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Expanding FAIR solutions across EOSC

Synchronisation Workshop 2023

Metrics and Assessing FAIRness

November 27th 2023

Mike Priddy and Maaike Verburg, DANS

Funded by the European Union

Welcome to Session One: Metrics and Assessing FAIRness

Mike Priddy (DANS) - chair
Maaike Verburg (DANS) - rapporteur

- The aim is to gather as much knowledge about metrics & assessment (including tools) as possible across Europe
- This is an interactive workshop; discussion and adding content is warmly welcomed.
- There will be two short conversation starters.
  - Neil Chue Hong (Software Sustainability Institute)
  - Daniel Garijo (Universidad Politécnica de Madrid)

Some details for this session.

- The session will be recorded but only for internal use for the rapporteur and the report writing.
- Shared **spreadsheet** and **note taking document** for use in the session (and afterwards).
  - In the spreadsheet please keep information factual, short and include links wherever possible.
  - In the note taking document you may add more detail and background.
  - Please be careful when editing spreadsheet cells.
  - Please refrain from editing other people's information - even typos.

Some more details for this session.

- You may wish to add more information later, spreadsheet & note taking document will be available until **December 10th**
- Survey responses have been added to the spreadsheet
- 6 questions but you may not have answers for them all.
- Particularly interested in Research Software and Semantic Artefacts but you may only be assessing FAIRness of data - still very interesting!

The main questions

1. What does your project or initiative do to implement FAIR principles & metrics? Please provide the relevant links.

The main questions

2. If your project, initiative, community, or organisation use tools for automated assessment of the FAIRness of digital objects, especially for research software, semantic artefacts, or data, which do you use?
    - What informed the decision?
    - Have you changed the tools being used, if so why?
    - If you are not using tools for automated FAIR assessment, why is that?
    - Please provide any relevant links to the tools used.

The main questions

3. Is your project, initiative, community, or organisation investigating or implementing discipline or community-specific metrics for FAIR assessments?
    - Please provide the relevant links to any examples for research software, semantic artefacts and data.
    - If you are only using generic metrics is there a specific reason why?

The main questions

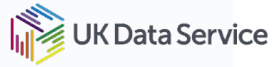
4. Do you have any suggestions to improve the (generic or discipline-specific) FAIR metrics and tools you use?
    - Do the tools provide suitable feedback about the tests and results?

5. Do the FAIR assessment tools and metrics require further convergence?
    - If so, why would this be useful in your community or organisation?

The main questions

6. How is the adoption of FAIR principles being measured in your community or infrastructure?
    - Does your community or infrastructure have a form of governance around FAIR metrics, tools and assessment processes across different digital objects? Please provide any relevant links.

The Consortium



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Metrics for FAIR software

Neil Chue Hong

Metrics for FAIR software assessment

How do we measure the “FAIR-ness” of software?

- Some principles are “precise” (e.g. “clear and accessible license)
- Some principles are “open” (e.g. “meets domain-relevant community standards)
- Some principles are easy to measure but hard to meet (e.g. “software includes qualified references to other objects”)
- Some principles are hard to measure but easy to “meet” (e.g. “software is described with rich metadata”)

FAIR is not binary, it is an indicator of progression

RDA FAIR4RS WG. (2022). ***FAIR Principles for Research Software (FAIR4RS Principles) (1.0)****. Zenodo.* *https://doi.org/10.15497/RDA00068*

Chue Hong, N., Breitmoser, E., Antonioletti, M., Davidson, J., Garijo, D., Gonzalez-Beltran, A., Gruenpeter, M., Huber, R., Jonquet, C., Priddy, M., Shepherdson, J., Verburg, M., & Wood, C. (2023). ***D5.2 - Metrics for automated FAIR software assessment in a disciplinary context (1.0 - DRAFT not yet approved by the European Commission)****. Zenodo.* *https://doi.org/10.5281/zenodo.10047401*

Automated FAIR software assessment

Software metrics can be applied at three main levels: source *code*, software *project*, and *repository*

The *same metric will have different implementations* depending on the type of software and the field

While metrics and assessment methods are expected to remain the same, the *criteria for compliance levels* will change as adoption of FAIR principles increases, and infrastructure, tools and guidance improve

Field	Description
Metric Identifier	The local identifier of the metric (FRSM-XX) FRSM: FAIR Research Software Metric.
Metric Name	Metric name in a human readable form.
Description	The definition of the metric, including examples.
FAIR4RS Principle	The FAIR4RS principle(s) most related to the metric.
RSMD Recommendation	The FAIR-IMPACT RSMD recommendation(s) most related to the metric
Assessment	Requirements and methods to perform the assessment against the metric. This includes a suggested compliance level (essential / important / useful), based on the concepts introduced by the FAIR Data Maturity Model Working Group (2020). Criteria at each level will change as adoption of FAIR increases.
Comments	Further notes associated with the implementation of the metric, which may include related resources, constraints and limitations.

D5.2 - Metrics for automated FAIR software assessment in a disciplinary context (1.0 - DRAFT not yet approved by the European Commission). *Zenodo.* https://doi.org/10.5281/zenodo.10047401

FAIR Research Software Metrics

Identifier	Name
FRSM-01	Does the software have a globally unique and persistent identifier?
FRSM-02	Do the different components of the software have their own identifiers?
FRSM-03	Does each version of the software have a unique identifier?
FRSM-04	Does the software include descriptive metadata which helps define its purpose?
FRSM-05	Does the software include development metadata which helps define its status?
FRSM-06	Does the software include metadata about the contributors and their roles?
FRSM-07	Does the software metadata include the identifier for the software?
FRSM-08	Does the software have a publicly available, openly accessible and persistent metadata record?
FRSM-09	Is the software developed in a code repository / forge that uses standard communications protocols?

Identifier	Name
FRSM-10	Are the formats used by the data consumed or produced by the software open and a reference provided to the format?
FRSM-11	Does the software use open APIs that support machine-readable interface definition?
FRSM-12	Does the software provide references to other objects that support its use?
FRSM-13	Does the software describe what is required to use it?
FRSM-14	Does the software come with test cases to demonstrate it is working?
FRSM-15	Does the software source code include licensing information for the software and any bundled external software?
FRSM-16	Does the software metadata record include licensing information?
FRSM-17	Does the software include provenance information that describe the development of the software?

D5.2 - Metrics for automated FAIR software assessment in a disciplinary context (1.0 - DRAFT not yet approved by the European Commission). *Zenodo.* *https://doi.org/10.5281/zenodo.10047401*

FAIR Semantic artefact assessment

Daniel Garijo

Assessing semantic artefacts

Which Semantic artefacts do you want / plan to assess?

- **Vocabularies and ontologies**
- SKOS schemes
- Taxonomies
- Lexicons
- Knowledge graphs

How far should FAIRness assessment go?

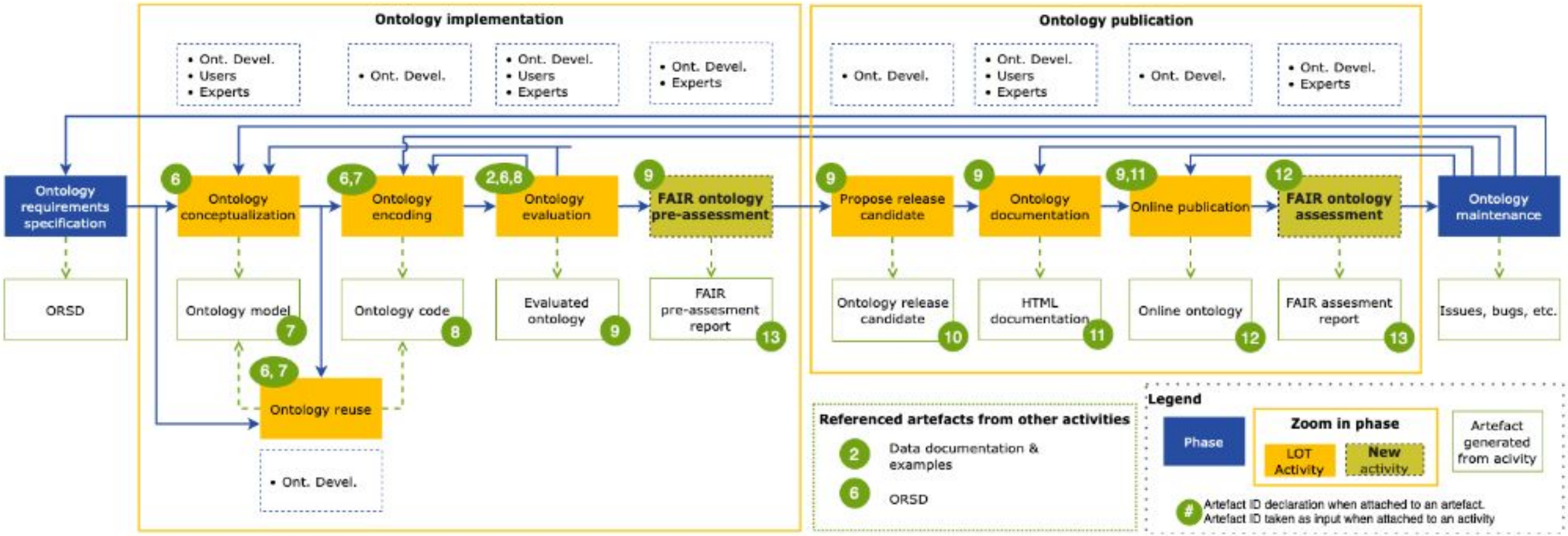
- Ontologies may import other ontologies. Do you also assess them?
- Concept schemes may be part of other concept schemes
- Shall we deal with individual class assessment?

Metadata usually travels with semantic artefacts

- Do you assess a registry record (e.g., O'FAIRE), or the semantic artefact itself (e.g., FOOPS!)?

Garijo, D., Poveda-Villalón, M., Flohr, P., Gonzalez-Beltran, A., le Franc, Y., & Verburg, M. (2023). M5.3 Semantic artefact assessment methodology (Version 1). Zenodo. https://doi.org/10.5281/zenodo.8305173

Proposed semantic artefact FAIR assessment methodology



Based on https://lot.linkeddata.es/