FAIRsharing content: **standards overview**

Core to research data management good practices

FAIRsharing promotes the **value** of standards, the backbone of the **FAIR Principles**

As trusted source of data and metadata* standards for all digital objects, incl. datasets, software, and materials across all disciplines, FAIRsharing:

- guides *users* to discover, select and use standards with confidence
- helps *developers* to make their standards more visible, more widely adopted and cited
- powers *third party tools* by providing trustworthy content to put standards into action

Standards ...

Are a **collectively agreed-upon** set of requirements, specifications, guidelines or characteristics that can be used for the **description**, **structure**, **harmonisation**, **citation**, **sharing**, and/or **preservation** of all kinds of data and metadata

Help **machines** with computational accessibility, **interoperability**, and use of data with little/no human intervention; enable humans to understand and **reuse** data at scale

* Where **data** can simply be a piece of information, e.g., observations, a list of measurements, descriptions of certain objects, **metadata** specifies the relevant information about the data, and can be of many types, including descriptive, administrative, and legal

FAIRsharing categorises standards with four types:

1 Reporting guidelines

Outline in narrative form the necessary and sufficient information that should be reported about data, such as in itemised, prescriptive checklists; or the features and behaviours that should be followed, such as in general guiding principles

2 Models and formats

Define the representation of information for use by machines; these range from conceptual models to transmission formats, facilitating data retrieval and exchange between systems

3 Terminology artefacts

Add an interpretive, semantic layer for use by machines and humans; these range from controlled vocabularies (lists of terms, often with definitions) to ontologies (complex hierarchical groupings), providing unambiguous identification of concepts and aiding data querying

4 Identifier schemata

Are formal systems to identify information in an unique, machine-readable way; these persistent identifiers (PIDs), minted by recognised registries, build reliable and long-lasting links between data, people, organisations and infrastructures

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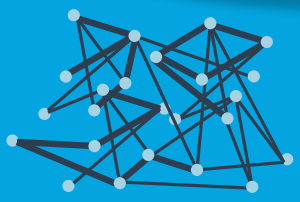
Find more at
fairsharing.org/educational

FAIRsharing.org
standards, databases, policies

FAIRsharing provides a snapshot of the **dynamic landscape** of standards



1. Tracks their **evolution**
2. Illustrates **relations** with other standards
3. Displays their **implementation** in databases
4. Monitors their **adoption** in data policies and guidelines

Benefits for all

Be familiar with standards at a level appropriate for your needs, e.g.

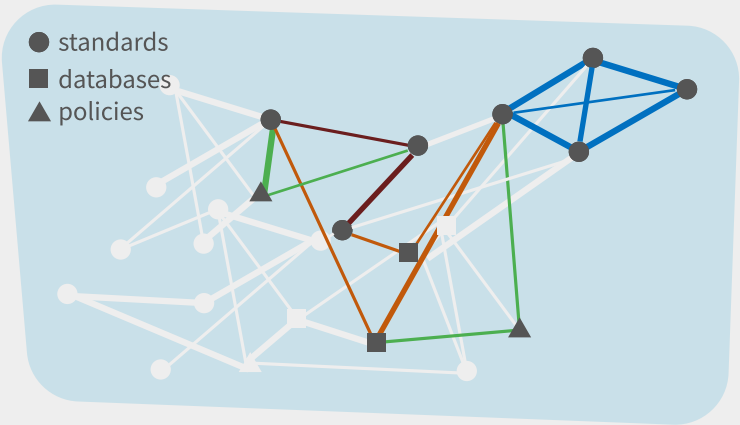
Researchers should understand the basics, to select the right set when defining a Data Management Plan (DMP)

Tools and service developers, and data professionals should have a high familiarity with standards, implement them in data infrastructures, and make them 'invisible' to researchers and other users of these systems

Trainers, guidance and policy makers should also have a strong grasp of standards to provide examples and recommend an appropriate set

FAIRsharing visualises **relationships** among resources, e.g.,

- many **standards** are used in **combination** as 'packages', such as when a **terminology** is ***related to*** a given **format**
- which **standards** are ***implemented by*** **databases** and are ***recommended by*** **policies**



There is no central authority for standards, but there are two main producer groups:

- Standards Developing Organisations, with formal membership & development processes, create *de jure* standards often available for a fee
- Grass-roots, open communities create freely available *de facto* standards via a more organic process, generally accepted through common use
- As long as a standard is recognized by the research community and discipline you belong to, both types are suitable for enabling FAIR data

Navigating the standards ecosystem is challenging:

- Standards are often fragmented, with unnecessary duplications and gaps
- High numbers of published standards in some research areas reflects the dynamic nature of data types, technologies, and needs of the research communities
- Several mappings are being created to enable crosswalking among standards
- Measuring the uptake is not trivial and achieving a full picture is practically impossible

Do not be discouraged: it is always better to use a standard, even if imperfect, than none!

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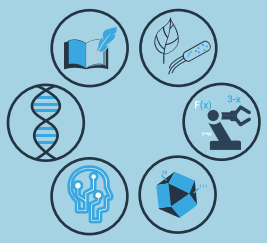
FAIRsharing displays the intended use of each standard



Subject tags indicate the specific scientific significance, or domain, e.g., *Neuroscience*, *Linguistics*

Subject agnostic is used to describe standards that are suitable for all research areas

Domain tags indicate the specific relevance to technology or protocol, e.g., *magnetic resonance imaging*, *literature mining*

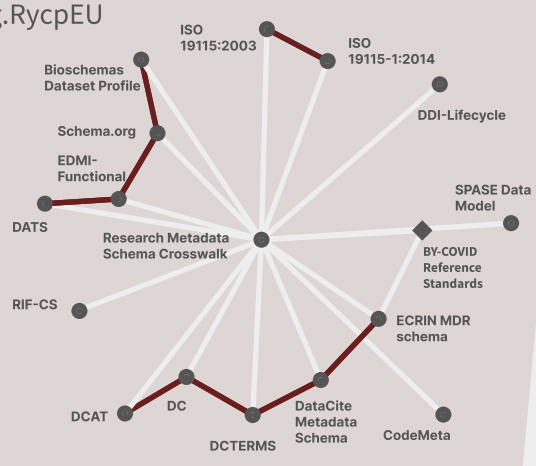
FAIRsharing uses indicators to show the life-cycle status of each standard

- **Ready** when a resource is considered suitable for use
- **In development** when a resource is being developed and may be used but may also be in a state of flux
- **Deprecated** when the community no longer mandates its use; this status is curated jointly with an explanation and, where available, a link to the standard that has superseded it, or been merged with it
- **Uncertain** when contact cannot be established with the community or owners of a resource, and therefore its current status cannot be determined; generally used on a temporary basis

Examples

Collection of 15 research metadata schemas crosswalked to Schema.org by the RDA Research Metadata Schemas WG
List: fairsharing.org/3641
Graph: fairsharing.org/graph/3641

A guideline for *Astrophysics and Astronomy*, DOI: 10.25504/FAIRsharing.RycpEU
A model/format for *generic* use, DOI: 10.25504/FAIRsharing.hzdzq8
A terminology for *Linguistics*, DOI: 10.25504/FAIRsharing.8DCv6L
A *general purpose* standard, DOI: 10.25504/FAIRsharing.5bbab9



Views of standards by type:
fairsharing.org/standards/identifier_schemas
fairsharing.org/standards/model_and_format
fairsharing.org/standards/reporting_guidelines
fairsharing.org/standards/terminology_artefacts

Search standards using different options:
fairsharing.org/#search

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