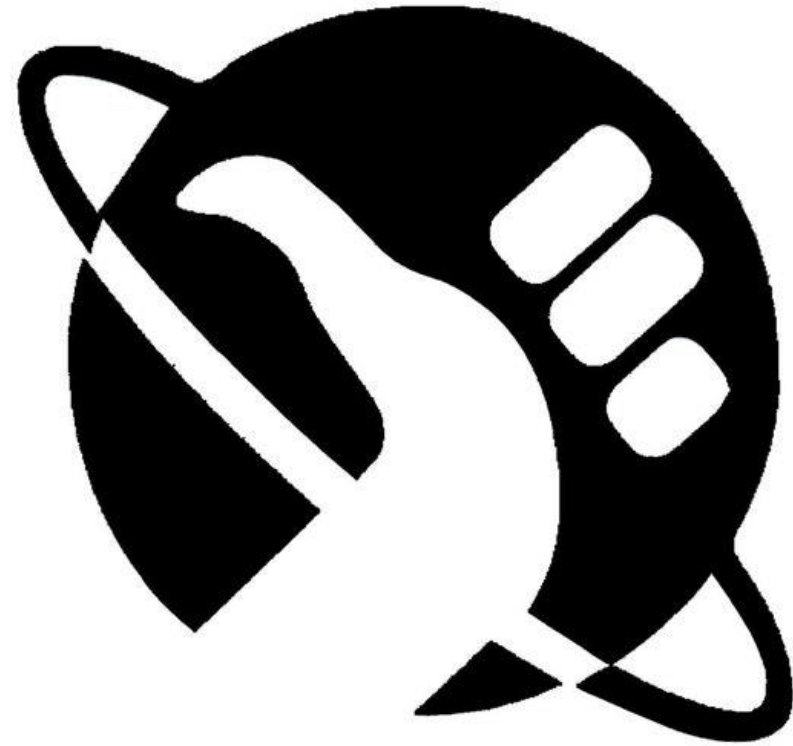# > A Researcher's Guide to Data FAIRification

An update on what the Danish GO FAIR office can offer
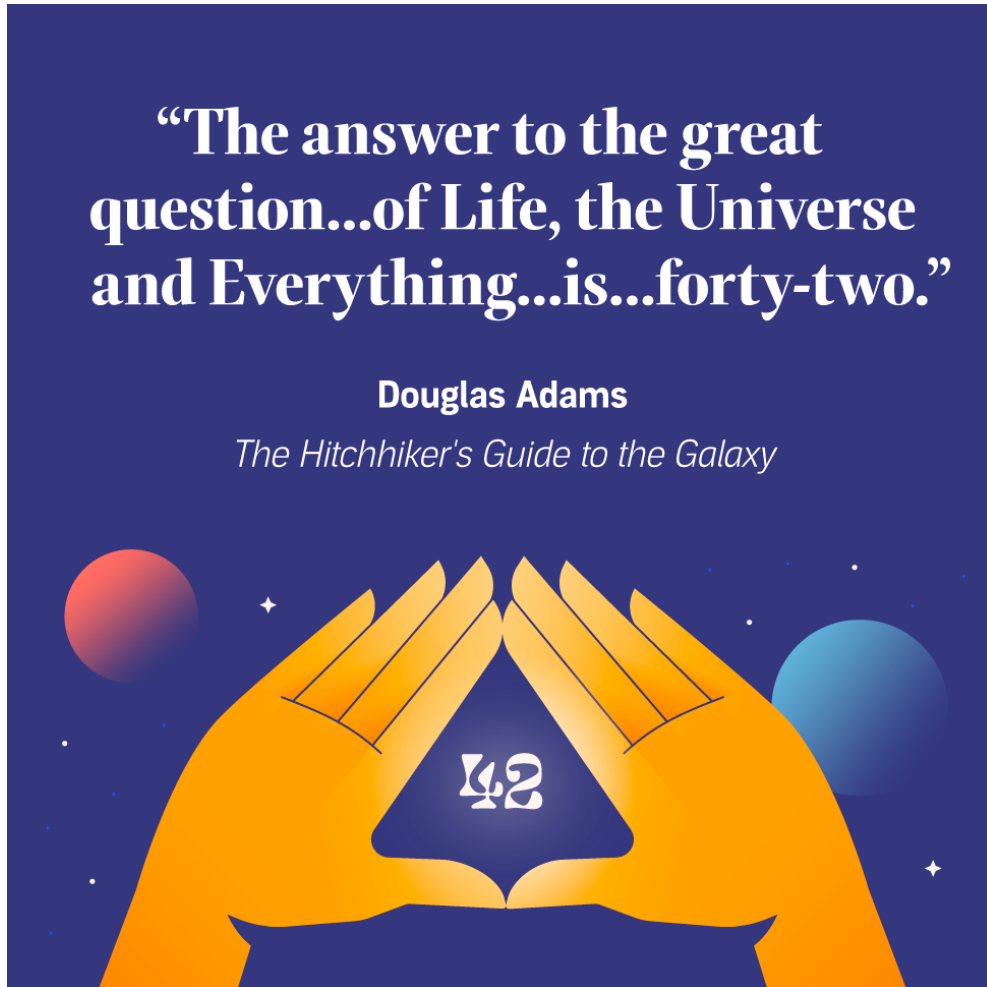
DeiC conference 2023

Hannah Mihai, Data Management Consultant

> So, what are we doing now?

"The answer to the great question...of Life, the Universe and Everything...is...forty-two."

Douglas Adams

The Hitchhiker's Guide to the Galaxy
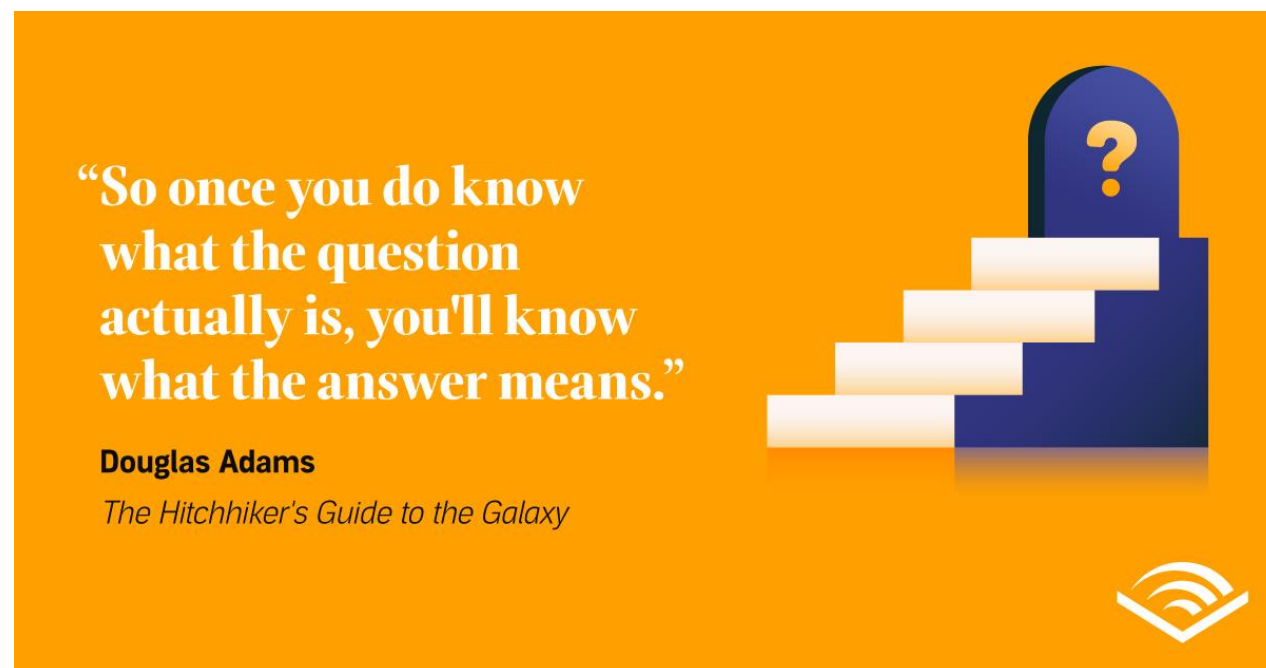
Nationalt RDM Netværk

Få hjælp - dit lokale Front Office

> It depends…

- There are a lot of different reasons for Data FAIRification:

    - I want to safe myself time.

    - I want to be an early mover and be a driver in the recent developments.

    - I want others to reuse my data.

    - The funder told me to do so, otherwise I am not getting any money…

"So once you do know what the question actually is, you'll know what the answer means."

Douglas Adams
The Hitchhiker's Guide to the Galaxy

Source: https://www.audible.com/blog/quotes-hitchhikers-guide-to-the-galaxy

> The Danish GO FAIR Office

The Danish GO FAIR office is part of GO FAIR international. The office's aim is to implement FAIR data management principles in Denmark to improve the findability, accessibility, interoperability and reuse of digital research assets. It is in line with the national strategy for FAIR Data Management.
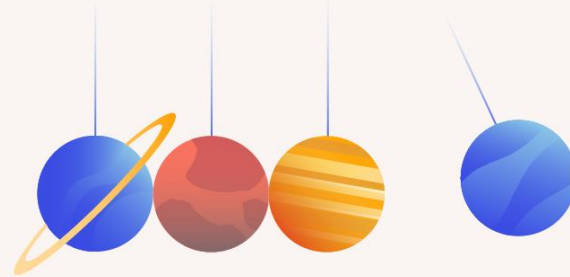

Source: https://deic.dk/en/data-management/GO-FAIR

Always bring a towel...

" **If you want to survive out here, you've got to know where your towel is.**"

Douglas Adams

The Hitchhiker's Guide to the Galaxy

Source: https://www.audible.com/blog/quotes-hitchhikers-guide-to-the-galaxy

> Where should I start?

- **FAIR Aware tool**

FAIR | Aware

Your first step towards your FAIR data(set)

Glossary 📖

FAIR questions 👁👁

FINDABLE

1. Are you aware that a data(set) should be assigned a globally unique persistent and resolvable identifier when deposited with a data repository? ℹ
- ○ Yes
- ○ No

2. Are you aware that when you deposit a data(set) in a data repository, you will need to provide discovery metadata in order to make the data(set) findable, understandable and reusable to others? ℹ
- ○ Yes
- ○ No

3. Are you aware that the data repository providing access to your data(set) should make the metadata describing your data(set) available in a format readable by machines as well as humans? ℹ
- ○ Yes
- ○ No

> Where should I start?

- F-uji tool
- FAIR Assessment Tools:

Towards an 'Apples to Apples' Comparison

F-UJI is a web service to programatically assess FAIRness of research data objects at the dataset level based on the FAIRsFAIR Data Object Assessment Metrics 🔗

Click here to assess a dataset

	Score earned:	Fair level:
Findable:	6 of 7	moderate
Accessible:	1 of 3	initial
Interoperable:	2 of 4	moderate
Reusable:	2 of 10	initial

Reusable R1.3 / R1.2 / R1.1 / R1 / I3 / I2 / Interoperable I1 / A1 Accessible / F3 / F4

45 %

Findable

FsF-F1-01D - Data is assigned a globally unique identifier.

FAIR level:	3 of 3	advanced
Score:	1 of 1
Output:	{ "guid": "https:\/\/doi.org\/10.17894\/ucph.e58a99c2-da7b-444a-b1c0-11f00e70041c", "guid_scheme": "doi" }

Metric tests:

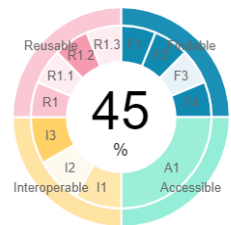| Test:	Test name:	Score:	Maturity:	Result:
FsF-F1-01D-1	Identifier is resolvable and follows a defined unique identifier syntax (IRI, URL)	1	3	✓
FsF-F1-01D-2	Identifier is not resolvable but follows an UUID or HASH type syntax			?

Debug messages:

Level:	Message:
INFO	Using idutils schemes
SUCCESS	Unique identifier schemes found ['doi', 'url']
INFO	Finalized unique identifier scheme - doi

FsF-F1-02D - Data is assigned a persistent identifier.

FsF-F2-01M - Metadata includes descriptive core elements (creator, title, data identifier, publisher, publication date, summary and keywords) to support data findability.

FsF-F3-01M - Metadata includes the identifier of the data it describes.

FsF-F4-01M - Metadata is offered in such a way that it can be retrieved programmatically.

> Aligning yourself to your community

- FAIR Implementation Profile (FIP)

FIP Wizard

Chapters

I. About	✓
II. Declare your FAIR Implementation Community	4
III. Declarations for Findability	7
IV. Declarations for Accessibility	5
V. Declarations for Interoperability	6
VI. Declarations for Reusability	5
VII. Register a new resource as a nanopublication	✓

✓ **III.1 Declaration F1 Metadata: What globally unique, persistent, resolvable identifier service do you use for metadata records?**

Principle F1 states that digital resources, i.e., data and metadata, must be assigned a globally unique and persistent identifier which serves as a permanent machine interpretable reference. The GO FAIR Foundation emphasizes the need for persistence and global uniqueness, as well the property of resolvability of the identifiers (see also A1). Globally unique means that the identifier is guaranteed to unambiguously refer to the intended resources (where 'global' is means 'universal' as there are described digital assets outside the 'world'). Therefore, it is insufficient for it to be unique only locally (e.g. unique within a single, local database). Persistence refers to the requirement that this globally unique identifier is never reused in another context, and continues to identify the same resource over time, even if that resource should no longer exist, or moves from one digital environment to another. While global uniqueness is a technical property (i.e., an algorithm that can guarantee with mathematical precision that the issued identifiers are unique), persistence is a social commitment made by the stakeholder responsible for issuing the identifiers, that these identifiers will continue to map to the objects they identify for a defined period of time. An additional property supported by the GO FAIR Foundation is that the identifier is also 'resolvable' by machines. An identifier is most useful in a large-scale automated environment only when it can be resolved into (i.e., linked to) the object it identifies. Furthermore, the GO FAIR Foundation also assumes predictable identifier resolution behavior, allowing identifier resolution to behave consistently across multiple requests. Taken together, the GO FAIR Foundation assumes FAIR implementations to have Globally Unique, Persistent and Resolvable Identifiers (GUPRIs).

To summarize, this question requests a FAIR Enabling Resource of type "identifier service" which is a service that provides for metadata (1) algorithms guaranteeing global uniqueness, (2) policy document that guarantees persistence and (3) resolution of the identifier to machine-actionable metadata describing the object and its location.

☑ Desirable: *Defining FAIR Implementation Profile*

○ **a. Declaration: No implementation choice has been made by this community**

◉ **b. Declaration: FAIR Enabling Resource(s)**

↺ Clear answer

Answered about 1 month ago by Hannah Mihai.

✓ **III.1.b.1 List the FAIR Enabling Resource(s)**

☑ Desirable: *Defining FAIR Implementation Profile*

🖉 **III.1.b.1.a.1 Select the FAIR Enabling Resource**

☑ Desirable: *Defining FAIR Implementation Profile*

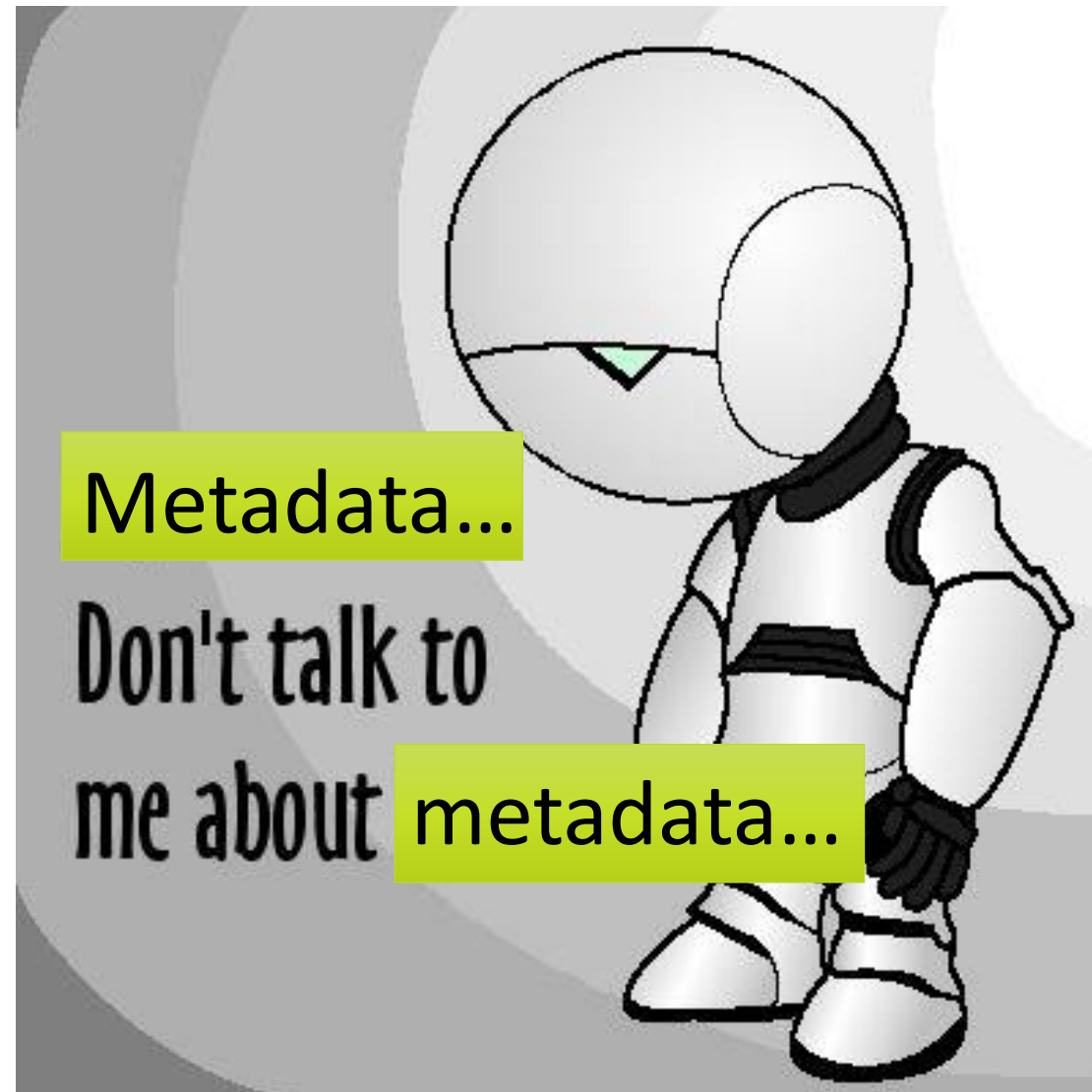🖉 **III.1.b.1.a.2 This implementation choice is:**

☑ Desirable: *Defining FAIR Implementation Profile*

○ **a. Currently in use by the community**

○ **b. Currently in use, but is planned to be replaced in the future**

○ **c. Is planned to be used in the future**

> National Services to help you

- DeiC Dataverse
- DeiC Storage and DeiC Sensitive Storage
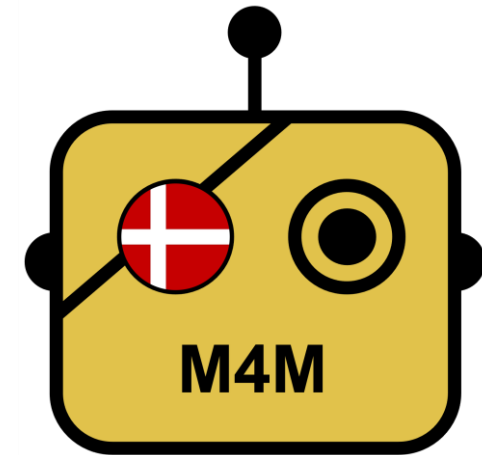- DeiC DMP (formerly known as DMPonline)

Source: https://quotesgram.com/img/cupid-depression-quotes/8598579/

> Machine-actionable metadata

Ontologier – best machine readable

```xml
<?xml version="1.0" encoding="utf-8" ?>
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
         xmlns:skos="http://www.w3.org/2004/02/skos/core#"
         xmlns:dc="http://purl.org/dc/terms/">

  <skos:Concept rdf:about="http://purl.org/m4m-dk-3/variables/CountryCode">
    <dc:source rdf:resource="https://www.iso.org/obp/ui/#search"/>
    <skos:topConceptOf rdf:resource="http://purl.org/m4m-dk-3/variables/"/>
    <skos:inScheme rdf:resource="http://purl.org/m4m-dk-3/variables/"/>
    <skos:definition xml:lang="en">2 char code as defined in the ISO standard ISO 3166-1 alpha-2 codes</skos:definition>
    <skos:prefLabel xml:lang="en">CountryCode</skos:prefLabel>
  </skos:Concept>

  <skos:Concept rdf:about="http://purl.org/m4m-dk-3/variables/">
    <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#ConceptScheme"/>
    <skos:hasTopConcept rdf:resource="http://purl.org/m4m-dk-3/variables/CountryCode"/>
  </skos:Concept>

</rdf:RDF>
```

> Machine-actionable metadata

Publication of metadata

> Past experiences

- BioImaging group from Copenhagen University
  - General introduction to FAIRification tools and how to use them on their large image-files
  - Use-case for the new national infrastructure services
- Environmental Science group from Aarhus University
  - Support with a Data Management plan for a Horizon Europe project.

  "The support meetings with DeiC have contributed to a better understanding of the requirements for a Data Management Plan and the possibilities for storing data"

  Steen Solvang Jensen, senior researcher at the Department of Environmental Science.

> *And just one more thing….*

Source: https://www.thatawesomeshirt.com/shirt/2405/so-long-and-thanks-for-all-the-fish/

- …Any questions?

- Contact:
  Hannah.Mihai@deic.dk
  Sandra.Boerman@deic.dk
  Anne.Sofie.Fink@deic.dk
  Rene.Belso@deic.dk