

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 dissemination 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 disclose lineage, and enable assessment of data reliability and reproducibility.
- Standardized procedures for assessing, communicating and documenting **data quality**, including uncertainty, validation, completeness, and versioning, to establish a basis for data trust and ensure data are fit for purpose.
- Clear definition of **access and use constraints** using standardized and machine-readable methods, e.g. common licenses, to promote legal clarity.

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.

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