eosc | FAIR-IMPACT
Expanding FAIR solutions across EOSC

eosc | FAIRCORE4EOSC
Core Components Supporting a FAIR EOSC

R for Reusability

Certification, metrics & guidelines for FAIR data and software

An interactive session: is FAIR enough?

FAIRfest 21 February 2025
The Hague, The Netherlands (Madurodam)
Celebrating the advancements in FAIR solutions for EOSC

Interactive session?

Housekeeping rules

- Keep discussion respectful, agree to disagree
- Code of Conduct
- The session is hybrid and recorded
- Questions can be asked on the shared doc
- Activities will take place in the room and in the doc

Agenda

- Introduction
  - Session audience
  - Session panelists
- Celebrating FAIR-IMPACT & FAIRCORE4EOSC results
  - Small pieces of a large puzzle
- Reusability activity & discussion
- Conclusion

Activity 1: Meet your neighbor

Who are you?

What object type(s) do you work with?

What is your experience with FAIR?

Onsite: Turn to your neighbor and tell your story

Online **https://tinyurl.com/r4reusability**

Session panelists

- Wim Hugo (DANS-KNAW) => CAT
- Hervé L'Hours (UK Data Service) => Repository Transparency/Prototype
- Alex Ioannidis (CERN) => RSAC Zenodo/InvenioRDM
- Elena Breitmoser (EPCC) => F-UJI for Research Software
- Daniel Garijo (UPM) => FAIR Semantic artefact assessment (O'FAIRe + FOOPS)

Wim Hugo (DANS-KNAW)

CAT and KB

Ensuring reusability is, at heart, about quality assurance. The Compliance Assessment Toolkit (**CAT**) (FC4E) and the accompanying Knowledge Base (**KB**) (FC4E, F-I) assists with

- **Assessing the fitness for use** of a wide variety of Identifier Systems (PIDs) - ***these are fundamental to ensuring reusability***, especially when providing URIs in datasets!
- **Matching Identifier Systems with Entities**: selecting the appropriate Identifier for the concept or thing being referenced.
- **Guidelines and Best Practices** - spanning FAIR and Identifier Systems - in preparation for release end of March.
- Work is under way to extend CAT to FAIR assessments, repository appraisal, and EOSC-related compliance

DOI	10.5281/zenodo.14881287
DOI	10.5281/zenodo.12683217
DOI	10.5281/zenodo.14794354
DOI	10.5281/zenodo.10245076

CAT beta release

Hervé L’Hours (UK Data Service)A

Trustworthy and FAIR-enabling Repositories Prototype

- Support Action (in Progress)
- Published Guidelines
- Transparency as a driver for Trust
- Repository as single source
  - Organisation metadata
  - FAIR-enabling metadata
- Expose once, harvest everywhere
- Input for registries, knowledge graphs, assessment
- Future ReUsability statements:
  - data usage license
  - Provenance
  - community standards

Prototype Support Action
https://fair-impact.eu/testing-tdr-and-fair-enabling-prototype

Guidelines:
https://doi.org/10.5281/zenodo.10058634

Alex Ioannidis (CERN)

Zenodo/InvenioRDM APIs and Connector to SWH

- **Archival and Traceability**
  - ⚠️ Source code and version history often become inaccessible over time
  - 👉 Linking DOIs with SWHIDs ensures automatic archival and traceability
- **Metadata Limitations**
  - ⚠️ Sparse metadata reduces discoverability and accurate citation
  - 👉 Enhanced metadata fields (e.g. repository URLs, license) enrich records for better reuse
- **Platform Integration**
  - ⚠️ Limited interoperability between repositories hinders reuse
  - 👉 Platform-level integration streamlines broader adoption

Read the SWH/Zenodo integration announcement https://blog.zenodo.org/2024/10/21/2024-10-21-swh/

💬 **Discussion:** What additional metadata practices could further abil

faiR software metrics & automated assessment

- Everyone cares about making their software useful/re-usable
- R is not addressed by one single, absolute metric
- Extension of F-UJI tool for automated FAIR research software assessment as POC
  - FRSM-13: “Does the software describe what is required to use it”?
    - R1, R2
  - FRSM-15: “Does the software source code include licensing information for the software”?
    - R1.1

Read the Metrics for Research Software

Daniel Garijo (UPM)

FAIR Semantic Artefact Reusability

- **Challenge**: Is my semantic artifact described with sufficient metadata to make sure **it can be reused**?
- **Solution**:
  - FAIR assessment methodology, including a **pre-assessment** phase to check compliance of existing metadata
  - Adoption of MOD, and recommendations based on
    - Landscape analysis
    - Expert votes
    - Coverage for reusability
  - Implementation in **FOOPS!** and **O'FAIRe**
- **What is next**: Actionable suggestions

DOI 10.5281/zenodo.8305173

Read the **methodology** And check **FOOPS**! And **O'FAIRe**

Activity 2: Do we care about Reusability?

Do you care about Reusability in your current role?

Onsite: Turn to your neighbor and tell your story

Online **https://tinyurl.com/r4reusability**

How: R in FAIR: data vs research software

FAIR Guiding Principles (2016)	FAIR4RS Principles (2021)
R. Reusable	
The ultimate goal of FAIR is to optimize the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined in different settings.	**Software is both usable (it can be executed) and reusable (it can be understood, modified, built upon, or incorporated into other software).**
R1. (Meta)data are richly described with a plurality of accurate and relevant attributes	R1. Software is described with a plurality of accurate and relevant attributes.
R1.1. (Meta)data are released with a clear and accessible data usage license	R1.1. Software **is given** a clear and accessible license.
R1.2. (Meta)data are associated with detailed provenance	R1.2. Software is associated with detailed provenance.
R1.3. (Meta)data meet domain-relevant community standards	R3. Software meets domain-relevant community standards.
	R2. Software includes qualified references to other software.

Note: interoperability and reusability as defined by in FAIR Data Principles overlap when applied to software. In FAIR4RS, reusability (and usability) focuses on the ability to execute, inspect, & understand the software, so it can be modified, built upon, or incorporated into other software.

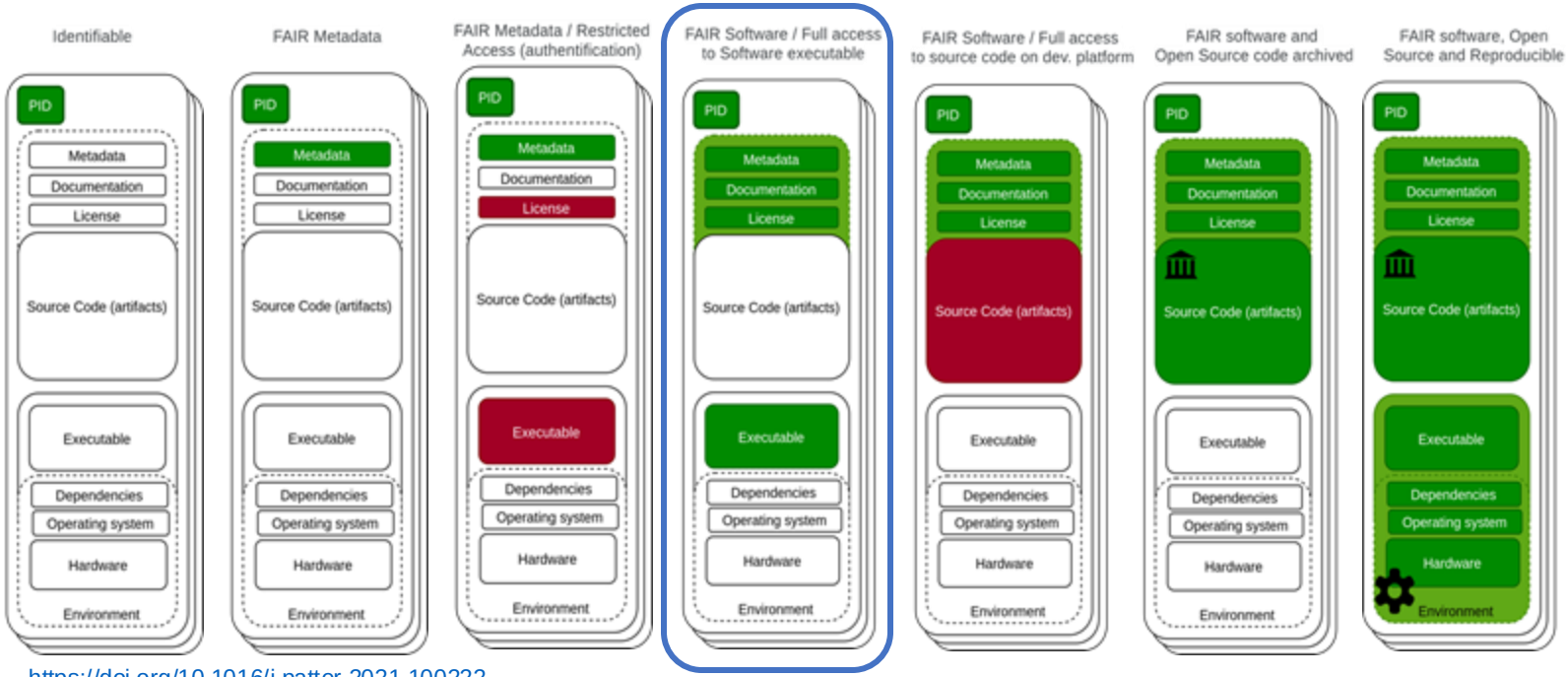
Activity 3: Reusability scope

How do you see Reusability?

Onsite: with your neighbor choose one object type and discuss reusability

Online **https://tinyurl.com/r4reusability**

Is FAIR enough to Reuse software?



https://doi.org/10.1016/j.patter.2021.100222

Activity 4: discussion topics

What you always wanted to ask and never dared to?

Onsite: Turn to your neighbor and collect together questions

When done, join another binome and choose one question for the panelists

Online **https://tinyurl.com/r4reusability**

Handing over: and now what?

Key takeaway towards an Open Science future