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FAIR enabling services

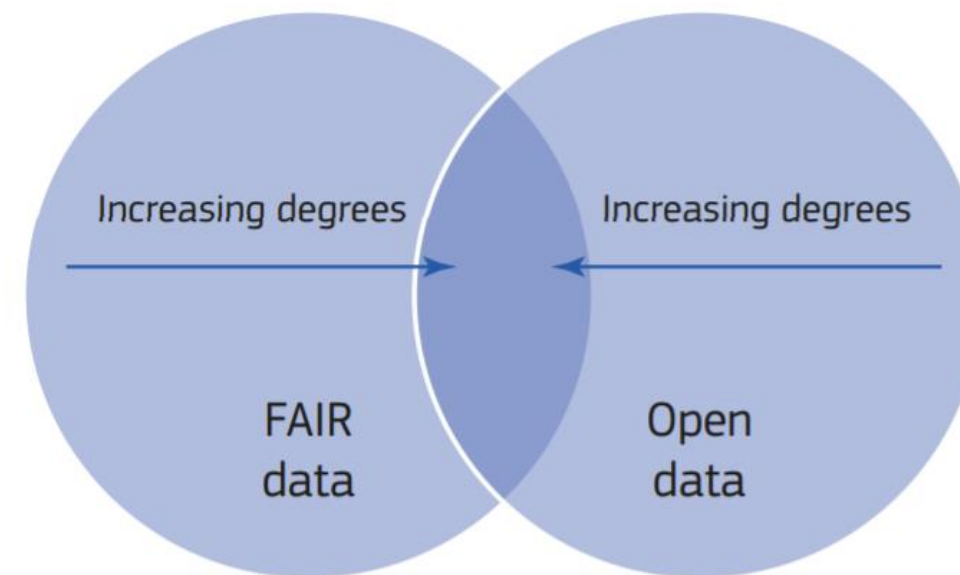


Turkey in Horizon 2020 | FGT-11: Focus Group Training on Open Science | 20 April 2021



Why having just a service is not enough

□ FAIR-enabling ecosystems



“highly distributed ecosystem requiring technical mechanisms linking resources, and social mechanisms to define specifications, standards and protocols”

https://ec.europa.eu/info/sites/info/files/turning_fair_into_reality_1.pdf

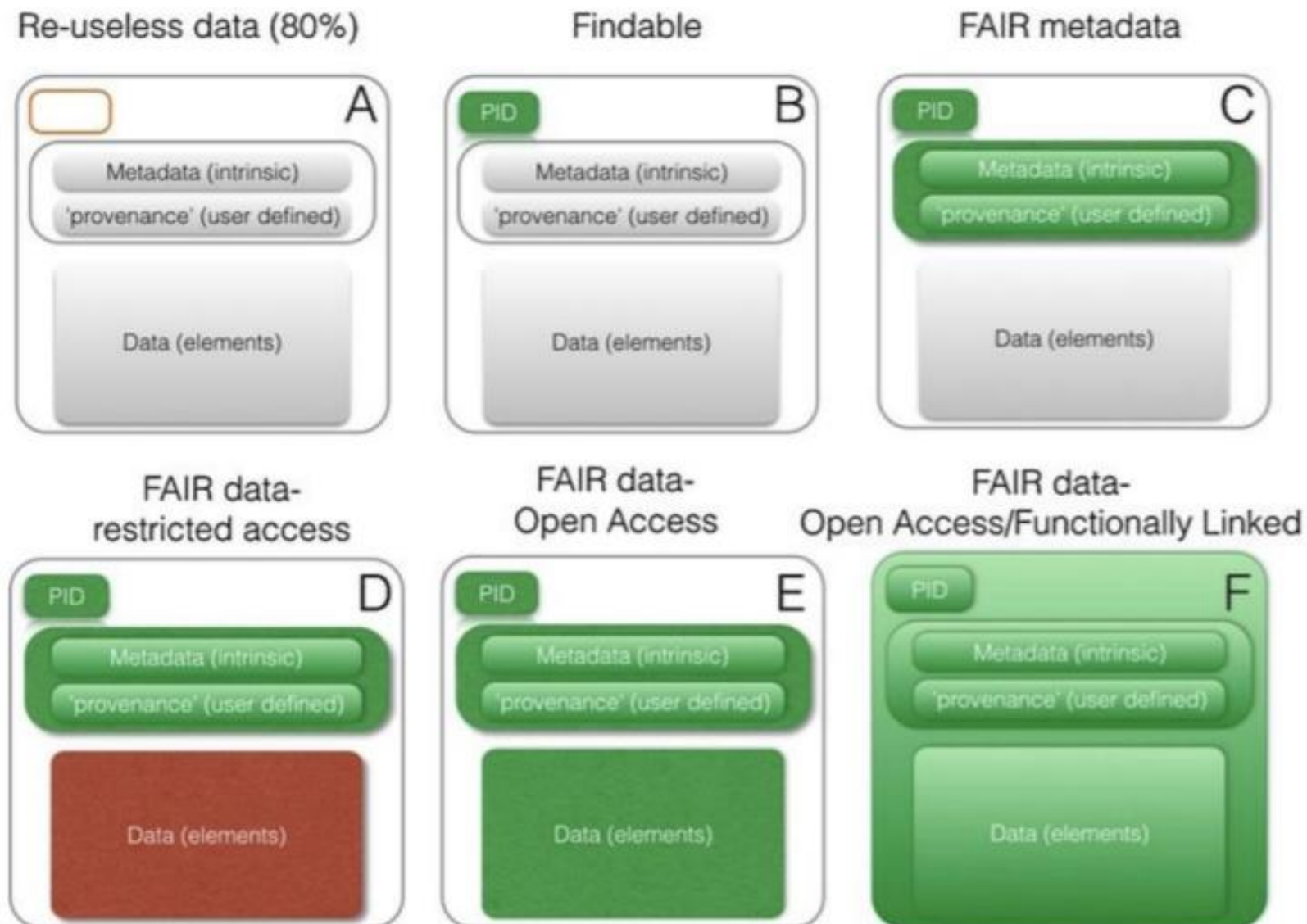
”

“More work is needed to extend the FAIR data principles for application to a wide range of data services, including registries, Data Management Planning tools, metadata standards and vocabulary bodies, identifier providers, software libraries and other cloud services. Such extensions must take into account good management practice and sustainability. In doing so, the example of CoreTrustSeal and recommendations about business models and sustainability are good places to start”

FAIRsFAIR report

Digital Objects

Data as increasingly FAIR Digital Objects



Box 2: The FAIR Guiding Principles

To be Findable:

- F1. (meta)data are assigned a globally unique and persistent identifier
- F2. data are described with rich metadata (defined by R1 below)
- F3. metadata clearly and explicitly include the identifier of the data it describes
- F4. (meta)data are registered or indexed in a searchable resource

To be Accessible:

- A1. (meta)data are retrievable by their identifier using a standardized communications protocol
 - A1.1 the protocol is open, free, and universally implementable
 - A1.2 the protocol allows for an authentication and authorization procedure, where necessary
- A2. metadata are accessible, even when the data are no longer available

To be Interoperable:

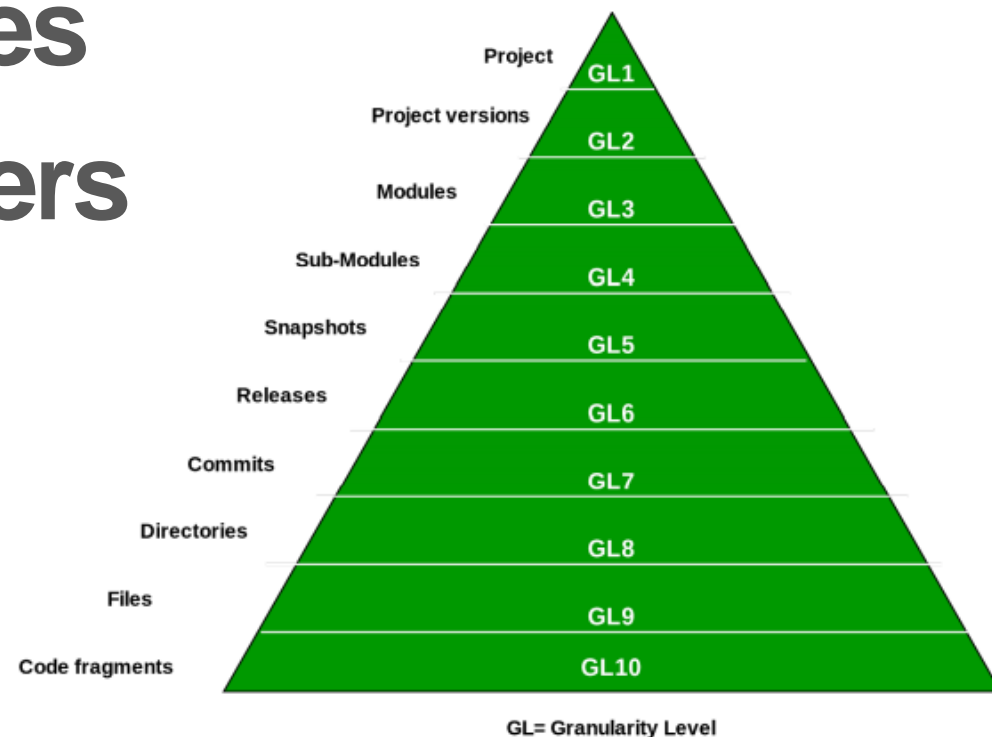
- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (meta)data use vocabularies that follow FAIR principles
- I3. (meta)data include qualified references to other (meta)data

To be Reusable:

- R1. meta(data) are richly described with a plurality of accurate and relevant attributes
 - R1.1. (meta)data are released with a clear and accessible data usage license
 - R1.2. (meta)data are associated with detailed provenance
 - R1.3. (meta)data meet domain-relevant community standards

FAIR for software

- Archived
- Provided metadata and vocabularies
- Licenses
- Identifiers



<https://www.nature.com/articles/sdata201618>

Recommendation n°1	FAIR principles for research software outcomes MUST be produced by taking into account the specific nature of software and not as just a simple adaptation of the FAIR guiding principles for data.
Recommendation n°2	Applying principles and recommendations to software demands effort, time and skill. The realistic nature of these principles MUST be considered.
Recommendation n°3	A large community forum MUST be consulted when writing the principles. This community forum MUST include stakeholders from different disciplines and with different roles, looking at software in all its aspects: as a tool, as a research outcome and as the object of research.
Recommendation n°4	Existing infrastructures that already provide solutions for software artifacts SHOULD be asked to review the FAIR principles for research software.
Recommendation n°5	Each principle MUST be relevant for software source code.
Recommendation n°6	Each principle MUST be achievable for software source code.
Recommendation n°7	Each principle SHOULD be measurable for software source code; detailed explanations of how a measurable principle is measured MUST be available.
Recommendation n°8	Each principle SHOULD contribute to software recognition in scholarly communication.
Recommendation n°9	Each principle SHOULD contribute to the curation quality of the software resource.
Recommendation n°10	Each principle MAY solve one or more research software challenges (e.g credit, reproducibility, sustainability & management, documentation, quality control, quality metadata, licensing and more).

Example

Repositories - Example

- Registries
 - OpenDOAR
 - Re3data
- Policy
- Metadata / Interoperability
- Licenses
 - Repository
 - Metadata
 - Content
- Certification
- FAIR Metrics

Registries

The screenshot shows the top part of the OpenDOAR website. At the top left, there is a logo for 'Jisc' and the text 'Digital Resources > Open Access'. Below this is a blue header with the text 'OpenDOAR'. Underneath the header is a navigation bar with buttons for 'Browse', 'Search', 'Statistics', 'Policy Tool', 'Our APIs', 'Suggest', and 'Admin'. Below the navigation bar is a section titled 'Directory of Open Access Repositories' with a sub-header 'OpenDOAR is a global directory of Open Access repositories and their policies.' At the bottom of this section is a search bar with the placeholder text 'Search for a repository' and a 'Search' button.

OpenDOAR is the quality-assured global directory of academic open access repositories. It enables the identification, browsing and search for repositories, based on a range of features, such as location, software or type of material held [more...](#)

The screenshot shows the re3data.org website. At the top left is the 're3data.org' logo. To the right of the logo is a navigation bar with links for 'Search', 'Browse', 'Suggest', 'Resources', and 'Contact'. On the far right is the 'DataCite' logo. Below the navigation bar is a search bar with the placeholder text 'Search...' and a 'Search' button. To the right of the search bar is a 'Toggle short help' link. Below the search bar is a pagination bar with links for '← Previous', '1', '2', '3', '4', '5', '6', '7', '...', '98', and 'Next →'. To the right of the pagination bar is a 'Sort by' dropdown menu. Below the pagination bar is the text 'Found 2428 result(s)'. The main content area shows a search result for 'CancerData.org'. The result includes the title 'CancerData.org', the subtitle 'Sharing data for cancer research', and a list of subject(s): 'Basic Biological and Medical Research', 'Medicine', 'Biology', and 'Life Sciences'. Below the subject(s) is a list of content type(s): 'Standard office documents', 'Databases', 'Images', 'Structured graphics', and 'Scientific and statistical data formats'. Below the content type(s) is a list of raw data types: 'Raw data', 'Plain text', 'Archived data', and 'other'. Below the raw data types is a list of country: 'Netherlands'. Below the country is a paragraph of text: 'The CancerData site is an effort of the Medical Informatics and Knowledge Engineering team (MIKE for short) of Maastricht Clinic, Maastricht, The Netherlands. Our activities in the field of medical image analysis and data modelling are visible in a number of projects we are running. CancerData is offering several datasets. They are grouped in collections and can be public or private. You can search for public datasets in the NBIA (National Biomedical Imaging Archive) image archives without logging in.'

Repository Policies

Metadata Policy (for information describing items in the repository)

- Anyone may access the metadata free of charge.
- The metadata may be re-used in any medium without prior permission for not-for-profit purposes provided the OAI Identifier or a link to the original metadata record are given.
- The metadata must not be re-used in any medium for commercial purposes without formal permission.

Data Policy (for full-text and other full data items)

- Anyone may access full items free of charge.
- Single copies of full items can be reproduced, and displayed or performed in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge.
- Full items must not be sold commercially in any format or medium without formal permission of the copyright holders.

Content Policy (for document types and datasets)

- This is an institutional or departmental repository OR Multi-institution subject-based repository [list subjects]:
- The repository holds all types of items OR The repository only permits the following item types [list]
- All items are individually tagged with their peer-review status and publication status.

Submission Policy (concerning depositors, quality and copyright)

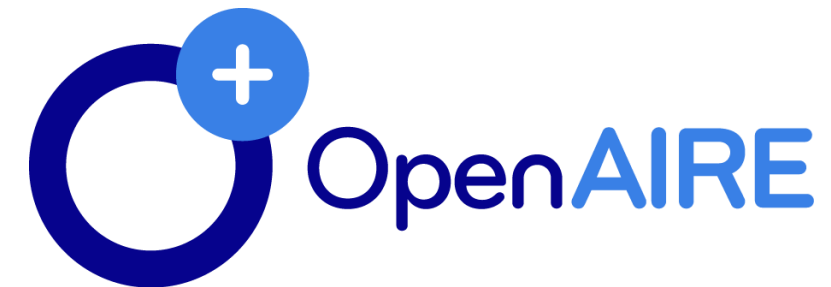
- Items may only be deposited by accredited members of the organisation, or their delegated agents.
- Authors may only submit their own work for archiving.
- The administrator only vets items for the exclusion of spam
- The validity and authenticity of the content of submissions is the sole responsibility of the depositor.
- Items may not be deposited until any publishers' or funders' embargo period has expired.
- Any copyright violations are entirely the responsibility of the authors/depositors.
- If the repository receives proof of copyright violation, the relevant item will be removed immediately.

Preservation Policy

- Items will be retained indefinitely.
- The repository will try to ensure continued readability and accessibility.
- The repository regularly backs up its files according to current best practice.
- Items may not normally be removed from the repository.
- Acceptable reasons for withdrawal include:
 - Proven copyright violation or plagiarism
 - Legal requirements and proven violations
 - National Security
 - Falsified research
- Withdrawn items are not deleted per se, but are removed from public view.
- Withdrawn items' identifiers/URLs are retained indefinitely.
- URLs will continue to point to 'tombstone' citations, to avoid broken links and to retain item histories.

Repositories Interoperability

- Literature
- Data
- CRIS
- (Software)



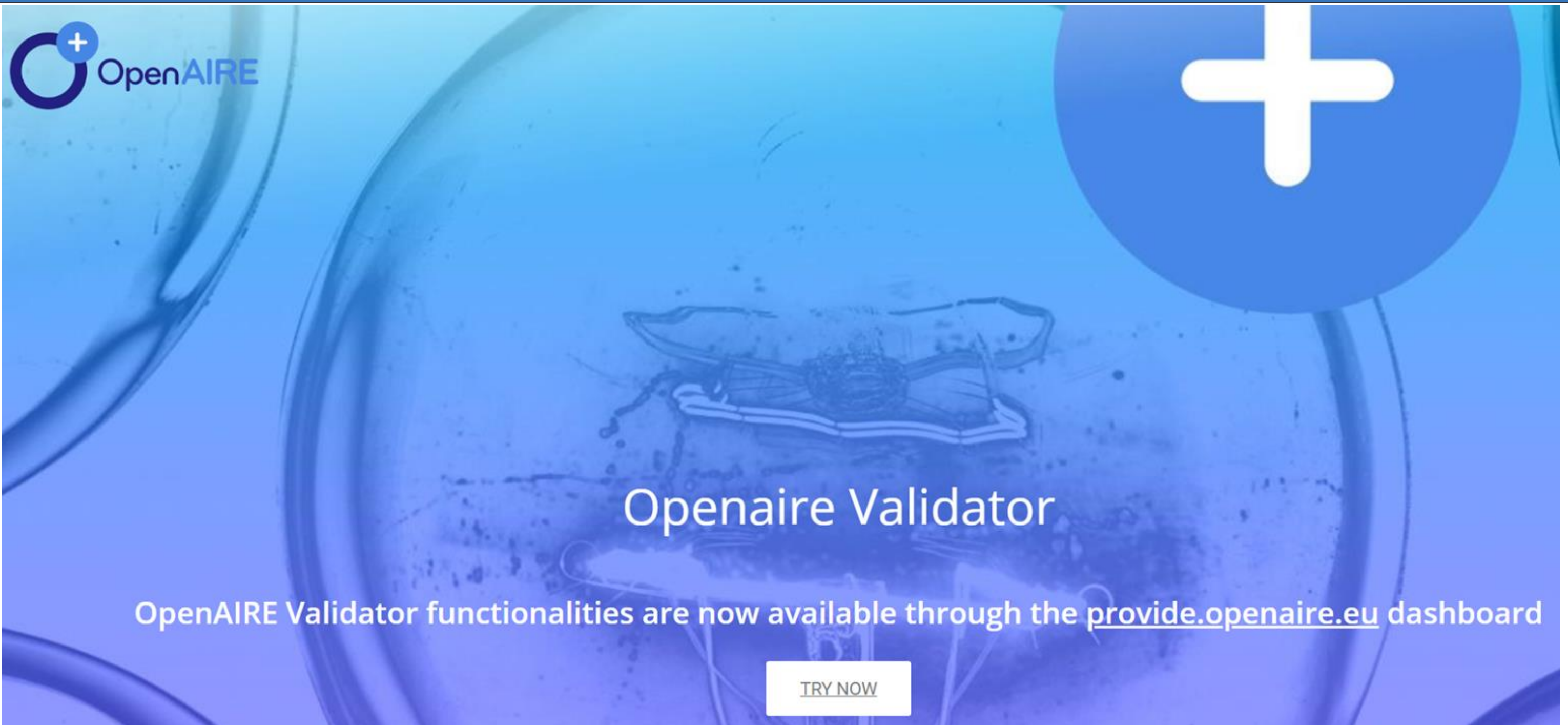
Current Guidelines


- [OpenAIRE Guidelines for Literature Repositories](#)
- [OpenAIRE Guidelines for Data Archives](#)
- [OpenAIRE Guidelines for CRIS Managers](#)
- [Draft OpenAIRE Guidelines for Software Repository Managers](#)
- [Draft OpenAIRE Guidelines for Other Research Products](#)

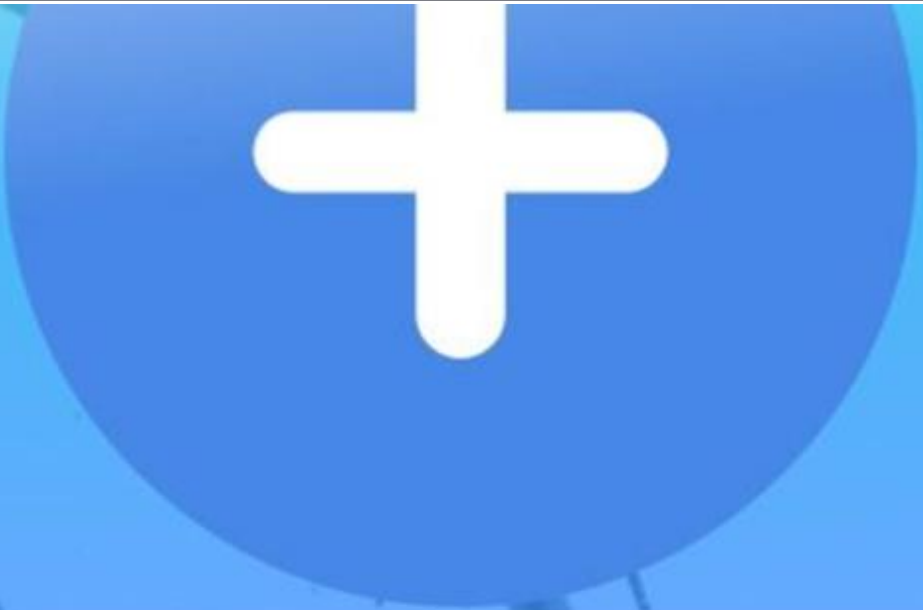
The guidelines specifically provide guidance on how to specify:

- Access right
- Funding information
- Related publications, datasets, software etc..

Validator

A promotional banner for the OpenAIRE Validator. The background is a blue-tinted image of a microscope lens focusing on a biological specimen. In the top left corner is the OpenAIRE logo, which consists of a blue circle with a white plus sign inside, followed by the text 'OpenAIRE'. In the top right corner is a large blue circle with a white plus sign. The text 'Openaire Validator' is centered in the middle of the banner. Below it, a line of text states: 'OpenAIRE Validator functionalities are now available through the [provide.openaire.eu](https://www.openaire.eu) dashboard'. At the bottom center is a white rectangular button with the text 'TRY NOW' in blue capital letters.

 OpenAIRE



Openaire Validator

OpenAIRE Validator functionalities are now available through the [provide.openaire.eu](https://www.openaire.eu) dashboard

[TRY NOW](#)

<https://www.openaire.eu/validator/>

Certification

- ❑ R0. Context
- ❑ R1. The repository has an explicit mission to provide access to and preserve data in its domain.
- ❑ R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.
- ❑ R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.
- ❑ R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.



CoreTrustSeal Requirements v02.00-2020-2022 (doi:10.5281/zenodo.3638211)

2. Licenses

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

Compliance Level:

Response

Guidance:

Repositories must have an appropriate rights model covering data access and use, communicate about them with users, and monitor compliance. This Requirement relates to the access regulations and applicable licenses set by the data repository itself, as well as any codes of conduct that are generally accepted in the relevant sector for the exchange and proper use of knowledge and information. Evidence should demonstrate that the repository has sufficient controls in place according to the access criteria of their data holdings, as well as evidence that any relevant licenses or processes are well managed.

For this Requirement, please describe:

- License agreements in use.
- Conditions of use (Intellectual Property Rights, distribution, intended use, protection of sensitive data, etc.).
- Documentation on measures in the case of noncompliance with conditions of access and use.

Note that if all data holdings are completely public and without conditions imposed on users—such as attribution requirements or agreement to make secondary analysis openly available—then it can simply be stated.

The ethical and privacy provisions that impact on licenses are dealt with in R4 (Confidentiality/Ethics). Assurance that deposit licenses provide sufficient rights for the repository to maintain, preserve, and offer access to data should be covered under R10 (Preservation Plan).

<https://www.coretrustseal.org/why-certification/requirements/>

Assessing FAIRness of data

FAIR Data Maturity Model: specification and guidelines

[Home](#) » [Data Management](#) » FAIR Data Maturity Model: Specification And Guidelines

Priority	Principle				
	Findable	Accessible	Interoperable	Reusable	Grand Total
Essential	7	8	0	5	20
Important	0	3	7	4	14
Useful	0	1	5	1	7
Grand Total	7	12	12	10	41



B2FIND / Findable				
FAIR: Findable	reduce	respect	enable	comment
F1. (meta)data are assigned a <u>globally unique and eternally persistent identifier</u> .		F1		B2FIND relies on the harvested repositories to attach a PID to its records and expose that as part of the metadata. If the provided metadata contains a PID B2FIND represents this PID and uses it to link the harvested metadata to the original data object in the repository.
F2. data are described with <u>rich metadata</u> .			F2	B2FIND relies on the provided metadata by the harvested repositories. B2FIND does not further enrich metadata. enhances F2 with citation metadata
F3. (meta)data are <u>registered or indexed in a searchable resource</u> .			F3	By being on B2FIND the (meta)data is registered and indexed and can be found through search.
F4. metadata <u>specify</u> the data identifier.			F4	In the current data infrastructure landscape B2FIND takes the position of a metadata registry and indexer. It extends

<https://zenodo.org/record/3688762#.XrE4FagzY2y>

Things to consider

- **What type of service is it (where in the RDM lifecycle)?**
- **What are the basic service components?**
- **Where does the service act on the digital object: bitstream, metadata, PIDs?**
 - **Software as a digital object**
 - As a tool - As a research outcome or result - As the object of research.
- **Get started with the certification – check operational aspects required**

Areas of collaborations

- **Research Community Dashboards**
 - One per scientific community
- **Argos DMP templates**
 - Work on metadata, ontologies, repositories, etc
- **Training**
 - For service providers
 - For researchers
 - Topics: Open access publishing, FAIR RDM, DMPs, FAIR-enabling services

Thank you!

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