FAIR Evaluation

How to test tricky things and

How testing guides improvements in FAIRness
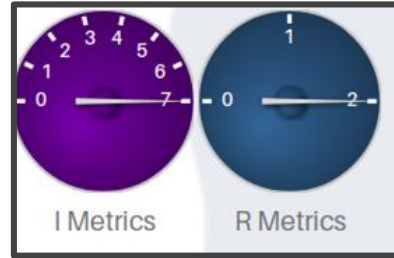
Mark D Wilkinson, presenting to EOSC Nordic, Feb 8, 2022
mark.wilkinson@upm.es

Testing tricky things

"...testing the 'Interoperability' and 'Reusability' principles are particularly hard, it would be valuable for the audience to hear more about the choices that you have made…"
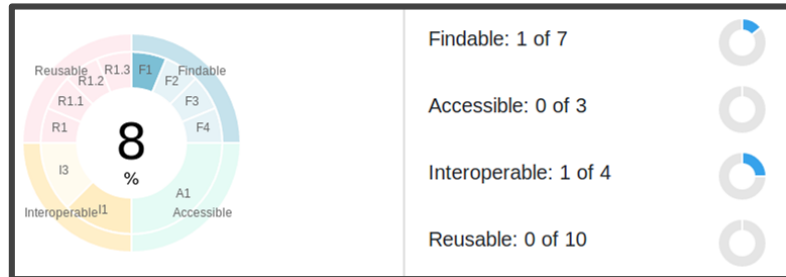
– Bert Meerman, GO FAIR Foundation

First… there seems to be little agreement on these!

The Evaluator

I Metrics   R Metrics

7 Interoperability tests
2 Reusability tests

F-UJI

Findable: 1 of 7

Accessible: 0 of 3

Interoperable: 1 of 4

Reusable: 0 of 10

4 Interoperability tests
10 Reusability tests

This likely reveals **a difference in the software authors' interpretation** of the Principles themselves

The reason The Evaluator has so few "R" tests is that **I personally believe that most of the R principles cannot be tested** in a "generic" way

I interpret the R's as being primarily community-centric Principles

And therefore, IMO, most "R" tests will have to emerge from the various domains and stakeholder communities

The Evaluator Tests

I1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.

Two tests:

Knowledge representation language (weak): Can the machine find ANY structured metadata (including "vanilla" XML, JSON, or other structured metadata)

Knowledge representation language (strong): Can the machine find Linked Data

It tests only the **existence** of this metadata, not its content

The Evaluator Tests

I2. (Meta)data use vocabularies that follow FAIR principles

Two tests:

FAIR Vocabularies (weak):   The machine must find Linked Data. Predicates from that Linked Data are then filtered* and the remaining ones are resolved. If they resolve, they are accepted. ⅔ of the predicates **must resolve** to pass the test. (⅔ is a totally arbitrary number, but that is made clear in the test documentation)

FAIR Vocabularies (strong): The machine must find Linked Data. Predicates from that Linked Data are then filtered* and the remaining ones are resolved. If they resolve to Linked Data, it is accepted. ⅔ of the predicates **must resolve to Linked Data** to pass the test.

The Evaluator Tests

I3. (Meta)data include qualified references to other (meta)data

One test:

Outward Links: The machine must find Linked Data. Objects of triples in that Linked Data are filtered*. They are then checked against the domain of the metadata host. Any Object **URL that is in a domain outside of the host** is acceptable. Only one needs to exist (pretty weak test!)

The Evaluator Tests

R1.1. (Meta)data are released with a clear and accessible data usage license

Two tests:

License (weak):   The machine must find structured metadata. Keys in "hash" style structured data are regexp tested against 'license'. Existence is accepted. Linked data is then tested for one of:
- `http://www.w3.org/1999/xhtml/vocab#license`
- `http://purl.org/ontology/dvia#hasLicense`
- `http://purl.org/dc/terms/license`
- `http://creativecommons.org/ns#license`
- `https://reference.data.gov.au/def/ont/dataset#hasLicense`

If found, the object of that triple must also be a Resource (not a string)

License (strong): As above, but only Linked Data is accepted

I don't think the other "R"s can be tested "generically"

HOWEVER!!!!.....

FAIR Metrics Domain Specific - Use of Rare Disease (RD) specific Search Engines to find the (meta)data of the indexed resource

F4

Description: We extract the title property of the resource from the metadata document and check if the RD specific search engine returns the metadata document of the resource that we are testing.
Created by: Rajaram Kaliyaperumal on Feb 2, 2022 (updated on Feb 2, 2022)
Interface smarlURL: https://w3id.org/rd-fairness-tests/RD-F4

FAIR Metrics Domain Specific - RD-R1 Metadata contains ORDO and HPO terms

R1

Description: A domain-specific test for metadata describing records in the Rare Disease domain. It tests if the metadata contains annotations conforming to the Human Phenotype Ontology URLs or the Orphanet Rare Disease Ontology URLs. One or more of either of these annotations, as the object of any triple, will be sufficient to pass the test.
Created by: Mark D Wilkinson on Jan 21, 2022 (updated on Jan 21, 2022)
Interface smarlURL: https://raw.githubusercontent.com/LUMC-BioSemantics/RD-FAIRmetrics/main/docs/yaml/RD-R1.yml

FAIR Metrics Domain Specific - RD-R1.3 Metadata conforms to EJP RD model

R1.3

Description: A domain-specific test for metadata of resources in the Rare Disease domain. It tests if the metadata is structured conforming to the EJP RD DCAT-based metadata model. No failures in the ShEx validation of the metadata content of the resource against the EJP RD ShEx shapes, will be sufficient to pass the test.
Created by: Núria Queralt Rosinach on Feb 2, 2022 (updated on Feb 2, 2022)
Interface smarlURL: https://w3id.org/rd-fairness-tests/RD-R1-3

FAIR Metrics Domain Specific - Use of Rare Disease (RD) specific Search Engines to find the (meta)data of the indexed resource

F4

Description: We extract the title property of the resource from the metadata document and check if the RD specific search engine returns the metadata document of the resource that we are testing.
Created by: Rajaram Kaliyaperumal on Feb 2, 2022 (updated on Feb 2, 2022)
Interface smarlURL: https://w3id.org/rd-fairness-tests/RD-F4

I *LOVE* that this is happening!

It was always the objective of The Evaluator to enable community/domain-specific testing

Hopefully, this is just the beginning!

FAIR Metrics Domain Specific - RD-R1.3 Metadata conforms to EJP RD model

R1.3

Description: A domain-specific test for metadata of resources in the Rare Disease domain. It tests if the metadata is structured conforming to the EJP RD DCAT-based metadata model. No failures in the ShEx validation of the metadata content of the resource against the EJP RD ShEx shapes, will be sufficient to pass the test.
Created by: Núria Queralt Rosinach on Feb 2, 2022 (updated on Feb 2, 2022)
Interface smarlURL: https://w3id.org/rd-fairness-tests/RD-R1-3

Evaluation-guided FAIRness

"It would also be good if you have some examples where the evaluator has helped to increase the FAIRness levels"

– Bert Meerman, GO FAIR Foundation

http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e

FAIR Data Point

Q Search FAIR Data Point...

FF ▾

The Duchenne Parent Project FAIR Data ... / Exemplar Default Catalog for EOSC ...

Exemplar Default Catalog for EOSC Nordic Meeting

(Owner)   ✎ Edit   ⚙ Settings   🗑 Delete

I was asked to give a demo on how an evaluator can improve the score of a resource.

Datasets

✚ Create

A dataset within the demonstrative catalog

For the EOSC Nordic meeting, as a demo

HP_0000708   HP_0000750   HP_0000819   NCIT_C115805   NCIT_C171133

Issued 01-02-2022   **Modified** 01-02-2022

Metadata Issued
01-02-2022

Metadata Modified
01-02-2022

Conforms to

- **Catalog Profile**

Version
http://w3id.org/duchenne-fdp/abcde

Language
English

License
cc-by-nc-nd3.0

Issued
01-02-2022

Modified
01-02-2022

Home page
duchenne-fdp

The FAIR Evaluator (Commercial Version)

Start new Evaluations:

Your Identifier (ORCID or other): `0000-0000-0000-000X`

Evaluation Descriptive Title: `evaluation for EOSC Nordic`

GUIDs (one per line):
```
http://fdp.duchennedatafou
ndation.org:7070/catalog
/e6bbaa76-3717-48c6-90c3-
280bed592d8e
```

[Evaluate]

Note: **Depending on the number of IDs being tested, and the Collection chosen, this may take several hours...**

Select a Maturity Indicator Collection to Apply:

◉ Collection of all Maturity Indicators written by Mark D Wilkinson version 2

○ test for nuria

○ Only RARE Disease

The FAIR Evaluator (Commercial Version)

Start new Evaluations:

Your Identifier (ORCID or other): `0000-0000-0000-000X`

Evaluation Descriptive Title: `evaluation for EOSC Nordic`

GUIDs (one per line): `http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e`

Select a Maturity Indicator Collection to Apply:

- ⦿ Collection of all Maturity Indicators written by Mark D Wilkinson version 2
- ○ test for nuria
- ○ Only RARE Disease

[Evaluate]

Note: Depending on the number of IDs being tested, and the Collection chosen, this may take several hours...

This is how I hoped The Evaluator would be used!

Test of: http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:14:30 +0000

F Metrics   A Metrics   I Metrics   R Metrics

Test of: http://fdp.duchennedatafoundation.org:7070/cat
alog/e6bbaa76-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:14:30 +0000

F Metrics

A Metrics

I Metrics

R Metrics

Harvester Output

FAIR Metrics Gen2 - Data Identifier Explicitly In Metadata

FAIR Metrics Gen2 - Data Identifier Persistence

FAIR Metrics Gen2 - Grounded Metadata

FAIR Metrics Gen2 - Identifier Persistence

FAIR Metrics Gen2 - Searchable in major search engine

FAIR Metrics Gen2 - Structured Metadata

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

FAIR Metrics Gen2- Unique Identifier

Test of: http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:14:30 +0000

F Metrics A Metrics I Metrics R Metrics

Harvester Output

FAIR Metrics Gen2 - Data Identifier Explicitly In Metadata

FAIR Metrics Gen2 - Data Identifier Persistence

FAIR Metrics Gen2 - Grounded Metadata

FAIR Metrics Gen2 - Identifier Persistence

INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.2.3'

INFO: The metadata GUID appears to be a URL. Testing known URL persistence schemas (pu
FAILURE: The metadata GUID does not conform with any known permanent-URL system.

FAIR Metrics Gen2 - Searchable in major search engine

FAIR Metrics Gen2 - Structured Metadata

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

FAIR Metrics Gen2- Unique Identifier

INFO: The metadata GUID appears to be a URL. Testing known URL persistence schemas (purl, oclc, fdlp, purlz, w3id, ark, doi(as URL).
FAILURE: The metadata GUID does not conform with any known permanent-URL system.

Test of: http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e

Tue, 1 Feb 2022 12:14:30 +0000

F Metrics A Metrics I Metrics R Metrics

Harvester Output

FAIR Metrics Gen2 - Data Identifier Explicitly In Metadata

FAIR Metrics Gen2 - Data Identifier Persistence

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FAIR Metrics Gen2 - Identifier Persistence

FAIR Metrics Gen2 - Searchable in major search engine

FAIR Metrics Gen2 - Structured Metadata

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

```
INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.4.4'

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data
/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc
/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d
/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fd
/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the t
(http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact
```

FAIR Metrics Gen2- Unique Identifier

Test of: http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e

Tue, 1 Feb 2022 12:14:30 +0000

F Metrics   A Metrics   I Metrics   R Metrics

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.4.4'

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data /dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc /identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d /identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fd /e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the t (http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates (["http://purl.org/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier", "http://schema.org/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the test (http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact identifier match is required.

**Test of: http://fdp.duchennedatafoundation.org:7070/cat
alog/e6bbaa76-3717-48c6-90c3-280bed592d8e**

Tue, 1 Feb 2022 12:14:30 +0000

F Metrics   A Metrics   I Metrics   R Metrics

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.4.4'

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data
/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc
/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d
/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fd
/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the t
(http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates
(["http://purl.org/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier",
"http://schema.org/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms/identifier as
a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-
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Tue, 1 Feb 2022 12:14:30 +0000

F Metrics   A Metrics   I Metrics   R Metrics

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.4.4'

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data
/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc
/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d
/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fd
/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the t
(http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates
(["http://purl.org/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier",
"http://schema.org/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms/identifier as
a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-
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3717-48c6-90c3-280bed592d8e). **Exact identifier match is required.**

Test of: http://fdp.duchennedatafoundation.org:7070/cat
alog/e6bbaa76-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:14:30 +0000

F Metrics

A Metrics

I Metrics

R Metrics

Harvester Output

FAIR Metrics Gen2 - Data authentication and authorization

FAIR Metrics Gen2 - Metadata Persistence

FAIR Metrics Gen2 - Metadata authentication and authorization

FAIR Metrics Gen2 - Uses open free protocol for data retrieval

FAIR Metrics Gen2 - Uses open free protocol for metadata retrieval

Test of: http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e

Tue, 1 Feb 2022 12:14:30 +0000

F Metrics   A Metrics   I Metrics   R Metrics

Harvester Output

FAIR Metrics Gen2 - Data authentication and authorization

FAIR Metrics Gen2 - Metadata Persistence

```
INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.2.1'

INFO: Found linked data. Testing for the 'http://www.w3.org/2000/10/swap/pim/doc#persistenceP
WARN: Did not find the #persistencePolicy predicate in the linked data.
FAILURE: was unable to find a persistence policy using any approach.
```

FAIR Metrics Gen2 - Metadata authentication and authorization

FAIR Metrics Gen2 - Uses open free protocol for data retrieval

FAIR Metrics Gen2 - Uses open free protocol for metadata retrieval

INFO: Found linked data. Testing for the 'http://www.w3.org/2000/10/swap/pim/doc#persistencePolicy' predicate.
WARN: Did not find the #persistencePolicy predicate in the linked data.
FAILURE: was unable to find a persistence policy using any approach.

We're still working on the Duchenne Parent Project metadata persistence policy document, so I cannot solve that problem

(…but at least The Evaluator told me exactly
what I have to do to solve it!)

We're still working on the Duchenne Parent Project metadata persistence policy document, so I cannot solve that problem

(…but at least The Evaluator told me exactly
what I have to do to solve it!)

The other two problems I can solve immediately!

And the Evaluator told me that both problems
had the same "root"

INFO: The metadata GUID appears to be a URL. Testing known URL persistence schemas (purl, oclc, fdlp, purlz, w3id, ark, doi(as URL)).
FAILURE: The metadata GUID does not conform with any known permanent-URL system.

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates (["http://purl.org/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier", "http://schema.org/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the test (http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). **Exact identifier match is required.**

INFO: The metadata GUID appears to be a URL. Testing known URL persistence schemas (purl, oclc, fdlp, purlz, w3id, ark, doi(as URL)).
FAILURE: The metadata GUID does not conform with any known permanent-URL system.

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates (["http://purl.org/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier", "http://schema.org/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the test (http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). **Exact identifier match is required.**

https://w3id.org/duchenne-fdp

A PURL system using an .htaccess record to redirect

```
Options +FollowSymLinks
RewriteEngine on
RewriteRule ^app/?(.*) http://fdp.duchennedatafoundation.org:7070/$1 [R=307,L]
RewriteRule ^home/?(.*) http://fdp.duchennedatafoundation.org:7070/$1 [R=307,L]
RewriteRule ^/?(.*) http://fdp.duchennedatafoundation.org:7070/$1 [R=307,L]
```

http://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e

FAIR Data Point

The Duchenne Parent Project FAIR Data ... / Exemplar Default Catalog for EOSC ...

Exemplar Default Catalog for EOSC Nordic Meeting

Owner   ✏ Edit   ⚙ Settings   🗑 Delete

I was asked to give a demo on how an evaluator can improve the score of a resource.

Datasets   ➕ Create

A dataset within the demonstrative catalog

For the EOSC Nordic meeting, as a demo

HP_0000708   HP_0000750   HP_0000819   NCIT_C115805   NCIT_C171133

Issued 01-02-2022   **Modified** 01-02-2022

Metadata Issued   Metadata Modified
01-02-2022   01-02-2022

Conforms to

• **Catalog Profile**

Version
http://w3id.org/duchenne-fdp/abcde

Language
English

License
cc-by-nc-nd3.0

Issued
01-02-2022

Modified
01-02-2022

Home page
duchenne-fdp

What do you think the score will be now?

Did I solve both of the "F" problems?

What do you think the score will be now?

Did I solve both of the "F" problems?

INFO: The metadata GUID appears to be a URL. Testing known URL persistence schemas (purl, oclc, fdlp, purlz, w3id, ark, doi(as URL)).
FAILURE: The metadata GUID does not conform with any known permanent-URL system.

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates (["http://purl.org/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier", "http://schema.org/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the test (http://fdp.duchennedatafoundation.org:7070/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact identifier match is required.

What do you think the score will be now?

Did I solve both of the "F" problems?

(THIS is why testing is so useful!!)

Test of: http://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:45:49 +0000

F Metrics   A Metrics   I Metrics   R Metrics

I only moved from 5 to 6… what tests am I still failing?

Test of: http://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:45:49 +0000

F Metrics
A Metrics
I Metrics
R Metrics

Harvester Output

FAIR Metrics Gen2 - Data Identifier Explicitly In Metadata

FAIR Metrics Gen2 - Data Identifier Persistence

FAIR Metrics Gen2 - Grounded Metadata

FAIR Metrics Gen2 - Identifier Persistence

FAIR Metrics Gen2 - Searchable in major search engine

FAIR Metrics Gen2 - Structured Metadata

FAIR Metrics Gen2- Metadata Identifier Explicitly In Metadata

FAIR Metrics Gen2- Unique Identifier

?!?!?!??

Didn't I fix that
problem?

Can you see it?

```
INFO: TEST VERSION 'Hvst-1.4.1public:Tst-0.4.4'

INFO: Linked Data Found. Now searching for the metadata identifier using appropriate linked data predicates (["http://purl.org
/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier", "http://schema.org
/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms
/identifier as a string or URI.
FAILURE: While (apparent) metadata record identifiers were found (["https://w3id.org/duchenne-fdp/catalog
/e6bbaa76-3717-48c6-90c3-280bed592d8e"]) none of them matched the initial GUID provided to the test (http://w3id.org/duchenne-
fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e). Exact identifier match is required.
```

Can you see it?

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/dc/elements/1.1/identifier", "https://purl.org/dc/elements/1.1/identifier", "http://purl.org/dc/terms/identifier", "http://schema.org
/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
INFO: found identifier 'https://w3id.org/duchenne-fdp/catalog/e6bbaa76-3717-48c6-90c3-280bed592d8e' using http://purl.org/dc/terms
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/identifier", "https://purl.org/dc/terms/identifier", "https://schema.org/identifier"]).
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OOPS!! Be consistent with the GUIDs in my metadata record!!!

Test of: https://w3id.org/duchenne-fdp/catalog/e6bbaa76
-3717-48c6-90c3-280bed592d8e
Tue, 1 Feb 2022 12:58:23 +0000

F Metrics A Metrics I Metrics R Metrics

20/22 Tests Pass

I built this exemplar from scratch

in less than an hour

starting from a "native" FDP record and manually improving it
"in real time"

to show how to quickly achieve improvements via testing

If I called the Bing API to index my FDP

And if I added another triple pointing at my
persistence policy

I could have achieved a 100% perfect FAIRness score
in less than 2 hours

Evaluation even told me when I had failed to fix a problem
I thought I had fixed!!!

Conclusion:

FAIR Evaluation is extremely useful
in guiding the path to FAIRness

My Future for FAIR Testing

- **"Apples to Apples" workshops (this week!)**
  - Discuss with wide range of stakeholders **what are the appropriate paths to follow to find metadata** about a digital object?
- **Evolve away from "FAIR Assessment" to "FAIR Assistance"**
  - Bad assessment scores can be **demoralizing**!
  - The Evaluator output is ~helpful… **but only for geeks!**
  - **Connect the Evaluator to the new FAIRsharing API** and use FAIRsharing (likely together with a community-specific FIP) to **provide clear and accurate advice on HOW to solve a metric test failure.**
  - **FAIRsharing already indexes the Maturity Tests** used by The Evaluator, and **is linking them to FIPs** such that this **Assistance will automatically update** along with FAIRsharing
- **I have turned The Evaluator's metadata harvesting workflow into a Web Service**. Can be used by anyone to help harmonize the metadata gathering approach prior to running tests.

FAIRsharing.org
standards, databases, policies