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Materials Data Infrastructure and Ontology Development for Exemplary Reference Dataset

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Our Goal

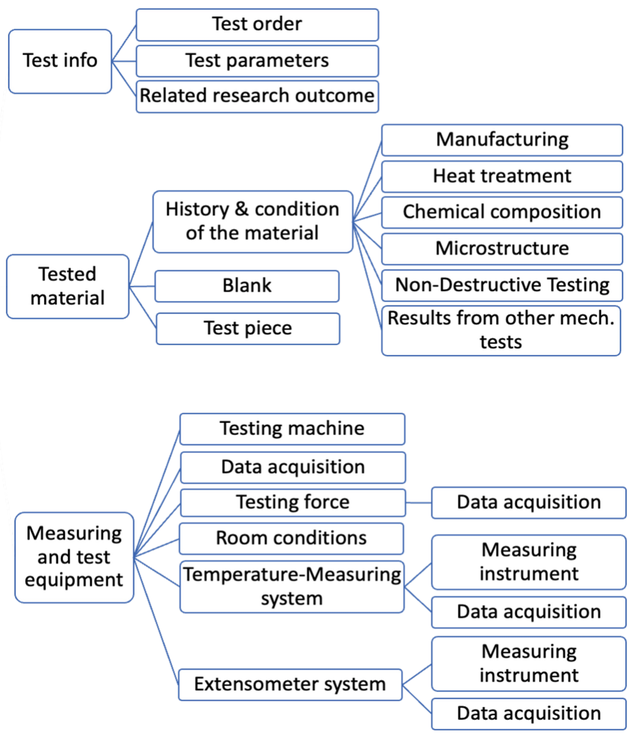
Conceptualize & implement a digital infrastructure for
- Shaping, storing, sharing
- Search, discovery, and usage of reference data

Key Takeaways

The infrastructure enables the researcher to:
- Validate a dataset as a reference dataset → Metadata schema
- Search/find data → FDO and instantiated ontology

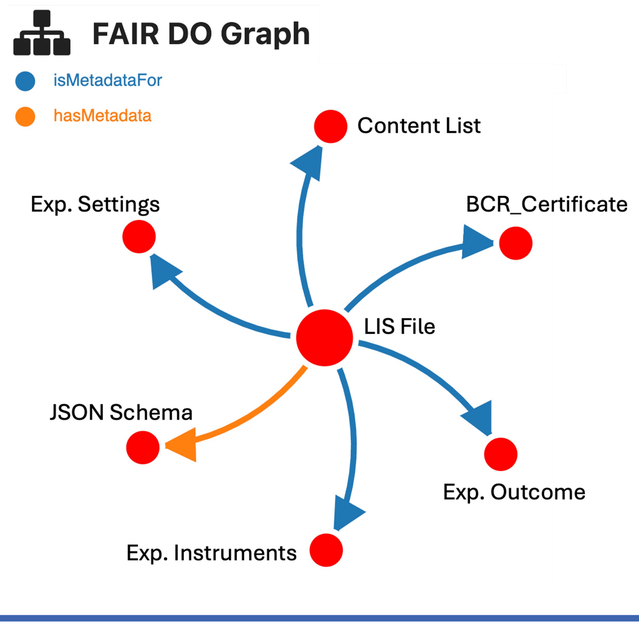
Data Schema

- List use-case-related minimum requirements
- Usage of a defined **vocabulary**
- RDM to enhance documentation practices
- Serves as a template for other methods
- Used for shaping, sharing, and structuring data

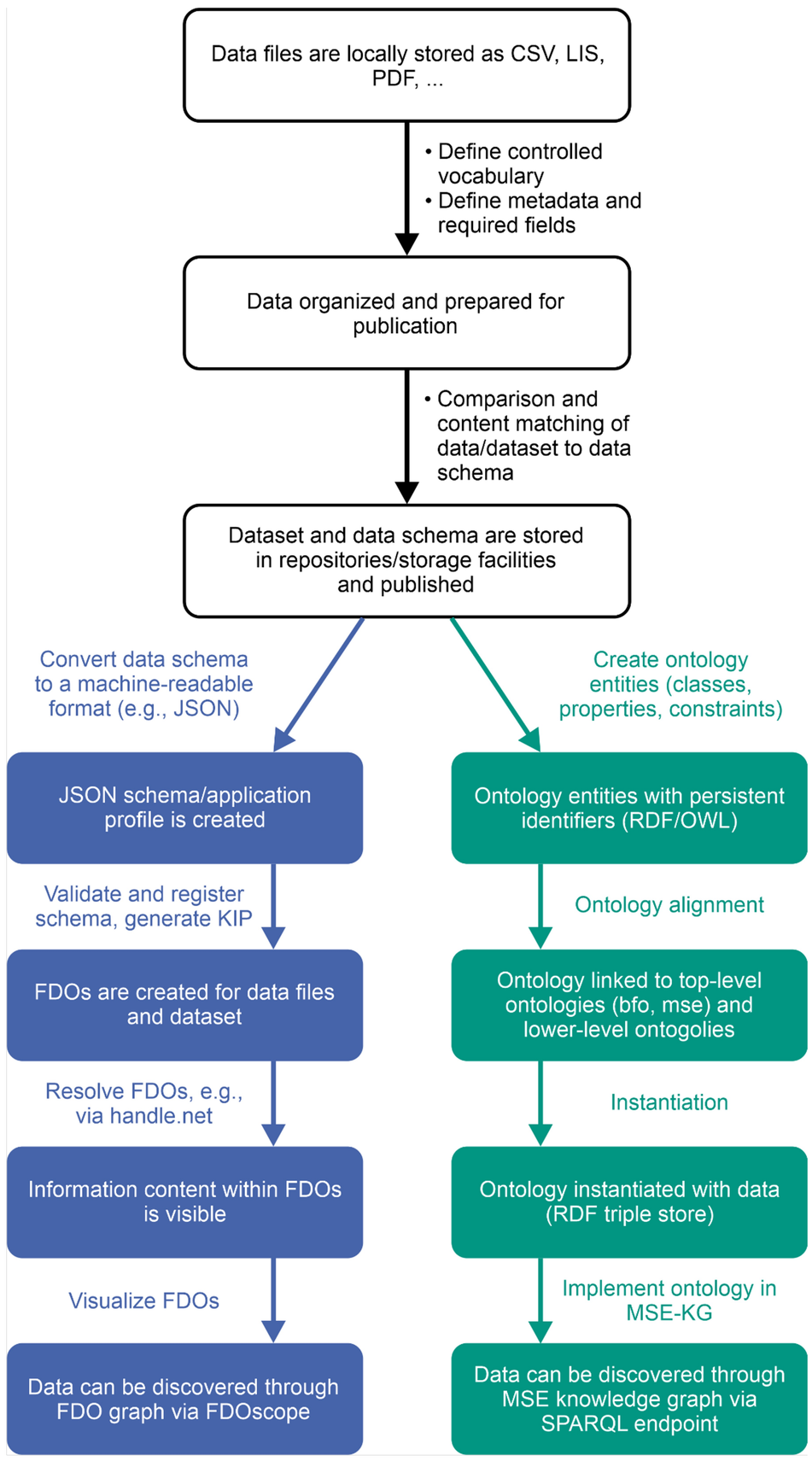


Data Discovery and Usage

FAIR Digital Object (FDO)
- Globally accepted representation of research data that makes FAIR data not only machine readable but also machine actionable across scientific disciplines
- Allows a common view on all data artifacts independent of their scientific contents and metadata structures

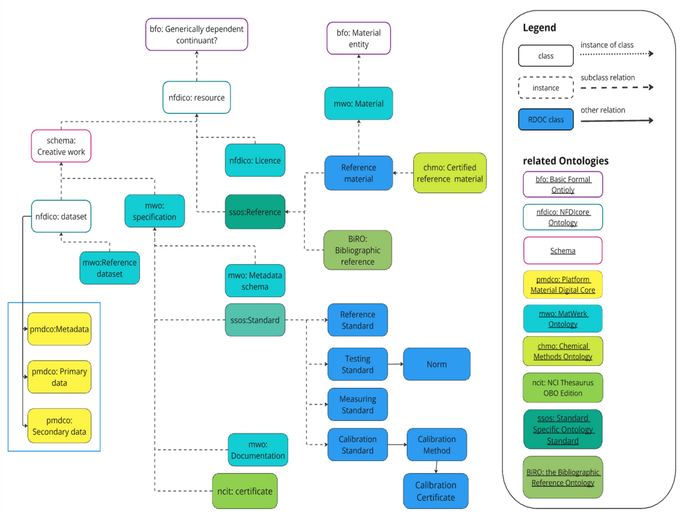


Schematic View of the Data Journey

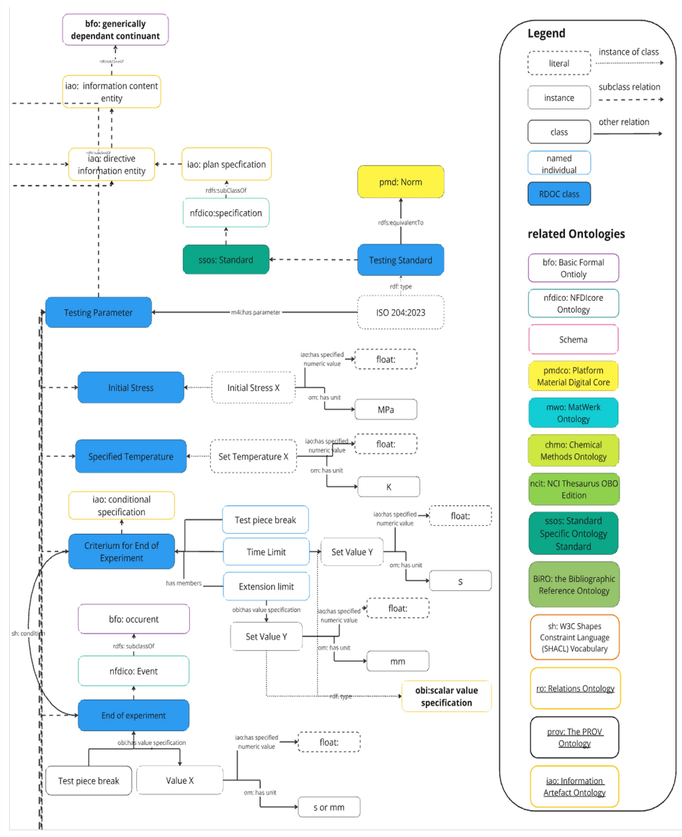


Ontology Development

Concepts for a universal Reference Dataset



Concepts for a Reference Dataset for Creep Testing



→ Instantiate ontology
→ Integrate into MSE-KG
→ Link to other resources in MSE community

Possible usages of reference data

- Calibration of measurement devices, procedures or algorithms
- Comparison of data for interpreting individual measurement results
- Input for machine learning-based data analytics and for computational materials science (digital twin)
- Best practice examples for measurement and documentation procedures

Visit our project here:

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