

# Technical & Semantic Interoperability aspects across EOSC

EOSC Federation Interoperability session

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# FAIR demands for Semantic Interoperability

Metadata should be machine-interpretable by making use of:

FAIR Principle I1 -> Knowledge representation languages  
and semantic artefacts:

FAIR Principle I2 -> FAIR vocabularies

FAIR Principle I3 -> Semantic models

Interoperability can be achieved via:

- ✓ convergence in the use of semantic artefacts
- ✓ crosswalks and mappings across semantic artefacts used

# Semantic Interoperability Reality Check

- Metadata often still use literals (keywords)
- When semantic terms are used, they vary considerably and are not sufficiently interoperable
- Semantic artefacts are often created within projects and not maintained
- Semantic artefacts are not easily created and understood by domain experts

# Semantics needs mature technologies

- Metadata editors that allow the ingestion of semantic concepts
- Services that enable the generation of FAIR mappings and crosswalks
- Services that support data experts in documenting their data
- AI that supports FAIRification

# Maturity level of... Communities

- Emerging communities – aim to be FAIR from beginning
- Mature communities – reluctant in implementing FAIR
- Mature FAIR Implementation Communities – invest in the implementation of FAIR Enabling Resources in their infrastructure
- EOSC requires mature workflows to help emerging and mature communities to become increasingly FAIR

# One example: I-ADOPT annotation service

- [RDA I-ADOPT Framework](#): transforms keywords into machine-interpretable descriptions of observational datasets and acts as a crosswalk between existing descriptions
- The [I-ADOPT Modelling Challenge](#) collected 326 implementations of the Framework (Sept-October 2024) to test and improve the interoperability of the model
- FAIR2Adapt will develop a customizable I-ADOPT annotation service based on LLMs trained with the challenge datasets (2025)
- This service will be open-source, embeddable in different EOSC relevant platforms like RO-Hub, semantic artefact catalogs (2026)