Interoperability challenges in Europe

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CHORUS FORUM: MAKING FAIR’S INTEROPERABILITY AND REUSABILITY DATA GOALS POSSIBLE
17 June 2022
Ensure healthy lives and promote well-being for all at all ages
- Findable
- Accessible
- Interoperable
- Reusable
FAIR data in European repositories

Figure A. The distribution of FAIR scores in the sample (n = 7827).

Q5.3 How familiar are you with the FAIR principles in relation to managing and sharing data?
### Barriers

<table>
<thead>
<tr>
<th>Category</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of data repositories</td>
<td>32%</td>
<td>33%</td>
<td>17%</td>
<td>18%</td>
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<tr>
<td>Commercial use</td>
<td>31%</td>
<td>33%</td>
<td>23%</td>
<td>13%</td>
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<tr>
<td>Misinterpretation/ falsification risk</td>
<td>27%</td>
<td>36%</td>
<td>26%</td>
<td>11%</td>
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<tr>
<td>Lack of recognition</td>
<td>15%</td>
<td>37%</td>
<td>34%</td>
<td>14%</td>
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<tr>
<td>Time and effort</td>
<td>10%</td>
<td>39%</td>
<td>43%</td>
<td>7%</td>
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<tr>
<td>Skills needed</td>
<td>16%</td>
<td>44%</td>
<td>31%</td>
<td>8%</td>
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<tr>
<td>Financial costs</td>
<td>16%</td>
<td>35%</td>
<td>38%</td>
<td>11%</td>
<td></td>
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</tr>
<tr>
<td>Legal restrictions</td>
<td>13%</td>
<td>37%</td>
<td>40%</td>
<td>10%</td>
<td></td>
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<tr>
<td>Data protection</td>
<td>11%</td>
<td>41%</td>
<td>39%</td>
<td>9%</td>
<td></td>
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</table>

*Adapted from Simons, Natasha; Goodey, Greg; Hardeman, Megan; Clare, Connie; Gonzales, Sara; et al. (2021): The State of Open Data 2021. Digital Science. Report.*

https://doi.org/10.6084/m9.figshare.17061347.v1
EOSC will be a multi-disciplinary environment where researchers can publish, find and re-use data, tools and services, enabling them to better conduct their work.

EOSC builds on existing infrastructure and services supported by the EC, Member States and research communities.

EOSC will improve the situation for researchers in many ways, namely:

- Seamless access to content and services via common AAI,
- Access to data from various sources which is FAIR and ideally open,
- Access to services for storage, computation, analysis, preservation and more,
- Adoption of standards so data and services can be combined,
- Helpdesk, training and support to improve use of EOSC.

https://eosc.eu/
The image contains a diagram illustrating the Tripartite Governance structure involving the European Commission, EU MS (Steering Board), and EOSC Association. The diagram highlights the following key points:

- **Implementation of EOSC**
  - PID policy and implementation
  - Researcher engagement and adoption
  - Rules of Participation (RoP) compliance monitoring
- **Metadata and data quality**
  - FAIR metrics and data quality
  - Semantic interoperability
- **Research careers and curricula**
  - Data stewardship curricula and career paths
  - Research careers, recognition and credit
  - Upskilling countries to engage in EOSC
- **Technical challenges on EOSC**
  - AAI Architecture
  - Infrastructures for quality research software
  - Technical interoperability of data and services
- **Sustaining EOSC**
  - Financial Sustainability
  - Long-term data preservation

The text also includes URLs:

- [https://eosc.eu/](https://eosc.eu/)
Technical layer
- 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 layer
- 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.

Organisational layer
- 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 layer
- 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.

FAIR-IMPACT in a nutshell
Expanding FAIR Solutions across Europe

Call HORIZON-INFRA-2021-EO
OSC-01-05

Enabling discovery and interoperability of federated research objects across scientific communities

Expanding FAIR solutions in Europe
Partly following up on FAIRsFAIR

EU funded project
Coordination and Support Action
10 million euro
36 months, starting 1 June 2022

28 partners and affiliate entities
From 10 EU member states: NL, FI, FR, DK, IT, DE, ES, NO, BE, RO and the UK

Twitter: fairimpact_eu
Linkedin page: https://www.linkedin.com/company/fair-impact-eu-project/
FAIR-IMPACT overall objective

WHAT:
To realise a FAIR EOSC by supporting the implementation of FAIR-enabling practices across scientific communities and research outputs at a European, national, and institutional level;

HOW:
• identifying current and emerging components for enabling FAIR (practices, policies, tools & technical specifications);
• translating viable solutions, guidelines and frameworks that have been developed for one domain or research output and supporting their application in others;
• taking the next step in implementation by defining the support, governance, and coordination mechanisms required to ensure the continuous function of FAIR-enabling practices in the EOSC.
FAIR-IMPACT Work Packages
<table>
<thead>
<tr>
<th>Table 1.1: WP objectives matched against the overall expected outcomes</th>
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<tbody>
<tr>
<td><strong>Outcome 1: Improved FAIRness of data and other research outputs by coordinating the implementation of frameworks and the alignment of FAIR data practices.</strong></td>
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<tr>
<td><strong>Objectives WP3: Persistent identifiers</strong></td>
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<td>• coordination mechanism for EOSC PID service providers;</td>
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<td>• meeting end user needs in the development of the EOSC PID landscape and solutions;</td>
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<td>• alignment of PID infrastructures with EOSC policy and architecture;</td>
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<td>• support instruments for facilitating uptake.</td>
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<td><strong>Objectives WP4: Metadata and ontologies</strong></td>
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<td>• broader and more harmonised use of semantic artefacts in EOSC;</td>
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<td>• guidelines to collect and curate research software metadata;</td>
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<td>• a framework for metadata crosswalks and mappings between semantic artefacts;</td>
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<td>• use of semantic artefacts within data repositories for better data search and indexing.</td>
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<td><strong>Objectives WP5: Metrics, certification and guidelines</strong></td>
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<td>• FAIR digital object assessment (metrics and tools) across disciplines;</td>
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<td>• FAIR principles for research software (metrics and practical tests);</td>
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<td>• FAIRness of semantic artefacts;</td>
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<td>• Support for the network of FAIR-enabling trustworthy repositories, registries and discovery portals.</td>
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<td><strong>Objectives WP6: Interoperability</strong></td>
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<tr>
<td>• semantic and technical interoperability mechanisms across domains;</td>
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<td>• legal and organisational interoperability across domains;</td>
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<td>• foster alignments with global and non-scientific large data infrastructures to promote FAIR for interoperability.</td>
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Main takeaways

FAIR is not yet a given for researchers and we should not forget that the cultural and support challenges are at least as big as the technical ones;

RPOs, repositories, funders and publishers need to provide support to enable researchers to share FAIR data;

Interoperability is a global challenge that asks for global collaboration.
Thanks for listening!

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https://www.fairsfair.eu/