

# FAIR

## Prinzipien und Tools für die Evaluation und das Assessment

**Andreas Czerniak**  
[0000-0003-3883-4169](tel:0000-0003-3883-4169)



# Agenda

- Die Prinzipien von FAIR
  - FAIR - Communities
- Tools für die Evaluierung und das Assessment von FAIR Indikatoren
- Ausblick

# FAIR

- The FAIR Guiding Principles for scientific data management and stewardship (Nature, Scientific Data, 2016)

There is an **urgent need to improve the infrastructure** supporting the **reuse of scholarly data**. A diverse set of stakeholders—representing academia, industry, funding agencies, and scholarly publishers—have come together to design and jointly endorse a concise and measurable set of principles that we refer to as the **FAIR Data Principles**. The intent is that these may act as a guideline for those wishing to **enhance the reusability of their data** holdings. Distinct from peer initiatives that focus on the human scholar, the FAIR Principles put specific emphasis on enhancing the ability of **machines to automatically find and use the data**, in addition to supporting its reuse by individuals. This Comment is the first formal publication of the FAIR Principles, and includes the rationale behind them, and some exemplar implementations in the community.

# FAIR - Prinzipien

F  
indable



R  
eusable



# Communities zu den FAIR-Prinzipien

- **Research Data Alliance (RDA)** ( <https://www.rd-alliance.org/groups/working-groups> )
  - FAIR Data Maturity Model WG
  - FAIR for Research Software WG (FAIR4RS)
  - CURE-FAIR WG
  - FAIR for Virtual Research Environments WG
  - FAIRsharing Registry: Connecting data policies, standards and databases RDA WG
  - Open Science Graphs for FAIR Data IG
  - FAIR Principles for Research Hardware IG

# Projekte zu FAIR

- GO-FAIR ( <https://www.go-fair.org/> )

GO FAIR Today

Implementation Networks

 CHANGE

 TRAIN

 BUILD

FAIR Principles

# Projekte zu FAIR

- FAIRsFAIR ( <https://www.fairsfair.eu/> )



- European Open Science Cloud (EOSC)
  - FAIR Working Group



- FAIR metrics and Data Quality Task Force

**FAIR metrics and Data Quality**

# Elemente der FAIR - Prinzipien

- RDA FAIR data maturity spec.

- **41 Elemente**

(<https://doi.org/10.15497/RDA00050>,  
DE: <https://doi.org/10.5281/zenodo.5834115>)

Indicator Id	FAIR Indicator	Priority
RDA-F1-01M	Metadata is identified by a persistent identifier	Essential
RDA-F1-01D	Data is identified by a persistent identifier	Essential
RDA-F1-02M	Metadata is identified by a globally unique identifier	Essential
RDA-F1-02D	Data is identified by a globally unique identifier	Essential
RDA-F2-01M	Rich metadata is provided to allow discovery	Essential
RDA-F3-01M	Metadata includes the identifier for the data	Essential
RDA-F4-01M	Metadata is offered in such a way that it can be harvested	Essential

- FAIRsFAIR spec.

- **15 Elemente**

(<https://doi.org/10.5281/zenodo.6461229>)

Identifier	Name
<a href="#">FsF-F1-01D</a>	<b>Data</b> is assigned a globally unique identifier.
<a href="#">FsF-F1-02D</a>	<b>Data</b> is assigned a persistent identifier.
<a href="#">FsF-F2-01M</a>	<b>Metadata</b> includes descriptive core elements (creator, title, data identifier, publisher, publication date, summary and keywords) to support data findability.
<a href="#">FsF-F3-01M</a>	<b>Metadata</b> includes the identifier of the data it describes.
<a href="#">FsF-F4-01M</a>	<b>Metadata</b> is offered in such a way that it can be retrieved by machines.
<a href="#">FsF-A1-01M</a>	<b>Metadata</b> contains access level and access conditions of the data.
<a href="#">FsF-A1-02M</a>	<b>Metadata</b> is accessible through a standardized communication protocol
<a href="#">FsF-A1-03D</a>	<b>Data</b> is accessible through a standardized communication protocol
<a href="#">FsF-A2-01M</a>	<b>Metadata</b> remains available, even if the data is no longer available.



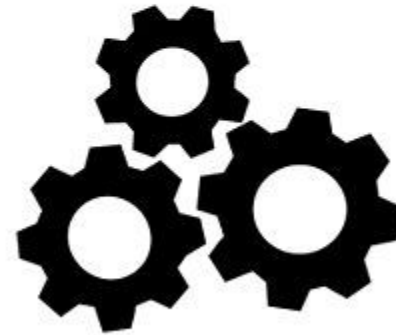
# FAIR - Prinzipien

F  
Findable

A  
Accessible

I  
Interoperable

R  
Reusable



**FAIR**  $\neq$  **Open**

# FAIR – Tools für die Evaluation und das Assessment

Ein Einblick

# FAIR - Tools Übersicht

-  <https://ardc.edu.au/resources/aboutdata/fair-data/fair-self-assessment-tool>
- **SATIFYD – Self-Assessment Tool to Improve the FAIRness of Your Dataset (DANSK)**
- **F-UJI - FAIRsFAIR**
- **OpenAIRE FAIR-Assistance**
- ...

<https://fairassist.org/>

# FAIR - Tools

- auf einen einzelnen Datensatz bezogen

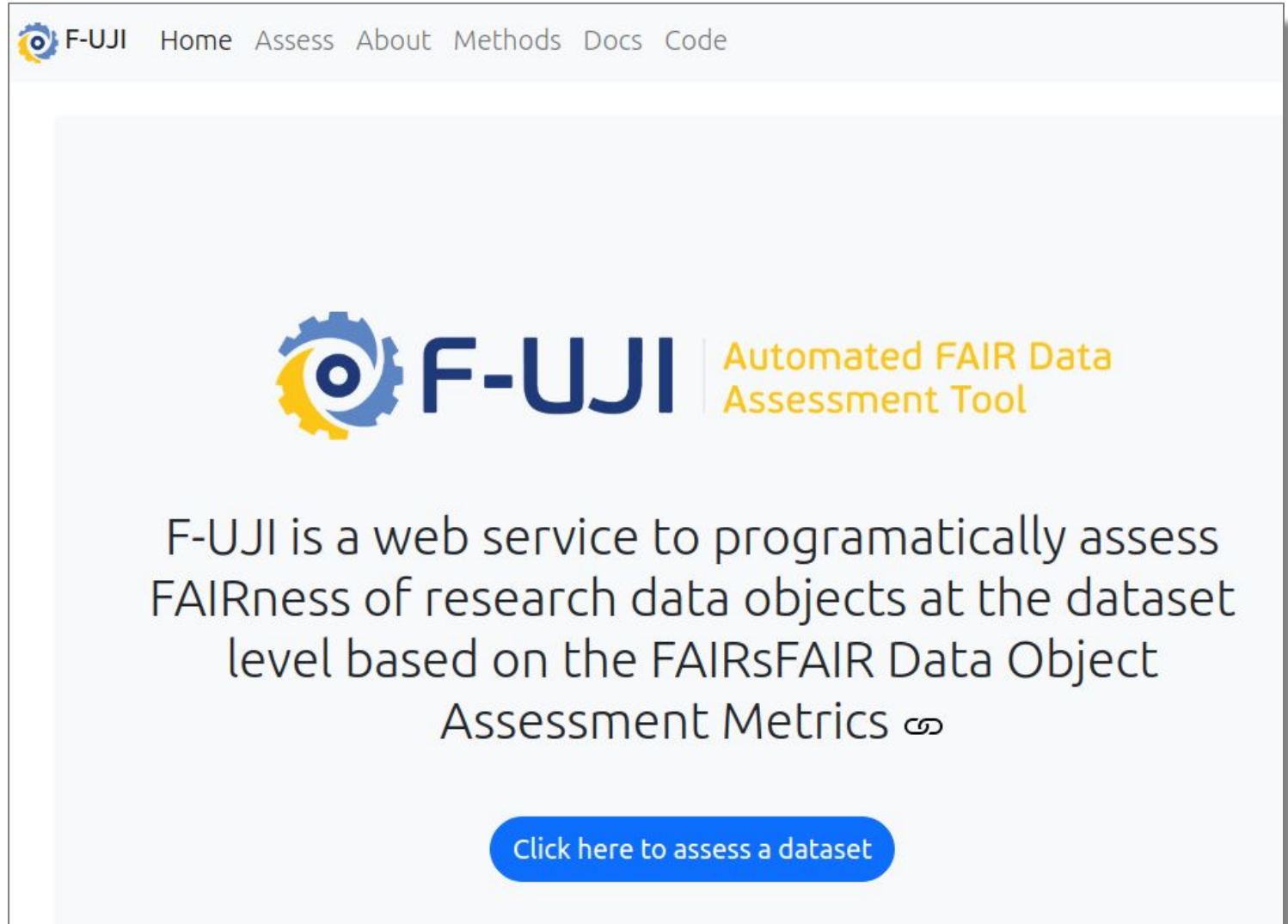
**F-UJI**

- umfasst das gesamte Repositorium/FIS

**OpenAIRE  
FAIR-Assistance**


# F-UJI (FAIRsFAIR)

- <https://www.f-uji.net/>
- Begutachtung von **einem** ausgewählten Datensatz



The screenshot shows the homepage of the F-UJI website. At the top, there is a navigation bar with the F-UJI logo and links for Home, Assess, About, Methods, Docs, and Code. The main content area features the F-UJI logo, which consists of a blue gear with a yellow crescent shape inside, followed by the text 'F-UJI' in blue. To the right of the logo, the text 'Automated FAIR Data Assessment Tool' is displayed in yellow. Below this, a paragraph describes F-UJI as a web service for assessing FAIRness of research data objects at the dataset level, based on FAIRsFAIR Data Object Assessment Metrics. At the bottom, there is a blue button with the text 'Click here to assess a dataset'.

F-UJI Home Assess About Methods Docs Code

 **F-UJI** | Automated FAIR Data Assessment Tool

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](#)

# F-UJI (FAIRsFAIR)

## FAIR assessment

F-UJI is a web service to programatically assess FAIRness of research data objects (aka data sets) based on metrics developed by the [FAIRsFAIR](#) project.

Please use the form below to enter an identifier (e.g. DOI, URL) of the data set you wish to assess. Optionally you also can enter a metadata service (OAI-PMH, SPARQL, CSW) endpoint URI which F-UJI can use to identify additional information.

Research Data Object (URL/PID):\*

 Settings

▶ Start FAIR Assessment

# F-UJI (FAIRsFAIR)

## Assessment Results:

### Evaluated Resource:

OpenAIRE Research Graph Dump

✓ Save

↓ {JSON}

↗ New

FAIR level: ?

advanced

Resource PID/URL:

10.5281/zenodo.5801283

DataCite support:

enabled

Metric Version:

metrics\_v0.4

Metric Specification:

<https://doi.org/10.5281/zenodo.4081213>

Software version:

1.4.6

Download assessment results:

[{JSON}](#)

Save and share assessment results:

# F-UJI (FAIRsFAIR)

## Report:

### Findable

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

### Accessible

FsF-A1-01M - Metadata contains access level and access conditions of the data.	✓	▼
FsF-A1-03D - Data is accessible through a standardized communication protocol.	✓	▼
FsF-A1-02M - Metadata is accessible through a standardized communication protocol.	✓	▼

### Interoperable

FsF-I1-01M - Metadata is represented using a formal knowledge representation language.	✓	▼
FsF-I1-02M - Metadata uses semantic resources	✓	▼
FsF-I3-01M - Metadata includes links between the data and its related entities.	✓	▼

### Reusable

FsF-R1-01MD - Metadata specifies the content of the data.	✓	▼
FsF-R1.1-01M - Metadata includes license information under which data can be reused.	✓	▼
FsF-R1.2-01M - Metadata includes provenance information about data creation or generation.	✓	▼
FsF-R1.3-01M - Metadata follows a standard recommended by the target research community of the data.	✓	▼
FsF-R1.3-02D - Data is available in a file format recommended by the target research community.	✓	▼



# F-UJI (FAIR)

## Report:

### Findable

FsF-F1-01D - Data is assigned a g

FsF-F1-02D - Data is assigned a p

FsF-F2-01M - Metadata includes identifier, publisher, publication findability.

FsF-F3-01M - Metadata includes

FsF-F4-01M - Metadata is offered programmatically.

### Accessible

FsF-A1-01M - Metadata contains

FsF-A1-03D - Data is accessible t

FsF-A1-02M - Metadata is access

## FsF-I1-02M - Metadata uses semantic resources



FAIR level: 1 of 3

initial

Score: 0 of 1

Output: []

### Metric tests:

Test:	Test name:	Score:	Maturity:	Result:
FsF-I1-02M-1	Vocabulary namespace URIs can be identified in metadata	1		
FsF-I1-02M-2	Namespaces of known semantic resources can be identified in metadata			

### Debug messages:

Level:	Message:
INFO	Number of vocabulary namespaces extracted from all RDF-based metadata -: 13
INFO	Default vocabulary namespace(s) excluded -: ['http://www.w3.org/1999/xhtml/vocab#', 'http://purl.org/dc/elements/1.1/', 'http://schema.org/', 'http://ogp.me/ns#']
INFO	Check the remaining namespace(s) exists in LOD -: []
WARNING	NO vocabulary namespace match is found
WARNING	Vocabulary namespace (s) or URIs specified but no match is found in LOD reference list (examples) -: ['http://www.openarchives.org/OAI/2.0/oai_dc.xsd', 'http://schema.datacite.org/meta/kernel-3/metadata.xsd', 'http://schema.datacite.org/meta/kernel-4.1/metadata.xsd', 'https://creativecommons.org/licenses/by/4.0', 'http://creativecommons.org/licenses/by', 'https://zenodo.org/record', 'http://datacite.org/schema/', 'http://www.w3.org/1999/xhtml', 'http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd']

resentation

entities.

ta can be reused.

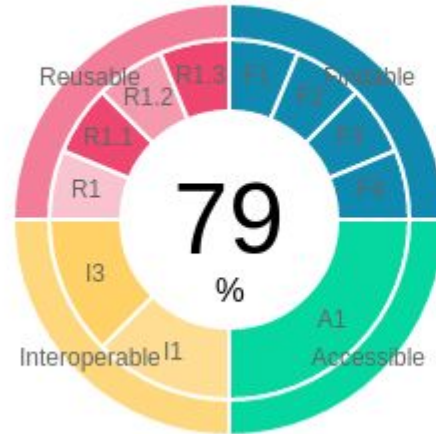
creation or

get research

arget research

# F-UJI (FAIRsFAIR)

## Summary:

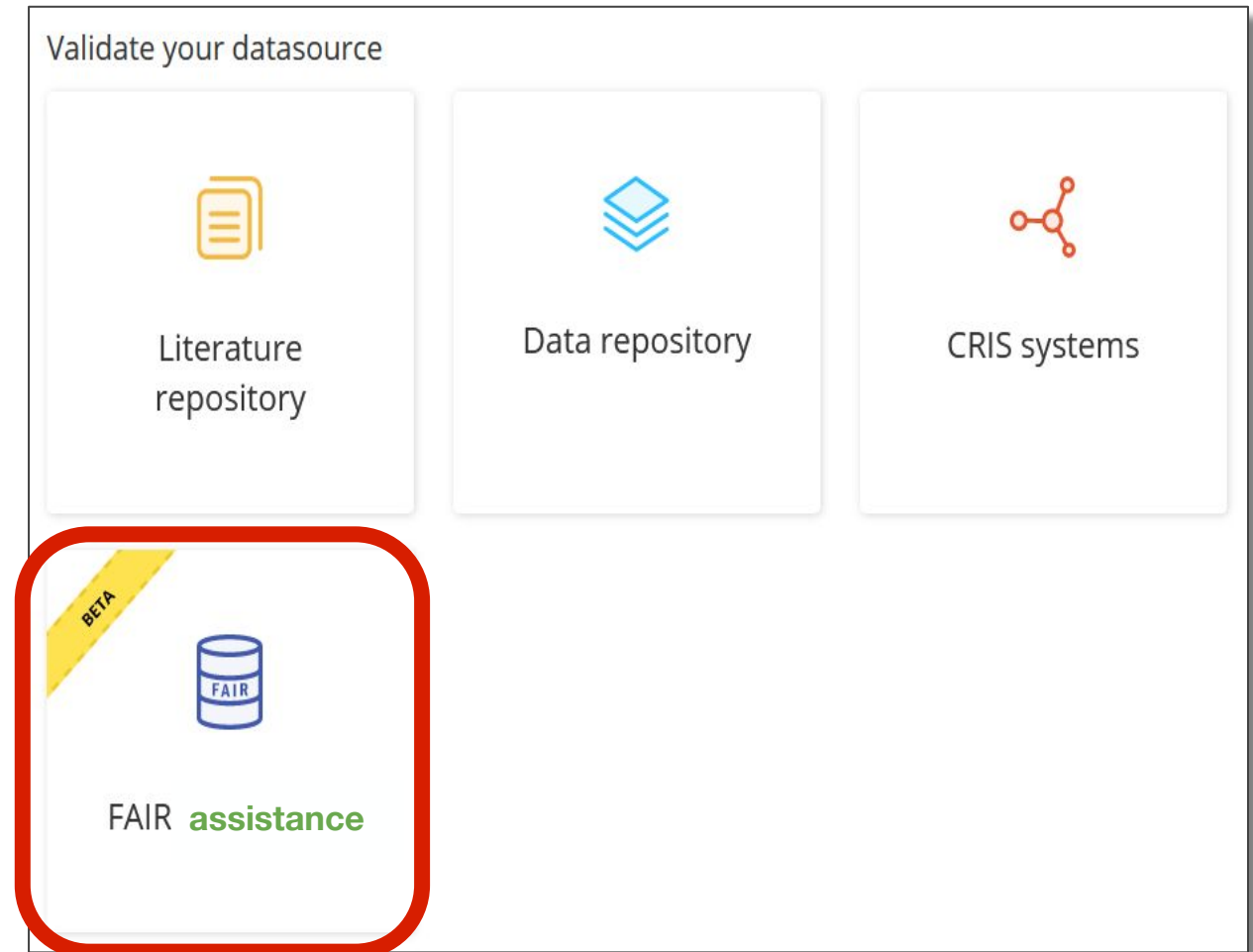


	Score earned:		Fair level:
<b>Findable:</b>	7 of 7		<b>advanced</b>
<b>Accessible:</b>	3 of 3		<b>advanced</b>
<b>Interoperable:</b>	3 of 4		<b>moderate</b>
<b>Reusable:</b>	6 of 10		<b>moderate</b>

**Problem: Nur ein Datensatz wird evaluiert !**

# OpenAIRE Validator – FAIR-Assistance

- <https://provide.openaire.eu>
- Begutachtung der **gesamten Metadaten** eines Repositoriums/FIS



# OpenAIRE Validator – FAIR-Assistance

## Run compatibility test

- 1 Select datasource
- 2 Select guidelines
- 3 Select parameters
- 4 Finish

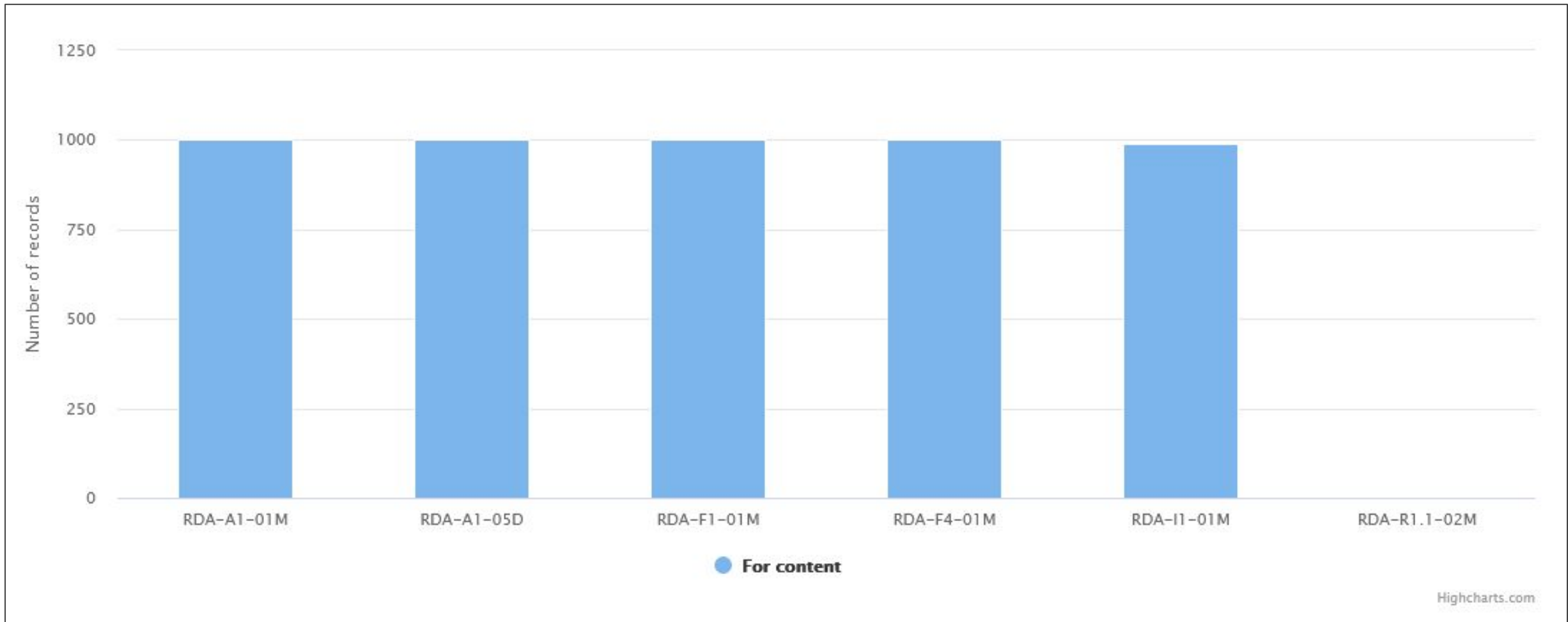
Select base URL from one of your registered repositories

-- none selected --

or enter new

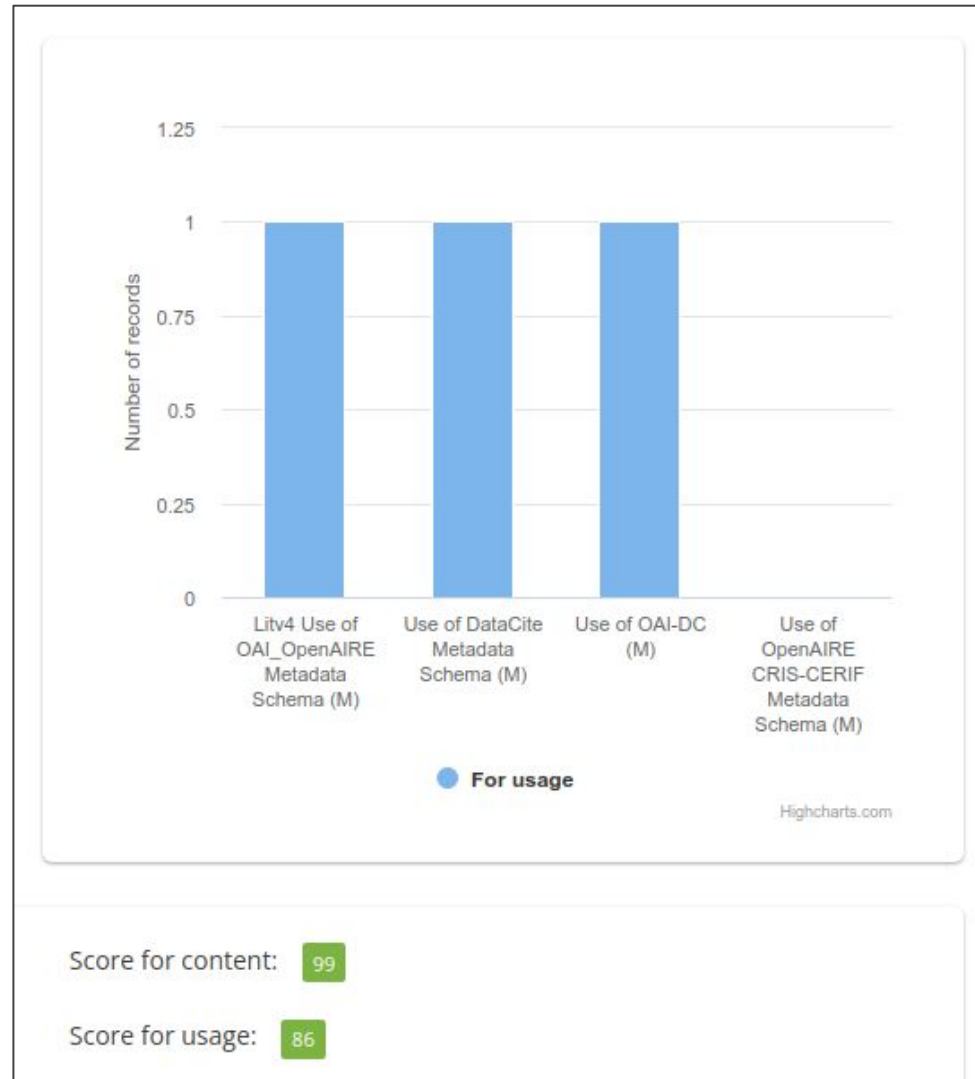
`https://pub.uni-bielefeld.de/oai|`

# OpenAIRE Validator – FAIR-Assistance



# OpenAIRE Validator – FAIR-Assistance

FOR CONTENT		FOR USAGE		
RULE NAME	RULE DESCRIPTION	RULE WEIGHT	# OF RECORDS	STATUS
RDA-A1-01M	Metadata contains information to enable the user to get access to the data.	9	1000/1000	✓
RDA-A1-05D	Data can be accessed automatically (i.e. by a computer program)	9	1000/1000	✓
RDA-F1-01M	Metadata is identified by a persistent identifier.	5	1000/1000	✓
RDA-F4-01M	Metadata is offered in such a way that it can be harvested and indexed.	5	1000/1000	✓
RDA-I1-01M	Metadata uses knowledge representation expressed in standardised format.	9	962/1000	✗ <a href="#">View Errors</a>
RDA-R1.1-02M	Metadata refers to a reuse license	5	961/1000	✗ <a href="#">View Errors</a>



# Ausblick

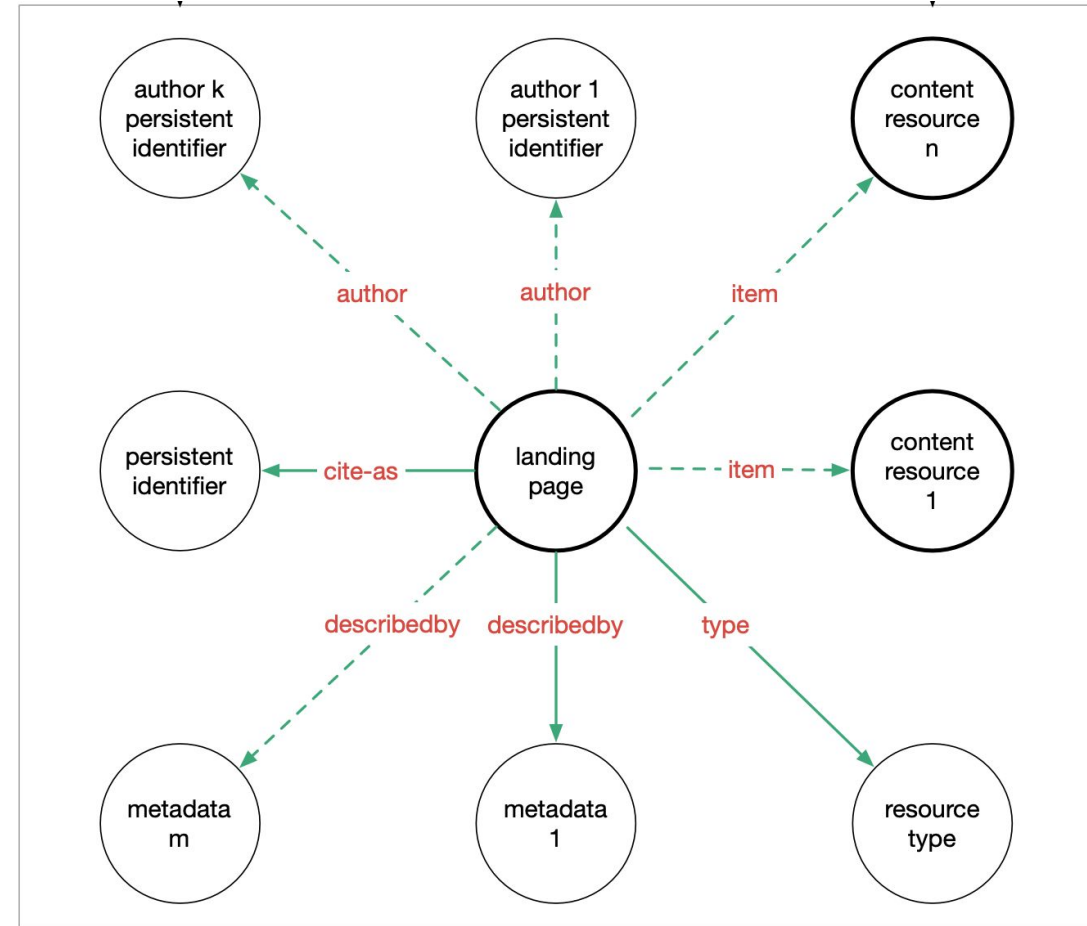
# Communities

- Etablierung neuer Working Groups u.a. bei RDA
  - FAIR Principles for Research Hardware
- Diskussion um Standardisierung der Interpretation der FAIR-Elemente.
- Unterstützung durch Training oder Zertifizierungen von Repositorien.



# Repositories/Evaluator - Tools

- FAIR-SignPosting  
( <https://signposting.org/FAIR/> )
- Standardisierung der Ergebnisse zwischen den FAIR-Evaluatoren.



# Vielen Dank für Ihre/Eure Aufmerksamkeit

und seid FAIR.