IRI:
urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology

Other visualisation:
Ontology source

Abstract

dct:title

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Classes

accessible[C]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Accessible

stored for long term so that they can easily be accessed and/or downloaded with well-defined access conditions, whether at the level of metadata, or at the level of the actual data. Once the user finds the required data, she/he needs to know how can they be accessed, possibly including authentication and authorisation.

has super-classes

f a i r [c]

has sub-classes

accessible metadata [c], standardised communication protocol [c]

is in range of

should be [op]

is disjoint with

findable [c], interoperable [c], reusable [c]

accessible metadata[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#AccessibleMetadata

A2: Metadata should be accessible even when the data is no longer available: Datasets tend to degrade or disappear over time because there is a cost to maintaining an online presence for data resources. When this happens, links become invalid and users waste time hunting for data that might no longer be there. Storing the metadata generally is much easier and cheaper. Hence, principle A2 states that metadata should persist even when the data are no longer sustained. A2 is related to the registration and indexing issues described in F4.

has super-classes

accessible [c]

is in domain of

retrievable by [op], using [op]

article[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Article

has super-classes

digital resource [c]

is disjoint with

data set [c], software [c]

authentication authorisation[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#AuthenticationAuthorisation

A1.2: The protocol allows for an authentication and authorisation where necessary The ‘A’ in FAIR does not necessarily mean ‘open’ or ‘free’. Rather, it implies that one should provide the exact conditions under which the data are accessible. Hence, even heavily protected and private data can be FAIR.

has super-classes

standardised communication protocol [c]

has members

authentication [ni], authorisation [ni]

data set[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#DataSet

has super-classes

digital resource [c]

is disjoint with

article [c], software [c]

domain relevant community standards[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Domain-relevantCommunityStandards

R1.3: (Meta)data meet domain-relevant community standards

It is easier to reuse data sets if they are similar: same type of data, data organised in a standardised way, well-established and sustainable file formats, documentation (metadata) following a common template and using common vocabulary. If community standards or best practices for data archiving and sharing exist, they should be followed. For instance, many communities have minimal information standards (e.g., MIAME, MIAPE). FAIR data should at least meet those standards. Other community standards may be less formal, but nevertheless, publishing (meta)data in a manner that increases its

use(ability) for the community is the primary objective of FAIRness. In some situations, a submitter may have valid and specified reasons to divert from the standard good practice for the type of data to be submitted. This should be addressed in the metadata. Note that quality issues are not addressed by the FAIR principles. The data's reliability lies in the eye of the beholder and depends on the intended application.

has super-classes

rich accurate relevant metadata [c]

f a i r vocabulary[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#FAIRVocabulary

I2: (Meta)data use vocabularies that follow the FAIR principles The controlled vocabulary used to describe datasets needs to be documented and resolvable using globally unique and persistent identifiers. This documentation needs to be easily findable and accessible by anyone who uses the dataset.

has super-classes

interoperable [c]

findable[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Findable

Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services, so this is an essential component of the FAIRification process.

has super-classes

f a i r [c]

has sub-classes

globally unique persistent identifier [c], rich metadata [c], searchable resource [c]

is in range of

should be [op]

is disjoint with

accessible [c], interoperable [c], reusable [c]

globally unique persistent identifier[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#GloballyUniquePersistentIdentifier

F1: Research output are assigned globally unique and persistent identifiers: Globally unique and persistent identifiers remove ambiguity in the meaning of your published data by assigning a unique identifier to every element of metadata and every concept/measurement in your dataset or any digital research output. In this context, identifiers consist of an internet link (e.g., a URL that resolves to a web page that defines the concept such as a particular human protein).

has super-classes

findable [c]

is in range of

include [op], retrievable by [op]

has members

d o i [ni]

interoperable[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Interoperable

The data usually need to be integrated with other data. In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

has super-classes

f a i r [c]

has sub-classes

f a i r vocabulary [c], knowledge representation [c], qualified cross reference [c]

is in range of

should be [op]

is disjoint with

accessible [c], findable [c], reusable [c]

knowledge representation[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#KnowledgeRepresentation

I1: (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation: Humans should be able to exchange and interpret each other's data (so preferably do not use dead languages). But this also applies to computers, meaning that data that should be readable for machines without the need for specialised or ad hoc algorithms, translators, or mappings. Interoperability typically means that each computer system at least has knowledge of the other system's data exchange formats.

has super-classes

interoperable [c]

provenance[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Provenance

has super-classes

rich accurate relevant metadata [c]

is also defined as

named individual

qualified cross reference[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#QualifiedCrossReference

I3: (Meta)data include qualified references to other (meta)data A qualified reference is a cross-reference that explains its intent. The goal therefore is to create as many meaningful links as possible between (meta)data resources to enrich the contextual knowledge about the data, balanced against the time/energy involved in making a good data model. To be more concrete, you should specify if one dataset builds on another data set, if additional datasets are needed to complete the data, or if complementary information is stored in a different dataset. In particular, the scientific links between the datasets need to be described. Furthermore, all datasets need to be properly cited (i.e., including their globally unique and persistent identifiers).

has super-classes

interoperable [c]

reusable[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Reusable

The ultimate goal of FAIR is to optimise the reuse of data. Data should be ready to be Reused for future research and to be further processed using computational methods. This requires adequate information about how the data were obtained and processed (provenance) and an appropriate license.

has super-classes

f a i r [c]

has sub-classes

rich accurate relevant metadata [c]

is in range of

should be [op]

is disjoint with

accessible [c], findable [c], interoperable [c]

rich accurate relevant metadata[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#RichAccurateRelevantMetadata

R1: (Meta)data are richly described with a plurality of accurate and relevant attributes

It will be much easier to find and reuse data if there are many labels are attached to the data. Principle R1 is related to F2, but R1 focuses on the ability of a user (machine or human) to decide if the data is actually USEFUL in a particular context. To make this decision, the data publisher should provide not just metadata that allows discovery, but also metadata that richly describes the context under which the data was generated. This may include the experimental protocols, the manufacturer and brand of the machine or sensor that created the data, the species used, the drug regime, etc. Moreover, R1 states that the data publisher should not attempt to predict the data consumer's identity and needs. We chose the term 'plurality' to indicate that the metadata author should be as generous as possible in providing metadata, even including information that may seem irrelevant.

has super-classes

reusable [c]

has sub-classes

domain relevant community standards [c], provenance [c], usage license [c]

rich metadata[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#RichMetadata

F2: Research output are described with rich metadata: Rich metadata allow a computer to automatically accomplish routine and tedious sorting and prioritising tasks that currently demand a lot of attention from researchers. The rationale behind this principle is that someone should be able to find research output based on the information provided by their metadata, even without their identifier.

has super-classes

findable [c]

is in domain of

include [op]

has members

communication protocol [ni], contact email [ni], contact name [ni], description [ni], format [ni], issued [ni], landing page [ni], language [ni], license [ni], modified [ni], o r c i d [ni], provenance [ni], public access level [ni], publisher [ni], references [ni], software code [ni], title [ni], unique identifier [ni]

searchable resource[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#SearchableResource

F4: (Meta)data are registered or indexed in a searchable resource: Identifiers and rich metadata descriptions alone will not ensure ‘findability’ on the internet. Perfectly good data resources may go unused simply because no one knows they exist. If the availability of a digital resource such as a dataset, service or repository is not known, then nobody (and no machine) can discover it. There are many ways in which digital resources can be made discoverable, including indexing.

has super-classes

findable [c]

has members

registry index [ni]

software[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Software

has super-classes

digital resource [c]

is disjoint with

article [c], data set [c]

standardised communication protocol[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#StandardisedCommunicationProtocol

A1: (Meta)data are retrievable by their identifier using a standardised communication protocol: Protocol called tcp, that the computer executes to load data in the user's web browser. (Note that http(s) or ftp, which form the backbone of modern internet, are built on tcp, and make requesting and providing digital resources substantially easier than other communication protocols.)

has super-classes

accessible [c]

has sub-classes

authentication authorisation [c], universal open free [c]

is in range of

using [op]

has members

communication protocol [ni]

universal open free[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#UniversalOpenFree

A1.1: The protocol is open, free and universally implementable To maximise data reuse, the protocol should be free (no-cost) and open (-sourced) and thus globally implementable to facilitate data retrieval. Anyone with a computer and an internet connection can access at least the metadata.

has super-classes

standardised communication protocol [c]

has members

communication protocol [ni]

usage license[c]

back to ToC or Class ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#UsageLicense

R1.1: (Meta)data are released with a clear and accessible data usage license R1.1 is about legal interoperability. What usage rights do you attach to your data? This should be described clearly. Ambiguity could severely limit the reuse of your data by organisations that struggle to comply with licensing restrictions. Clarity of licensing status will become more important with automated searches involving more licensing considerations. The conditions under which the data can be used should be clear to machines and humans.

has super-classes

rich accurate relevant metadata [c]

Object Properties

include retrievable by should be using

include[op]

back to ToC or Object Property ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Include

has characteristics: functional

has domain

rich metadata [c]

has range

globally unique persistent identifier [c]

retrievable by[op]

back to ToC or Object Property ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#retrievableBy

has characteristics: functional

has domain

accessible metadata [c]

has range

globally unique persistent identifier [c]

should be[op]

back to ToC or Object Property ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#shouldBe

has characteristics: functional

has domain

f a i r [c]

has range

accessible [c]

findable [c]

interoperable [c]

reusable [c]

using[op]

back to ToC or Object Property ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#using

has characteristics: functional

has domain

accessible metadata [c]

has range

standardised communication protocol [c]

Data Properties

identifier issued

identifier[dp]

back to ToC or Data Property ToC

IRI: http://purl.org/dc/terms/identifier

DOI (Digital Object Identifier)

Identifer for academic, professional, and government information.

issued[dp]

back to ToC or Data Property ToC

IRI: http://purl.org/dc/terms/issued

has super-properties
top data property

Named Individuals

authentication authorisation communication protocol communication protocol contact email contact name d o i description format issued landing page language license modified o r c i d provenance public access level publisher references registry index software code title unique identifier

authentication[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Authentication

belongs to

authentication authorisation [c]

authorisation [ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Authorisation

belongs to

authentication authorisation [c]

has facts

access rights [dp] ""^^*literal*

communication protocol [ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Communication_Protocol

belongs to

rich metadata [c]

communication protocol [ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#communicationProtocol

belongs to

standardised communication protocol [c]

universal open free [c]

contact email [ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Contact_Email

belongs to

rich metadata [c]

has facts

mbox dp ""

contact name ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Contact_Name

belongs to

rich metadata c

has facts

name dp ""

d o i ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#DOI

belongs to

globally unique persistent identifier c

has facts

identifier dp ""

description ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Description

belongs to

rich metadata c

has facts

description dp ""

format ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Format

belongs to

rich metadata [c]

has facts

has format [dp] ""^^*literal*

issued[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#issued

belongs to

rich metadata [c]

has facts

issued [dp] *"2018-01-01"^^date*

landing page[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#landingPage

belongs to

rich metadata [c]

has facts

home page [dp] ""^^*any u r i*

language[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#language

belongs to

rich metadata [c]

has facts

language [dp] ""^^*language*

license[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#license

belongs to

rich metadata [c]

modified[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Modified

belongs to

rich metadata [c]

has facts

modified [dp] *"2018-01-01"^^date*

o r c i d[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#ORCID

belongs to

rich metadata [c]

has facts

identifier [dp] ""

provenance[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Provenance

belongs to

rich metadata [c]

has facts

has provenance dp ""^^*literal*

is also defined as

class

public access level ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Public_Access_Level

belongs to

rich metadata c

has facts

access rights dp ""

publisher ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Publisher

belongs to

rich metadata c

has facts

publisher dp ""

references ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#References

belongs to

rich metadata c

has facts

references dp ""

registry index ni

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Registry_Index

belongs to

searchable resource [c]

has facts

registry index [dp] ""^^*name*

registry index [dp] ""^^*any u r i*

is also defined as

data property

software code[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#SoftwareCode

belongs to

rich metadata [c]

title[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Title

belongs to

rich metadata [c]

has facts

title [dp] ""

unique identifier[ni]

back to ToC or Named Individual ToC

IRI: urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#Unique_Identifier

belongs to

rich metadata [c]

has facts

identifier dp ""^^*literal*

General Axioms

All Disjoint Classes

back to ToC

accessible[c], findable[c], interoperable[c], reusable[c]

All Disjoint Classes

back to ToC

article[c], data set[c], software[c]

Namespace Declarations

back to ToC

default namespace
urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#

FAIR-Ontology
urn:absolute:/home/owairdhi/Documents/Protege/FAIR-Ontology#

computernetworks
http://mmisw.org/ont/Technology/ComputerNetworks/

foaf
http://xmlns.com/foaf/0.1/

owl
http://www.w3.org/2002/07/owl#

prov
http://www.w3.org/ns/prov#

rdf
http://www.w3.org/1999/02/22-rdf-syntax-ns#

rdfs
http://www.w3.org/2000/01/rdf-schema#

terms

http://purl.org/dc/terms/

xsd

http://www.w3.org/2001/XMLSchema#
