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Kent State University, USA
Vlasimir Alexiev,
Ontotext, Bulgaria

Innovative Use of KOS that are Published as Linked Open Data (LOD)

Slides will be available through http://nkos.slis.kent.edu/

The First NKOS Workshop at ICADL
December 9, 2015, Yonsei University, Seoul, Korea

outline

- A. Background
  - Trend: Publishing KOS as LOD
- B. **Usages of LOD KOS**
  - I. For vocab creators/managers
  - II. For LOD data creators
  - III. For Web site developers
  - IV. For Researchers

A. Background
Trend: publishing KOS as LOD

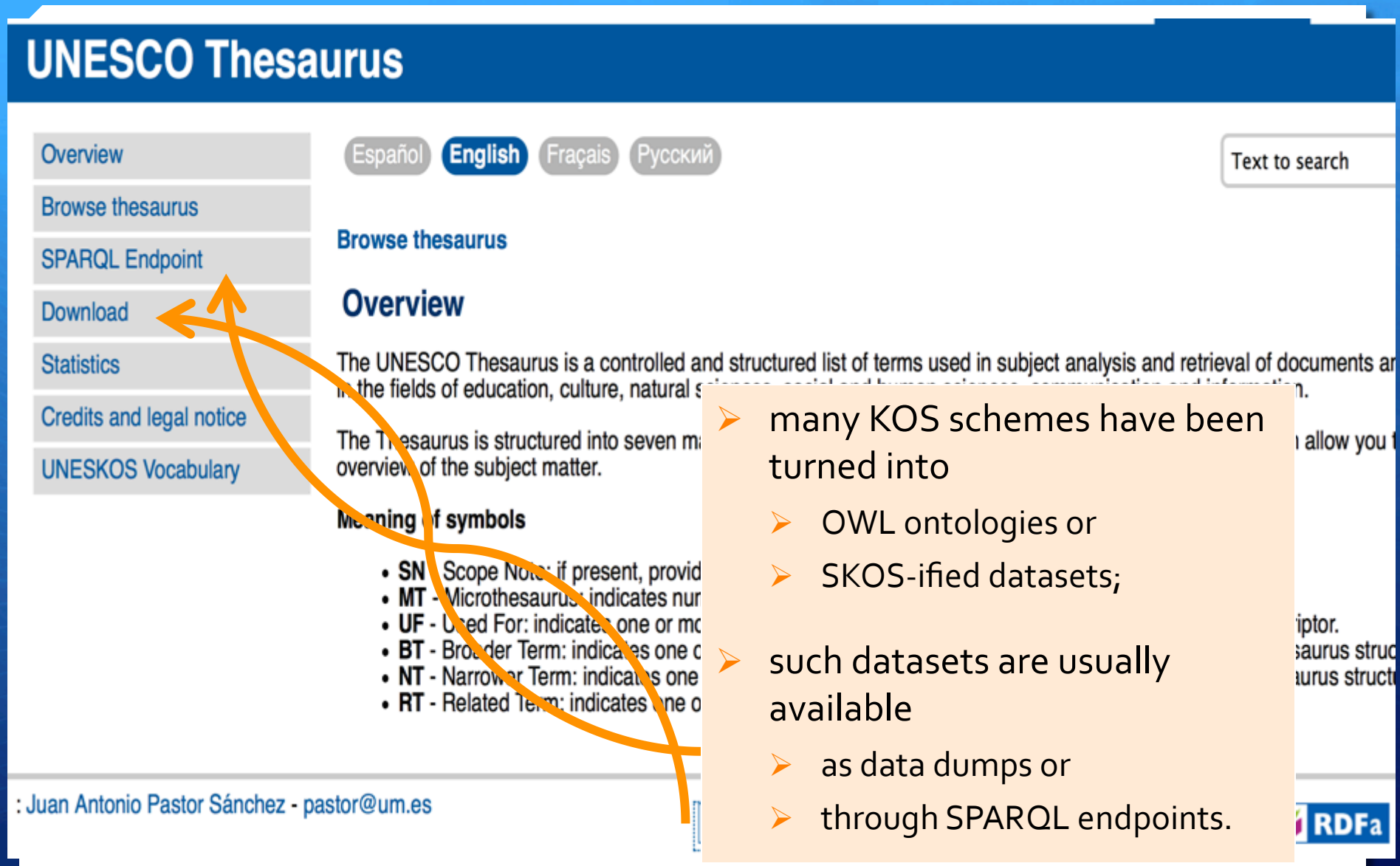
Semantic Web standards *enables* **LOD KOS**

- SKOS
- OWL
- RDFS

- SPARQL
- RDF

- 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.

LOD = Linked Open Data KOS=Knowledge Organization Structures/Systems



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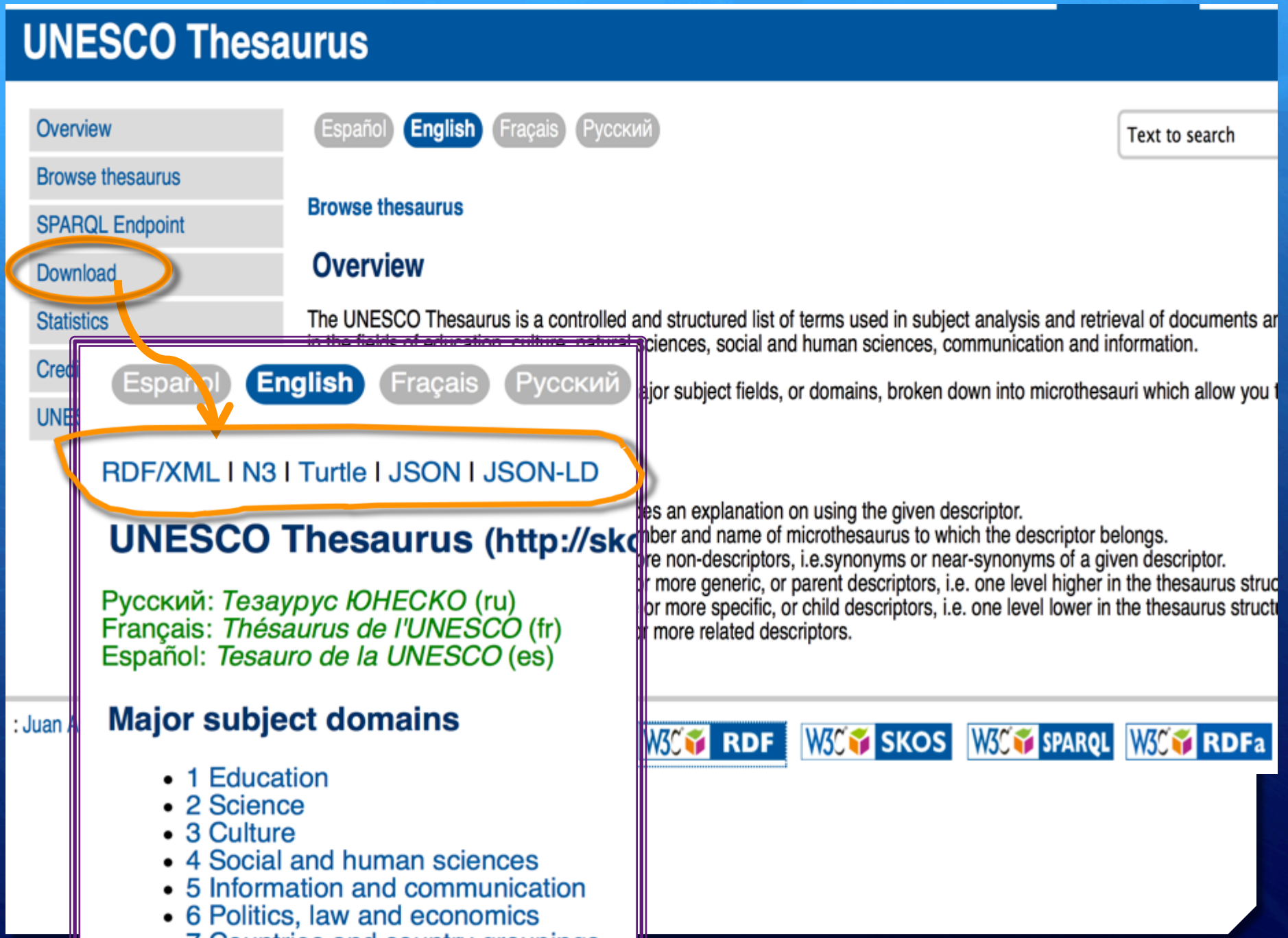
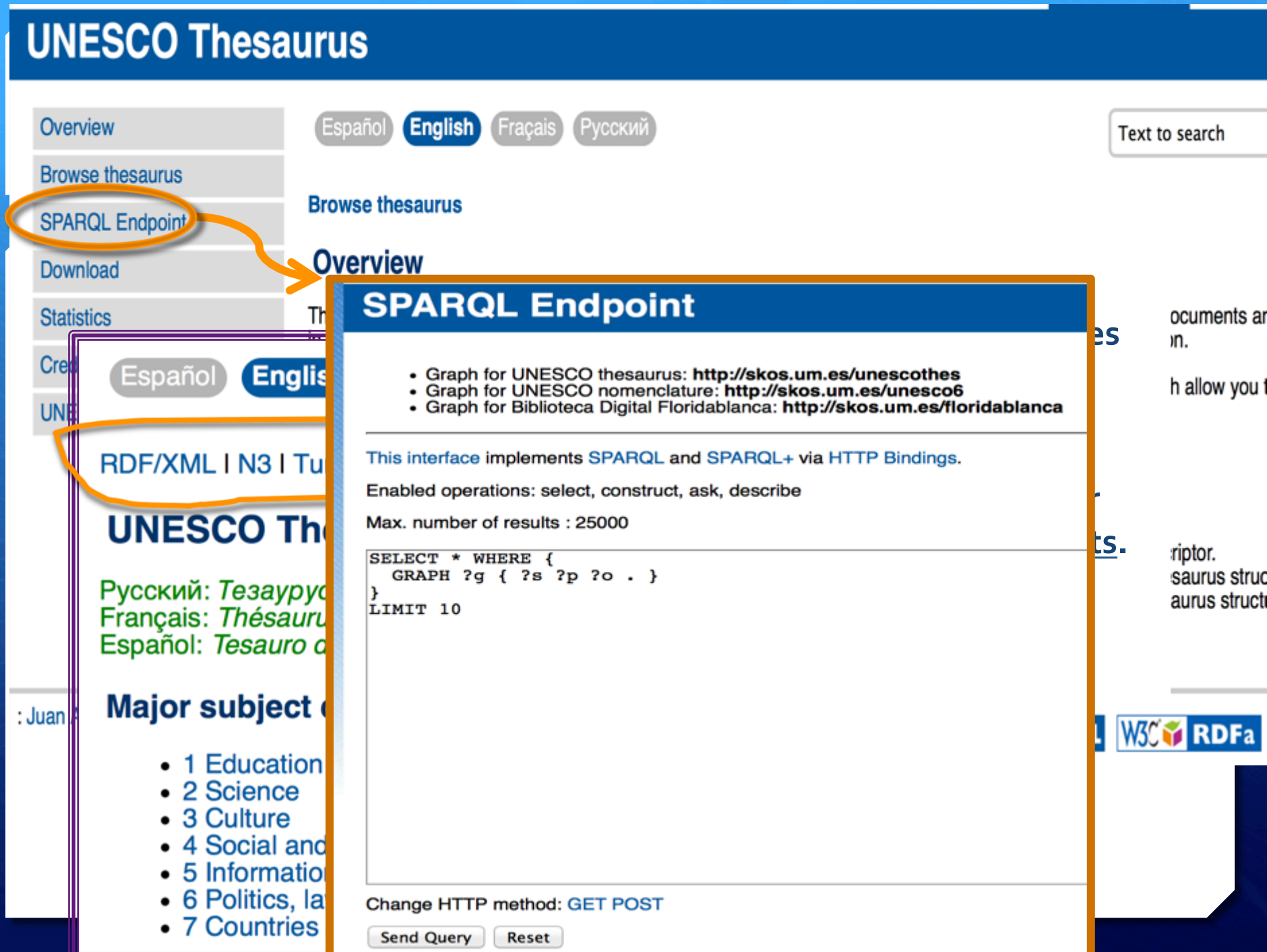
  - OWL ontologies or
  - SKOS-ified datasets;
- such datasets are usually available
  - as data dumps or
  - through SPARQL endpoints.


UNESCO Thesaurus
Overview
Browse thesaurus
SPARQL Endpoint
Download
Statistics
Español
English
Fraçais
Русский
Text to search
Browse thesaurus
Overview
The UNESCO Thesaurus is a controlled and structured list of terms used in subject analysis and retrieval of documents ar
ciences, social and human sciences, communication and information.
jor subject fields, or domains, broken down into microthesauri which allow you
RDF/XML | N3 | Turtle | JSON | JSON-LD
es an explanation on using the given descriptor.
ber and name of microthesaurus to which the descriptor belongs.
re non-descriptors, i.e.synonyms or near-synonyms of a given descriptor.
more generic, or parent descriptors, i.e. one level higher in the thesaurus struc
or more specific, or child descriptors, i.e. one level lower in the thesaurus structu
more related descriptors.
UNESCO Thesaurus (http://sk
Русский: Тезаурус ЮНЕСКО (ru)
Français: Thésaurus de l'UNESCO (fr)
Español: Tesauro de la UNESCO (es)
Major subject domains
1 Education
2 Science
3 Culture
4 Social and human sciences
5 Information and communication
6 Politics, law and economics
7 Countries and country groupings
: Juan
W3C RDF
W3C SKOS
W3C SPARQL
W3C RDFa


UNESCO Thesaurus
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Español
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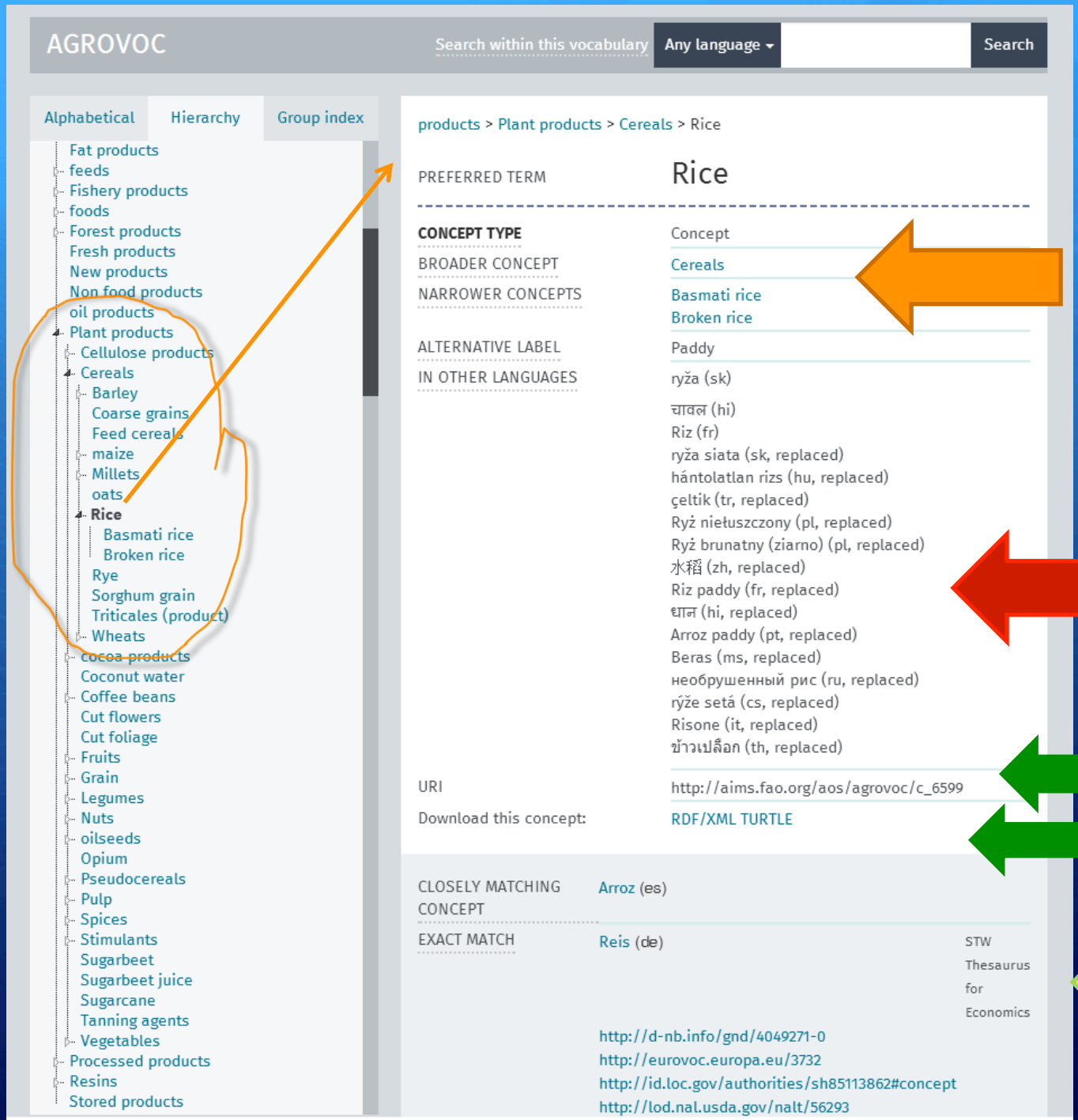
Fraçais
Русский
Text to search
Browse thesaurus
Overview
SPARQL Endpoint
Graph for UNESCO thesaurus: http://skos.um.es/unescothes
Graph for UNESCO nomenclature: http://skos.um.es/unesco6
Graph for Biblioteca Digital Floridablanca: http://skos.um.es/floridablanca
This interface implements SPARQL and SPARQL+ via HTTP Bindings.
Enabled operations: select, construct, ask, describe
Max. number of results : 25000
SELECT * WHERE {
GRAPH ?g { ?s ?p ?o . }
}
LIMIT 10
Change HTTP method: GET POST
Send Query
Reset
RDF/XML | N3 | Tu
UNESCO Th
Русский: Тезаурус
Français: Thésaurus
Español: Tesauro
Major subject
1 Education
2 Science
3 Culture
4 Social and
5 Information
6 Politics, la
7 Countries
W3C RDFa

Inside …



Original thesaurus display

Broader /Narrower

Labels in different languages

URI

LOD format

Interlinking

http://aims.fao.org/skosmos/agrovoc/en/page/c_6599

AGROVOC

Search within this vocabulary | Any language | Search

Alphabetical | Hierarchy | Group index

- Fat products
- feeds
- Fishery products
- foods
- Forest products
- Fresh products
- New products
- Non food products
- oil products
- Plant products
  - Cellulose products
  - Cereals
    - Barley
    - Coarse grains
    - Feed cereals
    - maize
    - Millets
    - oats
    - Rice
      - Basmati rice
      - Broken rice
    - Rye
    - Sorghum grain
    - Triticales (product)
    - Wheats
  - cocoa products
  - Coconut water
  - Coffee beans
  - Cut flowers
  - Cut foliage
  - Fruits
  - Grain
  - Legumes
  - Nuts
  - oilseeds
  - Opium
  - Pseudocereals
  - Pulp
  - Spices
  - Stimulants
  - Sugarbeet
  - Sugarbeet juice
  - Sugarcane
  - Tanning agents
  - Vegetables
- Processed products
- Resins
- Stored products

c_6211
Products @en

skos:broader

c_8171
Plant products @en

skos:broader

c_1474
Cereals @en

skos:broader

c_6599
Maize @en

skos:broader

c_7552
Sweet corn @en

products > Plant products > Cereals > Rice

PREFERRED TERM **Rice**

CONCEPT TYPE	Concept
BROADER CONCEPT	Cereals
NARROWER CONCEPTS	Basmati rice Broken rice
ALTERNATIVE LABEL	Paddy
IN OTHER LANGUAGES	ryža (sk) चावल (hi) Riz (fr) ryža siata (sk, replaced) hántolatlan rizs (hu, replaced) çeltik (tr, replaced) Ryż niełuszczony (pl, replaced) Ryż brunatny (ziarno) (pl, replaced) 水稻 (zh, replaced) Riz paddy (fr, replaced) धान (hi, replaced) Arroz paddy (pt, replaced) Beras (ms, replaced) необрушенный рис (ru, replaced) [illegible] (cs, replaced) Risone (it, replaced) ข้าวเปลือก (th, replaced)
URI	http://aims.fao.org/aos/agrovoc/c_6599
Download this concept:	RDF/XML TURTLE

skos:related

c_15500
corn starch@en

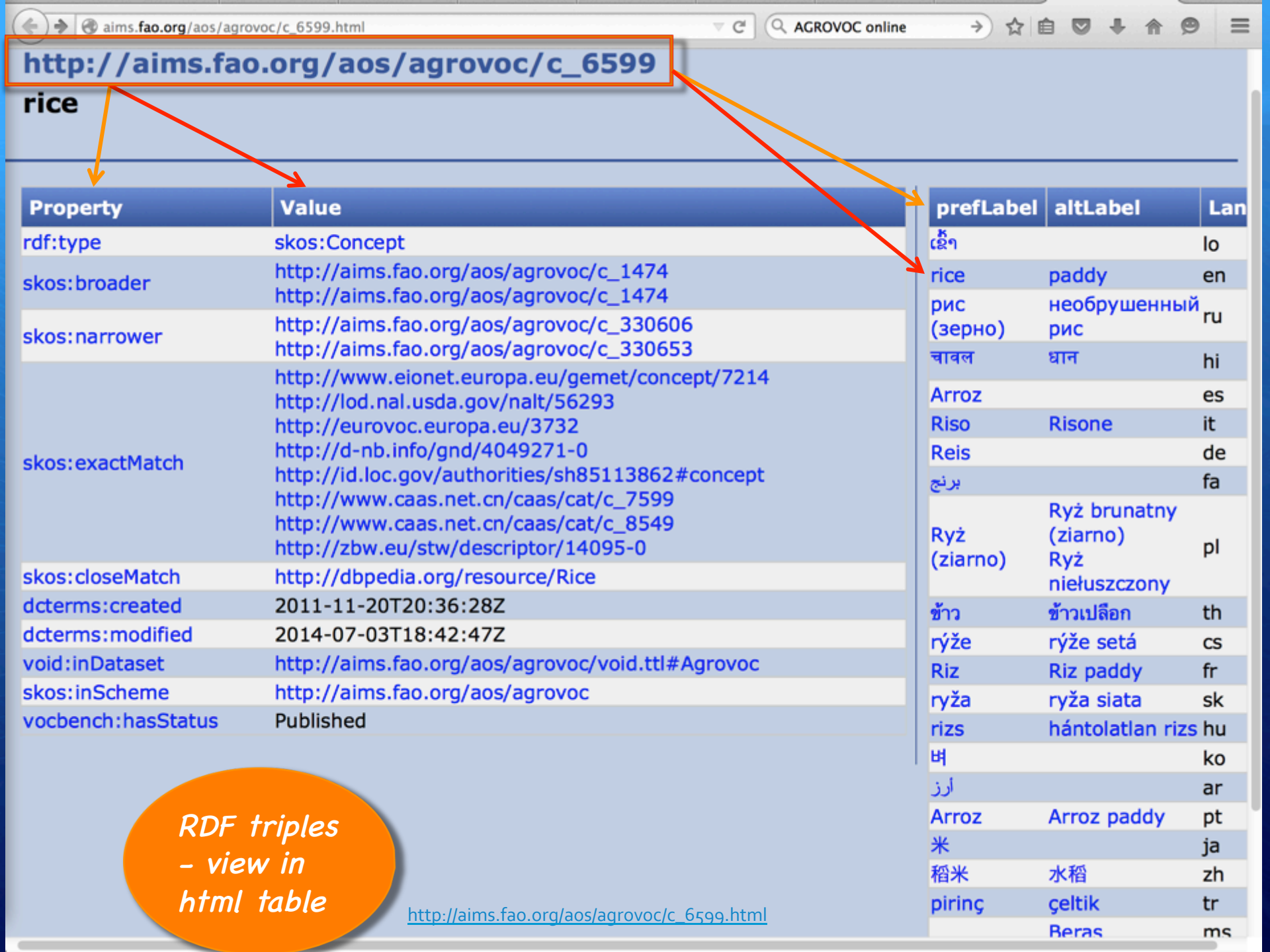
CLOSELY MATCHING CONCEPT	Arroz (es)
EXACT MATCH	Reis (de)

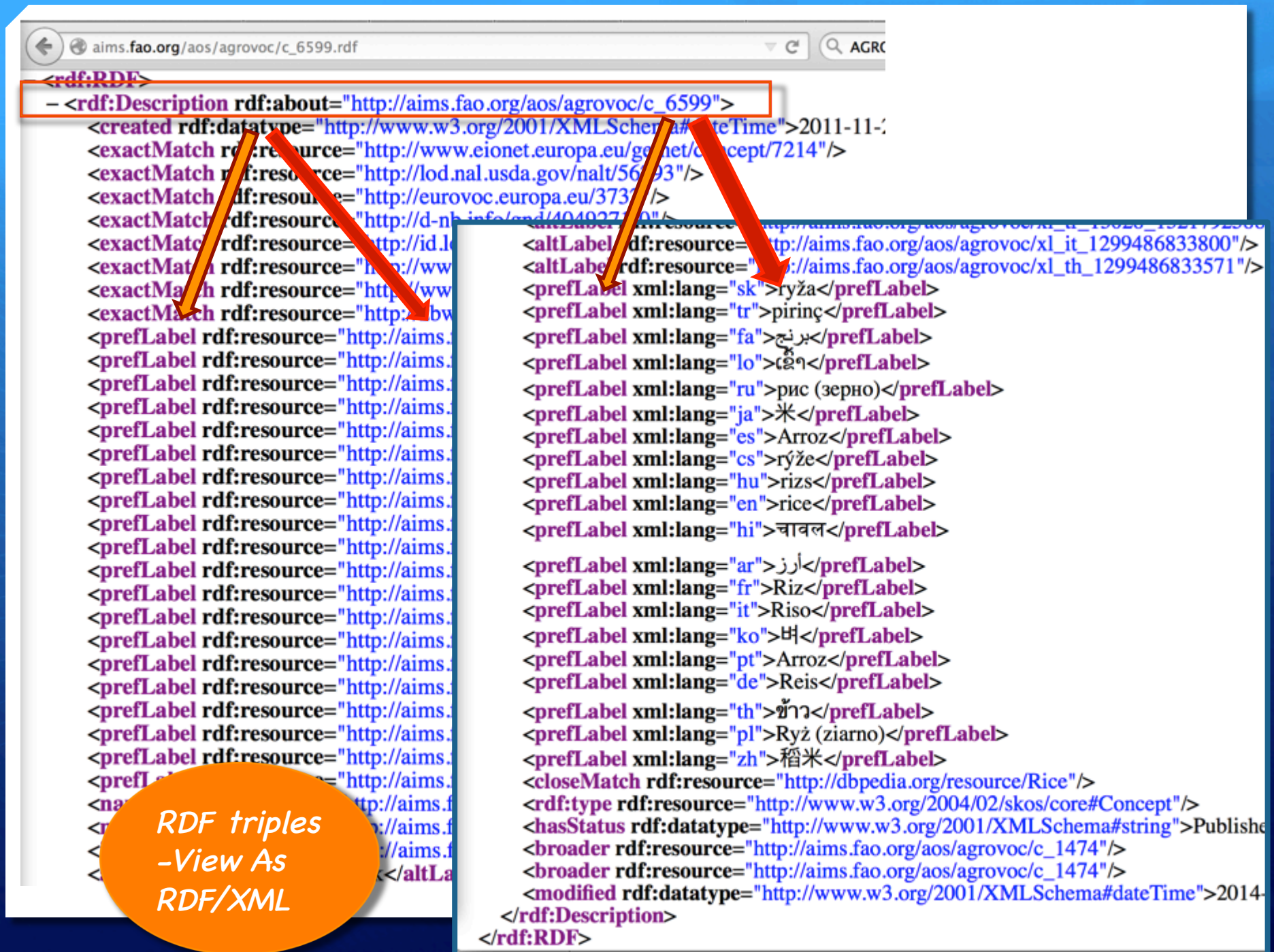
c_14385
Soft corn @en

STW Thesaurus for Economics

http://d-nb.info/gnd/4049271-0
http://eurovoc.europa.eu/3732
http://id.loc.gov/authorities/sh85113862#concept
http://lod.nal.usda.gov/nalt/56293

Relationships expressed in SKOS


aims.fao.org/aos/agrovoc/c_6599.html
AGROVOC online
http://aims.fao.org/aos/agrovoc/c_6599
rice
Property
Value
rdf:type
skos:Concept
skos:broader
http://aims.fao.org/aos/agrovoc/c_1474
http://aims.fao.org/aos/agrovoc/c_1474
skos:narrower
http://aims.fao.org/aos/agrovoc/c_330606
http://aims.fao.org/aos/agrovoc/c_330653
skos:exactMatch
http://www.eionet.europa.eu/gemet/concept/7214
http://lod.nal.usda.gov/nalt/56293
http://eurovoc.europa.eu/3732
http://d-nb.info/gnd/4049271-0
http://id.loc.gov/authorities/sh85113862#concept
http://www.caas.net.cn/caas/cat/c_7599
http://www.caas.net.cn/caas/cat/c_8549
http://zbw.eu/stw/descriptor/14095-0
skos:closeMatch
http://dbpedia.org/resource/Rice
dcterms:created
2011-11-20T20:36:28Z
dcterms:modified
2014-07-03T18:42:47Z
void:inDataset
http://aims.fao.org/aos/agrovoc/void.ttl#Agrovoc
skos:inScheme
http://aims.fao.org/aos/agrovoc
vocbench:hasStatus
Published
prefLabel
altLabel
Lan
ເຂົ້າ
lo
rice
paddy
en
рис (зерно)
необрушенный рис
ru
चावल
धान
hi
Arroz
es
Riso
Risone
it
Reis
de
برنج
fa
Ryż (ziarno)
Ryż brunatny (ziarno)
Ryż niełuszczony
pl
ข้าว
ข้าวเปลือก
th
rýže
rýže setá
cs
Riz
Riz paddy
fr
ryža
ryža siata
sk
rizs
hántolatlan rizs
hu
벼
ko
أرز
ar
Arroz
Arroz paddy
pt
米
ja
稻米
水稻
zh
pirinç
çeltik
tr
Beras
ms
RDF triples - view in html table
http://aims.fao.org/aos/agrovoc/c_6599.html


aims.fao.org/aos/agrovoc/c_6599.rdf
<rdf:RDF>
<rdf:Description rdf:about="http://aims.fao.org/aos/agrovoc/c_6599">
<created rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2011-11-
<exactMatch rdf:resource="http://www.eionet.europa.eu/gemet/concept/7214"/>
<exactMatch rdf:resource="http://lod.nal.usda.gov/nalt/56693"/>
<exactMatch rdf:resource="http://eurovoc.europa.eu/3732"/>
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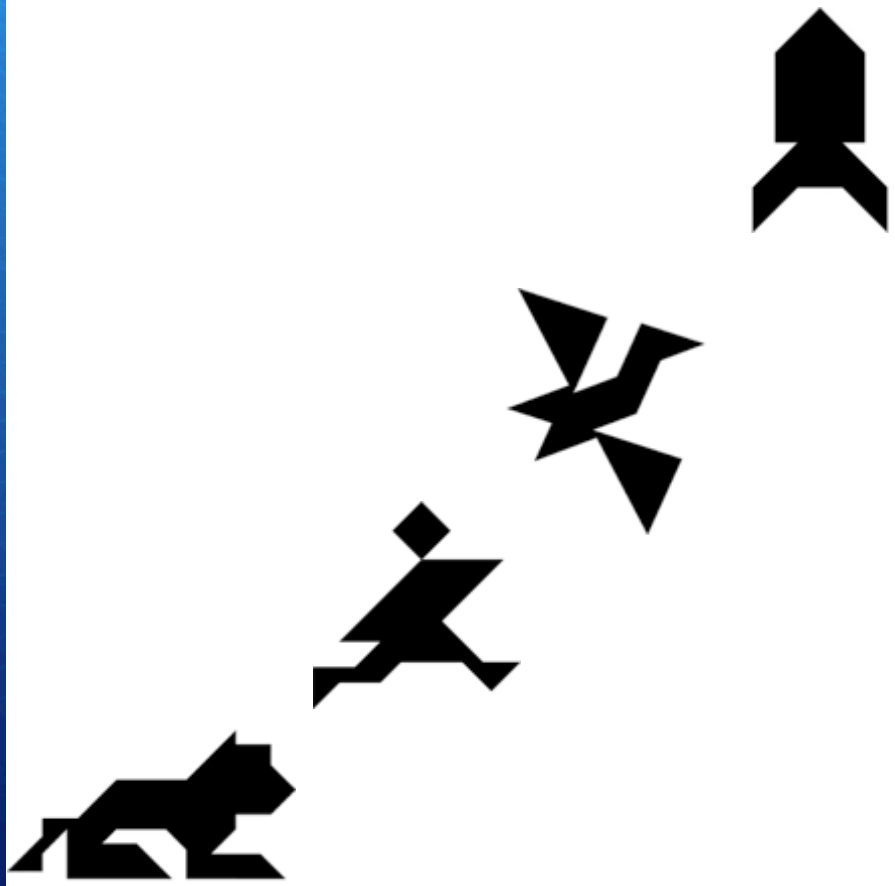
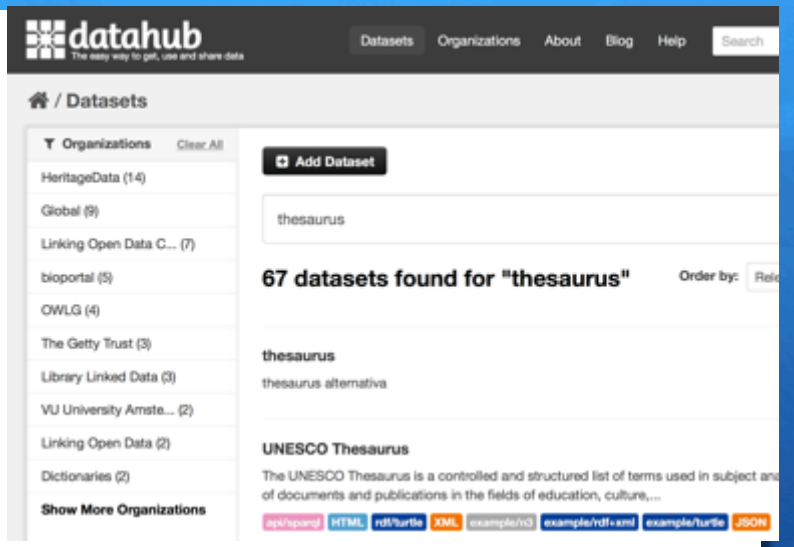
<altLabel rdf:resource="http://aims.fao.org/aos/agrovoc/xl_th_1299486833571"/>
<prefLabel xml:lang="sk">ryža</prefLabel>
<prefLabel xml:lang="tr">pirinç</prefLabel>
<prefLabel xml:lang="fa">برنج</prefLabel>
<prefLabel xml:lang="lo">ເຂົ້າ</prefLabel>
<prefLabel xml:lang="ru">рис (зерно)</prefLabel>
<prefLabel xml:lang="ja">米</prefLabel>
<prefLabel xml:lang="es">Arroz</prefLabel>
<prefLabel xml:lang="cs">rýže</prefLabel>
<prefLabel xml:lang="hu">rizs</prefLabel>
<prefLabel xml:lang="en">rice</prefLabel>
<prefLabel xml:lang="hi">चावल</prefLabel>
<prefLabel xml:lang="ar">أرز</prefLabel>
<prefLabel xml:lang="fr">Riz</prefLabel>
<prefLabel xml:lang="it">Riso</prefLabel>
<prefLabel xml:lang="ko">벼</prefLabel>
<prefLabel xml:lang="pt">Arroz</prefLabel>
<prefLabel xml:lang="de">Reis</prefLabel>
<prefLabel xml:lang="th">ข้าว</prefLabel>
<prefLabel xml:lang="pl">Ryż (ziarno)</prefLabel>
<prefLabel xml:lang="zh">稻米</prefLabel>
<closeMatch rdf:resource="http://dbpedia.org/resource/Rice"/>
<rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
<hasStatus rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Publishe
<broader rdf:resource="http://aims.fao.org/aos/agrovoc/c_1474"/>
<broader rdf:resource="http://aims.fao.org/aos/agrovoc/c_1474"/>
<modified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2014-
</rdf:Description>
</rdf:RDF>
RDF triples
-View As
RDF/XML

B. Usages of LOD KOS



LOD KOS in the Datahub



Datahub datasets 106,28

KOS in Datahub 1133 found

"thesaurus" 67 found 39 with SEP

"classification" 458 found 29 with SEP

"taxonomy" 26 found 8 with SEP

"terminology" 35 found 7 with SEP

"list" 52 found 17 with SEP

"Ontology" 495 found

SEP = SPARQL end point

LOD KOS 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, FAO geopolitical ontology
  - VIAF (Virtual International Authority File)
  - and several national library's name authorities
  - FAO geopolitical ontology

- **Standardized domain KOS**
  - AGROVOC
  - STW Thesaurus for Economics
  - 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
  - and dozens for biomedicine
- **Language- and culture-specific KOS**
  - Traditional Korean Medicine Ontology
  - Art and Architecture Thesaurus-Taiwan
  - National Diet Library of Japan (NDL) Authorities.

I. For vocab creators/ managers

1. As the resources of

   creating, maintaining, enriching, extending, and translating a controlled vocabulary

2. As the vocabulary management facility

obtaining

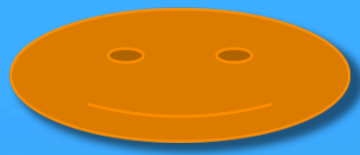
- established entries,
- relationships,
- multilingual labels,
- …

efficient
accurate

Constructing a micro-thesaurus dataset in a second

- Top of the AAT hierarchies
- .... Objects Facet
- ..... Object Genres (Hierarchy Name)
- ..... object genres (object classifications)
- ..... <object genres by function>
- ..... accessories
- ..... aids to navigation
- ..... beacons [N]
- ..... buoys [N]
- ..... lighthouses [N]
- ..... light stations [N]
- ..... navigational instrum
- ..... amulets
- ..... Thor's hammers (ar
- ..... armrests (object genre
- ..... backdrops
- ..... backrests
- ..... ceremonial objects
- ..... baptismal syringes
- ..... bow stands [N]
- ..... brush aspergilla [N]
- ..... calumets [N]
- ..... ceremonial chairs [N
- ..... ceremonial containe
- ..... ceremonial costume
- ..... ceremonial sound d
- ..... ceremonial watercra
- ..... ceremonial weapons
- ..... déblés [N]

aat:300264447	agere lfa@en
aat:300262796	aids to navigation@en
aat:300210466	aigrettes (plumes)@en
aat:300181617	airport beacons@en
aat:300181651	airway beacons@en
aat:300263682	akonkromfi@en
aat:300210415	albs@en
aat:300198819	alms dishes@en
aat:300210416	almuces (hoods)@en
aat:300263075	aloalo@en
aat:300391092	altar bells@en
aat:300391083	altar candlesticks@en
aat:300262580	altar crosses@en
aat:300198805	altar cruets@en
aat:300075940	altarpieces@en
aat:300264259	alusi@en
aat:300210417	amices@en
aat:300198899	ampullae@en
aat:300266585	amulets@en



HOW?

1

2

ID: 300117143

<object genres by function> (object genres (objec
Name))

Terms:

object genres by function (**preferred**,C,U,English-
objectgenres naar functie (C,U,Dutch-P,D,U,U)
categorías de objetos por función (C,U,Spanish-P,

Facet/Hierarchy Code: V.PE

Hierarchical Position:

Objects Facet
.... Object Genres (Hierarchy Name) (G)
..... object genres (object classifications) (G)
..... <object genres by function> (G)

Sources and Contributors:

categorías de objetos por función..... [CDBP-DIB

Top of the AAT hierarchies
.... Objects Facet
..... Object Genres (Hierarchy Name)
..... object genres (object classifications)
..... <object genres by function>
..... accessories
..... aids to navigation
..... beacons [N]
..... buoys [N]
..... lighthouses [N]
..... light stations [N]
..... navigational instruments [N]
..... amulets
..... Thor's hammers (amulets) [N]
..... armrests (object genre)
..... backdrops
..... backrests
..... ceremonial objects
..... baptismal syringes
..... bow stands [N]
..... brush aspergilla [N]
..... calumets [N]
..... ceremonial chairs [N]
..... ceremonial containers [N]
..... ceremonial costume [N]
..... ceremonial sound devices [N]
..... ceremonial watercraft [N]
..... ceremonial weapons [N]
..... déblés [N]

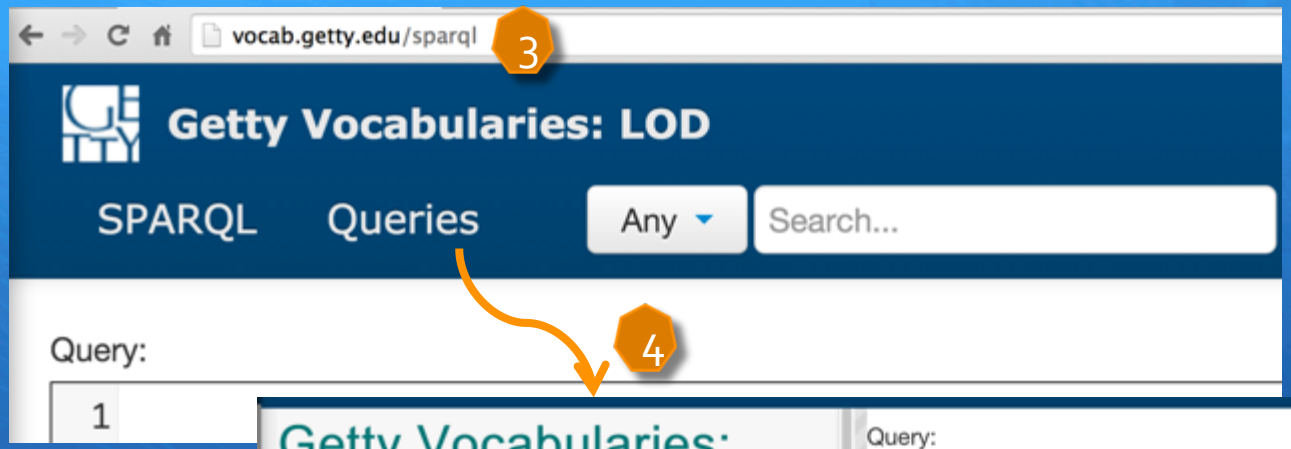
Steps:

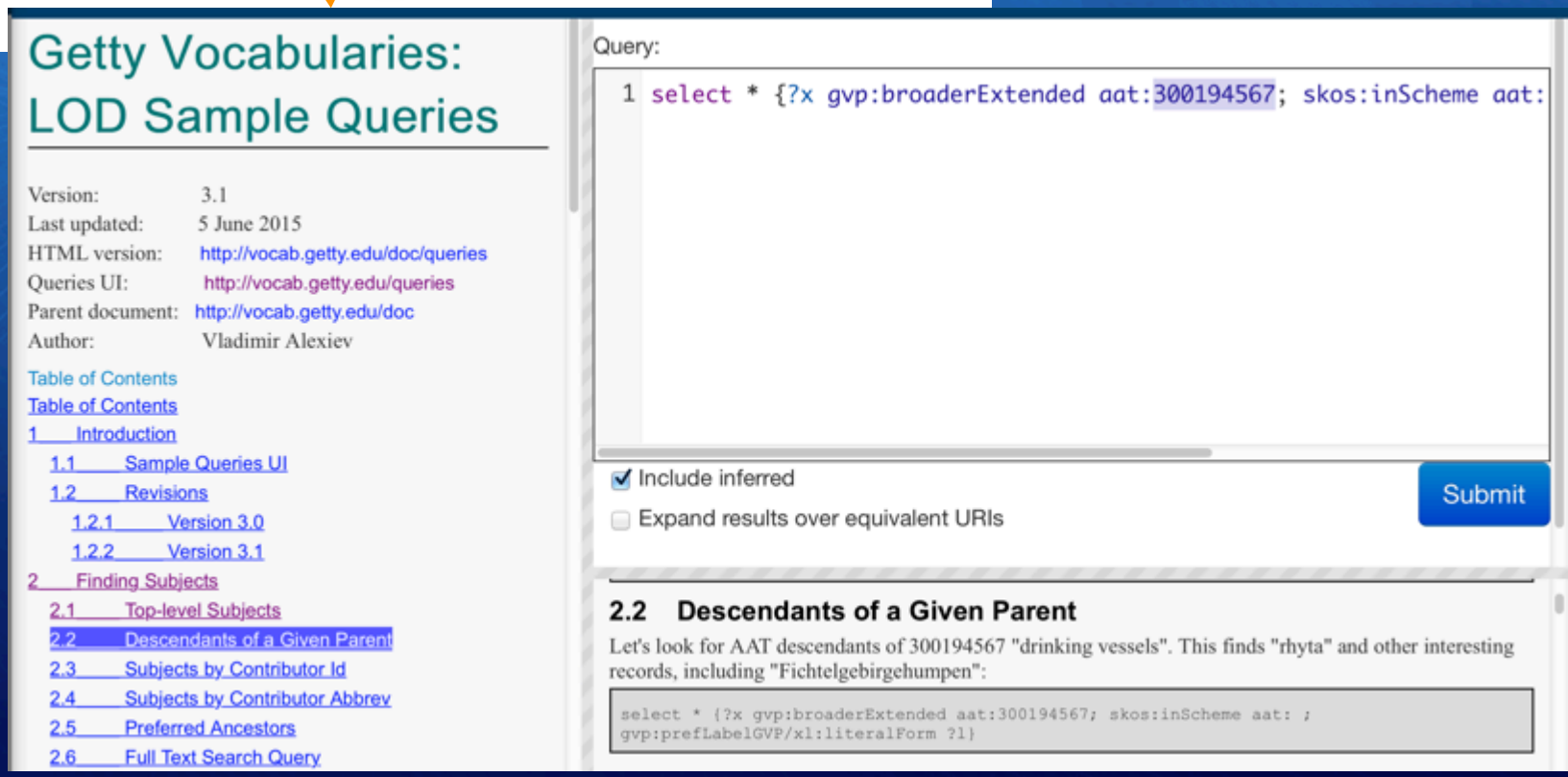
1. Choose a facet or a hierarchy from AAT...
2. Get the ID

3. Go to SPARQL Endpoint →

Steps:

3. Go to Getty Vocab SPARQL Endpoint: http://vocab.getty.edu/sparql
4. Choose from 'queries' template:





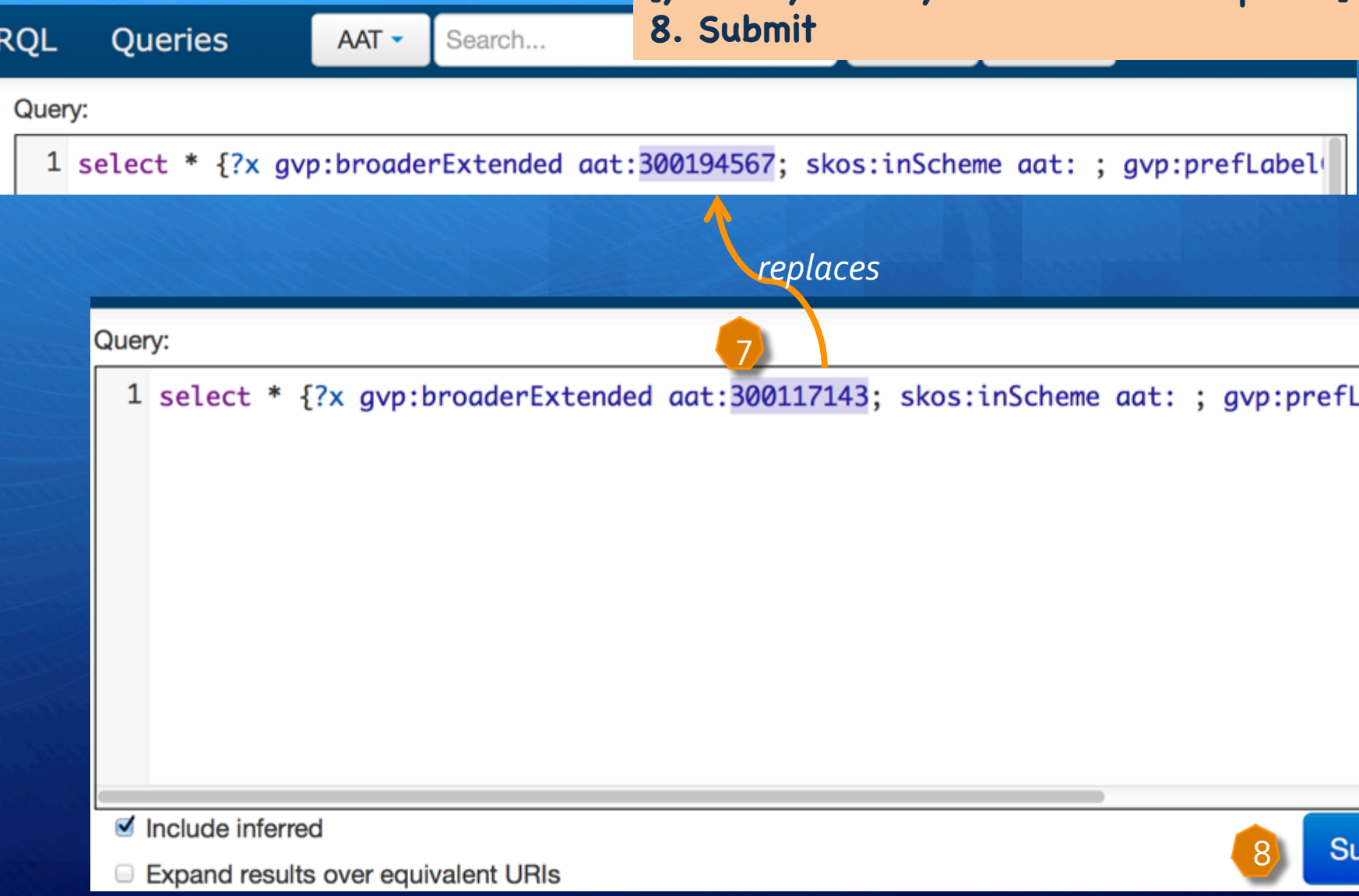
Steps:

5. Choose "Descendants of a Given Parent" from the template, click.

→ The template's text will show on the right.

6. Click 'SPARQL" to copy the query.

Steps
7. Replace the ID (e.g., 300117143) in the Query template
[you may modify to add more requests]
8. Submit



Getty Vocabularies: LOD

SPARQL Queries AAT Search... Search Brief

Results: (200 of 569)

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

x	l
aat:300391225	<religious visual works by related event>@en
aat:300391082	Advent candleholders@en
aat:300391224	Advent wreaths@en
aat:300178242	Andachtsbilder@en
aat:300265145	Bhagavad-gītās@en
aat:300263184	Bible stories@en
aat:300264513	Bibles@en
aat:300263411	Bibles historiales@en
aat:300211640	Bibles moralisées@en
aat:300026456	Biblia pauperum@en
aat:300262593	Bifwebe@en
aat:300262950	Buddhas@en

It gave me the results in 2 seconds.

I. (cont.) For vocab creators/managers

2. As the vocabulary management facility

in data-driven editing and publishing workflow

<u>management data</u>

- Administrative
- Provenance
- Use

http://aims.fao.org/aos/agrovoc/c_6599
rice

Property	Value
rdf:type	skos:Concept
skos:broader	http://aims.fao.org/aos/agrovoc/c_1474 http://aims.fao.org/aos/agrovoc/c_1474
skos:narrower	http://aims.fao.org/aos/agrovoc/c_330606 http://aims.fao.org/aos/agrovoc/c_330653
skos:exactMatch	http://www.eionet.europa.eu/gemet/concept/7214 http://lod.nal.usda.gov/nalt/56293 http://eurovoc.europa.eu/3732 http://d-nb.info/gnd/4049271-0 http://id.loc.gov/authorities/sh85113862#concept http://www.caas.net.cn/caas/cat/c_7599 http://www.caas.net.cn/caas/cat/c_8549 http://zbw.eu/stw/descriptor/14095-0
skos:closeMatch	http://dbpedia.org/resource/Rice
dcterms:created	2011-11-20T20:36:28Z
dcterms:modified	2014-07-03T18:42:47Z
void:inDataset	http://aims.fao.org/aos/agrovoc/void.ttl#Agrovoc
skos:inScheme	http://aims.fao.org/aos/agrovoc
vocbench:hasStatus	Published

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 Scheme

- Smartphones
- http://content.glin.gov/subjectTerm/535

Sources

- found: Wikipedia, Aug. 6, 2007 (smartphone: full-
  capabilities with the functionality of a complete p
  and tethered modem capabilities on top of the de
- found: MobileTechReview WWW Home page, Au
- found: CNET reviews Home page, Aug. 6, 207 (s
- found: Google search, May 4, 2011: (1,070,000 h

Change Notes

- 2007-08-06: new
- 2011-07-18: revised

Smartphones

URI(s)

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

rich management data

```
– <skos:changeNote>
  – <cs:ChangeSet>
      <cs:subjectOfChange rdf:resource="http://id.loc.gov/authorities
      /subjects/sh2007006251"/>
      <cs:creatorName rdf:resource="http://id.loc.gov/vocabulary
      /organizations/dlc"/>
      <cs:createdDate rdf:datatype="http://www.w3.org
      /2001/XMLSchema#dateTime">2007-08-06T00:00:00</cs:createdDate>
      <cs:changeReason rdf:datatype="http://www.w3.org
      /2001/XMLSchema#string">new</cs:changeReason>
    </cs:ChangeSet>
  </skos:changeNote>
– <skos:changeNote>
  – <cs:ChangeSet>
      <cs:subjectOfChange rdf:resource="http://id.loc.gov/authorities
      /subjects/sh2007006251"/>
      <cs:creatorName rdf:resource="http://id.loc.gov/vocabulary
      /organizations/dlc"/>
      <cs:createdDate rdf:datatype="http://www.w3.org
      /2001/XMLSchema#dateTime">2011-07-18T13:04:07</cs:createdDate>
      <cs:changeReason rdf:datatype="http://www.w3.org
      /2001/XMLSchema#string">revised</cs:changeReason>
    </cs:ChangeSet>
  </skos:changeNote>
```

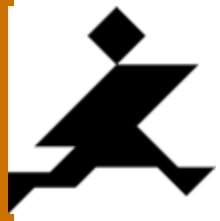
1. Transforming your database to LOD Datasets
   - Developers
   - Publishers
2. Creating machine-understandable data for your website
   - Individuals
   - Webmasters
3. As components and plug-ins
   - in editing and publishing workflows, or
   - for website products

II. For LOD data creators

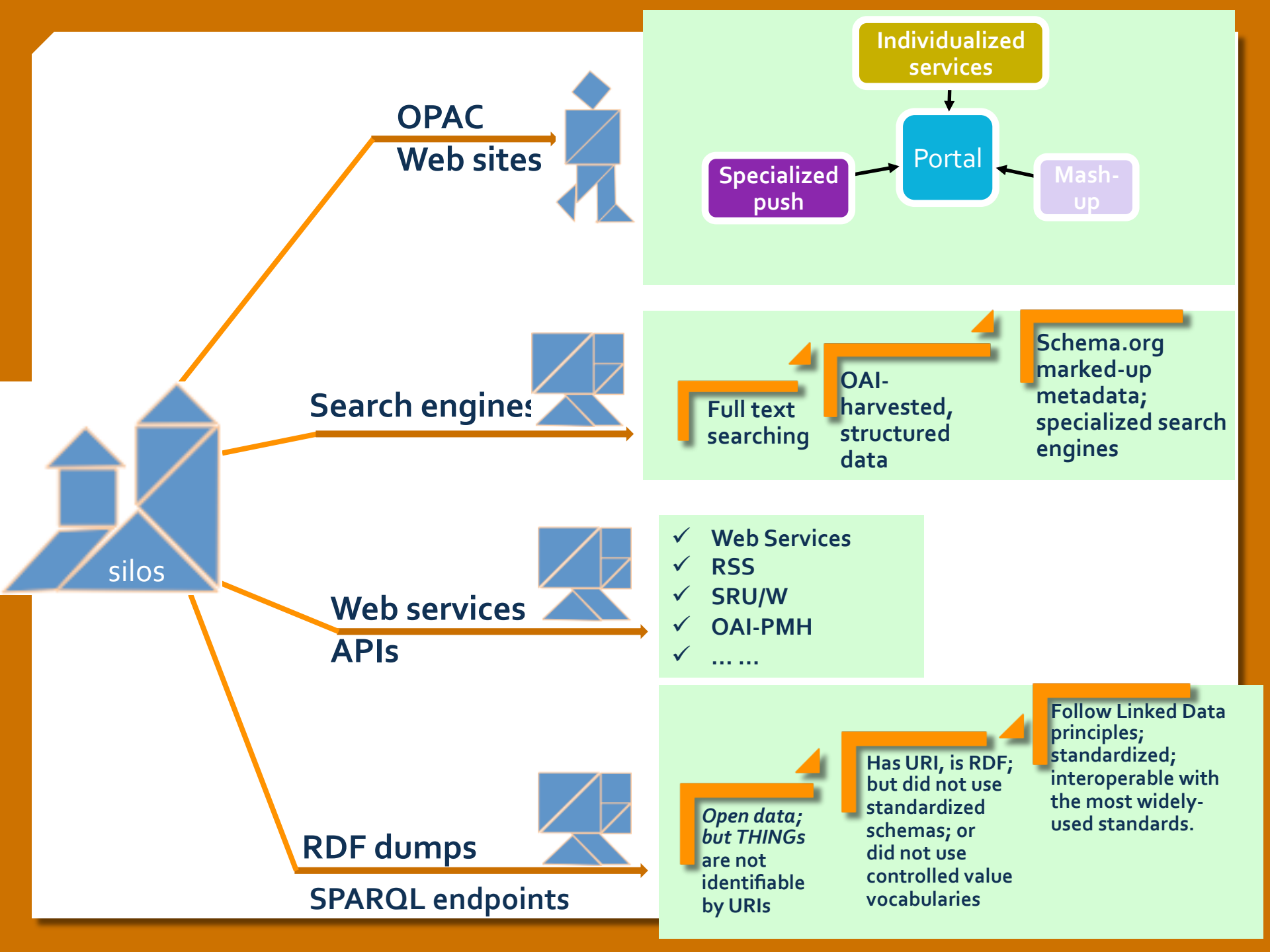
1. Transforming one's databases to LOD Datasets

LOD KOS

- Enable owners of structured data to convert and publish their metadata under the LOD principles
  - i.e., use HTTP URIs/IRIs as names of things
- Enhance semantic consistency and interoperability



Increase the findability of their data.


silos
OPAC
Web sites
Search engines
Web services
APIs
RDF dumps
SPARQL endpoints
Individualized services
Portal
Specialized push
Mash-up
Full text searching
OAI-harvested, structured data
Schema.org marked-up metadata; specialized search engines
✓ Web Services
✓ RSS
✓ SRU/W
✓ OAI-PMH
✓ … …
Open data; but THINGs are not identifiable by URIs
Has URI, is RDF; but did not use standardized schemas; or did not use controlled value vocabularies
Follow Linked Data principles; standardized; interoperable with the most widely-used standards.

KOS for Entity Names and Concepts

ID: 700001931
Images: 1

Work

Gezicht op Olinda, Brazilië (easel painting (painting by form); Frans Jansz. Post
1662; Rijksmuseum (Amsterdam, North Holland, Netherlands); SK-A-742; RM001

Titles:
Gezicht op Olinda, Brazilië (preferred,C,U,RP,Dutch-P,U,U)
View of Olinda, Brazil (C,U,DE,English-P,U,U)

Catalog Level: item

Work Types:
easel painting (painting by form) [300177435] (preferred)
..... (Objects Facet, Visual and Verbal Communi... (Hierarchy Na
works, <visual works by material or tec... isual w

Concept

Classifications:
paintings (preferred)

Creation Date: 1662

Agent

Creator Display:
Frans Jansz. Post (Haarlem 1612 - Haarlem 1680-02-16) [preferred,VP]
painter Post, Frans (Dutch painter and draftsman, 1612-1680) [5000170]

Locations:
Current: Rijksmuseum (Amsterdam, ...lands) [500246547]
Repository Numbers: SK-A-742; RM...

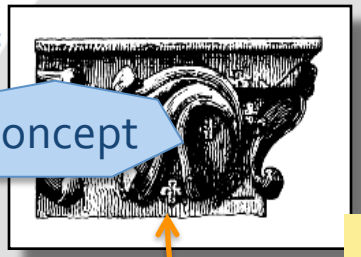
Place

Display Materials: oil on canvas
oil paint (paint) [300015050]
.....(Materials Facet, M... Hierarchy Name), materials (matter), <materials by func...
<coating by form... ...int by composition or origin>)
canvas [3000140...]
.....(Materials Facet, Materials (Hierarchy Name), materials (matter), <materials by form>,
form>, <fiber and fiber products>, fiber products, textile materials, <textile materials by pro...

Concept

Dimensions: 107.5 x 172.5 cm

Art & Architecture Thesaurus **(AAT)**



Concept

Union List of Artist Names **(ULAN)**

Agent

Getty Thesaurus of Geographic Names **(TGN)**

Place

Cultural Objects Name Authority (CONA)

Work

Home My Europeana Choose a language

europeana think culture

Search Creators | kaiser johann wilhelm | Search | Help

Return to search results Next >

Public Domain marked

View item at Rijksmuseum

Share

Cite on Wikipedia

Translate details

Select language

Powered by Microsoft® Translator

Het melkmeisje

Title:
Hollandse meesters

Description:
Een melkmeisje schenkt melk in een kom. Rechts van haar een venster. De prent maakt deel uit van een serie van 25 prenten naar Hollandse meesters. Boven de afbeelding: PL III.

Creator:
Kaiser, Johann Wilhelm (I) (Kaiser, Johann Wilhelm (I)) From: 1813-01-05— To: 1900-11-29

Contributor:
Johannes Vermeer (Johannes Vermeer)

Date of creation:
1823 - 1900

http://vocab.getty.edu/aat/300041273

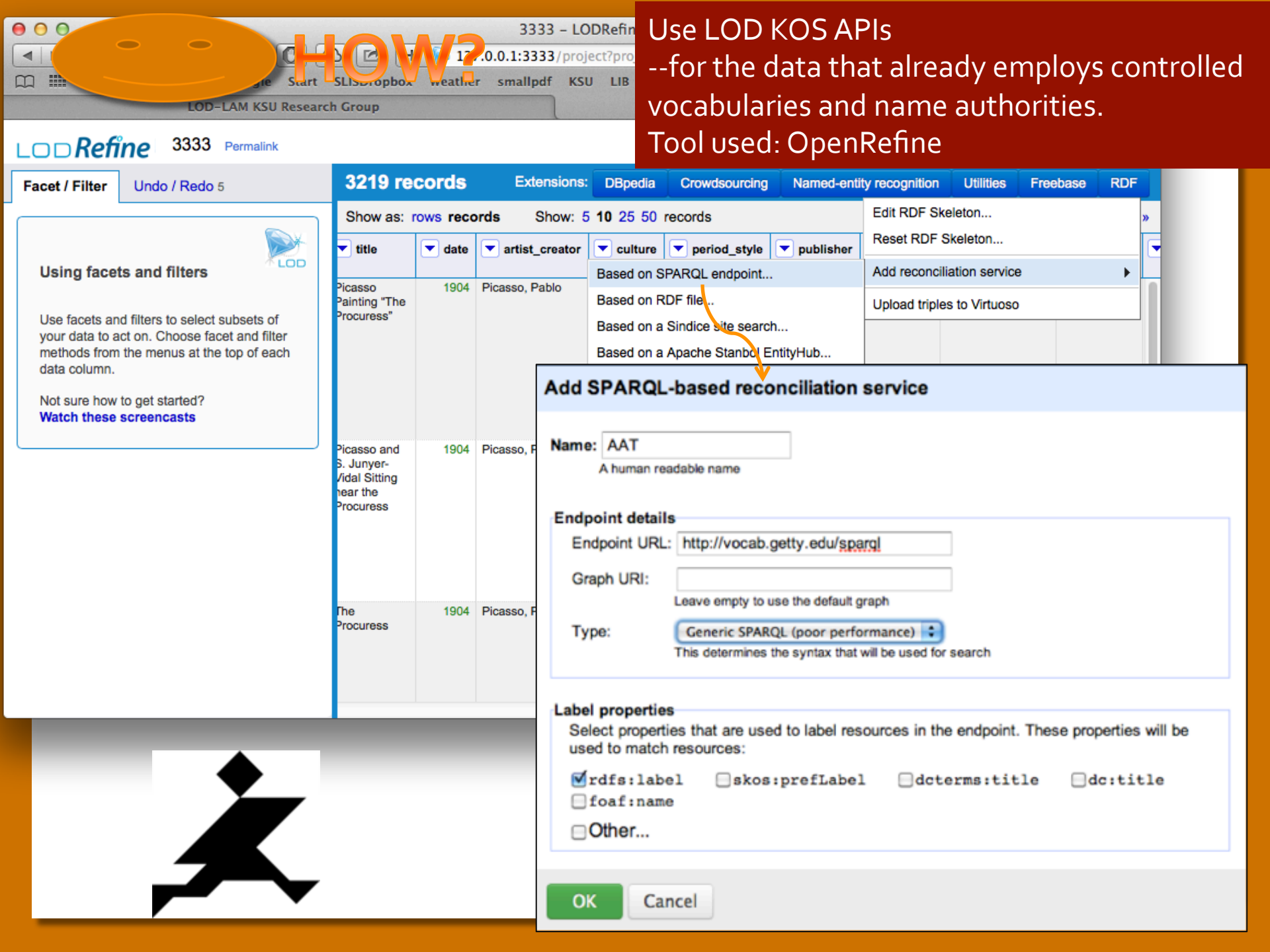
Type:
prints (visual works); fine art prints

Format:
chine collé; height 256 MM; width 176 MM; plaatrand hoogte 256 MM; plaatrand breedte 176 MM

Subject:
http://iconclass.org/47I22311

Identifier:
http://hdl.handle.net/10934/RM0001.COLLECT.130468

http://goo.gl/wo5OyH


HOW?
Use LOD KOS APIs
--for the data that already employs controlled vocabularies and name authorities.
Tool used: OpenRefine
LOD-LAM KSU Research Group
LODRefine
3333
Permalink
Facet / Filter
Undo / Redo 5
Using facets and filters
Use facets and filters to select subsets of your data to act on. Choose facet and filter methods from the menus at the top of each data column.
Not sure how to get started?
Watch these screencasts
3219 records
Extensions:
DBpedia
Crowdsourcing
Named-entity recognition
Utilities
Freebase
RDF
Show as: rows records
Show: 5 10 25 50 records
title
date
artist_creator
culture
period_style
publisher
Edit RDF Skeleton...
Reset RDF Skeleton...
Based on SPARQL endpoint...
Add reconciliation service
Based on RDF file...
Upload triples to Virtuoso
Based on a Sindice site search...
Based on a Apache Stanbol EntityHub...
Picasso Painting "The Procuress"
1904
Picasso, Pablo
Picasso and S. Junyer-Vidal Sitting near the Procuress
1904
The Procuress
1904
Add SPARQL-based reconciliation service
Name:
AAT
A human readable name
Endpoint details
Endpoint URL:
http://vocab.getty.edu/sparql
Graph URI:
Leave empty to use the default graph
Type:
Generic SPARQL (poor performance)
This determines the syntax that will be used for search
Label properties
Select properties that are used to label resources in the endpoint. These properties will be used to match resources:
rdfs:label
skos:prefLabel
dcterms:title
dc:title
foaf:name
Other...
OK
Cancel

HOW?

Use LOD KOS APIs
--mapping outsiders

nomisma.org/id/ephesus

ephesus (nmo:Mint)

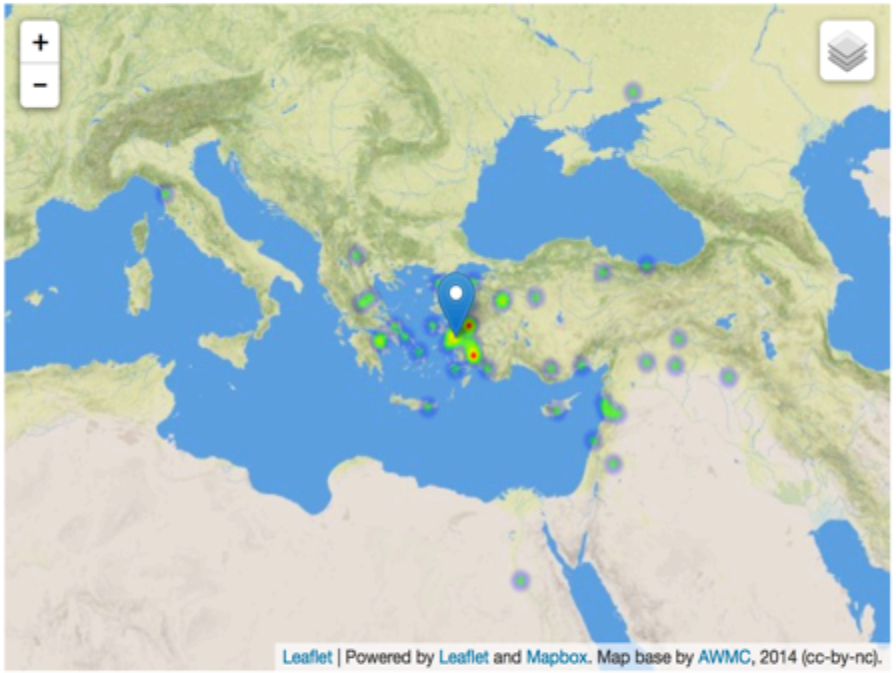
skos:prefLabel	Efese *(af)*, ኤፌሶን *(am)*, أفسس *(ar)*, Efes *(az)*, Горад Эфес *(be)*, Ефес *(bg)*, Efesos *(br)*, Efes *(bs)*, Efes *(ca)*, Efez *(cs)*, Effesus *(cy)*, Efesos *(da)*, Ephesos *(de)*, Έφεσος *(el)*, Ephesus *(en)*, Efeso *(eo)*, Éfeso *(es)*, Efeso *(eu)*, افسس *(fa)*, Efesos *(fi)*, Efesus *(fo)*, Ephèse *(fr)*, Éfeso *(gl)*, אפסוס *(he)*, Efez *(hr)*, Epheszosz *(hu)*, Եփեսոս *(hy)*, Ephesos *(id)*, Efesos *(is)*, Efeso *(it)*, エフェソス *(ja)*, Efesus *(jv)*, ეფესო *(ka)*, 에페소스 *(ko)*, Ephesus *(la)*, Efesas *(lt)*, Efesa *(lv)*, Ефес *(mk)*, इफेसूस *(mr)*, Efesus *(ms)*, Efesos *(nb)*, Efese *(nl)*, Efesos *(nn)*, Efez *(pl)*, Éfeso *(pt)*, Efesos *(ro)*, Эфес *(ru)*, Efes *(sh)*, Efez *(sk)*, Efez *(sl)*, Ефес *(sr)*, Efesos *(sv)*, Efeso *(sw)*, எபேசஸ் *(ta)*, เอฟิซัส *(th)*, Efeso *(tl)*, Efes *(tr)*, Ефес *(uk)*, افسس *(ur)*, Efes *(uz)*, Ephesus *(vi)*, 以弗所 *(zh)*
skos:definition	The mint at the ancient site of Ephesus in Ionia. *(en)*
dcterms:isPartOf	http://nomisma.org/id/greek_numismatics
geo:location	http://nomisma.org/id/ephesus#this
rdf:type	skos:Concept
skos:altLabel	Ephesos *(en)*
skos:broader	http://nomisma.org/id/ionia
skos:closeMatch	http://collection.britishmuseum.org/id/place/x107267
skos:closeMatch	http://dbpedia.org/resource/Ephesus
skos:closeMatch	http://gazetteer.dainst.org/app/#!/show/2287728
skos:closeMatch	http://pleiades.stoa.org/places/599612
skos:closeMatch	http://viaf.org/viaf/156158309
skos:closeMatch	http://vocab.getty.edu/tgn/7002499
skos:closeMatch	http://www.geonames.org/7522155
skos:closeMatch	http://www.wikidata.org/entity/Q47611
skos:closeMatch	https://www.freebase.com/m/02p8r

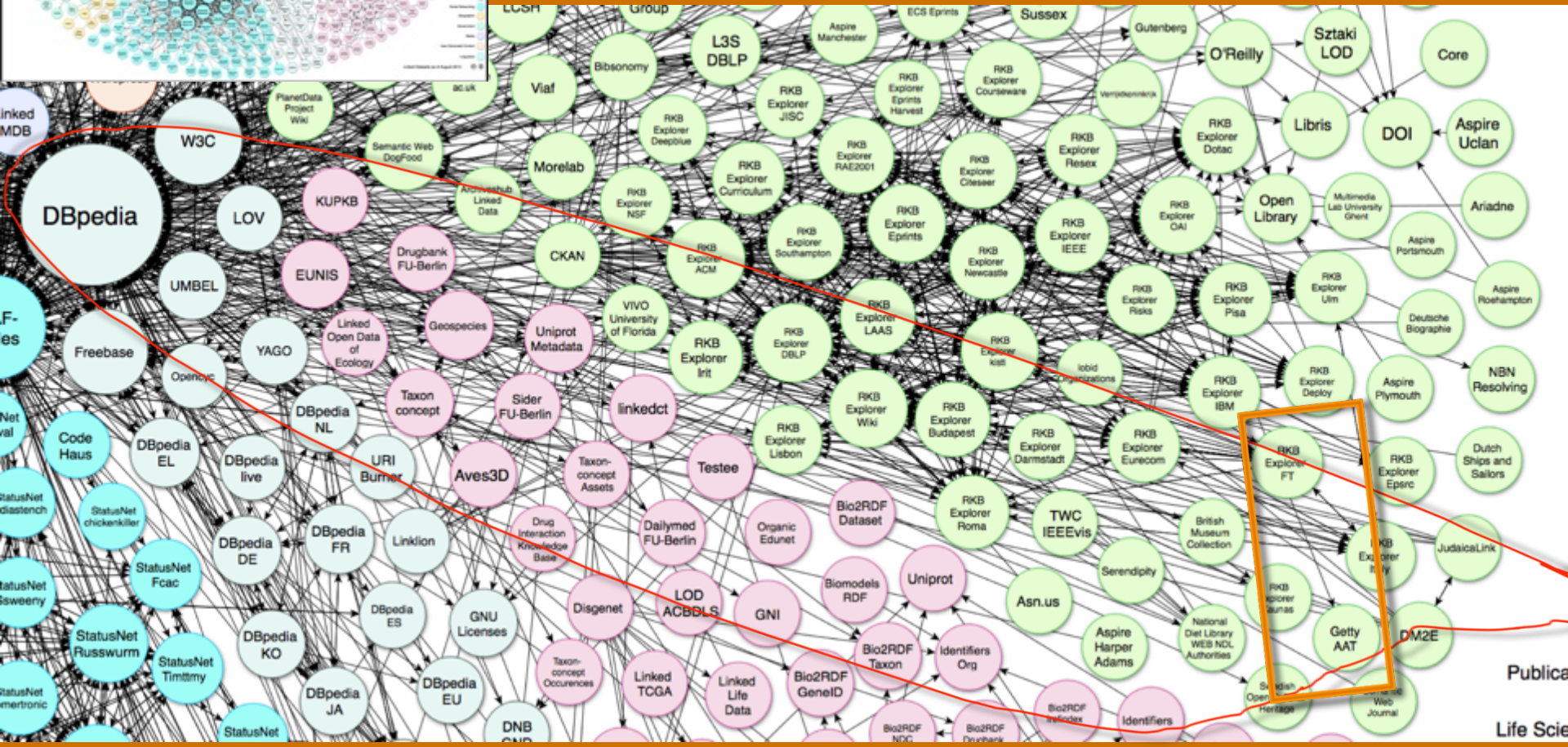
#this (geo:SpatialThing)

dcterms:isPartOf	http://nomisma.org/id/ionia#this
geo:lat	37.939722
geo:long	27.340833

Export

GitHub File RDF/XML RDF/TTL JSON-LD KML





http://lod-cloud.net/ 2014-08

II. (cont.) For LOD data creators

- 1. Transforming your database to LOD Datasets
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  - Webmasters.
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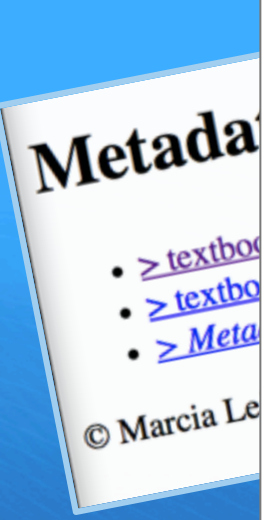
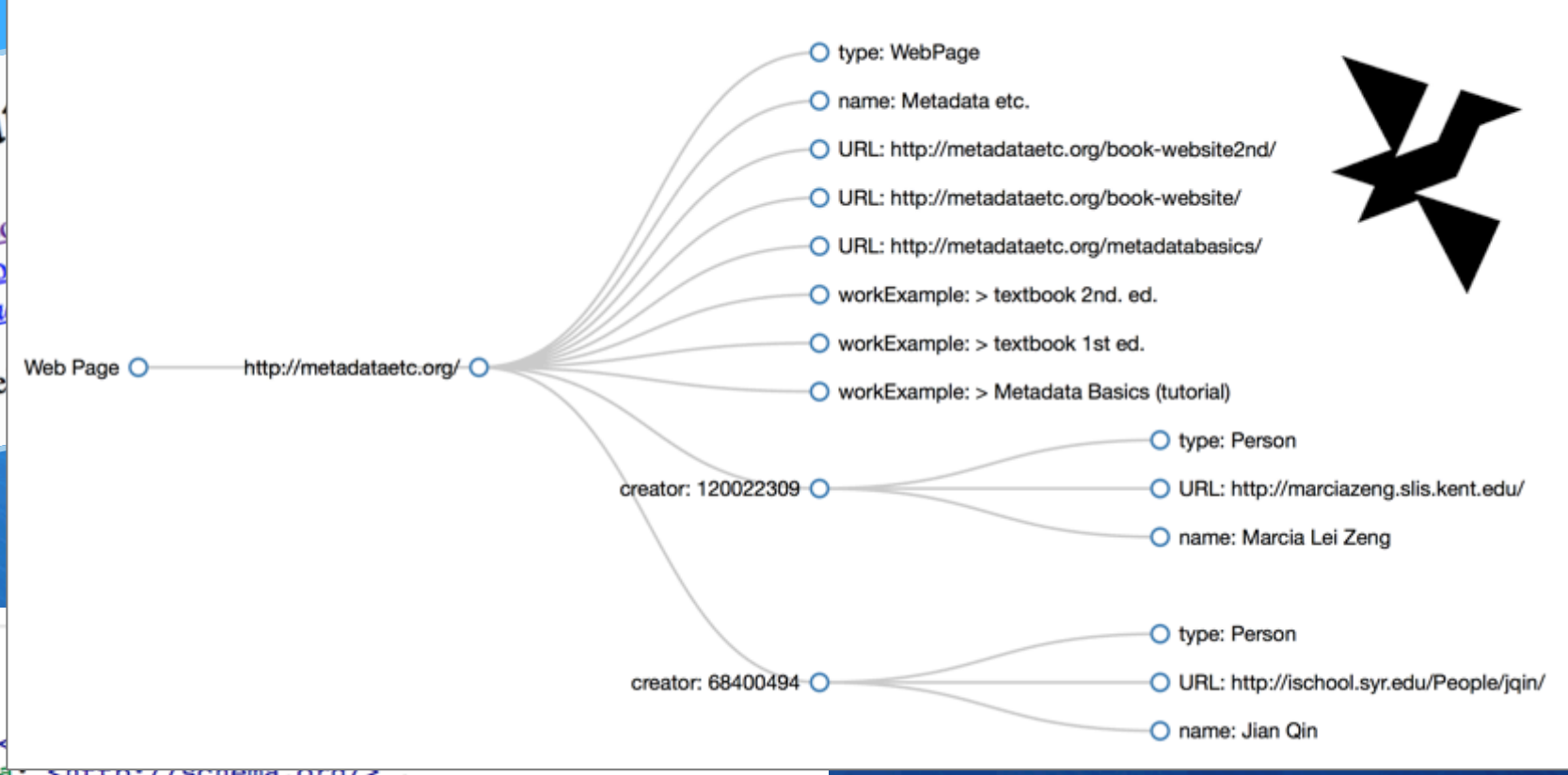
  - in editing and publishing workflows, or
  - for website products


```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transit
<html xmlns="http://www.w3.org/1999/xhtml">
    <head> <meta http-equiv="Content-Type" content="
        <title>Metadata etc.</title>
   </head>
  <body>
<div prefix="http://www.w3.org/1999/02/22-rdf-syntax
<h1>Metadata etc.</h1>
 <ul>
<li><a href="http://metadataetc.org/book-website2nd/
<li><a href="http://metadataetc.org/book-website/">&
<li><a href="http://metadataetc.org/metadatabasics/"
</ul>
<p>&copy; Marcia Lei Zeng and Jian Qin </p>
</div>
  </body>
</html>
```

```
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
<title>Metadata etc.</title>
</head>
<body>
<div prefix="http://www.w3.org/1999/02/22-rdf-syntax-ns# http://schema.c
<div resource="http://metadataetc.org" typeof="schema:WebPage">
 <h1 property="schema:name">Metadata etc.</h1>
 <ul>
  <li><div><a property="schema:URL" href="http://metadataetc.org/book-we
  <span property="schema:workExample">&gt; textbook 2nd. ed. </span></a>
  <li><div><a property="schema:URL" href="http://metadataetc.org/book-we
  <li><div><a property="schema:URL" href="http://metadataetc.org/metadat
<div id="supportingText"><p>&copy;
 <span property="schema:creator" resource="http://viaf.org/viaf/1200223(
   <a property="schema:URL" href="http://marciazeng.slis.kent.edu/">
   <span property="schema:name">Marcia Lei Zeng</span></a> </span> and
 <span property="schema:creator" resource="http://viaf.org/viaf/6840049
   <a property="schema:URL" href="http://ischool.syr.edu/People/jqin/">
   <span property= "schema:name">Jian Qin</span></a></span></p>
</div></div></div>
</body>
</html>
```





Visualization

```
@prefix rdf: <
@prefix schema: <http://schema.org/> .

<http://metadataetc.org>
   rdf:type schema:WebPage;
   schema:name "Metadata etc.";
   schema:URL <http://metadataetc.org/book-website2nd/>;
   schema:URL <http://metadataetc.org/book-website/>;
   schema:URL <http://metadataetc.org/metadatabasics/>;
   schema:workExample "> textbook 2nd. ed. ";
   schema:workExample "> textbook 1st ed.  ";
   schema:workExample "> Metadata Basics (tutorial) ";
   schema:creator <http://viaf.org/viaf/120022309>;
   schema:creator <http://viaf.org/viaf/68400494> .
<http://viaf.org/viaf/120022309>
   rdf:type schema:Person;
   schema:URL <http://marciazeng.slis.kent.edu/>;
   schema:name "Marcia Lei Zeng" .
<http://viaf.org/viaf/68400494>
   rdf:type schema:Person;
   schema:URL <http://ischool.syr.edu/People/jqin/>;
   schema:name "Jian Qin" .
```

This can be used by anyone for their websites.

II. (cont.) For LOD data creators

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  - in editing and publishing workflows

1. Visualize concepts and relationships
2. Mash-up
3. User-friendly knowledge presentation

III. For Web site developers

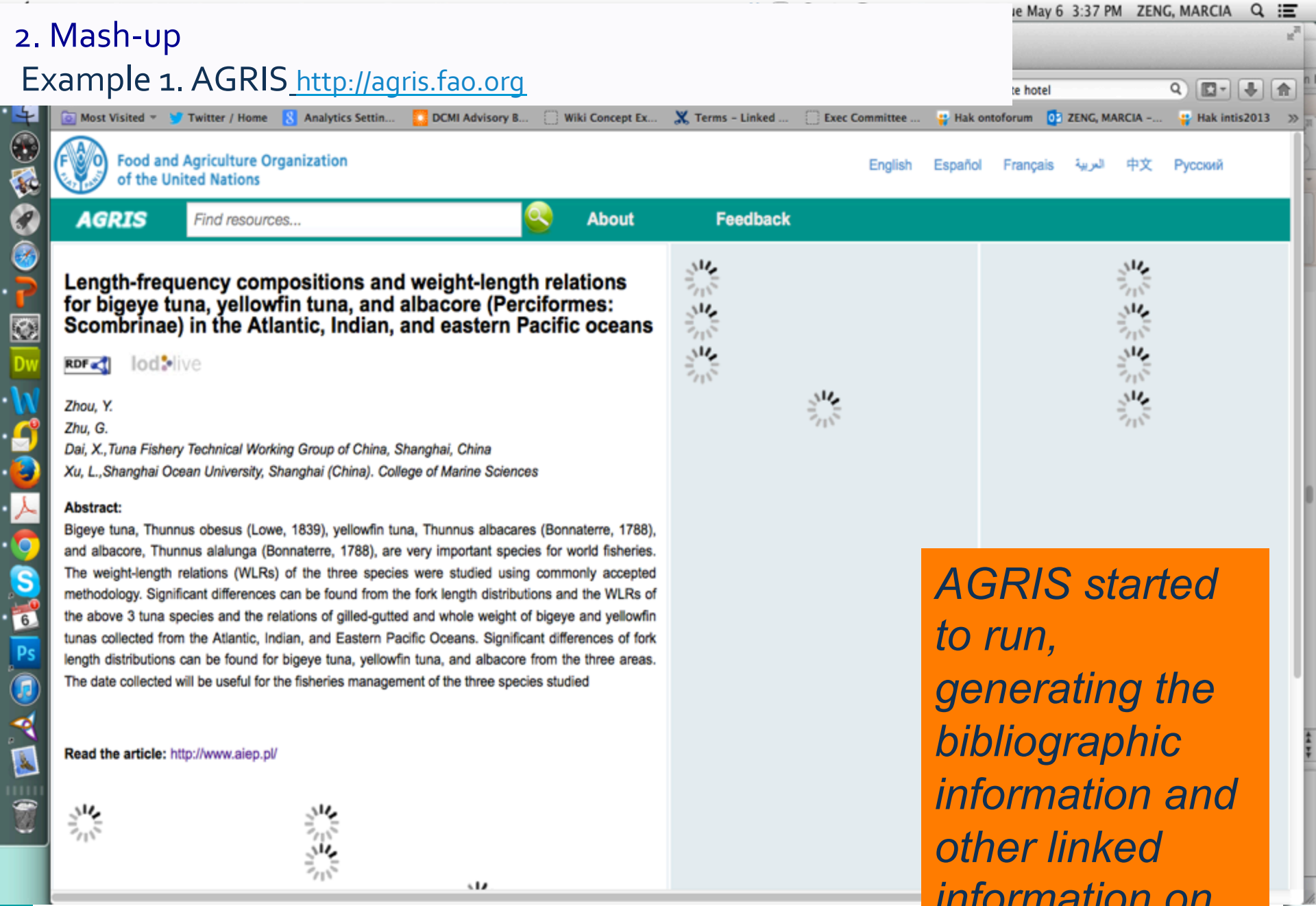
III. (cont.) For Web site developers

- 1. Visualize concepts and relationships
- 2. Mash-up
- 3. User-friendly knowledge presentation

E.g., embedded into a discovery system
Agrovoc of the UN FAO
Uses KOS as a backbone of linked datasets
live mashups in the AGRIS web portal

2. Mash-up

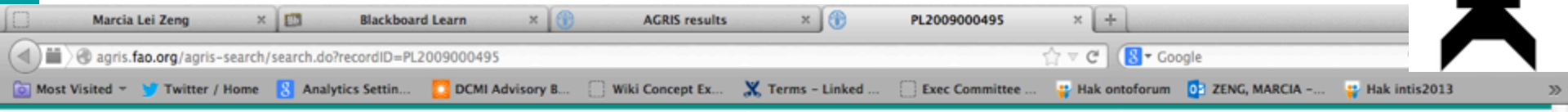
Example 1. AGRIS http://agris.fao.org



AGRIS started to run, generating the bibliographic information and other linked information on the fly…

http://agris.fao.org/openagris/search.do?recordID=PL2009000495

Using KOS to Mash-up on-the-fly



Length-frequency compositions and weight-length relations for bigeye tuna, yellowfin tuna, and albacore (Perciformes: Scombrinae) in the Atlantic, Indian, and eastern Pacific oceans

RDF lodlive

Zhou, Y.
Zhu, G.
Dai, X.,Tuna Fishery Technical Working Group of China, Shanghai, China
Xu, L.,Shanghai Ocean University, Shanghai (China). College of Marine Sciences

Abstract:
Bigeye tuna, Thunnus obesus (Lowe, 1839), yellowfin tuna, Thunnus albacares (Bonnaterre, 1788), and albacore, Thunnus alalunga (Bonnaterre, 1788), are very important species for world fisheries. The weight-length relations (WLRs) of the three species were studied using commonly accepted methodology. Significant differences can be found from the fork length distributions and the WLRs of the above 3 tuna species and the relations of gilled-gutted and whole weight of bigeye and yellowfin tunas collected from the Atlantic, Indian, and Eastern Pacific Oceans. Significant differences of fork length distributions can be found for bigeye tuna, yellowfin tuna, and albacore from the three areas. The date collected will be useful for the fisheries management of the three species studied

Read the article: http://www.aiep.pl/

Agrovoc Keywords
- Thunnus obesus
- fishery data
- Tuna
- Animal developmental stages
- body weight
- statistical data
- Animal physiology
- Fishery production
- Thunnus
- Thunnus alalunga
- Fishery management
- Pacific Ocean
- Animal growth forms

Acta Ichthyologica et Piscatoria (Journal)

FREQUENCY: Semiannual (2 numbers a year)

START DATE: 1972

Source:

Centralna Biblioteka Rolnicza/Central Agricultural Library

CBR is a scientific library subordinated to the Ministry of Agriculture and Rural Development. It has branch in

Powered by Google™
Read the article and/or related articles:

Length-frequency compositions and weight-length relations for ...

Dec 1, 2008 ... ... **yellowfin tuna**, and **albacore** (**Perciformes**: **Scombrinae**) in the **Atlantic**, **Indian**, ... The **weight-length relations** (WLRs) for **bigeye tuna**, **yellowfin tuna**, and **albacore**, collected in the **Atlantic**, **Indian**, and **eastern Pacific oceans** were studied ... tuna, and **albacore** collected from the **Atlantic**, **Indian**, and **eastern** ...

Go to the page

[PDF] Guoping ZHU 1, 2, 3, Liuxiong XU 1, 2 *, Yingqi ZHOU 1, 2, and ...

Table S1.

Regional patterns in mercury and selenium concentrations of ...

Data from **www.nature.com**

Climatology: Extremes in the Indian Ocean

Marine biogeochemistry: The ups and downs of ocean oxygen

Earth science: Subtle minds and mid-ocean ridges

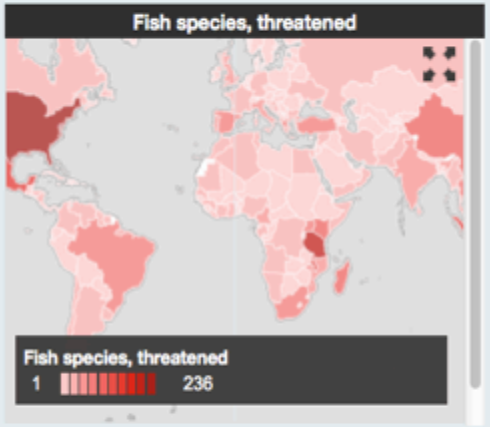
Ocean–atmosphere coupling: Mesoscale eddy effects

Data from **DBPedia**:

Body weight

Atlantic ocean

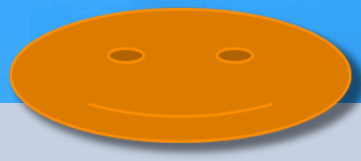
Data from **World Bank** (double-click an area to zoom)



Thunnus obesus distribution map. Data from Global Biodiversity Information Facility (GBIF)

View a larger map

http://agris.fao.org/openagris/search.do?recordID=PL2009000495



http://aims.fao.org/aos/agrovoc/c_2593

Property	Value
void:inDataset	http://aims.fao.org/aos/agrovoc/void.ttl#Agrovoc
http://art.uniroma2.it/ontologies/vocbench#hasStatus	Published
dcterms:modified	2014-07-03T19:17:01Z
http://aims.fao.org/aos/agrontology#influences	http://aims.fao.org/aos/agrovoc/c_23988 http://aims.fao.org/aos/agrovoc/c_36263 http://aims.fao.org/aos/agrovoc/c_4802 http://aims.fao.org/aos/agrovoc/c_23990 http://aims.fao.org/aos/agrovoc/c_33483
http://www.w3.org/2004/02/skos/mapping#exactMatch	http://aims.fao.org/aos/asfa/c_5599
skos:inScheme	http://aims.fao.org/aos/agrovoc
skos:broadMatch	http://www.caas.net.cn/caas/cat/c_40002 http://www.caas.net.cn/caas/cat/c_19629 http://www.caas.net.cn/caas/cat/c_19623 http://www.caas.net.cn/caas/cat/c_19627 http://www.caas.net.cn/caas/cat/c_40490 http://www.caas.net.cn/caas/cat/c_19577 http://www.caas.net.cn/caas/cat/c_19573 http://www.caas.net.cn/caas/cat/c_19576 http://www.caas.net.cn/caas/cat/c_19567 http://www.caas.net.cn/caas/cat/c_19560 http://www.caas.net.cn/caas/cat/c_19619 http://www.caas.net.cn/caas/cat/c_9096 http://www.caas.net.cn/caas/cat/c_19557 http://www.caas.net.cn/caas/cat/c_55260 http://www.caas.net.cn/caas/cat/c_19587 http://www.caas.net.cn/caas/cat/c_19581 http://www.caas.net.cn/caas/cat/c_19586 http://www.caas.net.cn/caas/cat/c_19608
skos:narrower	http://aims.fao.org/aos/agrovoc/c_331336 http://aims.fao.org/aos/agrovoc/c_26824 http://aims.fao.org/aos/agrovoc/c_35294 http://aims.fao.org/aos/agrovoc/c_554 http://aims.fao.org/aos/agrovoc/c_24949 http://aims.fao.org/aos/agrovoc/c_24950
skos:broader	http://aims.fao.org/aos/agrovoc/c_330892
rdf:type	skos:Concept
skos:closeMatch	http://dbpedia.org/resource/Environment
dcterms:created	2012-02-03T16:31:26Z
skos:exactMatch	http://lod.nal.usda.gov/nalt/26877 http://zbw.eu/stw/descriptor/15759-6 http://d-nb.info/gnd/4061616-2 http://www.eionet.europa.eu/gemet/concept/2944 http://linkeddata.ge.imati.cnr.it:2020/resource/EARTh/20200 http://www.caas.net.cn/caas/cat/c_19548

Mapping with other vocabularies

Type	Label	Lang
skosxl:prefLabel	környezet	hu
skosxl:prefLabel	环境	zh
skosxl:prefLabel	محیط زیست	fa
skosxl:prefLabel	بيئة	ar
skosxl:prefLabel	Środowisko	pl
skosxl:prefLabel	Medio ambiente	es
skosxl:prefLabel	ສະພາບແວດລ້ອມ	lo
skosxl:prefLabel	환경	ko
skosxl:prefLabel	పర్యావరణం	te
skosxl:prefLabel	สภาพแวดล้อม	th
skosxl:prefLabel	Ambiente	it
skosxl:prefLabel	environment	en
skosxl:prefLabel	UMWELT	de
skosxl:prefLabel	環境	ja
skosxl:prefLabel	навколишнє середовище	uk
skosxl:prefLabel	Environnement	fr
skosxl:prefLabel	окружающая среда	ru
skosxl:prefLabel	पर्यावरण	hi
skosxl:prefLabel	životné prostredie	sk
skosxl:prefLabel	životní prostředí	cs
skosxl:prefLabel	Ambiente	pt
skosxl:prefLabel	ortam	tr
skosxl:altLabel	ekologická zonácia	sk
skosxl:altLabel	Zonazione ecologica	it
skosxl:altLabel	ekologická pásma	cs
skosxl:altLabel	Ecological zones	en
skosxl:altLabel	पारिस्थितिक मण्डल	hi
skosxl:altLabel	Zone écologique	fr
skosxl:altLabel	జీవావరణ మండలాలు	te
skosxl:altLabel	Strefowość ekologiczna	pl
skosxl:altLabel	Zonation écologique	fr
skosxl:altLabel	OEKOLOGISCHE ZONIERUNG	de
skosxl:altLabel	生态区	zh
skosxl:altLabel	довкілля	uk
skosxl:altLabel	Ecological zonation	en
skosxl:altLabel	Ambiente	es
skosxl:altLabel	생태지대	ko
skosxl:altLabel	การแบ่งเขตทางนิเวศวิทยา	th
skosxl:altLabel	Milieu naturel	fr

III. (cont.) For Web site developers

- 1. Visualize concepts and relationships
- 2. Mash-up
- 3. User-friendly knowledge presentation

Example. Online Coins of the Roman Empire (OCRE)
http://numismatics.org/ocre/

Search, filter, analysis, display

numismatics.org/ocre/results?q=*:*

OCRE Browse Search Maps Contributors Visualize Queries API

The American Numismatic Society Online Coins o

Data Options

All Terms Map Results

Displaying records 1 to 20 of 23262 total results.

1

Keyword

Search

Select from List Ascending Sort Results

Refine Results

Authority
Deity
Denomination
Findspot
Issuer
Manufacture
Material
Mint
Object Type
Portrait

RIC I (second edition) Augustus 1A

Date 25 BC - 23 BC
Denomination Quinarius
Mint Emerita
Obverse AVGVST: Head of Augustus, bare, left
Reverse P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base

objects: 12; hoard: 1

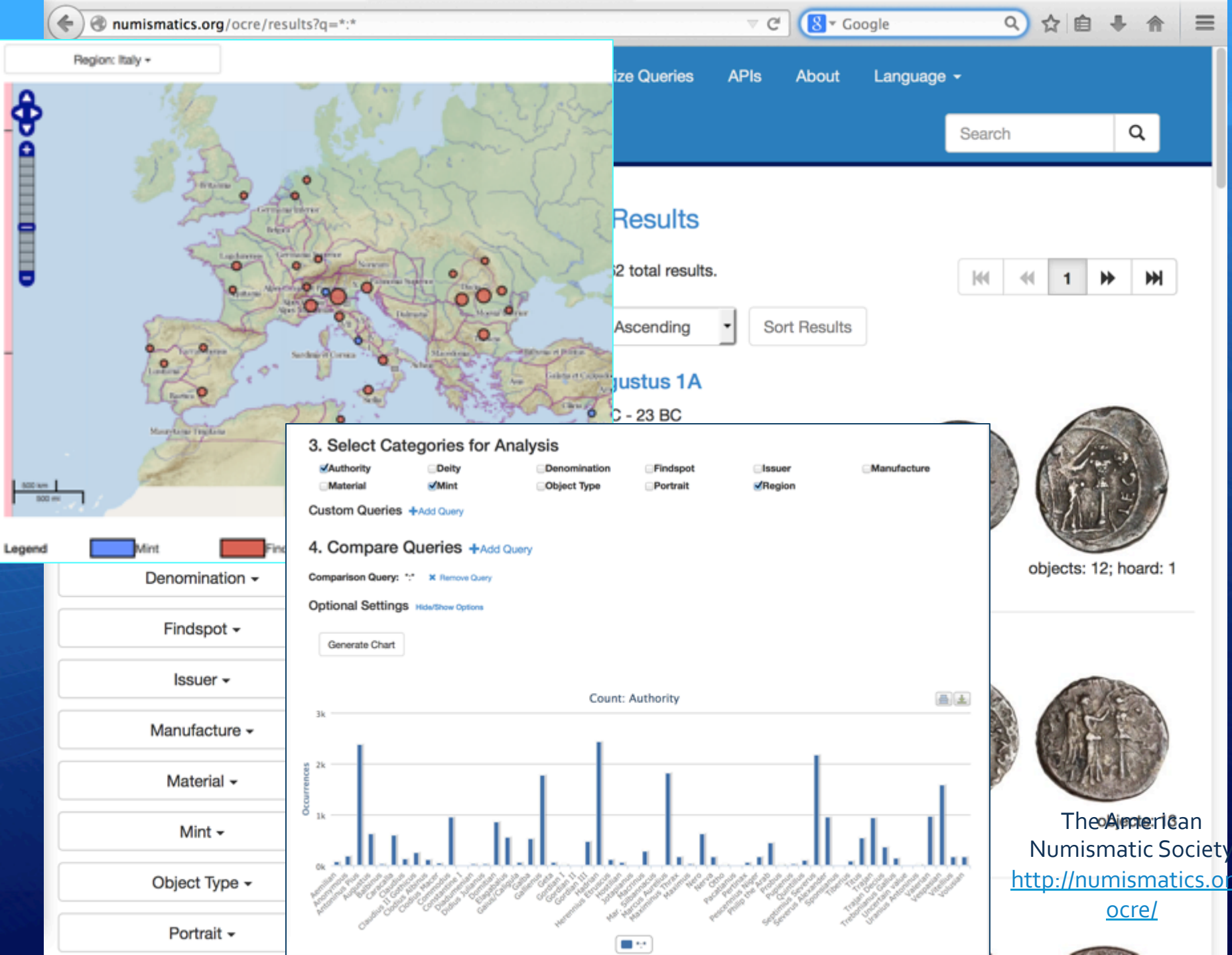
RIC I (second edition) Augustus 1B

Date 25 BC - 23 BC
Denomination Quinarius
Mint Emerita
Obverse AVGVST: Head of Augustus, bare, left
Reverse P CARISI LEG: Victory standing right, placing wreath on trophy with dagger and sword at base

objects: 13

RIC I (second edition) Augustus 2A

Date 25 BC - 23 BC



The American Numismatic Society
http://numismatics.org/ocre/

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 cultural history?

IV. For Researchers

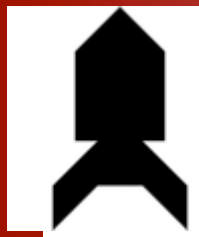
1. As knowledge bases of research

- LOD KOS can be used for
  - obtaining special graphs or datasets for very complicated questions, and
  - revealing unknown relationships
    - e.g.,
      - associative relations of agent (people or organization),
      - places by type within a geo-bounding box,
      - scientific names not in English or Latin,
      - preferred gene name and disease annotation of all human Universal Protein Resource (UniProt) entries that are known to be involved in a disease,
      - …

Getty Vocabularies: LOD Sample Queries

obtaining special graphs or datasets
for
very complicated questions,
and
revealing unknown relationships

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



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

http://sparql.uniprot.org/

Universal Protein Resource (UniProt)

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 '3Fe-4S': (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 sequence variant that leads to a 'loss of function': (show)
10. Select all human UniProt entries with a sequence variant that leads to a tyrosine to phenylalanine substitution: (show)
11. Select all UniProt entries with annotated transmembrane regions and the regions' begin and end coordinates on the canonical sequence: (show)
12. Select all UniProt entries that were integrated on the 30th of November 2010: (show)
13. Was any UniProt entry integrated on the 9th of January 2013? (show)
14. Construct new triples of the type 'HumanProtein' from all human UniProt entries: (show)
15. Select all triples that relate to the EMBL CDS entry AA089367.1: (show)
16. Select all triples that relate to the taxon that describes *Homo sapiens*: (show)
17. Select the average number of cross-references to the PDB database of UniProt entries that have at least one cross-reference to the PDB database: (show)
18. Select the number of UniProt entries for each of the EC (Enzyme Commission) second level categories: (show)

Conclusions

Many Usages of LOD KOS

- I. For vocab creators/ managers
- II. For LOD data creators
- III. For Web site developers
- IV. For Researchers

The KOS creations involve tremendous intellectual efforts and human resources.

In the LOD environment, many of them have become publicly available while easy to obtain and reuse.

Let's bring both developers and potential users together to think how to **build on the existing LOD KOS** and **maximize their usages** in **innovative** ways**.**