



FAIRSFair
Fostering Fair Data Practices in Europe

FAIR Digital Objects and FAIR Semantics

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Semantics: a first class citizen for FAIR



- **Interoperable**

- I1. (meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation
- I2. (meta)data use vocabularies that follow FAIR principles
- I3. (meta)data include qualified references to other (meta)data

FAIR principles: <https://www.go-fair.org/fair-principles/>



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← **FAIR Semantics**

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FAIR Semantics recommendations

- Based on community inputs
- First version released in March 2020
 - DOI: [10.5281/zenodo.3707984](https://doi.org/10.5281/zenodo.3707984).
- Second version released in January 2021
 - DOI: [10.5281/zenodo.4314320](https://doi.org/10.5281/zenodo.4314320)
- 17 generic recommendations and 14 best practices recommendations

Recommendations v2

- Alignment with RFC 2119 (MUST, SHOULD, MAY)

- 9 MUST
- 7 SHOULD
- 1 MAY
- 1 Undertermined

December 18, 2020

Project deliverable Open Access

D2.5 FAIR Semantics Recommendations Second Iteration

 Hugo, Wim;  Le Franc, Yann;  Coen, Gerard;  Parland-von Essen, Jessica;  Bonino, Luiz

This document is the second iteration of recommendations for making semantic artefacts FAIR. These recommendations result from initial discussions during a brainstorming workshop organised by FAIRsFAIR as a co-located event with the 14th RDA Plenary meeting in Helsinki. Based on the feedback received there, 17 preliminary recommendations related to one or more of the FAIR principles, and 10 best practice recommendations on semantic artefacts were documented. These recommendations were first published as [Deliverable 2.2](#) at the beginning of 2020^[1]. Following various dissemination and stakeholder engagement activities, including an evaluation workshop held in October 2020, this second iteration of recommendations and best practices are proposed.

Deliverable 2.5 is a complete, reviewed and improved version of D2.2. D2.5 supersedes D2.2

^[1] <https://doi.org/10.5281/zenodo.3707984>

Preview

Page: 1 of 65 Automatic Zoom

274

views

225

downloads

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Indexed in

OpenAIRE

Publication date:

December 18, 2020

DOI:

DOI [10.5281/zenodo.4314321](https://doi.org/10.5281/zenodo.4314321)

Provide feedbacks: GitHub

GitHub is being used by the team to collect feedback:

<https://github.com/FAIRsFAIR/FAIRSemantics>

Use of labels:

Please use "Clarification Needed" where you feel like a recommendation lacks clarity

Clarification Needed

Please use "Relevance" to comment on the relevance (or lack thereof) for the stakeholder you represent.

Relevance

Please use "Implementation Example" to suggest practical implementations or initiatives that are missing for this recommendation.

Implementation Example

It is also possible to submit problems encountered, suggestions, questions, recommendation proposals etc. as issues.

New issue

Identifier

Rec #	Recommendation	FAIR Principle
P-Rec. 1	Globally Unique, Persistent and Resolvable Identifiers MUST be used for Semantic Artefacts, their content (terms/concepts/classes and relations) and their versions	F1
P-Rec. 2	Globally Unique, Persistent and Resolvable Identifiers MUST be used for Semantic Artefact Metadata Record. Metadata and data must be published separately, even if it is managed jointly	F1, F3

Metadata

Rec #	Recommendations	FAIR principle
P-Rec 3	A common minimum metadata schema MUST be used to describe semantic artefacts and their content	F2, R1.1, R1.2 and R1.3
P-Rec. 8	Human and machine-readable persistence policies for semantic artefacts metadata and data MUST be published	A2
P-Rec. 9	Semantic artefacts MUST be made available as a minimum portfolio of common serialization formats	I1
P-Rec. 14	Standard vocabularies SHOULD be used to describe semantic artefacts	I2
P-Rec. 15	Provenance information regarding the reuse of components from third-party semantic artefacts SHOULD be made explicit	I3, R1.2
P-Rec. 16	The semantic artefact MUST be clearly licenced for use by machines and humans	R1.1
P-Rec. 17	Provenance MUST be clear for both humans and machine	R1.2

Repository

Rec #	Recommendation	FAIR Principles
P-Rec. 4	Semantic Artefact and its content SHOULD be published in a trustworthy semantic repository	F4
P-Rec.5	Semantic repositories MUST offer access to Semantic Artefacts and their content using community standard APIs and serializations to support both use/reuse and indexation by search engines	F4, A1, A1.1
P- Rec. 6	Build semantic artefacts' search engines that operate across different semantic repositories	F4
P-Rec. 7	Repositories MUST offer a secure access protocol and appropriate user access control functionalities	A1.2

« Semantic alignment »

Rec #	Recommendations	FAIR Principles
P-Rec. 10	Foundational Ontologies MAY be used to align semantic artefacts	I1, I2, I3
P-Rec. 11	A standardized knowledge representation language SHOULD be used for describing complex logical relations (semantic artefact)	I1
P-Rec. 12	Semantic mappings between the different elements of semantic artefacts SHOULD be published in machine-readable formats	I1, I3, R1.3
P-Rec. 13	Crosswalks, mappings and bridging between semantic artefacts SHOULD be documented, published and curated	R1.2, R1.3

Metadata

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Need for a common description for Semantic artefacts

- DCAT representation of Semantic artefacts
- FDO representation of Semantic artefacts

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- DCAT representation of Semantic artefacts (C. Jonquet, L. Bonino)
- FDO representation of Semantic artefacts (GO FAIR INTER)

Need for a common description for Semantic artefacts

- DCAT representation of Semantic artefacts (C. Jonquet, L. Bonino)
- FDO representation of Semantic artefacts (GO FAIR INTER)
- Minimum Metadata for FAIR Semantic artefact (C. Jonquet)

Minimum metadata for FAIR Semantic Artefacts

- 74 participants
- Selected mandatory, recommended and optional fields from DCAT
- Selected mandatory, recommended and optional fields from extended set of metadata specific to semantic artefacts



The image is a promotional poster for an event. On the left, there is a stylized graphic of a grey hexagonal frame containing the text 'SEMANTIC WEB' in red, bold, sans-serif capital letters. To the right of this frame are several red icons: a network diagram, a cursor arrow, and a circular icon with a fork and spoon. In the top right corner, the FAIRSFair logo is displayed, consisting of a blue circular icon with two arrows and the text 'FAIRSFair' in blue, with the tagline 'Fostering Fair Data Practices in Europe' below it. The main title of the event, 'Common Minimum Metadata for Semantic Artefact', is written in bold blue text. Below the title, the date '4 June 2021' and the time '09:30 - 13:00 CEST' are listed in blue text, separated by a horizontal line.

FAIRSFair
Fostering Fair Data Practices in Europe

**Common Minimum
Metadata for
Semantic Artefact**

4 June 2021
09:30 - 13:00 CEST

DCAT-AP for Semantic Artefact

- 74 participants
- Selected mandatory, recommended and optional fields from DCAT
- Selected mandatory and recommended set of fields specific to semantic artefacts

LINK WITH FAIR DIGITAL OBJECT?



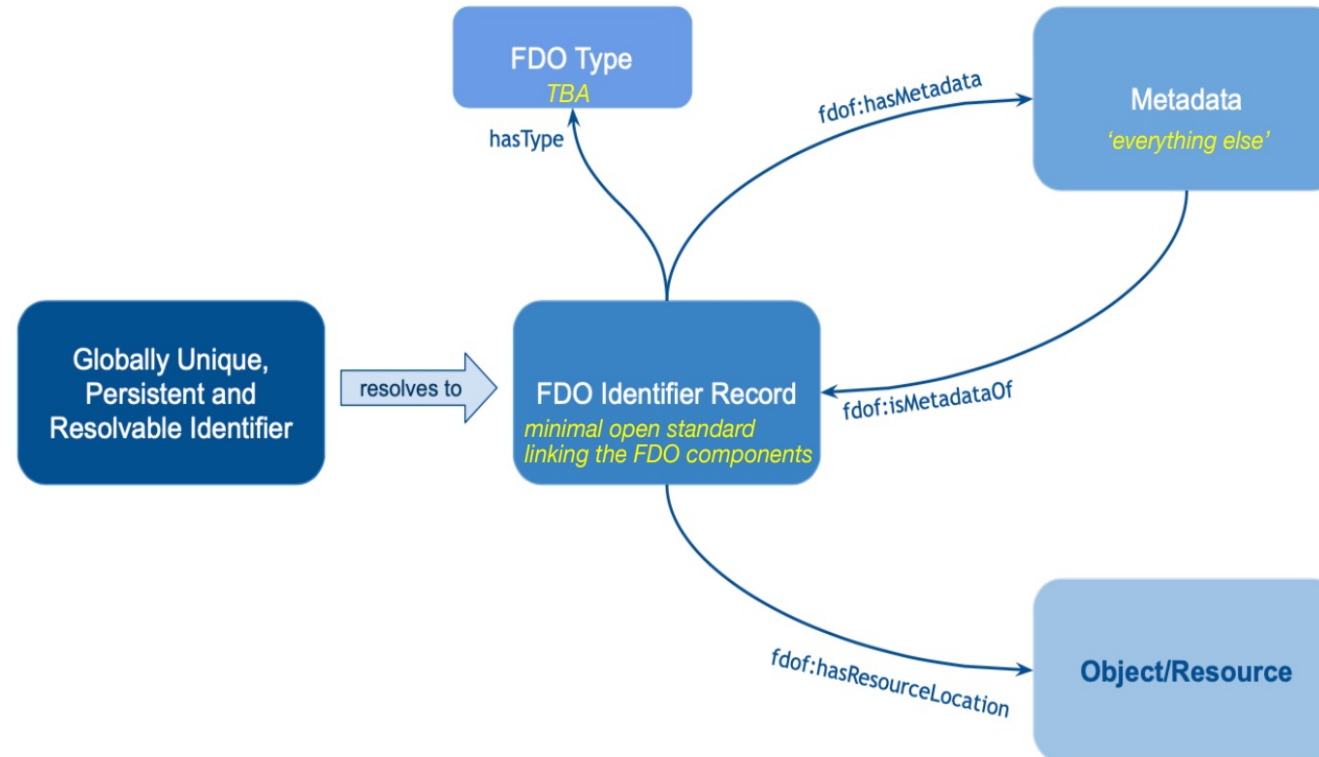
Semantic artefacts as FDO

- Discussed during the GOFAIR INTER Hackathon (May 18-19, July 1-2 2020)
- Investigated FDO-F within the context of Linked Data Framework
- Tentative ontology for FDO-F

Semantic artefact and FDO? A simple use-case

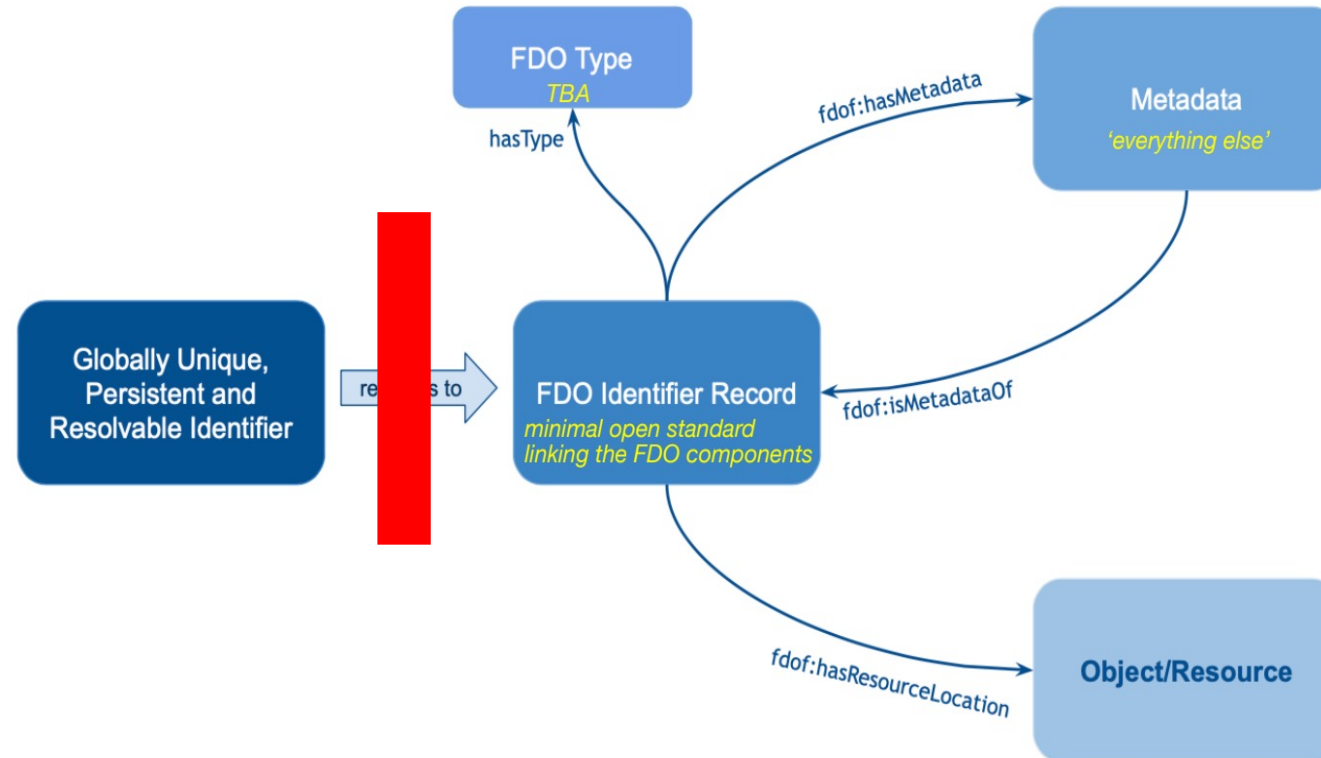
- A csv table of fake hourly measurements of lead concentrations in Tames (time serie)
- Semantic artefacts considered: Complex Properties Model (OWL) and EnvThes (SKOS)
- How do we represent the csv table as FDO? How do we represent semantic artefact as FDO? How do we link both?

Investigating the FAIR Digital Object

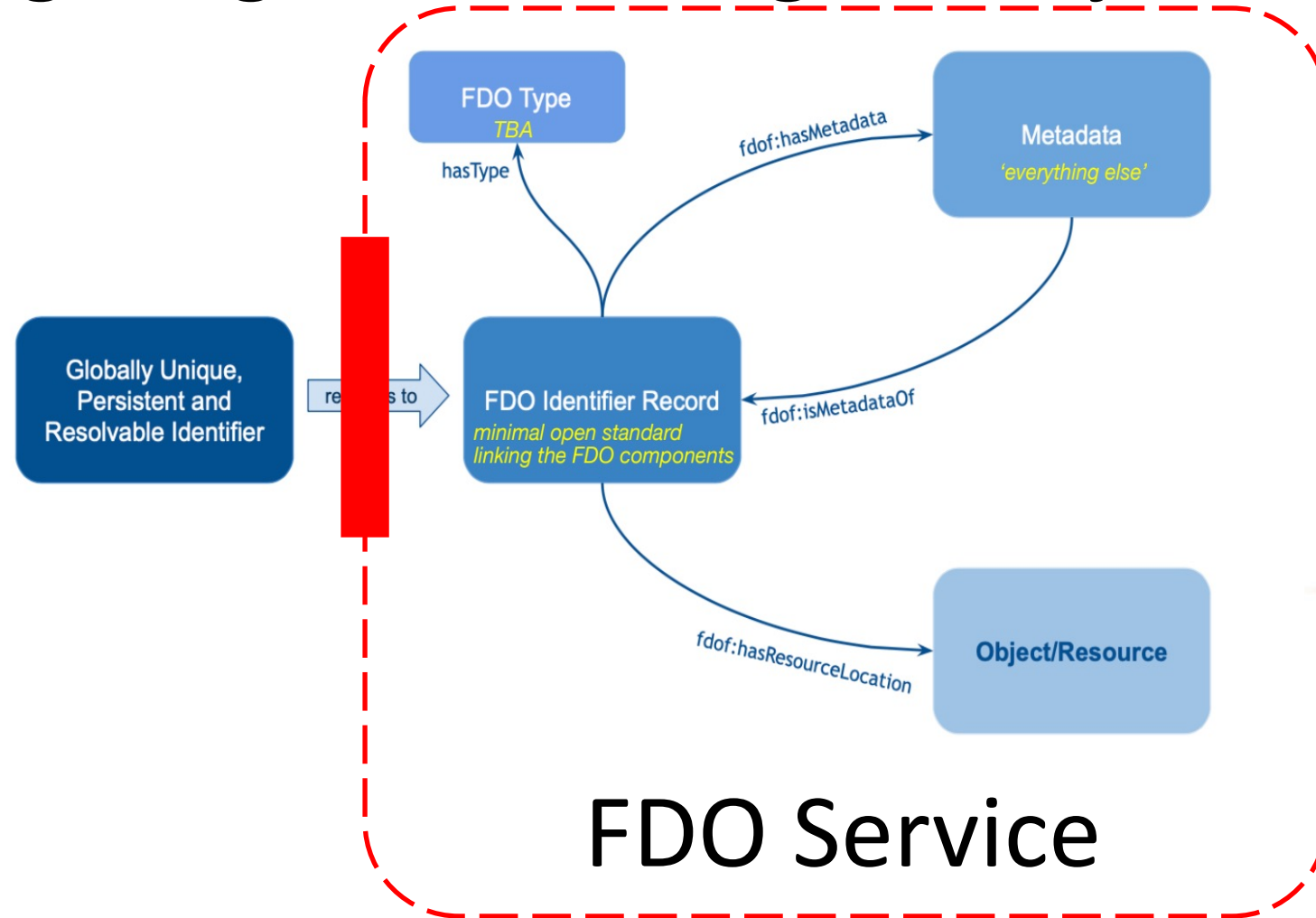


Bonino, 2019

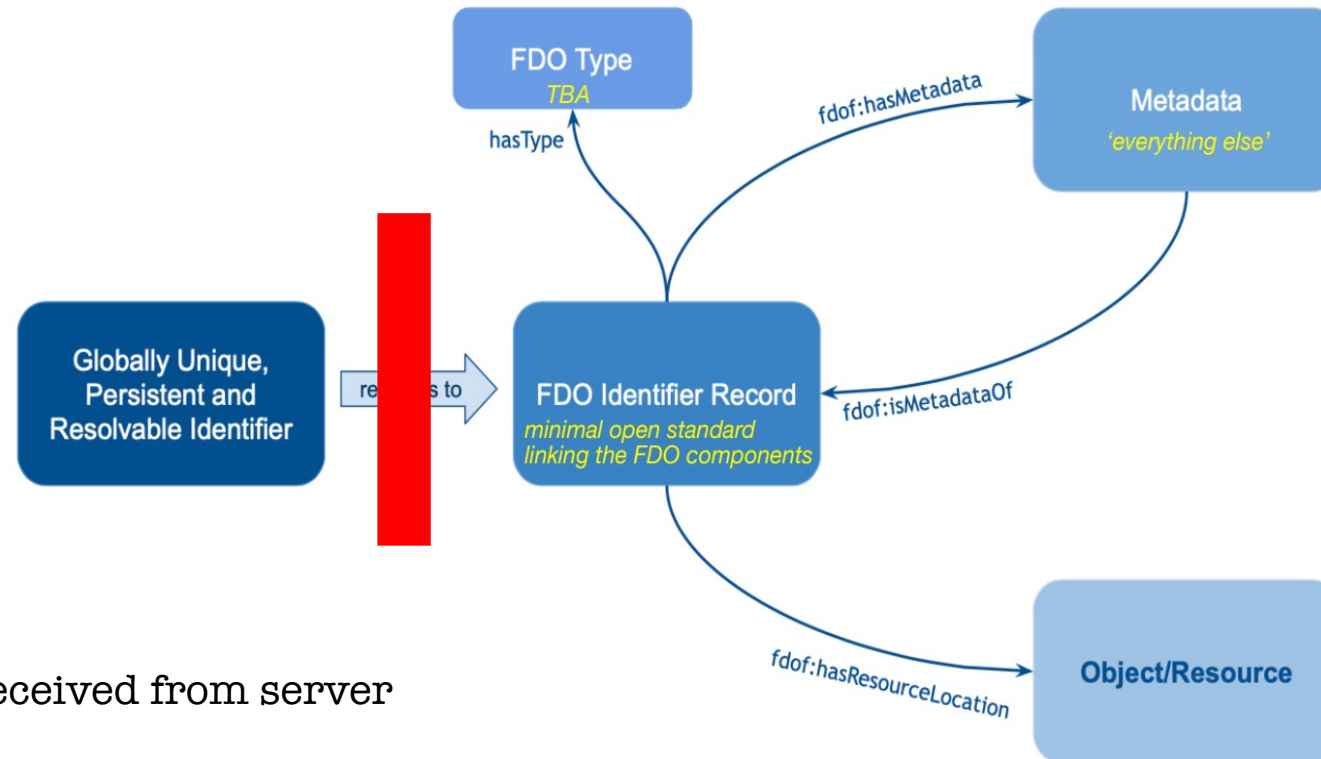
Investigating the FAIR Digital Object



Investigating the FAIR Digital Object



Investigating the FAIR Digital Object



Received from server

FDO Identifier Record

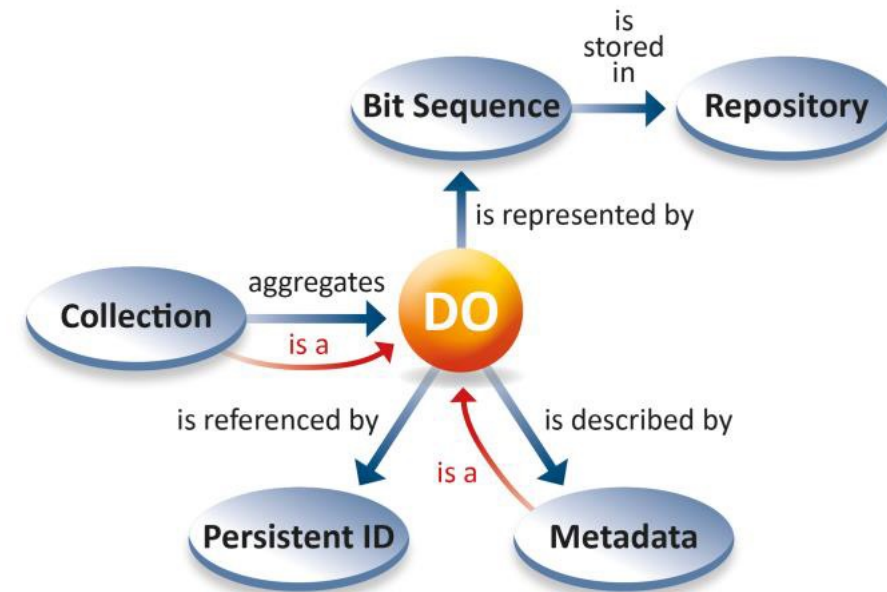
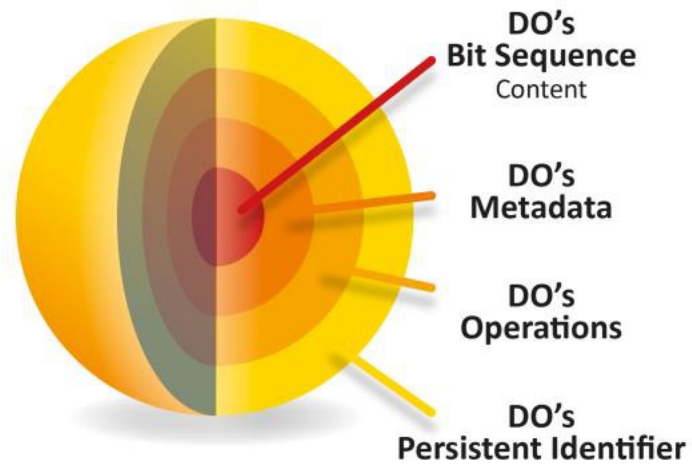
hasIdentifier: www.example.org/myleadmeasurement-180520/

hasMetadata: www.example.org/myleadmeasurement-180520/metadata

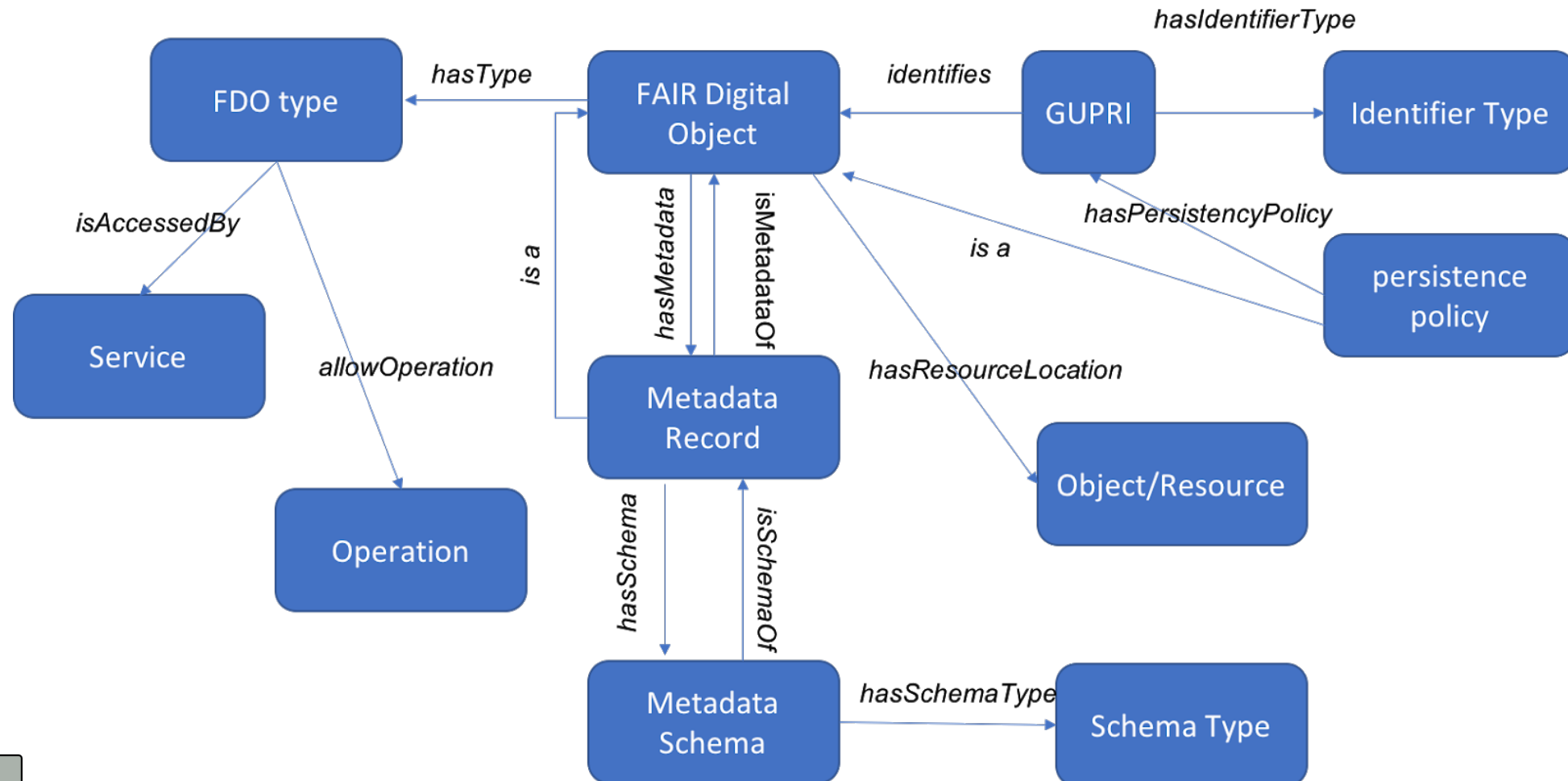
hasType: csv table

hasResourceLocation: www.example.org/myleadmeasurement-180520/table.csv.

Investigating the origin: Digital Object model



A tentative model



Next steps

- Define operations of the FDO service and model
- Apply model to use-case:
 - FDO description for Semantic artefacts
 - investigate link between data and concepts from semantic artefacts in the context of FDO
- Link with the minimum metadata for FAIR semantic artefacts based on DCAT