FAIR data and how to evaluate your data

Hannah Mihai, DeiC

About DeiC

- DeiC's vision:
  - provide access to a digital infrastructure that enables research at a high international level.

- DeiC makes decisions on development and operation for
  - the research network
  - digital infrastructure services
  - cyber and information security services
  - computing and storage facilities

About DeiC

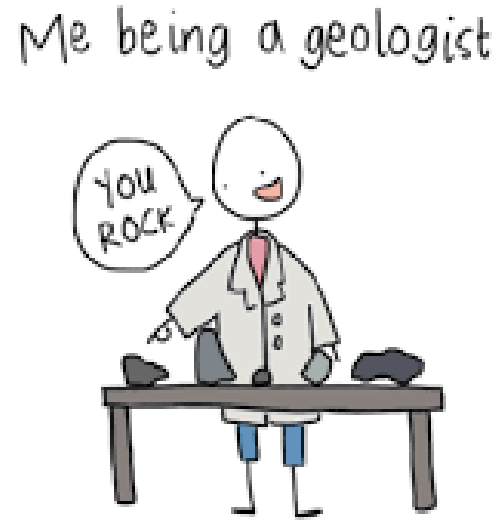
- DeiC is tasked with:
  - Developing a strategy for managing research data and national data repositories.
  - Managing and allocating funds for national digital research infrastructure.
  - Coordinating participation in national and international collaborations on digital research infrastructure.
  - Advising the Ministery for Higher Education and Science and the Danish Agency for Higher Education and Science on digital research infrastructure.

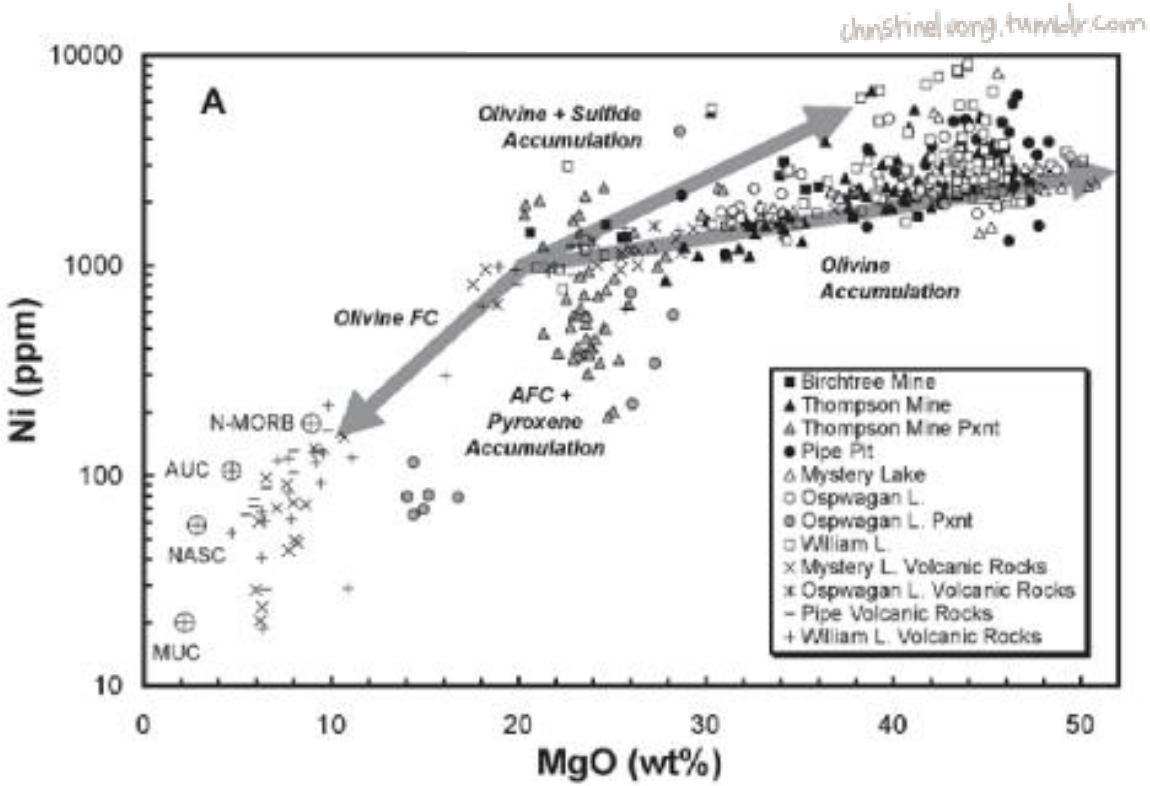
- DeiC consists of four departments: DM, HPC, Quantum Computing, Secretariat

About me

- M.Sc. in Geoscience
  - Started a PhD, didn't finish for many reasons

… one of them Data Management related





About me

- Data Management Consultant at DeiC for the past five years

About you

Go to menti.com and use the code 1302 0751
or scan the QR code

FAIR data

Findable

- Data is assigned a persistent identifier, described with rich metadata, and registered in a searchable resource

Accessible

- Data and metadata are retrievable using standard protocols, ensuring it can be accessed, authorized, or authenticated even if not freely open.

Interoperable

- Data uses a formal, shared language for knowledge representation and follows standard vocabularies for integration with other data.

Reusable

- Data is well-documented, allowing it to be replicated or combined, and includes clear licenses for usage.

How do I make my data FAIR?

- Tons of resources and tools available
- FAIRification is an iterative process
- Your intention and environment have an influence on your choices
- It should be EASY!

1. Define the FAIRification rational for your data

Background

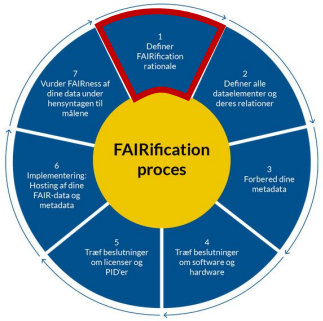
- Why should your data be FAIR?
- How FAIR is your data already?
- What datasets do you want to start with?

Tools

F-uji

FAIR Maturity Evaluation service

FAIR Data Self-Assessment Tool



2. Define all data elements and their relationships

Background

- What kind of data do you have?
- How much data do you have?
- Can you use existing ontologies?
- Do you need to build your own?

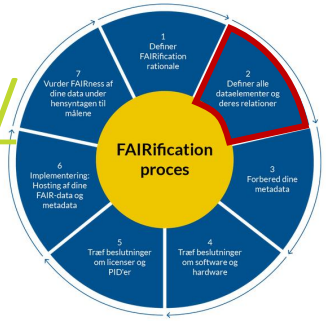
Tools

https://dmp.deic.dk/

https://ds-wizard.org/

https://www.w3.org/wiki/Ontology_repositories

https://protege.stanford.edu/



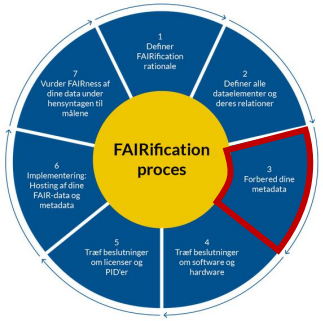
3. Prepare your metadata

Background

- What metadata is needed to describe my data?
- Do I need only generic metadata or is there a domain specific standard?
- Is it compatible with my ontology?

Tools

- Your repository of choice
- https://metadatacenter.readthedocs.io/en/latest/



4. Make software and hardware decisions to support FAIRification

Background

- Does my University have a storage solution for the data before publication?
- After publication, do I put my data into a generic repository or a domain specific one?
- What will happen to my data after the grant of my current project runs out?

Tools

https://zenodo.org/

https://data.dtu.dk/

https://dataverse.deic.dk/

https://www.re3data.org/

https://www.coretrustseal.org/

5. Make decisions about licenses and PIDs

Background

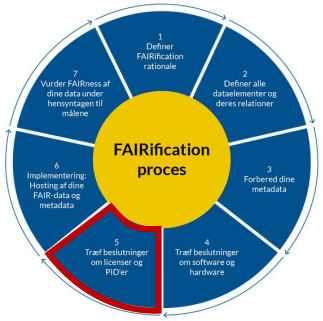
- Who should be able to reuse my data?
- How do I make sure data can easily be found and identified?

Tools

https://creativecommons.org/licenses/

https://www.openaire.eu/how-do-i-license-my-research-data

https://datacite.org/



6. Implementation: Hosting your FAIR data and metadata

Background

- Do you have all the necessary information to upload your data?
- Can you make it easier for yourself by using an API to automate your upload?

Tools

Depends on the repository you have chosen, make sure you have enough time, don’t rush.

7. Assess the FAIRness of your data taking into account the goals of your FAIRification efforts

Background

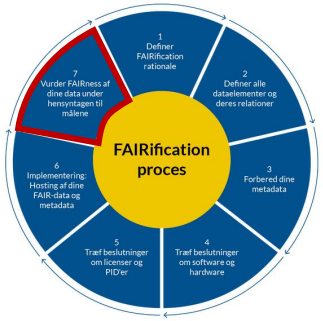
- Is your data FAIR enough?
- Is there room for improvement?

Tools

F-uji

FAIR Maturity Evaluation service

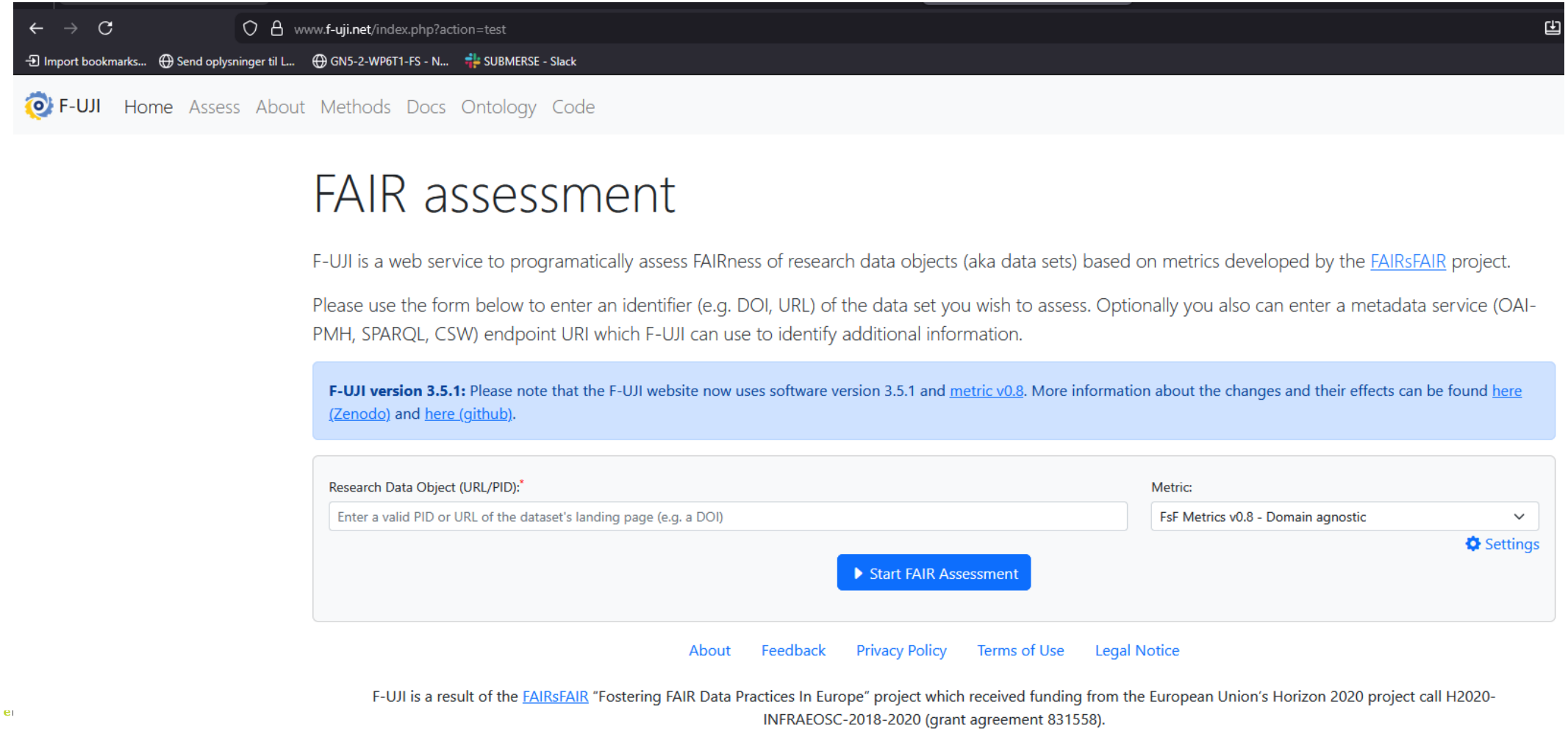
FAIR Data Self-Assessment Tool



Example of FAIR evaluation

- Demo: Fuji with a DeiC Dataverse dataset

Backup: Screenshots of the Demo



Backup: Screenshots of the Demo

Summary:

	Score earned:	Fair level:
Findable:	7 of 7	advanced
Accessible:	7 of 7	advanced
Interoperable:	4 of 6	moderate
Reusable:	6 of 6	advanced

Interoperable

- FsF-I1-01M - Metadata is represented using a formal knowledge representation language.
- FsF-I2-01M - Metadata uses registered semantic resources
- FsF-I3-01M - Metadata includes qualified references between the data and its related entities.

Backup: Screenshots of the Demo

Interoperable

FsF-I1-01M - Metadata is represented using a formal knowledge representation language.

FsF-I2-01M - Metadata uses registered semantic resources

FsF-I3-01M - Metadata includes qualified referenc

Debug messages:

Level:	Message:
INFO	Removing default namespaces from 29 vocabulary namespaces found in structured metadata
INFO	Default vocabulary namespace(s) excluded -: ['http://purl.org/dc/terms', 'http://schema.org', 'http://schema.org', 'http://www.w3.org/XML/1998/namespace', 'http://purl.org/dc/elements/1.1', 'http://www.w3.org/2001/XMLSchema-instance', 'http://www.w3.org/2001/XMLSchema-instance', 'http://www.w3.org/1999/02/22-rdf-syntax-ns', 'http://ogp.me/ns']
INFO	Removing default namespaces from 1 vocabulary namespaces extracted from links found in metadata
INFO	Default vocabulary namespace(s) excluded -: ['http://schema.org']
INFO	Check if known namespace(s) are used in structured metadata (RDF, XML) which exist(s) in a LOD registry -: ['http://creativecommons.org/licenses/by', 'https://creativecommons.org/licenses/by/4.0', 'https://doi.org/10.1007', 'http://datacite.org/schema', 'http://schema.datacite.org/meta/kernel-4.5/metadata.xsd', 'http://www.openarchives.org/OAI/2.0/oai_dc', 'https://doi.org/10.60612/DATADK/UNIANS', 'http://www.openarchives.org/OAI/2.0/oai_dc.xsd', 'http://datacite.org/schema/kernel-4', 'http://dublincore.org/documents/dcmi-terms', 'http://schema.datacite.org/meta/kernel-4.1/metadata.xsd', 'https:', 'https://doi.org/10.60612/datadk/unians', 'ddi:codebook:2_5', 'https://ddialliance.org/Specification/DDI-Codebook/2.5/XMLSchema/codebook.xsd', 'https://dataverse.deic.dk/citation?persistentId=doi:10.60612/DATADK', 'http://datacite.org/schema', 'https://dataverse.deic.dk/api/access/datafile', 'https://orcid.org', 'https://doi.org/10.60612/DATADK', 'https://doi.org/10.60612/datadk']
WARNING	NO known vocabulary namespace URI is found which is listed in the LOD registry

Hands on

- Go to Fuji and test one of your own published datasets

- How did you like the experience?
- Is your data more or less FAIR than you were expecting?
- Did you find anything you would like to share?

The bigger picture

Danish Code of Conduct for Research Integrity (January 2026)

Published by the Danish Agency for Higher Education and Science

Why it exists:

Guides responsible research

National framework for *good research practice*

Protects research quality

Honesty, transparency & accountability

Proper data management and publication

Clarifies responsibilities

Roles of researchers, supervisors & institutions

Prevents misconduct

Fabrication
Falsification
Plagiarism

Builds public trust

Ensures credibility of Danish research

Research Data Management in the Codex

Data Management Plans

- Publicly available research data, should be described and where and how it is stored

Storage, archiving and administration of data and metadata

- Research data should be stored, archived and administered in a form compliant with the FAIR principles

Metadata, responsibility and traceability

- It should be clear from the metadata who conducted the research and who is responsible for the data and research results

Universities are responsible for Research Data Management.

- Secure storage facilities must be provided
- Compliance with confidentiality, integrity and availability requirements
- Support for responsible data storage and preservation by researchers
- Training in research integrity for PhD students and postdocs
- Guidance on research data management based on the FAIR principles

Thank you for your attention!

If you are interested in getting the slides or want to chat a bit more:

Hannah.Mihai@deic.dk