

NFDI-MatWerk / Materials Data Infrastructure

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NFDI-MatWerk

The German National Research Data Infrastructure (NFDI) aims to systematically develop sustainably secure data holdings of science and research as well as making them accessible. It is being established as a networked structure of consortia acting on their own initiative. In NFDI-MatWerk, a reliable digital platform for the materials and nanosciences is being established, which enables the digital representation of materials data and specific metadata.

Task Area Materials Data Infrastructure

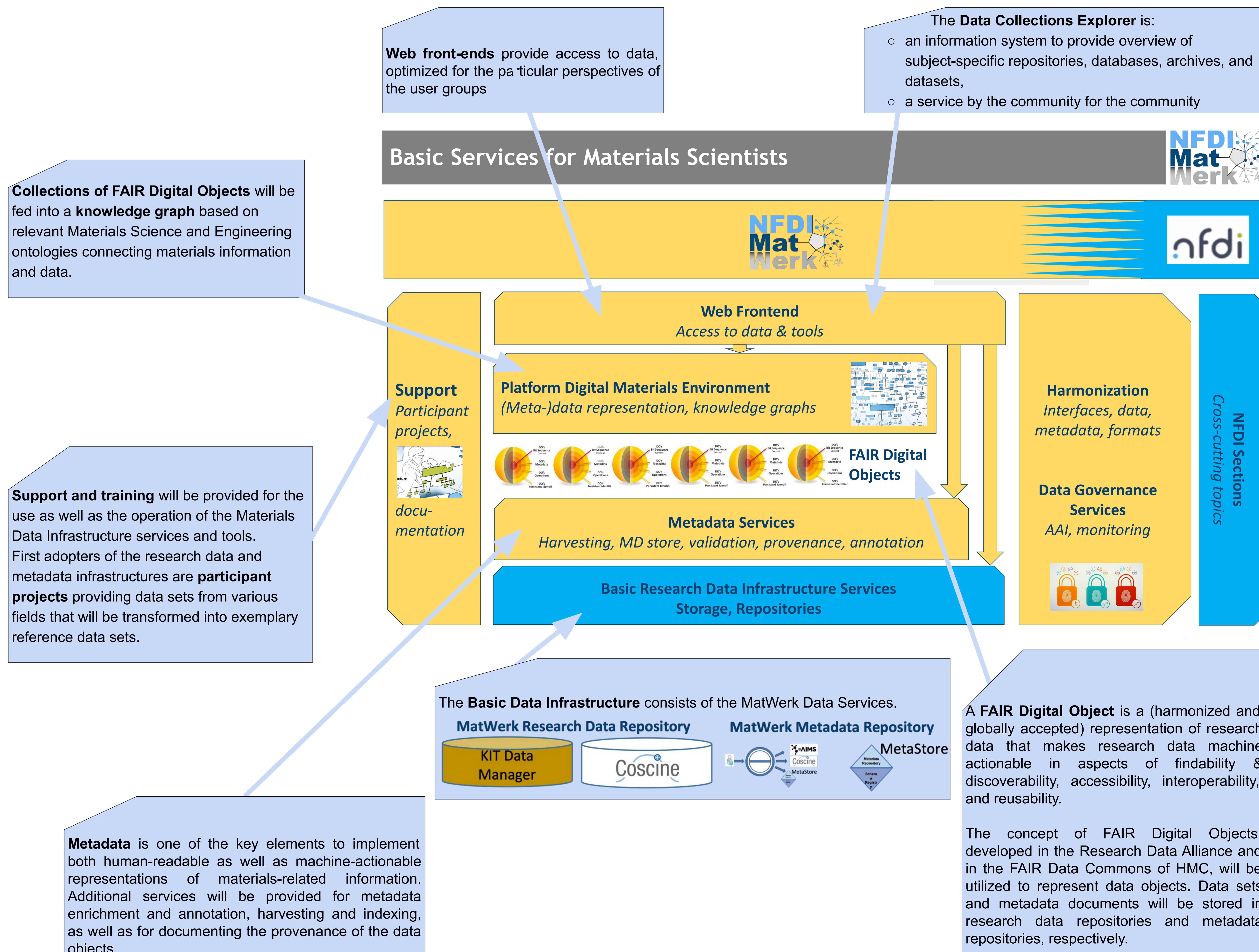
Within NFDI-MatWerk the Task Area Materials Data Infrastructure will provide services to easily store, share, search, and analyze data and metadata while ensuring data integrity, provenance, and authorship.

Status of the work:

- Providing basic services and tools
- Analyzing current data flow processes of the use cases
- Analyzing weak and lacking spots (e. g. paper lab books, versioning of samples, ...)
- Analyzing used data types
- Developing interfaces for data flow

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Collections of FAIR Digital Objects will be fed into a **knowledge graph** based on relevant Materials Science and Engineering ontologies connecting materials information and data.

Web front-ends provide access to data, optimized for the particular perspectives of the user groups

The Data Collections Explorer is:

- an information system to provide overview of subject-specific repositories, databases, archives, and datasets,
- a service by the community for the community

Support and training will be provided for the use as well as the operation of the Materials Data Infrastructure services and tools. First adopters of the research data and metadata infrastructures are **participant projects** providing data sets from various fields that will be transformed into exemplary reference data sets.

The **Basic Data Infrastructure** consists of the MatWerk Data Services.

MatWerk Research Data Repository: KIT Data Manager, Coscine

MatWerk Metadata Repository: AIMS, Coscine, MetaStore, MetaStore

Metadata is one of the key elements to implement both human-readable as well as machine-actionable representations of materials-related information. Additional services will be provided for metadata enrichment and annotation, harvesting and indexing, as well as for documenting the provenance of the data objects.

A **FAIR Digital Object** is a (harmonized and globally accepted) representation of research data that makes research data machine actionable in aspects of findability & discoverability, accessibility, interoperability, and reusability.

The concept of FAIR Digital Objects, developed in the Research Data Alliance and in the FAIR Data Commons of HMC, will be utilized to represent data objects. Data sets and metadata documents will be stored in research data repositories and metadata repositories, respectively.