task JA1.4.B.1 (if positive), the B2NOTE service will be integrated within web user interface of the OpenAIRE RCD.	T6.4	T7.2, T7.3

#### Joint Activity Milestones

JAM	Description	Timeline [PM01- PM36]
JAM1.20	Feasibility study on the usability and integration of the B2NOTE service in OpenAIRE services (including considerations on policies, business model, operations costs)	M18
JAM1.21	If preliminary study is positive: B2NOTE integrated with OpenAIRE Zenodo	M24
JAM1.22	If preliminary study is positive: B2NOTE integrated with OpenAIRE Research Community Dashboard	M30

#### JA1.4.C Anonymisation of sensitive data

EOSC-hub Coordination: **Maria Francesca Iozzi**, Coordinator of T6.6 Sensitive Data (UNINETT)

OpenAIRE-Advance Coordination: **Prodromos Tsiavos**, Athena RC (Manolis Terrovitis, with support of Prodromos Tsiavos for the legal aspects)

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Processing, analysis, sharing and/or publishing of sensitive data is often restricted, and it is regulated by institutional, national and/or European laws and policies. Often sensitive data can only be made available after anonymising information that can be used to identify persons.

OpenAIRE is developing an anonymisation service, called Amnesia, in which users can easily anonymise personal information within data objects. The Amnesia service is, at time of this writing, in beta stage. Within EOSC-hub a dedicated task has been included to integrate and to offer secure computing environments within EOSC-hub and to explore solutions for making sensitive data FAIR. In this context, the Amnesia service can provide a possible solution for communities and users with sensitive data to automatically anonymise personal information within sensitive data. The main objective of this joint activity is to pilot the usability of the Amnesia service within the sensitive data services provided via EOSC-hub for data anonymisation prior to data exporting and metadata anonymisation prior to publishing and discovery of sensitive data in B2SHARE and B2FIND.

After a successful pilot, EOSC-Hub/OpenAIRE can promote the OpenAIRE Amnesia service to research communities to have data properly anonymised to a given degree of anonymisation.

**Benefits.** Via the OpenAIRE Amnesia service, researchers in need of anonymising data will have a service to easily anonymise data, to make it easier to make it available and/or share it between users across communities.

**Services involved.** OpenAIRE Amnesia, TSD and ePouta sensitive data services

##### Subtasks

Subtask Number	Name	Description	EOSC-hub tasks	OpenAIRE-Advance tasks
JA1.4.C.1	Definition of use case for OpenAIRE Amnesia service within the EUDAT Sensitive Data Services	Assess the usability, costs and security aspects of the OpenAIRE Amnesia service and describe an exemplar use case for properly anonymising data stored within the TSD or ePouta sensitive data services. Amnesia will be evaluated against national and European regulations. A possible use case scenario is the publishing and discovery of sensitive in B2SHARE and findable via B2FIND after anonymisation.	T6.6	T10.2
JA1.4.C.2	Pilot OpenAIRE Amnesia service within the EUDAT Sensitive Data Services	This is an enabling task between OpenAIRE Amnesia and EUDAT TSD involving service experts. The described use case will be implemented and tested.	T6.6	T10.2

##### Joint Activity Milestones

JAM	Description	Timeline [PM01- PM36]
JAM1.23	Use case documented for piloting the OpenAIRE Amnesia service within the EUDAT Sensitive Data Services	M12
JAM1.24	Report on the usability of the OpenAIRE Amnesia service within the EUDAT Sensitive Data services	M24

[1] <https://guidelines.openaire.eu/en/latest/>

[2] <http://software-guidelines.readthedocs.io/en/latest/introduction.html>

[3] <http://guidelines-other-products.readthedocs.io/en/latest/>