

FAIR PRINCIPLES

ICTP, November 23 2021

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The road ahead



...but there is a lot more to discuss, in Open Science

1

Open Access (why, what and how)

2

FAIR principles

Why do we need FAIR

[BUT FIRST: EVER LOST YOUR
OWN DATA/COULD NO LONGER
ACCESS/UNDERSTAND?]

DATA ARE DIFFICULT TO FIND

ONCE FOUND, DIFFICULT TO
ACCESS

ONCE ACCESSED, DIFFICULT
TO INTERPRET

AND IF NOT FOUND YOU
SPEND A LOT OF TIME IN RE-
CREATING THEM

THAT'S WHY WE NEED FAIR

[the 3 steps]



OPEN FAIR MANAGED

1. DATA SHOULD BE «AS OPEN AS POSSIBLE»

2. BUT IF DATA ARE NOT «FAIR», OPENING IS RISKY
(MISUSE, MISINTERPRETATION, ...)

3. IF DATA ARE NOT PROPERLY MANAGED FROM THE BEGINNING,
IT'S ALMOST IMPOSSIBLE TO MAKE THEM «FAIR»
[WITH EOSC MANAGED/FAIR INCREASINGLY OVERLAPPING, «FAIR BY DESIGN»]

AND MANAGING DATA PROPERLY IS IN THE PRIMARY INTEREST OF ANY RESEARCHER,
AS THE WHOLE RESEARCH PROCESS RESULTS STREAMLINED AND MORE EFFECTIVE

Open Science in Horizon Europe

Open Science in Horizon Europe RIA/IA/CSA

Guide to Os in HEurope



IN THE METHODOLOGY YOU NEED TO ADDRESS BOTH:

- 1) HOW YOU WILL COMPLY WITH THE **MANDATORY PRACTICES**
- 2) HOW YOU WILL ADOPT **RECOMMENDED PRACTICES**

RECOMMENDED PRACTICES

IN THE LIST OF ACHIEVEMENTS:
5 RELEVANT OUTPUTS (publications, data)
OPENLY ACCESSIBLE + PERSISTENT IDENTIFIER
+ «AS OPEN AS POSSIBLE»



LIST OF ACHIEVEMENTS
Template PartA

IN THE PROJECT METHODOLOGY

- 1) EMBEDDED OPEN SCIENCE PRACTICES
- 2) FAIR DATA MANAGEMENT + DMP SCHEMA



EXCELLENCE
Template PartB

MAXIMIZING IMPACT USING OPEN SCIENCE (OS IS AMONG KEY PATHWAY INDICATORS) + SCHEMA OF DISSEMINATION PLAN (DELIVERABLE M6)



IMPACT
Template PartB

OPEN SCIENCE PRACTICES/SKILLS IN PREVIOUS PROJECTS TO EVALUATE QUALITY OF IMPLEMENTATION AND CONSORTIUM CAPACITY



QUALITY OF IMPLEMENTATION
Template PartB

MANDATORY PRACTICES

DEPOSIT+ IMMEDIATE ACCESS (ZERO EMBARGO + CC BY) =

1. OPEN RESEARCH EUROPE
2. OA JOURNAL
3. TRADITIONAL JOURNAL [RETAINING RIGHTS]



OPEN SCIENCE
Publications

RESPONSIBLE MANAGEMENT ACCORDING TO FAIR PRINCIPLES

2. DATA AND OTHER OUTPUTS «AS OPEN AS POSSIBLE, AS CLOSED AS NECESSARY»
3. DATA MANAGEMENT PLAN BY M6



OPEN SCIENCE
FAIR data

INFORMATION ON OUTPUTS/TOOLS AND ACCESS TO DATA/RESULTS FOR VALIDATION OF RESEARCH



ENSURE
REPRODUCIBILITY

PROJECT PROPOSAL WILL BE EVALUATED ON

a) HOW IT WILL ADOPT RECOMMENDED PRACTICES AND b) HOW IT WILL BE COMPLIANT TO MANDATORY ONES



OPEN SCIENCE IS A METHODOLOGY.

THAT'S WHY IN HORIZON EUROPE IT HAS BEEN MOVED TO THE «SCIENTIFIC EXCELLENCE» SECTION OF THE PROPOSAL TEMPLATE.

YOUR PROPOSAL WILL BE EVALUATED ALSO ON HOW YOU ADAPT/ADOPT OPEN SCIENCE PRACTICES AND A RESPONSIBLE FAIR DATA MANAGEMENT

...FAIR means
[for machines]



FINDABLE

- IDENTIFIERS
- METADATA

ACCESSIBLE

- WHERE TO FIND THE DATA AND UNDER WHAT ACCESS CONDITIONS
 - NOT «OPEN»
 - OPEN FORMATS

INTEROPERABLE

- STANDARDS
- ONTOLOGIES

REUSABLE

- LICENSES
- DOCUMENTATION

MACHINE-READABLE

Personal health data train

FAIR AT
WORK

2020

Issues Online Early About Submit

January 01 2020

FAIR Principles: Interpretations and Implementation Considerations

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Author and Article Information

Data Intelligence (2020) 2 (1-2): 10–29.

NO MISTAKES!

- Findability: Digital resources should be easy to find for both humans and computers. Extensive machine-actionable metadata are essential for automatic discovery of relevant datasets and services, and are therefore an essential component of the FAIRification process [14].
- Accessibility: Protocols for retrieving digital resources should be made explicit, for both humans and machines, including well-defined mechanisms to obtain authorization for access to protected data.
- Interoperability: When two or more digital resources are related to the same topic or entity, it should be possible for machines to merge the information into a richer, unified view of that entity. Similarly, when a digital entity is capable of being processed by an online service, a machine should be capable of automatically detecting this compliance and facilitating the interaction between the data and that tool. This requires that the meaning (semantics) of each participating resource – be they data and/or services service – is clear.
- Reusability: Digital resources are sufficiently well described for both humans and computers, such that a machine is capable of deciding: if a digital resource *should* be reused (i.e., is it relevant to the task at-hand?); if a digital resource *can* be reused, and under what conditions (i.e., do I fulfill the conditions of reuse?); and *who to credit* if it is reused.



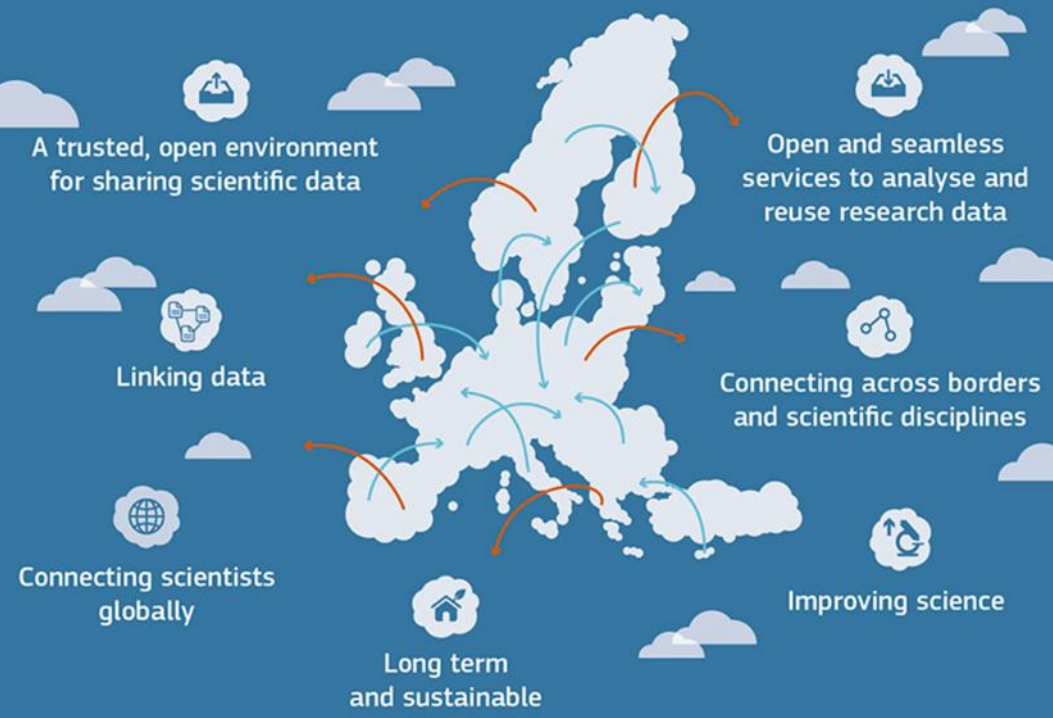
Focus

ENABLE REUSE

DATA IS A RENEWABLE RESOURCE AS MUCH AS SUN AND WIND.
EVERY 18 MONTHS WE DOUBLE THE AMOUNT OF DATA WE PRODUCE.
INDUSTRIAL AND COMMERCIAL DATA, **85% OF WHICH IS NEVER USED.**
THIS IS NOT SUSTAINABLE. WITHIN THOSE DATA, THERE ARE HIDDEN TREASURES
AND UNTAPPED OPPORTUNITIES FOR BUSINESS AND SOCIETY [[Von der Leyen 2020](#)]

[THAT'S WHY THE EOSC!]

BRINGING TOGETHER CURRENT AND FUTURE DATA INFRASTRUCTURES



The Vienna Declaration

Vienna, 23 November 2018

We, Ministers, declare the European Open Science Cloud

1. **Recall** the challenge of the European Open Science Cloud, as defined in the Brussels Declaration on 10 July 2018.

2. **Reaffirm** the potential of the European Open Science Cloud, in line with the vision of the European Open Science Cloud, sustainable in the long term.

3. **Recognise** that the European Open Science Cloud is an iterative and based on consensus among scientists, researchers, funders, users and service providers.

4. **Highlight** that Europe is well placed to take a global leadership position in the development and application of cloud services for Science. Reaching out over time to the world.

5. **Recall** that the Council of the European Union, in its 2018 Roadmap and the federated

9. **Call** for the European Open Science Cloud to provide all researchers in Europe with seamless access to an open-by-default, efficient and cross-disciplinary environment for storing, accessing, reusing and processing research data supported by FAIR data principles.

6. **Note** that the 2018 EOSC Summit (held on 11 June 2018) called for acceleration towards making the European Open Science Cloud a reality, hinting at the need to further strengthen the ongoing dialogue across institutions and with stakeholders, for a new governance framework to be launched in Vienna, on 23 November 2018.

EOSC IS NOT A BIG BOX

THE EUROPEAN OPEN SCIENCE CLOUD? SOME NUANCES AND DEFINITIONS

Imagine a federated, globally accessible environment where researchers, innovators, companies and citizens can publish, find and re-use each other's data and tools for research, innovation and educational purposes. Imagine that this all operates under well-defined and trusted conditions, supported by a sustainable and just value for money model. This is the environment that must be fostered in Europe and beyond to ensure that European research and innovation contributes in full to knowledge creation, meet global challenges and fuel economic prosperity in Europe. This we

EOSC IS NOT A
REPOSITORY NOR A
«CLOUD»

YOU MAKE YOUR
DATA FAIR SO THAT
EOSC *SERVICES*
CAN «FIND» THEM...

A SUPPORTING
ENVIRONMENT
FOR OPEN SCIENCE
AND NOT AN
«OPEN CLOUD»
FOR SCIENCE

YOU DON'T
«UPLOAD» YOUR
DATA INTO EOSC

AND GIVE SEAMLESS
ACCESS TO 20 M EU
RESEARCHERS

OBJECTIVES

EOSC SRIA 1.0

Open Science practices and skills
are rewarded and taught, becoming
the 'new normal'

FAIR principles



«ACCESSIBLE»
DOES NOT MEAN
«OPEN».

DATA CAN BE CLOSED,
PROVIDED YOU – AND
MACHINES - KNOW
WHERE TO FIND THEM
AND UNDER WHAT
ACCESS CONDITIONS

To be Findable:

- F1. (meta)data are assigned a globally unique and eternally persistent identifier.
- F2. data are described with rich metadata.
- F3. (meta)data are registered or indexed in a searchable resource.
- F4. metadata specify the data identifier.

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 RE-USABLE:

- R1. meta(data) have 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 their provenance.
- R1.3. (meta)data meet domain-relevant community standards.

FAIR/Open

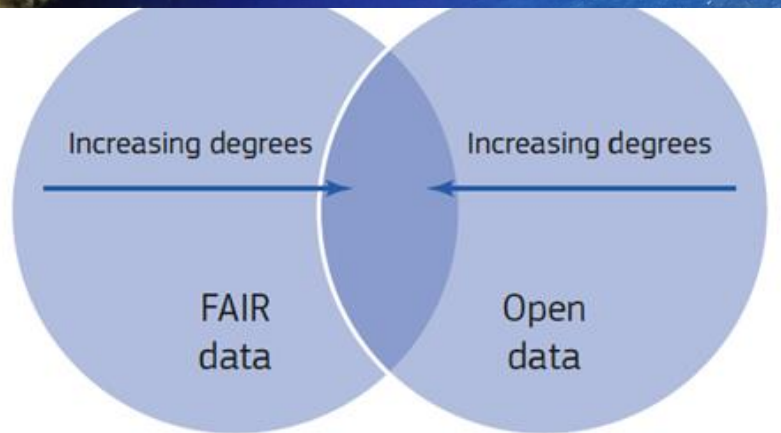


Figure 4. The relationship between FAIR and Open



THERE WILL BE AN INCREASING DEGREE IN OVERLAPPING.
BUT WE'LL ALWAYS HAVE PERFECTLY FAIR CLOSED DATA

4. ...and what FAIR is not

FAIR is not a standard: The FAIR guiding principles are sometimes incorrectly referred to as a 'standard', even though the original publication explicitly states they are not [25]. The guiding principles allow many different approaches to rendering data and services Findable, Accessible, Interoperable, to serve the ultimate goal: the reuse of valuable research objects. Standards are prescriptive, while guidelines are permissive. We suggest that a variety of valuable standards can and should be developed, each of which is guided by the FAIR Principles. FAIR simply describes the qualities or behaviours required of data resource achieve – possibly incrementally – their optimal discovery and scholarly reuse.

FAIR is not equal to RDF, Linked Data, or the Semantic Web The reference article Scientific Data [25] emphasises the machine-actionability of data and metadata. This implies (in fact, requires) that resources that wish to maximally fulfil the FAIR guideline must utilise a widely-accepted machine-readable framework for data and knowledge

FAIR is not just about humans being able to find, access, reformat and finally reuse

data: The official press release for the publication of the FAIR Principles states the authors' position clearly: "The research data publication autonomously, and the FAIR Principles. Computers are now at the heart of recent surveys, the time reported dealing with discovering and reuse has been pegged at 80% [19]. Were they to deal with FAIR data and services, it is today. The avoidance of time-consuming stewardship. To serve this potential and services should be actionable wherever possible.

FAIR is not equal to Open: The 'A' in FAIR stands for 'Accessible under well defined conditions'. There may be legitimate reasons to shield data and services generated with public funding from public access. These include personal privacy, national security, and competitiveness. The FAIR principles, although inspired by Open Science, explicitly and

- PRINCIPLES, NOT STANDARD [IMPLEMENTATION NEEDED]
- NOT JUST FOR HUMANS
- NOT EQUAL TO LINKED DATA, RDF...
- NOT EQUAL TO «OPEN»

3. What FAIR is...

FAIR refers to a set of principles, focused on ensuring that research objects are reusable, and actually will be reused, and so become as valuable as is possible. They deliberately do not **specify technical requirements,** but are a set of guiding principles that provide for a continuum of increasing reusability, **via many different implementations.** They describe characteristics and aspirations for systems and services to support the creation of valuable research outputs that could then be rigorously evaluated and extensively reused, with appropriate credit, to the benefit of both creator and user.

FAIR in a nutshell

FAIR data training

Findable

Accessible

Interoperable

Reusable

FAIR for Developers

FAIR data self-assessment tool

f t in +SHARE

F1. (meta)data are assigned a globally unique and eternally

There are many resources created by the ARDC on the topic of **metadata**

- Metadata guide
- Data versioning

The ARDC has information on persistent identifiers on three different levels

- Persistent identifiers: awareness level
- Persistent identifiers: working level
- Persistent identifiers: expert level

It is also a provider of services for minting persistent identifiers of many different types (e.g. of the data being identified):

- Digital Object Identifier (DOI) System for research data
- Handle minting Service (Identify My Data)
- International Geo Sample Numbers (IGSN)

Complementary to the assignment of persistent identifiers is their proper



FAIR software

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Data Science, June 12 2020

Guest editors: Paul Groth and Michel Dumontier

Article type: Position Paper

Authors: Lamprecht, Anna-Lena^{a,*} | Garcia, Leyla^b | Kuzak, Mateusz^{c,d} | Martinez, Carlos^e | Arcila, Ricardo^f | Martin Del Pico, Eva^g | Dominguez Del Angel, Victoria^h | van de Sandt, Stephanieⁱ | Ison, Joni^j | Martinez, Paula Andrea^k | McQuilton, Peter^l | Valencia, Alfonso^{m,n} | Harrow, Jennifer^o | Psomopoulos, Fotis^p | Gelpi, Josep LL^{q,r} | Chue Hong, Neil^{s,t} | Goble, Carole^u | Capella-Gutierrez, Salvador^{v,w}

2. Software is not data

Technically, software is a special kind of data. In computing, digital data (ultimately sequences of ones and zeros) are used to represent all information, including factual data as well as computer instructions. In the more abstract context of FAIR, software and data are regarded as different kinds of digital research objects next to each other. As such, they share particular characteristics that allow them to be shared, such as the possibility of having a Digital Object Identifier (DOI) and a Creative Commons license. However, as elaborated by Katz

Quality aspects concerning the form of software can be considered as covered by FAIR, in particular by the interoperability and reusability principles. It is important to realise that unlike data, software is not static and can only be (re)used if it is sustainable and evolves along with the continuous development of the entire software ecosystem. The quality of its codebase is decisive for a software's ability to evolve sustainably. This characteristic is often also referred to as maintainability, and

Summary of the proposed FAIR principles for research software and how they relate to the FAIR Guiding Principles for data. It is indicated whether a given FAIR data principle has been simply rephrased to adjust it to software, extended to cover a broader scope, reinterpreted to match the different context, discarded as it does not apply, or newly proposed as it only applies for research software

	FAIR for data	FAIR for software	Operation
F1	(Meta)data are assigned a globally unique and persistent identifier.	Software and its associated metadata have a global, unique and persistent identifier for each released version.	Rephrased
F2	Data are described with rich metadata.	Software is described with rich metadata.	Rephrased
F3	Metadata clearly and explicitly include the identifier of the data it describes.	Metadata clearly and explicitly include identifiers for all the versions of the software it describes.	Rephrased and extended
F4	(Meta)data are registered or indexed in a searchable	Software and its associated metadata are included in a searchable software	Rephrased

I2	(Meta)data use vocabularies that follow FAIR principles.	–	Reinterpreted, extended and split
I2S.1	–	Software and its associated metadata are formally described using controlled vocabularies that follow the FAIR principles.	Reinterpreted, extended and split
I2S.2	–	Software use and produce data in types and formats that are formally described using controlled vocabularies that follow the FAIR principles.	Reinterpreted, extended and split
I3	(Meta)data include qualified references to other (meta)data.	–	Discarded
I4S	–	Software dependencies are documented and mechanisms to access them exist.	Newly proposed



DIGITAL OBJECT

Data, code and other research outputs

At its most basic level, data or code is a bitstream or binary sequence. For this to have meaning and to be FAIR, it needs to be represented in standard formats and be accompanied by Persistent Identifiers (PIDs), metadata and documentation. These layers of meaning enrich the object and enable reuse.



IDENTIFIERS

Persistent and unique (PIDs)

Digital Objects should be assigned a unique and persistent identifier such as a DOI or URN. This enables stable links to the object and support citation and reuse to be tracked. Identifiers should also be applied to other related concepts such as the data authors (ORCIDs), projects (RAIDs), funders and associated research resources (RRIDs).



STANDARDS & CODE

Open, documented formats

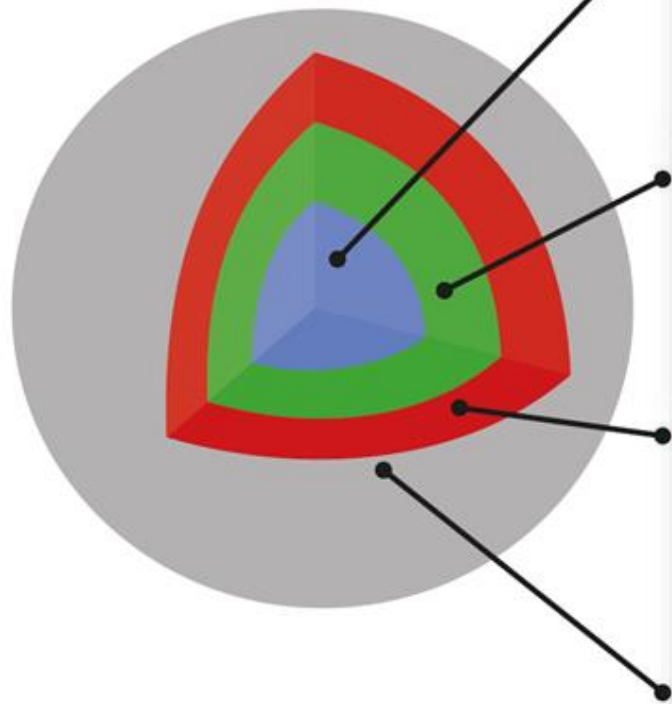
Digital Objects should be represented in common and ideally open file formats. This enables others to reuse them as the format is in widespread use and software is available to read the files. Open and well-documented formats are easier to preserve. Data also need to be accompanied by the code use to process and analyse the data.



METADATA

Contextual documentation

In order for Digital Objects to be assessable and reusable, they should be accompanied by sufficient metadata and documentation. Basic metadata will enable data discovery, but much richer information and provenance is required to understand how, why, when and by whom the objects were created. To enable the broadest reuse, they should be accompanied by a plurality of relevant attributes and a clear and accessible usage license.



Nov. 2018

Final Report and Action Plan
from the European
Commission Expert Group
on FAIR Data

TURNING
FAIR INTO
REALITY

... a report from Vienna

FAIR: technology VS domain



Technical infrastructure (generic operations)
Data/metadata (domain-specific content)

FAIR GENERIC VS
DOMAIN SPECIFIC
STRICTLY INTERLINKED

Box 2 | The FAIR Guiding Principles

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

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

E.Schultes, 2019

FAIR for dummies

RESEARCHERS'
RESPONSIBILITY

REPOSITORIES TAKE
CARE OF...

Explanation of the [FAIR data principles](#) ²⁰¹⁹

Wilkinson et al. (2016), The FAIR Guiding Principles for scientific data management and stewardship, *Scientific Data* 3, [doi:10.1038/sdata.2016.18](https://doi.org/10.1038/sdata.2016.18)

Principle	In other words	Researcher's responsibility	Requirements to be fulfilled by the repository	
To be findable: Data and metadata should be easy to find by both, humans and computer systems. Basic machine readable descriptive metadata allows the discovery of interesting data sets and services.	F1. (meta)data are assigned a globally unique and persistent identifier	Each data set is assigned a globally unique and persistent identifier (PID), for example a DOI , ARK , RRID ... These identifiers allow to find, cite and track (meta)data.	Ensure that each data set is assigned a globally unique and persistent identifier. Certain repositories automatically assign identifiers to data sets as a service. If not, researchers must obtain a PID via a PID registration service.	A repository needs to have a predictable way to assign a PID to each component of a dataset (e.g. each file or nanopublication), in order to be able to include these identifiers into the corresponding metadata before the submission.
	F2. data are described with rich metadata (defined by R1 below)	Each data set is thoroughly (see below, in R1) described: these metadata document how the data was generated, under what term (license) and how it can be (re)used, and provide the necessary context for proper interpretation. This information needs to be machine-readable.	Fully document each data set in the metadata, which may include descriptive information about the context, quality and condition, or characteristics of the data. Another researcher in any field, or their computer, should be able to properly understand the nature of your dataset. Be as generous as possible with your metadata (see R1).	Allow researchers to upload metadata for each data set.
	F3. metadata clearly and explicitly include the identifier of the data it describes	The metadata and the data set they describe are separate files. The association between a metadata file and the data set is obvious thanks to the mention of the data set's PID in the metadata.	Make sure that the metadata contains the data set's PID.	Allow researchers to upload metadata for each data set.
	F4. (meta)data are registered or indexed in a searchable resource	Metadata are used to build easily searchable indexes of data sets. These resources will allow to search for existing data sets similarly to searching for a book in a library.	Provide detailed and complete metadata for each data set (see F2).	Request and store part of the metadata in a structured way, for example by providing a form with specific fields to be completed or by providing an XML schema to be used by the researchers. For example the storing of PID's, author names, disciplines, etc. will facilitate the creation of indexes. However, it must remain possible to provide arbitrary metadata in addition.

FAIR

files

International Conference on Conceptual Modeling


2020

ER 2020: [Advances in Conceptual Modeling](#) pp 138-147 | [Cite as](#)


Reusable FAIR Implementation Profiles as Accelerators of FAIR Convergence


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COMMON RULES
FOR COMMUNITIES
- CONVERGENCE


 FIP Wizard


 Knowledge Models

 FIPs

 Create a FIP

Social Science Survey Research_V1

 Questionnaire

 Metrics

 Preview

View

Current Phase

Before Submitting the Proposal


Chapters

Background: The FAIR Implementation Profile and FAIR Implementation Community

II. FAIR Implementation Community


III. Findability

25

 Questionnaire

 Metrics

 Preview

 Documents

 Settings

View

Comments

TODOS

Version history

 Share

Chapters

Background: The FAIR Implementation Profile and FAIR Implementation Community

II. FAIR Implementation Community

III. Findability

IV. Accessibility

V. Interoperability

VI. Reusability

VII. Register a new resource as a nanopublication

III. Findability

"Digital resources should be easy to find for both humans and computers. Extensive machine-actionable metadata are essential for automatic discovery of relevant datasets and services, and are therefore an essential component of the FAIRification process." - from FAIR Principles: Interpretations and Implementation Considerations

1 F1 What globally unique, persistent, resolvable identifiers do you use for metadata records?

Different identifier service providers offer different kinds of resolution services impacting F2 and I. One example would be a Digital Object Identifier (DOI).

You can answer by indicating **only a single resource at a time**. Please follow this priority:

1. *Consideration*: Please provide comments about the reasons why your community chose to use this resource
2. *Wikidata*: Check for existing resources from Wikidata (by typing in that field a keyword and clicking enter, you will find related resources). Alternatively, you may provide here an IRI for a resource from any other third party source. If not found there then follow point 3 below.
3. *Nanobench*: Check for existing resources from Nanobench (by clicking in that field, available resources

I. Background: The FAIR Implementation Profile and FAIR Implementation Community

The FAIR Implementation Profile (FIP) is a collection of FAIR implementation choices made by a FAIR Implementation Community for each of the FAIR Principles. Community-specific FIPs are themselves captured as FAIR datasets and are made openly available to other communities for reuse. To create a FIP, the data steward of a community needs to fill out this questionnaire where the implementation choices are recorded as resources. The questionnaire is structured as follows: the first section is about the FAIR Implementation Community, which is then followed by a number of questions per FAIR principle. The answer to each of the questions should be a FAIR-Enabling Resource. The questionnaire offers to look up the resource in Nanobench. If the resource cannot be found in any of these applications, there is an option at the end of the questionnaire to register a FAIR-Enabling Resource as a nanopublication in Nanobench. The resource will get a PURL which can then directly be used when further filling out the questionnaire. When the questionnaire is filled in, the FIP is considered to be the implementation of R1.3, which is why there is no separate question addressing this subprinciple. [FIP wizard](#)

FAIR Implementation Profiles

FAIR Implementation Profile

FAIR principle	Question	FAIR enabling resource types
F1	What globally unique, persistent, resolvable identifiers do you use for metadata records?	Identifier type
F1	What globally unique, persistent, resolvable identifiers do you use for datasets?	Identifier type
F2	Which metadata schemas do you use for findability?	Metadata schema
F3	What is the technology that links the persistent identifiers of your data to the metadata description?	Metadata-Data linking mechanism
F4	In which search engines are your metadata records indexed?	Search engines
F4	In which search engines are your datasets indexed?	Search engines
A1.1	Which standardized communication protocol do you use for metadata records?	Communication protocol
A1.1	Which standardized communication protocol do you use for datasets?	Communication protocol
A1.2	Which authentication & authorisation technique do you use for metadata records?	Authentication & authorisation technique
A1.2	Which authentication & authorisation technique do you use for datasets?	Authentication & authorisation technique
A2	Which metadata longevity plan do you use?	Metadata longevity
I1	Which knowledge representation languages (allowing machine interoperation) do you use for metadata records?	Knowledge representation language
I1	Which knowledge representation languages (allowing machine interoperation) do you use for datasets?	Knowledge representation language
I2	Which structured vocabularies do you use to annotate your metadata records?	Structured vocabularies
I2	Which structured vocabularies do you use to encode your datasets?	Structured vocabularies
I3	Which models, schema(s) do you use for your metadata records?	Metadata schema
I3	Which models, schema(s) do you use for your datasets?	Data schema
R1.1	Which usage license do you use for your metadata records?	Data usage license
R1.1	Which usage license do you use for your datasets?	Data usage license
R1.2	Which metadata schemas do you use for describing the provenance of your metadata records?	Provenance model
R1.2	Which metadata schemas do you use for describing the provenance of your datasets?	Provenance model

[Data steward profile]

7.4. Critical success factors

The developments and expected impacts described above will not happen spontaneously. For these benefits to materialise a number of critical success factors (CSFs) must be in place. The following CSFs have been identified for EOSC:

- Researchers performing publicly funded research make relevant results available as openly as possible;
- Professional data stewards are available in research-performing organisations in Europe to help implement FAIR principles and support Open Science;

Competence Profile

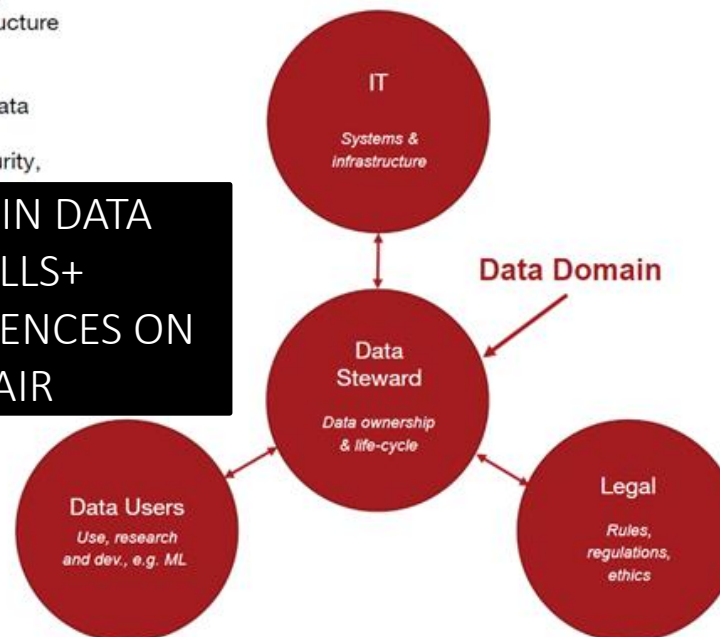
A data steward is a data specialist with strong domain-specific knowledge who understands and appreciates the relevance of data, data sources, data infrastructure and constraints within a scientific or other application domain.

The future Data Steward must assume ownership and responsibility for data, data quality, and the data life-cycle as their primary function. They should ensure collaboration and coherence between IT competences, quality assurance, security, rules & regulations, and facilitate the application and use of data internally and externally in the organisation.

Competence profile examples

- Domain-specific data understanding
- Ability to ensure that structured and unstructured data is modelled, harvested, stored, and maintained in documented, and regulated fashion with focus on findability, accessibility, interoperability, and reusability.
- Competences to facilitate HPC (High Performance Computing) during development and research through handling of large-scale data in public and private enterprises.
- Understanding of and competences within legal, ethical and security aspects of data handling, data sharing, e.g., integrity and GDPR.

DOMAIN DATA
SKILLS+
COMPETENCES ON
FAIR



... FAIRy shades

Findable

Does the dataset have any identifiers assigned?

No identifier

Is the dataset identifier included in all metadata records/files describing the data?

No

How is the data described with metadata?

The data is not described

What type of repository or registry is the metadata record in?

The data is not described in any repository

Accessible

How accessible is the data?

No access to data or metadata

Is the data available online without requiring specialised protocols or tools once access has been approved?

No access to data

Will the metadata record be available even if the data is no longer available?

Unsure

The screenshot shows the ANDS Training page. The header includes the ANDS logo and navigation links: About us, News and Events, Partners and Communities, Working with data, Online Services, and Guides and resources. The main content area is titled 'Working with data' and features a sidebar with links to 'The FAIR data principles', 'FAIR webinar series (Aug/Sep 2017)', 'FAIR data training' (selected), 'Findable', 'Accessible', 'Interoperable', 'Reusable', and 'FAIR data training narkane'. The main content area is titled 'FAIR data training' and includes a list of resources: 'A basic checklist' (or more comprehensive breakdown), 'Use the FAIR data self-assessment tool' in training or consultation, 'Discussing the components via a process of transforming a dataset to be more FAIR', and 'Case studies of domain specific consideration of the principles'.

<https://www.ands-nectar-rds.org.au/fair-tool>

VERY USEFUL TO ASK
THE RIGHT QUESTIONS
BUT IT'S SUBJECTIVE...



home

news

events

programs

about

FAIR self-assessment tool

Welcome to the ARDC FAIR Data self-assessment tool. Using this tool you will be able to assess the 'FAIRness' of a dataset and determine how to enhance its FAIRness (where applicable).

FAIR aware

- QUESTIONS
- TEST KNOWLEDGE
- TEST WILLINGNESS
- GIVES INFO



Let's assume you have research data almost ready for uploading to a repository: do you already know how you and the repository can work together to make the data as findable, accessible, interoperable and reusable (FAIR) as possible? By guiding you through the assessment process, the FAIR-Aware tool can help you to better understand the FAIR Principles and how making data FAIR can increase the potential value and impact of your data.

FAIR-Aware is an disciplinary-agnostic online tool developed by the FAIRsFAIR project. Different scientific communities can adapt it to their own use. You should, however, have a target dataset in mind to be able to answer the questions and complete the assessment.

1. Are you aware that a dataset should be assigned a globally unique and persistent identifier when deposited with a data repository?

Selected datasets should be assigned a globally unique and persistent identifier (PID) so they can be located unambiguously by humans or machines on the web. Persistent identifiers are maintained and governed so that they remain stable and direct the users to the same relevant object consistently over time. Examples of PIDs include Digital Object Identifier (DOI), the Handle System, identifiers.org, w3id.org and Archival Resource Key (ARK).

Identifiers are normally assigned by data repositories (or other service providers) when data and/or metadata are made available through their services. Repositories ensure that the identifier continues to point to the same data or metadata, according to the specified access terms and conditions. For example, you can search for data repositories providing DOIs on registries such as Re3data or FAIRsharing (see related databases).

It is worth noting here that not all data you produce during your research will need a PID. In general, those that underpin published findings or have longer term value are worth assigning a PID. If in doubt about which data should be allocated a PID, speak to your local research data management support team.

[Want to know more?](#)

FINDABLE

1. Are you aware that a dataset should be assigned a globally unique and persistent identifier when deposited with a data repository?

2. Are you aware that when you deposit a dataset in a data repository, you will need to provide some data (e.g. discovery metadata) in order to make the dataset understandable and reusable to others?

3. Are you aware that the repository providing access to your dataset should make the metadata describing your datasets available in a format readable by machines as well as humans?

- ☒ Yes
☐ No

To what degree do you intend to comply with this?

Very likely ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1
Very unlikely

FAIR maturity evaluator

Evaluating FAIR maturity through a scalable, automated, community-governed framework

Mark D. Wilkinson , Michel Dumontier, Susanna-Assunta Sansone , Luiz Olavo Bonino da Silva Santos, Mario Prieto, Dominique Batista, Peter McQuilton, Tobias Kuhn, Philippe Rocca-Serra, Mercè Crosas & Enk Schultes 

Scientific Data 6, Article number: 174 (2019) | Download Citation  | [Sept. 20, 2019](#)
13 Altmetric | Metrics »

- OBJECTIVE
- MACHINE READABLE – AS FAIR DATA ARE

FAIR Evaluation Services FAIR evaluation service

Resources and guidelines to assess the FAIRness of digital resources.

Patience ! If you notice any unexpected failures in the tests, please report them to mark.wilkinson@upm.es



Import MI Tests

Import Maturity Indicators Tests as YAML  interface annotation

Get started



Create collections

Assemble Maturity Indicators Tests into community centered collections

Get started



Evaluate resources

Evaluate resources FAIRness against Collections of Maturity Indicator Tests

Get started

Philosophy of FAIR testing



FAIR METRICS GEN2 - IDENTIFIER PERSISTENCE

Status: Failure

Principle tested: F1

Description: Metric to test if the unique identifier of the metadata resource is likely to be persistent. Known schema are registered in FAIRSharing (https://fairsharing.org/standards/?q=&selected_facets=type_exact:identifier%20schema). For URLs that don't follow a schema in FAIRSharing we test known URL persistence schemas (purl, oclc, fdlp, purlz, w3id, ark).

Created on: Feb 18, 2019 by [Mark D Wilkinson](#) (updated on Feb 20, 2019).

Test results

INFO: The metadata GUID appears to be a URL. Testing known URL persistence schemas (purl, oclc, fdlp, purlz, w3id, ark).

FAILURE: The metadata GUID does not conform with any known permanent-URL system.

FAIR Evaluation Services

Resources and guidelines to assess the FAIRness of digital resources.

F-UJI



About FAIR Support FAIR Landscape Tools & Software Competence Centre Events Project Outputs Outreach

Screenshots of the tool below

```
{
  "metric_identifier": "fai-01-000",
  "metric_name": "Data is assigned a persistent identifier.",
  "output": [
    {
      "pid": "https://doi.org/10.1304/PANGAEA.000011",
      "pid_scheme": "doi",
      "resolvable_status": true,
      "resolved_url": "https://doi.pangaea.de/10.1304/PANGAEA.000011"
    }
  ],
  "score": 1,
  "error": null,
  "test_data": {
    "INFO: Persistence identifier scheme - doi",
    "INFO: Deriving page http://doi.org/10.1304/PANGAEA.000011",
    "INFO: Content negotiation script=txt/html, application/abcd+xml, status=200",
    "INFO: Found HTML page",
    "INFO: Object identifier active (status code = 200)"
  },
  "test_status": "pass"
},
{
  "metric_identifier": "fai-02-000",
  "metric_name": "Metadata includes descriptive core elements (creator, title, data identifier, public)",
  "output": [
    {
      "new_metadata_found": {
        "creator": "Robert Huber"
      }
    }
  ]
}
```



F-UJI

About FA

F-UJI Automated FAIR Data Assessment Tool

Home / F-UJI Automated FAIR Data Assessment Tool

FAIRsFAIR has developed F-UJI, a service based on REST, and is piloting a programmatic assessment of the FAIRness of research datasets in five trustworthy data repositories.



F-UJI

Automated FAIR Data
Assessment Tool

The F-UJI assessment is based on **16 out of 17 core FAIR object assessment metrics** developed within FAIRsFAIR and each corresponding to a part or the whole of a FAIR principle. F-UJI adheres to existing web standards and [PID resolution services best practices](#) and utilises external registries and resources such as [re3data](#)¹ and [Datacite](#)² APIs, [SPDX License List](#)³, [RDA Metadata Standards Catalog](#)⁴, and [Linked Open Vocabularies \(LOV\)](#)⁵. For information on the practical tests implemented against the metrics, see [Devaraju, Huber, et al., 2020](#).

FAIR enough

fair-enough.semanticscience.org

EVALUATIONS COLLECTIONS ASSESSMENTS HTTP API GRAPHQL LOGIN WITH

Evaluate how FAIR is a resource

FAIR score: 9/10 Bonus score: 4/6

90% 66%

Log level
Success and failures

URL of the resource to evaluate
`https://doi.org/10.1594/PANGAEA.908011`

FAIR enough

Findable

Resource identifier is unique and persistent

Check if the identifier of the resource is unique (HTTP) and persistent (some HTTP domains)
Metric: F1
Assessment URL: https://github.com/MaastrichtU-IDS/fair-enough/blob/main/backend/app/assessments/f1_unique_persistent_identifier.py
FAIR score: 2/2 | Bonus score: 0/0

- ✓ [2021-11-08@21:17:07] Validated the given resource URI `https://doi.org/10.1594/PANGAEA.908011` is a URL
- ✓ [2021-11-08@21:17:07] Validated the given resource URI `https://doi.org/10.1594/PANGAEA.908011` is a persistent URL

The resource is indexed in a searchable resource

Search for existing metadata about the resource URI in data repositories, search engines, etc.
Metric: F4
Assessment URL: https://github.com/MaastrichtU-IDS/fair-enough/blob/main/backend/app/assessments/f4_searchable.py
FAIR score: 1/1 | Bonus score: 1/1

- 🔍 [2021-11-08@21:17:16] Retrieved metadata about `10.1594/PANGAEA.908011` from DataCite API
- ✓ [2021-11-08@21:17:19] Found the resource URI `https://doi.pangaea.de/10.1594/PANGAEA.908011` when searching on Google for Maximum diameter of *Neogloboquadrina pachyderma sinistral* from surface sediment samples from the Norwegian-Greenland Sea

Accessible

AUTOMATIC CHECK ON FAIR PRINCIPLES (+BONUS)

FAIR cookbook

RECIPES TO MAKE YOUR DATA FAIR

 FAIRcookbook

 Search this book...

FAIR Cookbook

FOREWORD

Introduction

Ethical values of FAIR

Glossary

RECIPES

Findability

Accessibility

Interoperability

Reusability

Infrastructure

Assessment

Applied examples

ABOUT

FAIR Cookbook

FAIR cookbook

Created by researchers and data managers professionals, the FAIR Cookbook is an online resource for the Life Sciences with recipes that help you to make and keep data Findable, Accessible, Interoperable and Reusable (FAIR).

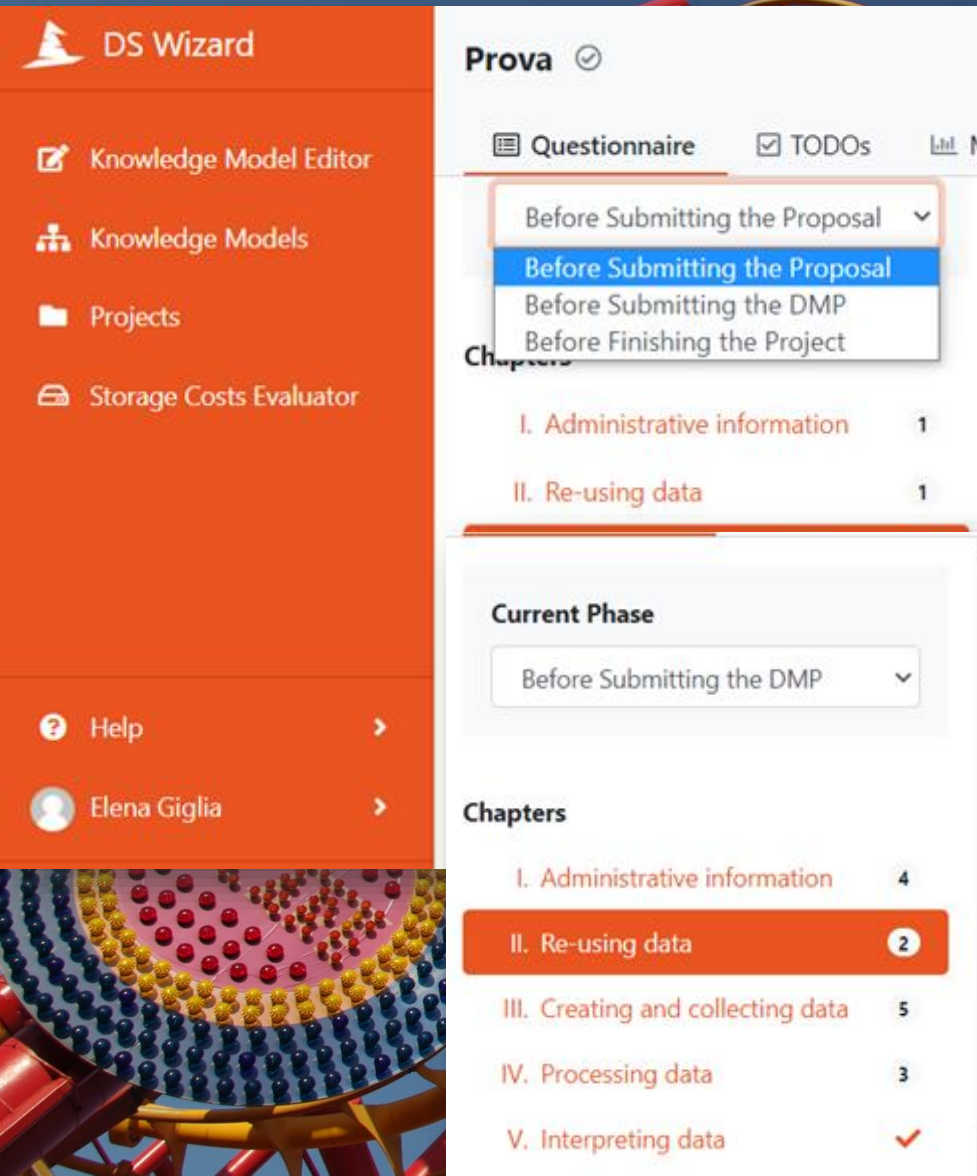
Turning FAIR into practice

The **FAIR Principles** put specific emphasis on enhancing the ability of machines to automatically find and use the data, in addition to supporting its reuse by individuals. However, the FAIR Principles are aspirational and generic. The FAIR Cookbook guides *researchers* and *data stewards* of the Life Science domain in their FAIRification journey; and also provides *policy makers* and *trainers* with practical examples to recommend in their guidance and use in their educational material.

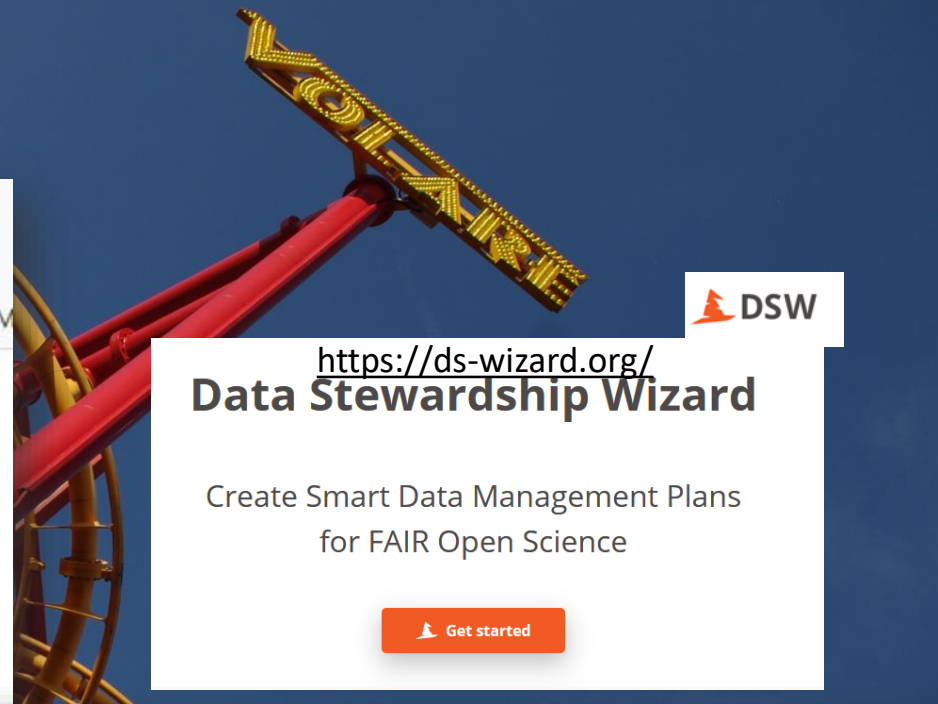
Learning objectives

The FAIR Cookbook provides recipes for you to learn: how to FAIRify datasets, the levels and indicators of FAIRness, the maturity model, the technologies, the tools and the standards available, as well as the skills required, and the challenges, to achieve and improve FAIRness.

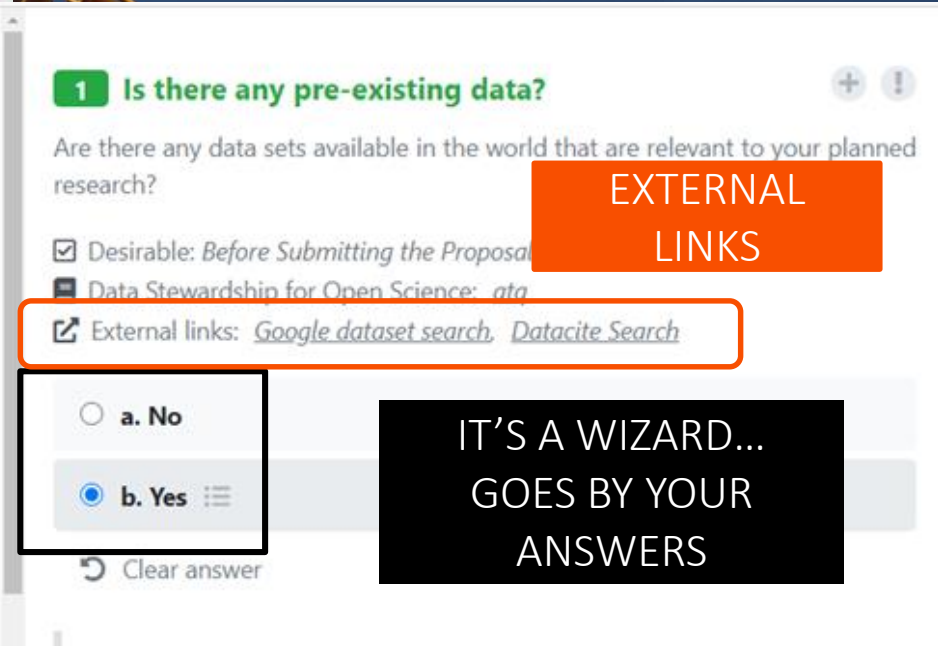
FAIR Wizard



The screenshot shows the DS Wizard interface. On the left is an orange sidebar with the following items: DS Wizard (with a wizard icon), Knowledge Model Editor, Knowledge Models, Projects, Storage Costs Evaluator, Help, and Elena Giglia. The main area is titled 'Prova' and contains a 'Questionnaire' tab, a 'TODOs' checkbox, and a dropdown menu for 'Before Submitting the Proposal'. Below this is a 'Chapters' list with five items: I. Administrative information (1), II. Re-using data (1), III. Creating and collecting data (5), IV. Processing data (3), and V. Interpreting data (✓). The 'Current Phase' dropdown is set to 'Before Submitting the DMP'.



The screenshot shows the landing page of the Data Stewardship Wizard. It features a red roller coaster track against a blue sky background. The DSW logo is in the top right corner. The main heading is 'Data Stewardship Wizard' with the URL <https://ds-wizard.org/> above it. Below the heading is the text 'Create Smart Data Management Plans for FAIR Open Science' and a 'Get started' button.



The screenshot shows a question in the wizard: '1 Is there any pre-existing data?'. The question text is 'Are there any data sets available in the world that are relevant to your planned research?'. There are two radio button options: 'a. No' and 'b. Yes'. The 'b. Yes' option is selected. Below the options is a 'Clear answer' button. To the right of the question is an orange box labeled 'EXTERNAL LINKS'. Below this box is a red-bordered box containing the text 'External links: Google dataset search, Datacite Search'.

IT'S A WIZARD...
GOES BY YOUR
ANSWERS

Questionnaire ☒ TODOs Metrics Preview Documents Settings

Current Phase

Before Submitting the DMP ▼

Chapters

- I. Administrative information 4
- II. Re-using data 5
- III. Creating and collecting data 5
- IV. Processing data 3
- V. Interpreting data ✓

1 What existing data formats/types will you be using?

Have you identified types of data that you will use that are used by others too? Some types of data (for example "images" or "tables") are used by many different projects. For such data, often common standards exist (in our example "JPG" and "CSV" [comma separated values]) that help to make these data reusable. Are you using such common data formats?

Please make sure you list all the data types that are important for your project. You should make sure also to list the formats used in any data sets that you are re-using.

☒ Desirable: Before Submitting the Proposal

☒ Data Stewardship for Open Science: *n/y*

1.a.1 Data format/type

+ Add TODO

What's up?

Unless you do entirely novel types of research, there are likely to be multiple data formats around in which the types of data you generate may be captured, processed and formatted. Some of these may be 'exotic' and not used (anymore) by the majority of the community, which frequently means that they will be difficult to find, map, inter-operate and reuse. In addition, it is less likely that standard workflows will process these data formats. Especially in case the intention to use the data generated in combinatorial or integrated experiments with OPEDAS, the formatting of your data is extremely important. In many cases, data in proprietary or exotic formats can be munged and recreated into more commonly used formats, but these processes are very cumbersome and error-prone. It is therefore of the utmost importance to consult the expert community and get the data in the most optimal formats of further analysis and ultimately for reuse by your own group and others.

Do

- Always use community-compliant, supported and sustainable data formats whenever possible.
- Turn to experts to tell you what are the best formats to use for the particular data types you will create.
- Ensure you are prepared to answer questions on the use of the data (for instance, which workflows will they be subjected to).
- Choose the formats with the richest expression possibility. It is easier to leave things blank then extending a poor data format later.

Don't

- Assume that your data is so unique that it needs an entirely new format.
 - Think that a spreadsheet with free text labels or your locally developed database is the best way to store and reuse your data.
 - Format and store data in any format without keeping rich and relevant metadata and provenance.
 - Throw away the original data unless you are absolutely sure that storing them has no further added value, for example for review of experimental and analytical procedures.
- Not having certain pre-formatted data available may actually preclude the publication, reuse and citation of your (original) data by others and might also jeopardise the publication of accompanying articles.

Links

- DS Question GitHub resources repository: [njy](#)

OPENS PROF. MONS'
«DATA STEWARDSHIP»
RELEVANT CHAPTER

FAIR Wizard

IN THE END, THE SYSTEM
EXTRACTS THE RELEVANT
INFORMATION FROM
YOUR ANSWER AND FILLS
THE DMP IN

1. Data Summary

Re-used datasets

We will use the following reference datasets:

- **Leiden Bookseller database** (<https://doi.org/10.5281/zenodo.5534110>)

We will use version "1.0" of this dataset. If a new version becomes available during the project, we will stay with the old version.

We will use the following already existing non-reference datasets:

- **VIAF**

We will use its online version without downloading it.

Data formats and types

We will be using the following data formats and types:

- **Comma-separated Values**

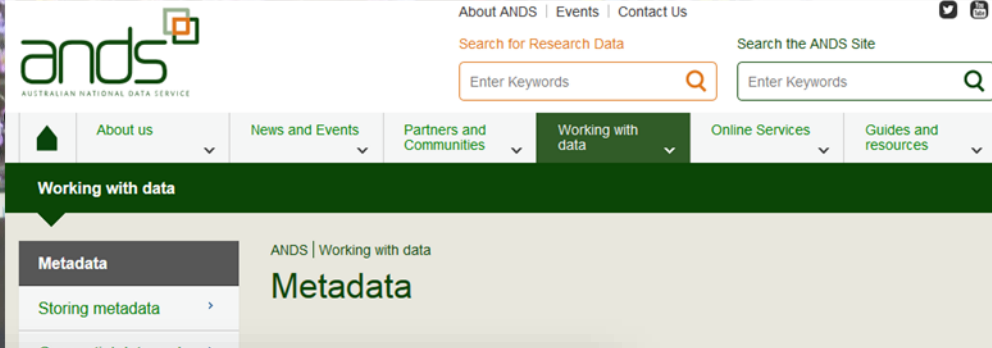
It is a standardized format. This is a suitable format for long-term archiving.

We expect to have 20 GB of data in this format.

FINDABLE



F = Findable. Met



- **Descriptive metadata:** information required for discovery and assessment of the collection,
 - e.g. title, contributors, subject or keywords, study description, and location and dates of the study.
- **Provenance metadata:** this relates to the origins and processing of the data, and enables interpretation and reuse of the data. It ranges from the human to the highly technical, and usually requires some knowledge of the domain to create.
 - e.g. Where did the data come from? Why was it collected? Who collected it, when and where? What instruments/technologies were used to collect the data, and how were they set up? How has the data been processed?
- **Technical metadata:** fundamental information for a person or a computer application to read the data.
 - e.g. How is the data set up? What formats, and versions of formats, are used? How is the database configured? How does it relate to other data?
- **Rights and access metadata:** information to enable access, and licensing or usage rules.
 - e.g. How can someone access the data? Who is allowed to view or modify the data, or the metadata, and under what conditions? Who has some kind of authority over the data? Are there costs associated with access? Under what licence is the data being made available?
- **Preservation metadata:** this builds on the history from the Provenance, Rights and Technical metadata, and also includes information to allow the data to be managed for long-term accessibility.
 - e.g. Has there been any restructuring or other changes to the files, e.g. due to migration to new file formats? What software has been used to access the data?
- **Citation metadata:** information required for someone to cite the data
 - e.g. Creator(s), Publication Year, Title, Publisher, Identifier.

F = Findable. Metadata standards

Metadata

RDA | Metadata Directory

RDA Metadata directory

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[View the extensions](#)

[View the tools](#)

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- [Hydrography](#) [Edit](#)
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F = findable. Metadata tools

What CEDAR does

<https://metadatacenter.org/>

The CEDAR Workbench, as we refer to the suite of CEDAR tools, makes it easy to collect and use metadata. Eventually our tools will create a metadata record to its eventual processing, and even enhancement, by users and analysts. But for now, CEDAR tools help users collect metadata, and download the information that users have provided.

What can CEDAR do for me already?

As of its production release, in February 2017, CEDAR addresses these scenarios:

- create user-friendly, shareable forms for collecting metadata, with features like
 - nested and repeatable elements and fields
 - reusable elements
 - control over tool tips, field titles, and field descriptions
- share your forms and metadata
 - provide a link to your metadata editors, so they can enter metadata responses based on your forms
 - share your forms and other content with individuals or a group
 - create and manage groups to make permissions simpler
- associate your questions (fields) and possible answers (values) with controlled terms
 - select any term or collection of terms from the NCBO BioPortal semantic repository
 - combine different terms from different controlled vocabularies into a single set of options
 - create your own terms, or term lists ('value sets') that can be re-used
- view responses meeting your (simple) search criteria, in several forms
 - CEDAR Metadata Editor's metadata view
 - an in-line JSON-LD format, used by CEDAR for all its metadata instances
 - download of JSON-LD files via the [CEDAR REST API](#), for offline integration with your workflow
- use the Workbench Desktop interface to manage your content
 - use My Workspace to see your items, or Shared with Me to see other items you can access
 - select an item and control-click or use the 3-dot menu in the upper right to share it, copy it, delete it, or get info on it
- enable intelligent metadata suggestions in your template by using a field's Suggestions tab
 - CEDAR keeps track of metadata entered for that field
 - users will see a drop down list of the most popular metadata entries, and can select from them
- remotely access CEDAR content and capabilities using the [CEDAR REST API](#)

With these capabilities, you can capture simple or rich metadata for your project, build a repository of project metadata, or design particular needs. Advanced users can even submit metadata entries through CEDAR's REST API.



CEDAR MAKES IT EASY TO COLLECT AND USE METADATA

Project ID
Scope
Experiment Type
Sample

CANCEL

Select option...

Genome sequencing and assembly
Raw sequence reads
Genome sequencing
Assembly
Clone ends
Epigenomics
Exome

Let's pick a scope and an experiment type.



F = Findable. Persistent identifiers

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FOR RESEARCHERS FOR ORGANIZATIONS ABOUT HELP SIGN IN

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ORCID provides a persistent digital identifier that distinguishes you from every other researcher and, through integration in key research workflows such as manuscript and grant submission, supports automated linkages between you and your professional activities ensuring that your work is recognized. Find out more

1 REGISTER Get your unique ORCID identifier Register now! Registration takes 30 seconds.

2 ADD YOUR INFO Enhance your ORCID record with your professional information and link to your other identifiers (such as Scopus or ResearcherID or LinkedIn).

<https://orcid.org/>

LATEST NEWS
Tue, 26 Feb 2019
Construyendo una Infraestructura para Apoyar a los Investigadores - Una entrada a

re3data.org
Find an appropriate repository to access and deposit research data with re3data.org

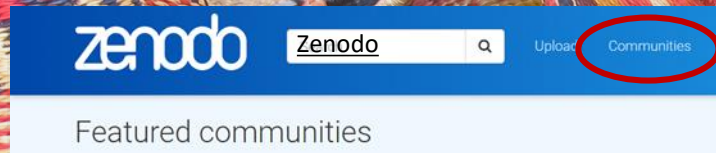
Generate your references automatically with our easy-to-use citation formatting tool.
<https://www.datacite.org/>

- ASSIGN A DOI
- DIGITAL OBJECT
- IDENTIFIER
- USE ORCID-ID AS
- RESEARCHERS

ACCESSIBLE



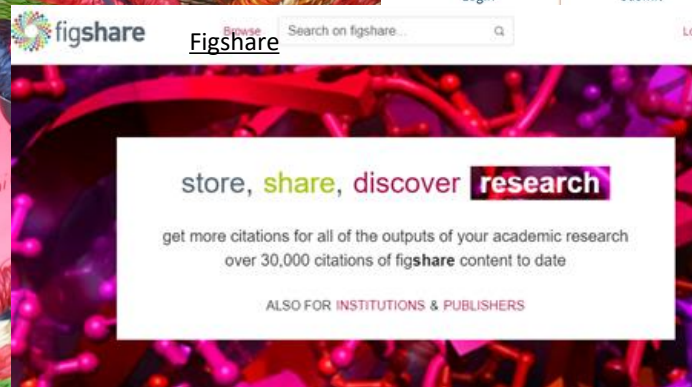
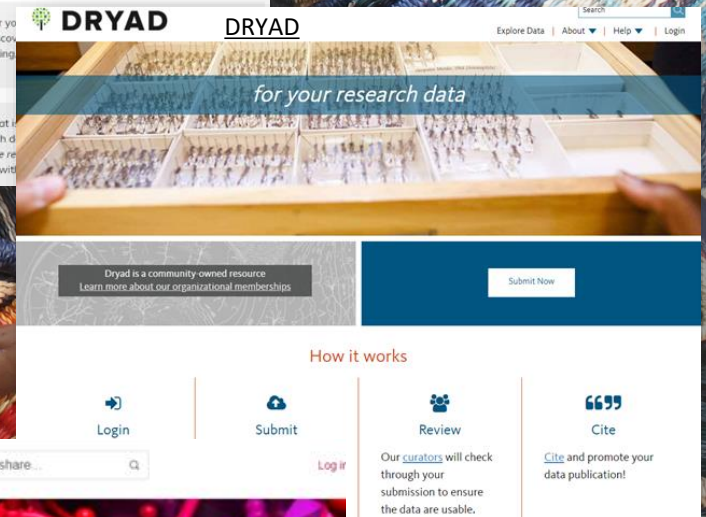
A = Accessible — Data repositories



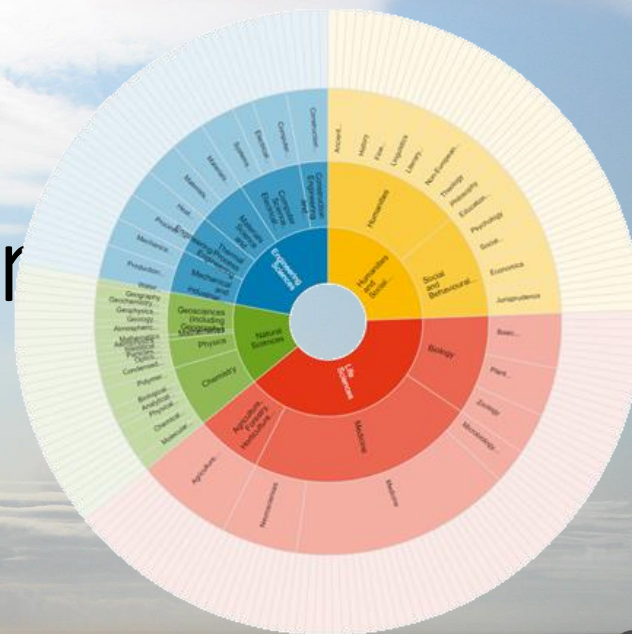
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- **Trusted** — built and operated by CERN and OpenAIRE to ensure that everyone can join in Open Science.
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- **No waiting time** — Uploads are made available online as soon as you hit publish, and your DOI is registered within seconds.
- **Open or closed** — Share e.g. anonymized clinical trial data with only medical professionals via our restricted access mode.
- **Versioning** — Easily update your dataset with our versioning feature.
- **GitHub integration** — Easily preserve your GitHub repository in Zenodo.
- **Usage statistics** — All uploads display standards compliant usage statistics

YOU CAN CREATE A
«COMMUNITY»
[THE PROJECT?]



A = Accessible. Looking for a repositor



2,000 Data Repositories and Science Europe's Framework for Discipline-specific Research Data Management

By offering detailed information on more than 2,000 research data repositories, re3data has become the most comprehensive source of reference for research data infrastructures globally. Through the development and advocacy of a framework for discipline...

[Read more](#)

Three new DOI Fabrica features to simplify account management

Last month month we launched DOI Fabrica, the modernized version of the DataCite Metadata Store (MDS) web frontend. It is the one place for DataCite providers and their clients to create, find, connect and track every single DOI from their organization...

[Read more](#)

One step closer towards instant DOI search results

Art Art? You might be wondering, what this pink and green picture illustrates? A few months ago we couldn't show you this picture; the data that we used to created it, did not exist. And the answer to what this illustrates – this is simply a distorted...

[Read more](#)

<https://www.re3data.org/>

A = Accessible. Data journals

Title	URL	Charge	Notes for authors (N.B. we suggest checking in particular for policy on submission of data already published)	Publisher	Notes on Subject Area
Journal of Open Archaeology Data	http://openarchaeologydata.metajnl.com/		http://openarchaeologydata.metajnl.com/about/submissions	Ubiquity Press	Archaeology
Open Health Data	http://openhealthdata.metajnl.com/		http://openhealthdata.metajnl.com/about/submissions		
Journal of Open Psychology Data	http://openpsychologydata.metajnl.com/		http://openpsychologydata.metajnl.com/about/submissions		
Scientific Data	http://www.nature.com/scientificdata/		http://www.nature.com/scientificdata/		

[UCL Home](#) » / [Open@UCL Blog](#) » / Data journals and data reports – don't miss out

Data journals and data reports – don't miss out on this useful publishing format!

Aug. 2021

By Kirsty, on 17 August 2021

Guest post by [James Houghton](#) – Research Data Support Officer

Why not publish a data report article?

Publishing with a data journal offers several benefits. First, a data report article is more formal than a publication of data files in a repository and is a peer reviewed publication which then contributes to a researcher's publication record which is important for CVs and advancement for many. Second, they allow a more detailed explanation of a dataset and any analysis or code related to it than is usually otherwise possible. Third, the appearance of an article in a recognised journal can help to drive visibility of a dataset for other researchers. In practice it may often be the case that a repository will be used to host material which is discussed at

Dataset Description

Object Name

- *walkers* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for records made by individual walkers during stage-one fieldwalking.
- *points* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for pottery sherds counted during stage-one fieldwalking.
- *pottery* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for the main pottery database, assembled various artefact specialists.
- *petrography* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for those sherds sampled for thin section petrography.
- *thicks* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for the main thicks database.
- *other* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for the main database of all non-ceramic and non-lithic finds.
- *trunks* – three files providing the data, metadata and field type definitions (.csv, .txt, .csvt respectively) for the main database of all standing remains, except for terraces.
- *coast* – a vector polygon dataset (.shp and associated files) with the shape of Antikythera's coastline.
- *geology* – a vector polygon dataset (.shp and associated files) with the main bedrock units on Antikythera.
- *tracts* – a vector polygon dataset (.shp and associated files) with the main stage-one survey units.
- *grids* – a vector polygon dataset (.shp and associated files) with the main stage-two survey units.
- *terraces* – vector line dataset (.shp and associated files) with all observable agricultural terraces (i.e. the location

- *other* – primarily Andrew Bevan (UCL), with further assistance from James Conolly (Trent)
- *geology* – a combination of fieldwork by Ruth Siddall (UCL) and remote sensing by Andrew Bevan (UCL)

Repository Location

UK Archaeology Data Service Collection 1115 (doi: 10.5284/1012484)

Publication Date

05/02/2012

Language

English (a Greek language summary of the project methods and results can be found at www.ucl.ac.uk/asp/ or www.tuarc.trentu.ca/asp/).

License

Creative Commons CC-BY 3.0

Reuse Potential

Due to their unusual coverage of an entire landscape, these datasets would provide a good basis for developing a tutorial on survey, GIS and/or spatial analysis in archaeology. They also lend themselves to the comparative analysis of evidence from other intensive Mediterranean surveys that are in the public domain (e.g. <http://dx.doi.org/10.5284/1000771>).

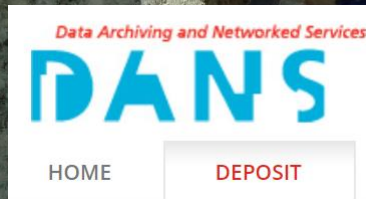
Data journals

Panayiota Polydoratou

Alexander Technological Educational Institute of Thessaloniki

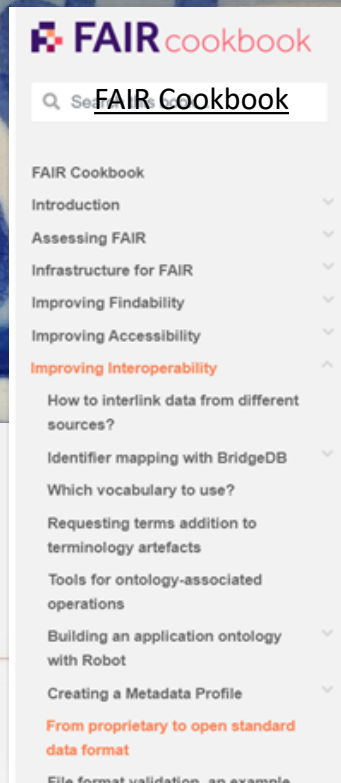
European Commission Workshop
Alternative Open Access Publishing Models: Exploring New Territories
Communication
Brussels, 12 October 2015

A = Accessible. Formats














Type	Preferred format(s)	Non-preferred format(s)
Text documents	<ul style="list-style-type: none"> PDF/A (.pdf) 	<ul style="list-style-type: none"> ODT (.odt) MS Word (.doc, .docx) RTF (.rtf) PDF (.pdf)
Plain text	<ul style="list-style-type: none"> Unicode text (.txt) 	<ul style="list-style-type: none"> Non-Unicode text (.txt)
Markup language	<ul style="list-style-type: none"> XML (.xml) HTML (.html) Related files: .css, .xslt, .js, .es 	<ul style="list-style-type: none"> SGML (.sgml)
Spreadsheets	<ul style="list-style-type: none"> ODS (.ods) CSV (.csv) 	<ul style="list-style-type: none"> MS Excel (.xls, .xlsx) PDF/A (.pdf) OOXML (.docx, .docm)
Databases	<ul style="list-style-type: none"> SQL (.sql) SIARD (.siard) DB tables (.csv) 	<ul style="list-style-type: none"> MS Access (.mdb, .accdb) (v. 2000 or later) dBase (.dbf) HDF5 (.hdf5, .he5, .h5)
Statistical data	<ul style="list-style-type: none"> SPSS Portable (.por) SPSS (.sav) STATA (.dta) DDI (.xml) data (.csv) + setup (.txt) 	<ul style="list-style-type: none"> SAS (.7dat; .sd2; .tpt) R (* under examination)
Raster images	<ul style="list-style-type: none"> JPEG (.jpg, .jpeg) TIFF (.tif, .tiff) PNG (.png) JPEG 2000 (.jp2) 	<ul style="list-style-type: none"> DICOM (.dcm) (by mutual agreement)

A = Accesible - Formats



From proprietary to open standard data format

 Recipe metadata Identifier: RX.X version: v1.0	 Difficulty level 	 Reading Time 	 Intended Audience 
 Recipe Type 	 Executable Code 		

Main Objectives

- Document how to convert raw data from a propriatory, vendor specific format to an open standard format.
- Apply the approach to an IMI dataset, more specifically a targeted metabolic profiling using Biocrates kit produced by IMI Resolute project.

Table of Data Standards

Data Formats Terminologies Models

mzML PSI-MS

Ingredients

Tools and Software:

- [github](#)
- [docker](#)
- [python](#)

Converting Mass Spectrometry data to mzML format: a Step by Step Process.

Step 1: obtain the dataset

In the case of the **IMI RESOLUTE** project, the data is released via the **University of Luxembourg** server (assuming you have access resolved):

```
$> sftp fairplus@NNN.000.000.NNN
>get RESOLUTE_Targeted_Metabolomics_of_parental_cell_lines.tar.gz
>exit
```


INTEROPERABLE



I = Interoperable

WHAT ARE STANDARDS?

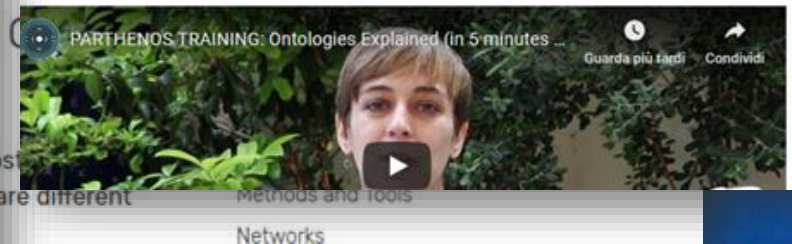
Even perfect metadata may not allow data to become interoperable if a different standard or schema is used. A "standard" refers to a system that structures what types of information are captured for each item in a collection. In our .mp3 library system, a standard is expressed in the header record where categories such as 'name,' 'time,' 'artist,' and 'album' are listed, with every entry having this information filled in. Standards are used to ensure that metadata is as useful as possible for organising a collection, ensuring that common questions (how many songs are there on the album "Big Bar") can be easily and accurately answered.

FORMAL ONTOLOGIES: A COMPLETE NOVICE'S GUIDE

[Formal ontologies](#)

WHAT ARE KNOWLEDGE REPRESENTATION SYSTEMS AND 'ONTOLOGIES'?

In addition to metadata and standardised metadata schemas, research infrastructures can also use other forms of "knowledge representation system" to enhance the researcher's experience of the interoperable data they present. When we talk about 'Knowledge Representation Systems' in research infrastructures, we usually mean a specific category of hierarchical systems of terms known more commonly as an 'ontology'. Before the digital age, philosophers referred to an ontology as "the study of the kinds of things that exist". Ontologies are similar to taxonomies, another knowledge organisation framework you probably remember from early lessons in biology.



I= Interoperable – a

FAIRDOM Platform

SEEK

https://fair-dom.org/platform/







Rightfield is an open-source tool for adding ontology term selection to Excel spreadsheets. Rightfield is used by a 'Template Creator' to create semantically aware Excel spreadsheet templates. The Excel templates are then reused by Scientists to collect and annotate their data; without any need to understand, or even be aware of, Rightfield or the ontologies used. Rightfield embedded templates are used within the **Samples** framework of the **SEEK**.

MORE INFORMATION

Rightfield

Metadata	Values (examples)	Notes
Asset Title		The name of the data file
Uploader		The person submitting the asset to SEEK
Uploader SEEK ID		If you add your own SEEK ID, this will help us link this asset with your profile
Project	Project	The project that the asset belongs to
ASSAY		
Assay SEEK ID		If referring to an existing Assay, you can link to it via the Assay SEEK ID.
Assay Title		The title of an existing assay
Assay_type	ExperimentalAssayType	The assay_type describes the type of experiment you are performing
Technology_type	amplification by-product_formation catabolic_response cell_growth_optimisation cell_size Comparative_genomic_hybridization comparative_genomics continuousEnzymatic	Describes the type of instruments and/or equipment used for the experiment
Description		A brief, human readable description.
Experimentalist		The names of the people who carried out the experiments. These can either be SEEK members or external scientists
Date		The start date for the experiment if different from the upload date
SOP		Links to SOPs and protocols used to carry out the experiment. If they are already in SEEK, you can refer to them by their SEEK ID
Publication (optional)		If this data appears in a publication, you can link it directly, or via the assay or study. If it is already registered in SEEK, you can use the PubMed ID or DOI as a reference.
Experimental_conditions		
Item	ExperimentalConditions	The name of the experimental condition you are fixing in your experiment (e.g. temperature, concentration, pH etc). If there is more than 1, please list them in columns across the spreadsheet
Compound (if concentration)		The compound name is only required if the item is concentration.
Unit		The SI units of the experimental conditions measurements.
Start_value (optional)		This field is used for recording changes throughout the experiment to measure different conditions (e.g. pH or dilutions)
End_value (optional)		This field is used for recording changes throughout the experiment to measure different conditions (e.g. pH or dilutions)
Comments		Additional information that would be useful for people reading this data file

I = Interoperable



1. Interlinking data from different sources

2. Identifier mapping with BridgeDb

3. Introduction to terminologies and ontologies

4. Selecting terminologies and ontologies

5. Requesting new terms

6. Ontology-related tools and services

7. Building an application ontology with ROBOT

8. Creating a data/variable dictionary

9. Creating a metadata profile




10. Converting from proprietary to open format

11. An inventory of tools for converting your data to RDF


12. File format validation,



1. Interlinking data from different sources

Recipe Overview

-  Reading Time
30 minutes
-  Executable Code
No
-  Difficulty
☆☆☆☆

Interlinking data from different sources



-  Recipe Type
Background information
-  Audience
Principal Investigator, Data Manager, Data Scientist

Cite me with FCB016

1.1. Main Objectives

The FAIR principles, under [Interoperability](#) state that:

13. (Meta)data include qualified references to other (meta)data

[FAIR cookbook](#)

[FAIRsharing. To be interoperable]

FAIRsharing.org
standards, databases, policies

FAIRsharing

Search all of FAIRsharing

Standards Databases Policies Collections Add/Claim Content Stats Log in or Register

A curated, informative and educational resource on data and metadata *standards*, inter-related to *databases* and data *policies*.

HOW CAN WE HELP?

We guide consumers to discover, select and use these resources with confidence, and producers to make their resource more discoverable, more widely adopted and cited.

FAIRsharing.org
standards, databases, policies

Search all of FAIRsharing

Standards Databases Policies Collections Add/Claim Content Stats Log in or Register

Recommended Records

Recommended

Associated Publication?

No Publication Has Publication

Claimed?

No Maintainer Has Maintainer

Record Status

Uncertain Deprecat In develo Ready

Standard Type

Terminology Artifact 821

Model/Format 477

Reporting Guideline 189

Matrix 20

Registry Name

Animal natural history and life history

Semanticscience Integrated Ontology

BioAssay Ontology

Apollo-SV

Sort by

B

Preclinical Studies

Recommended Records

Recommended

Associated Publication?

No Publication Has Publication

Claimed?

No Maintainer Has Maintainer

Record Status

Uncertain Deprecat In develo Ready

Standard Type

Terminology Artifact 22

Registry Name Abbreviation Type Subject Domain

CDISC Analysis Data Model CDISC ADaM Standard Biomedical Science Analysis Data Model Data Transformation

CDISC Study Data Tabulation Model CDISC SDTM Standard Biomedical Science Report Device

CDISC Clinical Data Acquisition Standards Harmonization CDISC CDASH Standard Biomedical Science Data Acquisition Report

Terminology of FAH Standard Anatomy Histology Home sapiens None None None None

REUSABLE



R = Reusable. Documentation

DOCUMENTATION (README FILE) TO
- AVOID MISUSE/MISINTERPRETATION
- KEEP INTEGRITY



Project-level documentation

[CESSDA guide](#)



Project-level documentation explains the aims of the study, what the research questions/hypotheses are, what methodologies were being used, what instruments and measures were being used, etc. In the accordion the questions which your project-level documentation should answer are stated in more

detail:

- ⊕ 1. For what purpose was data created
- ⊕ 2. What does the dataset contain
- ⊕ 3. How was data collected
- ⊕ 4. Who collected the data and when
- ⊕ 5. How was the data processed
- ⊕ 6. What possible manipulations were done to the data
- ⊕ 7. What were the quality assurance procedures
- ⊕ 8. How can data be accessed

Data-level documentation

Data-level or object-level documentation provides information at the level of individual objects such as pictures or interview transcripts or variables in a database. You can embed data-level information in data files. For example, in interviews, it is best to write down the contextual and descriptive information about each interview at the beginning of each file. And for quantitative data variable and value names can be embedded within the data file itself.



⊖ Quantitative data

Variable-level annotation should be embedded within a data file itself. If you need to compile an extensive variable level documentation that can be created by using a structured metadata format.



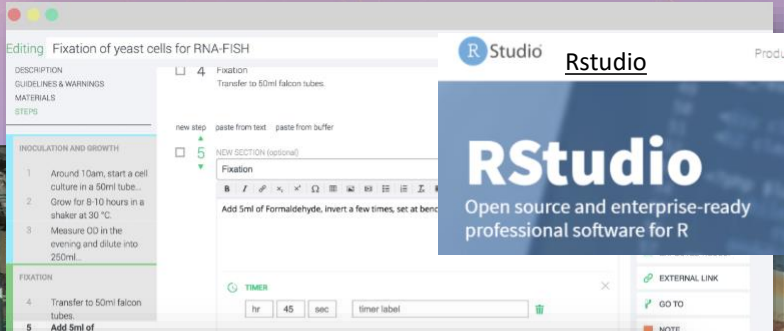
Data-level documentation for quantitative data

For quantitative data document the following:

- **Information about the data file**
Data type, file type and format, size, data processing scripts.
- **Information about the variables in the file**
The names, labels and descriptions of variables, their values, a description of derived variables, if applicable, for missing data, etc. The unit of measurement.

≡ **protocols.io**

Make your science more reproducible
protocols.io is the #1 open access repository for science methods



RStudio
Open source and enterprise-ready professional software for R

girgink Initial commit	Initial commit
.gitignore	Initial commit
LICENSE	Initial commit
README.md	Initial commit
README.md	

JupyterFAIR

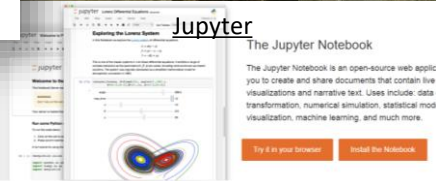
JupyterFAIR aims to provide a tool for seamless integration of Jupyter-based research environments and research data repositories.

JUPYTER FAIR, NEW PROJECT

What is an Open Notebook?

Open Notebooks are documents that contain equations, visualisations, narrative text and live code that can be executed independently and interactively, with output visible immediately beneath the input.

They bring together analysis descriptions and results, which can be executed to perform the data analysis in real time.



The Turing Way

Welcome The Turing way

The Turing Way is an open source community-driven guide to reproducible, ethical, inclusive and collaborative data science.

Our goal is to provide all the information that data scientists in academia, industry, government and the third sector need at the start of their projects to ensure that they are easy to reproduce and reuse at the end.

The book started as a guide for reproducibility, covering version control, testing, and continuous integration. However, technical skills are just one aspect of making data science research "open for all".

In February 2020, The Turing Way expanded to a series of books covering reproducible research, project design, communication, collaboration, and ethical research.



application

application enables users to:

browser, with automatic syntax highlighting, indentation, and tab

browser, with the results of computations attached to the code which

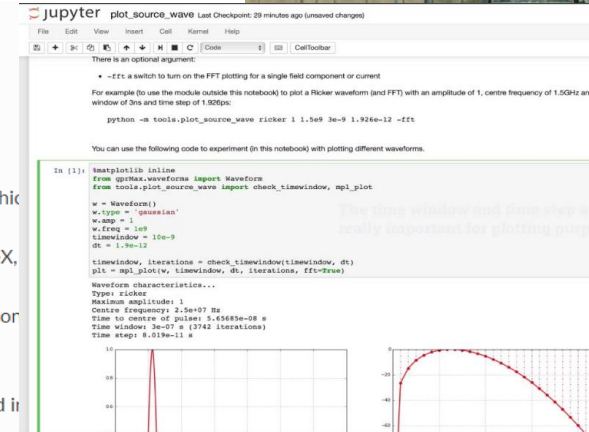
computations with rich media representations, such as HTML, LaTeX,

interactive JavaScript widgets, which bind interactive user interface con

to reactive kernel side computations.

ext using the Markdown markup language.

cal equations using LaTeX syntax in Markdown, which are rendered in



...WHY NOT?

- PROTOCOLS.IO TO DEPOSIT YOUR METHODS
- OPEN LAB NOTEBOOK TO TRACK ANYTHING YOU DO
- [TIME CONSUMING THE FIRST TIME, THEN...]

R= Reusable. Licenses

Copyright: protects the STRUCTURE, selection or arrangement of their contents" (Art. 3) NOT THE DATA

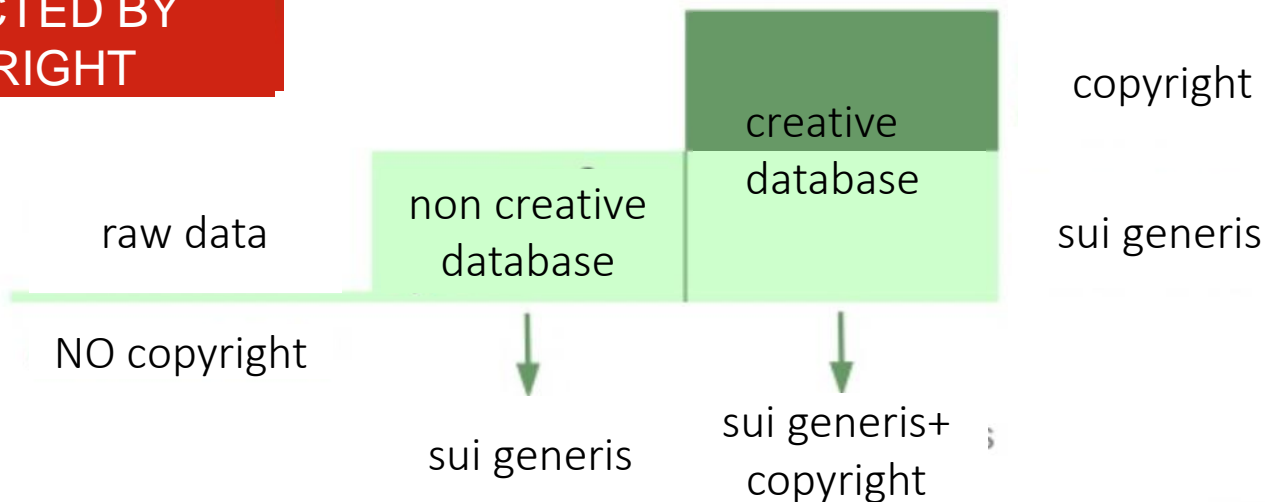
Sui generis database right: protects the «substantial effort» in OBTAINING data [NOT «CREATING»]... the right owner often is the institution

Database=a collection of independent works, data or other materials arranged in a systematic or methodical way (Art.1)

REMEMBER:
RAW DATA ARE NOT
PROTECTED BY
COPYRIGHT

Official Journal of the European Communities
DIRECTIVE 96/9/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 11 March 1996
on the legal protection of databases
COUNCIL OF THE EUROPEAN UNION,
in Community, and in particular Article 57 (2), 66 and 100a thereof,

Simone Aliprandi
2014
QUALI DIRITTI SUI DATI?



R = Reusable – Legal aspects

1. THE PROTECTION OF DATA, DATA SETS AND DATABASES

European Union (EU) law defines “databases”, but not data sets or, at least for copyright purposes, data. Databases that meet the legal definition^① can be protected by copyright if they are original. Data sets, if they correspond to the definition of database, are protected by copyright otherwise not. Data as such are normally excluded from copyright protection [2,3]. It is important to understand that copyright protects original expressions in the “literary and artistic” domain^②, an expression that has historically included works such as books, musical works, choreographies, cinematographic works, drawings, etc [4]. Ideas, procedures, methods of operation or mathematical concepts as such, news of the day and miscellaneous facts are excluded from copyright protection [4,5,6].



MIT Press Direct



2020

Data Intelligence

Volume 2, Issue 1-2

Winter-Spring 2020



< Previous Article Next Article >

Article Contents

Abstract

1. THE PROTECTION OF DATA, DATA SETS AND DATABASES

2. SUITABLE OPTIONS FOR LICENSING DATA AND DATABASE RIGHTS

January 01 2020

Licensing FAIR Data for Reuse

Ignasi Labastida ✉, Thomas Margoni

> Author and Article Information

Data Intelligence (2020) 2 (1-2): 199–207.

https://doi.org/10.1162/dint_a_00042



Cite



PDF



Permissions



Share

Abstract

The last letter of the FAIR acronym stands for Reusability. Data and metadata should be made available with a clear and accessible usage license. But, what are the choices? How can researchers share data and allow reusability? Are all the licenses available for sharing content suitable for data? Data can be covered by different layers of copyright protection making the relationship between data and copyright particularly complex. Some research



R = Reusable – Legal aspects

 **OpenAIRE** How do I know SERVICES SUPPORT

Guides for Researchers

How do I know if my research data is protected?

Learn more about what is research data and their protection by intellectual property rights

 **OpenAIRE** SERVICES SUPPORT

Guides for Researchers

How do I license my research data?

Learn more about licenses for research data and how to apply it

WHAT IS RESEARCH DATA?
PROTECTION OF RESEARCH DATA
SUI GENERIS DATABASE RIGHT (SGDR)
COPYRIGHT
TRAINING MATERIALS

What is Research Data?

Research data are the evidence that underpins the answer to the research question, and can be used to validate findings regardless of its form (e.g. print, digital, or physical). These might be quantitative information or qualitative statements collected by researchers in the course of their work by experimentation, observation, modelling, interview or other methods, or information derived from existing evidence. Data may be raw or primary (e.g. direct from measurement or collection) or derived from primary data for subsequent analysis or interpretation (e.g. cleaned up or as an extract from a larger data set), or derived from existing sources where the rights may be held by others. Data may be defined as 'relational' or 'functional' components of research, thus signalling that their identification and value lies in whether and how researchers use them as evidence for claims. They may include, for example, statistics, collections of digital images, sound recordings, transcripts of interviews, survey data and fieldwork observations with appropriate annotations, an interpretation, an artwork, archives, found objects, published texts or a manuscript.

LICENSES FOR RESEARCH DATA

HOW TO APPLY LICENSES FOR RESEARCH DATA

SPECIFICATIONS OF LICENSING RESEARCH DATA

TRAINING MATERIALS

Licenses for Research Data

What licence should be applied to the research data?

It depends on what rights protect your research data, if at all. In the light of what is explained in the guide "[How do I know if my research data is protected?](#)":

- If your research data qualifies as a work (literary work such as a journal article or a software), then CC BY 4.0 is usually the best choice. The use of the Share Alike (SA) is also compatible with the Open Access definition and reinforced in Plan S licensing guidance for publications. Non-commercial should be avoided as it is not Open Access compliant. Non-derivative is a tricky issue and should be avoided, especially if you do not know what you are doing. That said, it may not be incompatible with the Open Access definition.
- If your research data is a database or a dataset (unstructured data that do not meet the database definition) usually the best option is a CC0, which waives all your rights in the database.

Keep in mind that CC licences only deal with copyright and copyright related matter. Personal data are not included in CC and are analysed separately.

What is a Creative Commons licence?

How can a protected dataset be used?	+
Where are licences found?	+
Interoperability and stacking	+
What happens if I use 'Share Alike' (SA) licensed material in my work? Does that mean I have to make my work available under the same SA licence?	+
Can a dataset be used if there is no licence?	+
What are the risks of using a dataset without a licence?	+
Training materials	+

 **OpenAIRE** Can I use SERVICES

Guides for Researchers

Can I reuse someone else's research data?

Learn more on how to reuse research data

Creative Commons

CC Factsheet  creative commons UK

FACT SHEET ON CREATIVE COMMONS & OPEN SCIENCE v0.1

This information guide contains questions and responses to common concerns surrounding open science and the implications of licensing data under Creative Commons licences. It is intended to aid researchers, teachers, librarians, administrators and many others using and encountering Creative Commons licences in their work.

CC0: FROM A LEGAL
POINT OF VIEW, THE
ONE AND ONLY LICENSE

What is Open Science?

[Open Science](#) is the movement to make scientific research and data accessible to all for knowledge dissemination and public reuse.

How should I licence my data for the purposes of Open Science?

We recommend you use the [CC0 Public Domain Dedication](#), which is first and foremost a waiver, but [can act as a licence](#) when a waiver is not possible.

CC ZERO LICENCE, 'NO RIGHTS RESERVED' LOGO



By applying CC0 to your data you enable everyone to freely reuse your data as they see fit by waiving (giving up) your copyright and related rights in that data.

You should keep in mind that there are many situations in which data is **not** protected as a matter of law. Such data can include facts, names, numbers – things that are considered 'non-original' and part of the public domain thus not subject to copyright protections. Similarly, your database (which is a structured collection of data) might be considered 'non-original' and thus ineligible for copyright, and it might additionally be excluded

from other forms of protection (like the [EU sui generis database right](#), also known as the 'SGDR', for non-original databases).

In these cases, using a Creative Commons licence such as a CC BY could signal to users that you claim a copyright in the non-original data despite the law, and perhaps despite your real intention.

Finally, if your data is in the public domain worldwide, you might state simply and obviously on the material that no restrictions attach to the reuse of your data and apply a [Public Domain Mark](#).

PUBLIC DOMAIN MARK LOGO



When in doubt, consider which use may be appropriate according to the chart below:

CC0 & PUBLIC DOMAIN LICENCES WHICH LICENSE TO USE AND WHEN



'Creative arrangement' of data is original, but any copyright has been waived and content is made available copyright-free



'Creative arrangement' of data is not original; the author acknowledges this and communicates the data is in the public domain

But I would like attribution when others use my dataset. In that case, shouldn't I use a CC BY licence?

We recommend that you avoid using a CC BY licence. Here's why:

While attribution is a genuine, recognisable concern, not only might using a CC BY licence be legally unenforceable when no underlying copyright or SGDR protects the work, but it may also communicate the wrong message to the world. A better solution is to use CC0 and [simply ask for credit](#) (rather than require attribution), and provide a citation for the dataset that others can copy and paste with ease. Such requests are consistent with scholarly norms for citing source materials.

Legally speaking, datasets that are **not** subject to copyright or related rights (and are thus in the public domain) cannot be the object of a copyright licence. Despite this, agreements based in contract law may be enforceable. Creative Commons licences, however, are copyright licences. Therefore, where the conditions for a copyright or related right are not triggered, copyright licences, such as the CC BY licence, [are unenforceable](#).

In some cases, however, rights may exist (like the *sui generis* database right previously mentioned), and permission for others to use your dataset may be legally required. These rights are meant to protect the maker's investment, rather than originality. As such, database rights do not include the moral right of attribution. So by using a CC BY licence, you signal to users that you restrict access to your dataset beyond the protections provided by the law. We are not saying that this cannot be done, we are just saying that if you choose to do this, you should make sure you fully understand what it entails.

Commons and Open

USE A CC0

- THEN ASK FOR CREDIT
- PROVIDE A CITATION TO C&P
- BEAR IN MIND IT'S BAD SCIENCE NOT TO CITE THE SOURCE
- CC0 DOES NOT MEAN ACADEMIC UNPOLITENESS

cannot be done, we are just saying that if you choose to do this, you should make sure you fully understand what it entails.

I'm uncomfortable with others using my research for commercial purposes. Should I use a non-commercial licence for my dataset?

We recommend you avoid using a non-commercial licence. Here's why:

For legal purposes, drawing a line between what is and is not 'commercial' can be tricky; it's not as black and white as you might think. For example, if you release a dataset under a non-commercial licence, it would clearly prohibit an organisation

I'm uncomfortable permitting use of my research for any and all purposes. Should I use a 'No Derivatives' (ND) licence for my dataset?

We recommend you avoid using a 'No Derivatives' licence. Here's why:

Similar to how a non-commercial licence might restrict meaningful reuse of your dataset, a ND licence can have the same effect: it may prevent someone from recombining and reusing your data for new research. For data to be truly Open Access, it must permit these important types of reuse.

It sounds like you're really pushing for the use of CC0 for open science datasets.

Exactly. Data is only open if anyone is free to use, reuse, and distribute it. This means it must be made available for both commercial and non-commercial purposes under non-discriminatory conditions that allow for it to be modified.

When data is made available for all reuse, others can create new knowledge from combining it. This leads to the enrichment of open datasets and further dissemination of knowledge. Accordingly, CC0 is ideal for open science as it both protects and promotes the unrestricted circulation of data.

And remember, it's bad science not to cite the source of data you use. To help others cite your data [include a citation](#) that users can copy and paste to give you credit for your hard work.

...Data Management Plan



- A STRUCTURED WAY TO THINK TO YOUR RESEARCH FROM THE PERSPECTIVE OF YOUR DATA: collection, preservation, description, sharing
 - CLEAR RULES FROM THE BEGINNING
 - LIVING DOCUMENT TO BE UPDATED
 - ...AND THEN... ACT ACCORDINGLY...

DMP online and Data Wizard video tutorials – to draft your DMP

YouTube **Video DSW**

Outline

- Introduction
- DSW for Researchers + Demo
- DSW for Data Stewards + Demo
- How to Get Started
- Questions & Discussion



VIDEO –
HOW DMPONLINE
AND DSW WORK

DMPonline tutorial videos
10 video • 567 visualizzazioni • Ultimo aggiornamento in data 23 set 2020

DMPonline tutorial videos for administrators.

TheDigitalCuration **ISCRIVITI**

Video Number	Video Title	Channel	Duration
1	1 Introduction to DMPonline - 1. 1. What is DMPonline, creation of account & basic terminology	TheDigitalCuration	5:34
2	1 Introduction to DMPonline - 1.2 Granting administrator privileges	TheDigitalCuration	3:22
3	1 Introduction to DMPonline - 1.3 Customising your institutional profile	TheDigitalCuration	1:38
4	1 Introduction to DMPonline - 1.4 Providing feedback on plans	TheDigitalCuration	2:44
5	2.1. DMPonline tutorial - creating themed guidance	TheDigitalCuration	5:54
6	2.2. DMPonline tutorial- creating question specific guidance	TheDigitalCuration	3:44
7	3. DMPonline Tutorial - Creating Template	TheDigitalCuration	5:10
8	4. DMPonline Tutorial - Conditional questions	TheDigitalCuration	5:10
9	5. DMPonline tutorial - customising funder template	TheDigitalCuration	4:34

DMPONLINE video tutorials

VISITA PLAZA DE TOROS



1

START EARLY

Read the guidance and ask for advice early on in the process, as writing a DMP may take some time

2

CONSIDER REUSE

Think about reusing existing data. Describe what you will need to know about your data five years from now

3

CHECK POLICIES

Talk to your supervisor or lab members about existing data management policies and standards

4

MAKE USE OF SUPPORT

Use your in-house support services like RDM Support, the Library, IT department or legal desk

5

THINK BROAD

Also address software code, algorithms and any other valuable research assets in your DMP

6

COPY WHERE YOU CAN

Look at other (submitted) plans and copy when appropriate

7

BE UNIQUE WHERE NEEDED

Since every research project is unique, so are the data it generates. Copying from sample DMPs is not sufficient

8

BE CONCRETE

Make your answers as concrete as possible. Show that you have consulted RDM experts

9

SAY SO IF YOU DON'T KNOW

Indicate what you do not yet know and how you will resolve these questions later

10

UPDATE

DMPs add to the planning of your research methods. Therefore define, carry out and update your DMP just as you would any method

Tips&tricks

... «as open as possible»...

Commission européenne
Europese Commissie



Carlos Moedas ✓

@Moedas

Segui

2/4 "Open as possible, as closed as necessary" is the new principle for all [#data](#) from publicly funded [#research](#) in Europe [#openaccess](#)

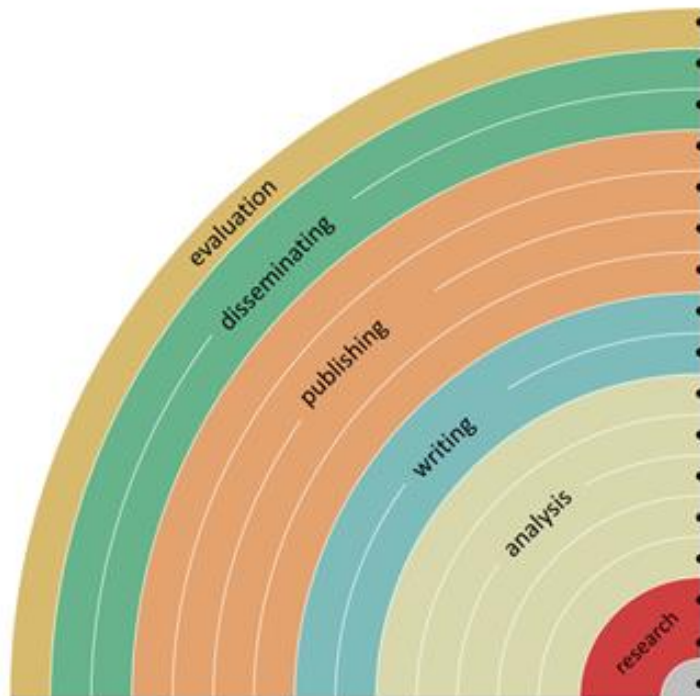
RETWEET
76

MI PIACE
32



Open Science: why just your data?

YOU CAN MAKE YOUR WORKFLOW MORE OPEN BY...



- adding alternative evaluation, e.g. with [altmetrics](#)
- communicating through social media, e.g. [Twitter](#)
- sharing posters & presentations, e.g. at [FigShare](#)
- using open licenses, e.g. [Creative Commons](#) BY
- self archiving in [archives](#) or publishing on [Open journals](#)
- using open peer review, e.g. at [PubPeer](#) o [F1000](#)
- sharing preprints, e.g. at [OSFpreprint](#), [arXiv](#) o [biorXiv](#)
- using actionable formats, e.g. with [Jupyter](#) o [CoCalc](#)
- open XML-drafting, e.g. at [Overleaf](#) o [Authorea](#)
- sharing protocols & workflows, e.g. at [Protocols.io](#)
- sharing notebooks, e.g. at [OpenLabNotebook](#)
- sharing code, e.g. at [GitHub](#) licensing [GNU/MIT](#)
- sharing data, e.g. at [Dryad](#), [Zenodo](#) o [Dataverse](#)
- pre-registering, e.g. at [OSFregistry](#) o [AsPredicted](#)
- commenting openly, e.g. with [Hypothes.is](#) o [Pund.it](#)
- using shared reference libraries, e.g. with [Zotero](#)
- sharing (grant) proposals, e.g. with [RIO Journal](#)



A wooden sign made of several vertical planks is placed on a brick patio. The sign features a quote in bold, black, sans-serif capital letters. In the background, there is a rustic wooden bench made of thick, weathered planks. The ground is paved with reddish-brown bricks, and a concrete curb is visible in the foreground.

**"IF YOU ARE NOT
DOING WHAT
YOU LOVE,
YOU ARE
WASTING
YOUR TIME."**

... thank you!