The EOSC Interoperability Framework

Interoperability taskforce

FAIR WG & Architecture WG

Oscar Corcho (Universidad Politécnica de Madrid)

Credits:

- Core EOSC IF team: Magnus Eriksson, Krzysztof Kurowski, Milan Ojsteršek, Christine Choirat, Mark van de Sanden, Frederik Coppens

- Legal interoperability team: Ohad Graber-Soudry, Timo Minssen, Daniel Nilsson, Marcelo Corrales, Jakob Wested, Bénédicte Illien

Riding the Next Wave of Research Data

7th June 2021

EOSC Working groups (2019-2020)

- **Landscape**: Mapping of the existing research infrastructures which are candidates to be part of the EOSC federation;
- **FAIR**: Implementing the FAIR data principles by defining the corresponding requirements for the development of EOSC services, in order to foster cross-disciplinary interoperability;
- **Architecture**: Defining the technical framework required to enable and sustain an evolving EOSC federation of systems;
- **Rules of participation**: Designing the Rules of Participation that shall define the rights, obligations governing EOSC transactions between EOSC users, providers and operators;
- **Skills and Training:** Providing a framework for a sustainable training infrastructure to support EOSC in all its phases and ensure its uptake;
- **Sustainability**: Providing a set of recommendations concerning the implementation of an operational, scalable and sustainable EOSC federation after 2020.

Task forces:
- **FAIR Practice**
- **Interoperability**
- **Metrics and certification**
- **PIDs**

https://www.eoscsecretariat.eu/eosc-working-groups
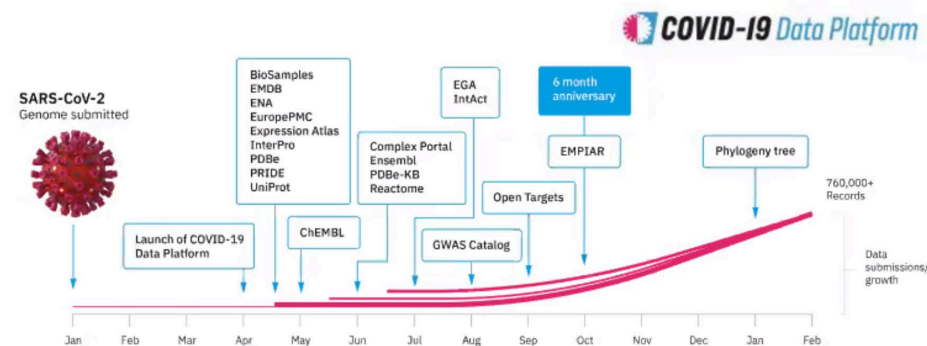
What is interoperability? And in EOSC?

★ **Interoperability** - a characteristic of an **IT system**, whose **interfaces** are completely understood, to work with **other IT systems**, at present or in the future, in either implementation or access, without any restrictions or with a controlled access [Source: Wikipedia]

★ **Interoperability** is focused on making sure that the **data can be int** and can be **used with applications** the fol

Data P

I1. (Met represe

I2. (Met vocabularies that follow FAIR principles

I3. (Meta)data include qualified references to other (meta)data

"Data" should be understood in a very general manner (also software, workflows, notebooks, publications, etc.)

As interoperable as possible (technically, semantically, legally...)

Interoperability at the COVID-19 Data Portal

From Rolf Apweiler's presentation today

Why do we need an EOSC Interoperability Framework?

Why? Successful, effective, homogeneous and sustainable "data" sharing inside and across research communities
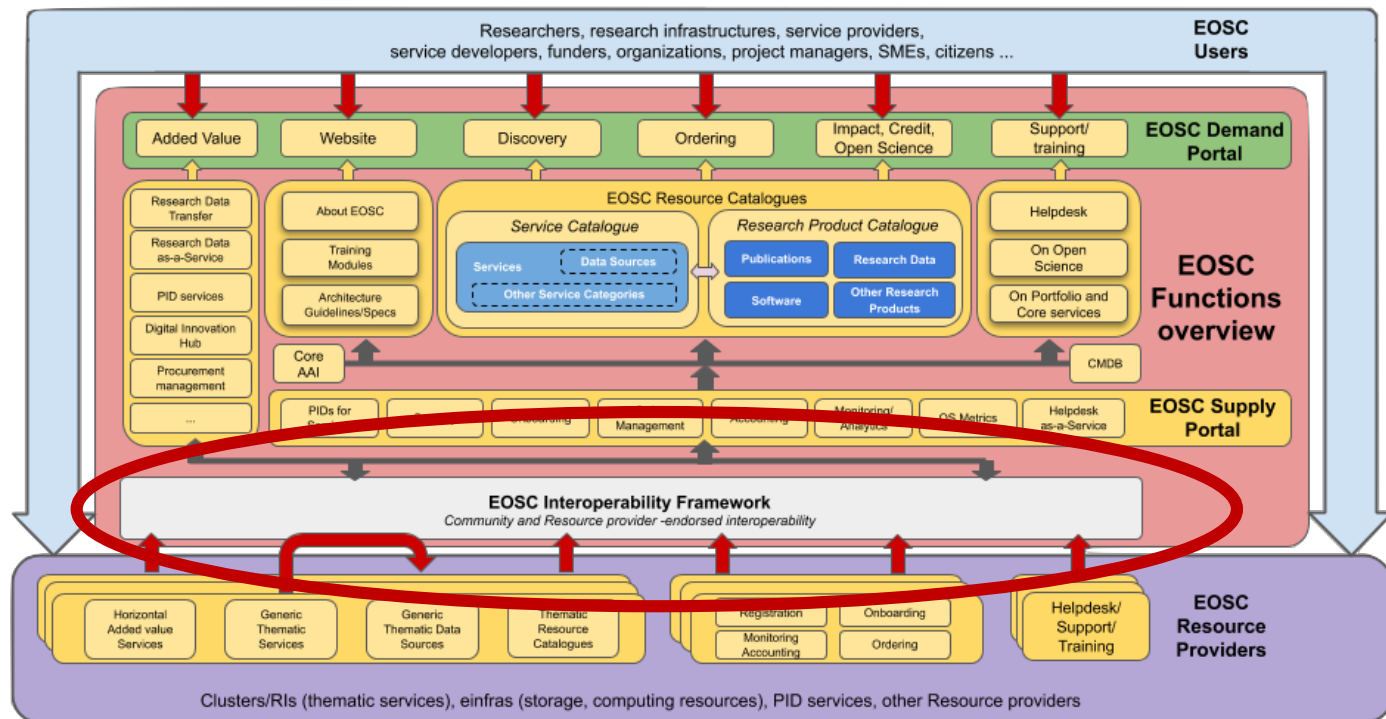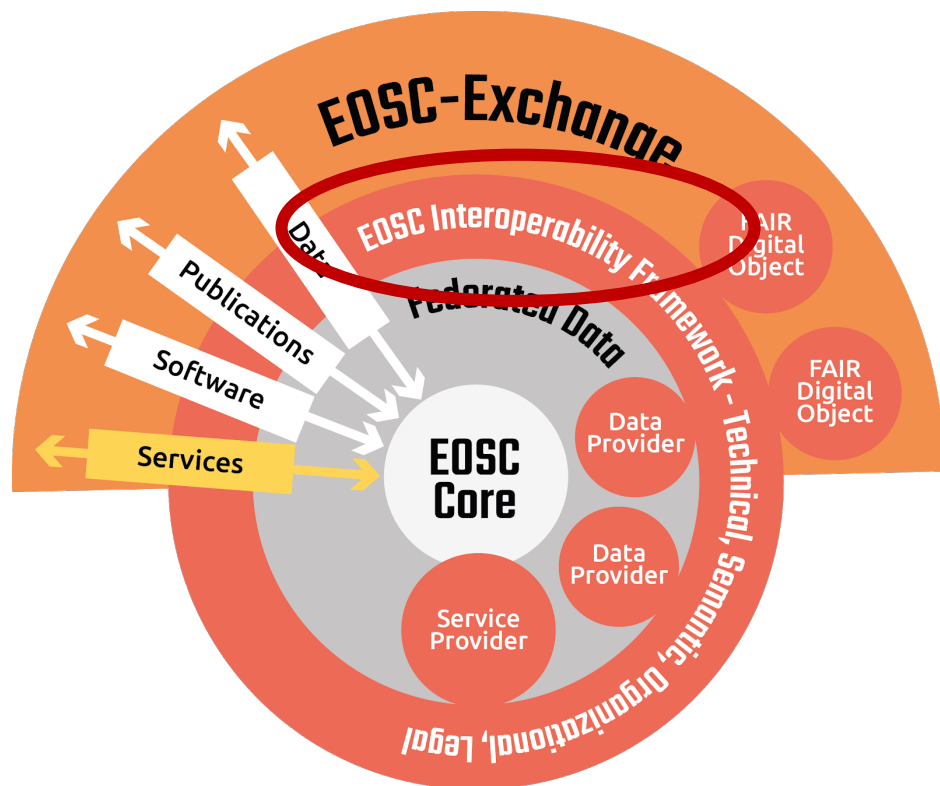
Minimum Viable EOSC

Roadmap of activities

Investigate & Questionnaire

Evaluate & report on tech practice and standards

Legal & semantic interoperability

EOSC Interoperability Framework
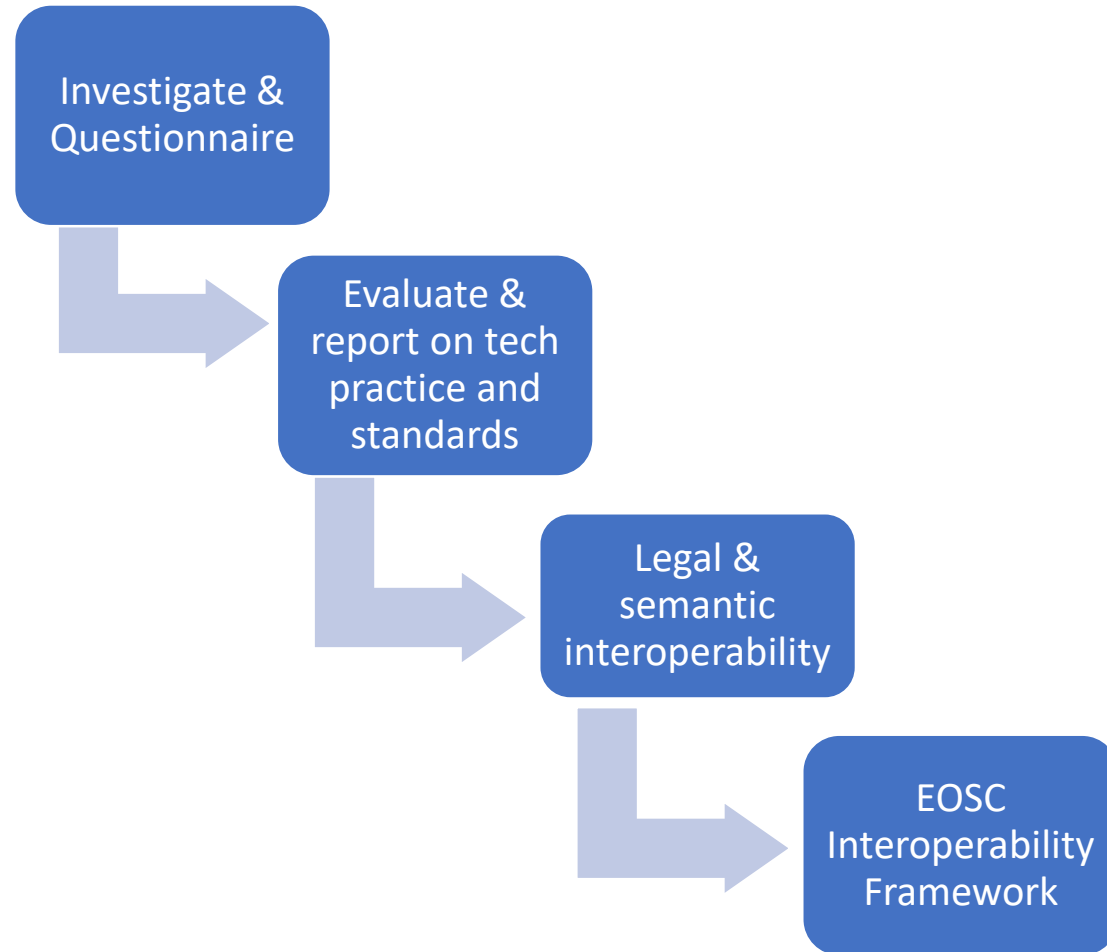
Four main steps

- **Investigate** interoperability practices across disciplines and scientific communities

- **Evaluate** and create an internal report on practice and **technical** interoperability
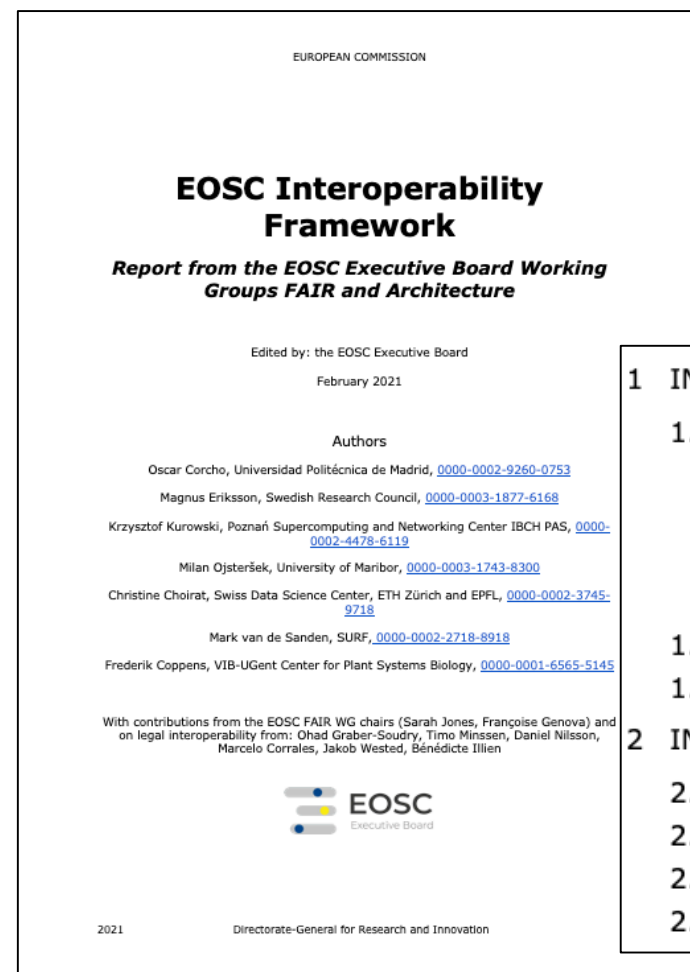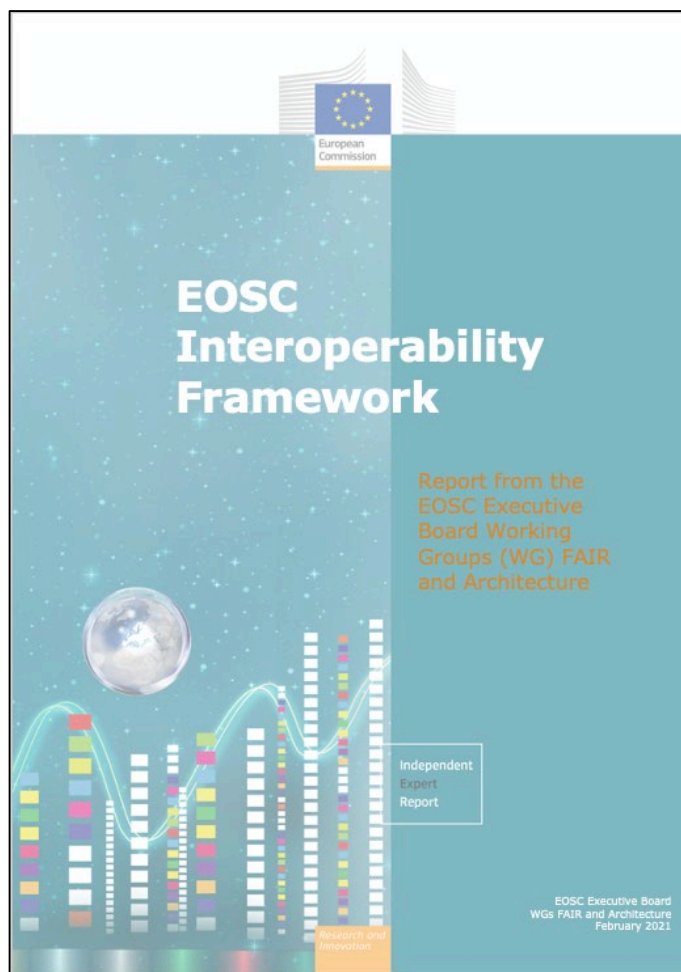
- Investigate **semantic** and **legal** interoperability further

- **Collaborate** with FAIR Architecture WG to release EOSC Interoperability Framework

EOSC Interoperability Framework (Feb 2021)

https://op.europa.eu/s/oZnu

EUROPEAN COMMISSION

EOSC Interoperability Framework

Report from the EOSC Executive Board Working Groups FAIR and Architecture

Edited by: the EOSC Executive Board

February 2021

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With contributions from the EOSC FAIR WG chairs (Sarah Jones, Françoise Genova) and on legal interoperability from: Ohad Graber-Soudry, Timo Minssen, Daniel Nilsson, Marcelo Corrales, Jakob Wested, Bénédicte Illien

EOSC Executive Board

2021   Directorate-General for Research and Innovation

EOSC Executive Board
WGs FAIR and Architecture
February 2021

Layers of interoperability

Governance
Bringing communities together
Rules of participation
Policy

Copyright
Licenses
Data protection
GDPR

Frameworks
Infrastructure providers
Services

Community standards
Metadata & Ontologies
Interpretation of meaning & structure

Interoperability Governance

Legal
Interoperability

Organisational
Interoperability

Semantic
Interoperability

Technical
Interoperability

Integrated
Public Service Governance

The European Interoperability Framework four levels of interoperability

Problems, needs and recommendations

Recommendations (I)

Technical	- Open Specifications for EOSC Services. - A common security and privacy framework (including Authorisation and Authentication Infrastructure). - Easy-to-understand Service-Level Agreements for all EOSC resource providers. - Easy access to data sources available in different formats. - Coarse-grained and fine-grained dataset (and other research object) search tools. - A clear EOSC PID policy.
Semantic	- Clear and precise, publicly-available definitions for all concepts, metadata and data schemas. - Semantic artefacts preferably with open licenses. - Associated documentation for semantic artefacts. - Repositories of semantic artefacts, rules with a clear governance framework. - A minimum metadata model (and crosswalks) to ease discovery over existing federated research data and metadata. - Extensibility options to allow for disciplinary metadata. - Clear protocols and building blocks for the federation/harvesting of semantic artefacts catalogues.

Recommendations (II)

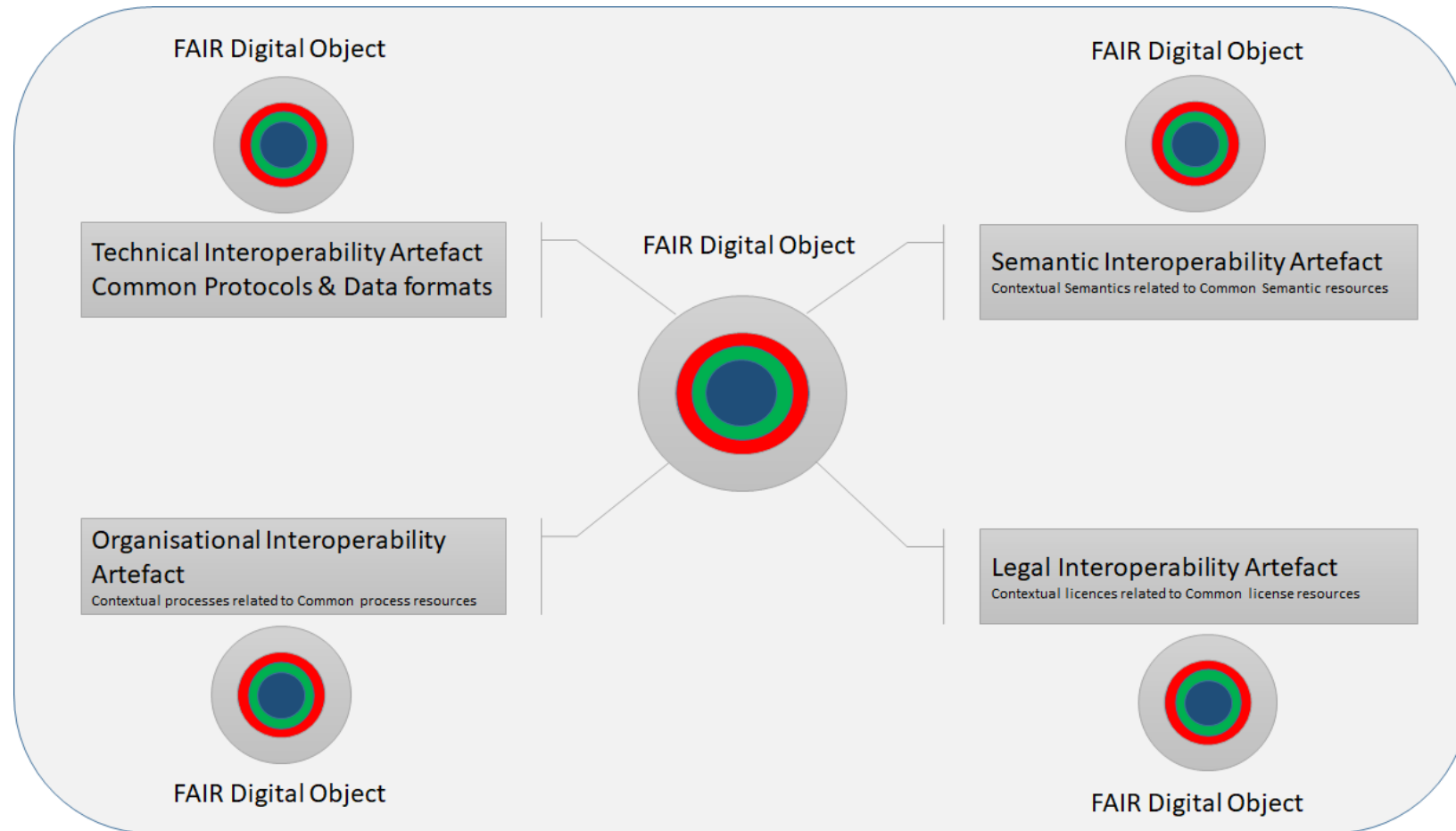|	
Organisational	- Interoperability-focused rules of participation recommendations. - Usage recommendations of standardised data formats and/or vocabularies, and with their corresponding metadata. - A clear management of permanent organisation names and functions.
Legal	- Standardised human and machine-readable licenses, with a centralised source of knowledge and support on copyright and licenses. - Permissive licenses for metadata (and preferably for data, whenever possible). And CC0 preferred over CC BY 4.0. - Identification of different parts of a dataset with different licenses. - Clearly marked instances of expired or inexistent copyright, as well as for orphan data. - A clear list of EOSC-recommended licenses and their compatibility with Member States' recommended licenses. - Tracking of license evolution over time for datasets. - Harmonised policy and guidance to dealing with cases where patent filing or trade secrets may be compromised by disclosure. - GDPR-compliance for personal data. - Additional restrictions on access and use of data only applied in cases of applicable legislation or legitimate reasons. - Harmonised terms of use across repositories - Alignment between Member States national legislations and EOSC.

Towards the EOSC IF

And two accompanying sets of materials:

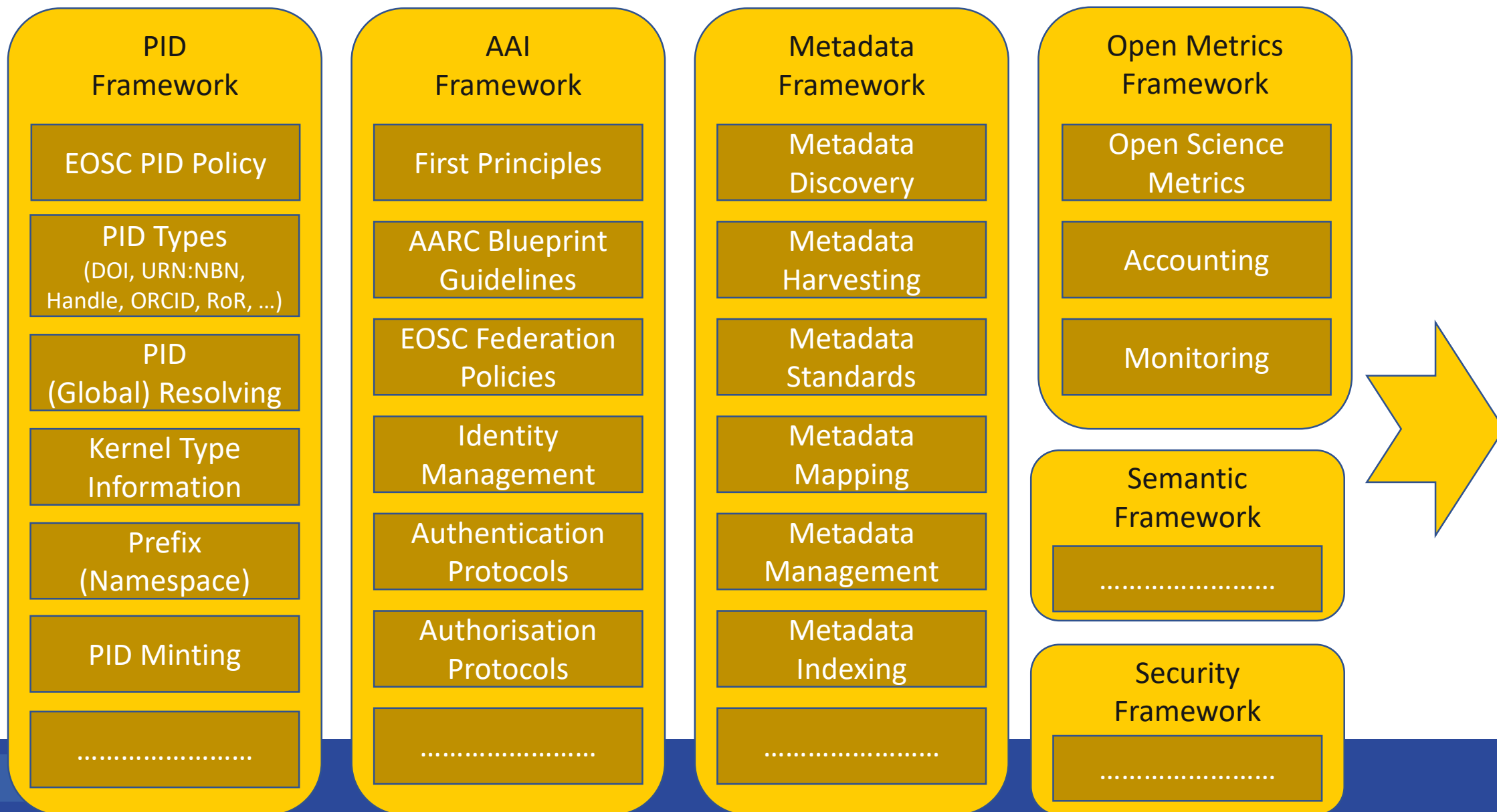- Eriksson, van de Sanden, Kurowski, Coppens, Corcho, Ojsteršek, & Choirat. (2021). EOSC Interoperability Framework Reference Architecture (Version 1.0). Zenodo. http://doi.org/10.5281/zenodo.4420096
- Ojsteršek. (2021). Crosswalk of most used metadata schemes and guidelines for metadata interoperability (Version 1.0) [Data set]. Zenodo. http://doi.org/10.5281/zenodo.4420116

FAIR Digital Objects (and their metadata)

EOSC Interoperability Framework

PID Framework
- EOSC PID Policy
- PID Types (DOI, URN:NBN, Handle, ORCID, RoR, …)
- PID (Global) Resolving
- Kernel Type Information
- Prefix (Namespace)
- PID Minting
- ………………

AAI Framework
- First Principles
- AARC Blueprint Guidelines
- EOSC Federation Policies
- Identity Management
- Authentication Protocols
- Authorisation Protocols
- ………………

Metadata Framework
- Metadata Discovery
- Metadata Harvesting
- Metadata Standards
- Metadata Mapping
- Metadata Management
- Metadata Indexing
- ………………

Open Metrics Framework
- Open Science Metrics
- Accounting
- Monitoring

Semantic Framework
- ………………

Security Framework
- ………………

How to proceed after FAIR WG Interoperability taskforce output

- **Establishing governance structure and maintenance of the framework (technical and semantics)**

- **Learn from best practices on interoperability (e.g., COVID-19 Data portal)**

- **Detailed specification and deployment of architectural building blocks (based on best practices)**

Recommendations

Photo by Mantas Hesthaven on Unsplash

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