

LOD = Linked Open Data

KOS = Knowledge Organization Structures/Systems



Functional Metrics for LOD KOS Products

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NKOS Workshop, Sept. 25 @DC2019, Seoul, S.Korea

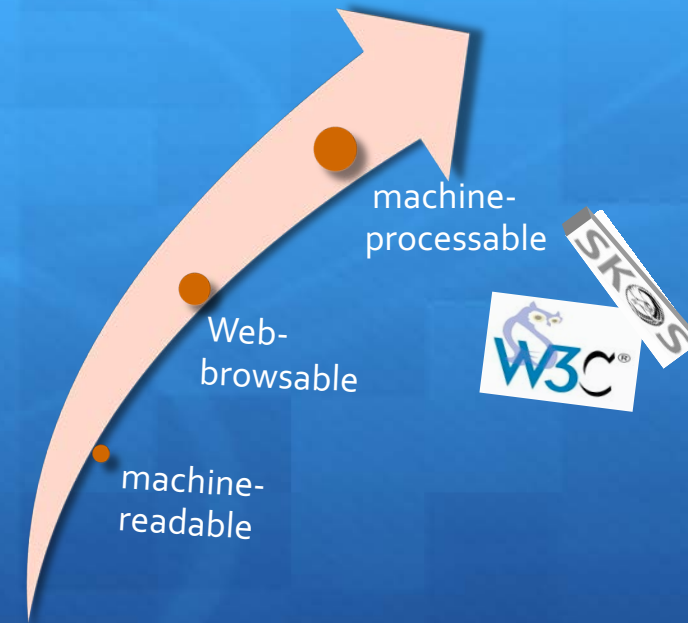
Outline

◆ A. Trend: Publishing KOS as LOD

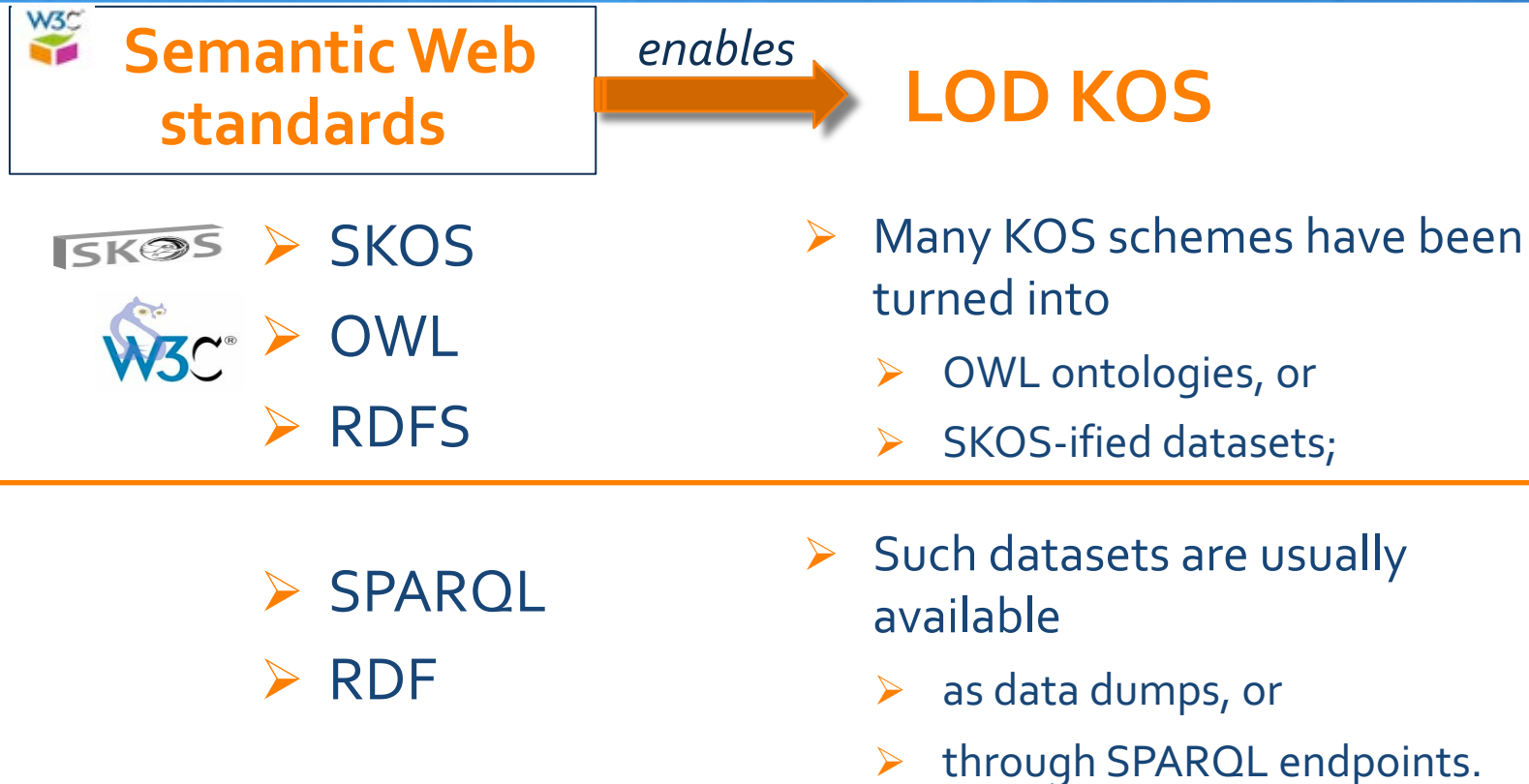
◆ B. Metrics development for LOD KOS

- a) -- as an open dataset
- b) -- as a KOS vocabulary

◆ C. Discussion



A. Trend: Publishing KOS as LOD



BARTOC

*(The Basel Register of
Thesauri, Ontologies
& Classifications)*

KOS registered:

-(2016-05): 1,836

-(2017-08): 2,753

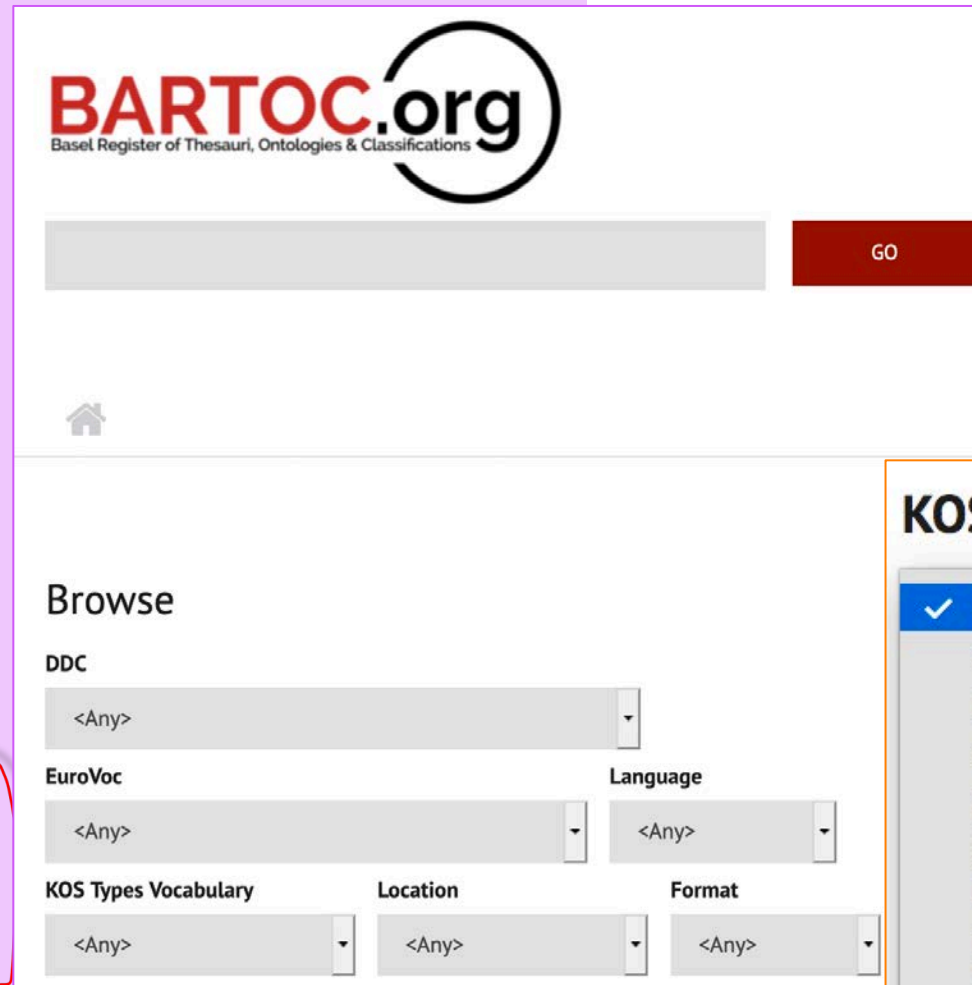
❖ RDF: 297

-(2019-08): **2,988**

❖ RDF: 438

❖ SKOS: 433

<http://bartoc.org/>
Accessed 2019-05-14



The screenshot shows the BARTOC.org website. At the top is the logo "BARTOC.org" with the tagline "Basel Register of Thesauri, Ontologies & Classifications". Below the logo is a search bar with a "GO" button. A home icon is visible below the search bar. The "Browse" section contains several dropdown menus: "DDC" (set to "<Any>"), "EuroVoc" (set to "<Any>"), "Language" (set to "<Any>"), "KOS Types Vocabulary" (set to "<Any>"), "Location" (set to "<Any>"), and "Format" (set to "<Any>").

KOS Types Vocabulary

✓ - None -

categorization scheme
classification scheme
dictionary
gazetteer
glossary
list
name authority list
ontology
semantic network
subject heading scheme
synonym ring
taxonomy
terminology
thesaurus

BioPortal Statistics	
Ontologies	796
Classes	9,821,387
Resources Indexed	0
Indexed Records	0
Direct Annotations	95,468,433,792
Direct Plus Expanded Annotations	144,789,582,932

Category

- ☐ All Organisms (28)
- ☐ Anatomy (69)
- ☐ Animal Development (13)
- ☐ Animal Gross Anatomy
- ☐ Arabidopsis (3)
- ☐ Biological Process (50)

Group

- ☐ BIBLIO (10)
- ☐ BIS (3)
- ☐ CGIAR (1)
- ☐ CTSA (6)
- ☐ OBO_Foundry (11)
- ☐ PSI (4)

Format

- ☐ OBO (103)
- ☐ OWL (557)
- ☐ SKOS (27)
- ☐ UMLS (33)

SNOMED CT (SNOMEDCT)

SNOMED Clinical Terms

Uploaded: 4/29/19

RxNORM (RXNORM)

RxNorm Vocabulary

Uploaded: 4/29/19

National Drug Data File (NDDF)

National Drug Data File Plus Source Vocabulary

Uploaded: 4/29/19

National Drug File - Reference Terminology

National Drug File - Reference Terminology Public Inferred Edit

Uploaded: 7/6/18

Human Phenotype Ontology (HP)

The Human Phenotype Ontology is being developed to provide vocabulary for the phenotypic features encountered in human

Uploaded: 6/3/19

Foundational Model of Anatomy (FMA)

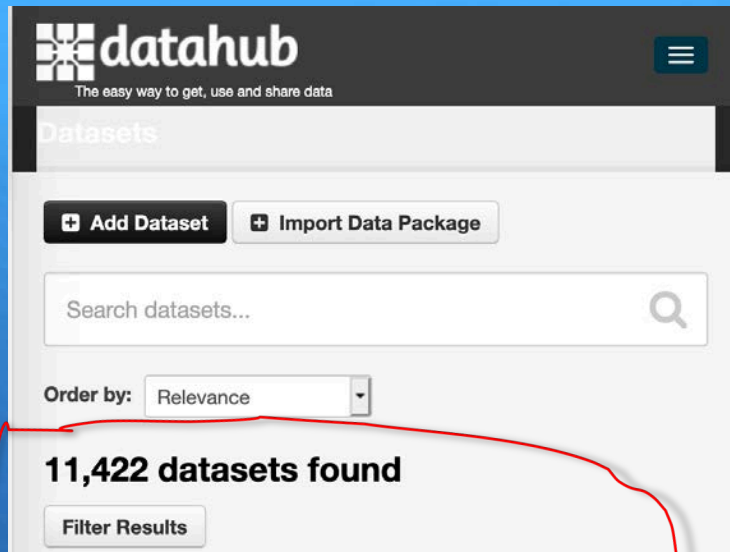
FMA is a domain ontology that represents a coherent body of e about human anatomy

Uploaded: 5/13/19

2019-08-22 data

<http://bioportal.bioontology.org/>

Findings from the datahub, as of 2019-08



(for LOD datasets,
not limited to KOS)

<https://old.datahub.io/dataset>
Accessed 2019-08-21

Search Type of KOS/DATASET	# found (initial)	# found (verified)	# with SPARQL endpoints
Authority Files	164	18	11
List	825	71	59
Terminology	39	35	8
Thesaurus	80	91*	41
Taxonomy	37	22	10
Classification	478	43	31
**Ontology	531	266	114
Totals	1623 (+531 ontologies)	280 (+ 266 ontologies)	160 (+114 ontologies)

From Library of Congress Subject Headings

Data of a LOD KOS are expressed as RDF triples and may be encoded using any concrete RDF syntax.

Available in various formats

Details

Suggest Terminology

Smartphones

URI(s)

- > <http://id.loc.gov/authorities/subjects/sh2007006251>
- > <info:lc/authorities/sh2007006251>
- > <http://id.loc.gov/authorities/sh2007006251#concept>

Instance Of

- > [MADS/RDF Topic](#)
- > [MADS/RDF Authority](#)
- > [SKOS Concept](#)

Scheme Membership(s)

- > [Library of Congress Subject Headings](#)

Collection Membership(s)

- > [LCSH Collection - Authorized Headings](#)
- > [LCSH Collection - General Collection](#)
- > [LCSH Collection - May Subdivide Geographically](#)

Variants

- > Smart cell phones
- > Smart phones

Broader Terms

- > [Cell phones](#)
- > [Pocket computers](#)

Narrower Terms

- > [Atrix \(Smartphone\)](#)
- > [BlackBerry \(Smartphone\)](#)
- > [BlackBerry Bold \(Smartphone\)](#)
- > [BlackBerry Curve \(Smartphone\)](#)
- > [BlackBerry Pearl \(Smartphone\)](#)
- > [BlackBerry Storm \(Smartphone\)](#)
- > [Droid \(Smartphone\)](#)
- > [G1 \(Smartphone\)](#)
- > [HTC One \(Smartphone\)](#)
- > [iPhone \(Smartphone\)](#)
- > [Nexus One \(Smartphone\)](#)
- > [Nokia smartphones](#)
- > [Palm Pre \(Smartphone\)](#)
- > [Samsung Galaxy Nexus \(Smartphone\)](#)
- > [Samsung Galaxy Note \(Smartphone\)](#)
- > [Samsung Galaxy S \(Smartphone\)](#)

Closely Matching Concepts from Other Schemes

- > [älypuhelimet](#)
- > [smartphone](#) Label from public data source Wikidata
- > [Smartphones](#)
- > [Smartphones](#)

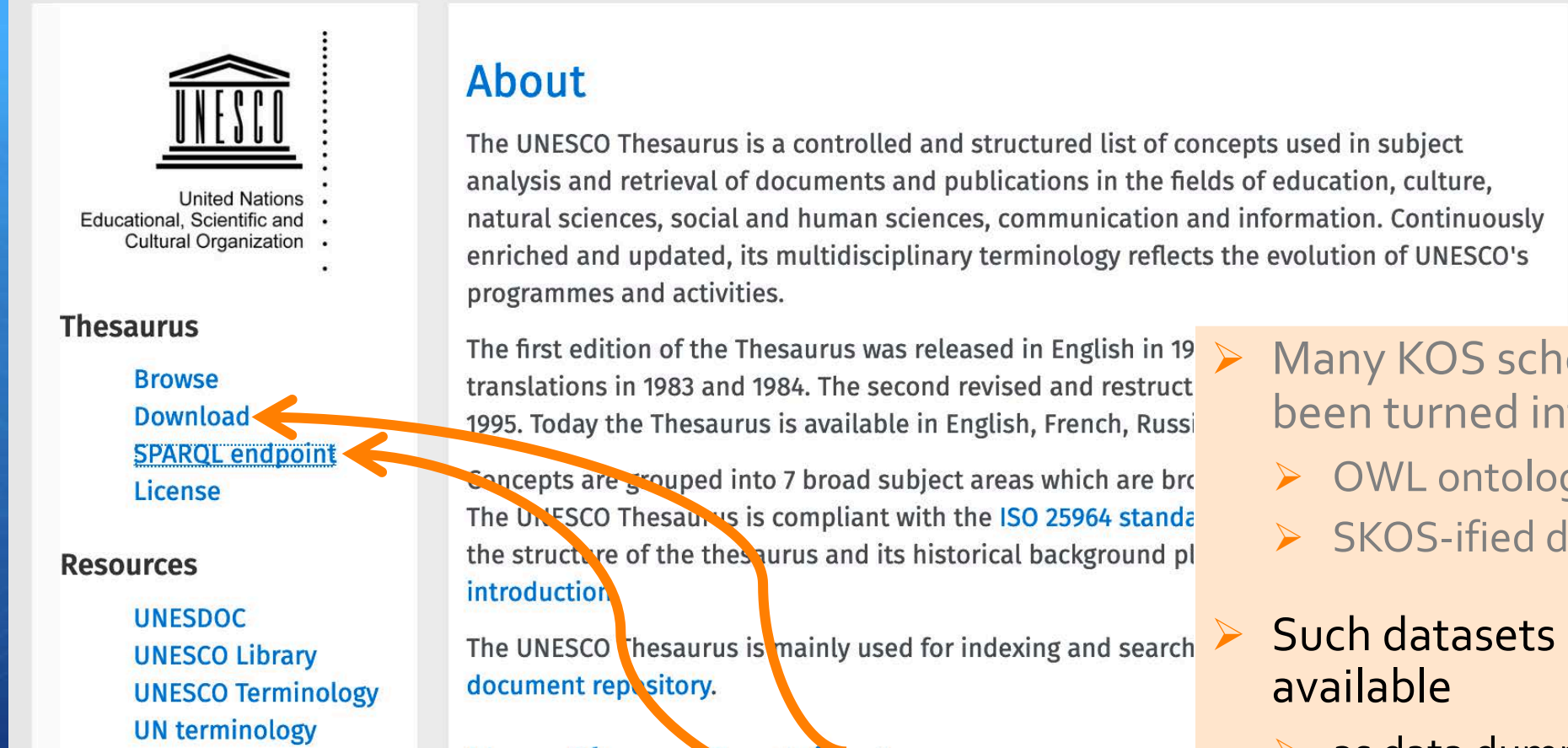
Alternate Formats

- > [RDF/XML \(MADS and SKOS\)](#)
- > [N-Triples \(MADS and SKOS\)](#)
- > [JSON \(MADS/RDF and SKOS/RDF\)](#)
- > [MADS - RDF/XML](#)
- > [MADS - N-Triples](#)
- > [MADS/RDF - JSON](#)
- > [SKOS - RDF/XML](#)
- > [SKOS - N-Triples](#)
- > [SKOS - JSON](#)
- > [MADS/XML](#)
- > [MARC/XML](#)

Images captured 2019-05-14

<http://id.loc.gov/authorities/subjects/sh2007006251>

UNESCO Thesaurus



UNESCO
United Nations
Educational, Scientific and
Cultural Organization

Thesaurus

- [Browse](#)
- [Download](#)
- [SPARQL endpoint](#)
- [License](#)

Resources

- [UNESDOC](#)
- [UNESCO Library](#)
- [UNESCO Terminology](#)
- [UN terminology](#)

About

The UNESCO Thesaurus is a controlled and structured list of concepts used in subject analysis and retrieval of documents and publications in the fields of education, culture, natural sciences, social and human sciences, communication and information. Continuously enriched and updated, its multidisciplinary terminology reflects the evolution of UNESCO's programmes and activities.

The first edition of the Thesaurus was released in English in 1954, with translations in 1983 and 1984. The second revised and restructured edition was published in 1995. Today the Thesaurus is available in English, French, Russian and Chinese.

Concepts are grouped into 7 broad subject areas which are broadly defined. The UNESCO Thesaurus is compliant with the [ISO 25964 standard](#) for the structure of the thesaurus and its historical background please see the [introduction](#).

The UNESCO Thesaurus is mainly used for indexing and search of documents in the [document repository](#).

- Many KOS schemes have been turned into
 - OWL ontologies or
 - SKOS-ified datasets;
- Such datasets are usually available
 - as data dumps or
 - through SPARQL endpoints.

<http://vocabularies.unesco.org/browser/en/about>
Image captured 2019-05-14

UNESCO vocabularies - SPARQL service

A. Trend: Publishing KOS as LOD

Default graph (IRI)

Contact us

Query

```
1 PREFIX skos: <http://www.w3.org/2004/02/skos/core#> SELECT DISTINCT ?c
  where { ?c a skos:Concept } LIMIT 100
```

- Many KOS schemes have been turned into
 - OWL ontologies or
 - SKOS-ified datasets;
- Such datasets are usually available
 - as data dumps or
 - through SPARQL endpoints.

Query examples

- Explore a sample of the data
- List all concepts of a micro-thesaurus in french
- List all concepts of a domain
- List all concepts
- List all micro-thesauri
- List all the translations english-french
- List the translations english-russian
- List concepts created after a given date
- Get the list of countries
- Select all the properties of a concept
- Make a search on all the concept labels
- Get all concepts in english and french, with synonyms, notes, broaders, narrowers and related (with I
- Get the hierarchical table of all the concepts (with IDs)
- Get the hierarchical table of all the concepts (with labels)

Result format:

HTML

- ✓ HTML
- Text
- XML
- JSON
- NTriples
- RDF/XML
- CSV
- TSV

Run Query

Reset

Marcia Zettl & J. Clunis - NKOS Workshop @DC2019, Sept 24, Seoul

<http://vocabularies.unesco.org/sparql-form/>

Image captured 2019-05-14

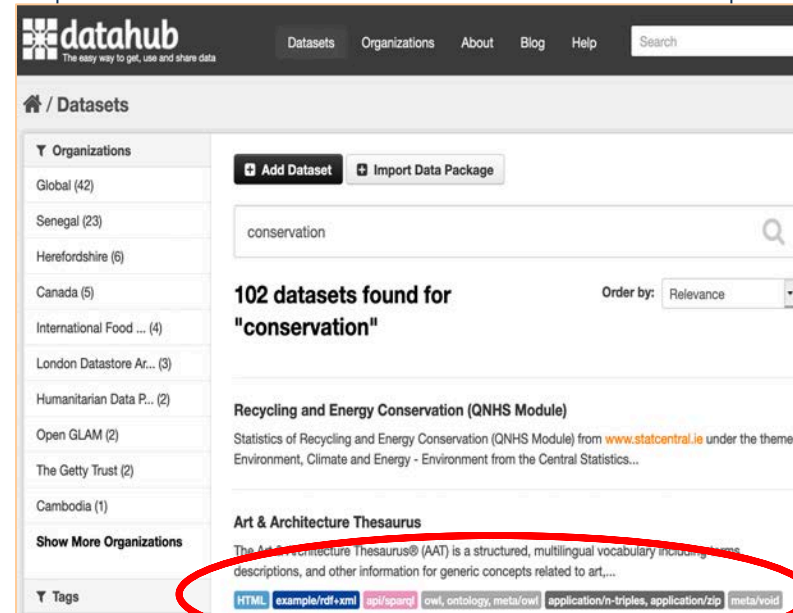
LOD KOS in the Datahub -Examples

General-purpose KOS

- Library of Congress Subject Headings (LCSH)
- EuroVoc
- Faceted Application of Subject Terminology (FAST)
- Universal Decimal Classification (UDC) Summary
- Library of Congress Classification;
- National Diet Library of Japan subject headings

Name-authority types of KOS

- ❑ Getty Thesaurus of Geographic Names (TGN)
- ❑ Union List of Artist Names (ULAN)
- ❑ FAO geopolitical ontology
- ❑ VIAF (Virtual International Authority File)
- ❑ & several national library's name authorities



Available in
various
formats

Standardized domain KOS

- AGROVOC
- Art and Architecture Thesaurus (AAT)
- ICONCLASS - Multilingual Thematic Classification
- English Heritage Monument Types Thesaurus & a series of thesauri for cultural heritage
- Medical Subject Headings (MeSH)
- Gene Ontology
- STW Thesaurus for Economics
- & dozens for biomedicine

Language- and culture-specific KOS

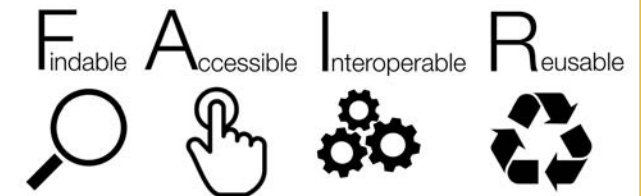
- Traditional Korean Medicine Ontology
- Art and Architecture Thesaurus-Taiwan
- National Diet Library of Japan (NDL) Authorities
- & more

B. Metrics development for LOD KOS

- a) -- as an open dataset -- FAIR
- b) -- as a KOS vocabulary



a).-- as an open dataset



➤ Following the FAIR Principle



Data and supplementary materials have sufficiently rich metadata and a unique and persistent identifier.

FINDABLE



Metadata and data are understandable to humans and machines. Data is deposited in a trusted repository.

ACCESSIBLE



Metadata use a formal, accessible, shared, and broadly applicable language for knowledge representation.

INTEROPERABLE

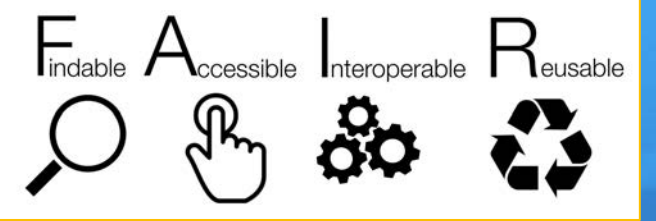


Data and collections have a clear usage licenses and provide accurate information on provenance.

REUSABLE

Image source: LIBER Europe: [Implementing FAIR Data Principles - The Role of Libraries](https://en.wikipedia.org/wiki/Implementing_FAIR_Data_Principles_-_The_Role_of_Libraries)
https://en.wikipedia.org/wiki/FAIR_data

LOD KOS' FAIR: Findable



Findable

F1. (Meta)data are assigned a globally unique and persistent identifier

F2. **Data are described with rich metadata** (defined by R1 below)

F3. Metadata clearly and explicitly include the identifier of the data they describe

F4. (Meta)data are registered or indexed in a searchable resource

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

Examples from the datahub:
- Various levels of F[indable]



Additional Info

Field

Source

Author

Maintainer

Version

Last Updated

Created

Languages

VS.

Additional Info

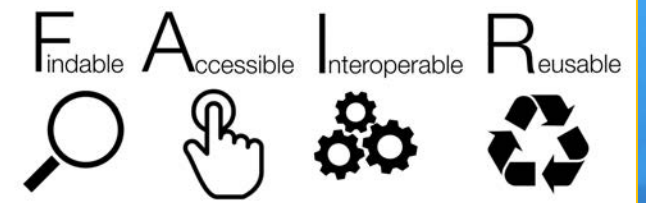
Field

Source

Last Updated

Created

LOD KOS' FAIR: Accessible



Examples from the datahub: - Various levels of A[ccessible]

UNESCO Thesaurus
The UNESCO Thesaurus is a controlled and structured list of terms used in subject analysis and retrieval of documents and publications in the fields of education, culture,...

Open Thesaurus
About Thesauri in: Dutch German Norwegian Polish Portuguese Slovak Slovenian Spanish More
background information on the English and German Wikipedia pages:...

NCI Thesaurus
Thesaurus publikovaný NCI v USA

Thesaurus Datenwissen
This service exposes the data from openthesaurus.de as Linked Data.

Thesaurus BNCF
Nuovo soggetto (NS), edited by the National Central Library of Florence, is the Italian subject indexing tool for various types of resources. It has been developed in...

Courts thesaurus
Courts thesaurus is structuring German and European courts in a hierarchical fashion and includes e.g. address information. This thesaurus is not only dedicated to parties...

NCI Thesaurus
A vocabulary for clinical care, translational and basic research, and public information and administrative activities.

Open Data Thesaurus
The Open Data Thesaurus is a collection of key concepts and entities, their definitions and semantic links. Following the principle of 'test your own dog food' this thesaurus is...

Social Semantic Web Thesaurus
People, organisations, applications and technologies etc. relevant for the area of the Social Semantic Web

WikiWord Thesaurus Data
About Overview: The WikiWord-Thesaurus is a multilingual Thesaurus derived from Wikipedia by extracting lexical and semantic information. It was originally developed for a...

QGeneral Multilingual Environmental Thesaurus
About A thesaurus in 20+ languages for terms related to the environment and environmental data. Published by the European Environment Agency. Available in RDF without reuse...

STW Thesaurus for Economics
The thesaurus provides vocabulary on any economic subject: about 6,000 standardized subject headings and about 18,000 entry terms to support individual keywords. You can also...

Data and Resources

SPARQL Endpoint
No description for this resource

Home page for browsing and searching
No description for this resource

Complete dataset in Turtle
No description for this resource

Complete dataset in RDF/XML
No description for this resource

Dataset description in VoID
No description for this resource

Example in HTML
No description for this resource

Example in Notation-3
No description for this resource

Example in RDF/XML
No description for this resource

Example in Turtle
No description for this resource

Unnamed resource
No description for this resource

Example in JSON
No description for this resource

Example in JSON-LD
No description for this resource

VS.

Data and Resources

Linked Data entry point (RDFa)
Linked Data entry point (RDFa)

Download (RDF/XML)
Download (RDF/XML)

Metadata and data are understandable to humans and machines. Data is deposited in a trusted repository.

ACCESSIBLE

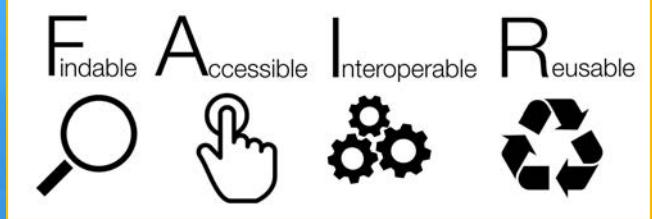
Accessible

A1. (Meta)data are retrievable by their identifier using a standardised communications protocol

- A1.1 The protocol is open, free, and universally implementable
- A1.2 The protocol allows for an authentication and authorisation procedure, where necessary

A2. Metadata are accessible, even when the data are no longer available

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



LOD KOS' FAIR: Interoperable

Interoperable

1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
2. (Meta)data use vocabularies that follow FAIR principles
3. (Meta)data include qualified references to other (meta)data

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



Metadata use a formal, accessible, shared, and broadly applicable language for knowledge representation.

INTEROPERABLE

Preliminary study findings:

- (Meta)data that have been used in describing the vocabularies vary at different registries.
- The way of categorizing the vocabulary type in the datahub is unstandardized, even though the terms to use are suggested.

Search Type of KOS/DATASET	# found (initial)	# found (verified)
Authority Files	164	18
List	825	71
Terminology	39	35
Thesaurus	80	91*
Taxonomy	37	22
Classification	478	43
**Ontology	531	266
Totals	1623 (+531 ontologies)	280 (+ 266 ontologies)

LOD KOS' FAIR: Reusable

Reusable

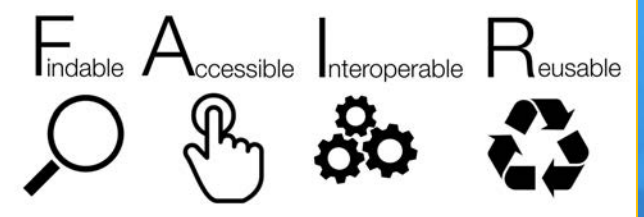
R1. Meta(data) are richly described with a plurality of accurate and relevant attributes

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

R1.2. (Meta)data are associated **with detailed provenance**

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

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



Data and collections have a clear usage licenses and provide accurate information on provenance.

REUSABLE

Examples from the datahub:
- Various levels of R[eusable]

VS.

provenance-metadata

publications

published-by-producer

rdf

thesaurus

vocab-mappings

lodcloud-diagram-20...

lodcloud-diagram-20...

no-license-metadata

no-proprietary-vocab

no-provenance-metadata

no-vocab-mappings

publications

published-by-producer

B. Metrics development for LOD KOS

- a) -- as an open dataset -- FAIR
- b) -- as a KOS vocabulary -- FIT

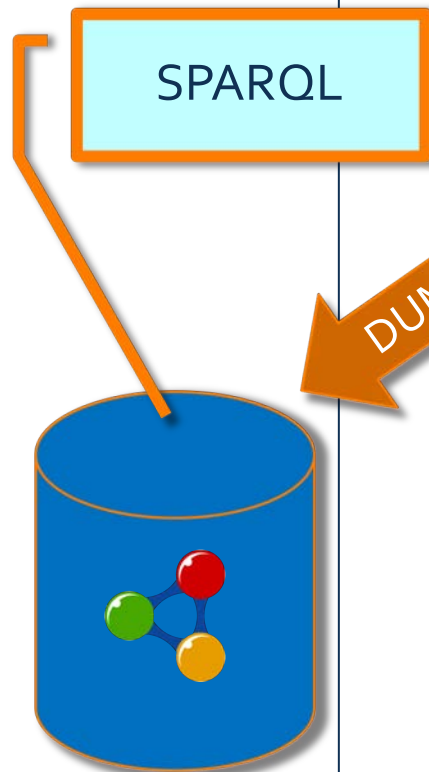


Functional
Impactful
Transformable



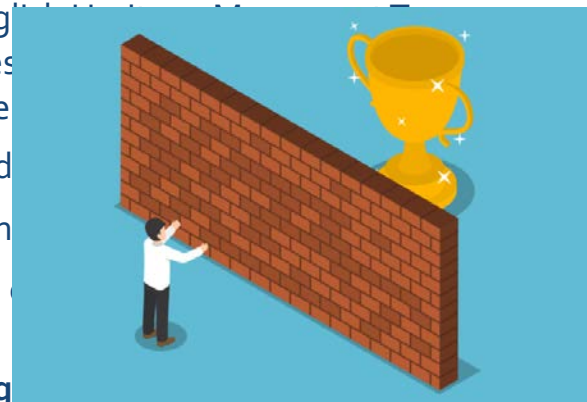
b) -- as a value vocabulary

KOS vocabularies in the Datahub -Examples



- **General-purpose KOS**
 - Library of Congress Classification (LCSH)
 - EuroVoc
 - Faceted Application of Subject Terminology
 - Universal Decimal Classification (UDC) Summary
 - Library of Congress Classification
 - National Diet Library of Japan subject headings
- **Name-authority types of KOS**
 - Getty Thesaurus of Geographic Names (TGN)
 - Union List of Artist Names
 - VIAF (Virtual International Authority File)
 - and several national library's name authorities
 - FAO geopolitical ontology

- **Standardized domain KOS**
 - AGROVOC
 - **Great!** Thesaurus for Economics
 - Art and Architecture Thesaurus (AAT)
 - ICONCLASS - Multilingual Thematic Classification
 - **However**
 - English Thesaurus of Economics
 - Thesaurus of Economics
 - a set of
 - Medical
 - General
 - and
- **Language**
 - Trade
 - Art a
 - Nati
 - Auth



They need to be explored through RDF delivery services →

Delivering the [whole] KOS vocabularies

- Example

Asset
EuroVoc
Thesaurus
URI: <http://publications.europa.eu/resource/dataset/eurovoc>

About Browse content Documentation Links Releases SKOS

EuroVoc is a multilingual, multidisciplinary thesaurus covering the activities of the particular. It contains terms in 23 EU languages (Bulgarian, Croatian, Czech, Danish, French, German, Greek, Hungarian, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Slovenian, Spanish and Swedish), plus in three languages of countries which are candidates for accession: македонски (mk), shqip (sq) and српски (sr).

ID: EuroVoc
Version: 20190329-1 **LATEST**
Published: 2019-03-29
Author: Publications Office
Publisher: Publications Office

Downloads

- [ZIP EuroVoc_Excel_export.zip](#)
- [ZIP EuroVoc_MarcXML.zip](#)
- [ZIP eurovoc_skos.zip](#)
- [ZIP eurovoc_in_skos_core_concepts.zip](#)
- [ZIP eurovoc_skos_ap.zip](#)
- [RDF eurovoc-skos-ap-act.rdf](#)
- [XML at-eurovoc-v3.xsd](#)
- [ZIP eurovoc_xml.zip](#)

Alignments

- [RDF EuroVoc Alignment Rameau](#)
- [RDF EuroVoc Alignment UMTHESES](#)
- [RDF EuroVoc Alignment Inspire](#)
- [RDF EuroVoc Alignment ESCO](#)
- [RDF EuroVoc Alignment Eclac](#)
- [RDF EuroVoc Alignment Gemet](#)

<https://publications.europa.eu/en/web/eu-vocabularies/th-dataset/-/resource/dataset/eurovoc>

EU Vocabularies

EUROPA > Publications Office of the EU > EU Vocabularies > linked-data

Home Controlled vocabularies Models Business collections Releases

Linked data query wizard

Select scope > Select metadata > Define conditions > Execute

SPARQL

SELECT
Pref Label

WHERE
Pref Label

Linked data

```
1 PREFIX cdm:<http://publications.europa.eu/ontology/cdm#>
2 SELECT DISTINCT
3 ?SKOS_definition
4 ?SKOS_prefLabel
5 WHERE{
6 ?work a skos:Concept.
7 OPTIONAL{?work skos:prefLabel ?SKOS_prefLabel}.
8 OPTIONAL{?work skos:definition ?SKOS_definition}.
9 OPTIONAL{?work skos:altLabel ?SKOS_altLabel}.
10 FILTER(?SKOS_prefLabel="rice" OR ?SKOS_altLabel="rice")
11 }
12 LIMIT 10
13 OFFSET 0
```

Line: 1; Position: 1; Query is valid

Query Results

Sort by

RESULTS 10 **START FROM** 0

Save to my searches Edit in FLINT Execute

<https://publications.europa.eu/en/advanced-sparql-query-editor>

B. Metrics for LOD KOS

b) -- as a value vocabulary

Functional

Functional

Made available in ways that enhance their inherent purpose.

F1. Delivered in *consumable* formats

- Available in various data serialization formats
- Accessible through SPARQL endpoints

F2. Endpoints are *operational*

- Ensures sustainability

F3. Dataset properties and structures are *informed* effectively

- Contains refined query examples to reveal the internal structures.

F4. Services are user-friendly, making vocabulary contents reachable

- Enhanced *usability (user friendliness)* through default or example queries for data exploration.

F1. Exposed to users in *consumable* formats

- Available in various data serialization formats

Library of Congress Subject Headings

LCSH has been actively maintained since 1898 to catalog materials held at the Library of Congress. By virtue of cooperative cataloging other libraries around the United States also use LCSH to provide subject access to their collections. In addition LCSH is used internationally, often in translation.

Data and Resources

- LCSH SKOS (ntriples)**
N-Triples using SKOS and DublinCore
- LCSH SKOS (rdf/xml)**
RDF/XML using SKOS and DublinCore vocabularies
- RDF/XML example**
RDF/XML example



Consumable?

Findings based on data from datahub:

Functional

Format	2016	2017	2019
json	54	42	75
html	47	37	72
xml	55	42	70
tsv	44	30	64
rdf+xml	40	30	62
default/auto	37	27	51
turtle	30	26	40
csv	34	20	40
n-triples	26	18	37
javascript	23	11	32
spreadsheet	22	3	31
plain/text	20	21	28
query structure	15	15	23
Serialized PHP	15	15	22
ASCII			3
Raw Response			3
Pivot Table			2
Google Chart			2
json-ld		3	1
sqlite Database		1	1

Offering various serializations make data more likely to be FIT (functional, impactful and transformable.)

2016

Search Type of KOS/DATASET	# found	# with SPARQL endpoints
Thesaurus	67	39
Classification	458	29
Taxonomy	26	8
Terminology	35	7
List	665	52
Total	1251	135

2017

Search Type of KOS/DATASET	# found	# with SPARQL endpoints
Thesaurus	79	40
Classification	476	31
Taxonomy	35	8
Terminology	39	8
List	821	58
Total	1450	145

➤ Accessible through SPARQL

Functional

with **SPARQL Endpoints**
In addition to data dumps ...

2019

Search Type of KOS/DATASET	# found	# with SPARQL endpoints
Authority File	164	11
Thesaurus	80	41
Classification	478	31
Taxonomy	37	10
Terminology	39	8
List	825	59
Total	1623	160

- Data collected from datahub

F2. Endpoints are *operational* .

Findings (2019): Near 80% are operational.

Number of Non-Functioning SPARQL endpoints

Reality check

*after removing
duplicates and not
including
ontologies.*

Year	Checked	Not available
2019	171	83
2017	117	63
2016	127	29

Ensures sustainability!

F3. Dataset properties and structures are *informed* effectively.

Functional

Social Semantic Web

Thesaurus

Wiki

SPARQL

SPARQL Endpoint

```
PREFIX skos:<http://www.w3.org/2004/02/skos/core#>
SELECT DISTINCT ?Concept ?prefLabel
WHERE
{
  ?Concept ?x skos:Concept .
  { ?Concept skos:prefLabel ?prefLabel . FILTER (regex(str(?prefLabel), '^a.*', 'i')) }
} ORDER BY ?prefLabel LIMIT 50 OFFSET 0
```

Query valid!

Format:

HTML Table

Add Namespace

☐ SKOS

☐ DC

☐ DCTERMS

☐ OWL

☐ RDF

☐ RDFS

☐ SWC

[Sample Query 1](#)

Returns all URIs and preferred labels of concepts that start with the letter "A" a

50 concepts are displayed.

[Sample Query 2](#)

Returns 50 Triples of any kind.

[Sample Query 3](#)

Returns preferred and alternative label and the definition of a maximum of 50 c

In order to master a query, one must understand:

- the syntax,
- forms,
- operators,
- result set modifiers,
- variables, and
- functions of the SPARQL query language.

+

- properties used by various involved RDF vocabularies

(cont.)F3. Dataset properties and structures are *informed* effectively.

WHY?

If these thesauri are **similar in structure** and **use similar sets of properties**, I could learn from one, and then apply that knowledge to others when forming the SPARQL queries ...

	A	B
1		http://skos.um.es/sparql/
2	color legend	UNESCO Thesaurus
3	SKOS	http://purl.org/dc/elements/1.1/source
4	DC	http://purl.org/dc/elements/1.1/title
5	DCTERMS	http://purl.org/dc/terms/created
6	OWL	http://purl.org/dc/terms/creator
7	RDFS	http://purl.org/dc/terms/date
8	RDF	http://purl.org/dc/terms/modified
9	dbpedia	http://purl.org/dc/terms/publisher
10	w3.org/geo	http://purl.org/dc/terms/source
11	FOAF	http://purl.org/dc/terms/title
12	creativecommons	http://purl.org/umu/unescosvoc#contains
13	SWC	http://purl.org/umu/unescosvoc#memberOf
14	special	http://www.w3.org/1999/02/22-rdf-syntax-ns#type
15	other	http://www.w3.org/2000/01/rdf-schema#comment
16	schema.org	http://www.w3.org/2000/01/rdf-schema#label
17	w3.org/ns	http://www.w3.org/2002/07/owl#sameAs
18		http://www.w3.org/2004/02/skos/core#altLabel
19		http://www.w3.org/2004/02/skos/core#broader
20		http://www.w3.org/2004/02/skos/core#closeMatch
21		http://www.w3.org/2004/02/skos/core#hasTopConcept
22		http://www.w3.org/2004/02/skos/core#inScheme
23		http://www.w3.org/2004/02/skos/core#member
24		http://www.w3.org/2004/02/skos/core#narrower
25		http://www.w3.org/2004/02/skos/core#notation
26		http://www.w3.org/2004/02/skos/core#prefLabel
27		http://www.w3.org/2004/02/skos/core#related
28		http://www.w3.org/2004/02/skos/core#scopeNote
29		http://www.w3.org/2004/02/skos/core#topConceptOf
30		

Reality check

Reality check: For the 82 KOSs which provided SPARQL Endpoints, are they similar in structure and do they use a similar sets of properties? [Study conducted in 2016.]

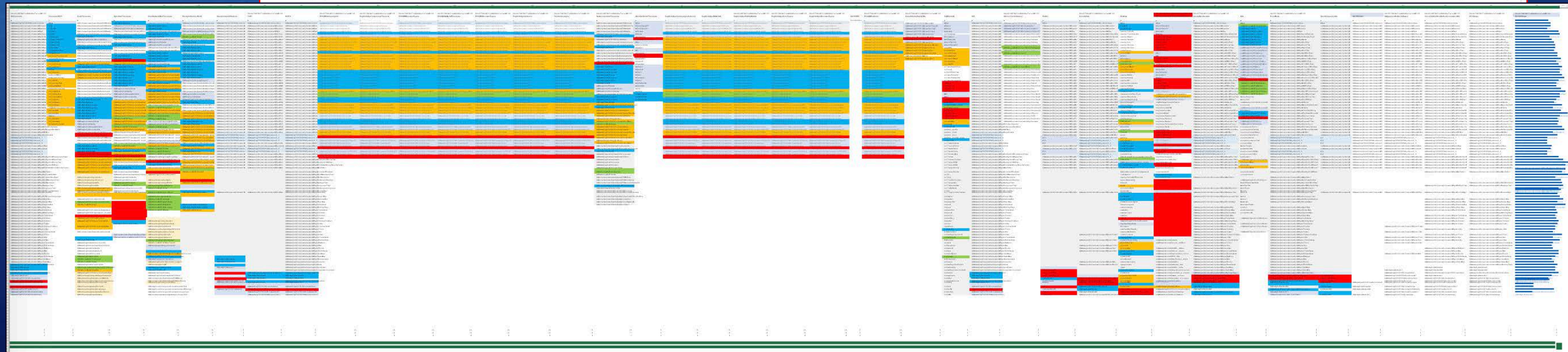
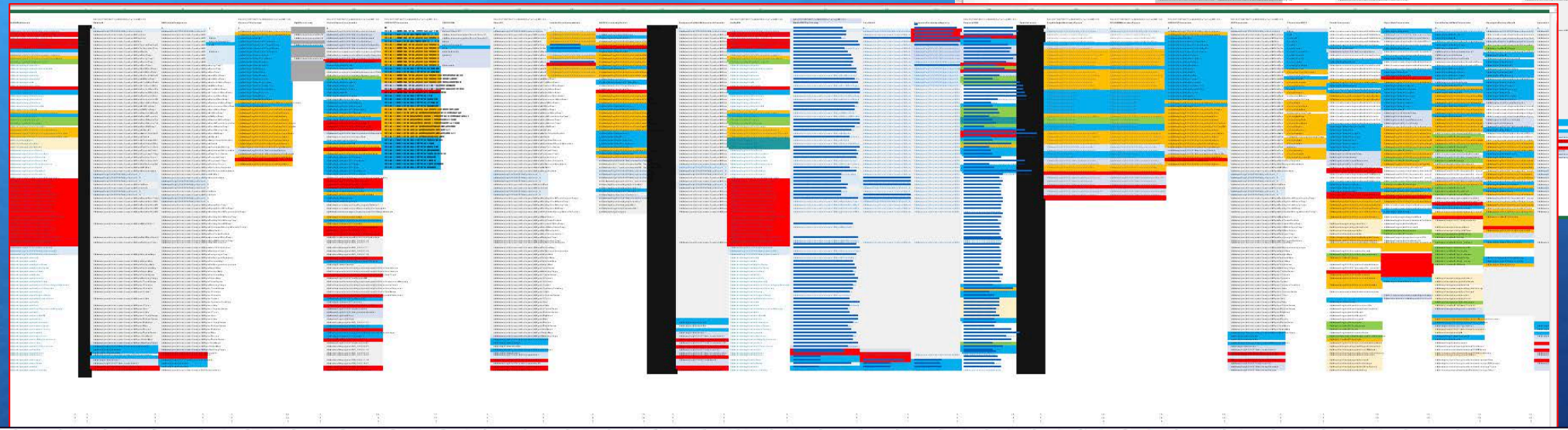
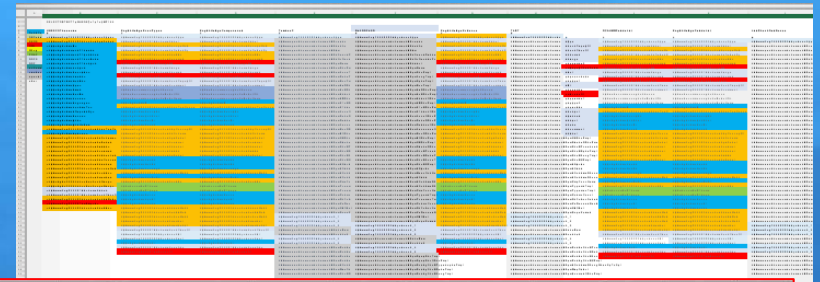
Finding:
The majority have specialized properties to represent their structure.

color legend	UNESCO Thesaurus	Social Semantic Web Thesaurus	STW Thesaurus for Economics	TGN	NO	Thesaurus BRIC	Courts Thesaurus	Open Data Thesaurus	Ecological Survey of Australia	Spanish Linguistics Dataset	United Clean Data Energy	Earth
SKOS	http://www.unesco.org/thesaurus/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
DC	http://www.dublincore.org/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
DCTERMS	http://www.dublincore.org/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
OWL	http://www.w3.org/2002/07/owl	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
RDFS	http://www.w3.org/2000/01/rdf-schema	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
RDF	http://www.w3.org/1999/02/22-rdf-syntax-ns	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
dbpedia	http://www.dbpedia.org/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
w3.org/geo	http://www.w3.org/2003/01/geo	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
FOAF	http://xmlns:foaf.org/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
creativecommons	http://creativecommons.org/licenses/by/4.0/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
SWC	http://www.semanticweb.org/thesaurus/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
special	http://www.semanticweb.org/thesaurus/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
other	http://www.semanticweb.org/thesaurus/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
schema.org	http://schema.org/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/
w3.org/ns	http://www.w3.org/ns/	http://www.semanticweb.org/thesaurus/	http://www.stw-thesaurus.org/	http://www.tgn.org/	http://www.no.org/	http://www.bric-thesaurus.org/	http://www.courts-thesaurus.org/	http://www.opendata-thesaurus.org/	http://www.ecological-survey.org/	http://www.spanish-linguistics.org/	http://www.clean-data-energy.org/	http://www.earth-thesaurus.org/

Even if you know how to make a SPARQL query, you still have to know the internal properties and data structures, in order to use them.

- DublinCore
- DBPedia
- SKOS
- OWL
- W3.org
- FOAF
- RDFS
- RDF
- schema.org
- creative commo
- special
- other

Again, reality check: For the KOSs which provided SPARQL Endpoints, are they similar in structure and do they use a similar set of properties?
[Study conducted in 2019.]



(cont.)F3. Dataset properties and structures are *informed* effectively.

- Contains multiple refined query examples to *inform* knowledge of dataset properties and structures.
- Include at least a basic default query such as `SELECT * WHERE ?s ?p? o? LIMIT 100` which would allow users to explore the first 100 triples in the graph.
- Include queries to allow users to explore unique features of the dataset.

F4. Services are user-friendly, making vocabulary contents reachable.

Functional

Findings (2019) of 171 endpoints:

- 66 offered a default query.
- 15 offered example queries of any kind.

Social Semantic Web Thesaurus

Wiki SPARQL

SPARQL Endpoint

```
PREFIX skos:<http://www.w3.org/2004/02/skos/core#>
SELECT DISTINCT ?Concept ?prefLabel
WHERE
{
  ?Concept ?x skos:Concept .
  { ?Concept skos:prefLabel ?prefLabel . FILTER (regex(str(?prefLabel), '^a.*', 'i')) }
} ORDER BY ?prefLabel LIMIT 50 OFFSET 0
```

Query valid!

Format: HTML Table

Add Namespace

- ☐ SKOS
- ☐ DC
- ☐ DCTERMS
- ☐ OWL
- ☐ RDF
- ☐ RDFS
- ☐ SWC

[Sample Query 1](#)

Returns all URIs and preferred labels of concepts that start with the letter "A" and sorts them alphabetically. 50 concepts are displayed.

[Sample Query 2](#)

Returns 50 Triples of any kind.

[Sample Query 3](#)

Returns preferred and alternative labels and the definition of a maximum of 50 concepts where these values are not empty.

Marcia Zeng & J. Clonis - NKOS Workshop @DC2019, Sept 24, Seoul

In order to master a query, one must understand:

- the syntax,
- forms,
- operators,
- result set modifiers,
- variables, and
- functions of the SPARQL query language.

+

- properties used by various involved RDF vocabularies²⁹

(cont.) F4. Services are user-friendly, making vocabulary contents reachable.

Enhance *usability* (*user friendliness*) through default or example queries for data exploration.

Default graph (IRI)

Query

```

1 PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
2 PREFIX isothes: <http://purl.org/iso25964/skos-thes#>
3 SELECT (CONCAT(?mtCode, ' - ', ?mtEnglishLabel) AS ?microThesaurus) ?concept (STR(?englishLabel) AS ?english) WHERE {
4   ?collection isothes:superGroup <http://vocabularies.unesco.org/thesaurus/domain1> .
5   ?collection skos:member ?concept .
6   ?collection skos:notation ?mtCode .
7   ?collection skos:prefLabel ?mtEnglishLabel .
8   FILTER(langMatches(lang(?mtEnglishLabel), 'en')) .
9   ?concept skos:prefLabel ?englishLabel.
10  FILTER(langMatches(lang(?englishLabel), 'en'))
11 }
12 ORDER BY ?microThesaurus ?englishLabel

```

Query examples

- Explore a sample of the data
- List all concepts of a micro-thesaurus in french
- List all concepts of a domain
- List all concepts
- List all micro-thesauri
- List all the translations english-french
- List the translations english-russian
- List concepts created after a given date
- Get the list of countries
- Select all the properties of a concept
- Make a search on all the concept labels
- Get all concepts in english and french, with synonyms, notes, broader, narrower and related (with IDs)
- Get the hierarchical table of all the concepts (with IDs)
- Get the hierarchical table of all the concepts (with labels)

reachable !

3/82 (2016)
9/160 (2019)
gave more than
3 sample
queries like
this.

Result format

Wen Zeng & J. Clunis - NKOS Workshop @DC2019, Sept 24, Seoul

B. Metrics development for LOD KOS

- a) -- as an open dataset -- PAIR
- b) -- as a KOS vocabulary -- FIT



Functional
Impactful
Transformable





-- as a KOS vocabulary

Impactful

Maximizing the impact of a
LOD KOS vocabulary

I1. Exposed through terminology services

- a) Vocab Registries
- b) Vocab Repositories / portals

I2. Used by data providers

- a) as a primary value Vocab
- b) in semantic enrichment

I3. Mapped with other KOS vocabularies

I4. Showed/discussed at professional conferences and publications

I1. Exposed through terminology services

a) Registries --offer information *about* vocabularies

a. Registry of KOS

- BARTOC (Basel Register of Thesauri, Ontologies & Classifications):
2900+ <https://bartoc.org/>
- Taxonomy warehouse <http://www.taxonomywarehouse.com/default.aspx>
- Taxobank: 2000 vocabularies <http://www.taxobank.org/>

b. Registry of LOD vocabularies (“property vocabularies” & “value vocabularies”)

- E.g., LOV (Linked Open Vocabularies) <http://lov.okfn.org/dataset/lov> :
 - 600+ registered, some are value vocabularies.

c. 3) Registry of LOD products, including KOS

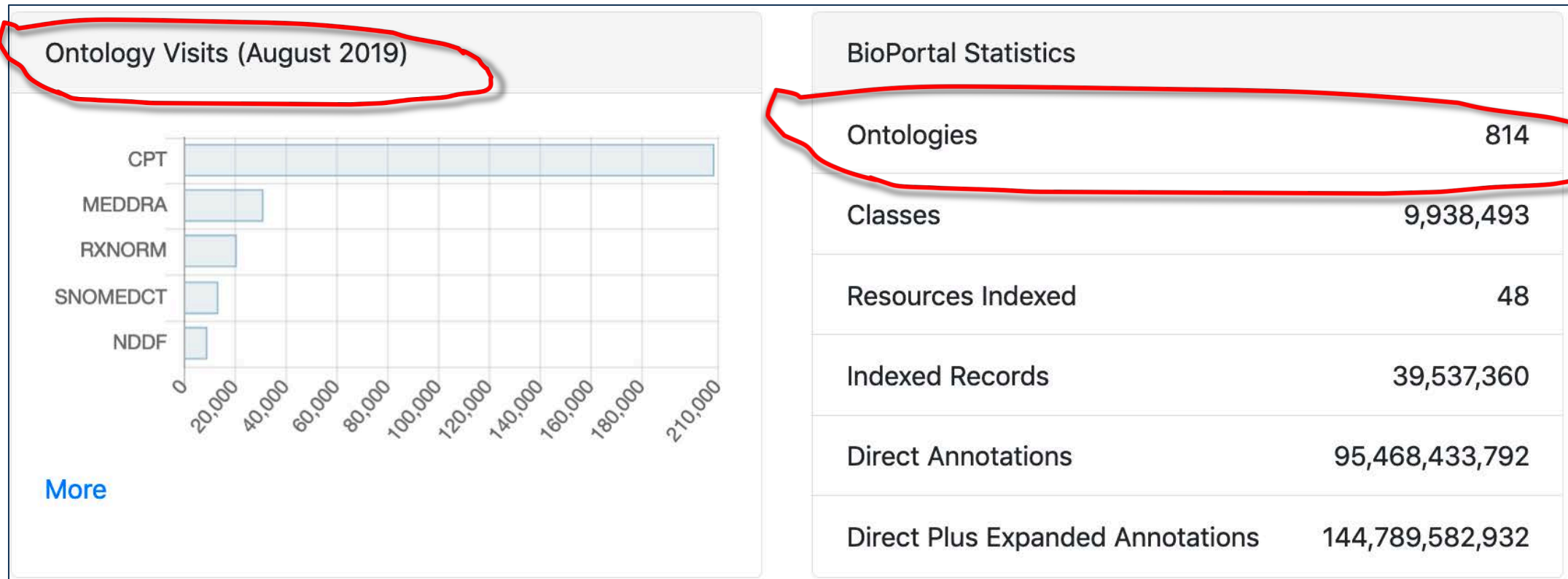
- DataHub <https://datahub.io/>

I1. Exposed through terminology services

b) Vocabulary repositories - Hosting & managing; updated regularly



2019-09-10 data



A domain-oriented portal,
revealing the impacts

I2. Used by data providers

a) as a primary value vocabulary

Medical Subject Headings
Last uploaded: August 27, 2019

Summary **Classes** Properties Notes Mappings Widgets

Details

Acronym	MESH
Visibility	Public
Description	Medical Subject Headings (MeSH);National Library of Medicine; 2011
Status	Production
Format	UMLS
Contact	NLM Customer Service, custserv@nlm.nih.gov
Categories	Health
Groups	Unified Medical Language System
License Information	This ontology is made available via the UMLS. Users of all UMLS ontologies must abide by the terms of the UMLS license, available at https://uts.nlm.nih.gov/license.html

Metrics ?

Classes	276,475
Individuals	0
Properties	38
Maximum depth	15
Maximum number of children	121
Average number of children	4
Classes with a single child	3,376
Classes with more than 25 children	154
Classes with no definition	247,234

Visits ↓

Submissions

Version	Released	Uploaded	Downloads
2019AA (Uploaded)	05/06/2019	08/27/2019	RDF/TTL
2018AB (Parsed, Indexed, Metrics, Annotator, Error Diff)	11/05/2018	04/29/2019	RDF/TTL CSV
2018AA (Archived)	05/07/2018	07/06/2018	RDF/TTL
2017AB (Archived)	11/06/2017	07/06/2018	RDF/TTL
2017AA (Archived)	05/08/2017	04/06/2018	RDF/TTL

[more...](#) **Projects using MESH** +

Projects using MESH +

[ARRS Goldminer](#)

[Biomedical Semantic QA](#)

[Cell line ontology](#)

[DisGeNET-RDF](#)

[eagle-i](#)

[Epidemic Marketplace](#)

[Kino](#)

[Lexigram](#)

[Neuronal Morphologies and Species Metadata](#)

[Classification System](#)

[Plant Ontology](#)

[PubChem](#)

[Retrospective Analytics System](#)

[Semantic Indexing of French Biomedical Data Resources](#)

[Socrates MD](#)

[The Ontological Discovery Environment](#)

<http://bioportal.bioontology.org/ontologies/MESH>

I2. Used by data providers

b) in semantic enrichment

Europeana enriches ... by aligning to (xxx)

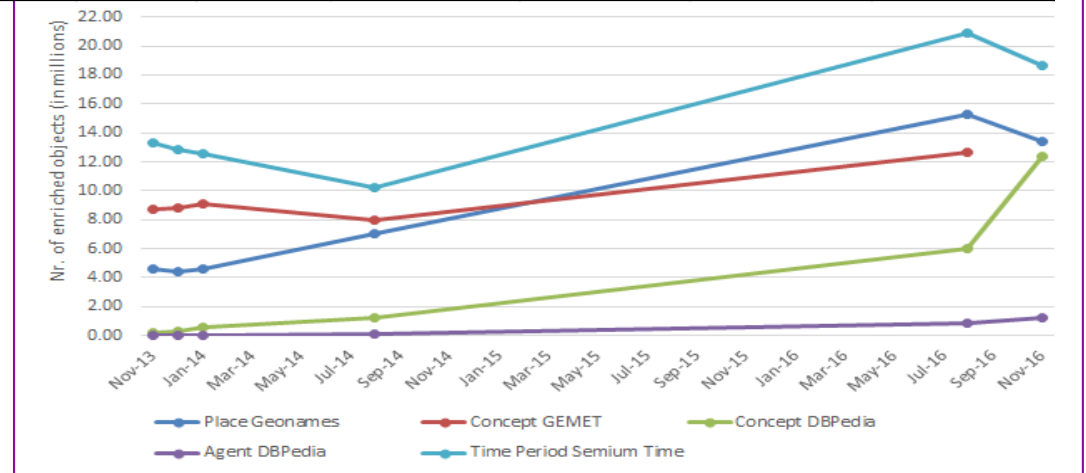
- places (GeoNames),
- agent names (Dbpedia),
- concepts (GEMET, Dbpedia), and
- time period (Semium Time).

-- relate Objects to concepts, agents, places, etc., using the properties in EDM (e.g., *dc:subject*, *dc:creator*).

Results obtained with the semantic enrichment

Table 3. Quantitative overview of the results obtained with the semantic enrichment.

Type	Nov-13	Dec-13	Jan-14	Aug-14	Aug-16	Nov-16	April-18	June-19
Place	4.6M	4.4M	4.6M	7,0M	15,269,339	13,449,346	13,684,525	14,019,045
Concept	8.9M	9.1M	9.7M	9,2M	12,633,522	12,367,496	13,275,736	15,734,342
Agent	12K	34K	44K	144K	889,152	1,228,862	1,400,248	1,309,614
Time Period	13.3M	12.8M	12.6M	10,2M	20,925,367	18,607,930	18,786,476	17,406,100



- Source: Europeana Semantic Enrichment Framework *Documentation*, Available from <https://pro.europeana.eu/page/europeana-semantic-enrichment>

Vocabularies used by Europeana in semantic enrichment

	A	B	C
1	Vocabulary	URL	Type of entity
2	The Getty - Art & Architecture Thesaurus (AAT)	http://vocab.getty.edu/aat/	skos:Concept
3	The Getty - Union List of Artist Names (ULAN)	http://vocab.getty.edu/ulan/	edm:Agent
4	Getty Thesaurus of Geographic Names (TGN)	http://vocab.getty.edu/tgn/	edm:Place
5	Virtual International Authority File (VIAF)	http://viaf.org/viaf/	edm:Agent
6	Geonames	http://sws.geonames.org/	edm:Place
7	IconClass	http://iconclass.org/	skos:Concept
8	Gemeinsame Normdatei (GND)	http://d-nb.info/gnd	edm:Agent, edm:Place, skos:Concept
9	Israel Museum Jerusalem Concepts	http://www.imj.org.il/imagine/thesaurus/objects/	skos:Concept
10	data.europeana.eu WWI Concepts from Library of Congress Subject Headings (LCSH)	http://data.europeana.eu/concept/loc	skos:Concept
11	Europeana Sounds Genres	http://data.europeana.eu/concept/soundgenres/	skos:Concept
12	UDC	http://udcdata.info/rdf/	skos:Concept
13	UNESCO Thesaurus	http://vocabularies.unesco.org/thesaurus/	

Europeana semantic enrichment (<https://pro.europeana.eu/page/europeana-semantic-enrichment>) -- link to [several vocabularies](#) , captured 2019.9.

I3. Mapped with other KOSs



Impactful

Alignments
require
interoperability
in syntax
&
structure

Interoperable

<https://publications.europa.eu/en/web/eu-vocabularies/th-dataset/-/resource/dataset/eurovoc>

Asset
EuroVoc
Thesaurus
URI: <http://publications.europa.eu/resource/dataset/eurovoc>

About Browse content Documentation Links Releases SKOS Web services

EuroVoc is a multilingual, multidisciplinary thesaurus covering the activities of the EU, the European Parliament in particular. It contains terms in 23 EU languages (Bulgarian, Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish and Swedish), plus in three languages of countries which are candidates for EU accession: македонски (mk), shqip (sq) and српски (sr).

ID: EuroVoc
Version: 20190329-1 **LATEST**
Published: 2019-03-29
Author: Publications Office

Alignments

- [EuroVoc_Alignments.zip](#)
- [EuroVoc_MarcXML.zip](#)
- [eurovoc_skos.zip](#)
- [eurovoc_in_skos_core_concepts.zip](#)
- [eurovoc_skos_ap.zip](#)
- [eurovoc-skos-ap-act.rdf](#)
- [at-eurovoc-v3.xsd](#)
- [eurovoc_xml.zip](#)

Other versions

- 20181220-0
- 20180621-0
- 20171215-0

Alignments

- [EuroVoc Alignment Rameau](#)
- [EuroVoc Alignment UTHES](#)
- [EuroVoc Alignment Inspire](#)
- [EuroVoc Alignment ESCO](#)
- [EuroVoc Alignment Eclac](#)
- [EuroVoc Alignment Gemet](#)
- [EuroVoc Alignment LCSH](#)
- [EuroVoc Alignment ThesSoz](#)
- [EuroVoc Alignment Unesco](#)
- [EuroVoc Alignment ZBW](#)
- [EuroVoc Alignment Unbis](#)
- [EuroVoc Alignment mesh](#)
- [EuroVoc Alignment Eige](#)
- [EuroVoc Alignment Agrovoc](#)
- [EuroVoc Alignment gnd](#)

The figure shows two AGROVOC concepts linked by the property `skos:broader` (hierarchical relation), each with an SKOS-XL label.

Example
syntax
&
structure

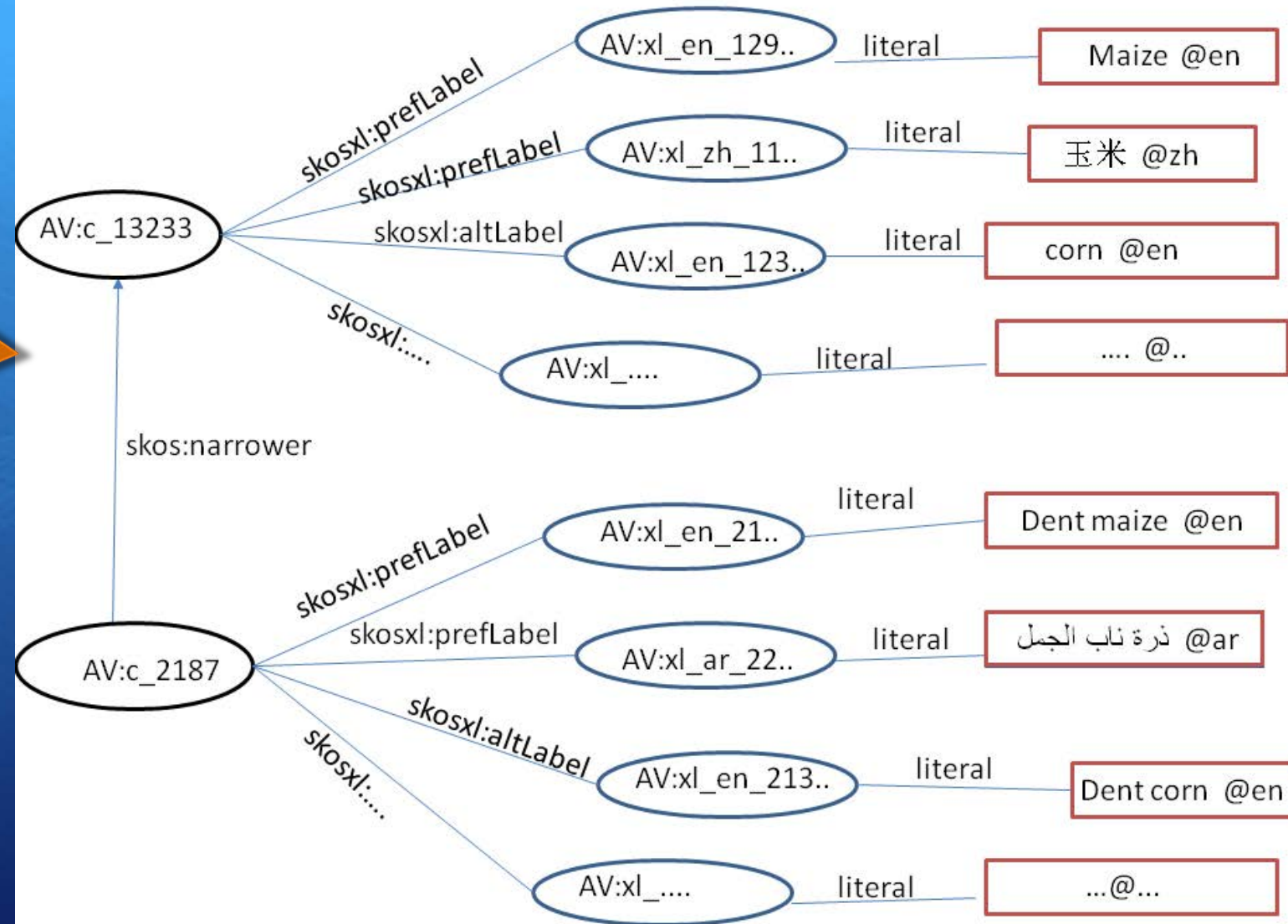


Image source: <http://aims.fao.org/standards/agrovoc/concept-scheme>

AGROVOC Linked Open Data

Resource	Topics	Total # of Linked concepts	Languages	Linked Resource available as LOD?	Type of link (and # of linked concepts)								
1	Aquatic Sciences and Fisheries Abstracts (ASFA): Thesaurus	Fisheries	1784		Yes	skos:closeMatch (38), skos:lexactMatch (1741)	9	Geopolical Ontology	Geopolitical entities	253	AR, CH, EN, ES, FR, RU	Yes	skos:exactMatch (253)
2	Biotechnology Glossary (FAO)	Biotechnologies	793	EN, ES, FR, +3 more	Yes	skos:closeMatch (793)	10	Library of Congress Subject Headings (LCSH)	General	1 079	EN	Yes	skos:exactMatch (1079)
3	Chinese Agricultural Thesaurus (CAT)	Agriculture	up to 20700		Yes	skos:narrowMatch (137) skos:broadMatch (10153) skos:exactMatch (10325)	11	NALThesaurus	Agriculture	13705	EN, ES	Yes	skos:exactMatch (13703) skos:closeMatch (2)
4	DBpedia	General	11013	EN, ES, FR + 8 more	Yes	skos:closeMatch (11013)	12	RAMEAU Répertoire d'autorité-matière encyclopedique et alphabetique unifie	General	671	FR	Yes	skos:exactMatch (671)
5	Dewey Decimal Classification (DDC)	General	401	EN, ES, FR + 8 more	Yes	skos:closeMatch (2) skos:exactMatch (399)	13	STW - Thesaurus for Economics	Economy	1125	EN, DE	Yes	skos:exactMatch (1122) skos:closeMatch (3)
6	EUROVOC	General EU	1 269	EN, ES, FR + 21 more	Yes	skos:exactMatch (1269)	14	TheSoz - Thesaurus for the Social Sciences	Social sciences	827	EN, DE	Yes	skos:exactMatch (821) skos:closeMatch (6)
7	GEMET	Environment	1 185	EN, ES, FR + 30 more	Yes	skos:exactMatch (1185)	15	SWD (Schlagwortnormdatei)	General	6245	DE	Yes	skos:exactMatch skos:closeMatch skos:broadMatch skos:narrowMatch
8	GeoNames	Geographical entities	206	EN, ES, FR + 63 more	Yes	skos:exactMatch (206)	16	Environmental Applications Refe Thes	Environment	1385	EN+	Yes	skos:exactMatch (1385)

<http://aims.fao.org/standards/agrovoc/linked-data>

<http://aims.fao.org/standards/agrovoc/linked-data>

STW Thesaurus for Economics

STW Mappings

Here you find mappings to other thesauri and vocabularies which can also be [downloaded](#).

- Integrated Authority File (GND)
- Wikidata
- DBpedia
- Thesaurus Social Sciences (TheSoz)
- AGROVOC
- WKD German labor law thesaurus
- JEL classification
- SDMX subject-matter domains classification

[RDF/XML](#) [RDF/Turtle](#)

STW Thesaurus for Economics

Mapping AGROVOC

About the Mapping

Description: Built by an automatic string matching process, verified intellectually by a domain expert (see also <http://thedatahub.org/dataset/agrovoc-skos>)

Creator: [FAO - Food and Agriculture Organization of the United Nations](#)

Rights: see <http://aims.fao.org/download-agrovoc>

Relations: 1027 skos:exactMatch
1 skos:closeMatch

Publisher: ZBW - Leibniz Information Centre for Economics

Mapping WKD German labor law thesaurus

About the Mapping

Description: Created by WKD and SWC in course of the LOD2 project and continuously maintained by domain experts of WKD

Creator: [Wolters Kluwer Deutschland GmbH](#)

License: <http://creativecommons.org/publicdomain/zero/1.0/>

Rights: The CC0 license has been applied to the mapping for broad and easy re-use without legal restrictions. We would, however, appreciate an attribution to the creators (as indicated above) and the free availability of projects which make use of this mapping.
<http://opendatacommons.org/norms/odc-by-sa/>

Relations: 270 skos:exactMatch

Publisher: ZBW - Leibniz Information Centre for Economics

Vocabulary sharing and mapping by volunteers (non-centralized)

Tool: Mix'n'Match

This tool lists entries of some external databases (over 1000 catalogs), and allows users to match them against Wikidata items.

<https://tools.wmflabs.org/mix-n-match/#/>

Mix'n'matchEnglishlog into WiDaR for actionsSearch

This tool can list entries of some external databases, and allows users to match them against Wikidata items. Think 'red link lists on steroids'. See [the manual](#) for a how-to. For an alternative, see [OpenRefine](#).

Catalog groups

Group	Catalogs
Cinema	9
Software	10
Wolfram Language entity	85
Archives	19
Art	82
Biography	616
Biology	66
Books	21
Encyclopedia	34
Entertainment	37
Food	10
General	48

Search catalogs

Start typing here

Latest catalogs

[liebertpub](#) Mary Ann Liebert, Inc. journals

[Dimore Storiche Italiane](#) database containing Italian villas, palaces, gardens and parks members of Associazione Dimore Storiche Italiane (Q63137315)

[OpenEdition Books author](#) identifier for an author on OpenEdition

[Voice Directors](#) from behindthevoiceactors

[Behind The Voice Actors video game](#) identifier for video games on the website Behind The Voice Actors

[EAS Fellows](#) Ethiopian Academy of Sciences

[Enciclopedia delle donne](#) identifier for a subject on the "Enciclopedia delle donne"

[Nolo's Free Dictionary Of Law Terms and Legal Definitions](#) dictionary of legal terms

[Wex articles](#) legal dictionary and encyclopedia published by the Legal Information Institute

[NGMDB Prod](#) Catalog of US Map publications

Catalogs by property class

Group	Catalogs
Authority control for people	517
Catalogs without Wikidata property	42
Identifier that supports notability	359

Mix'n'Match

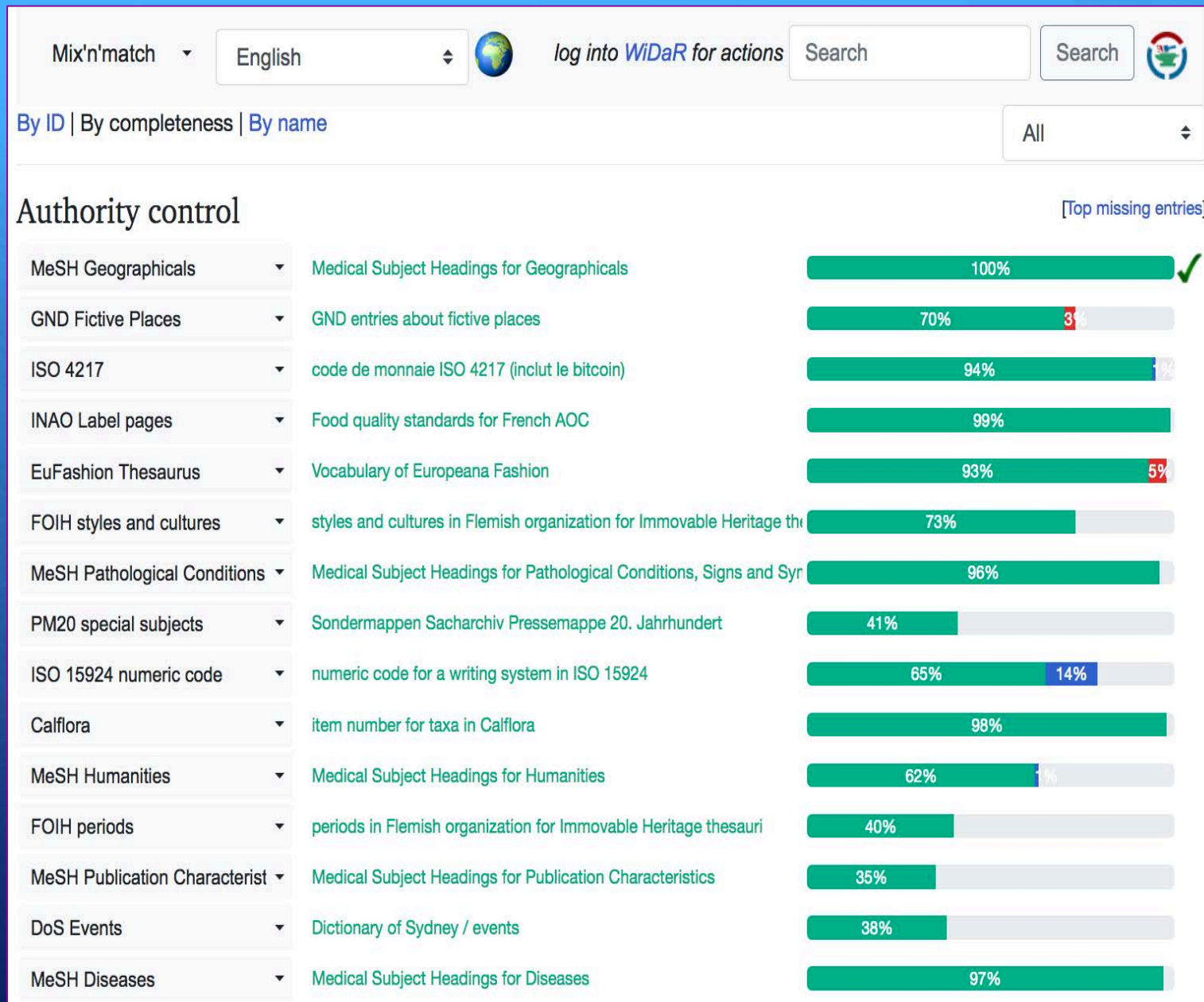
(cont.) Vocabulary
sharing and mapping by
volunteers

(non-centralized)

Tool: Mix'n'Match

This tool lists entries of some external
databases (over 1000 catalogs), and
allows users to match them against
Wikidata items.

Encyclopedia	34	Catalogs by property class	
Entertainment	37		
Food	10	Group	Catalogs
General	48	Authority control for people	517
Geography	91	Catalogs without Wikidata property	359
Heritage	61	Identifier that suggests notability	239
Infrastructure	19	Identifier	196
Journals	64	Authority control	102
Language	6	Software	95
Literature	51	Authority control for places	85
Location	37	Taxa	75
Media	70	Films	72
Medical	24	Organisations	66
Organisation	38	Authority control for artists	63
Philately	4	Encyclopedias	61
Religion	10	Film industry	59
Science	46	Identifier that does not imply notability	53
		Authority control for works	53
		Authority control for writers	53
		Video games	48
		Sports hall of fame	45
		Politics	41
		Artworks	37
		Medicine	37



Authority Control (100+) includes:

- Well-known vocabularies such as *GeoNames*, *FAST*, *UNESCO Thesaurus*, and *MeSH (Medical Subject Headings)* sub-lists,
- Other specialized vocabularies, e.g.:
 - DoS (Dictionary of Sydney),
 - INRAN Italian Food Nutrient profiles,
 - ISO 15924 numeric code,
 - Gran Enciclopèdia Catalana,
 - Europeana Fashion Thesaurus,
 - MIMO Music Instruments,
 - Great Russian Encyclopedia
 - etc.

More than half of these vocabularies have over 70% of entries manually mapped to Wikidata.

I4. Showed/discussed at professional conferences and publications

-- as a KOS vocabulary

- NKOS workshops
- LODLAM Summit
- ISKO and ISKO-chapter events
- Books and journal articles
-

B. Metrics development for LOD KOS

- a) -- as an open dataset -- PAIR
- b) -- as a KOS vocabulary -- FIT



Functional
Impactful
Transformable





-- as a KOS vocabulary

Transformable

Extends the functionality and impact through innovative adaptations.

T₁. Allows special KOS products to be *derived* from the original data

T₂. The user is given *autonomy* to determine what structure and information is desired and can be reproduced

T₃. *Extended* to fit diverse needs, e.g. language and culture

T₄. Supports *innovative* transformative uses beyond normal “value vocabularies”

UNESCO vocabularies - SPARQL service

Default graph (IRI)

Query

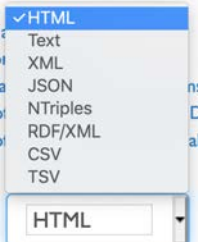
```
1 PREFIX skos: <http://www.w3.org/2004/02/skos/core#> PREFIX isothes: <http://purl.org/iso25964/skos-thes#> SELECT ?domainNotation (STR(?domainLabel) AS ?domainEnglish) ?mtNotation (STR(?englishLabel) AS ?english) WHERE {  
2   ?collection a <http://vocabularies.unesco.org/ontology#MicroThesaurus> .  
3   ?collection isothes:superGroup ?domain .  
4   ?collection skos:notation ?mtNotation .  
5   ?collection skos:prefLabel ?englishLabel .
```

Query examples

- Explore a sample of the data
- List all concepts of a micro-thesaurus in french
- List all concepts of a domain
- List all concepts
- List all micro-thesauri
- List all the translations english-french
- List the translations english-russian
- List concepts created after a given date
- Get the list of countries
- Select all the properties of a concept
- Make a search on all the concept labels
- Get all concepts in english and french, with synonyms, notes, broader, narrower and related (with IDs)
- Get the hierarchical table of all the concepts (with IDs)
- Get the hierarchical table of all the concepts (with labels)

Result format:

HTML



Run Query

Reset

T1. Allows special KOS products to be *derived* from the original data

Transformable

Top-down

derivable?

<http://vocabularies.unesco.org/sparql-form/>
Image captured 2019-08-21

About 100 micro-thesauri can be obtained

Transformable

Top-down

domainNotation	domainEnglish	mtNotation	english
"1"	"Education"	"1.05"	"Educational sciences and environment"
"1"	"Education"	"1.10"	"Educational policy"
"1"	"Education"	"1.15"	"Educational planning"
"1"	"Education"	"1.20"	"Educational administration"
"1"	"Education"	"1.25"	"Educational management"
"1"	"Education"	"1.30"	"Educational systems and levels"
"1"	"Education"	"1.35"	"Educational institutions"
"1"	"Education"	"1.40"	"Curriculum"
"1"	"Education"	"1.45"	"Basic and general study subjects"
"1"	"Education"	"1.50"	"Technical and vocational study subjects"
"1"	"Education"	"1.55"	"Educational population"
"1"	"Education"	"1.60"	"Teaching and training"
"1"	"Education"	"1.65"	"Educational evaluation"
"1"	"Education"	"1.70"	"Educational facilities"
"2"	"Science"	"2.05"	"Scientific approach"
"2"	"Science"	"2.10"	"Science and research management"
"2"	"Science"	"2.15"	"Mathematics and statistics"
"2"	"Science"	"2.20"	"Physical sciences"
"2"	"Science"	"2.25"	"Chemical sciences"
"2"	"Science"	"2.30"	"Space sciences"
"2"	http://vocabularies.unesco.org/sparql-form/	"2.35"	"Earth sciences"
"2"	Image captured 2019-08-21	"2.40"	"Geography and oceanography"

"Politics, law and economics"	"6.05"	"Legal systems"
"Politics, law and economics"	"6.10"	"Human rights"
"Politics, law and economics"	"6.15"	"Politics and government"
"Politics, law and economics"	"6.20"	"International relations"
"Politics, law and economics"	"6.25"	"Economics"
"Politics, law and economics"	"6.30"	"Economic and social development"
"Politics, law and economics"	"6.35"	"Agriculture"
"Politics, law and economics"	"6.40"	"Industry"
"Politics, law and economics"	"6.45"	"Civil, military and mining engineering"
"Politics, law and economics"	"6.50"	"Manufacturing and transport engineering"
"Politics, law and economics"	"6.55"	"Materials and products"
"Politics, law and economics"	"6.60"	"Equipment and facilities"
"Politics, law and economics"	"6.65"	"Services"
"Politics, law and economics"	"6.70"	"Finance and trade"
"Politics, law and economics"	"6.75"	"Organization and management"
"Politics, law and economics"	"6.80"	"Personnel management"
"Politics, law and economics"	"6.85"	"Labour"

UNESCO vocabularies - SPARQL service

Contact us

Default graph (IRI)

Other special KOS sets can be obtained.

Query

```
1 PREFIX skos: <http://www.w3.org/2004/02/skos/core#> SELECT
  where {?c a skos:Concept} LIMIT 100
```

Query exemples

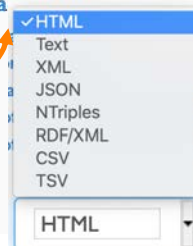
- Explore a sample of the data
- List all concepts of a micro-thesaurus in french
- List all concepts of a domain
- List all concepts
- List all micro-thesauri
- List all the translations english-french
- List the translations english-russian
- List concepts created after a given date
- Get the list of countries
- Select all the properties of a concept
- Make a search on all the concept labels
- Get all concepts in english and french, with synonyms, notes, broaders, narrowers and related
- Get the hierarchical table of all the concepts (with IDs)
- Get the hierarchical table of all the concepts (with labels)

Result format:

HTML

Run Query

Reset



<http://vocabularies.unesco.org/sparql-form>

Image captured 2019-05-14

Transformable

microThesaurus	country	english	Top - down french
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept688>	"Africa"	"Afrique"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept1608>	"Africa South of the Sahara"	"Afrique au sud du Sahara"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept689>	"Algeria"	"Algérie"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept690>	"Angola"	"Angola"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept691>	"Benin"	"Bénin"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept692>	"Botswana"	"Botswana"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept693>	"Burkina Faso"	"Burkina Faso"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept694>	"Burundi"	"Burundi"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept696>	"Cabo Verde"	"Cabo Verde"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept695>	"Cameroon"	"Cameroun"
"7.05 - Africa"	<http://vocabularies.unesco.org/thesaurus/concept697>	"Central Africa"	"Afrique cent"



- 1.2.2 Version 3.1
- 1.2.3 Version 3.2
- 1.2.4 Version 3.3
- 1.2.5 Version 3.4

2 Finding Subjects

- 2.1 Top-level Subjects
- 2.2 Descendants of a Given Parent
- 2.3 Subjects by Contributor Id
- 2.4 Subjects by Contributor Abbrev
- 2.5 Preferred Ancestors
- 2.6 Full Text Search Query
- 2.7 Stop-Word Removal
- 2.8 Case-insensitive Full Text Search Query
- 2.9 Exact-Match Full Text Search Query
- 2.10 Find Person Occupations by broaderExtended
- 2.11 Find Person Occupations by Double FTS
- 2.12 Find Quartz Timepieces by Double FTS
- 2.13 Find Subject by Exact English PrefLabel
- 2.14 Find Subject by Language-Independent PrefLabels
- 2.15 Combination Full-Text and Exact String Match
- 2.16 Find Subject by Any Label
- 2.17 Find Ordered Subjects

T2. The user is given *autonomy* to determine what structure and information is desired and can be reproduced.

Query:

<http://vocab.getty.edu/sparql>

```
1 select * {?x gvp:broaderExtended aat:300194567; skos:inScheme aat: ;  
2 gvp:prefLabelGVP/xl:literalForm ?l}
```

reproducible

☒ Include inferred☐ Expand results over equivalent URIs

bottom -- up

4

Submit

2.2 Descendants of a Given Parent

Let's look for AAT descendants of 300194567 "drinking vessels". This finds "rhyta" and other interesting records, including "Fichtelgebirgehumpen":

```
select * {?x gvp:broaderExtended aat:300194567; skos:inScheme aat: ; gvp:prefLabelGVP/xl:literalForm ?l}
```

SPARQL

2.3 Subjects by Contributor Id

You can easily find subjects contributed by a particular Contributor if you know the id. E.g. the Getty Conservation Institute (GCI) in AAT is aat_contrib:10000088. Let's find their contributions to aat:300033618 paintings (visual works):

```
select * {  
  ?x a gvp:Subject; dct:contributor aat_contrib:10000088;  
  gvp:broaderExtended aat:300033618;  
  gvp:prefLabelGVP/xl:literalForm ?l}
```

3



SPARQL

Queries

Any

Search...

Search

Brief

Results: (200 of 211) Query: [Descendants_of_a_Given_Parent](#)

Download SPARQL Results in: [JSON](#) | [XML](#) | [CSV](#) | [TSV](#)

x	l
aat:300417997	chih pei@en
aat:300418000	cold drink cups@en
aat:300311263	porongos@en
aat:300410765	achawall metahues@en
aat:300395558	maigeleins@en
aat:300200347	Pechkrüge@en
aat:300265252	Amen glasses@en
aat:300264998	segment cups@en
aat:300265003	Corinthian type skyphoi@en
aat:300265233	Fichtelgebirgehumpen@en
aat:300198910	band cups@en
aat:300198904	droop cups@en
aat:300110551	huacollas@en

Got the dataset in 2 seconds!

Download in a format you like.

The query can also generate scope note, etc.

Endless reuse potentials.

The query can also generate scope note, etc.

300212133 <costume by function>

through <http://vocab.getty.edu/sparql>

- ☐ Top of the AAT hierarchies
- ☐ Objects Facet
- ☐ Furnishings and Equipment (hierarchy name)
- ☐ Costume (hierarchy name)
- ☐ costume (mode of fashion)
- ☐ <costume by function>
- ☐ beachwear [N]
- ☐ bathing costumes
- ☐ bathing suits
- ☐ beach pajamas
- ☐ bearing cloths
- ☐ binders (costume)
- ☐ ceremonial costume
- ☐ academic costume
- ☐ ceremonial masks [N]
- ☐ chains of office [N]
- ☐ christening gowns [N]
- ☐ collectantenkleding
- ☐ copes [N]
- ☐ crowns (headdresses)
- ☐ kpeli-yehe [N]
- ☐ liturgical costume
- ☐ parade armors [N]
- ☐ parade helmets [N]
- ☐ robes (main garments) [N]
- ☐ wedding dresses [N]
- ☐ wreaths (costume accessories) [N]
- ☐ chrismales (clothing)
- ☐ costumes (character dress)
- ☐ karaori [N]
- ☐ coverups
- ☐ day wear
- ☐ dress (culture-related concept) [N]
- ☐ afternoon dress
- ☐ court dress

reproducible

Getty Vocabularies: LOD

SPARQL Queries Any Search... Search Brief

Results: (200 of 474) Query: Finding_Subjects

Download SPARQL Results in: JSON | XML | CSV | TSV

x	label	note
aat:300411751	doll's clothing@en	Miniature versions of clothing meant to be worn by figural toys.@en
aat:300224239	livery (uniforms)@en	Distinctive uniforms worn by servants or other classes of people.@en
aat:300412126	comic masks@en	Masks used by actors in Ancient Greek and Roman theater, having many standard variations, representing comical or silly expressions.@en
aat:300404137	academic robes@en	Formal or ceremonial robes of varying color and trim meant to convey status in an academic context. These have evolved from what was once everyday attire for scholars and clerics.@en
aat:300400705	laurel wreaths@en	Headgear comprising circular or U-shaped garlands made from the leaves and branches of the laurel tree. An example is as worn by Roman commanders during the triumphal procession after a partial victory.@en
aat:300209945	bathrobes@en	Loose-fitting knee-length or ankle-length garments, often tied with a belt, usually of a warm absorbent material worn before and after bathing or informally around the house.@en
aat:300390928	monastic clothing@en	Distinctive clothing worn by members of religious orders, by which their membership is typically identified.@en

bottom - - up

GACS Vocabularies About Feedback Help

GACS Beta Content language English Search

Alphabetical Hierarchy Groups

OBJECTS

- ABSTRACT OBJECTS
- FIELD OF STUDY
- LOCATION
- PHYSICAL OBJECTS
 - ANATOMICAL STRUCTURE
 - components
 - contaminants
 - cultures
 - equations
 - infrastructure
 - MANMADE OBJECTS
 - organisms
 - amoebae
 - aquatic organisms
 - autotrophs
 - beneficial organisms
 - biological control agents
 - bryophytes
 - chimeras (en-us)
 - dwarfs
 - edible species
 - eukaryotes
 - extremophiles
 - females
 - genetically modified organisms
 - hosts
 - alternative hosts
 - host plants
 - food plants
 - weed hosts
 - immunocompromised population
 - intermediate hosts
 - sentinel animals
 - indicator species
 - life form
 - males
 - microorganisms
 - nontarget organisms
 - pathogens
 - pests
 - pioneer species
 - plants (botany)
 - algae
 - alpine plants
 - annuals
 - antifungal plants
 - antiviral plants
 - aquatic plants
 - bamboo plants
 - C3 plants
 - C4 plants
 - carnivorous plants
 - climbing plants
 - clovers
 - crops
 - cryptogams
 - deciduous plants
 - embryophytes
 - endophytes
 - ferns and fern allies
 - forbs
 - gametophytes
 - grasses
 - halophytes
 - herbaceous plants
 - host plants
 - food plants
 - weed hosts
 - hyperaccumulators
 - introduced plants
 - lawns and turf
 - mature plants
 - mosses and liverworts
 - noxious plants

OBJECTS > PHYSICAL OBJECTS > organisms > plants (botany) > host plants
OBJECTS > PHYSICAL OBJECTS > organisms > hosts > host plants

PREFERRED TERM **host plants**

TYPE Organism

DEFINITION Plantas que sirven de albergue, hábitat, sitios de crianza o fuente de alimentos como parte del ciclo vital de otros organismos.
Plants which are hosts for symbiont organisms, including those that are trophically associated with them (such as plant pathogens, plant parasites and phytophagous arthropods).
Plants which provide shelter, habitat, breeding sites or serve as a food source as part of the life cycle of another organism.

BROADER CONCEPT hosts
plants (botany)

NARROWER CONCEPTS food plants
weed hosts

RELATED CONCEPTS plant parasites
plant pathogens

ALTERNATIVE LABEL host crops
host plant
hosts of plant diseases
hosts of plant pests
plant host
plant hosts

BELONGS TO GROUP organisms, by non-taxonomic groups

IN OTHER LANGUAGES

نباتات عائله	Arabic
寄主植物	Chinese
hostitelské rostliny	Czech
waardplanten	Dutch
Plante hôte	French
Wirtspflanze	German
	Hindi
	Hungarian
Rośliny żywicielskie	Polish
plantas hospedeiras	Portuguese
Planta hospedeira	Russian
растения-хозяева	Slovak
hostiteľské rastliny	Spanish
plantas huéspedes	Telugu
plantas hospedantes	Thai
అతిథిత్వం వహించే మొక్కలు	Turkish
konukçu bitki	Ukrainian
рослини-хазяї	

URI <http://id.agrisemantics.org/gacs/C1029>

Download this concept: RDF/XML TURTLE JSON-LD

EXACT MATCH host plants (en)
host plants
<http://id.cabi.org/cabt/58442>

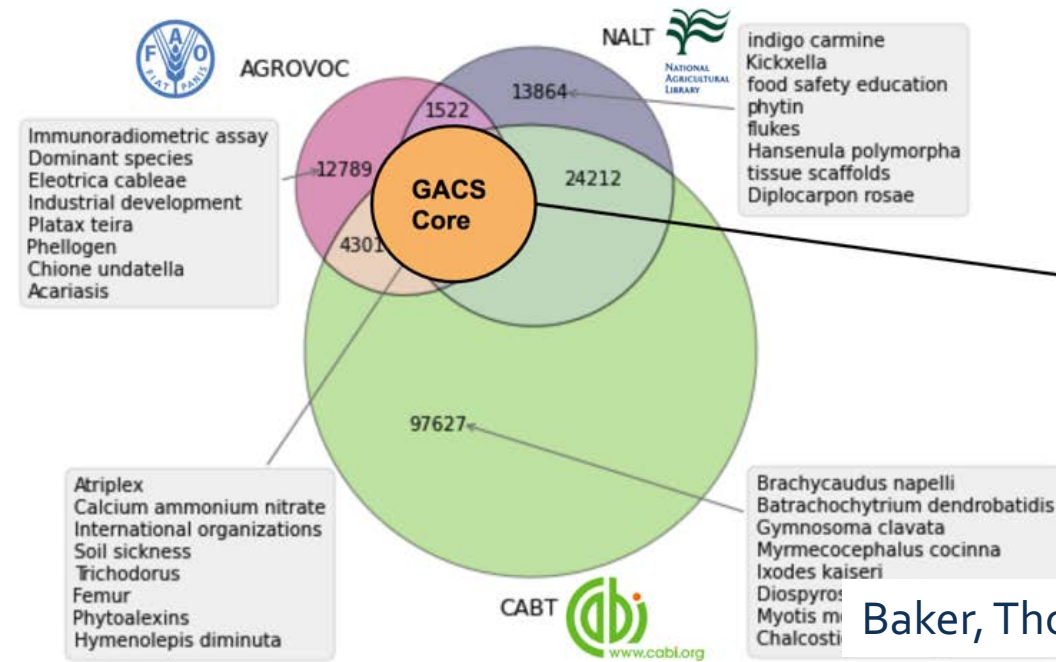
reproducible

(cont.) T2. The user is given *autonomy* to determine what structure and information is desired and can be reproduced.

Transformable

GACS – Global Agricultural Concept Scheme

May 2016



GACS Core Beta 3.1

- 15,000+ concepts
- 350,000+ labels in 29 languages

Baker, Thomas et al. 2016.

http://aims.fao.org/global_agricultural_concept_scheme_gacs

<http://browser.agrisemantics.org/gacs/en/>

T3. *Extended* to fit diverse needs, e.g. language and culture

➤ Extended to fit diverse needs

- Culture
- Language
- Domain
- Structure

➤ Virtual harmonization through linking

- E.g., *Faceted Application of Subject Terminology* (FAST) – VIAF, Wikidata

– because the vocabulary is available as a LOD KOS

FAST TERMS		
Search results for: "JFK (John Fitzgerald Kennedy), 1917-1963"		
Limit Results by: All		
Displaying 1 to 1 of 1		
<< Previous Next >>		
1 Jump		
Heading	Facet	Uses
Kennedy, John F. (John Fitzgerald), 1917-1963	person	13191

RECORD ID:

fst00035588

SOURCES AND OTHER LINKS:

Kennedy, John F. (John Fitzgerald), 1917-1963--(DLC)n 79055297

John F. Kennedy--http://en.wikipedia.org/wiki/John_F._Kennedy

Kennedy, John F. (John Fitzgerald), 1917-1963--<https://viaf.org/viaf/68910251>

LINKS TO FULL RECORD:

Permanent Link <http://id.worldcat.org/fast/35588>

MARC-21 record <http://id.worldcat.org/fast/35588/marc21.xml>

RDF record <http://id.worldcat.org/fast/35588/rdf.xml>

With the correct coding of properties
a FAST's **controlled term**

- is related to a **real-world entity** and
- allows humans to gather more information **about the entity** that is being described

```
<foaf:focus>
<rdf:Description rdf:about="http://en.wikipedia.org/wiki/John_F._Kennedy">
<rdfs:label>John F. Kennedy</rdfs:label>
</rdf:Description>
</foaf:focus>
```

```
<schema:sameAs>
<rdf:Description rdf:about="https://viaf.org/viaf/68910251">
<rdfs:label>Kennedy, John F. (John Fitzgerald), 1917-1963</rdfs:label>
</rdf:Description>
</schema:sameAs>
```

Virtual harmonization through linking

T4. Supports *innovative* transformative uses beyond normal “value vocabularies”

- LOD KOS can be used for
 - obtaining special graphs or datasets for very complicated questions, and
 - revealing unknown relationships.

Could a LOD KOS dataset be considered

- as a knowledge base?
- as the foundation of a network analysis?
- as the building blocks of a framework for research in humanities and science?

beyond being a ‘vocabulary’

Query examples can lead users to explore the rich contents of the datasets

Example: Universal Protein Resource (UniProt)

Transformable

innovative

Your SPARQL query

Add common prefixes

```
1 PREFIX up:<http://purl.uniprot.org/core/>
2 PREFIX taxon:<http://purl.uniprot.org/taxonomy/>
3 PREFIX rdfs:<http://www.w3.org/2000/01/rdf-schema#>
4 PREFIX skos:<http://www.w3.org/2004/02/skos/core#>
5 SELECT ?name ?text
6 WHERE
7 {
8     ?protein a up:Protein .
9     ?protein up:organism taxon:9606 .
10    ?protein up:encodedBy ?gene .
11    ?gene skos:prefLabel ?name .
12    ?protein up:annotation ?annotation .
13    ?annotation a up:Disease_Annotation .
14    ?annotation rdfs:comment ?text
15 }
16
```

Submit Query

Examples

1. Select all taxa from the UniProt taxonomy: (show)
2. Select all bacterial taxa, and their scientific name, from the UniProt taxonomy: (show)
3. Select all E-Coli K12 (including strains) UniProt entries and their amino acid sequence: (show)
4. Select the UniProt entry with the mnemonic 'A4_HUMAN': (show)
5. Select a mapping of UniProt to PDB entries using the UniProt cross-references to the PDB database: (show)
6. Select all cross-references to external databases of the category '3D structure databases' of UniProt entries that are classified with the keyword 'Acetoin biosynthesis (KW-0005)': (show)
7. Select all UniProt entries, and their recommended protein name, that have a preferred gene name that contains the text 'DNA': (show)
8. Select the preferred gene name and disease annotation of all human UniProt entries that are known to be involved in a disease: (show)
9. Select all human UniProt entries with a variant that leads to
10. Select all human UniProt variant that leads to substitution: (show)
11. Select all UniProt entries with a transmembrane region coordinates on the c
12. Select all UniProt entries with a 30th of November 20
13. Was any UniProt entry involved in a disease in 2013? (show)

About

This SPARQL endpoint contains all UniProt data. It is free to access and supports the SPARQL 1.1 Standard.

There are 42,049,660,299 triples in this release (2018_09). The query timeout is 45 minutes. All triples are available in the default graph. There are 17 named graphs.

Documentation

The documentation about UniProt RDF is spread into 2 parts

News

Forthcoming changes

Planned changes for UniProt

Tubulin code: a long sought-after player identified | Changes to the controlled vocabulary of human diseases | Changes to the controlled vocabulary for PTMs

UniProt release 2018_09

Human brain development: slow and steady wins the race | Change of the annotation topic 'Enzyme regulation' to 'Activity'

UniProt Universal Protein Resource

- a freely accessible database
- protein sequence and functional information,
- many entries being derived from genome sequencing projects.

UniProt

SPARQL Downloads Documentation/Help Contact

Results

[Sparql XML](#)
[Sparql JSON](#)
[CSV](#)
[Share](#)
[Show query](#)

name	text
HLA-B	Disease susceptibility is associated with variations affecting the gene represented in this entry. A restricted number of HLA-B27 subtypes can be associated with ankylosing spondylitis and other... and an elevated frequency of the B*2702 allele in ankylosing spondylitis patients is identified. The allele B*2707 seems to have a protective role some populations because it was found only in the healthy controls.
HLA-B	Disease susceptibility is associated with variations affecting the gene represented in this entry. Increased susceptibility to Stevens-Johnson syndrome is conferred by allele B*15:02.
YWHAG	The disease is caused by mutations affecting the gene represented in this entry.
HLA-C	Disease susceptibility is associated with variations affecting the gene represented in this entry.
HLA-DRB1	Disease susceptibility is associated with variations affecting the gene represented in this entry.
HSD3B2	The disease is caused by mutations affecting the gene represented in this entry.
HSD3B2	Mild HSD3B2 deficiency in hyperandrogenic females is associated with characteristic features of polycystic ovary syndrome, such as insulin resistance and luteinizing hormone hypersecretion.
PPP2R1A	The disease is caused by mutations affecting the gene represented in this entry.
HAPO	The disease is caused by mutations affecting the gene represented in this entry.

<https://sparql.uniprot.org/>

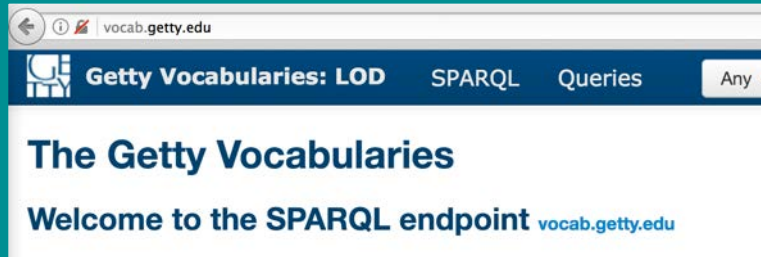
Results

[Sparql XML](#)
[Sparql JSON](#)
[CSV](#)
[Share](#)
[Show query](#)

name	text
ZFYVE19	A chromosomal aberration involving ZFYVE19 is associated with acute myeloblastic leukemia (AML). Translocation t(11;15)(q23;q14) with KMT2A/MLL1 (PubMed:12618766).
AGT	The disease is caused by mutations affecting the gene represented in this entry.
AGT	Disease susceptibility is associated with variations affecting the gene represented in this entry.
ANK1	The disease is caused by mutations affecting the gene represented in this entry.
ANK2	The disease is caused by mutations affecting the gene represented in this entry.
ANK3	The disease is caused by mutations affecting the gene represented in this entry. A homozygous deletion in ANK3 predicted to result in frameshift and premature truncation, has been shown to be the cause of moderate intellectual disability, an ADHD-like phenotype and behavioral problems in a consanguineous family (PubMed:23390136).
ANK3	Genetic variations in ANK3 may be associated with autism spectrum disorders susceptibility.
ANKRD1	The disease may be caused by mutations affecting the gene represented in this entry.
ANKS6	The disease is caused by mutations affecting the gene represented in this entry.
ANGPTL8	The gene represented in this entry may be involved in disease pathogenesis. Increased protein levels are observed in the serum of patients and are associated with insulin resistance (PubMed:25024395, PubMed:25303484, PubMed:24963292, PubMed:24852694). According to another report, protein levels are decreased in the serum of patients (PubMed:25050901). Discrepancies between increased and decreased levels of proteins levels in NIDDM patients may be explained by the use of different kits developed on the market that either use antibodies recognizing the N-terminal or the C-terminal part of the protein (PubMed:25099942). These results should however be reinvestigated in light of recent advances that suggest that this protein is not promoting pancreatic beta cell proliferation.
ANGPTL8	The gene represented in this entry may be involved in disease pathogenesis. Increased protein levels are observed in the serum of patients. This result should however be reinvestigated in light of recent advances that suggest that this protein is not promoting pancreatic beta cell proliferation.
ANKLE2	The disease is caused by mutations affecting the gene represented in this entry.
ANKH	The disease is caused by mutations affecting the gene represented in this entry.

varying degrees of neurodevelopmental delay and cerebellar ataxia. One child also exhibits episodes of unresponsiveness suggestive of absence seizures and facial dysmorphism. Deletion at 12q21.1 deletes the entire single exon of ATXN7L3B.

Example: Getty Vocabularies: LOD



innovative

Getty Vocabularies: LOD

SPARQL

Transformable

4 TGN-Specific Queries

- 4.1 Places by Type
- 4.2 Places, with English or GVP Label
- 4.3 Places by Direct and Hierarchical Type
- 4.4 Breakdown of Sovereign States by Type
- 4.5 Inhabited Places That Were Sovereign States
- 4.6 Places by Type and Parent Place
- 4.7 Places by Type, with placeTypePreferred
- 4.8 Places by Triple FTS
- 4.9 Places by FTS Parents
- 4.10 Capitals by Association
- 4.11 Members of the European Union
- 4.12 Members of the United Nations
- 4.13 Geo Chart with sgvizler
- 4.14 Column Chart with sgvizler
- 4.15 Countries and Capitals By Type and Containment
- 4.16 Places by Coordinate Bounding Box
- 4.17 Places Within Bounding Box
- 4.18 Places by Type Within Bounding Box
- 4.19 Places Outside Bounding Box (Overseas Possessions)
- 4.20 Places Nearby Each Other

Query:

```
1 select ?place
2 ?place skos
3 foaf:focu
4 gvp:prefL
5 filter (50.
```

One can obtain special RDF graphs or datasets for very complicated questions, and for revealing unknown relationships

☒ Include inferred

☐ Expand results over

4.16 Places by C

Find places whose coord

```
select ?place ?name ?
```

http://vocab.getty.edu/queries#Top-level_Subjects

Name authorities
offer foundational
structured data for
network analyses.

innovative



<http://vocab.getty.edu/queries>

At the same query
templates page

Find the section for ULAN.

- There are many
interesting query
examples.

4.20 Places Nearby Each Other

5 ULAN-Specific Queries

5.1 Agents by Type

5.2 Associative Relations of Agent

5.3 Female Artists ←

5.4 Female Artists as a Hobby

5.5 Native American Painters ←

5.6 Names of Native American Painters

5.7 Architects Born in the 14th or 15th Century

5.8 Indian and Pakistani Architectural Groups

5.9 Non-Italians Who Worked in Italy ←

5.10 Artists Associated to a Given Patron or His
Family

5.11 German, Dutch, Flemish printmakers, listed with
their teachers ←

5.12 Artists Whose Identity May be Associated or
Confused With Another ←

5.13 Ordered Hierarchy of Given Subject

5.14 Ancient Artists or Groups by Nationality ←

5.15 Art Repositories in the USA by State ←

5.16 Popes and Their Reigns

5.17 Pope Reign Durations

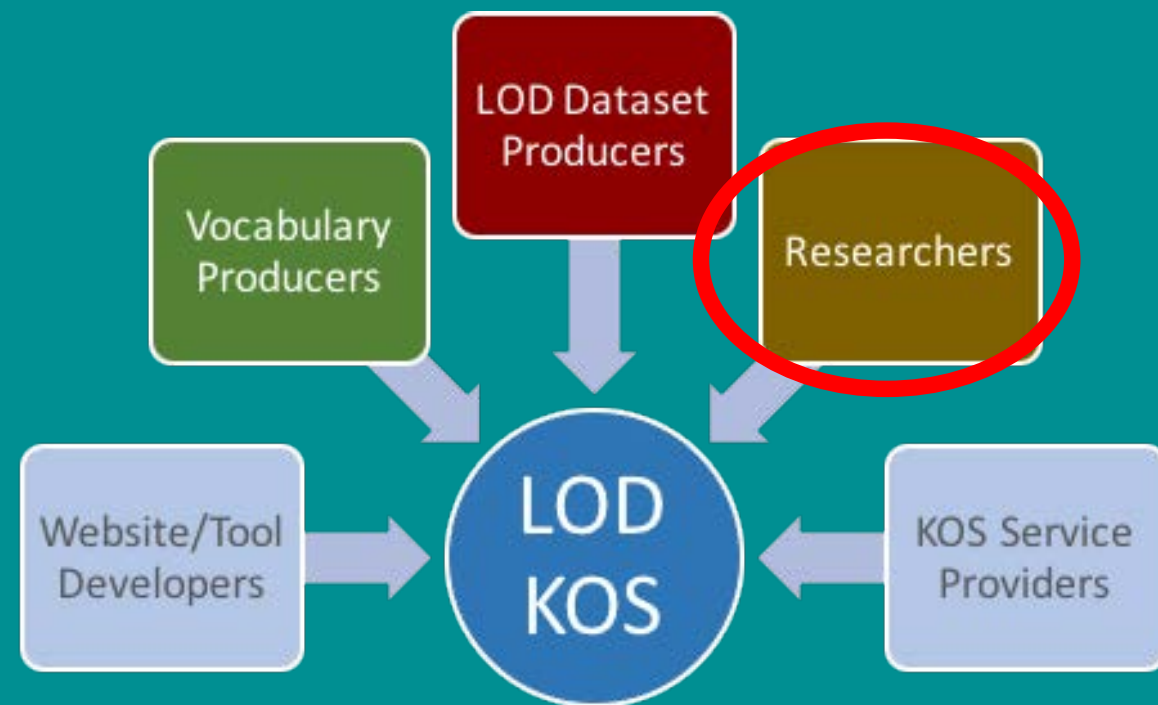
5.18 Life Events

(cont.)T4. Supports *innovative* transformative uses

LOD KOS products can be transformed **beyond** being just “value vocabularies”

They can become knowledge bases and provide semantic-rich discoveries

Transformable



➤ Functional

Made available in ways that enhance their inherent purpose

F1. Delivered in *consumable* formats.

F2. Endpoints are *operational*.

- Ensures sustainability

F3. Dataset properties and structures are *informed* effectively.

- Contains refined query examples to reveal the internal structures.

F4. Services are user-friendly, making vocabulary contents reachable

- Enhanced *usability (user friendliness)* through default or example queries for data exploration.

➤ Impactful

Maximizing the impact of a LOD KOS vocab

I1. Exposed through terminology services

- a) Vocab Registries
- b) Vocab Repositories / portals

I2. Used by data providers

- a) as a primary value Vocab
- b) in semantic enrichment

I3. Mapped with other KOS vocabs

I4. Showed/discussed at professional conferences and publications

➤ Transformable

Extends the functionality and impact through innovative adaptations

T1. Allows special KOS products to be *derived* from the original data

T2. The user is given *autonomy* to determine what structure and information is desired and can be reproduced.

T3. *Extended* to fit diverse needs, e.g. language and culture

T4. Supports *innovative* transformative uses beyond normal “value vocabularies”

C. Discussion:

Can we decide on the principles for the **LOD KOS**?

FAIR & FIT

- As a dataset
 - **FAIR**
- As a value vocabulary
 - **F**unctional
 - **I**mpactful
 - **T**ransformable

How can we categorize and produce other labels?

➤ **F**unctional

- Consumable
- Operational
- Use-friendly, Reachable
- Informative

➤ **I**mpactful

- Exposed
- Used
- Mapped
- Showed/Discussed

➤ **T**ransformable

- Derivable
- Autonomous
- Extendable
- Innovative

Other?

? Trustworthy

? Mature

? Refined

LOD = Linked Open Data

KOS=Knowledge Organization Structures/Systems

Please email me if you got more ideas, and would like to work together. mzeng@kent.edu

Thank you!



Functional Metrics for LOD KOS Products

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NKOS Workshop, Sept. 25 @DC2019, Seoul, S.Korea