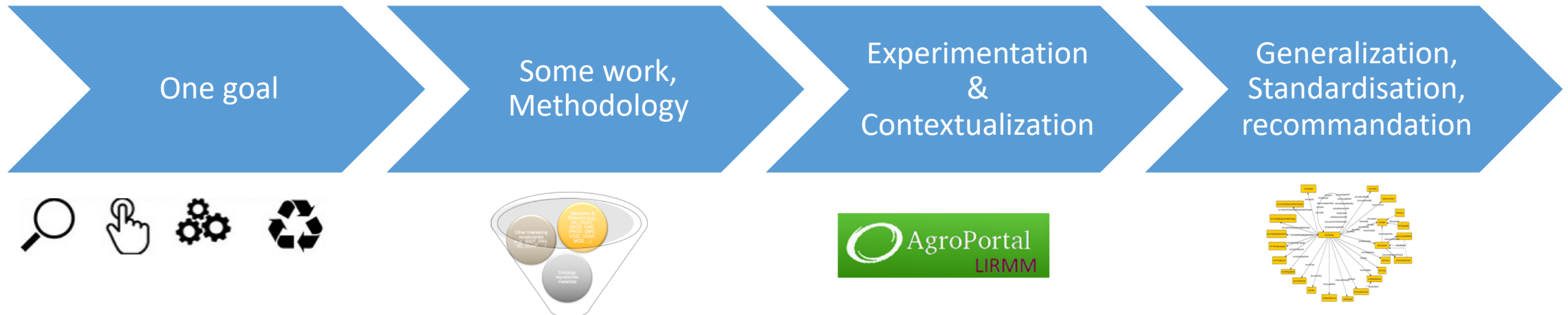


Recap of the first phase of work done by the RDA VSSIG's **Ontology Metadata** task group



Clement Jonquet, LIRMM, University of Montpellier

jonquet@lirmm.fr



As any data, semantic resources (ontologies, thesaurus, vocabularies).... need to be FAIR

- The FAIR principles have established the importance of using **standard vocabularies or ontologies to describe FAIR data and to facilitate interoperability and reuse...**

- **Explosion** of the number of ontologies/vocabularies



- **Cumbersome** to identify the ontologies, we need and manage their overlap.

Ontology repositories help to make them FAIR



F indable



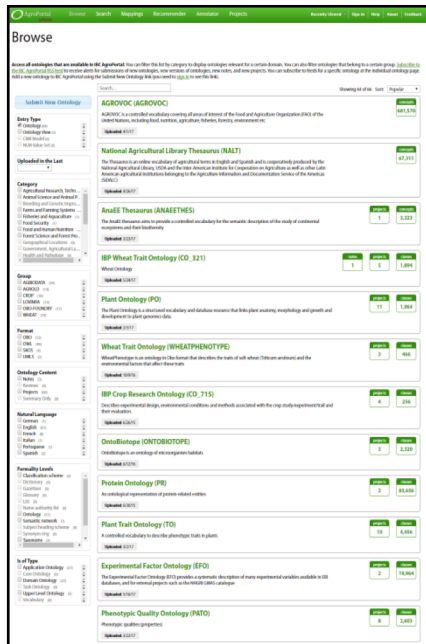
A ccessible



I nteroperable



R e-usable



API Documentation

General Usage

This API is comprised of a set of resources (Ontologies, Classes, etc) and related endpoints (Search, Annotator, Recommender) that are connected together via links, much like webpages. We recommend that you try browsing the API using a web browser. Chrome and Firefox work very well while IE does not before you start writing code. For more information, please see the documentation on [Media Types and Hypermedia Links](#) or view our [sample code](#), available in Java, Python, Ruby and other languages (please email api@ontology.org if you would like examples in another language).

Common Parameters

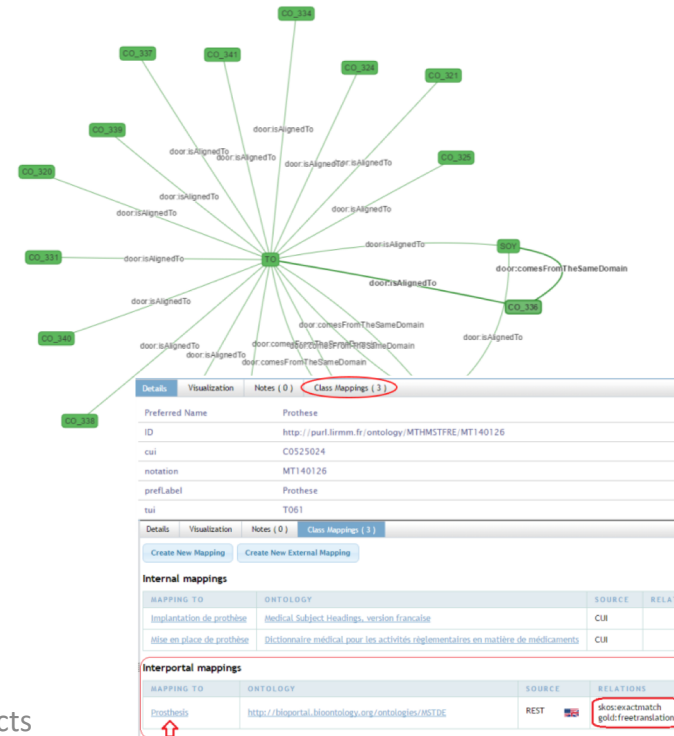
Parameter	Possible Values	Description
apikey	(your api key)	An API Key is required to access any API call. It can be provided in three ways: 1. Using the <code>apikey</code> query string parameter 2. Providing an <code>Authorization</code> header: <code>Authorization: apikey token:your_apikey</code> (replace your <code>apikey</code> with your actual key) 3. When using a web browser to explore the API, if you provide your API Key once using method 1, it will be stored in a cookie for subsequent requests. You can

SPARQL httpd server v1.1.5-122-1

KB ontologies_api

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
```

```
SELECT * WHERE {
  ?s ?p ?o
} LIMIT 10
```



OntoBiotope

Details

DESCRIPTION
OntoBiotope is an ontology of biotope-related entities. It is designed to be used as a reference ontology for biotope-related data. It is a part of the EMBL-EBI Ontology Project.

REVISIONS

REVISION	RELEASE DATE	UPDATE DATE	DESCRIPTION
1.0	2015-06-20 10:00:00	2015-06-20 10:00:00	Initial release
1.1	2015-06-20 10:00:00	2015-06-20 10:00:00	Initial release

Reviews
No reviews available.

Submissions
No submissions available.

Views
No views available.

Projects Using This Ontology

PROJECT	DESCRIPTION	PERSON	MODIFICATION
EMBL-EBI Ontology Project	EMBL-EBI Ontology Project	EMBL-EBI Ontology Project	EMBL-EBI Ontology Project

Ontology libraries, registries, repositories

- Ontology **libraries** defined as
 - “a library system that offers various functions for **managing, adapting and standardizing groups of ontologies**. It should fulfill the needs for re-use of ontologies. In this sense, an ontology library system should be easily accessible and offer efficient **support for re-using** existing relevant ontologies and standardizing them based on upper-level ontologies and ontology representation languages.” [Ding & Fensel, 2001]
- Ontology repositories defined as
 - “a structured **collection** of ontologies (...) by using an Ontology **Metadata Vocabulary**. References and **relations between ontologies** and their modules build the semantic model of an ontology repository. Access to resources is realized through **semantically-enabled interfaces** applicable for humans and machines. Therefore a repository provides a formal query language” [Hartmann, Palma, Gomez-Perez, 2009]

What are the ontology libraries out there?

- Ontology repositories / portal

- [NCBO BioPortal](#)

- [Ontobee](#)

- [AberOWL](#)

- [EBI Ontology Lookup Service](#)

- OKFN Linked Open Vocabularies

- ONKI Ontology Library Service

- MIMI Ontology Registry and Repository

- ESIPportal

- AgroPortal

- EcoPortal

- [SIFR BioPortal](#)

- [MedPortal](#)

- [CISMEF HeTOP](#)

- OntoHub

- [Ontoserver](#)

- Web indexes

- Watson, Swoogle, Sindice, Falcons

- Ontology libraries / listings (more or less updated)

- [OBO Foundry](#)

- WebProtégé

- Romulus

- DAML ontology library

- Colore

- FAO VEST Registry

- [FAIRsharing](#)

- DERI Vocabularies , OntologyDesignPatterns, Semanticweb.org, W3C Good ontologies

- BARTOC

- Platform technology, Terminology Services

- Mondeca ITM, LexEVS, ANDS, SKOSMOS, NERC-NVS

- Abandoned projects

- Cubboard, Knoodl, Schemapedia, SchemaWeb, OntoSelect, OntoSearch, TONES

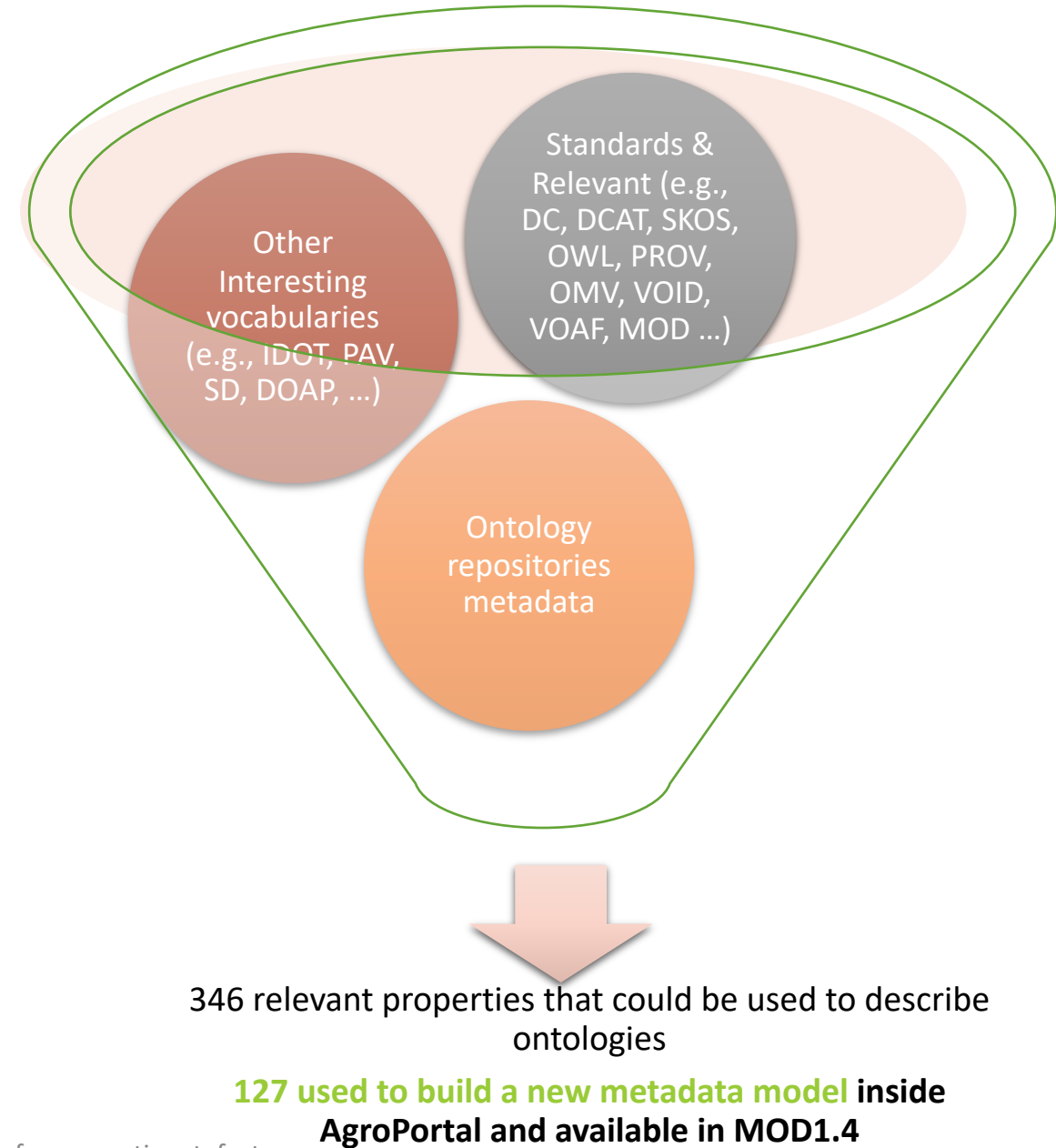


Harnessing the Power of Unified Ontology Metadata ...

<https://doi.org/10.1007/s13740-018-0091-5>

Review of ontology metadata practices

- Analysis of the **use of metadata vocabularies** in describing ontologies (by ontology developers)
 - 805 ontologies analyzed
- Analysis of the existing **metadata vocabularies**
 - 23 metadata vocabularies
- Analysis of the **uses of metadata vocabularies in various ontology libraries and repositories** (e.g., BioPortal, MMI, LOV, OBO Foundry)
 - 13 libraries



Analysis of ontology metadata practices: findings

- **Variety of metadata vocabularies** (e.g., DC, DCT, PROV, VOID, DCAT, Schema.org)
 - **Interestingly**: the only ontology specific metadata vocabulary OMV (first published in 2005) is found to be **hardly used** by the community
 - No existing vocabularies really covers enough aspects to be used solely
- **Metadata vocabularies do not rely on one another** although there is a strong overlap
 - Multiple properties to capture similar information (e.g., **dc:license**, and **cc:license**)
 - For instance, 25 properties available for dates
- Reviewed **ontology libraries and repositories** use some metadata elements but **do not always use standard metadata vocabularies**
- **16% of ontologies did not use any metadata** properties, 43% use less than 10 properties
 - Properties facilitated by ontology editors are more frequent
 - Confusion of use: DC/DC Term or SKOS documentation properties

Surveying the ontology community about metadata

<https://zenodo.org/record/3484530#.Xa8Qe5IzZdh>

Survey of ontology metadata practices

QUESTIONS RÉPONSES 144

Rubrique 1 sur 5

RDA VSSIG Ontology Metadata Task Group Survey

The goal of this survey initiated by the "ontology metadata" task group of the RDA Vocabulary Semantic Services Interest Group, is to understand how the ontology developer community authors metadata to describe their ontologies and how ontology users use or appreciate these metadata.

We would like to find answers to following key questions:

- Do ontology developers actually describe their ontology metadata?
- Do ontology users rely on/utilize metadata in their use of ontologies?
- What are the ways to improve the current situation and make ontologies more FAIR?

The survey should not take more than 10-15 minutes.

Thank you for your help,
Clement Jonquet, Biswanath Dutta, Anne Toulet and Barbara Magana

Some definitions of the technical terms used in this survey

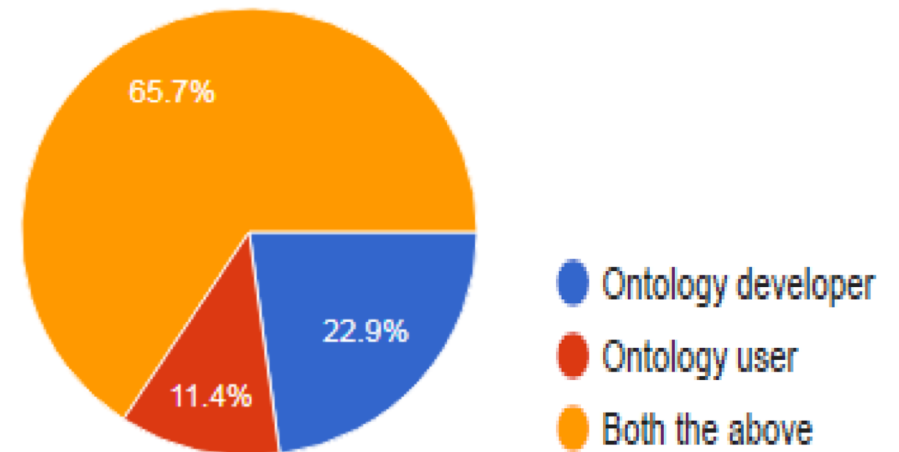
- Ontology: by ontology we mean not only an OWL structure that respects all the conditions to qualify as a fully formalized ontology. We include every semantic resource which formalizes some knowledge (vocabulary, thesaurus, taxonomy, terminology, etc.). The point is not to focus on the level of formalization of the semantic resource, but on its metadata description.
- Ontology metadata: by metadata we mean any property used to describe the ontology itself or relations between the described ontology and other resources.
- Metadata vocabularies: to avoid confusion with ontologies, we here call metadata vocabularies the semantic resources (e.g., Dublin Core, VoID, Ontology Metadata Vocabulary, DCAT, MOD, etc), which can be used to describe ontologies (or at least offer a list of metadata properties).
- Metadata authoring: the process of choosing and editing a metadata property when describing an ontology.

Après la section 1 Passer à la section suivante

With the goal to answer the following questions:

- Do ontology developers actually describe their ontology metadata?
- Do ontology users rely on/utilize metadata in their use of ontologies?
- What are the ways to improve the current situation and make ontologies more FAIR?

Total 168 participants.



The survey report is available here:

<https://zenodo.org/record/3484530#.Xa8Qe5IzZdh>

What are the top 5 things you would like to know when searching and selecting an ontology (possibly besides the following basic information such as title, author, date, format, and subject of an ontology, etc.)? (141/168)

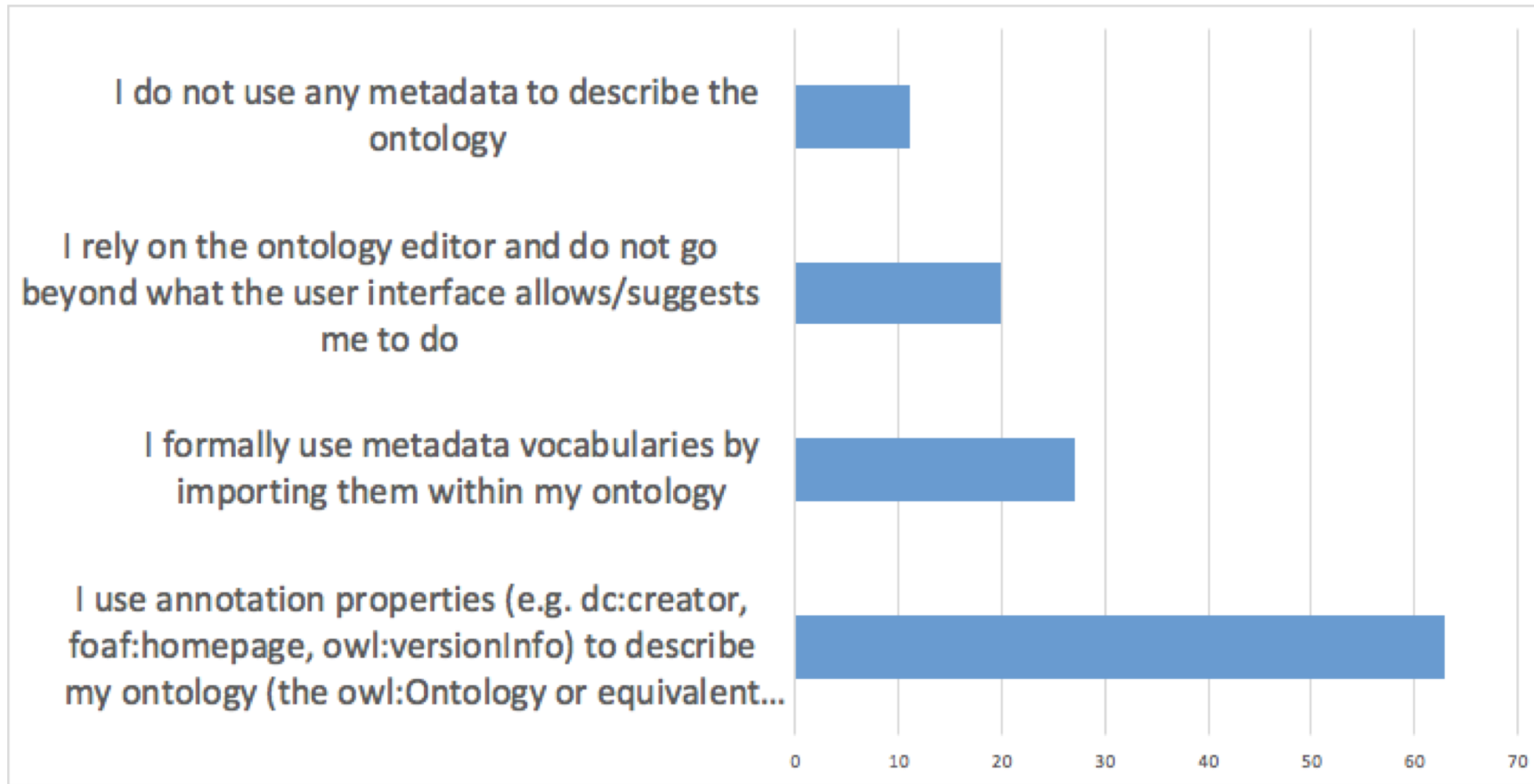
(Selected)

- How complex the ontology (with lots of relations)?
- Update frequency
- Credibility
- Uses and user base
- Subject coverage and comprehensiveness
- Community support
- Expressivity level
- Actively maintained?
- Natural language description
- Depth
- Code source location and issue tracker
- Any standard/ nomenclature applied
- How the ontology evolved (research project, industrial application need)?
- Underline use case, scope, publications

What are the top 5 things you would like to know when searching and selecting an ontology (141/168)



As an ontology developer, how do you author ontology metadata? (161/168)



Selected replies:

I leverage the ontology properties offered by repositories

we add small amounts of custom metadata (via the ontology editor)

I describe the ontology (in english) in the OWL:comment field

If there would be good tools integrated in Protégé I would use those for adding additional metadata elements

This is beyond my level of knowledge

I put them in an accompanying text file

Publications

Do you know or use the following metadata standards?

Unknown (u)	NKOS (104), IDOT (102) DOOR (100), VANN (95), ADMS (91), MOD (91), OMV (81), OboInOwl(80), DCT (48),
Known but never used (k)	CC (45), SD (42), FOAF(38), OMV (33), VOID (29), SKOS (27), SPARQL (25), OMV (33), MOD (24)
Sometimes used (s)	SPARQL (36), MOD (7), OMV (4),
Often used (o)	DC(42), DCT(25), DCAT (16), OMV (6), MOD(2)
Always used (mandatory for me) (m)	OWL (59), RDFS (54), SPARQL (41), FOAF (16), DCT (15), OMV(2)

We listed in total 23 vocabularies

Harnessing the Power of Unified Metadata ... in an
Ontology Repository:
The Case of AgroPortal

<https://doi.org/10.1007/s13740-018-0091-5>

AgroPortal an ontology repository for agronomy, food, plant sciences & biodiversity

- Publish, search, download
- Browse, visualize
- Peer review
- Versioning
- Annotation
- Recommendation
- Mapping
- Notes
- Projects

The 'Browse' page displays a list of ontologies with various filters on the left. The filters include Entry Type (Ontology, CIMI Model, NLM Value Set), Uploaded in the Last (dropdown), Category (Agricultural Research, Animal Science, etc.), Group (AGBIODATA, AGROLD, etc.), Format (OBO, OWL, etc.), Ontology Content (Notes, Reviews, etc.), and Natural Language (German, English, etc.). The main list shows ontologies like AGROVOC (681,570 concepts), AnaEE Thesaurus (3,323 concepts), National Agricultural Library Thesaurus (67,311 concepts), OntoBiotope (2,320 classes), Protein Ontology (83,656 classes), IBP Crop Research Ontology (256 classes), Process and Observation Ontology (4,449 classes), and IBP Wheat Trait Ontology (1,023 classes).

The homepage features a green header with navigation links: Browse, Search, Mappings, Recommender, Annotator, Projects, Recently Viewed, Sign In, Help, About, Feedback. A central banner explains the portal's purpose: 'Use AgroPortal to access and share ontologies. You can create ontology-based annotations for your own text, link your own project that uses ontologies to the description of those ontologies, find and create relations between terms in different ontologies, review and comment on ontologies and their components as you browse them. Sign in to AgroPortal to submit a new ontology or ontology-based project, provide comments on ontologies or add ontology mappings.' Below this are search and explore boxes, a table of 'Ontology Visits (April 2017)', a 'Latest Notes' section, and a 'Links' section with various tools and datasets.

<http://agroportal.lirmm.fr>

Supported by: ANR, IBO, Institut de Biologie Computationnelle. With the collaboration of: CNRS, Bioversity International, INRA, IRD, CIRAD. Powered by NCBO BioPortal.

- 125 ontologies, 90 candidates
- 5 driving use cases
- ~200 registered users

Describe ontologies with semantic metadata

- Display “per ontology”
 - Ontology specific properties => viewable and editable within the ontology specific page
- Everything you need to know about an ontology
- URIs used in the backend to store the information
 - e.g., CC-BY => <https://creativecommons.org/licenses/by-nd/4.0/>
- Get my metadata back button
- Metadata automatically extracted from the files

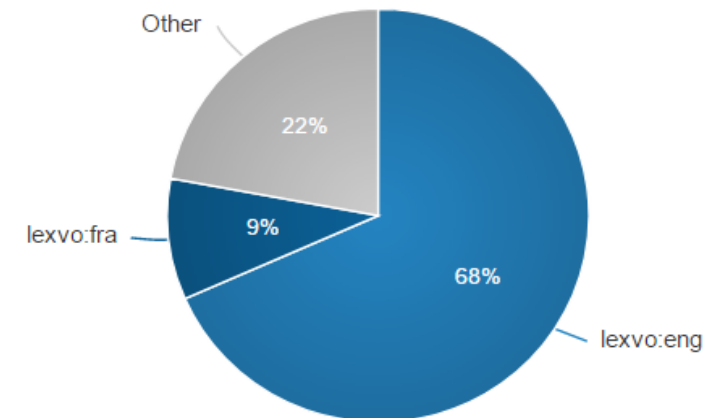
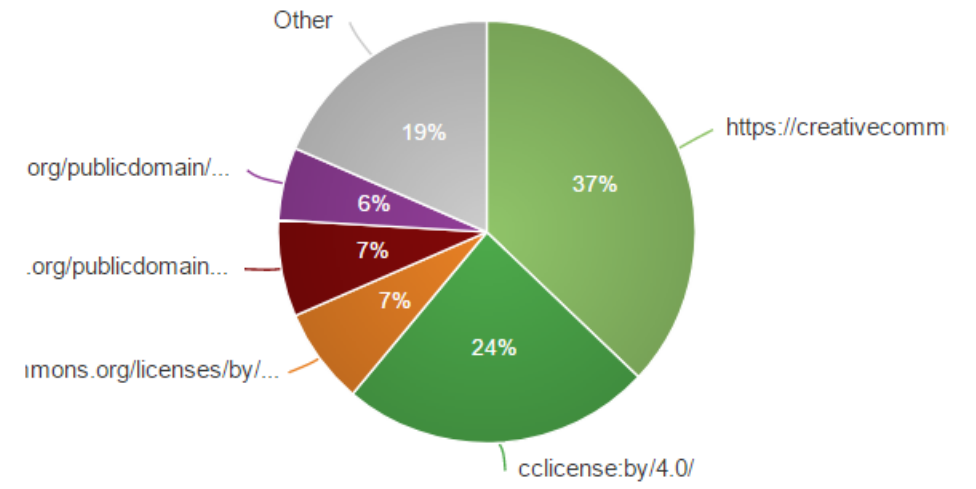
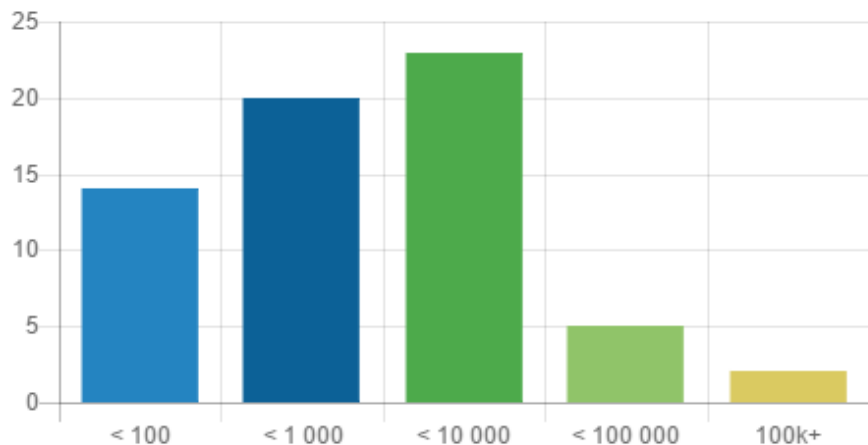
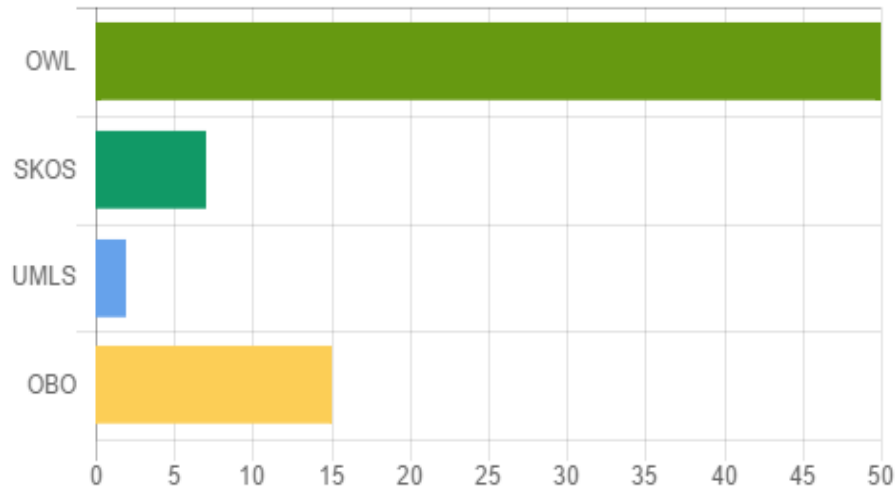
The screenshot displays the OntoBiotope web interface. The top navigation bar includes links for Browse, Search, Mappings, Recommender, Annotator, Projects, and Landscape. The main content area is divided into several sections:

- Details:** A table providing basic information about the ontology, including its acronym (ONTOBIOTOPE), visibility (Public), description, status (Production), format (OBO), contact (Claire Nédélec), home page, publications page, documentation page, categories (Natural Resources, Earth and Environment), and groups (INRA Linked Open Vocabularies).
- Additional Metadata:** A table providing more detailed information, including natural language (English), version (1.2), release date (2015-06-29T00:00:00+00:00), keywords (information extraction, corpus annotation, natural language processing, ontology building, biology, genetics), known usage (Used by the BioNLP Shared task), notes, creators (Claire Nédélec), designed for ontology task, endorsed by (INRA), funded by (INRA), has formality level, has license (CC-BY), ontology syntax, is of type, publisher (INRA), identifier (DOI), and copyright holder (INRA).
- Metrics:** A table showing various metrics such as number of classes (2320), number of individuals (0), number of properties (0), maximum depth (13), maximum number of children (42), average number of children (3), classes with a single child (248), classes with more than 25 children (3), and classes with no definition (2320).
- Visits:** A line graph showing the number of visits over time, with a peak in early 2017.
- Reviews:** A section for reviews, currently showing no reviews available.
- Submissions:** A table showing submissions, including version, release date, upload date, and download links.
- Views:** A section for views, currently showing no views available.
- Projects Using This Ontology:** A table showing projects using the ontology, including project name, description, people, and institution.

Red boxes highlight the 'Go to the REST API JSON entry' button, the 'Get my metadata back' buttons (N-Tuple, JSON-LD, RDF/XML), and the 'Additional Metadata' table.



Structural information about ontologies

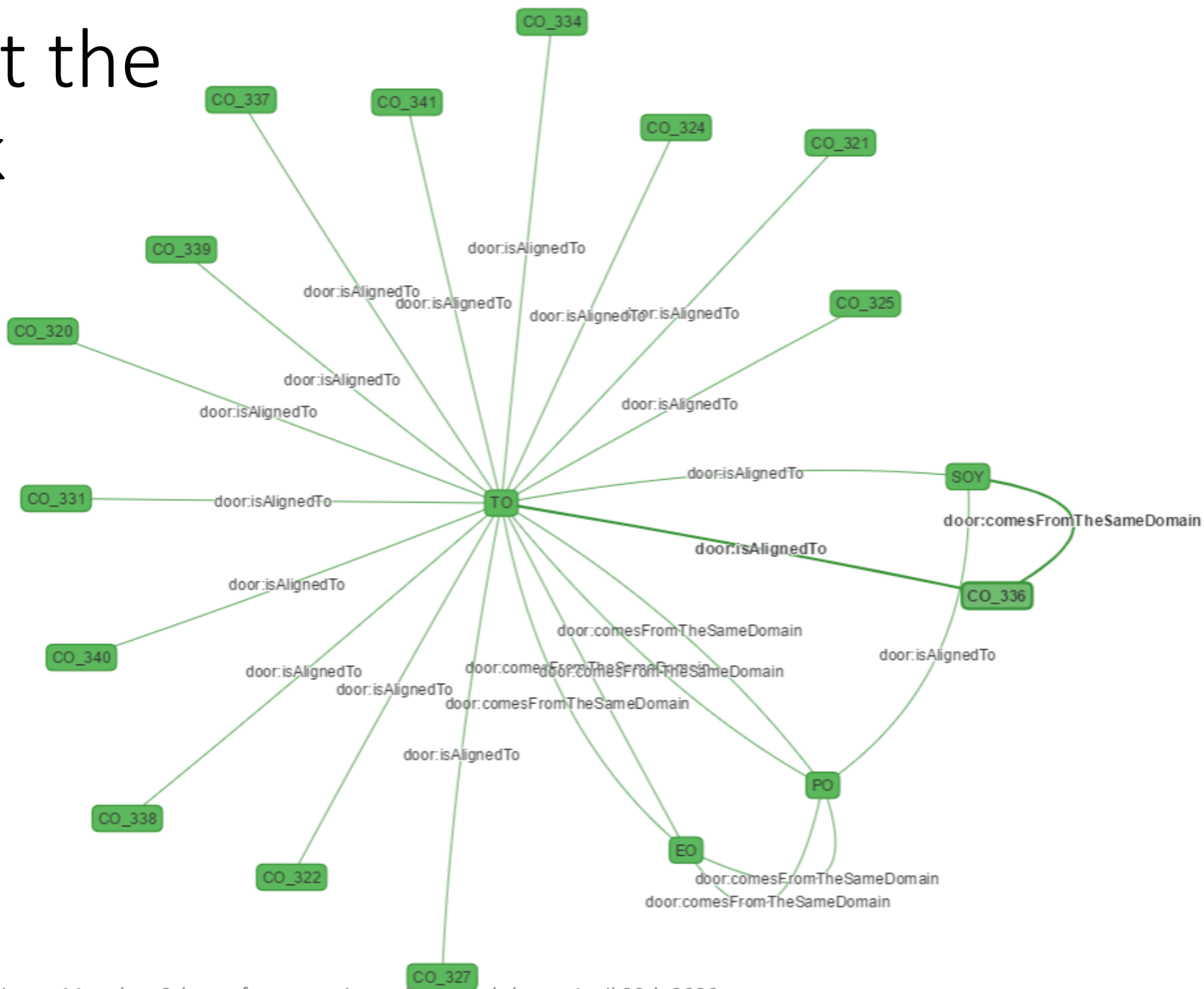


Information about the community

RDA WDI (<http://ist.blogs.inra.fr/wdi/>)
IBP (<https://www.integratedbreeding.net/>)
iastate.edu inra.fr inserm.fr www.irstea.fr
CIMMYT (<http://www.cimmyt.org/>)
CGIAR (www.cgiar.org/)
IITA (<http://www.iita.org/>)
www.inra.fr **INRA** INERA (<http://www.inera.bf/>)
INRA (<http://www.inra.fr/>)
EIAR (<http://www.eiar.gov.et/>)
ICRISAT (<http://www.icrisat.org/>)

NCBITAXON CO_020
CO_340 CROPUSAGE CO_337 PCO PR
GENO CO_338 CO_320 OFPE CO_339 ATOL CO_322
ANAEETHES SNPO CO_324 CO_341 TO PATO CO_121 FALDO
GR-TAX EFO BFO VARIO USE GO PO AFEQ CO_325 CL STY CDAO
ADO CO_336 CO_331 SO MS20 VT CO_125 CO_321 EO
PO2 GFVO CO_715 ENVO BT CO_334 LEXEAU
XEO ONTOBIOTOPE BIOREFINERY SOY DURUM_WHEAT RO ADKB
WHEATPHENOTYPE GECO EDAM CO_327
TRANSMAT TRIPHASE

Information about the ontology network



```

],
documentation: http://www.w3.org/2000/01/rdf-schema-more,
version: "10 February 2004",
description: "AGROVOC is a controlled vocabulary covering all areas of interest of the Food and Agriculture Organization (FAO) of the United Nations. It is published by FAO and edited by a community of experts.\r\n\r\nComplete metadata d\r\n\r\nhttp://aims.fao.org/aos/agrovoc/void.ttl",
status: "production",
- contact: [
  - {
    id: http://data.agroportal.lirmm.fr/contacts/86819aa0-1880-0135-178f-525400026749,
    name: "AGROVOC",
    email: "AGROVOC@fao.org"
  }
],
creationDate: "2017-04-01T03:52:55+02:00",
released: "1980-01-01T00:00:00+00:00",
numberOfClasses: 31,
numberOfIndividuals: 681570,
numberOfProperties: 192,
maxDepth: 0,
maxChildCount: 12,
averageChildCount: 4,
classesWithOneChild: 2,
classesWithMoreThan25Children: 0,
classesWithNoDefinition: 25,
modificationDate: "2017-05-05T00:00:00+00:00",
entities: 682514,
numberOfAxioms: 6230580,
keyClasses: "http://aims.fao.org/aos/agrovoc/c_12332, http://aims.fao.org/aos/agrovoc/c_203, http://aims.fao.org/aos/agrovoc/c_3055, http://aims.fao.org/aos/agrovoc/c_6599",
keywords: null,
knownUsage: null,
notes: "This file specifies in RDF Schema format then built-in classes and properties that together form the basis of the RDF/XML schema. It does not expect people to import this file explicitly into their ontology. People that do import this file should expect their ontology to conform to the Knowledge Representation Paradigm: null",
conformsToKnowledgeRepresentationParadigm: null,
hasContributor: null,
hasCreator: "FAO AIMS (http://aims.fao.org)",
designedForOntologyTask: [ ],
wasGeneratedBy: null,
wasInvalidatedBy: null,
curatedBy: null,
- endorsedBy: [
  "FAO (http://fao.org)",
  "RDA Wheat Data Interoperability (WDI) working group (http://ist.blogs.inra.fr/wdi)"
],
fundedBy: null,
translator: null,
hasDomain: "http://dbpedia.org/resource/Fishery, http://dbpedia.org/resource/Nutrition, http://dbpedia.org/resource/Agriculture, http://dbpedia.org/resource/Food, http://dbpedia.org/resource/Forestry",
hasFormalityLevel: http://w3id.org/nkos/nkostype#thesaurus,
hasLicense: https://creativecommons.org/licenses/by/3.0/,

```

All of it accessible thru
JSON-LD API

http://data.agroportal.lirmm.fr/ontologies/AGROVOC/latest_submission?include=all

Harvesting AgroPortal ontologies and vocabularies into FAIRsharing



FAIRsharing.org
standards, databases, policies

AnaEE Thesaurus
Abbreviation: anaeThes

General Information

The anaeThes thesaurus aims at providing a controlled vocabulary for the se of the AnaEE-France infrastructure through an iterative process combining bc AnaEE data bases and/or modeling platforms. The thesaurus consists of conce plants, micro-organisms, biodiversity); chemical compounds; experimentation functioning); modeling (e.g. formalism, platform, type of model, computer lang standards ontology).

How to cite this record: FAIRsharing.org: anaeThes; AnaEE Thesaurus; DOI: h
Homepage <http://agroportal.lirmm.fr/ontologies/ANAEETHES>
Developed in [France](#)
Created in 2017
Taxonomic range

All

Scope and data types

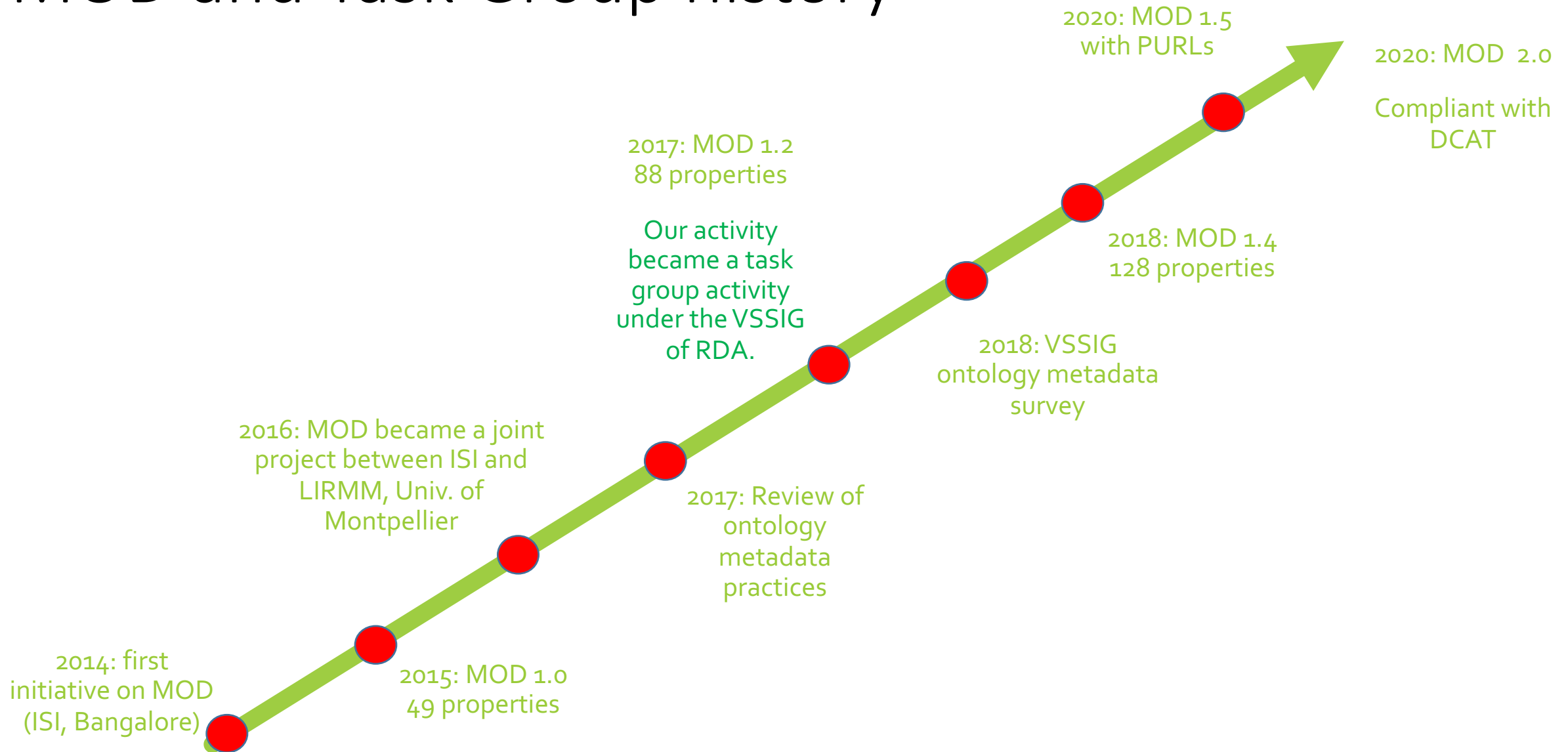
[Agricultural And Food Process Engineering](#) [Atmospheric Science](#) [Biodiversity](#) [Chemical E](#)
[Modelling And Simulation](#) [Natural Resources, Earth And Environment](#) [Protocol](#) [Unit](#)

Both manually curate the metadata ... better synchronization
of the fields to come....

New Generation Metadata vocabulary for Ontology Description and Publication

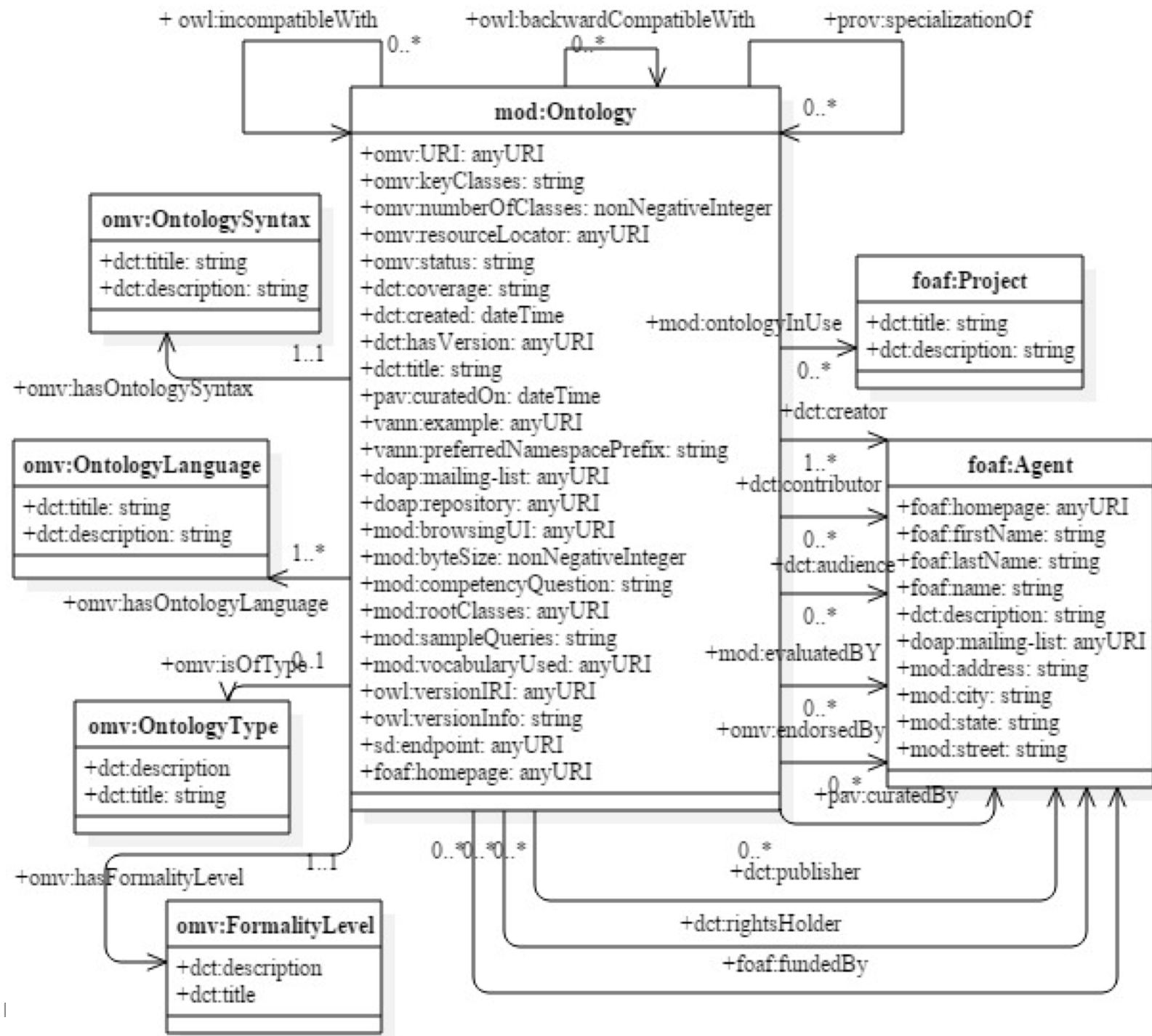
<https://doi.org/10.1007/978-3-319-70863-8> 17

MOD and Task Group history



Generalizing this with MOD 1.2

- Metadata vocabulary for Ontology Description and publication (v.1.2)
- 88 properties, only 13 new ones
- <https://github.com/sifrproject/MOD-Ontology>



Stable

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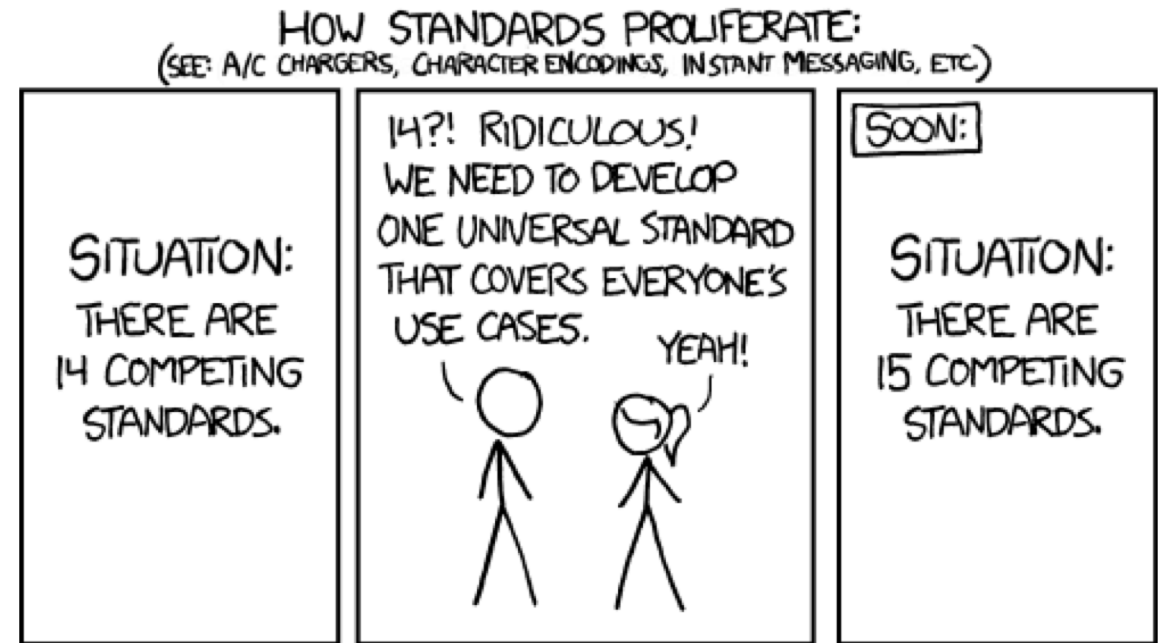
Stable

128 MOD properties: 1 example

```
### http://www.w3.org/2002/07/owl#VersionInfo
owl:VersionInfo a rdf:Property ;
    rdfs:domain          mod:Ontology ;
    rdfs:range           xsd:string ;
    dct:description      "The version of the released ontology."@en ;
    dct:relation         omv:version,
                        pav:version,
                        doap:release,
                        oboInOwl:data-version,
                        oboInOwl:hasVersion,
                        mod11:version,
                        schema:version;
    pav:derivedFrom      "http://www.isibang.ac.in/ns/mod/1.2"^^xsd:anyURI ;
    pav:importedOn       "2017-07-06"^^xsd:dateTime ;
    prov:wasInfluencedBy "MIRO guidelines: A.1" ;
    rdfs:label           "version information"@en ,
                        "information de version"@fr .
```


We do not promote MOD as a new standard

- But as a **set of identified metadata properties** that could be used to describe semantic artifacts
- **Only 26 properties in the “mod” namespace.** Most of them being technical ones (default description of terms, metrics...)
- Some of them very important: `omv:ontologyInUse`, `mod:hasEvaluation`, `mod:competencyQuestion`



MOD properties to implement MIRO

Matentzoglou et al. *Journal of Biomedical Semantics* (2018) 9:6
DOI 10.1186/s13326-017-0172-7

Journal of
Biomedical Semantics

REVIEW

Open Access



MIRO: guidelines for minimum information for the reporting of an ontology

Nicolas Matentzoglou^{1*}, James Malone², Chris Mungall³ and Robert Stevens¹

Abstract

Background: Creation and use of ontologies has become a mainstream activity in many disciplines, in particular, the biomedical domain. Ontology developers often disseminate information about these ontologies in peer-reviewed ontology description reports. There appears to be, however, a high degree of variability in the content of these reports. Often, important details are omitted such that it is difficult to gain a sufficient understanding of the ontology, its content and method of creation.

Results: We propose the *Minimum Information for Reporting an Ontology* (MIRO) guidelines as a means to facilitate a higher degree of completeness and consistency between ontology documentation, including published papers, and ultimately a higher standard of report quality. A draft of the MIRO guidelines was circulated for public comment in the form of a questionnaire, and we subsequently collected 110 responses from ontology authors, developers, users and reviewers. We report on the feedback of this consultation, including comments on each guideline, and present our analysis on the relative importance of each MIRO information item. These results were used to update the MIRO guidelines, mainly by providing more detailed operational definitions of the individual items and assigning degrees of importance. Based on our revised version of MIRO, we conducted a review of 15 recently published ontology description reports from three important journals in the Semantic Web and Biomedical domain and analysed them for compliance with the MIRO guidelines. We found that only 41.38% of the information items were covered by the majority of the papers (and deemed important by the survey respondents) and a large number of important items are not covered at all, like those related to testing and versioning policies.

Conclusions: We believe that the community-reviewed MIRO guidelines can contribute to improving significantly the quality of ontology description reports and other documentation, in particular by increasing consistent reporting of important ontology features that are otherwise often neglected.

Keywords: Ontologies, Reporting guidelines, Minimum information, Ontology reporting

Background

The need for a common understanding of the entities in a field of interest has led to the widespread adoption of ontologies as a means of representing knowledge [1]. This is particularly true in biology, medicine and healthcare [1, 2]. We also see the use of semantic technologies,

a category can be recognised by both humans and computers, for example by using automated reasoners. The definitions and descriptions of every entity in a category may be done in the form of natural language or logical axioms that describe the relationship of one category of objects to objects in another category [4]. Groups of data



MIRO Category	Number of properties	MOD 1.4 metadata properties
MUST	60	omv:acronym, dct:title, dct:alternative, skos:hiddenLabel, owl:ontologyIRI, owl:versionIRI, owl:versionInfo, dct:license, omv:hasOntologyLanguage, omv:hasFormalityLevel, omv:hasOntologySyntax, dct:description, foaf:page, omv:resourceLocator, omv:keywords, omv:designedForOntologyTask, omv:usedOntologyEngineeringMethodology, omv:conformsToKnowledgeRepresentationParadigm, dct:coverage, mod:competencyQuestion, foaf:homepage, vann:example, vann:preferredNamespaceUri, mod:prefLabelProperty, mod:synonymProperty, mod:definitionProperty, mod:authorProperty, mod:obsoleteProperty, mod:hierarchyProperty, void:uriRegexPattern, idot:exampleIdentifier, dct:creator, dct:contributor, dct:publisher, pav:curatedBy, schema:translator, dct:rightsHolder, dct:subject, mod:group, owl:imports, owl:priorVersion, owl:backwardCompatibleWith, door:comesFromTheSameDomain, voaf:similar, voaf:hasEquivalencesWith, mod:vocabularyUsed, mod:sampleQueries, void:uriLookupEndpoint, omv:knownUsage, omv:endorsedBy, mod:ontologyInUse, dct:audience, doap:repository, doap:bugDatabase, doap:mailing-list, mod:hasEvaluation, prov:wasGeneratedBy, dct:accrualMethod, dct:accrualPeriodicity, dct:accrualPolicy.
SHOULD	9	mod:metrics, omv:numberOfClasses, omv:numberOfIndividuals, omv:numberOfProperties, mod:numberOfDataProperties, omv:numberOfAxioms, mod:numberOfLabels, mod:byteSize, dct:source
OPTIONAL	2	omv:usedOntologyEngineeringTool, vann:preferredNamespacePrefix
No MAPPING	57	omv:status, dct:language, dct:abstract, mod:analytics, dct:identifier, owl:deprecated, cc:morePermissions, cc:useGuidelines, dct:bibliographicCitation, rdfs:comments, foaf:depiction, foaf:logo, dct:accessRights, vann:changes, mod:obsoleteParent, voaf:toDoList, schema:award, schema:associatedMedia, schema:includedInDataCatalog, owl:incompatibleWith, dct:isPartOf, dct:hasPart, dct:hasVersion, dct:isFormatOf, dct:hasFormat, dct:relation, voaf:specializes, schema:workTranslation, schema:translationOfWork, door:hasDisparateModelling, voaf:usedBy, voaf:generalizes, voaf:hasDisjunctionsWith, omv:keyClasses, void:rootResource, mod:browsingUI, sd:endpoint, mod:sampleQueries, void:propertyPartition, void:classPartition, void:dataDump, void:openSearchDescription, void:uriLookupEndpoint, dct:fundedBy, schema:comments, dct:created, dct:modified, dct:valid, dct:dateSubmitted, pav:curatedOn, mod:maxDepth, mod:maxChildCount, mod:averageChildCount, mod:classesWithOneChild, mod:classesWithMoreThan25Children, mod:classesWithNoDefinition, prov:wasInvalidatedBy.
TOTAL	128	

Our objective now: automatic FAIRness assessment of an ontology

1. within AgroPortal
2. outside of AgroPortal

- Enhance the level FAIRness of ontologies.
- Help users respect the I2 FAIR principle.
- Help users in identifying FAIR ontologies.
- Provide useful analysis of the semantic agronomic landscape.



OntoBiotope

Summary Classes Properties Notes Mappings Widgets

Details

ACRONYM	ONTOBIOTOPE
VISIBILITY	Public
DESCRIPTION	OntoBiotope is an ontology of microorganism habitats. Its modeling principle and its lexicon reflect the biotope classification used by biologists to describe microorganism isolation sites (e.g. GenBank, GOLD, ATCC). OntoBiotope is developed and maintained by the Meta-omics of Microbial Ecosystems (MEM) network in which 30 microbiologists from INRA (French National Institute for Agricultural Research) from all fields of applied microbiology participate. The relevance of OntoBiotope terms is evaluated through the PubMed abstracts by applying the ToMap method (Text to Ontology Mapping) to the OntoBiotope ontology. It also indexes 3.36 millions relations between taxa and their habitats.
STATUS	Production
FORMAT	OBO
CONTACT	Claire Nédélec, claire.nedelec@jouy.inra.fr
HOME PAGE	http://ovinec.inra.fr/
PUBLICATIONS PAGE	https://doi.org/10.1186/1471-2105-16-S10-S1
DOCUMENTATION PAGE	http://ovinec.inra.fr/
CATEGORIES	Natural Resources, Earth and Environment
GROUPS	INRA Linked Open Vocabularies

Additional Metadata

NATURAL LANGUAGE	
VERSION	1.2
RELEASE DATE	2015-06-29T00:00:00+00:00
KEYWORDS	information extraction, corpus annotation, natural language processing, ontology building, biology, genetics
KNOWN USAGE	Used by the BioNLP Shared task (Bacteria Biotope task) in 2011, 2013 and 2016
NOTES	OntoBiotope is developed and maintained by the Meta-omics of Microbial Ecosystems (MEM) network in which 30 microbiologists from INRA (French National Institute for Agricultural Research) from all fields of applied microbiology participate.
CREATORS	Claire Nédélec
DESIGNED FOR ONTOLOGY TASK	http://omv.ontoware.org/2005/05/ontology#AnnotationTask
ENDORSED BY	INRA (http://www.inra.fr/)
FUNDED BY	INRA (http://www.inra.fr/)
HAS FORMALITY LEVEL	http://3rd.org/inkosinkontype#ontology
HAS LICENSE	
ONTOLOGY SYNTAX	http://purl.obolibrary.org/obo/oboformat#spec.html
IS OF TYPE	http://omv.ontoware.org/2005/05/ontology#DomainOntology
PUBLISHER	INRA (http://www.inra.fr/)
IDENTIFIER	doi.org/10.15454/1.4382640528105164E12
COPYRIGHT HOLDER	INRA (http://www.inra.fr/)

Metrics

NUMBER OF CLASSES	2320
NUMBER OF INDIVIDUALS	0
NUMBER OF PROPERTIES	0
MAXIMUM DEPTH	13
MAXIMUM NUMBER OF CHILDREN	42
AVERAGE NUMBER OF CHILDREN	3
CLASSES WITH A SINGLE CHILD	248
CLASSES WITH MORE THAN 25 CHILDREN	3
CLASSES WITH NO DEFINITION	2320

Visits Download as CSV

Reviews Add your review

No reviews available.

Submissions

Submission	Release Date	Release Date	Release Date
BioNLP-ST 2013 version (download)	06/29/2015	06/29/2015	OBO

Views Create new view

No views available.

Projects Using This Ontology Create new project

Project	Description	People	Institution
LOVInra - Linked Open Vocabularies	LOVInra est un service proposé par la Collégation à	Sophie Aubin (sophie.aubin@versailles.inra.fr)	INRA
OntoBiotope	L'ambition pour OntoBiotope est de normaliser la description.	Claire Nédélec (claire.nedelec@jouy.inra.fr)	INRA
VEST-AgroPortal Map of Standards	This VEST-AgroPortal provides a global map of existing	Valeria Pesce (valeria.pesce@fao.org)	Food & Agriculture Organization

Our future goal

- Turn MOD 1.4 into an **extended** version, MOD 2.0, compliant with the DCAT specification (v2.0)
 - Produce an “application profile” for the description of ontologies
- Include new properties e.g., FAIR Digital Object specification will provide a `fdo:hasMetadata` property we have not found anywhere
- Discuss with the various **ontology editor** (e.g., Protégé, VocBench) on integration of MOD in the software
- Automate the process of **creating mod:Ontology instances** from ontology libraries (e.g., BioPortal, AgroPortal, OBO Foundry)
 - Exchange the content of these libraries without changing their internal data models

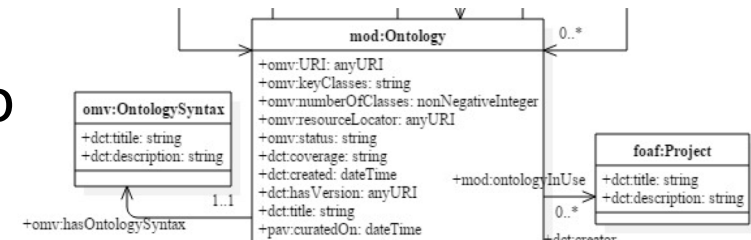
Start a new phase of the ontology metadata task group

- MOD took a “maximal” approach but can it help serving FAIRsFAIR’s *Minimum Metadata Schema for semantic artefacts*
- With help of the FAIRsFAIR context and under the umbrella of the RD VSSIG
- Address the FAIRsFAIR’s P-Recs
 - But also RDA SHARC, RDA FDMM, MIRO



Credits

- Anne Toulet, Vincent Emonet (LIRMM – Univ. of Montpellier)
 - AgroPortal metadata model, landscape, MOD, survey
- Biswanath Dutta (DRTC, Indian Statistical Institute, Bangalore)
 - MOD, survey, metadata analysis
- RDA VSSIG Ontology-metadata Task Group
 - The same + help and comments from ...
 - John Graybeal, Barbara Magagna, Romain David, Nicholas Car, Daniel Garijo, Sophie Aubin, etc.
- Emna Amdouni, (LIRMM – Univ. of Montpellier)
 - Ontology FAIRness assessment



Questions? More slides?

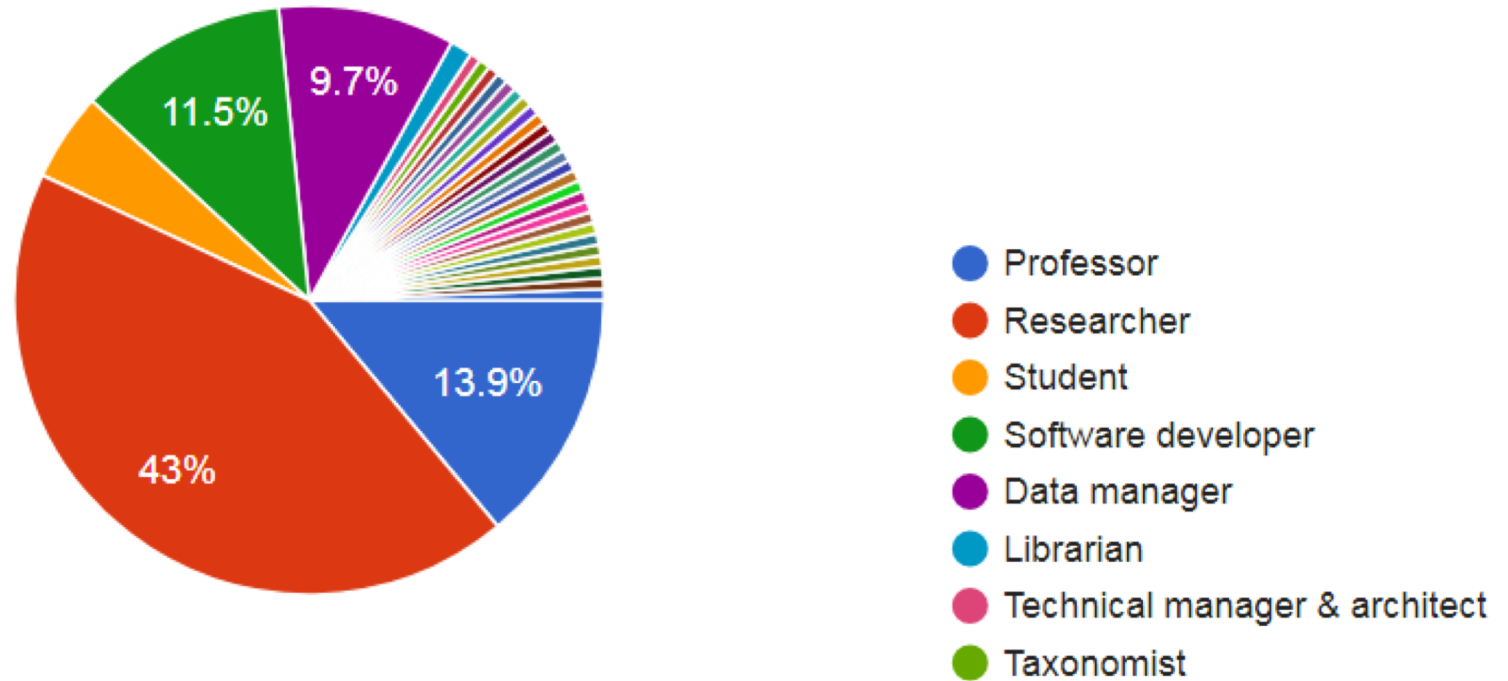
Thank you

jonquet@lirmm.fr

@jonquet_lirmm

More slides from the VSSIG
“ontology metadata” survey...

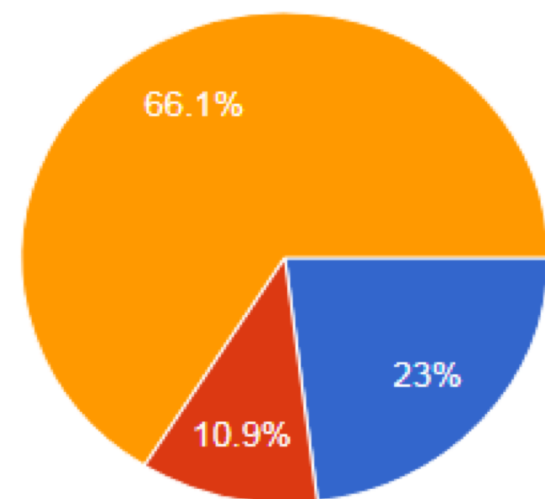
What kind of job do you do? (165/168)



Some other roles are: taxonomist, standard developers, metadata specialist, ontologist, semantic analyst, knowledge manager, architect, Linked Data architect, engineer, Technical manager, Company director, etc.

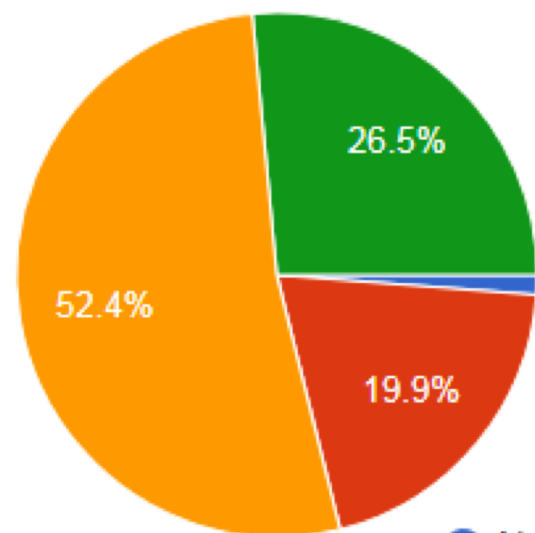
This shows how people tend to use different words to mean the near same thing when there is no control over the words use.

What kind of ontology user are you? (165/168)



- Ontology developer
- Ontology user
- Both the above

Please describe your level of experience and/or expertise related to ontologies. (166/168)



- Newbie
- Basic
- Advanced
- Expert

What are the main reasons for your interest in ontologies? (147/168)



A word cloud where the size of each word corresponds to its frequency in the responses. The most prominent words are 'data', 'development', 'knowledge', 'research', 'systems', 'semantic', 'representation', 'information', 'integration', 'interoperability', 'ontologies', 'domain', 'formal', 'linked', 'reasoning', 'web work', 'applications', 'discovery', 'description', 'management', 'metadata', 'models', 'text', 'terminology', 'tools', 'standard', 'standardisation', 'support', 'synthesis', 'technologies', 'theauri', 'understanding', 'usage', 'via', 'vocabularies', 'structure', 'studies', 'resources', 'query', 'related', 'practices', 'processes', 'projects', 'promote', 'provide', 'publishing', 'purpose', 'people', 'manner', 'making', 'management', 'manner', 'metadata', 'mining', 'models', 'necessary', 'logical', 'languages', 'interested', 'international', 'infrastructure', 'inference', 'improve', 'implicit', 'ict', 'human', 'end', 'etc', 'fair', 'format', 'general', 'geographic', 'harmonise', 'harmonization', 'database', 'deal', 'decision', 'definition', 'building', 'concepts', 'conceptual', 'context', 'create', 'creation', 'describing', 'design', 'different', 'enable', 'formal', 'general', 'geographic', 'harmonise', 'harmonization', 'access', 'agricultural', 'analysis', 'annotation', 'automated', 'automatic', 'better', 'building', 'concepts', 'conceptual', 'context', 'create', 'creation', 'database', 'deal', 'decision', 'definition', 'describing', 'description', 'design', 'different', 'discovery', 'domain', 'enable', 'end', 'etc', 'fair', 'format', 'general', 'geographic', 'harmonise', 'harmonization', 'human', 'ict', 'implicit', 'improve', 'inference', 'information', 'infrastructure', 'integration', 'interdisciplinary', 'interested', 'international', 'interoperability', 'job', 'knowledge', 'languages', 'linked', 'logical', 'making', 'management', 'manner', 'metadata', 'mining', 'models', 'necessary', 'ontology', 'people', 'practice', 'processes', 'projects', 'promote', 'provide', 'publishing', 'purpose', 'query', 'reasoning', 'related', 'representation', 'research', 'resources', 'science', 'search', 'semantic', 'share', 'solution', 'sources', 'specific', 'standard', 'standardisation', 'structure', 'studies', 'support', 'synthesis', 'systems', 'technologies', 'terminology', 'text', 'theauri', 'tools', 'understanding', 'usage', 'via', 'vocabularies', 'web work'.

Selected replies:

Use in annotating data and semantic representation of data

To unambiguously represent the reality.

Better data integration and query

Development of semantic based applications

Advanced data management for machine learning applications

Ontologies are cool!

How do you search or select ontology? (166/168)

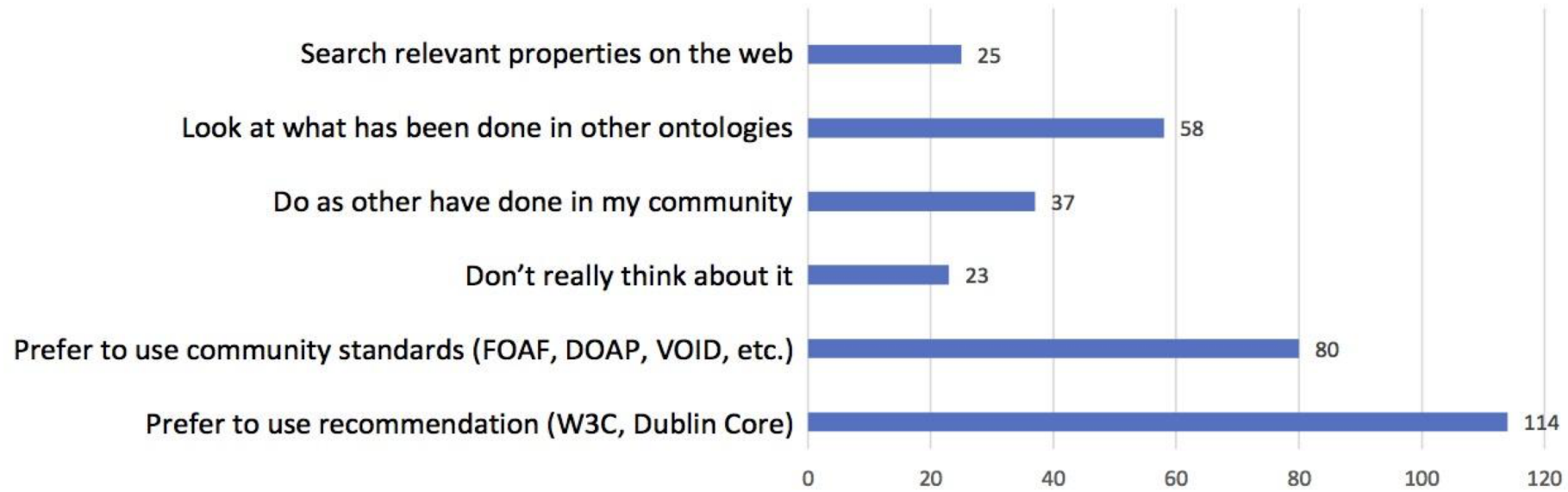
- *I know the ontologies I want to use: 88 responses (53%)*
- *I use ontology libraries and/or repositories: 85 responses (51%)*
- *I discover ontologies in literature or through my community: 105 responses (63%)*
- *I use ontology recommender service: 19 responses (11%)*

- Google(4), LOV(2)/LoV(1), Search engines, mailing list, BioPortal, Ontology lookup service, ...
- I ask people who know
- Via services like BioPortal and the OLS
- I prefer to build ontologies from the involved available data and the applications
- I map ontologies, as found in technical specifications, to ISO 15926-8
- I build them myself
- Either through Linked Open Vocabulary or Google or community

Do you know or use any other metadata vocabulary? (72/168)

- IAO (Information Artifact Ontology) (<https://bioportal.bioontology.org/ontologies/IAO>)
- SQWRL (**S**emantic **Q**uery-Enhanced **W**eb **R**ule **L**anguage)
(<https://github.com/protegeproject/swrlapi/wiki/SQWRL>)
- ISO-Thes (ISO 25964 SKOS extension) (<http://lov.okfn.org/dataset/lov/vocabs/iso-thes>)
- DDI (<http://www.ddialliance.org/explore-documentation>)
- MMC (Message Mapping Catalogue) (<https://www.smartdcc.co.uk/implementation/design-and-assurance/interface-specifications/message-mapping-catalogue/>)
- MADS (Metadata Authority Description Schema) (<http://www.loc.gov/standards/mads/>)
- DataCite Metadata Schema (<https://schema.datacite.org/>)
- SWEET - <http://sweetontology.net>, NASA GCMD Keywords -
<https://wiki.earthdata.nasa.gov/display/CMR/GCMD+Keyword+Access>
- GCMD keywords (<https://earthdata.nasa.gov/about/gcmd/global-change-master-directory-gcmd-keywords>)
- XKOS (SKOS extension for representing statistical classifications) (<http://rdf-vocabulary.ddialliance.org/xkos.html>)
- MARC, Darwin Core, LOM, Semantic Sensor Network Ontology; OWL-Time; GeoSPARQL; Linked Open Description of Events,

How do you choose your ontology metadata vocabularies when describing your ontology? (161/168)

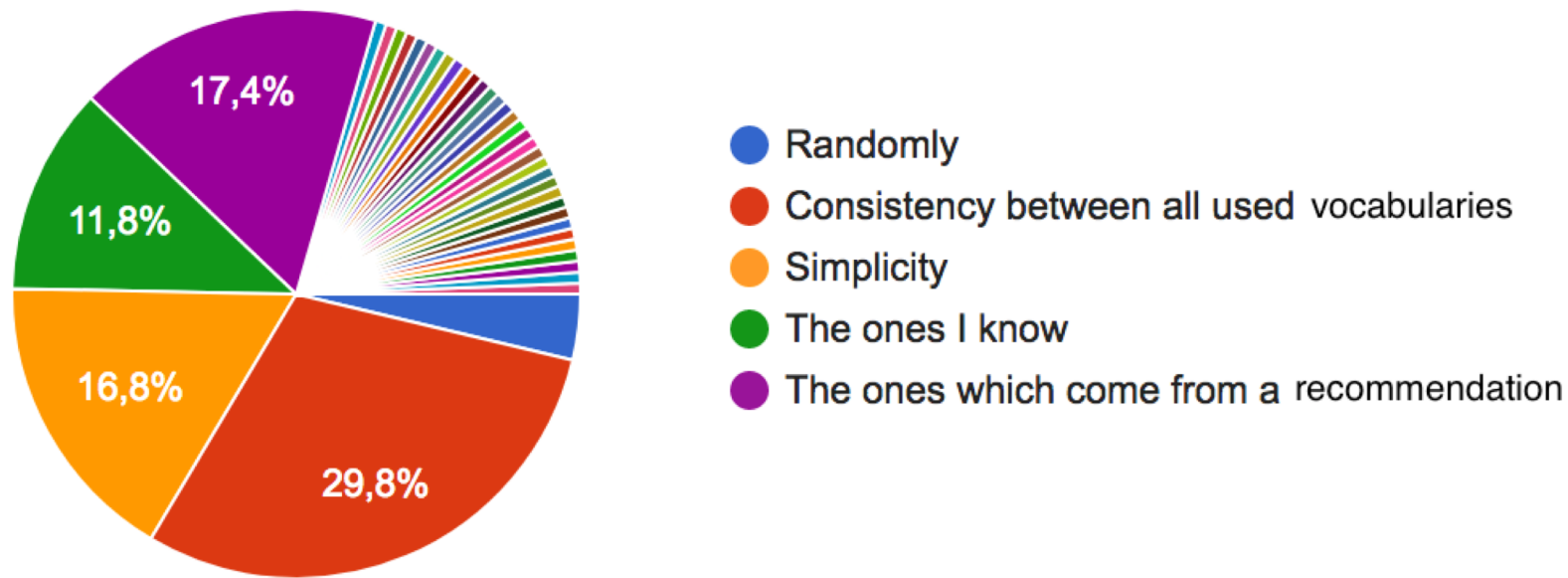


77% of the people use recommendation (W3C,Dublin Core) or community standards (FOAF or VOID)

46% look at what has been done in other ontologies or in their community

Only 7% of the people “don’t really think about it”

Current ontology metadata vocabularies overlap a lot. How do you select between two properties that have the same meaning, e.g. `rdfs:label`, `dc:title` and `omv:name`? (161/168)



The answers show that there is no specific approach to solve this problem of redundancy.

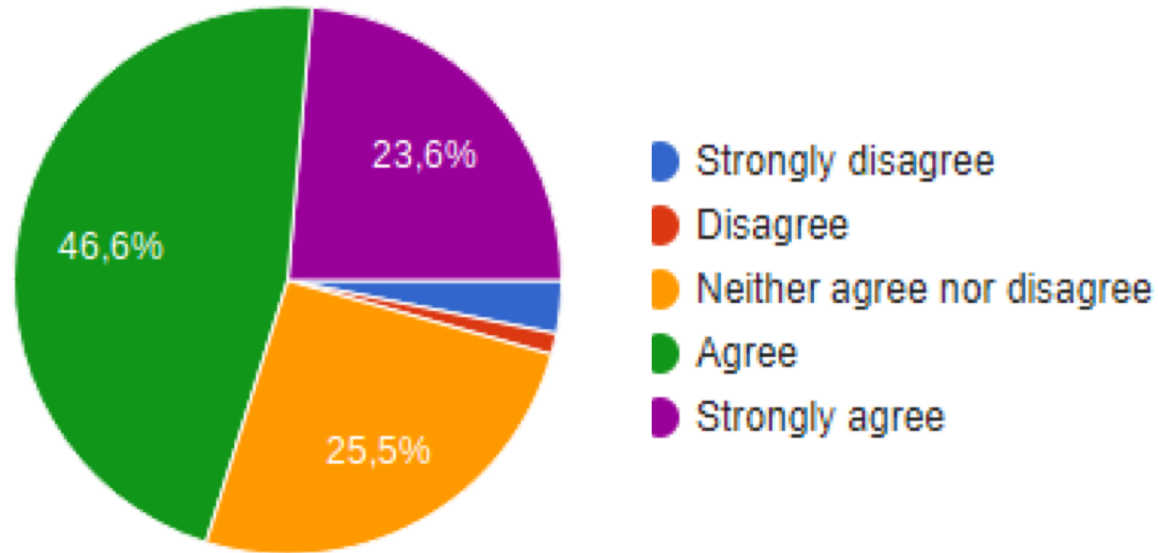
Please list out the metadata information that you think are missing in the existing metadata vocabularies that you are aware of? (73/168)

Some keywords identified in the responses

expressivity (3)
deprecation
quality (3)
contributing/support (5)
use cases (4)
provenance (8)
examples (2)
versioning/import (6)
privacy constraints (2)
term description (3)
metrics (2)
scope (4)
mappings (2)

Interesting to note that most of the mentioned elements exist already in the currently existing metadata vocabularies

Would you find it useful to be supported by a tool to author ontology metadata? (161/168)



What will make you focus more on ontology metadata authoring? (160/168)

- Guidelines on which metadata properties to use: 90 responses (56%)
- A set of recommendations on what to describe and how: 89 responses (56%)
- The adoption of a unique community standard like a W3C standard: 80 responses (50%)
- Better user interface within an ontology editor: 72 responses (45%)
- Simple template to copy/paste and quickly edit in the ontology file: 49 responses (31%)
- The incentives in terms of ontology citation, reuse, etc.: 44 responses (28%)
- If it is mandatory to publish metadata while uploading an ontology to a library or repository: 42 responses (26%)
- [Some unique answers in the next slide]

What will make you focus more on ontology metadata authoring? (160/168) (CONTD...2)

- **[Some unique answers]**
- Guidelines applies only if they are rigorous. Many are pretty bad.
- Useful tools that consume or generate the metadata
- Tools which use available metadata (whatever the vocabulary is) to add value for the end user: documentation generation, automatic translation to/from other vocabularies (using the mappings) - anything which is NOT authoring metadata for the sake of authoring metadata.
- I'm for simple metadata, good tools for data and we have to manage data with different metadata
- **Protege and the likes should simply ask for the most important metadata when creating a new ontology.**
- I already carefully document ontologies. What is missing is guidelines on how to specify metadata that will be recognised by the tools used in the different communities - as well as the ability of those tools to support the most common vocabularies, and do not stick only to their own and/or community-specific ones.
- Findability of the ontology
- None of the above

*Overall, do you think authoring and accessing ontology metadata is important?
Please specify why? (111/168)*

*Generally the people who are sloppy about it
are developing a sloppy ontology as well.*

accessing adding alignment already application areas authoring automatically available based best better cases
classes common community conceptual consistent context create curation data definition depend design
developers discover discovery documentation easily effort ensure essential etc examples existing facilitate
features field formal generation help important information integration issue
key knowledge language lot management mappings metadata model natural needs
ontology order organizations patterns people possible practice process properties provenance
provide purposes quality re-used real really recommend repository requirements resources result reuse
search semantic simple specific standard support survey talk term terminology things think tool
understand usage used users versioning vocabularies web work world

- 105/111 participants replied “yes” (94,6%)
- Why authoring and accessing ontology metadata is important?
 - Ontology search, discover, identify, selection,
 - Ontology organization, and management
 - Version control
 - Quality control
 - Resource linkage
 - Archiving
 - Ontology reuse
 - Enhancement of reproducibility
 - Semantic interoperability between machines
 - Ontology mapping
 - Access to ontological content
 - Ontology domain coverage
 - Reveals the ontology development context
 - Feedback to ontology designer

Do you have any recommendations or remarks on the subject? (111/168)

- **[Some recommendations/ remarks]**
 - A **single rigorous specification is important**. it has to be promoted as a standard.
 - The metadata types should be common, standardized and few
 - Need more advanced repositories like Bioportal for additional science areas and non-science areas...
 - Metadata is presumably intended to facilitate reuse
 - I think this is a really important issue. It is true that there are many vocabularies to be reused and just another common will just increase heterogeneity. In this sense I collaborate with this initiative putting together what is already available <https://w3id.org/widoco/bestPractices> (Maria Poveda Villalon)
 - There should be more than one way to create or obtain ontology metadata. Mappings between the key (most commonly used) properties of ontologies would allow ontology creators to work with the vocabularies they know best.
 - The one that impacts me most is versioning and inconsistencies caused by new versions of imports. The url the the correct repo and issue tracker should be key for building tools that can automatically submit issues etc (say, directly from Protege).
 - I would like to see that permanent urls are the only information really needed to lookup curation metadata.
 - Not OK to spend too much effort on a metadata authoring tool while not helping ontology users to understand if/when their ontology design patterns are compatible/incompatible/translatable into ontology design patterns used elsewhere
 - Vocabularies management needs to go beyond ontology, should also include codelists, taxonomy, thesauri, glossary, gazetteer.
 - There is an extreme lot of low-quality ontologies on the web, (...) We absolutely need quality control!
 - The current editing line is too complex (...) but I think that AgroPortal now automatically processes my RDF so things improve!.