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I for Interoperability
From Technical to Legal Interoperability

Opening by Anne Sofie, DeIC

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The Hague, The Netherlands (Madurodam)
Celebrating the advancements in FAIR solutions for EOSC

Time	Presentation	Presenter/s and panel
16:40 - 16:55	***From the technical to the legal interoperability***	Javier de la Cueva, University of the Instituto de Empresa, FAIR EOSC Champion
16:55 - 17:10	***Semantic and technical interoperability - How FAIRCORE4EOSC components are supporting FAIR interoperability***	Esteban Gonzalez, UPM and Tommi Suominen, CSC
17:10 - 17:25	***Legal and organisational interoperability specifically - as well as interoperability within the whole EOSC Eco-system and beyond***	Olivier Rouchon, CNRS
17:25 - 18:00	***Panel session:*** ***LOST interoperability - from policy level to implementations***	Javier de la Cueva, University of the Instituto de Empresa, Olivier Rouchon, CNRS, Esteban Gonzalez, UPM, Tommi Suominen, CSC, Maxence Azzouz-Thuderoz, FIZ Karlsruhe Roksana Wilk, Academic Computer Centre CYFRONET AGH

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From the technical to the legal interoperability

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Back to the basics

Limits to information transmission

- Technical – Based on hindering accessibility.
- Economic – Based on money barriers.
- Legal – Based on legal requirements.

Information regulation

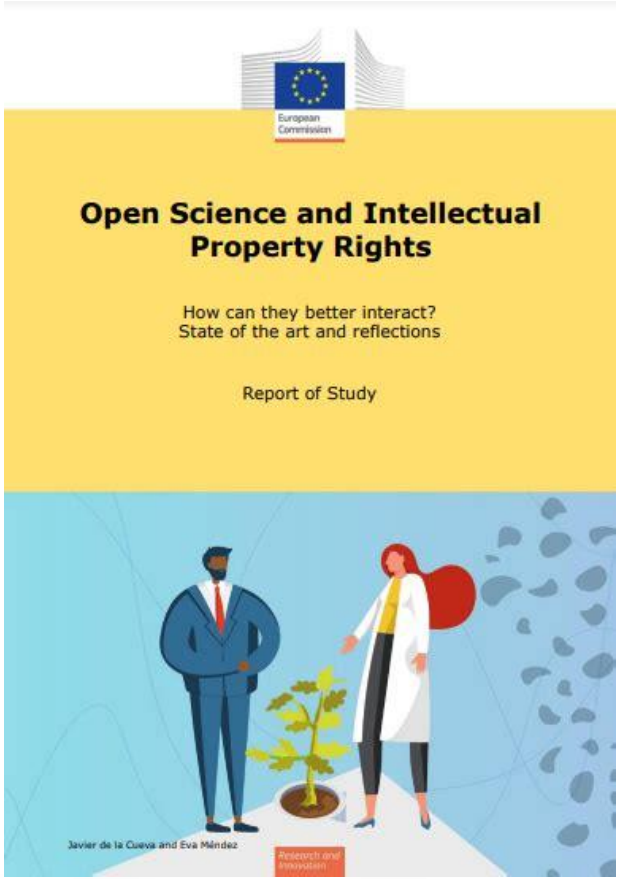
Two different main systems

- Everything is admissible, except…
  - Freedom of expression / Access to public information
- Everything is forbidden, except…
  - Intellectual property

Scientific information regulation

Main problem: science is under intellectual property regulations. Specifically copyright forbids the following activities upon a work.

- To copy
- To transform
- To distribute tangible copies
- To publicly communicate intangible copies



Solutions to the rescue

To use legally a work, the user needs to:

- Either obtain permission from the rightholders (in most cases, the author is NOT the rightholder)
- Either use an intellectual property exception
- Either use a work under public domain

Science is a stream of contributions

Thus, science needs

- **To check from upstream** the researcher receives permission, uses an intellectual property exception or use a work under public domain.
- **To guarantee downstream** the existence of the necessary permissions.

The challenge of interoperability

- **All technical issues: closed vocabularies, taxonomies, ontologies, plus:**
- **How to make machine actionable**
  - **The check from upstream**
  - **The downstream guarantee**
- **Multiple jurisdictions hermeneutics.**
  - **Does a commercial use of a work mean the same across all countries?**

Future? interoperability challenges

- There are legal norms written in formal languages (public sector interoperability).
- How would separation of powers be currently designed?
- Which organisation would be competent to establish a standard applicable to public sectors?
- Interoperability, thus, is not a legal issue, it is a political challenge. *Techné* as *politeia*.

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Semantic and technical interoperability - How FAIRCORE4EOSC components are supporting FAIR interoperability

Esteban Gonzalez, UPM

Tommi Suominen, CSC

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Strategic Research and Innovation Agenda (SRIA) of the European Open Science Cloud (EOSC)

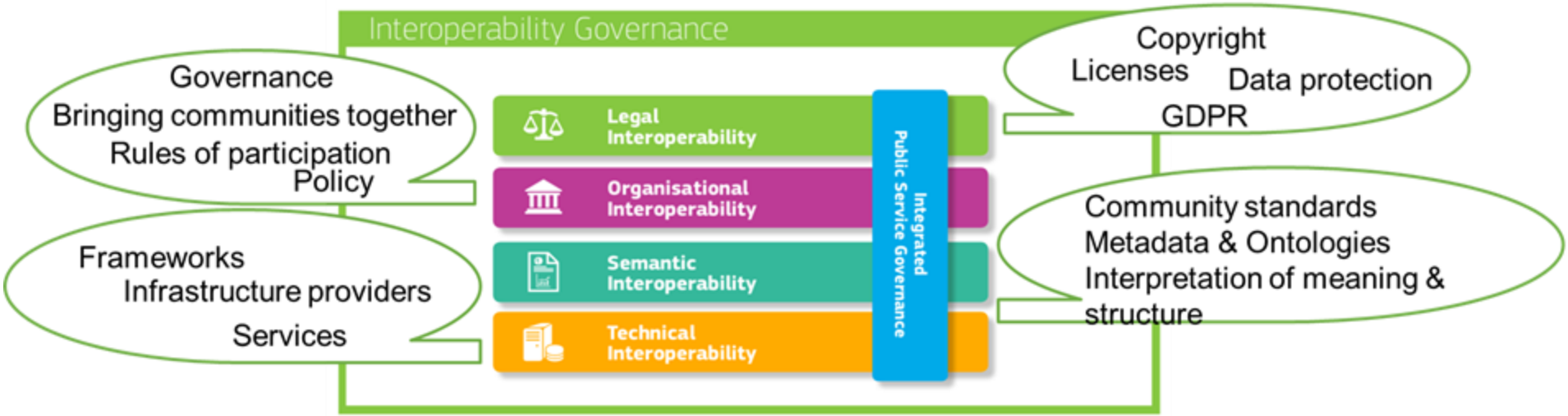
Achieving a good level of **technical, semantic, organisational and legal interoperability within EOSC** is essential **to federate services** and provide added value for users, **across disciplines**, countries and sectors.

Source: European Commission: Directorate-General for Research and Innovation, *Strategic Research and Innovation Agenda (SRIA) of the European Open Science Cloud (EOSC)*, Publications Office of the European Union, 2022, **https://data.europa.eu/doi/10.2777/935288**

What is the EOSC IF

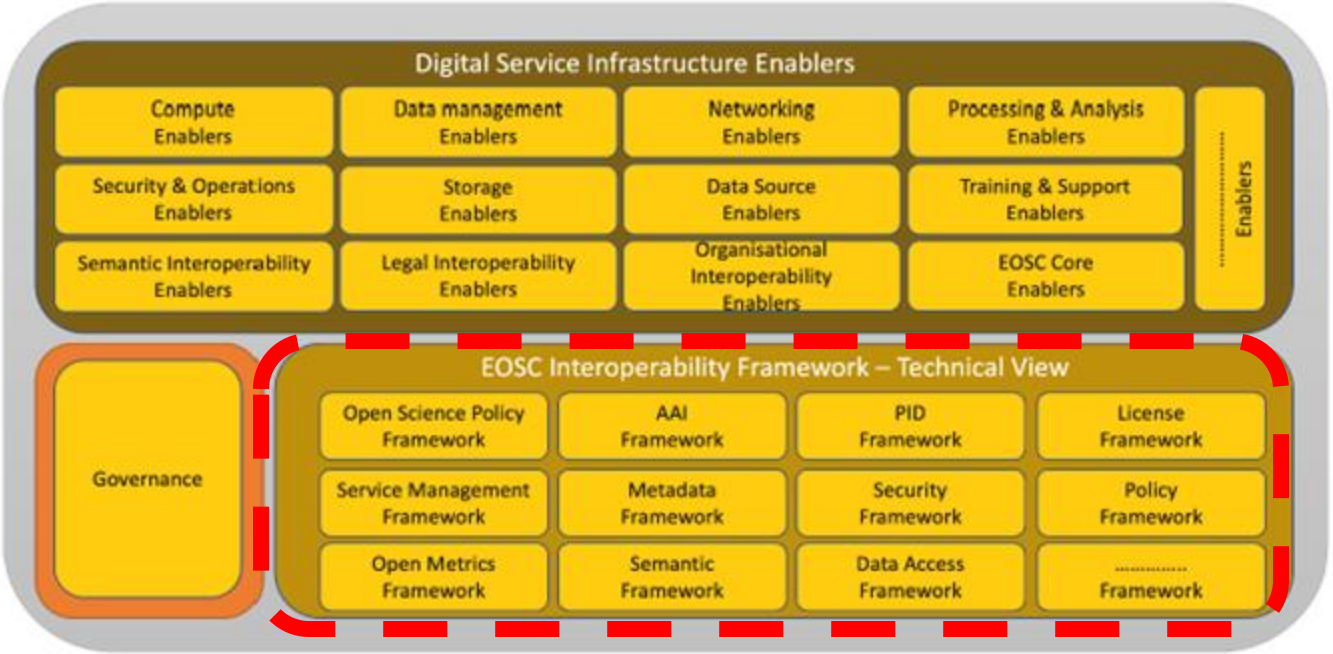
The EOSC Interoperability Framework is a set of policies and guidelines that enable **interoperability of resources and services**, and will facilitate **service composability**.

EOSC IF layers

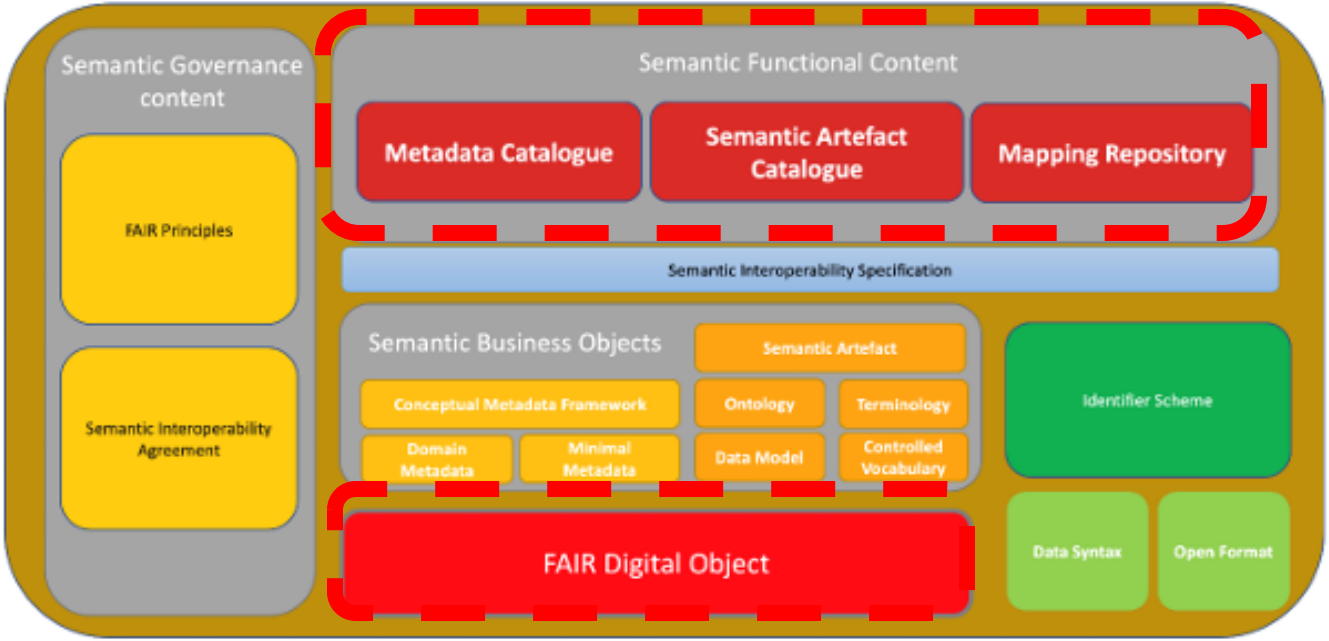


The European Interoperability Framework four levels of interoperability

Technical view



Semantic view



Problems

In 2021, the EOSC IF identified a list of problems related to interoperability

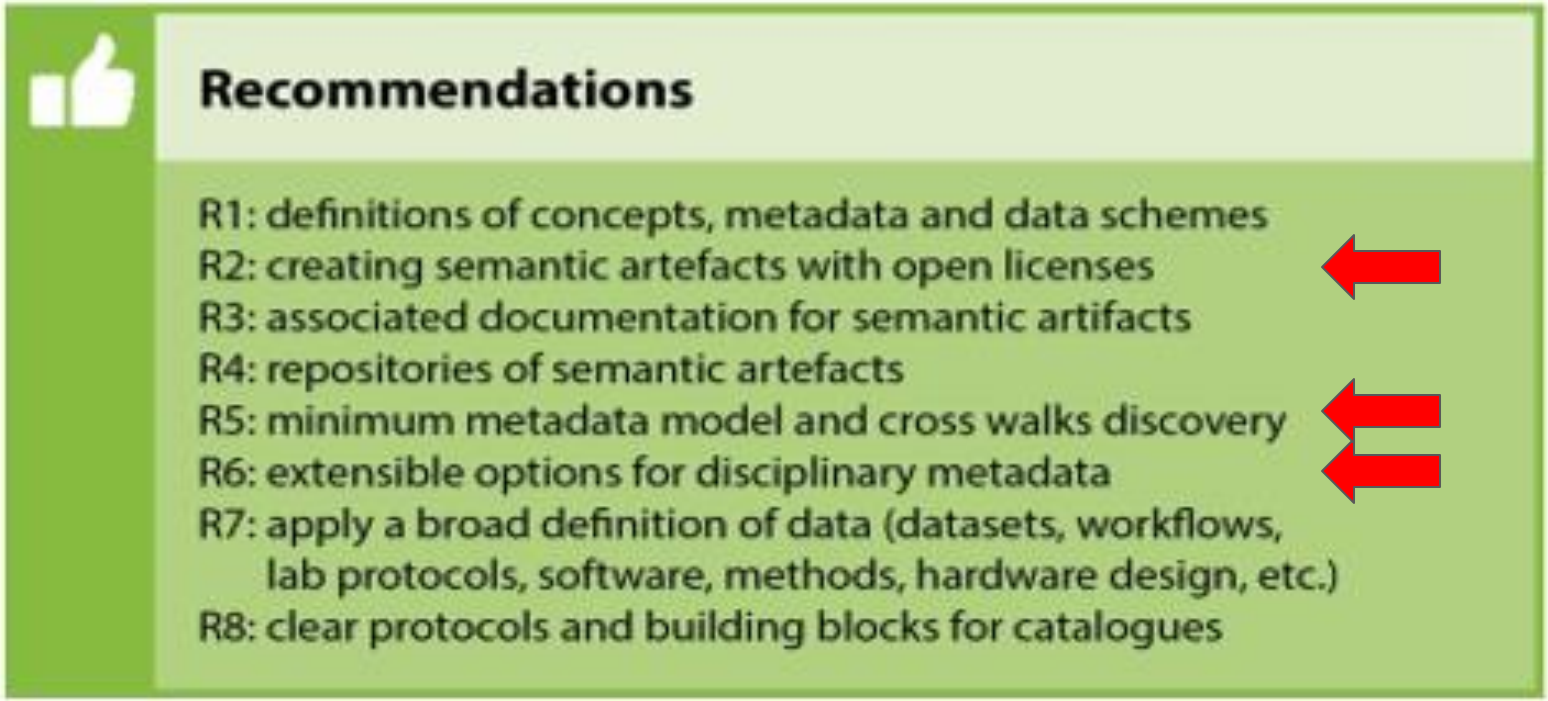
TECHNICAL INTEROPERABILITY

- Authentication systems for each community
- Research data is often provided in diverse formats and community based models making **cross-community dataset reuse challenging**.
- Different levels of granularity in research data
- Variety of PIDs types and policies

SEMANTIC INTEROPERABILITY

- Lack of common explicit definitions about the terms
- Lack of **common semantic artefacts across communities**.
- Poorly documentation. Besides, there is no common metadata schema across communities
- Lack of **expertise and skills related to semantics**

Recommendations



Cross domain recommendations

- The EOSC IF should embed a **library of Interoperability Guidelines**(EOSC IGs) to promote the branding and adoption of standards and common best practices in EOSC. he EOSC Interoperability Guidelines **should be recorded in a curated EOSC IF registry/repository**.
- Identify and consolidate different approaches to representing and exchanging (meta)data with the **FAIR Digital Object model** described in the EOSC-IF.
- Maintenance, sustainability, and governance of semantic artefacts deserve attention and **agreement across disciplinary communities**.
- More cross-disciplinary work is needed to **align semantic artefacts** with the same terms or concepts.

Example of components - Semantic Artefact Catalog

AgroPortal an ontology repository for agri-food

http://agroportal.lirmm.fr

- Publish, search, download
- Browse, visualize
- Peer review
- Versioning
- Annotation
- Recommendation
- Mapping
- Notes
- Projects

- 195 semantic artefacts, 200 candidates
- 467 registered users

C. Jonquet, A. Toulet, {...} P. Larmande. **AgroPortal: an ontology repository for agronomy**, *Computers and Electronics in Agriculture*. Jan 2018. 144, pp.126-143. Elsevier.

Example of components - Interoperability Compliance

Description:

The FAIRCORE4EOSC Compliance Assessment Toolkit (CAT) will assist actors in the PID ecosystem with assessment of their compliance with policy. The toolkit is by design capable of accommodating a wide variety of compliance assessment use cases but will initially focus on PID compliance only.

Objectives:

1. Allow consistent and unambiguous encoding of assessment principles, objectives, criteria, metrics and tests using a vocabulary developed for the toolkit
2. Enable the recording of Interoperability policy compliance for a range of important actors in the ecosystem. Some assessments are made by the administrators of the CAT on behalf of the community, while the majority of service providers and managers will be able to conduct self-assessments.

Example of components - Mappings

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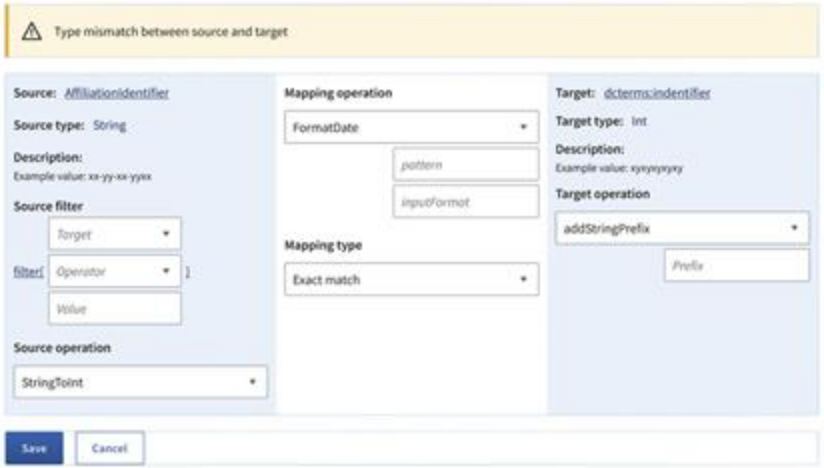
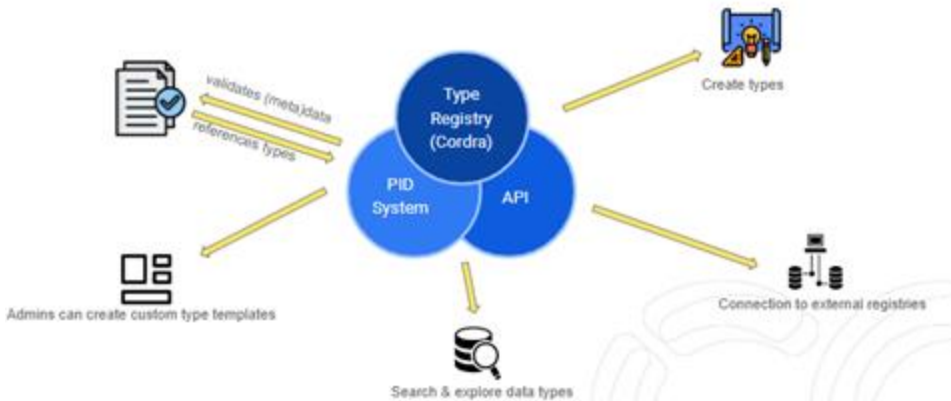
MSCR - Metadata Schema and Crosswalk Registry



DTR - Data Type Registry



Source: Kesäniemi, J. (2024, mayo 14). MSCR - Metadata Schema and Crosswalk Registry. SYMPOSIUM "CROSS-CUTTING RESEARCH SUPPORT SERVICES", Vienna, Austria. Zenodo. https://doi.org/10.5281/zenodo.11192310

Source: Lienhop, H. (2024, mayo 14). DTR - EOSC Data Type Registry. SYMPOSIUM "CROSS-CUTTING RESEARCH SUPPORT SERVICES", Vienna, Austria. Zenodo. https://doi.org/10.5281/zenodo.11192343

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Task 6.2
Legal and organisational interoperability

Thursday 20 February 2025

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Definitions

Organisational interoperability:
refers to the way in which organisations align their business processes, responsibilities and expectations to achieve commonly agreed and mutually beneficial goals.*

Legal interoperability:
is about ensuring that organisations operating under different legal frameworks, policies and strategies are able to work together.*

*European Commission: Directorate-General for Research and Innovation, Corcho, O., Eriksson, M., Kurowski, K., Ojsteršek, M. et al., *EOSC interoperability framework – Report from the EOSC Executive Board Working Groups FAIR and Architecture*, Publications Office, 2021, https://data.europa.eu/doi/10.2777/620649

The challenges of legal interoperability

- Licensing and Permissions
  - Licensing terms and conditions of the datasets?
  - Clear permissions for sharing, modification, and commercial use?
- Data Protection and Privacy
  - Personal or sensitive data?
- Data Sharing Agreements
  - Established among the data providers?
- Intellectual Property Rights
  - Impact on the use, distribution, and modification of the combined datasets?

D6.2: Core metadata schema for legal interoperability

Based on:

- **Desk research:** Turning FAIR into reality, Legal interoperability and the FAIR Data Principles, EOSC Interoperability Framework, etc.
- **3 use cases**: BY-COVID - EMBL ; SIKT-ESS, RELIANCE - UPM ; UKDS - CESSDA.
- **11 different schemas/controlled vocabularies evaluated** (Rioxx, Ro-Crate, OpenAIRE, etc.)

Main recommendations:

1. **Adopt the DCAT Metadata Schema**:
   - Provides a standardised way to describe datasets which machine-readable
   - Enhances interoperability between data catalogues, portals, and repositories.
   - Offers a rich and extensible set of properties for detailed dataset descriptions.
   - Widely adopted by various communities with numerous application profiles.
   - Integrates other well-known standards like DublinCore, and is already mapped to others such as Datacite, ADMS, and schema.org.
2. **Use Controlled Vocabularies**:
   - Employ recognised vocabularies for metadata elements, such as Access Rights AT, ODRL, DPV, and Licence AT, to ensure consistency and precision.

Rouchon, O., Kraaikamp, E., Gonzalez, E., Fink Kjeldgaard, A. S., Pedersen Tenderup, N., Davidson, J., Hodson, S., Rettberg, N., & Scharnhorst, A. (2024). D6.2 - Core metadata schema for legal interoperability (Version v1). Zenodo. https://doi.org/10.5281/zenodo.11104269

D6.3: MoU and SLA templates for data interoperability

Based on:

- **Desk research:** Turning FAIR into reality, Legal interoperability and the FAIR Data Principles, EOSC Interoperability Framework, etc.
- **Test on 8 organisations specialised in research data management**
- **Study of recommendations on data interoperability**

Main recommendations:

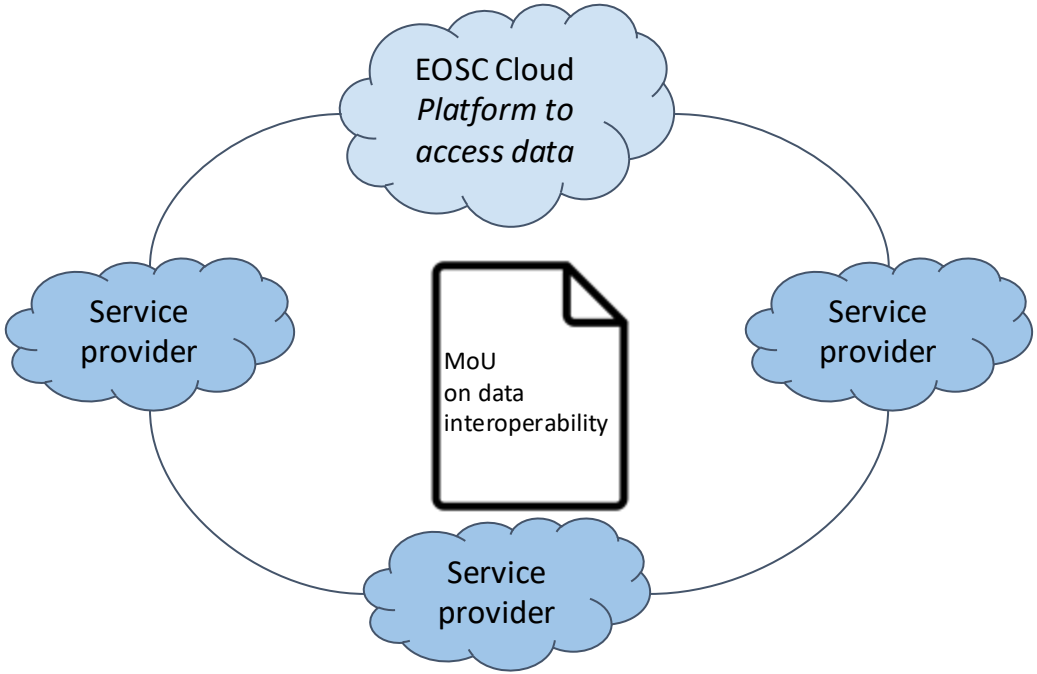
1. **MoU and SLA should not be used interchangeably –** They serve different purposes
2. **Data interoperability as a technical standard** – In the EOSC context, there is no single, comprehensive guidebook that consolidates all aspects of data interoperability into a unified framework. Instead, multiple initiatives and guidelines exist.
3. **Guidelines for MoU and SLA development –** Stakeholders need tailored guidance to develop MoUs and SLAs that fit their specific needs and contexts.
4. **MoU and SLA as key organisational interoperability tools** – By addressing different aspects of collaboration, these agreements enable organisations to work together effectively across diverse business environments.

LANDEL, S., Kraaikamp, E., Thorpe, D. E., Ashley, K., Davidson, J., Jasinska, A., Boerman, S., Caminha Juaçaba Neto, R., & Gonzalez, E. (2025). FAIR-IMPACT - D6.3 - MoU and SLA templates for data interoperaility (V1.0). Zenodo. https://doi.org/10.5281/zenodo.14770711

D6.3: distinction between MoU and SLA

Aspect	SLA (Service Level Agreement)	MoU (Memorandum of Understanding)
Purpose	Defines specific services, expected levels, and metrics	Outlines terms and details of a mutual understanding or partnership
Legal Binding	Legally binding	Generally not legally binding
Usage	Common in IT services, telecommunications, outsourcing	Used in international agreements, partnerships, collaborations
Example Scenarios	IT company providing cloud storage	Universities collaborating on a research project

Data interoperability: MoU as a tool to align standards



An MoU is typically a non-binding agreement **between two or more parties** that outlines the terms and details of "mutual understanding" or "cooperation".

⇒ MoU could be used to align standards on data interoperability

It represents a non binding agreement which detail how multiple stakeholders will work on a specific topic.

SLA: clarifies business processes

- SLA describes how a **service will be delivered.**
- In a multi-actor context such as EOSC, which integrates different sources of services, proposing such an agreement **enhances organisational interoperability.**
- Encouraging providers to **clarify how they operate.**

SLA Standard structure

1. General information about the parties
2. Scope & description of the Service
3. Service hours & exceptions
4. Service components & dependencies
5. Support
   - 5.1 Incident handling
   - 5.2Fulfilment of service requests
1. Service level targets
2. Limitations & constraints
3. Communication, reporting and escalations
   - 8.1 General communication
   - 8.2 Regular reporting
   - 8.3 SLA volations
   - 8.4 Escalation & complaints
1. Information security & data protection
2. Additional responsibilities of the service provider
3. User responsibilities
4. Review
5. Glossary of terms
6. Document control

D6.3 Kit for users

- **40 recommendations** for service providers to implement data interoperability

- 1 set of **guidelines** for developing an SLA
- 1 set of **guidelines** for developing an MoU

- **Analysing contexts** in which they can be used appropriately.

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Task 6.3 Interoperability within the EOSC ecosystem

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2016

FAIR Principles

2017

European Interoperability Framework
47 recommendations

2018

Turning FAIR into reality
15 recommendations

2020

Legal Interoperability & The FAIR Principles
31 recommendations

2021

EOSC Interoperability Framework
27 recommendations

DATA SPACES SUPPORT CENTRE

RDA

EOSC Architecture & Interoperability Framework

2023

DSSC Blueprint
11 Interoperability recommendations

2023

2023

Landscape Overview of the EOSC IF
9 recommendations

2024

Cross-Domain Interoperability Framework

2022

FAIR Digital Object Framework

2023

Global Open Research Commons International Model
21 Interoperability attributes

D6.4: Cross-domain recommendations & feedback for the EOSC IF

Based on:

- **Desk research:** Turning FAIR into reality, Legal interoperability and the FAIR Data Principles, EOSC Interoperability Framework, other existing interoperability Framworks, etc.
- **Collaboration with EOSC Interoperability TF, Data Spaces SC**
- **4 workshops:** RDA P23, EOSC WS, etc.

Main recommendations:

1. **Deploy a repository/catalog of interoperability profiles and guidelines organized into structured categories reflecting communities**

1. **Develop mapping registries describing cross-walks between the profiles**.

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Panel session: LOST - Legal, Organisational, Semantic and Technical - Interoperability - from policy level to implementations

Chaired by: Anne Sofie, DeIC

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Panel Question 1

In your opinion at which layer of the interoperability stack, Legal, Organisational, Semantic and Technical, are the biggest challenges to solve?

- **Legal**
- **Organisational**
- **Semantic**
- **Technical**

Panel Question 2

What might be the approach to achieve a working interoperability framework in a vast and heterogeneous environment which is EOSC?

Please name 2 top priorities in your opinion for a working interoperability framework?

Any Questions? Submit them on Mentimeter!

Join at menti.com!

Use code 6927 7068

Panel Question 3

How do we ensure uptake of the EOSC IF e.g. as for the FAIRCORE4EOSC components and it does not become a paper exercise?

Panel Question 4

LOST Interoperability

- from your perspective what's the dream scenario for getting the I in FAIR come to live?

Additional questions

Question A:
What is the future of the EOSC IF?
How can we incorporate existing solutions from other Interoperability Frameworks?

Question B:

In your opinion. what are the non-negotiable requirements that have to be followed to implement the interoperability in EOSC?


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