FAIR Building Blocks

Definition

The Mission and vision of the HMC Hub Earth and Environment is realized by the **Road-to-FAIR-Strategy**. To do so, we suggest implementing a common set of **FAIR building blocks**. These building blocks are operational measures required to support the findability, accessibility, interoperability, and reusability of research data. They include:

- Common and agreed procedures to refer to systematically described entities through the use of **persistent identifiers** (PIDs), to reduce redundancy, enrich context and improve consistency in referencing instances such as people, organizations, instruments, and datasets.
- Common understanding across systems and disciplines through the use of **semantic resources** to standardize metadata element names and reduce ambiguity.
- Common methods to structure data through the application of **interfaces, protocols, exchange formats, and schemas**, to ensure consistent structuring and exchange of metadata across systems.
- Common handling of data dissimination through **exchange containers** such as FAIR Digital Objects or DataCrates, to enable machine-actionable reuse and portability.

Other important topics where harmonization procedures are important are:

- Inclusion of **provenance information**, capturing data origin, transformation steps, and responsible agents, to enable assessment of data reliability and reproducibility.
- Clear **license information**, using standardized, machine-readable licenses, to define conditions of use and promote legal clarity.
- Documented procedures for assessing and communicating **data quality**, including uncertainty, validation, completeness, and versioning, to ensure data are fit for purpose.
- **Valuating research data management** (RDM) engagement, through citation of datasets with DOIs, inclusion of author contributions, and formal acknowledgment of data curation efforts.

These elements form the structural foundation for the detailed recommendations presented in this wiki.

A key precondition for the implementation of these recommendations is the availability of skilled personnel, such as data stewards, data curators, and developers, who support data management and the technical and semantic infrastructure required to implement FAIR.

Suggested Disciplinary Metadata Fields:

Instrument used for the measurement

- method of the measurement
- measured attribute
- measured parameter
- measured unit
- measured Object / Medium

- sampleID
- region where the sample was obtained