

## Basic Goals and Principles

# Basic recommendations and assumptions to develop and activate a FAIR Dataspace for the Helmholtz Association

## Description

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## Motivation for this Recommendation:

The Helmholtz Association is determined to make their data available according to the FAIR principles, thus making it findable, accessible, interoperable and reusable. This is expressed in the “Recommendations for Policies of the Helmholtz Centers on Research Data Management” [1].

In order to achieve interoperability of datasets among various data infrastructures (DIS) within the Helmholtz Association,

- a common and agreed procedure to refer to common information is needed
- common semantic concepts need to be implemented
- common data exchange containers and formats need to be defined and implemented
- common interfaces and data exchange protocols need to be agreed upon

These following recommendations aim to describe procedures to achieve the above-mentioned goals, and identify activities and the relevant stakeholder groups to implement these. This implies that the identified stakeholders assume certain responsibilities in order to make these recommendations work.

As these goals require certain decisions to be made, we describe the decision processes from high-level to lower levels, resulting in agreed procedures. We then describe the conduct of these procedures with respect to the involved stakeholder groups, their responsibilities and the actions to be taken.

The activities may be prioritized for implementation in a specific order or for a particular stakeholder group, either because they are simple to set up, or because they are prerequisites for other recommended activities. These decisions have to be made on a case by case basis, in order to move forward establishing the envisioned data space.

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I think in this paragraph we should do some modifications that put equal weight on all aspects of FAIR. The above version particularly addresses interoperability, but we want to improve all letters of FAIR (DK): The Helmholtz Association is committed to making its data available in accordance with the FAIR principles — ensuring that data are Findable, Accessible, Interoperable, and Reusable. This commitment is outlined in the “Recommendations for Policies of the Helmholtz Centers on Research Data Management” [1].

To achieve FAIR data across the various data infrastructures (DIS) within the Helmholtz Association,

coordinated efforts are required to address each aspect of FAIR:

- To support Findability and Accessibility, data must be clearly identified, described, and retrievable through standardized metadata and persistent identifiers.
- To ensure Interoperability, shared semantics, data formats, and communication protocols are needed to enable meaningful data exchange between systems.
- To foster Reusability, metadata must include information about licensing, provenance, and context, ensuring that data can be reliably interpreted and applied in new settings.

Accordingly, the following recommendations aim to define procedures and practices that support all FAIR dimensions. These include:

- common and agreed procedures referring to shared information are needed
- common semantic concepts need to be implemented
- common data exchange containers and formats need to be defined and implemented
- common interfaces and data exchange protocols need to be agreed upon

These following recommendations aim to describe procedures to achieve the above-mentioned goals, and identify activities and the relevant stakeholder groups to implement these. This implies that the identified stakeholders will take on specific responsibilities to ensure the success of the FAIR-aligned approach.

Since achieving these goals requires deliberate decision-making, the document outlines decision processes from high-level strategy to operational detail, resulting in agreed procedures. It further describes how these procedures are to be implemented, specifying the roles, responsibilities, and actions required of each stakeholder group.

Activities may be prioritized for implementation based on factors such as ease of deployment or their role as prerequisites for other efforts. These decisions should be made case by case to effectively progress toward the envisioned Helmholtz data space.

## Basic FAIR Implementation Recommendations

Implement the **FAIR building blocks**:

- Common use of **PID metadata** to harmonize common metadata (M)
- Common use of **standardized interfaces** in repositories and data products to harvest and exchange data (I)
- Common use of **semantic resources** (S), e.g. vocabularies, ontologies
- Use of **data containers**, e.g. FDOs or data crates, to achieve machine actionability (C)

**Other important topics** where harmonize procedures are important are:

- Well defined **licenses** (L)
- **Quality** assessment and control (Q)
- **Provenance** tracking (P)
- Stakeholder **roles and responsibilities** (R)
- **Valuing RDM engagement** (V) by treating published data similar to other publications

including DOIs and author references, citable, with licenses and credits to the authors. This includes accountability for publishing credit systems and others. Data citations improve the data set author's score.

A very important precondition for the implementation of these recommendations is the **presence of skilled and highly trained data management personnel**, such as data stewards, data curators, and developers for data management and processing tools.

## References

[1] Empfehlungen für Richtlinien der Helmholtz-Zentren zum Umgang mit Forschungsdaten, 2019, Helmholtz Open Science, <https://os.helmholtz.de/open-research-data/forschungsdaten-policies/>

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