



Nexus
Linguarum

4th Summer Datathon on Linguistic Linked Open Data
Cercedilla, Spain
30th May – 3 June 2022

VocBench 3

**A Semantic Web Collaborative Development Platform
for Ontologies, Thesauri and Lexicons**

Manuel Fiorelli, Armando Stellato (University of Rome Tor Vergata, Italy)



More than you will see today...

These slides will not be entirely shown during this introduction to VocBench.

However, they represent useful learning material that we leave to the audience, if interested, for better familiarizing with the VocBench platform



Outline

The VocBench Dev Team: A few words about us

FTL VocBench History: A one-slide faster-than-light history

Architecture and Requirements

A quick run-through the requirements that led to the development of VB3

VocBench Features

A look at the features implemented and provided by the VB platform

The OntoLex-lemon model

VocBench support for OntoLex

Metadata-powered Alignment

How VocBench exploits datasets' metadata (which VB itself contributes to generate) for driving optimized alignment scenarios

Our Research Lab



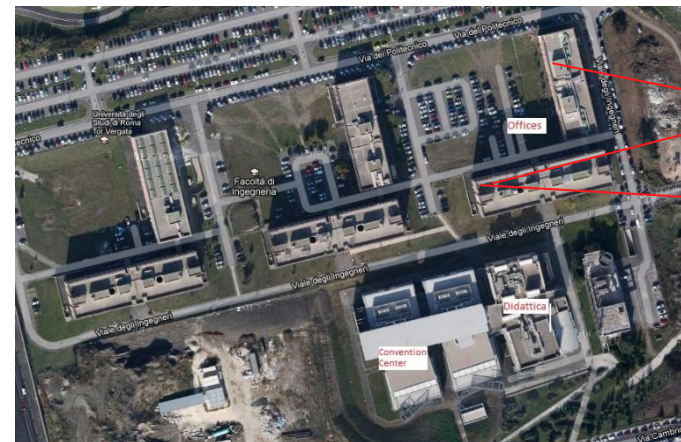
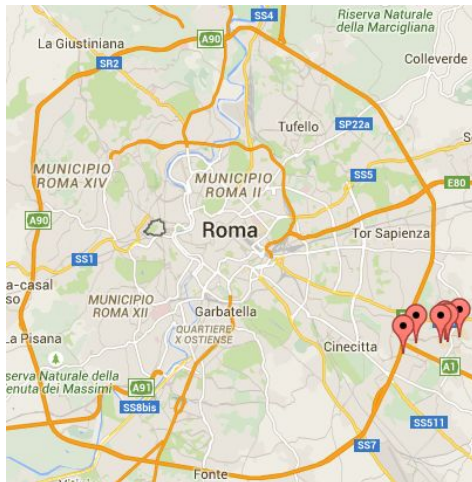
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- Realized as a University Campus distributed over a wide area in the SE of Rome



Our offices!

...and LAB!

We are located at the Faculty of Engineering, Information Engineering Building



The VocBench3 Team

The Developers



University of Rome Tor Vergata
Today, the University of tomorrow



Armando Stellato

PhD, Researcher, Project Leader
University of Rome Tor Vergata, Italy



An insane love for insane architectures...he has two imaginary friends, sitting on each of his shoulders, fighting an eternal battle between order and chaos.

Andrea Turbati

PhD, Research Associate
University of Rome Tor Vergata, Italy



Semantic Turkey developer

VocBench OSGi extension for Semantic Turkey

He can carve any system bit by bit, but don't talk to him about 'frameworks'... His motto? "if it works, it's good and if it ain't broke don't fix it!"

Manuel Fiorelli

PhD, Research Associate
University of Rome Tor Vergata, Italy



Semantic Turkey developer

Dangerously following and amplifying Armando's architectural leaps... his hobby is (before breakfast) refactoring 10 levels of abstraction into what Andrea just made work so well.

Tiziano Lorenzetti

Research Assistant
University of Rome Tor Vergata, Italy



Semantic Turkey developer

*<A> Uh...Tiziano...if you have time could you implement...
<T>: Done.
<A> Well, then, you could move on to...
<T>: I'm already on it, done by end of today.
<A> This guy is so efficient it's frustrating!*

The Users

a whole community supporting its development

funding sponsors



EU law and publications

ISA²

Interoperability solutions for public administrations, businesses and citizens

and other users (the community now is much much bigger, those here were there since the beginning...and pls forgive any omission!)



Food and Agriculture Organization
of the United Nations



IEDA
INTERDISCIPLINARY
EARTH DATA ALLIANCE



INRA
SCIENCE & IMPACT



Scottish Government
Riaghaltas na h-Alba
gov.scot



www.cabi.org



UNCCD



Senato
della Repubblica



United Nations
Environment Programme



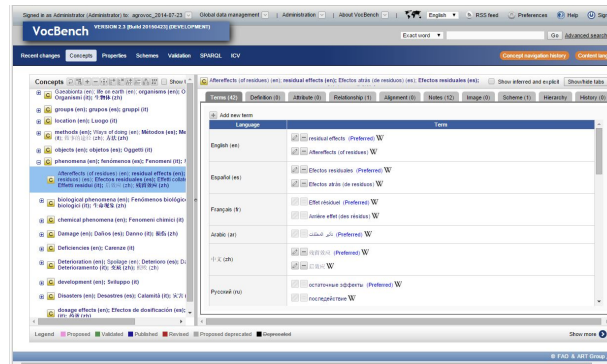
HARVARD
UNIVERSITY



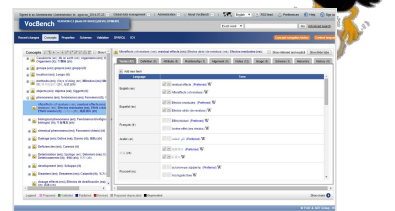
FTL VocBench History



VocBench



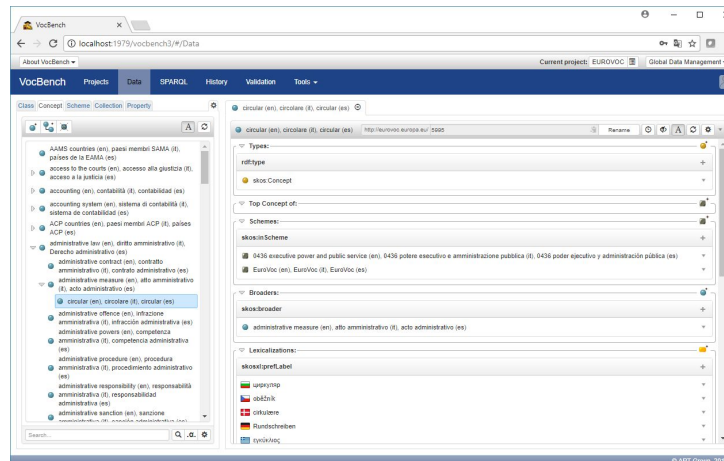
VocBench 2



Funding:

- FAO self-sustained project with occasional external funding

VocBench 3



Funding (since 2016-17)

- European Commission ISA² programme
- development managed by the Publications Office of the EU under contract 10632 (Infoneurope S.A.).

Funding:

- EC 6° framework
- NeOn project (IST-2005-027595)



Funding:

- Joint-project (and joint software!) between FAO's VocBench and Tor Vergata's Semantic Turkey.
- Self-sustained with occasional external funding (mostly EU)



VocBench

127.0.0.1:8080/Class

App PAPERS TV-SERIES PROGRAMMA_SERA... 2BUY 2READ CASA ART-SW FAO MAIL ONTOLEX PROJECTS PHONE APPS JIRA Altri Preferiti

VocBench Projects Class Property Concepts Schemes SPARQL Test Sign Up Login

Resource: Author http://iasted#Author

Types:

- Class
- rdfs:Class
- rdfs:Resource
- Thing

Class Axioms:

rdfs:subClassOf

- Author
- :send SOME :Registration_form
- :occupy SOME :Presenter_house
- :prepare SOME :Session_chair
- :obtain SOME :Invitation_letter
- Speaker
- rdfs:Resource
- (:go_through SOME :Registration AND :is_present_in SOME :Conference_days AND :is_present_in SOME :Conference_building)
- :give SOME :Brief_introduction_for_Session_chair
- :occupy SOME :Presenter_city
- :pay SOME :Registration_fee
- Person
- :need SOME :Viza
- :write SOME :Final_manuscript
- :give SOME :Lecture
- :occupy SOME :Presenter_state

...and now...

Search...

VOCBENCH 3



Requirements for VB3

R1. Multilingualism

R2. Controlled Collaboration

R3. Data Interoperability and C

R4. Software Interoperability/E

R5. Data Scalability

R6. Under-the-hood data access/modification

R7. Adaptive Context and Ease-of-u

R8. RDF Languages Support

R9. Maintainability (Architect

- Revamped Collaboration Mechanism

- Integrated application

- Different solutions for supporting alignment
- On the fly constraint-checking
- Mass integrity-checking and fixing

- SPARQL support (included in

- Piece-of-cake Installation

- Scale out to the scenario of use

- Ar

- All actions meta
- Meta and p

- OWL ontologies
- SKOS thesauri
- RDF datasets in general
- SKOSXL reified labels
- OntoLex lexicons
- ...the more the better!

- Users with proper authorization can reach and

- Possibility to store dataset dumps &
- access and compare them through a time-machine

- All data, metadata, action logs etc.. has to be represented as RDF, thus facilitating consistency and acidity of actions



Technological Stack in VB3

Lightweight Presentation Layer

- Angular (previously known as Angular 2)

Business Logic all in ST, including:

- User Management/Auth
- Data Validation/History

Commit to RDF4J framework

- A very popular middleware
- No relevant triple store is incompatible with it
- Some triple stores even comply with its server-side specification

Presentation (Angular)

Semantic Turkey

All BL including Collaboration
(includes: Spring/AspectJ/OSGi)

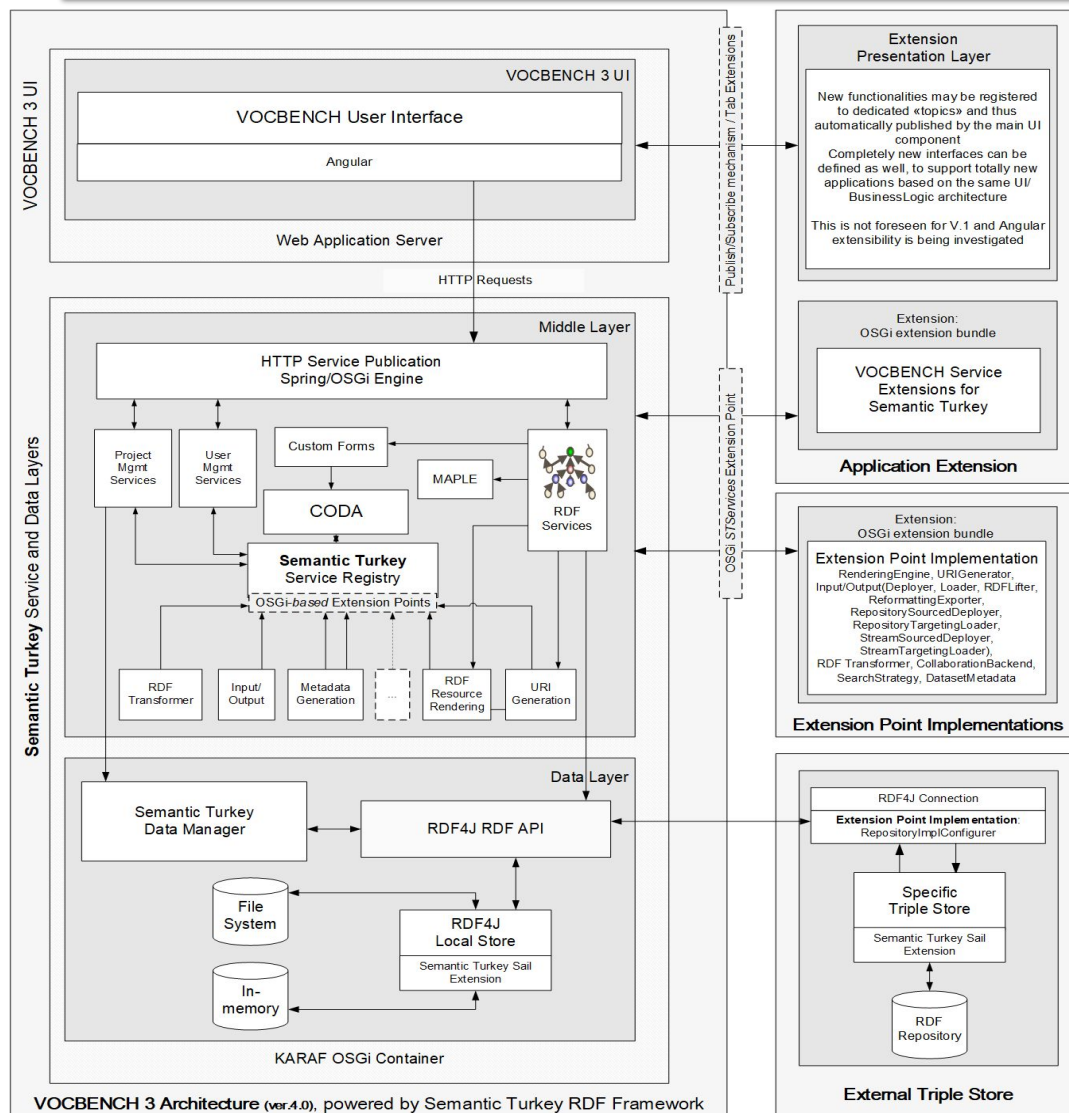
Specific Triple Store
Optimizations (e.g. Search)

-----RDF4J-----
Vendor data access layer

Vendor Triple store



Vocbench 3 (and ST) Architecture



Three layered extensible architecture

- **Presentation Layer**
 - Angular.Vocbench User Interface
- **Services Layer**
 - Enables communication between the client (Vocbench UI) and the ontology persistence layer.
 - HTTP based Services accessed through the Ajax paradigm
 - OSGi Extensible Servicing System
- **Persistence Layer**
 - Access to ontological knowledge.
 - Based on RDF4J Framework
 - Requires a dedicated RDF4J Sail expressly developed for VocBench in order to store information for projects using History & Validation



VocBench Availability

VocBench is mainly available as:

- standalone web application
- docker distribution

Instructions for installation are available here:

http://vocbench.uniroma2.it/doc/#requirements_and_installation

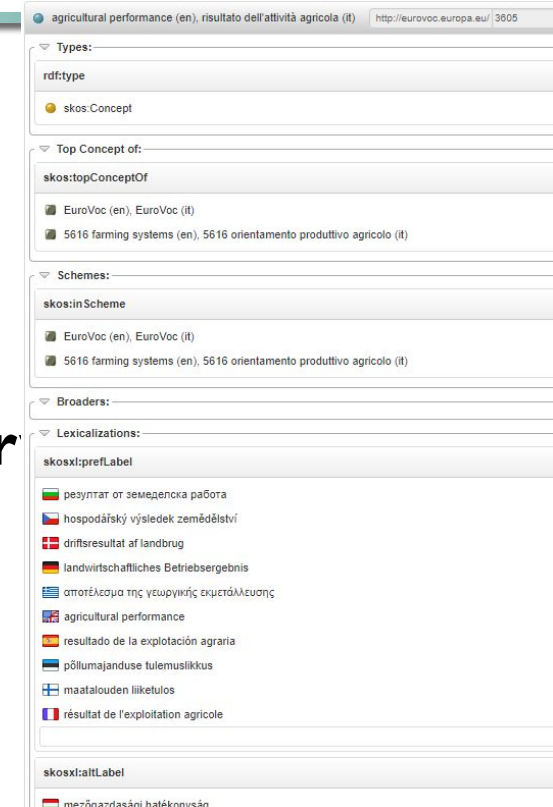


VB3 FEATURES!!!



A new User Interface

- Technology: **Angular**
- Approach
 - A single *resource-view* showing ever
 - Serving any kind of resource
 - Inspecting any detail of them
 - Custom Forms



R14. Customizable UI

R10. Full Editing Capability (RDF Observability&Reachability)



VocBench UI

The screenshot displays the VocBench web application interface. The browser address bar shows `localhost:1979/vocbench3/#/Data`. The application has a top navigation bar with tabs for 'About VocBench', 'Projects', 'Data', 'SPARQL', and 'Tools'. The 'Data' tab is active, showing a hierarchical tree of concepts on the left. The selected concept is 'administrative law (en), diritto amministrativo (it)', which is highlighted in blue. The right pane shows the details for this concept, including its URI (`http://eurovoc.europa.eu/517`), a list of notes, and a list of properties. The properties include 'skos:notation' (517), 'dct:created' (1995-10-02), 'skos:related' (public law, administrative code, administrative court, administrative science), 'http://purl.org/iso25964/skos-thes#status' (http://publications.europa.eu/resource/authority/status/active), 'dct:modified' (2015-12-10), and 'owl:versionInfo' (n/a). The bottom right corner of the interface indicates '© ART Group, 2016'.



UI and Multilingualism (R1)

The screenshot displays the VocBench web application interface. The browser address bar shows 'localhost:1979/vocbench3/#/Data'. The application has a navigation bar with 'VocBench', 'Projects', 'Data', 'SPARQL', and 'Tools'. The 'Data' tab is active, showing a list of concepts on the left and a detailed view of a selected concept on the right.

Left Panel (Concept List): A list of concepts is shown, including 'AAMS countries (en), paesi membri SAMA (it)', 'access to the courts (en), accesso alla giustizia (it)', 'legal aid (en), patrocinio gratuito (it)', 'local access to the law (en), giustizia di prossimità (it)', 'right of action (en), diritto di agire in giudizio (it)', 'accounting (en), contabilità (it)', 'account (en), conto (it)', 'accountant (en), contabile (it)', 'financial accounting (en), contabilità generale (it)', 'added value (en), valore aggiunto (it)', 'amortisation (en), ammortamento (it)', 'balance sheet (en), bilancio di società (it)', 'capital depreciation (en), svalutazione del capitale (it)', 'industrial capital (en), capitale industriale (it)', 'trading margin (en), margine commerciale (it)', 'working capital (en), capitale circolante (it)', 'operating result (en), risultato dell'esercizio (it)', and 'provision (en), riserva contabile (it)'. The 'financial accounting (en), contabilità generale (it)' concept is selected.

Right Panel (Concept Detail): The detail view for 'financial accounting (en), contabilità generale (it)' is shown. It includes sections for 'Types' (rdf:type: skos:Concept), 'Top Concept of', 'Schemes' (skos:in Scheme: EuroVoc (en), EuroVoc (it); 4026 accounting (en), 4026 gestione contabile (it)), 'Broaders' (skos:broader: accounting (en), contabilità (it)), and 'Lexicalizations' (skosxl:prefLabel: общо счетоводство, finanční účetnictví, eksternt regnskab, allgemeine Buchhaltung, γενική λογιστική, financial accounting). A red box highlights the 'Preferences' option in the user menu.

User Menu: The user menu is open, showing options: 'View profile', 'Preferences' (highlighted with a red box), 'Administration', and 'Log out'.

Annotations: Red boxes and arrows highlight specific features: a red box around the concept list, a red box around the 'Schemes' section, a red box around the 'Lexicalizations' section, and a red box around the 'Preferences' option in the user menu. Arrows point from the text 'and visualization' to the 'Schemes' section, 'Language preferences' to the 'Preferences' option, and 'multilingual editing' to the 'Lexicalizations' section.



UI and Multilingualism (R1)

VocBench

localhost:1979/vocbench3/#/Preferences

About VocBench

Current project: EUROVOC Global Data Management

VocBench Projects Data SPARQL Tools

Vocbench Preferences

Resource view mode:
Splitted

The Resource View panel is splitted in two: on the left there is a main Resource View which describes (and is synched with) the resource selected in the tree/list; on the right there is an optional secondary Resource View which describes a resource selected (double click) from the main Resource View.

Rendering Languages:

Language	Flag
<input type="checkbox"/> el	
<input checked="" type="checkbox"/> en	
<input type="checkbox"/> en-GB	
<input type="checkbox"/> en-US	
<input type="checkbox"/> es	
<input type="checkbox"/> et	
<input type="checkbox"/> fa	
<input type="checkbox"/> fi	
<input type="checkbox"/> fr	
<input type="checkbox"/> ga	
<input type="checkbox"/> hi	
<input type="checkbox"/> hr	
<input type="checkbox"/> hu	
<input type="checkbox"/> id	
<input checked="" type="checkbox"/> it	
<input type="checkbox"/> ja	

Language preferences

Other preferences:

- ☒ Show flags
- ☒ Show instances number

Project theme

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UI and Multilingualism (R1)

The screenshot displays the VocBench3 web application interface. The browser address bar shows 'localhost:1979/vocbench3/#/Data'. The application has a dark blue header with the title 'VocBench ...and multilingual UI!'. Below the header, there are tabs for 'Classe', 'Concetto', 'Schema', 'Collezione', 'Proprietà', and 'Datatype'. The main content area is divided into two panels. The left panel shows a hierarchical tree of concepts, with 'Beförderung auf dem Seeweg (de), maritime transport (en), trasporto marittimo (it)' selected. The right panel displays the selected concept's details, including its 'rdf:type' (skos:Concept), 'Top concept di:' (skos:topConceptOf), 'Schemi:' (skos:inScheme), and 'Lessicizzazioni:' (skosxl:prefLabel). The 'Lessicizzazioni:' section lists various translations in different languages, such as 'морской транспорт' (Russian), 'námoňní doprava' (Czech), 'søtransport' (Danish), 'Beförderung auf dem Seeweg' (German), 'θαλάσσια μεταφορά' (Greek), 'maritime transport' (English), 'transporte marítimo' (Spanish), and 'meretransport' (Dutch). The bottom of the interface shows the version 'v. 9.0.0-beta.0' and the copyright '© ART Group, 2016'.



Custom Forms

VocBench

localhost:1979/vocbench3/#/CustomForm

About VocBench

Current project: LittleOWLTest

Global Data Management

Create Custom Form

ID: it.uniroma2.art.semanticturkey.customform.form. Person *

Name: Template *

Description: This is a template of a CustomForm for custom constructors. It contains an empty graph section, while the node section just defines the nodes provided by the stand: *

Type: Graph

Ref: *

```
1 //uri of the new resource
18 resource uri stdForm/resource .
19
20 //in case of SKOS project, the label of the resource is a simple literal
21 label literal stdForm/label .
22
23 //in case of SKOSXL project, the label of the resource is a skosxl:Label composed by its URI and a
24 skos:literalForm
25 xLabel uri stdForm/xLabel .
26 lexicalForm literal stdForm/lexicalForm .
27
28 //language tag of the label
29 labelLang literal stdForm/labelLang .
30
31 //the user logged in the current session can be referenced too
32 user uri session/user .
33
34
35 }
```

Show property chain: *

Ok Cancel

A feature-structure based language¹ for describing custom elements to be added to a form (and how to process them for «RDFing» them)

[1] M. Fiorelli, M.T. Pazienza, A. Stellato and A. Turbati CODA: Computer-aided ontology development architecture, IBM Journal of Research and Development, doi:10.1147/JRD.2014.2307518, 58, 2, 1-12, March, 2014



Custom Forms

- Custom forms have been shown to cover even complex resources
- In (Fiorelli, Pazienza, Stellato)* their expressive power was sufficient to cover the management of *Ontolex-Lemon* data
<http://www.w3.org/>

The screenshot displays the VocBench web application. A modal window titled 'Add entry (en) entrata (it)' is open, allowing the user to create a new entry. The form includes fields for 'canonicalForm' (set to 'director'), 'reference' (set to 'http://dbpedia.org/ontology/director'), 'subjOfProp' (set to 'http://www.lexinfo.net/ontology/2'), 'subjectMarker' (set to 'of'), 'objOfProp' (set to 'http://www.lexinfo.net/ontology/2'), and 'objectMarker' (empty). A 'lime:entry' section is also visible, containing a list of entries with fields for 'reference', 'canonicalForm', 'objOfProp', 'subjOfProp', and 'subjectMarker'. The background shows the VocBench interface with a sidebar containing various ontologies and a main area for editing.

* Fiorelli, M., Lorenzetti, T., Pazienza, M.T., Stellato, A.: Assessing VocBench Custom Forms in Supporting Editing of Lemon Datasets. In : Language, Data, and Knowledge (Lecture Notes in Artificial Intelligence) 10318. Springer, Cham (2017), pp.237-252



Controlled Collaborative Editing through Role-based Access Control (RBAC)

Role-based Access Control

In VB2:

- hard-wired roles with predefined and limited editing possibilities
- do not easily scale-up to possible extensions of the system

R2. Controlled Collaboration!

R9. Maintainability (Architecture and Code Scalability)

Add capability to lex_contributor

Topic

Area: ☒ RDF ☐ RBAC ☐ PM ☐ UM ☐ CFORM ☐ SYS

Subject and scope: lexicalization

CRUDV ☒ Create ☒ Read ☐ Update ☐ Delete ☐ Validate

capability(rdf(lexicalization), "CR")

Ok Cancel

Roles:

- rdfigeek
- ontologist
- thesaurus-editor
- validator
- lexicographer
- mapper
- projectmanager
- lex_contributor

In VB3:

a simple language for specifying capabilities in terms of *area*, *subjects* and *scopes*. E.g., the expression:

`auth(rdf(datatypeProperty, taxonomy), 'R')`

corresponds to the authorization for being able to read taxonomical information about datatype properties

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VOCBENCH EXTENSIONS



VocBench Extensions

Vocbench supports extensibility on three different planes

- **SAIL Extensions** (low-level data-management extensions)
- **Service Extensions**: all functionalities of VocBench are published as services in Semantic Turkey. New services can be developed and plugged to the system
- **Extension Points**: some of VB functionalities have well-defined interfaces and can be replaced with different implementations



SAIL EXTENSIONS



Sail Extensions

Sails are a layered extension mechanism for interacting with the triplestore built-in the RDF Framework

Currently, VB3 provides 2 sail extensions

- Change-tracking sail (History and Validation)
- Trivial-inference-sail (Trivial Inference)



Advanced History and Change Tracking mechanism

VocBench Projects Data SPARQL History Validation Tools

Class Concept Scheme Collection Property

contract staff (en), personale a contratto (it) <http://eurovoc.europa.eu/5784> Rename

personal eventual
koosseisuvälised töötajad
henkilöstösääntöjen soveltamisalaa kuulumaton henkilöstö
ulkopuolinen henkilöstö
personnel externe
personnel non statutaire
osoblje zaposleno na temelju ugovora
határozott időre kinevezett tisztviselők
a személyzeti szabályzat hatálya alá nem tartozó alkalmazottak
külső személyzet

contrattisti
~~personale esterno~~
~~personale non-statutario~~

laisvai samdomi darbuotojai
sutartiniai darbuotojai
ārštata darbinieki

Show more...

Notes:

skos:scopeNote

Pagal terminuotą sutartį dirbantys asmenys.

Properties:

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In green, *italic*, suggested added content

In red, strike-through, suggested content to be deleted



Advanced History and Change Tracking mechanism

Landscape analysis for realizing H&CT

Fiorelli, M., Pazienza, M.T., Stellato, A., Turbati, A.:
Version Control and Change Validation for RDF Datasets.
In : Metadata and Semantics Research. 11th Research
Conference, MTSR 2017, Tallinn, Estonia, November 28 -
December 1, 2017, Proceedings. Springer (2017) (in
press).

VB2 change-tracking mechanism:

- A strength and weakness of VB
- Appreciated by many users
- Does not scale to new services and functionalities
- Not synchronized with lower-level changes (e.g. loaded data)
- Stored in

R6. Under-the-hood data
access/modification

In VB3

- abandoned separated relational DB with user and history data
- track-change mechanism working at triple-level
 - A *staging-graph* local to the data repository, with triples under validation
 - A *support repository* completely in RDF with reified triples
 - reified *staged* tripled
 - reified *historied* triples
- fine-grained representation complemented with rich metadata about the action and the context of the invocation
- change-tracking mechanism implemented as a sail for the RDF4J framework (<http://rdf4j.org/>).
- The sail is embedded with the system component inside other sail-compliant triple stores

R15. Everything's RDF

R11. Provenance

R4. Software Interoperability/Extensibility



Advanced History and Change Tracking mechanism

VocBench

localhost:1979/vocbench3/#/Validation

About VocBench

Current project: EUROVOC_HV Global Data Management

VocBench Projects Data SPARQL History Validation Tools

Staged commits

Operation sort: Unordered Time sort: Descending Show filters

Commit	Action	1st Param	Other param(s)	User	Date	Validate
http://eurovoc.europa.eu/metadata#a9b7589c-0eb9-4146-8f44-9f9c9e6924b6	SKOSXL/removeAltLabel	concept: <http://eurovoc.europa.eu/5784>	xlabel: <http://eurovoc.europa.eu/246132>	Armando Stellato <stellato@uniroma2.it>	18/9/2017 14:56:02	-----
http://eurovoc.europa.eu/metadata#a3ffab79-da68-4f15-8838-f1f00b0a435f	SKOSXL/addAltLabel	concept: <http://eurovoc.europa.eu/5784>	literal: "contrattisti"@it ...	Armando Stellato <stellato@uniroma2.it>	18/9/2017 14:47:29	-----

Actions are immediately derived from the code implementing the available services

The number of parameters being shown depends on the size of the screen

It is still possible to inspect the complete list of parameters

1 of 1 Accept all Reject all Validate

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Advanced History and Change Tracking mechanism

VocBench

localhost:1979/vocbench3/#/Validation

About VocBench

Current project: EUROVOC_HV Global Data Management

VocBench Projects Data SPARQL

SKOSXL/addAltLabel parameters

Name	Value
concept	<http://eurovoc.europa.eu/5784>
literal	"contrattisti"@it
mode	uri

Ok

Staged commits

Commit

http://eurovoc.europa.eu/metadata#a9b7589c-0eb9-4146-8f44-...

http://eurovoc.europa.eu/metadata#a3ffab79-da68-4f15-8838-...

User Date Validate

Armando Stellato	18/9/2017	
<stellato@uniroma2.it>	14:56:02	-----
Armando Stellato	18/9/2017	
<stellato@uniroma2.it>	14:47:29	-----

1 of 1 Accept all Reject all Validate

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Advanced History and Change Tracking mechanism

VocBench

localhost:1979/vocbench3/#/History

About VocBench

Current project: EUROVOC_HV Global Data Management

VocBench Projects Data SPARQL History Validation Tools

Commits

Operation sort: Unordered Time sort: Descending Show filters

Commit	Action	1st Param	Other param(s)	User	Date
http://eurovoc.europa.eu/metadata#e79ab989-d3f4-4f07-ab72-23b7252a641e	SKOSXL/removeAltLabel	concept: <http://eurovoc.europa.eu/5784>	xlabel: <http://eurovoc.europa.eu/246132>	Armando Stellato <stellato@uniroma2.it>	18/9/2017 15:26:49
http://eurovoc.europa.eu/metadata#810e3a76-cc4d-44ce-ad80-754426720ab0	SKOSXL/addAltLabel	concept: <http://eurovoc.europa.eu/5784>	literal: "contrattisti"@it	Armando Stellato <stellato@uniroma2.it>	18/9/2017 15:26:49
http://eurovoc.europa.eu/metadata#437f2999-a435-47c3-a74b-02b43180cbda	InputOutput/loadRDF	inputFile: eurovoc_no_skos_coreLabels.nt	baseURI: http://eurovoc.europa.eu/ ...	Armando Stellato <stellato@uniroma2.it>	18/9/2017 14:27:14
http://eurovoc.europa.eu/metadata#5d10f296-2d06-432e-83d1-62b5532f6ef5					18/9/2017 14:25:18

History page, almost identical to the Validation one, except for the absence of the *validate* option

1 of 1

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Advanced History and Change Tracking mechanism

The commit in the history can be inspected, showing the list of added/removed triples



Terms Black List

Project Creation has now a new option that can be activated only if validation is activated in turn.



Rejected terms (created as prefLabel upon creation of a new concept or simply added as additional terms to an existing concept) are blacklisted.

VocBench

localhost:1979/vocbench3/#/Validation

Current project: EUROVOC_2017-3_HV

Global Data Management

VocBench Projects Data SPARQL History Validation Tools

Staged commits

Operation sort: Unordered Time sort: Descending Show filters

Commit	Action	1st Param	Other param(s)	User	Date	Validate
http://eurovoc.europa.eu/metadata#4255194c-f7be-4e3e-9a41-c2617c3e1b69	SKOS/addBroaderConcept	concept: <http://eurovoc.europa.eu/3602>	broaderConcept: <http://eurovoc.europa.eu/4362>	Armando Stellato <stellato@uniroma2.it>	29/6/2018 11:25:14	-----
http://eurovoc.europa.eu/metadata#afed382c-08e8-4487-a7d4-a259bc1139da	SKOS/addBroaderConcept	concept: <http://eurovoc.europa.eu/5596>	broaderConcept: <http://eurovoc.europa.eu/54>	Armando Stellato <stellato@uniroma2.it>	29/6/2018 11:24:31	-----
http://eurovoc.europa.eu/metadata#1c2203ea-d4da-4092-9f9a-716b104431fb	SKOSXL/addAllLabel	concept: <http://eurovoc.europa.eu/5596>	literal: "diritto di azione in ricorso"@it	Armando Stellato <stellato@uniroma2.it>	29/6/2018 11:22:30	-----

A warning is issued whenever a user tries to add a previously rejected (blacklisted) term

Armando Stellato stellato@uniroma2.it

http://art.uniroma2.it/stellato

v. 5.0.1-beta.1

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On-the-fly automatic assertion of trivial inference

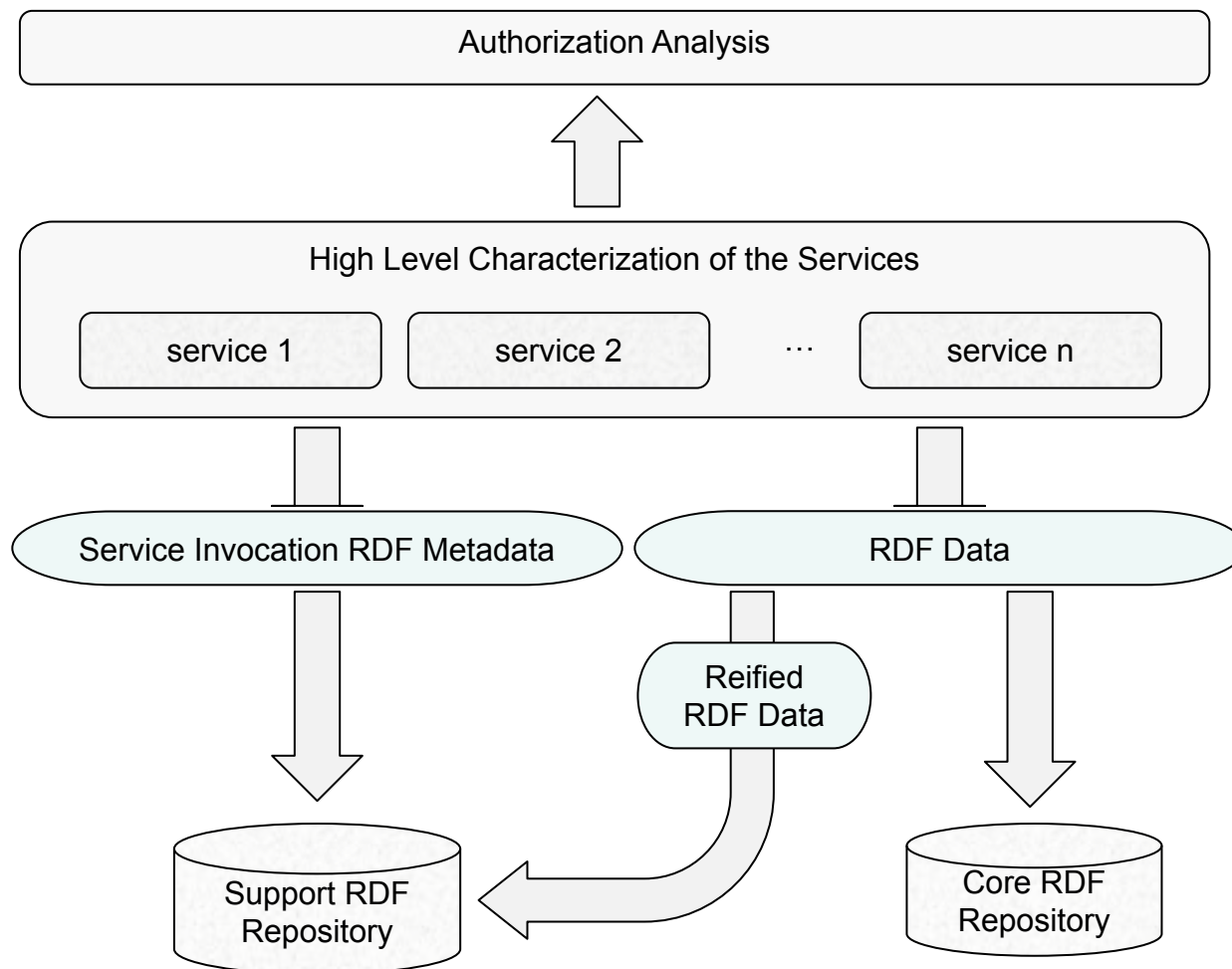
- Reasoning is a powerful features of RDFS & OWL
- Inferred content is usually stored in dedicated graphs, to avoid being confused with explicit one
- Editors are often not interested in seeing inferred content...
- ...but would like to explicitly assert trivial facts, such as materialization of triples derived from symmetric properties, inverse properties etc..
- The trivial-inference-sail provides exactly this service, by:
 - analyzing the TBOX
 - intercepting writes on the triplestore
 - materializing content inferred as of trivial inference as explicit one



SERVICE EXTENSIONS



Declarative Service Implementation



Service implementation in previous versions of VocBench

```
if (request.equals(Req.isTopConceptRequest)) {
    String skosConceptName = setHttpPar(Par.concept);
    String schemeName = setHttpPar(Par.scheme);
    checkRequestParametersAllNotNull(Par.concept, Par.scheme);
    response = isTopConcept(skosConceptName, schemeName);
}
```

```
public Response isTopConcept(String skosConceptName, String schemeName) {
    SKOSModel skosModel = getSKOSModel();
```

Parameter annotations may contain explicit validation checks with respect to the application's semantics

```
try {
    ARTResource[] graphs = getUserNamedGraphs();
    ARTURIResource skosConcept = retrieveExistingResource(skosModel, skosConceptName, graphs);
    ARTURIResource skosScheme = retrieveExistingResource(skosModel, schemeName, graphs);
    return createBooleanResponse(skosModel.isTopConcept(skosConcept, skosScheme, graphs));
} catch (NonExistingRDFResourceException e) {
    return logAndSendException(e);
} catch (ModelAccessException e) {
    return logAndSendException(e);
}
```

Method Annotations allow to:

- automatically publish services
- declare a-priori whether a method is allowed to read/write on the RDF data
- declare the required capabilities in order to be authorized to use the service

Parameters and returned values are now explicitly managed with their native types.
Marshalling/Unmarshalling to the serialization formats adopted by the service is demanded to dedicated components

Separation of service method-controller / automatic generation of controller

```
@STServiceOperation
@Read
@PreAuthorize("@auth.isAuthorized('rdf(concept, taxonomy)', 'R')")
public Collection<AnnotatedValue<Resource>> getTopConcepts(@Optional @LocallyDefinedResources List<IRI> schemes) {
```

The method signature then drives the generation of the controller, which is the direct frontend for the service. Exceptions are serialized in the response (the content of which codes both data and application-level error codes) and data validation annotations are managed by Spring data validation methods



EXTENSION POINTS



Extension Points

The following functionalities are available through extension points in VocBench

- **Collaboration Backend.** Support for different collaboration platforms. Currently, there are two available implementations for [JIRA](#) and [Freedcamp](#)
- **Dataset Metadata Exporter.** Support for the representation and export of metadata about the edited dataset according to different vocabularies (e.g. [VoID](#), [DCAT](#) (and [DCAT-AP](#)), [LIME](#), [ADMS](#)).
- **Input/Output related extension points**
 - **Deployer.** Support for exporting data to different types of destination. More specifically, a **RepositorySourcedDeployer** interacts with a triple-oriented destination (typically, a triple store compliant to the [SPARQL 1.1 Graph Store HTTP Protocol](#)), while a **StreamSourcedDeployer** is able to export data (previously serialized/reformatted by a *Reformatting Exporter*) to a stream-based information host (e.g. an *SFTP* server, or a generic *HTTP* endpoint). A deployer is also available for portals of the [OntoPortal](#) family
 - **Reformatting Exporter.** Support for the conversion of RDF data to a byte sequence, usually conforming to non-RDF formats. Currently there is an exporter for the [Zthes](#) (*XML thesaurus format*) and a spreadsheet exporter for thesauri
 - **Loader.** Support for loading data from a different types of sources. More specifically, a **RepositoryTargetingLoader** is able to import triples from a triple-oriented source (typically, a triple store compliant to the [SPARQL 1.1 Graph Store HTTP Protocol](#)), while a **StreamTargetingLoader** is able to load data to any stream-based information host (e.g. an *SFTP* server, or a generic *HTTP* endpoint), before handing it to an *RDF Lifter* for the conversion into RDF triples
 - **RDF Lifter.** Support for diverse input formats, being in charge of transforming their data to RDF (currently there is an exporter for the [Zthes](#) *XML thesaurus format*)
- **RDF Transformer.** Support for transforming RDF data (both in input and output procedures), by filtering out triples and creating new data.
- **Rendering Engine.** Production of intelligible labels for representing an RDF resource in a user interface. Each *Rendering Engine* provides a SPARQL fragment that is usually connected to the queries of the various resource retrieving services.
- **RepositoryImpl Configurer.** Support for different kinds of triple stores. Currently, there are implementations for various storage solutions of [Eclipse RDF4J](#) and for [Ontotext GraphDB Free/SE](#).
- **Search Strategy.** Support for choosing different implementations of different search operations.
- **URI Generator.** Automatic generation of URIs
- **Dataset Catalog Connector.** Support for different dataset catalogs, which can be used to search and then access existing datasets (existing implementations: [EU Open Data Portal](#), [LOD Cloud](#), [LOV](#), [PMKI](#))



Desktop Tool and Collaborative Web Platform



R7. Adaptive Context and Ease-of-use

- system offers a very lightweight installation (i.e. unzip and click-to-run)
- default configuration options for both system and project creation ☐ simple and easy-to-use as a desktop tool.
- Other more complex settings are still possible, satisfying different needs for distributed installation: separation of data servers, UI server, proxy configuration, better performance, etc...

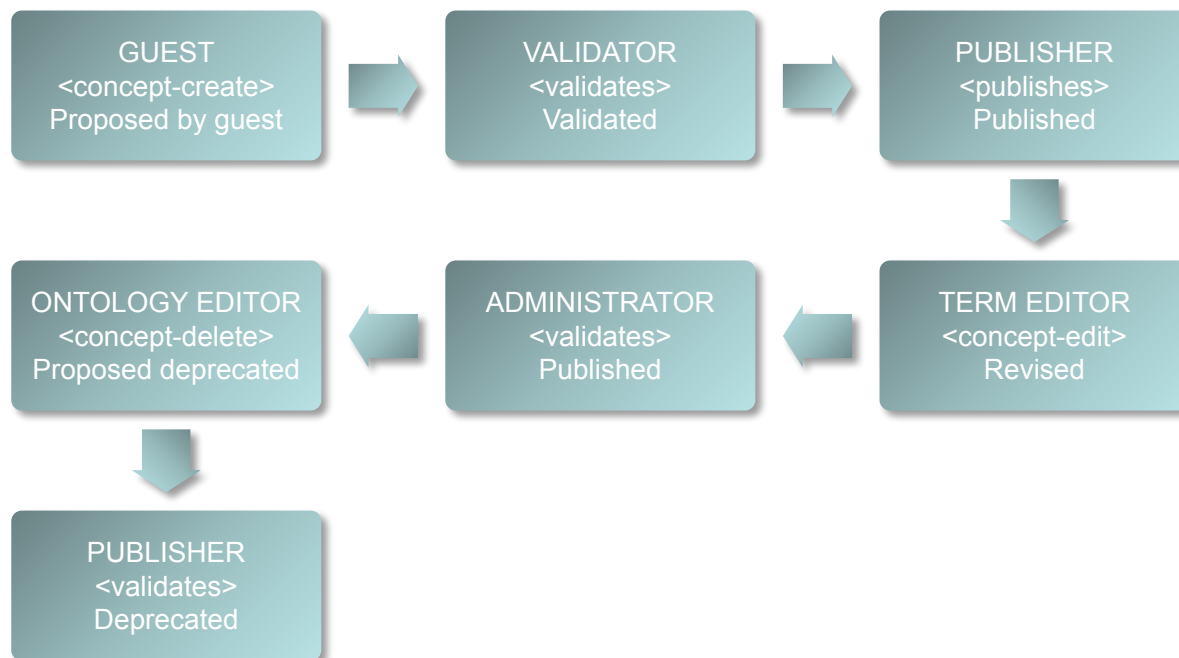


More Powerful yet Streamlined Workflow Management

Workflow Management available yet from VocBench I

- Following the full life-cycle of concepts/terms, from proposal to deprecation
- Supported by Role-based Access Control
- Represented through a dedicated VocBench vocabulary

an example of a
typical workflow:





More Powerful yet Streamlined Workflow Management

In VB3, Most of the workflow is implicit in the state transition – all in RDF – of triples from the staging repository/graphs to the core graph in the core repository

- *proposed*: no need to represent as a status: if validation is enabled, the concept is still not confirmed on the working graph (it is on a staging graph/repository), and is visible on the validation table
- *validated*: we removed this, as we didn't have feedback of users distinguishing between validated and published. *Published* is just a concept available in the published version
- *published*: since all the other statuses are represented explicitly or managed through the validation system, "published" is the only status which do not require any status.
 - Simply, a resource located in the working graph (has been validated) and that *is not* deprecated is considered to be *published*
- *deprecated*: explicitly marked as **owl:Deprecated**
- *proposed deprecated*: no need here as well to create a status: when validation is activated, the request to "deprecate" needs to be validated, thus a "deprecate" action is always initially put on the validation list



Complete Support for SKOS

Support for viewing multiple schemes

The screenshot displays the VocBench web application interface. The browser address bar shows `localhost:1979/vocbench3/#/Data`. The application has a navigation bar with tabs for 'About VocBench', 'Projects', 'Data', 'SPARQL', and 'Tools'. The 'Data' tab is active, showing a list of concepts under the 'Collection' sub-tab. The list includes concepts such as '4811 organisation of transport (en), 4811 organizzazione dei trasporti (it)', '4816 land transport (en), 4816 trasporti terrestri (it)', '4821 maritime and inland waterway transport (en), 4821 trasporti marittimi e fluviali (it)', '4826 air and space transport (en), 4826 trasporti aerei e spaziali (it)', '5206 environmental policy (en), 5206 politica dell'ambiente (it)', '5211 natural environment (en), 5211 ambiente naturale (it)', '5216 deterioration of the environment (en), 5216 degrado ambientale (it)', '5606 agricultural policy (en), 5606 politica agricola (it)', '5611 agricultural structures and production (en), 5611 produzione e strutture agricole (it)', '5616 farming systems (en), 5616 orientamento produttivo agricolo (it)', '5621 cultivation of agricultural land (en), 5621 coltivazione di terreni agricoli (it)', '5626 means of agricultural production (en), 5626 mezzo di produzione agricola (it)', '5631 agricultural activity (en), 5631 attività agricola (it)', '5636 forestry (en), 5636 foresta (it)', '5641 fisheries (en), 5641 pesca (it)', '6006 plant product (en), 6006 prodotto vegetale (it)', '6011 animal product (en), 6011 prodotto animale (it)', and '6016 processed agricultural product (en), 6016 prodotto agricolo trasformato (it)'. A search bar is located at the bottom of the list.



Complete Support for SKOS

Support for viewing multiple schemes: smart & quick choices for new resources

Armando

VocBench Projects Data SPARQL

localhost:1979/vocbench3/#/Data

Current project: EUROVOC Global Data Management

Create a skos:narrower skos:Concept

Label: English (en)

URI: http://eurovoc.europa.eu/ Leave empty in order to autogenerate a random URI

Schemes:

- 4006 business organisation (en), 4006 organizzazione aziendale (it)
- EuroVoc (en), EuroVoc (it)

Ok Cancel

Default schemes are suggested by reusing those of the parent concept
It is possible to quickly remove them or add new ones



Complete Support for SKOS

Support for Collections (Unordered and Ordered)

The screenshot displays the VocBench web application interface. The browser address bar shows `localhost:1979/vocbench3/#/Data`. The application has a navigation bar with tabs: **VocBench**, **Projects**, **Data**, **SPARQL**, and **Tools**. The **Data** tab is active, showing a tree view of concepts. Under **Countries (en)**, there is a sub-entry for **Republics (en)**. The right panel shows the details for the **Countries (en)** collection, with the URI `http://eurovoc.europa.eu/skosCollection_c06181bb`. The details are organized into sections:

- Types:** `rdf:type` is `skos:Collection`.
- Lexicalizations:** `skosxl:prefLabel` is `Countries`.
- Notes:** (Empty)
- Members:** `skos:member` includes:
 - `Republics (en)`
 - `Luxembourg (en), Lussemburgo (it)`
 - `Italy (en), Italia (it)`
- Properties:**
 - `dct:created`: 2017-09-18T16:42:41.964+02:00
 - `dct:modified`: 2017-09-18T16:52:01.234+02:00



OWL Support

Class Tree, Instance List, OWL Editing Support

R8. RDF Languages Support

The screenshot displays the VocBench web application interface. The main window shows the editing of the class `ist:Speaker`. The left sidebar contains a class tree with `ist:Speaker` selected. The central panel shows the class axioms, including `rdftype` (Class), `rdfs:subClassOf` (with instances `ist:give SOME ist:Lecture`, `ist:write SOME ist:Final_manuscript`, and `ist:Delegate`), `owl:disjointWith` (with instance `ist:Non_speaker`), and `Properties`. The right panel shows the instance list for `ist:write SOME ist:Final_manuscript`, including `owl:someValuesFrom`, `ist:Final_manuscript`, `owl:onProperty`, and `ist:write`. A red box highlights the Manchester expressions in the `rdfs:subClassOf` section, with a red arrow pointing to the text "Support for Manchester expressions".



OWL Support

«Inferred» View

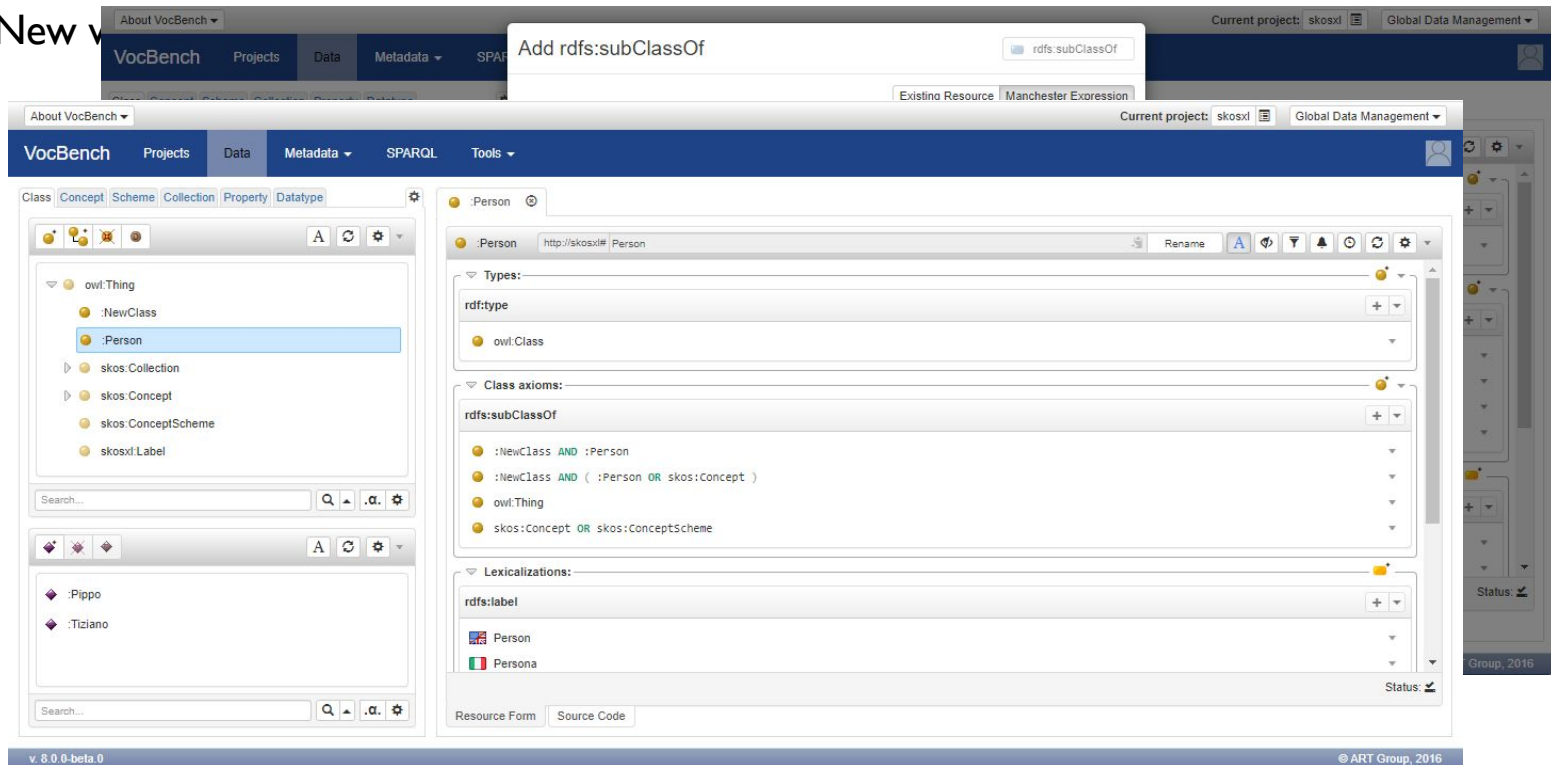
The screenshot displays the VocBench web interface in a browser window. The address bar shows `localhost:1979/vocbench3/#/Data`. The interface has a navigation bar with tabs for 'About VocBench', 'Projects', 'Data', 'SPARQL', and 'Tools'. The 'Data' tab is active, showing a tree view of classes on the left. The 'ist:Speaker' class is selected. The main area is divided into two panels. The left panel shows the 'Types' section for 'ist:Speaker', listing 'rdf:type' with options for Class, Resource, and Thing. The right panel shows the 'Class axioms' section, listing 'rdfs:subClassOf' with various axioms, 'owl:equivalentClass' with 'ist.write SOME ist.Final_manuscript', and 'owl:disjointWith' with 'ist.Non_speaker'. The bottom right corner of the interface indicates '© ART Group, 2016'.



OWL Support

Manchester Syntax and Visualization in-widget

- Syntax Highlighting and Completion
- Automatic Inspection of adopted vocabulary terms
- New v





SPARQL Querying and Update

The screenshot shows the VocBench web interface. The main window displays a SPARQL query editor with the following query:

```
1 PREFIX
12
13 SELECT * WHERE {
14   ?s a owl:Class
15 } LIMIT 10
```

Below the query editor are buttons for "Submit", "Clear", and "Include infer". A modal window is open, showing details for the class "Person" (URI: <http://xmlns.com/foaf/0.1/Person>). The modal window contains the following sections:

- Types:**
 - rdf:type
 - Class
 - Class
- Class axioms:**
 - rdfs:subClassOf
 - geo-pos:SpatialThing
 - Agent
 - <http://www.w3.org/2000/10/swap/pim/contact#Person>
 - owl:disjointWith
 - Project
 - Organization
- Lexicalizations:**
 - rdfs:label
 - Person
- Properties:**

The modal window has an "Ok" button at the bottom right.



Alignment

Two kind of Alignments:

- Manual Alignment across loaded projects
 - each project, target of an alignment, must *allow* access to the inspecting project
- Alignment Validation
 - dedicated dashboard for loading, inspecting and validating imported alignments
 - alignments must be compliant with the INRIA Alignment API's vocabulary in order to be imported into the validation tool



Manual Alignment

VocBench Repositories | GraphDB V x

localhost:1979/vocbench3/#/Data

About VocBench

Current project: EUROVOC_2017-03 Global Data Management

VocBench Projects Data SPARQL

Class Concept Scheme Collection Property

regional culture (en), cultura regionale (it)

customs regulations (en), regolamentazione doganale (it)

customs tariff (en), tariffa doganale (it)

data processing (en), trattamento dei dati (it)

data-processing law (en), diritto informatico (it)

deepening of the European Union (en), approfondimento dell'Unione europea (it)

defence policy (en), politica di difesa (it)

degradation of the environment (en), degradazione dell'ambiente (it)

demography (en), demografia (it)

destination of transport (en), ambito territoriale del trasporto (it)

distributive trades (en), distribuzione commerciale (it)

document (en), documento (it)

documentation (en), documentazione (it)

drawing up of the EU budget (en), formazione del bilancio dell'UE (it)

EAC countries (en), paesi membri della CAO (it)

folklore

Select aligned resource

Project: Teseo

Align with: Concept

Concept Scheme: http://www.senato.it/teseo/tes

- TEMPO LIBERO (it)
- TRASPORTI (it)
- UNIONE EUROPEA (it)
- UNITA' DI MISURA (it)
- URBANISTICA E TERRITORIO (it)
- VITA SOCIALE (it)
 - COMMEMORAZIONI E CELEBRAZIONI (it)
 - FESTIVITA' E SOLENNITA' CIVILI (it)
 - FOLKLORE (it)**
 - FUNERALI (it)
 - NOMADI (it)
 - QUALITA' DELLA VITA (it)

folklore

Ok Cancel

Regionalkultur

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Alignment Validation

VocBench Repositories | GraphDB

localhost:1979/vocbench3/#/AlignmentValidation

About VocBench Current project: Iasted Global Data Management

VocBench Projects Data SPARQL Tools

Alignment Validation: A Settings

Alignment file: Browse Iasted-sigkdd.rdf Load

Source ontology baseURI: http://Iasted
Target ontology baseURI: http://sigkdd

Source entity	target entity	Relation	Mapping Property	Action	Status
:Author	http://sigkdd#Author	= (1)	owl:equivalentClass	Accept Reject	✓
:Conference_hall	http://sigkdd#Conference_hall	= (1)		Accept Reject	
:Deadline	http://sigkdd#Deadline	= (1)		Accept Reject	
:Deadline_for_notification_of_acceptance	http://sigkdd#Deadline_Author_notification	= (0.7)		Accept Reject	
:Fee	http://sigkdd#Fee	< (0.9)		Accept Reject	
:Listener	http://sigkdd#Listener	= (1)		Accept Reject	
:Main_office	http://sigkdd#Main_office	= (1)		Accept Reject	
:Nonmember_registration_fee	http://sigkdd#Registration_Non-Member	= (0.8)		Accept Reject	
:Person	http://sigkdd#Person	= (1)		Accept Reject	
:Place	http://sigkdd#Place	= (1)		Accept Reject	
:Registration_fee	http://sigkdd#Registration_fee	= (1)		Accept Reject	
:Review	http://sigkdd#Review	= (1)		Accept Reject	
:Speaker	http://sigkdd#Speaker	= (1)		Accept Reject	
:Sponsor	http://sigkdd#Sponsor	= (0.9)		Accept Reject	

Quick Actions: Do quick action Apply to Ontology Export as...

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EDOAL

VocBench

Current project: EDOAL_EuroVoc-Teseo Global Data Management

Concept Scheme

Member of Parliament (en), parlamentare (it)

- alternate (en), supplente (it)
- elective office (en), mandato elettivo (it)
 - multiple office holding (en), cumulo di mandati (it)
 - financial interests of members (en), interesse finanziario dei membri (it)
 - incompatibility (en), incompatibilità (it)
 - parliamentary allowance (en), indennità parlamentare (it)
 - parliamentary immunity (en), immunità parlamentare (it)
 - privilege (en), privilegio (it)
 - secretarial allowance (en), indennità di segreteria (it)
 - Statute for Members of the Parliament (en), status dei parlamentari (it)
- military equipment (en), armamento (it)
- parliament (en), parlamento (it)
 - national parliament (en), parlamento nazionale (it)
 - regional parliament (en), parlamento regionale (it)
- parliamentary seat (en), seggio parlamentare (it)
- powers of parliament (en), competenza del parlamento (it)
- social rights (en), diritti sociali (it)

parliament

PMKI_EUROVOC_CUT300_REMOTE PMKI_Teseo_CUT300_REMOTE

New alignment

parliament (en), parlamento (it) PARLAMENTO (it)

Relation: Measure: 1 Create

Alignments

Left entity	Right entity	Relation	Measure
parliament (en), parlamento (it)	PARLAMENTO (it)	=	1.0

A new kind of project,
based on the EDOAL standard

Alignments are first class citizens
in the project, which is linked to
two other projects in VocBench

Equiparazione di Qualifiche (it)

- GIUSTA CAUSA (it)
- GIUSTIFICATO MOTIVO (it)
- LAVORO IN GENERALE (it)
 - MERCATO DEL LAVORO (it)
 - LICENZIAMENTI DISCRIMINATORI (it)
 - OPERAI (it)
 - PERSONALE AMMINISTRATIVO (it)
 - PERSONALE TECNICO (it)
 - PRATICA PROFESSIONALE (it)
 - PROCESSO DEL LAVORO (it)
 - QUADRI INTERMEDI (it)
- QUALIFICHE (it)
- TUTELA DEI LAVORATORI (it)
- UFFICI DEL LAVORO (it)
- PARLAMENTO (it)
 - CAMERE DEL PARLAMENTO E PARLAMENTO NEL SUO COMPLESSO (it)
 - ORGANIZZAZIONE PARLAMENTARE (it)
 - PARLAMENTARI (it)

diritto del lavoro

v. 8.0.2-beta.0

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Metadata-driven Ontology Alignment: MAPLE

- MAPLE is an orchestrator for ontology alignment scenarios
- By analyzing the metadata of the datasets involved in a mediation process, MAPLE can inform alignment systems on the proper configuration and best strategies to adopt
- In VB3, MAPLE analysis can be inspected by the user, who can override several of the choices performed by MAPLE
- VB provides an Open API for Alignment Systems so that they can interact with it
- Possibility for connected Alignment Systems to define a set of matchers and to export their configuration schemes
 - General configuration
 - Matchers Configuration
- Currently available systems
 - Genoma (a simple alignment system meant to prove the potentialities of MAPLE)
 - NAISC (*see presentation by John McCrae tomorrow!*)
 - More to come... (next in line: AgreementMakerLight: AML)

Versioned datasets and metadata

R12. Versioning Support

The screenshot shows the VocBench web interface at `localhost:1979/vocbench3/#/Data`. The interface includes a navigation bar with 'VocBench', 'Projects', 'Data', 'SPARQL', and 'Tools'. The 'Data' tab is active, showing a class hierarchy on the left and details for the selected class ':Person' on the right.

Class Hierarchy (Left Panel):

- owl:Thing
 - ist:Activity
 - ist:City
 - ist:Currency
 - ist:Item
 - ist:Money
 - ist:Person
 - ist:Place
 - ist:State
 - ist:Time
 - ist:Time_zone
 - :Person
 - owl:Nothing

Class Details (Right Panel):

- Types:**
 - rdf:type: Class
- Class axioms:**
 - rdfs:subClassOf: Thing
- Lexicalizations:**
- Properties:**
 - `http://purl.org/dc/terms/created`: 2017-09-18T17:50:50.936+02:00
 - `http://purl.org/dc/terms/modified`: 2017-09-18T18:11:47.580+02:00

Annotation: The different versions can be switched globally, but can also be inspected locally, going back to the previous version...we don't see the super classes that had been added in the meanwhile...

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Dataset Metadata Export



R13. Metadata Descriptions

VocBench

Repositories | GraphDB

localhost:1979/vocbench3/#/Metadata

About VocBench

VocBench Projects Data SPARQL

Namespaces and Imports Metadata Vocabularies

Metadata Vocabulary: if.uniroma2.art.semanticurkey.plugin

Exporter Configuration: Dataset Metadata Exporter

Settings

dataset_description_baseUri * http://eurovoc.europa.eu

dataset_localName * eurovoid

dataset_title * EuroVoc VoID Description

dataset_description * a metadata description

dataset_homePage http://eurovoc.europa.eu

dataset_creators http://publications.europa.eu

dataset_publisher http://publications.europa.eu

dataset_contributors

dataset_source

(*) Mandatory field

metadata_export.ttl

```
1 @prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
2 @prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
3 @prefix void: <http://rdfs.org/ns/void#> .
4 @prefix lime: <http://www.w3.org/ns/lemon/lime#> .
5 @prefix foaf: <http://xmlns.com/foaf/0.1/> .
6 @prefix dcterms: <http://purl.org/dc/terms/> .
7
8 <http://eurovoc.europa.eu/void> a void:DatasetDescription ;
9   foaf:primaryTopic <http://eurovoc.europa.eu/void#eurovoid> .
10
11 <http://eurovoc.europa.eu/void#eurovoid> a void:Dataset ;
12   void:triples 2157673 ;
13   void:distinctSubjects 398288 ;
14   void:distinctObjects 826891 ;
15   dcterms:conformsTo <http://www.w3.org/2004/02/skos/core> ;
16   void:classPartition _:modelbqd6cle2x203 , _:modelbqd6cle2x204 , _:modelbqd6cle2x205 ;
17   void:entities 7284 ;
18   void:subset <http://eurovoc.europa.eu/void#eurovoid_hu_lexicalization_set> , <http://eurovoc.europa.eu/void#eurovoid_hu_lexicalization_set> ;
19   dcterms:title "EuroVoc VoID Description" ;
20   rdfs:label "EuroVoc VoID Description" ;
21   dcterms:description "a metadata description of the thesauri Eurovoc" ;
22   foaf:homepage <http://eurovoc.europa.eu/> ;
23   dcterms:creator <http://publications.europa.eu> ;
24   dcterms:publisher <http://publications.europa.eu> .
25
26 _:modelbqd6cle2x203 void:class <http://www.w3.org/2004/02/skos/core#Concept> ;
27   void:entities 7154 .
28
29 _:modelbqd6cle2x204 void:class <http://www.w3.org/2004/02/skos/core#Collection> ;
30   void:entities 0 .
31
32 _:modelbqd6cle2x205 void:class <http://www.w3.org/2004/02/skos/core#ConceptScheme> ;
33   void:entities 130 .
34
35 <http://eurovoc.europa.eu/void#eurovoid_hu_lexicalization_set> dcterms:language <http://id.loc.gov/vocab/
36   a lime:LexicalizationSet ;
37   lime:avgNumOfLexicalizations 2.406 ;
38   lime:language "hu" ;
39   lime:lexicalizationModel <http://www.w3.org/2008/05/skos-xl> ;
40   lime:lexicalizations 17522 ;
41   lime:percentage 0.999 ;
42   lime:referenceDataset <http://eurovoc.europa.eu/void#eurovoid> ;
```

Integrated Constraint Validation (ICV)

R3. Data Interoperability and Consistency

The screenshot shows the VocBench web application running in a browser. The address bar displays `localhost:1979/vocbench3/#/lcv/TopConceptWithBroader`. The interface includes a navigation bar with 'VocBench', 'Projects', 'Data', 'SPARQL', and 'Tools'. The main content area is titled 'Top concepts with broader' and contains a query: `skos:Concept(s) that are skos.topConceptOf a skos:ConceptScheme and have some broader concept in the same skos:ConceptScheme`. Below the query, a table displays results with columns for 'Concept', 'Scheme', and 'Action'.

Concept	Scheme	Action
http://eurovoc.europa.eu/6131	http://eurovoc.europa.eu/100288	Remove broader(s) Remove as topConceptOf

At the bottom right of the interface, there is a 'Quick action' button.



Support for OntoLex in VB3

[illegible]

Armando Stellato stellato@uniroma2.it

<http://art.uniroma2.it/stellato>

Status:

v. 5.0.1-beta.1

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Dataset Catalog

Dataset Catalogs Extension Point

Expected to implement functionalities for:

Access to dataset catalogs, search, retrieval of RDF Datasets

Preload data at project creation

(so that it is possible to create a project for editing a dataset available in the inspected catalog)

Load data after a project has been created

owl:import data on an existing project

(usually for owl:importing OWL vocabularies)



Dataset Catalog

VocBench

localhost:1979/vocbench3/#/Projects/CreateProject

Current project: BMK1-EUROVOC-GUT300 Global Data Management

Dataset Catalog

Catalog: European Union Open Data Portal

Search: law

Search results:

case-report - Case reports Name Authority List @en
"This table provides the different names of the case law reports of the Court of Justice."@en

eli-european-legislation-identifier-italy - ELI (European Legislation Identifier) - Italy @en
"This is the ELI metadata of Italy. ELI (European Legislation Identifier) defines a common metadata model for sharing legislation description on the web of data. This is a set of ELI standard metadata for legislation as published on the Italian Official Gazette web portal (<http://www.gazzettaufficiale.it/>). The metadata set covers the period 1861 to 2018 (starting from the very first law issued by the Italian monarchy) and is related to all the normative acts published on the first of the seven volumes of the Italian Official Gazette. A full description of the ELI implementation published on the web portal <https://eur-lex.europa.eu/eli-register/italy.html> is available at <https://eur-lex.europa.eu/eli-register/italy.html>"@en

GvHAFRWLxgnvLVQOVgXHLQ - Food Enzymes @en
"The European Commission has proposed a general system for authorising and marketing enzymes in the European Union (EU). The new system provides for the introduction of a common procedure for assessing and authorising these substances. Only substances which are included in one of the harmonised lists will be authorised. This future legislation will, for the first time at European level, regulate the use of enzymes in food and define rules governing labelling. Manufacturers will also be able to initiate an authorisation procedure directly with the European Commission. Data is collected for risk

EuroVoc concept

- foodstuffs legislation 1
- Official Journal 1
- EU Official Journal 1
- foodstuff 1
- flavouring 1
- approximation of laws 1
- disclosure of information 1
- free movement of goods 1
- industrial policy 1
- legislation 1
- toxicology 1
- food additive 1
- genetically modified organism 1
- food safety 1
- EU law - national law 1
- enzyme 1
- consumer protection 1
- human nutrition 1

4 results 1 of 1

Dataset description:

ID	case-report
Title	Case reports Name Authority List @en
Description	Case reports Name Authority List @en
Dataset page	http://data.europa.eu/euodp/data/dataset/case-report
Ontology IRI	
Data dump	http://publications.europa.eu/mdr/resource/authority/case-report/skos/casereports-skos.rdf
URI prefix	
SPARQL Endpoint	
Model	
Lexicalization Model	

3 implementations currently developed for:

- LOD Cloud (*LOD renewed version realized by John McCrae, based on JSON metadata*)
- LOV (Linked Open Vocabularies : *based on connector to LOV's own services*)
- European Open Data Portal (EU ODP: *based on a metadata SPARQL endpoint / CKAN API*)

Ok Cancel Create

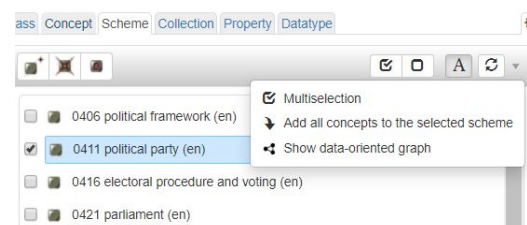
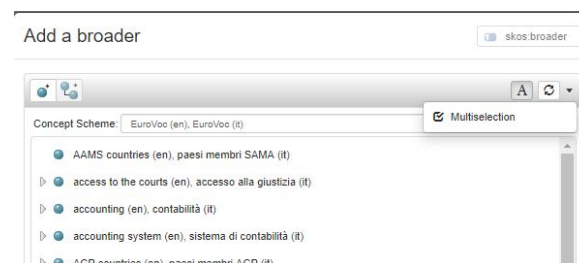
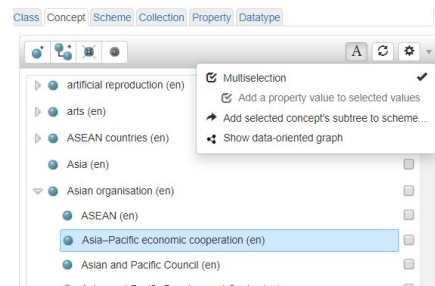
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Advanced Concept Management

Several functionalities for mass editing:

- Select a set of resources and add a property value to all of its elements
- Value a property on a resource with a set of object resources selected by the user
- Mass assignment of concepts (both by selection and subtrees) to schemes
- Edit a property value for all resources that have the same value



The requested feature was for concepts, but we extended (and adapted) it to all kind of resources



Graph Visualization

Two Views:

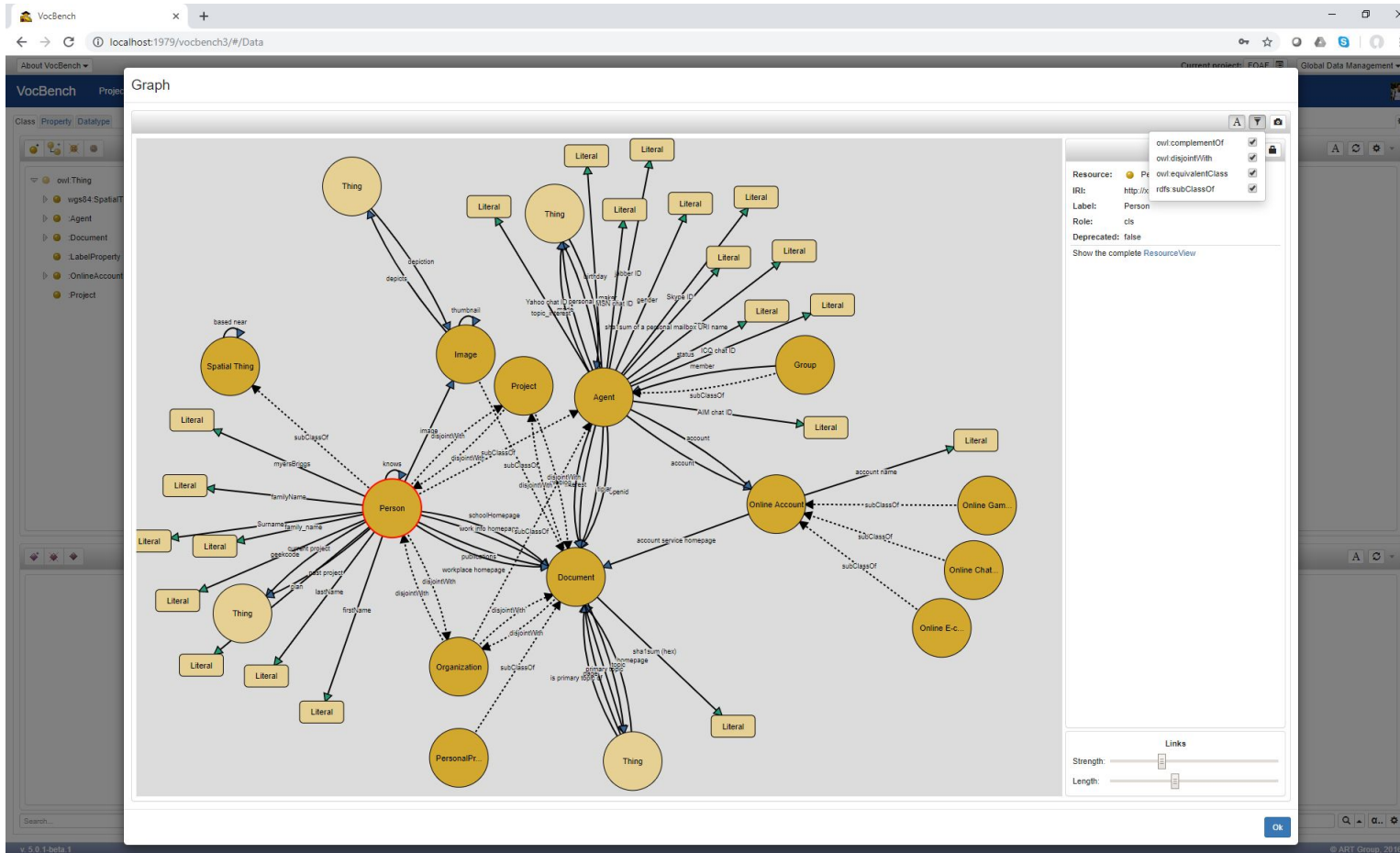
- **Model View:** strongly abstracted from triples, oriented to describing vocabularies
- **Data View:** more adherent to triples in the graph

Interwoven with different organization approaches:

- Exploration/Visualization: self-organizing diagram
- Diagram Editing: possibility to organize the elements of the graph



Graph View: Model View



The model view describes all classes in an ontology and their relevant axioms (a filter is available)

Properties are described as connectors between classes, by using their domain and range descriptors



Graph View: Data View

Resources can be dragged in or discovered by progressively expanding the boundary nodes in the graph

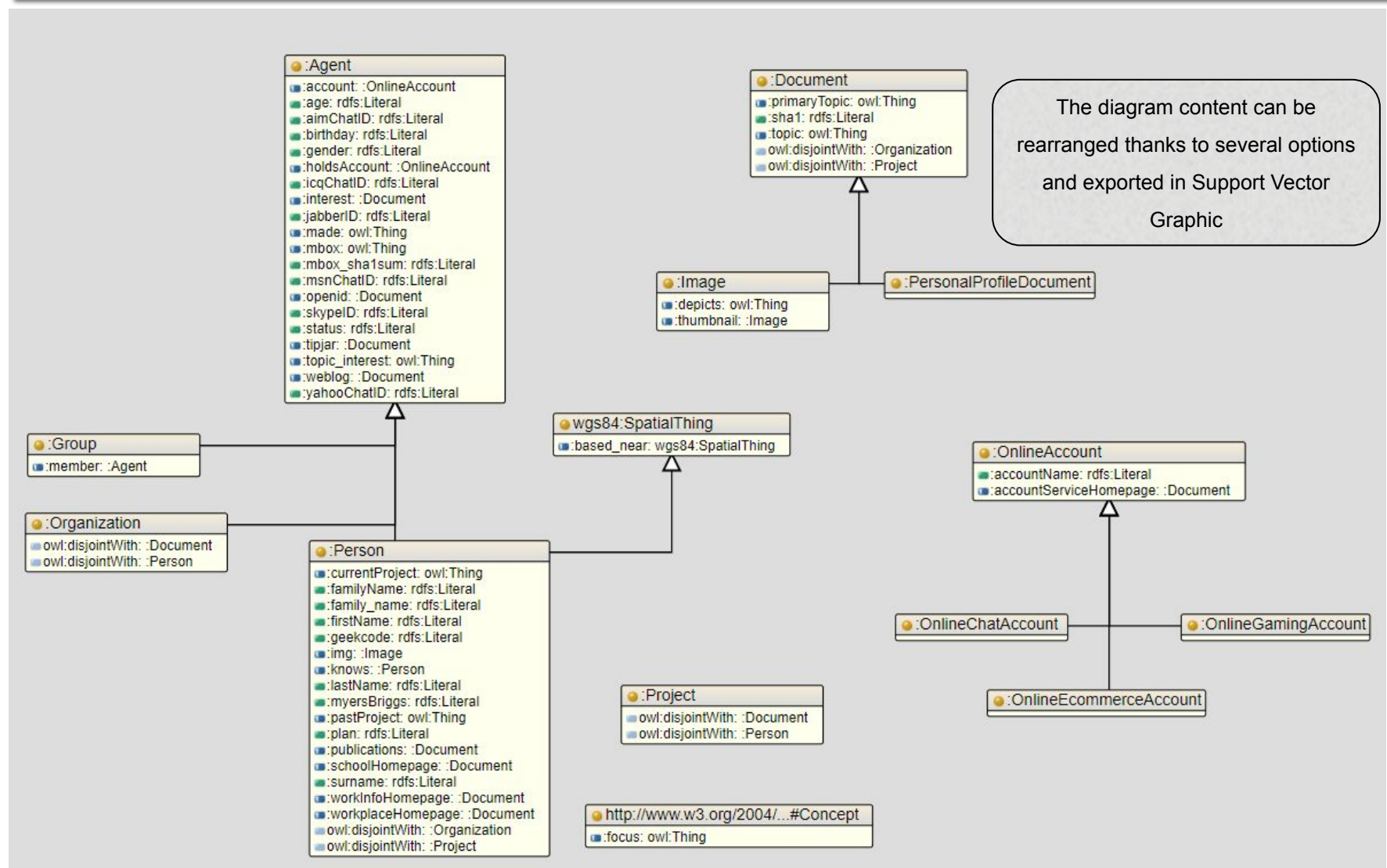
Any resource can be viewed in the data-oriented graph-view, which shows an almost triple-by-triple view of the resources managed in VocBench

A detailed configuration provides several filters, based on specific languages, on a global toggle for all literals or on properties from specific sections of the resource view

Whenever a resource is inspected, if the number of connected nodes is in any case too high, a dedicated window shows all the properties being used within that specific resource so that the user can prepare a tailored set of filters

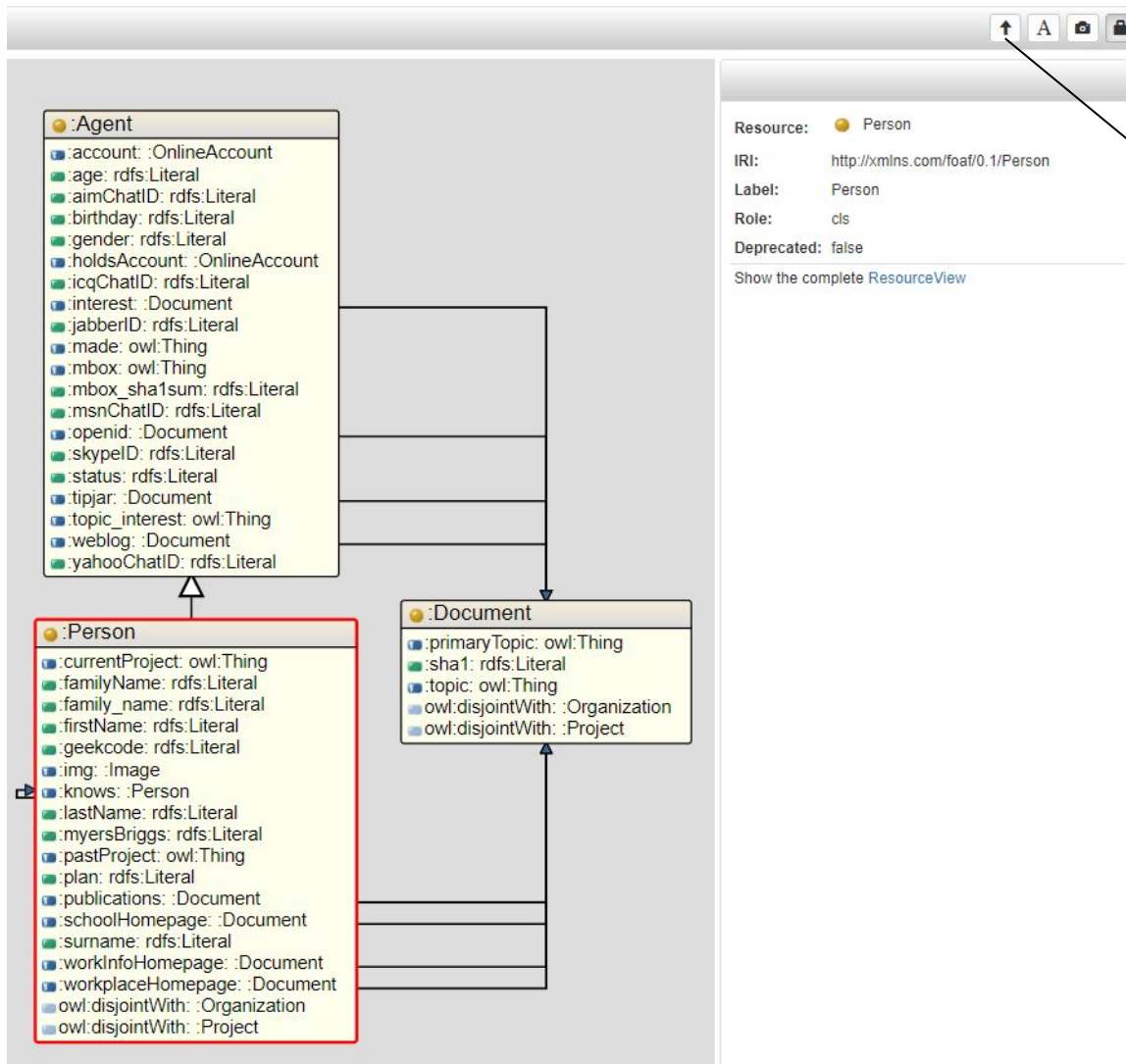


Graph View: Class Diagram





Graph View: Class Diagram



It is possible to toggle between a IS-A only representation and a description of all the relations holding between the classes by identifying the involved properties.

This latter option is suggested for more detailed inspections of few elements (e.g. the three classes in this view)



Graph Visualization

Objective for the future:

Push forward the concept of "diagram editing"

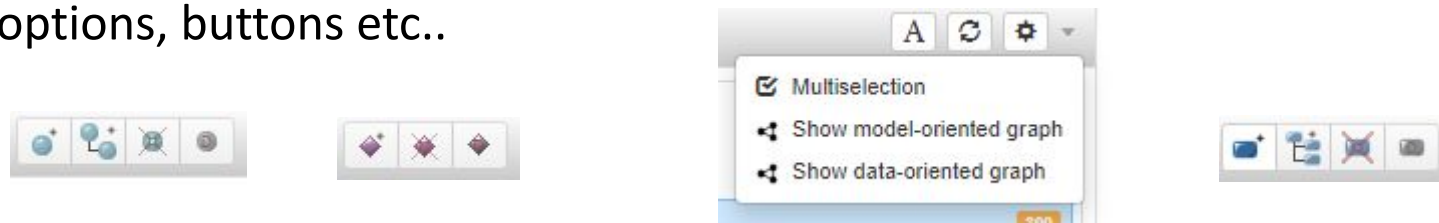
- Store not only the SVG data, but relevant metadata that allows the recreation of the graph model in VB from a stored image
- Create a fully-fledged graph editor in VB, which is bootstrapped by the data available in the project
- Allow for additional types of visualizations, e.g. one close to UML class diagrams





Pluggable-Action Framework

Actions that can be performed on resources are performable through menu options, buttons etc..



These were previously hard-coded in the UI..

Now, a lattice of <resource, actions, context> is built, considering resource characteristics such as their type, the context (e.g. the resource is read-only, is selected etc..) and, dynamically, the set of available actions is shown (according to the appropriate item – button, menu item – for the component) to the user, enabled or not.



Sheet2RDF "reloaded"

VocBench

localhost:1979/vocbench3/#/Sheet2RDF

About VocBench

Current project: Sheet2RDF_Example_Agrovoc Global Data Management

VocBench Projects Data SPARQL Tools

Spreadsheet file: Browse AgrovocSample_2 (NO explicit references, qname) - SKOSXL.xlsx

Spreadsheet preview (Rows: 20 out of 30)

skosxl:prefLabel@en	skosxl:prefLabel@it	skos:broader
activities	attività	
design	progetto	activities
growth control	controllo della crescita	activities
weather control	controllo meteorologico	activities
experimental design	schema sperimentale	design
project design	ideazione di un progetto	design
plot design	configurazione dell'app...	design
landscape design	progetto paesaggistico	design
universal design		design
animal husbandry methods	metodi di allevamento ...	growth control
cultivation	coltivazione	growth control
physiological regulation	regolazione fisiologica	growth control
animal growth promoters	promotori della crescita...	growth control
frost protection	protezione dal gelo	weather control
wind protection	protezione dal vento	weather control
cloud seeding	inseminazione di nubi	weather control
hail control	lotta anigrandine	weather control
artificial insemination	fecondazione artificiale	animal husband...
barrier husbandry	allevamento protetto	animal husband...

Subject mapping

Pearl

```
1 prefix : <http://aims.fao.org/aos/agrovoc/>
2 prefix grddl: <http://www.w3.org/2003/g/data-view#>
3 prefix dct: <http://purl.org/dc/terms/>
4 prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
5 prefix owl: <http://www.w3.org/2002/07/owl#>
6 prefix skosxl: <http://www.w3.org/2008/05/skos-xl#>
7 prefix coda: <http://art.uniroma2.it/coda/contracts/>
8 prefix xsd: <http://www.w3.org/2001/XMLSchema#>
9 prefix skos: <http://www.w3.org/2004/02/skos/core#>
10 prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>
11 prefix dc: <http://purl.org/dc/elements/1.1/>
12
13 rule it.uniroma2.art.Sheet2RDFAnnotation id:row {
14   nodes = {
15     @memoized
16     subject uri(coda:randIdgen('concept')) col_0/value .
17     col_0_litForm_node literal@en col_0/value
18     col_0_xlabelUri_node uri(coda:randIdgen('xlabel'),{lexicalForm = $col_0_litForm_node})) col_0/value .
19     col_1_litForm_node literal@it col_1/value .
20     col_1_xlabelUri_node uri(coda:randIdgen('xlabel'),{lexicalForm = $col_1_litForm_node})) col_1/value .
21     @memoized
22     broader uri(coda:randIdgen('concept')) col_2/value .
23   }
24   graph = {
25     $subject rdf:type skos:Concept .
26     OPTIONAL {
27       $subject skosxl:prefLabel $col_0_xlabelUri_node .
28       $col_0_xlabelUri_node skosxl:literalForm $col_0_litForm_node .
```

And produced triples

Generated triples preview (117 out of 175)

Subject	Predicate	Object
<http://aims.fao.org/aos/agrovoc/c_333290f>	<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>	<http://www.w3.org/2004/02/skos/core#Concept>
<http://aims.fao.org/aos/agrovoc/c_333290f>	<http://www.w3.org/2008/05/skos-xl#prefLabel>	<http://aims.fao.org/aos/agrovoc/xl_en_e682a060>
<http://aims.fao.org/aos/agrovoc/xl_en_e682a060>	<http://www.w3.org/2008/05/skos-xl#literalForm>	"activities"@en
<http://aims.fao.org/aos/agrovoc/c_333290f>	<http://www.w3.org/2008/05/skos-xl#prefLabel>	<http://aims.fao.org/aos/agrovoc/xl_it_3e8e1be6>
<http://aims.fao.org/aos/agrovoc/xl_it_3e8e1be6>	<http://www.w3.org/2008/05/skos-xl#literalForm>	"attività"@it
<http://aims.fao.org/aos/agrovoc/c_738664e8>	<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>	<http://www.w3.org/2004/02/skos/core#Concept>
<http://aims.fao.org/aos/agrovoc/c_738664e8>	<http://www.w3.org/2008/05/skos-xl#prefLabel>	<http://aims.fao.org/aos/agrovoc/xl_en_bd76f2b5>
<http://aims.fao.org/aos/agrovoc/xl_en_bd76f2b5>	<http://www.w3.org/2004/02/skos/core#literalForm>	"design"@en
<http://aims.fao.org/aos/agrovoc/c_738664e8>	<http://www.w3.org/2008/05/skos-xl#prefLabel>	<http://aims.fao.org/aos/agrovoc/xl_it_440559d4>
<http://aims.fao.org/aos/agrovoc/xl_it_440559d4>	<http://www.w3.org/2008/05/skos-xl#literalForm>	"progetto"@it
<http://aims.fao.org/aos/agrovoc/c_738664e8>	<http://www.w3.org/2004/02/skos/core#broader>	<http://aims.fao.org/aos/agrovoc/c_333290f>
<http://aims.fao.org/aos/agrovoc/c_edd7090a>	<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>	<http://www.w3.org/2004/02/skos/core#Concept>
<http://aims.fao.org/aos/agrovoc/c_edd7090a>	<http://www.w3.org/2008/05/skos-xl#prefLabel>	<http://aims.fao.org/aos/agrovoc/xl_en_3d1fa5fb>
<http://aims.fao.org/aos/agrovoc/xl_en_3d1fa5fb>	<http://www.w3.org/2008/05/skos-xl#literalForm>	growth control"@en
<http://aims.fao.org/aos/agrovoc/c_edd7090a>	<http://www.w3.org/2008/05/skos-xl#prefLabel>	<http://aims.fao.org/aos/agrovoc/xl_it_cc972c0>
<http://aims.fao.org/aos/agrovoc/xl_it_cc972c0>	<http://www.w3.org/2004/02/skos/core#literalForm>	"controllo della crescita"@it
<http://aims.fao.org/aos/agrovoc/c_edd7090a>	<http://www.w3.org/2004/02/skos/core#broader>	<http://aims.fao.org/aos/agrovoc/c_333290f>
<http://aims.fao.org/aos/agrovoc/c_14437dee>	<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>	<http://www.w3.org/2004/02/skos/core#Concept>

Possibility to export produced triples or to load them in the dataset

v. 5.0.1-beta.1

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Sheet2RDF "reloaded"

Desiderata

- The wizard must cover as much as possible of the PEARL features
- Automatic inference should cover even more than before
- Persist wizard status, not just the PEARL code (otherwise not possible to return to the wizard)
- introduce customizable templates (e.g. a graph pattern for SKOS-XL labels)
- allow for referencing more headers from a single template
- allow for the null assignment of a conversion to an header
- possibility to assign the subject to any column and reelaborate dinamically the dependencies
- possibility to refer map headers through their column reference rather than their name



Project facets

- Projects characteristics are described by properties (semantic/lexical model, use features of such as history/validation, location of the data repositories etc..)
- Users can add additional facets to describe and categorize projects
- VocBench provides a directory view in which any of the project facets can be used as a categorization scheme

About VocBench

Current project: Wordnet_gdb88 Global Data Management

VocBench Projects Data Metadata SPARQL Tools

Create

Project Name	Open/Close	Accessed	Model	Lexicalization	History	Validation	Repository Location	Actions
align								
Edoal								
edoal_eurovoc_teseo		<input type="radio"/>	EDOAL	RDFS	×	×	local	
Eurovoc_CUT_zeus		<input type="radio"/>	SKOS	SKOSXL	×	×	remote	
Teseo_CUT_zeus		<input type="radio"/>	SKOS	SKOSXL	×	×	remote	
Graph DB								
test								
Vocabularies								
CDM		<input type="radio"/>	OWL	RDFS	×	×	local	
Curia		<input type="radio"/>	SKOS	SKOS	×	×	local	
foaf		<input type="radio"/>	RDFS	RDFS	×	×	local	
GEMET		<input type="radio"/>	SKOS	SKOS	×	×	local	
Zeus								
Unclassified								

Change directory
Edit ACL
Edit description
Properties

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Custom Services and Reporters

- Possibility for the user to define new services in SPARQL (both queries for read operations and sparql updates for write operations) and publish them as Semantic Turkey services without any programming effort
- Possibility for the user to create reporting tasks based on templates filled with

– H

– C

616e9796-8386-4aa1-acf0-197a0dd6bfa4

1 / 1

Number of top concepts

18

Number of concepts

23

Number of collections

3

Number of schemes

3

Number of resources per scheme

Scheme	Number of resources
main (en) (http://skosxl#conceptScheme_63e606fb)	17
other (en) (http://skosxl#conceptScheme_44df1a39)	4
subtree (en) (http://skosxl#conceptScheme_758c8641)	1



Customizable Views

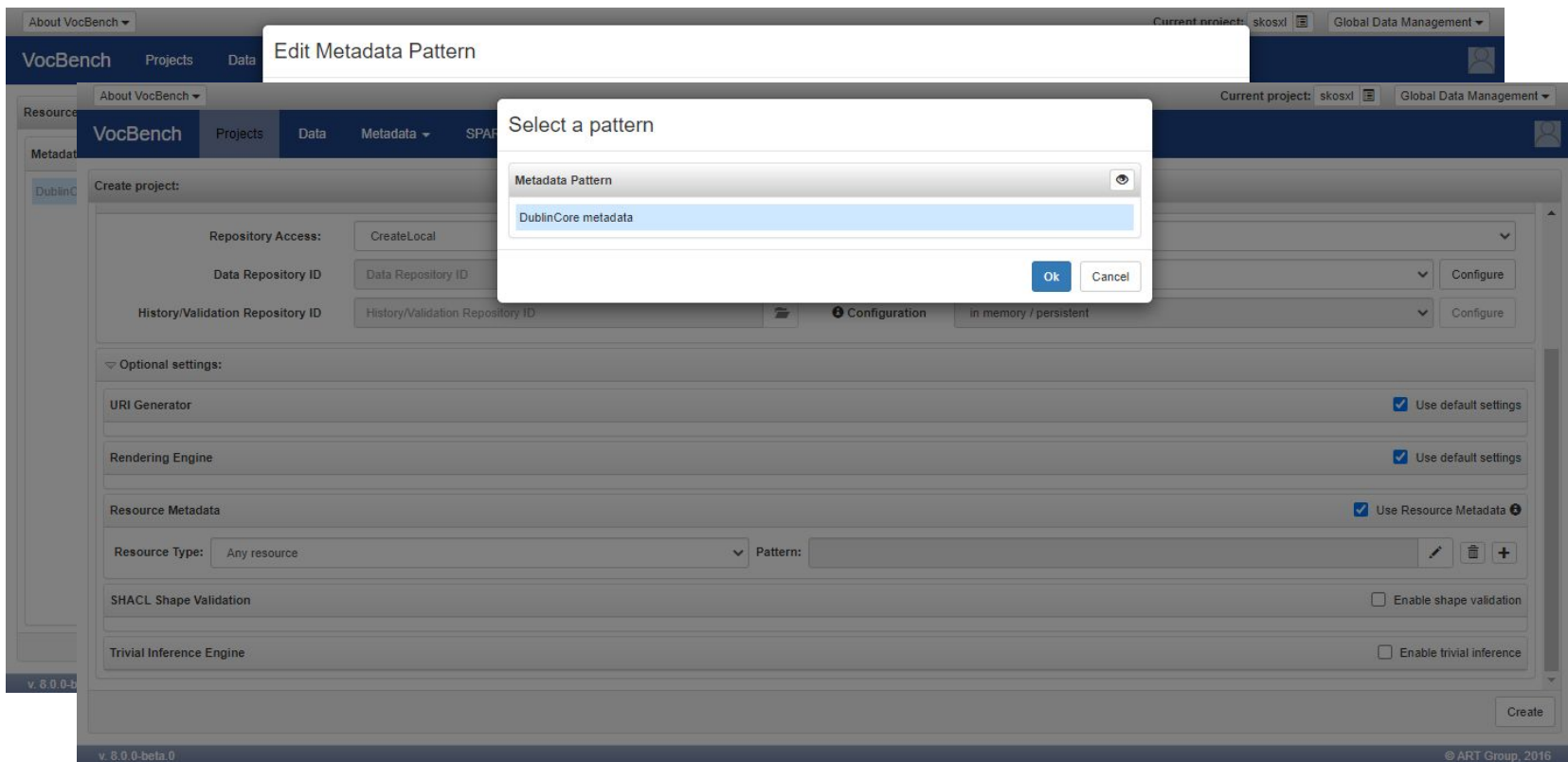
- Customizable by the user
- Predefined patterns for users can be set by Administrators and Project

The screenshot displays the VocBench web application interface. The top navigation bar includes 'VocBench', 'Projects', 'Data', 'Metadata', 'SPARQL', and 'Tools'. The 'Projects' tab is selected, showing a list of projects on the left and configuration options on the right. The 'ResourceView settings' dialog is open, showing the 'ResourceView template' configuration for a specific user. The 'Resource Types' section lists various types like 'Annotation Property', 'Class', 'Concept', etc. The 'Partitions' section lists various partitions like 'Types', 'Custom Form Preview', 'Superproperties', etc. The interface is labeled 'v. 8.0.0-beta.0' and '© ART Group, 2016'.



Resource Level Metadata

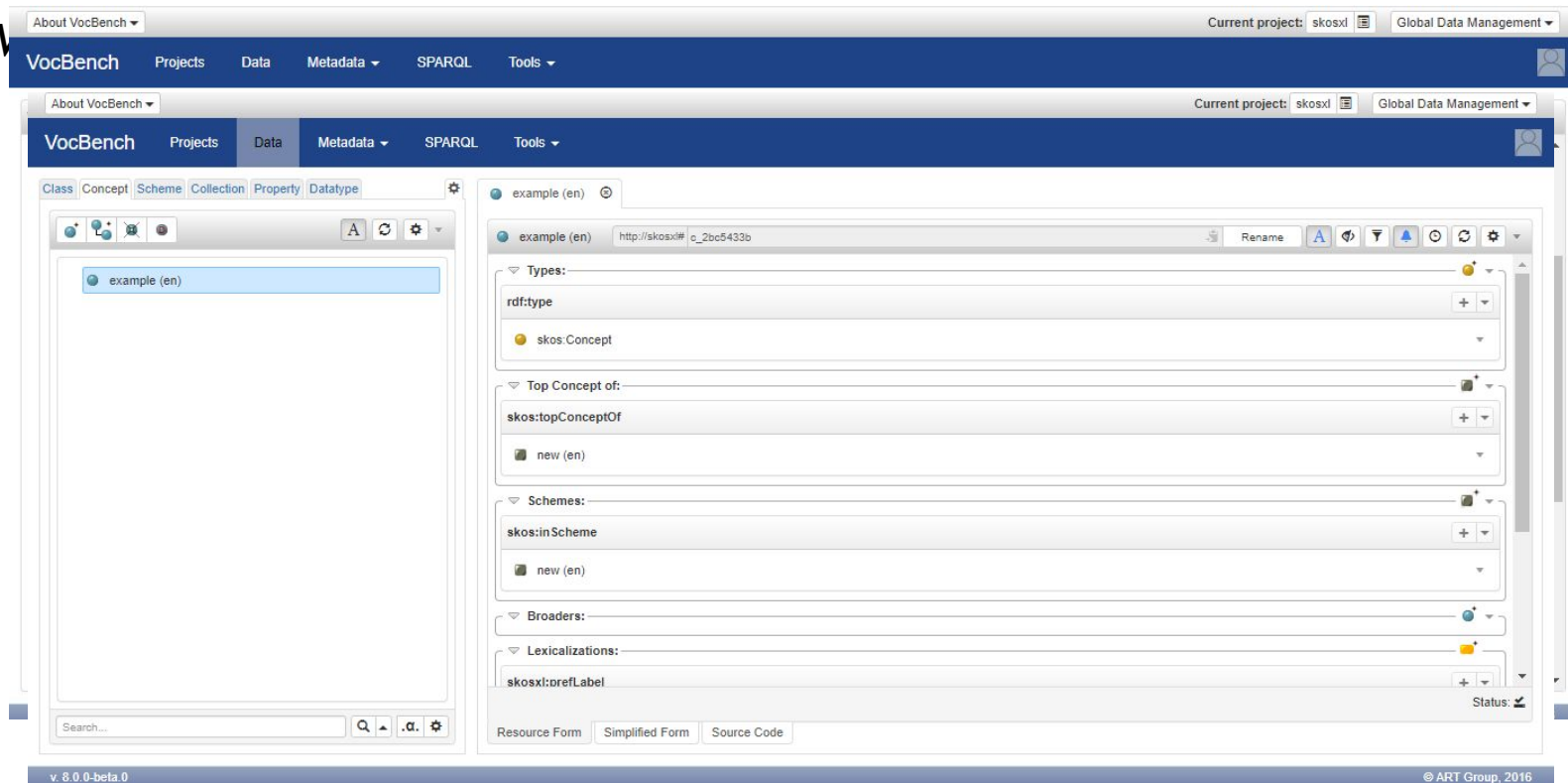
Describe metadata which is generated by triggering on events
(creation, modification, destruction) of resources





User Notification Support

- ask notifications about combinations of different events (creation, updated, deletion) for different type of resources (e.g. concepts, collections, classes, properties etc..)





Advanced SKOS Diffing Platform

- A separate service that can be invoked to diff any two versions of the same managed dataset or a managed dataset with an external copy of it



PEARL Annotations

Can be used to drive the semantics of Custom Forms

The screenshot displays the VocBench application interface. A modal dialog titled "Add skos:note" is open, allowing the configuration of a custom form for the 'skos:note' class. The dialog includes several fields: 'note' (text input), 'dataOneOf' (dropdown menu), 'objOneOf' (text input), 'role' (text input), 'range' (text input), 'rangeList' (text input), 'foreign' (text input), 'combo' (text input), and 'list' (text input). A legend at the bottom indicates that fields marked with an asterisk (*) are mandatory. The background shows the VocBench main interface with a project named 'skosxl' and a table of concepts.



Terminologist View


An alternative to the resource-view for editing SKOS-concepts – inspired by the IATE User Interface – with simplified experience, less RDF-centric


Area waterlogged outside irrigation (...) http://www.fao.org/landandwater/c_28


— :c_28 —


Area waterlogged outside irrigation (en), Area anegada fuera del perímetro de riego, Area anegada sin riego (es), Superficie engorgée sur des terres non irriguées (fr)
Part de la superficie engorgée dans les zones non irriguées.

— Broader Concepts —




Definition:
:xl_en_28
Term: Area waterlogged outside irrigation


Definition:
:xl_es_28
Term: Area anegada fuera del perímetro de riego, Area anegada sin riego


Definition: Part de la superficie engorgée dans les zones non irriguées.
:xl_fr_28
Term: Superficie engorgée sur des terres non irriguées



Dealing with Lexicons and Onto-Lexica interfaces

ONTOLEX-LEMON



The premises

Towards **OntoLex-Lemon** editing in **VocBench 3**

*A suite of vocabularies for the
representation of ontology lexicons*

*A web-based collaborative
thesaurus and ontology editor*



The Challenge

Towards **OntoLex-Lemon** editing in **VocBench 3**

*A suite of vocabularies for the
representation of ontology lexicons*

Use VocBench 3 to edit
data conforming to the
OntoLex-Lemon
model

*A web-based collaborative
thesaurus and ontology editor*



Where we are?

Towards OntoLex-Lemon editing in VocBench 3

Last year, we were eliciting requirements and designing
necessary features

Since then, we have gone ahead, and implemented
much of the functionality



Premise #1 – OntoLex-Lemon (1/5)

It is a modular specification¹ defining a lexicon model for ontologies (*lemon*).
It was published in early May 2016 by the W3C Community Group OntoLex.
It is the result of a collective endeavor informed by previous related models (the authors of which in most cases are part of the group) including:

- LingInfo
- LexOnto
- LexInfo
- LIR
- LMF
- Linguistic Watermark
- Monnet Lemon

¹ <https://www.w3.org/2016/05/ontolex/>



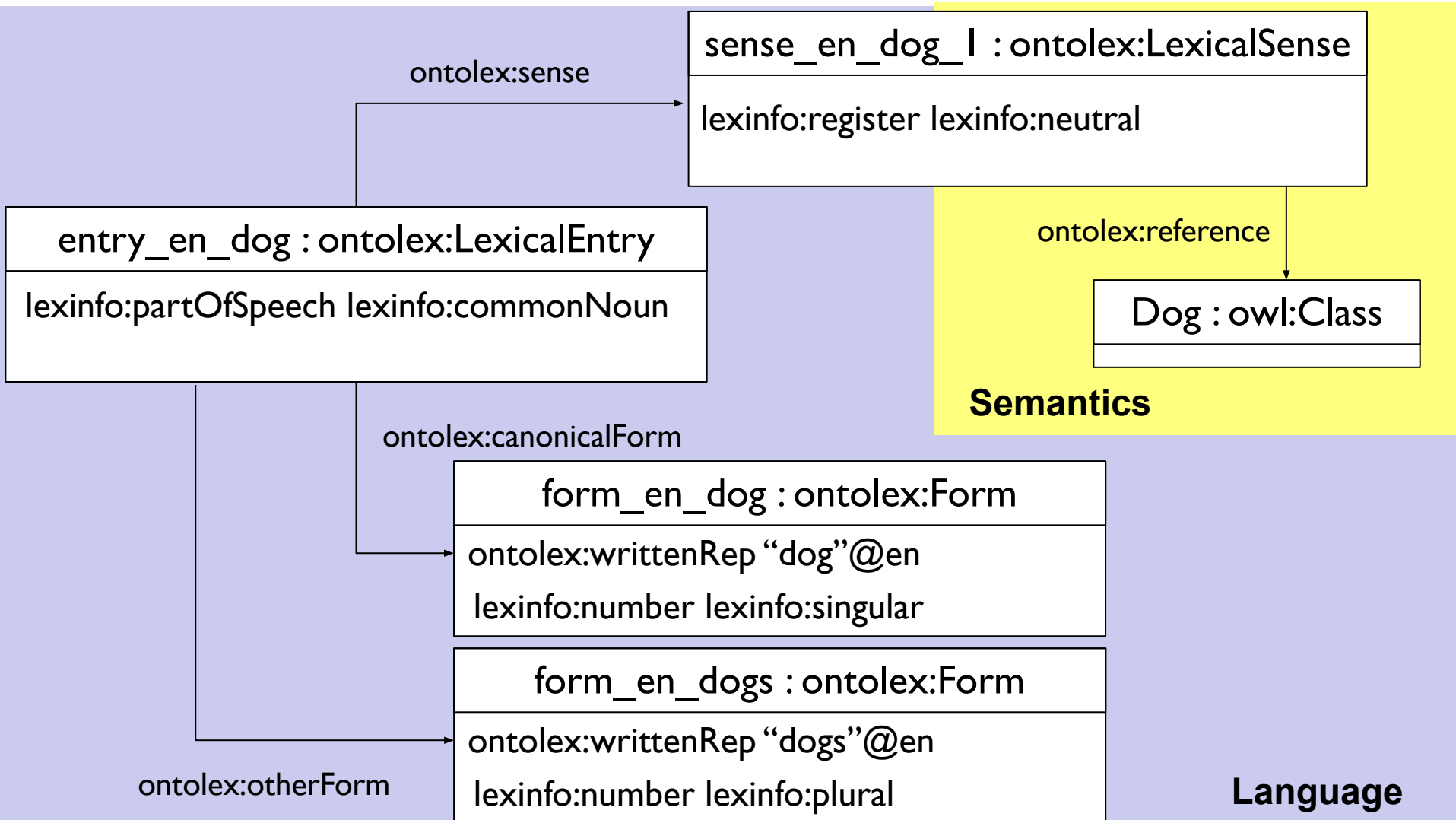
Premise #1 – OntoLex-Lemon (2/5)

The OntoLex-Lemon model consists of the following modules:

- Core (*ontolex*)
- Syntax and semantics (*symsem*)
- Decomposition (*decomp*)
- Variation and translation (*vartrans*)
- Metadata (*lime*)
- More are being developed (e.g. *lexicography*)



Premise #1 – OntoLex-Lemon (3/5)



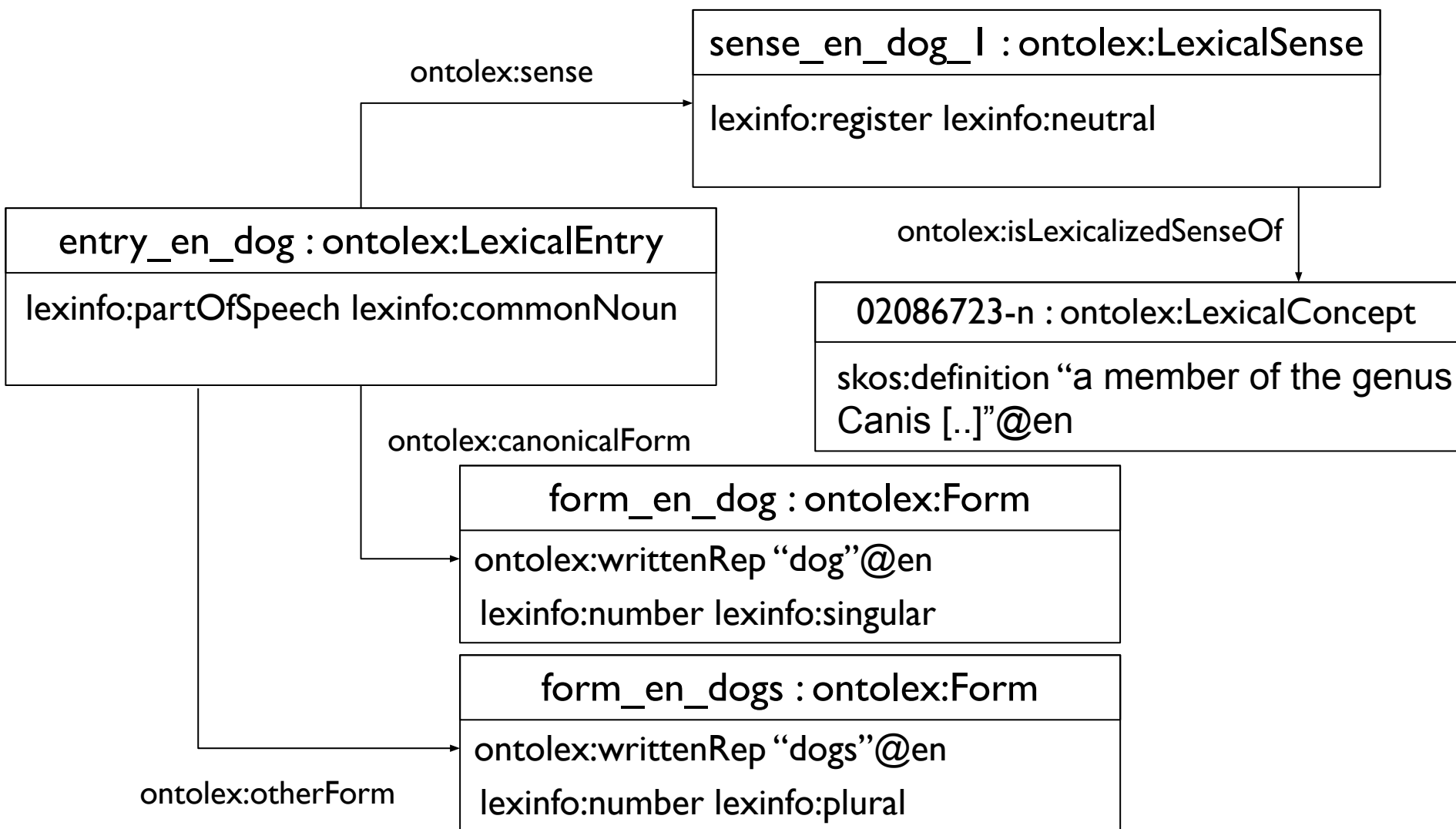


Premise #1 – OntoLex-Lemon (4/5)

OntoLex-Lemon (as well its predecessors) was used outside its official scope to represent diverse language resources, and it is going to be part of the backbone of the Linguistic Linked Open Data (LLOD) cloud.



Premise #1 – OntoLex-Lemon (5/5)





Use case: Open Multilingual Wordnet

OMW (<http://compling.hss.ntu.edu.sg/omw/>):

- Normalized the data
- Linked the data to PWN 3.0
- Put the data in one place

34 Open Wordnets Merged

Wordnet	Lang	Synsets	Words	Senses	Core	Licence	Data
Albanet	als	4,675	5,988	9,599	31%	CC BY 3.0	als.zi
Arabic WordNet (AWN v2)	arb	9,916	17,785	37,335	47%	CC BY SA 3.0	arb.z
BulTreeBank Wordnet (BTB-WN)	bul	4,959	6,720	8,936	99%	CC BY 3.0	bul.z
Chinese Open Wordnet	cmn	42,312	61,533	79,809	100%	wordnet	cmn.
Chinese Wordnet (Taiwan)	qcn	4,913	3,206	8,069	28%	wordnet	qcn.z
DanNet	dan	4,476	4,468	5,859	81%	wordnet	dan.z
Greek Wordnet	ell	18,049	18,227	24,106	57%	Apache 2.0	ell.zi
Princeton WordNet	eng	117,659	148,730	206,978	100%	wordnet	eng.z

We converted the provided

TAB delimited files into the OntoLex-Lemon model:

- 1,2 million lexical entries
- 117 thousand lexical concepts
- 1,95 million lexical senses



Preliminary Observations

The editing of OntoLex-Lemon data with traditional RDF/OWL editors is inconvenient, because the model relies heavily on:

- reification (e.g. of forms and senses)
- indirection (e.g. the written representation of a form of a lexical entry)
- unification of syntactic and semantic arguments



Possible Approaches

Dedicated editor

- PRO: optimized user-experience
- CONS: (risk of) siloed user-experience, loss of the benefits of RDF and its ecosystem
- Extension of an ontology/RDF editor VocBench 3
 - PRO: compatibility with the underlying RDF/OWL model
 - CONS: (risk of) less optimized user experience



Project metadata (1/2) and configuration

VocBench

Projects



Create project:

Project Name:

Test_OntoLex-Lemon

Base URI:

http:// example.org/

Model:

RDFS

Lexicalization: RDFS

☐ History ⓘ

☐ Validation ⓘ

Data Store

RDFS

Repository

SKOS

Remote Access Config

Data Rep

OntoLex

pure

Configuration

native store / persistent

Configure

History/Validation
Repository ID

Test_OntoLex-Lemon_support

Configuration

native store / persistent

Configure

Optional settings:

Create



Project metadata (2/2) and configuration

VocBench

Projects



Create project:

Project Name:

Base URI:

Model: Lexicalization: ☐ History ☐ Validation

Data Store

Repository Access:

Data Repository ID:

History/Validation Repository ID:

OntoLex

Configuration native store / persistent

Optional settings:

Create



Lexicons as instances

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection Property Lexicon Lex.Entry

http://purl.org/vocommons/voaf#vocabulary

- void:Dataset
 - lime:ConceptualizationSet
 - lime:LexicalizationSet
 - lime:Lexicon
- void:Linkset
- semiotics:Expression
 - ontolex:LexicalEntry
- semiotics:Meaning

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#

lexicon

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Lexical entries as instances

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection Property Lexicon Lex.Entry

void:Dataset

- lime:ConceptualizationSet
- lime:LexicalizationSet
- lime:Lexicon

void:Linkset

semiotics:Expression

- ontolex:LexicalEntry**

semiotics:Meaning

:ontolexLexicalEntry_671152ba

- http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#African+American__adjective
- http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#African+American__noun
- http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#alias__noun

lexical entry

This list is not filtered for a specific lexicon

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Dedicated lexicon list

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection Property Lexicon Lex.Entry

English Lexicon for the DBpedia ontology (Persons) (en)

Possibility to select a lexicon for filtering lexical entries

This is an excerpt of the Lemon lexicon (Unger et al., 2013) for the DBPedia Ontology

Unger, C., McCrae, J., Walter, S., Winter, S., & Cimiano, P. (2013). A lemon lexicon for DBpedia. In Proceedings of 1st International Workshop on NLP and DBpedia, co-located with the 12th International Semantic Web Conference (ISWC 2013), October 21-25, Sydney, Australia.



Browsing a lexicon (1/2)

VocBench Projects Data SPARQL Tools ▾

Class Concept Scheme Collection Property Lexicon Lex.Entry

A

- ◆ African American (en)
- ◆ African American (en)
- ◆ alias (en)
- ◆ Alma Mater (en)
- ◆ American (en)
- ◆ American (en)
- ◆ architect (en)
- ◆ aristocrat (en)
- ◆ attend (en)

Search...

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Browsing a lexicon (2/2)

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection Property Lexicon Lex.Entry

A B C D E F G H I J K L M N O P Q R S T

Search...

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Searching Lexical Entries

VocBench Projects Data SPARQL Tools ▾

Class Concept Scheme Collection Property Lexicon Lex.Entry

A ▼

- ◆ African American (en)
- ◆ African American (en)
- ◆ alias (en)
- ◆ Alma Mater (en)
- ◆ American (en)
- ◆ American (en)
- ◆ architect (en)
- ◆ aristocrat (en)
- ◆ attend (en)

Search...

Q .α. ⚙

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◆ Start with
◆ Contains ✓
◆ Ends with
◆ Exact
◆ Fuzzy



Browsing OMW (1/2)

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection Property

Lexicon Lex.Entry

ab (it)
abacà (it)
abaco (it)
abate (it)
abazia (it)
abbacinare (it)
abbadessa (it)
abbadia (it)
abbagliare (it)

Search... Q .a.

abate (it) http://art.uniroma2.it/pmki/omw/ ItaiWordnet-it-abate Rename

Subterms:

Lexical forms:

ontolex:canonicalForm

abate (it)

Lexical Senses:

ontolex:sense

:ItaiWordnet-it-abate-09754404-n

Denotations:

Evoked Lexical Concepts:

ontolex:evokes

:09754404-n

Other properties:

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Browsing OMW (2/2)

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection
Property Lexicon Lex.Entry

ab (it)
abacà (it)
abaco (it)
abate (it)
abazia (it)
abbacinare (it)
abbadessa (it)
abbadia (it)

Search... .α.

abate (it) :09754404-n

http://art.uniroma2.it/pmki/omw/09754404-n Rename

Schemes:
skos:inScheme
:pwn30-conceptset

Broaders:
skos:broader
:10675876-n

Lexicalizations:

Notes:
skos:definition
the superior of an abbey of monks

Other properties:

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Details of a lexical entry

Class Concept Scheme Collection Property

Lexicon Lex.Entry

P

- parent (en)
- patriarch (en)
- patron (en)
- patron saint (en)
- person (en)**
- philosopher (en)
- place of birth (en)
- place of death (en)
- poet (en)
- Pole (en)
- Polish (en)
- pope (en)
- precede (en)
- predecessor (en)
- priest (en)
- principal (en)
- profession (en)

Search... .a.

person (en)

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun

Rename

Types:

rdf:type

ontolex:LexicalEntry

Lexical forms:

ontolex:canonicalForm

person (en)

Lexical Senses:

ontolex:sense

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/sense

Denotations:

Evoked Lexical Concepts:

Other properties:

synsem:synBehavior

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/frame

lexinfo:partOfSpeech

lexinfo:commonNoun

Lexical forms

Lexical senses

Syntactic frame

Part of speech



Syntax an semantics mapping

Sense / OntoMap

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/sense

Types:

- rdf:type
 - ontolex:LexicalSense
 - synsem:OntoMap

Lexicalizations:

Other properties:

- ontolex:reference
 - dbo:Person
- synsem:isA
 - http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/subject

Syntactic frame

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/frame

Types:

- rdf:type
 - lexinfo:NounPredicateFrame
 - synsem:SyntacticFrame

Lexicalizations:

Other properties:

- lexinfo:subject
 - http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/subject

dbo:Person(x)

x is a person



Lemon design patterns

The lemon model (since the previous version in the Monnet project) requires complex modeling.

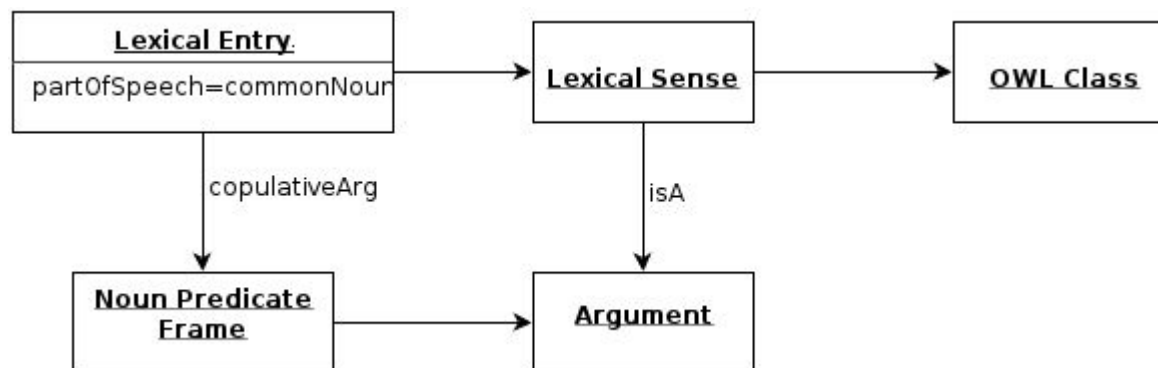
However, the graphs associated with lexical entries aren't arbitrary, but tend to exhibit some regularities.

It was possible to identify and catalog a number of design patterns for ontology-lexicons.

McCrae, J. P., & Unger, C. (2014). Design patterns for engineering the ontology-lexicon interface. In *Towards the Multilingual Semantic Web* (pp. 15-30). Springer, Berlin, Heidelberg.



Lemon design patterns – Class Nouns



ClassNoun("person",dbpedia:Person)

Source: <https://github.com/jmccrae/lemon.patterns>

The full catalog of design patterns can be found at:

<https://github.com/jmccrae/lemon.patterns>

A web service for mapping design patterns to RDF:

<http://services.lider-project.eu/lemonpatterns>



Custom forms (1/3)

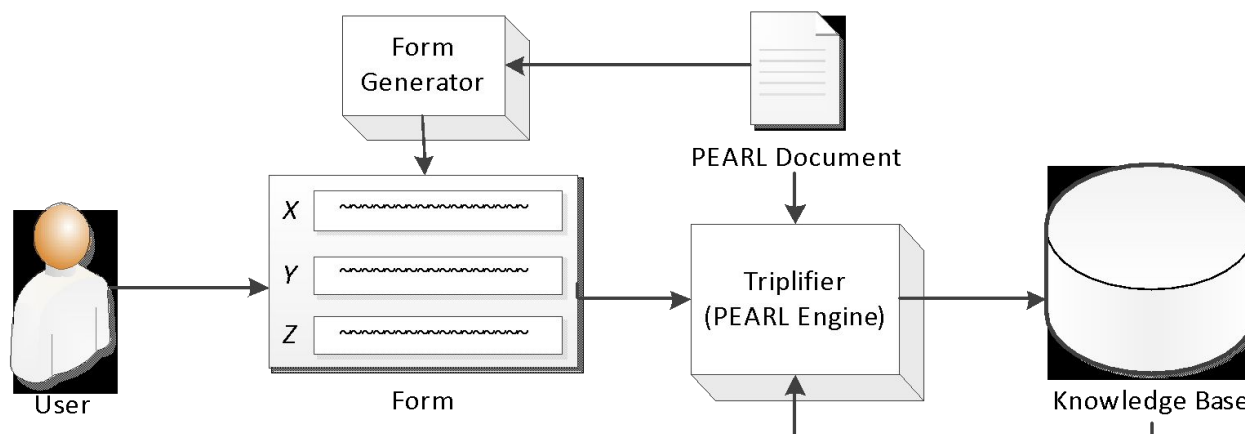
We implemented a subset of the lemon design patterns as VocBench Custom Forms:

<https://bitbucket.org/art-uniroma2/lemon-vb-customforms>



Custom forms (2/3)

Custom forms – a form definition mechanism for the instantiation of complex resources





Custom forms (3/3)

Custom forms repurpose our knowledge acquisition platform CODA (<http://art.uniroma2.it/coda/>), and use its triplication language PEARL to specify:

- ❶ a declaration of the data that is expected to be prompted by the user
- ❷ the transformation of the prompted data into valid RDF entities to be stored
- ❸ the organization of the produced RDF entities into meaningful graph patterns, instantiating the template of the resource to be created
- ❹ the automatic production of a form layout based on the above declarations



Custom Forms inside VB3

About VocBench ▾

VocBench Projects Data SPARQL Tools ▾

Class Concept Scheme Collection Property Lexicon Lex.E

Integrity Constraint Validator (ICV)
Alignment Validation
Sheet2RDF
Collaboration System
Custom Form configuration

P

- parent (en)
- patriarch (en)
- patron (en)
- patron saint (en)
- person (en)



Customs for lemon ontology-lexicons

VocBench Projects Data SPARQL Tools

Custom Forms configuration:

Custom Forms:

- it.uniroma2.art.semanticturkey.customform.form.ClassNounOntoLexLexi
- it.uniroma2.art.semanticturkey.customform.form.ConsequenceVerbOnto
- it.uniroma2.art.semanticturkey.customform.form.DataPropertyNounOnto
- it.uniroma2.art.semanticturkey.customform.form.IntersectiveAdjectiveOn
- it.uniroma2.art.semanticturkey.customform.form.IntersectiveDataPropert
- it.uniroma2.art.semanticturkey.customform.form.IntersectiveObjectProp
- it.uniroma2.art.semanticturkey.customform.form.NameOntoLexLexicalE
- it.uniroma2.art.semanticturkey.customform.form.ObjectPropertyNounOnto
- it.uniroma2.art.semanticturkey.customform.form.RelationalAdjectiveOnt
- it.uniroma2.art.semanticturkey.customform.form.RelationalNounOntoLe
- it.uniroma2.art.semanticturkey.customform.form.RelationalNounOntoLe

Form Collections:

- it.uniroma2.art.semanticturkey.customform.collection.OntologyLexiconLemon
- it.uniroma2.art.semanticturkey.customform.collection.note

Forms mapping:

Property/Class	Form Collection	Replace
http://www.w3.org/ns/lemon/ontolex#LexicalEntry	it.uniroma2.art.semanticturkey.customform.collection.OntologyLexiconLemonDesignPatterns	<input type="checkbox"/>

Project level elements System level elements

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Form-based preview – “person”

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection
Property Lexicon Lex Entry

person (en)

parent (en)
patriarch (en)
patron (en)
patron saint (en)
person (en)
philosopher (en)
place of birth (en)
place of death (en)
poet (en)
Pole (en)
Polish (en)
pope (en)
preceed (en)
predecessor (en)
priest (en)
principal (en)
profession (en)

Search... .a.

person (en) http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun Rename

Lexical forms:

ontolex:canonicalForm

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/canonicalForm

Lexical Senses:

ontolex:sense

http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/sense

Denotations:

Evoked Lexical Concepts:

Custom Form Preview:

Custom form name

Class Noun

reference

<http://dbpedia.org/ontology/Person>

Other properties:

synsem:synBehavior

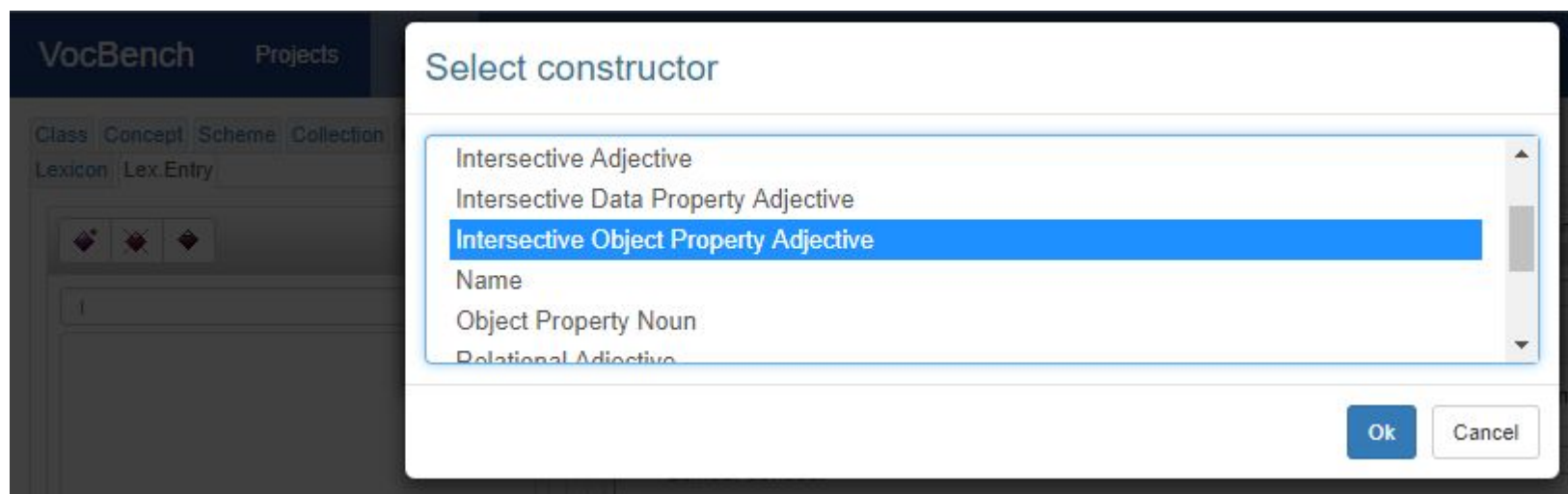
http://github.com/cunger/lemon.dbpedia/target/dbpedia_en_9#person__noun/frame

lexinfo:partOfSpeech

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Creating a new Lexical Entry (1/3) (w/ custom forms)





Creating a new Lexical Entry (2/3) (w/ custom forms)

VocBench Projects

Class Concept Scheme Collection
Lexicon Lex.Entry

Create new ontolex:LexicalEntry ontolex:LexicalEntry

Canonical Form: Italian (it) ▼

URI: Leave empty in order to autogenerate a random URI 🔒

property: 🟡 ▼ *

propertyValue: 🟡 ▼ *

Ok Cancel



Creating a new Lexical Entry (3/3) (w/ custom forms)

VocBench Projects Data SPARQL Tools

Class Concept Scheme Collection Property
Lexicon Lex.Entry

italiano (it)

italiano (it) http://example.org/ontolexLexicalEntry_12741778 Rename

Lexical forms:

ontolex:canonicalForm

italiano (it)

Lexical Senses:

ontolex:sense

:synsemOntoMap_0adb1133

Denotations:

Evoked Lexical Concepts:

Custom Form Preview:

Custom form name

Intersective Object Property Adjective

property

<http://dbpedia.org/ontology/nationality>

propertyVaue

<http://dbpedia.org/resource/Italian>

Other properties:

synsem:synBehavior

Search... Q .α

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The new Lexicographer view



A new simplified view for lexicographers:

- structured as an *editable* dictionary page
- fully exploits the Ontolex-lemon standard
- hides the complexities of the Ontolex model in RDF



Smart suggestions and use of NLP tools (to do)

In absence of
NLP
components, it
is possible to
match lexical
entries in the
text

comunità montana



(comunità) (montana)

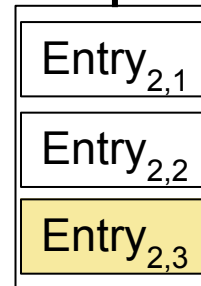
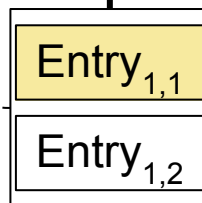
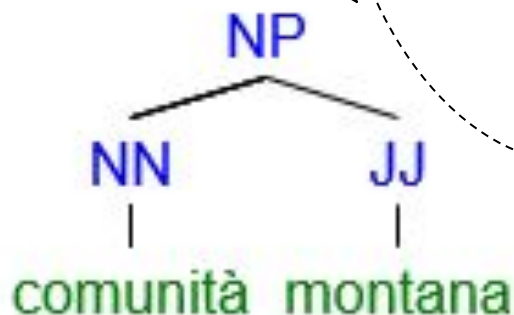


(NN comunità) (JJ montana)



(NN comunità) (JJ montano)

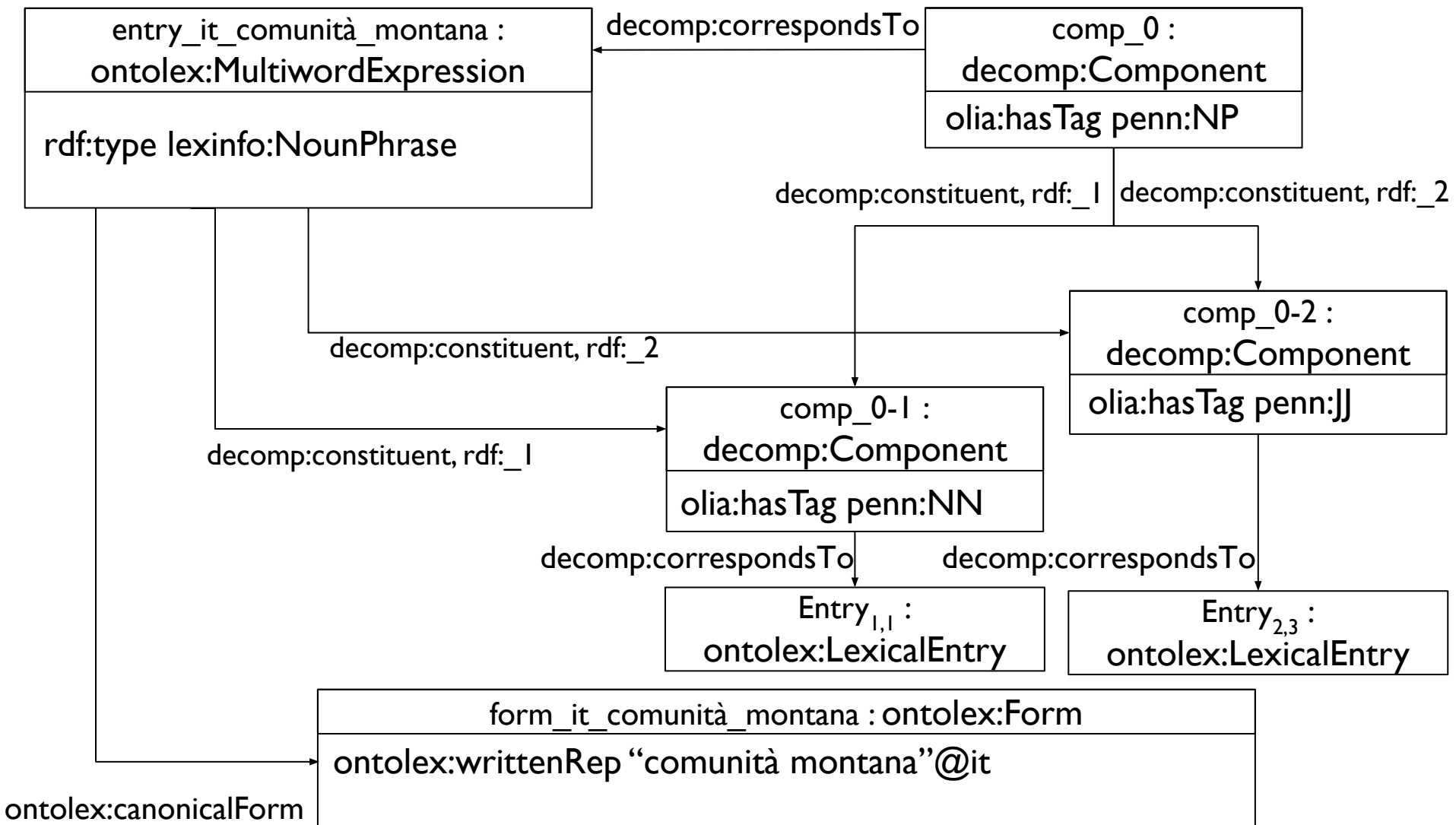
parsing



Look up of candidate
components
(or creation of new
lexical entries)



Smart suggestions and use of NLP tools (to do)





OntoLex: Lessons Learned by Supporting It

SKOS has been ruled by the "do whatever like this...or this...or this else" mantra. This created lot of inefficiency on a model that should be easier to process than OWL

OntoLex has a high level of complexity, we should sail away from that direction!

Here we report a few merely technical notes on issues we experienced when implementing support for OntoLex in VocBench and the PMKI Platform

- :entry property (no other precedent causes that explosion!)
 - See skos:inScheme...which has no inverse prop, while skos:topConceptOf has... There's a reason for that!
- :denote/:evoke: we should make it clear! (...and this means having proper examples out there)
- Containment among subsets: e.g. is a lime:Conceptualization a subset of lime:Lexicon
 - Indeed, this doesn't cause any issue, but it should be clear which triples belong to which (sub)dataset
- LexInfo: is it still non-updated? (and thus linking the legacy Lemon-Monnet)
- Need to cover more (possibly by leaving room for extensions, yet providing a standard way).
E.g. POS in GWA English WordNet, why not providing an official OntoLex POS vocabulary?



Ontolex: Lessons Learned by Supporting It

The second development iteration of OntoLex has seen interesting material (e.g. Lexicographer module)

We need to update metadata as well!

Maybe take back that ideas of representing existing resources / adding more metadata about a resource structure



Support to Automatic Alignment

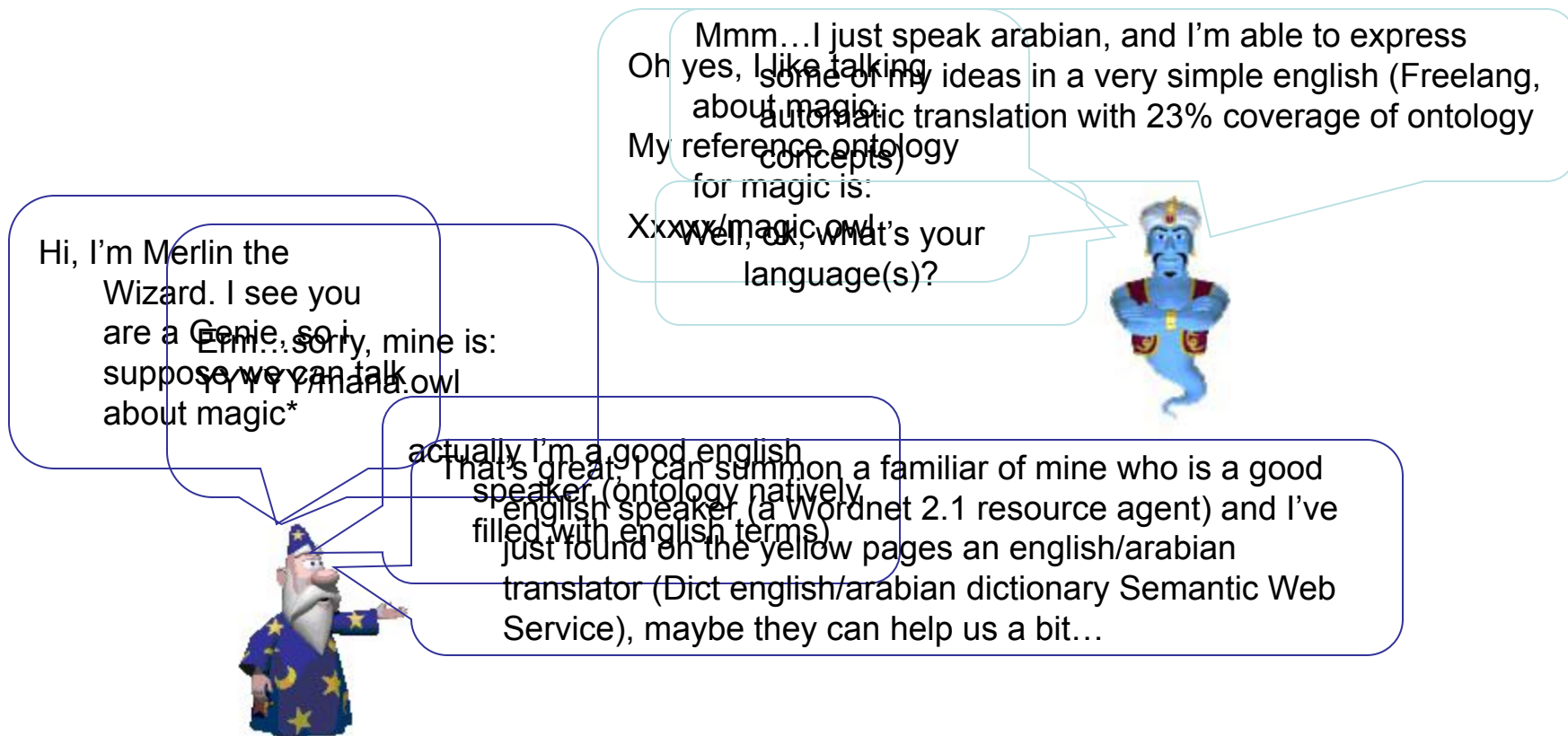
SEMANTIC AND LINGUISTIC COORDINATION IN MAPLE



...I have to summon here
...two very dear old friends...



Agent semantic/linguistic coordination



*agents are talking on the basis of a minimal agreed protocol which can then start a semantic coordination activity



...let's see what happens
behind the stages...



"Alignment Scenario" Evaluation by MAPLE

Short Description of the datasets to be compared

Description of the **support datasets**: usually lexicalizations of the same datasets to be aligned, but can include external supporting resources (e.g. lexical resources such as WordNet to expand language coverage, so called *synonymizers*)

Possible suggested pairings between lexicalization sets (supported by *synonymizers*, *translators* etc..) and summarized into a score

```
result:
  sourceDataset:
    @type: null
    @id: "http://example.org/59a81cd5-cfd7-435b-8d65-e0f303e105f4/void.ttl#9a64ce19-27a0-48ca-9294-c13f823604e1"
    uriSpace: "http://www.senato.it/teseo/tes/"
    sparqlEndpoint: "http://localhost:7200/repositories/TESEO_core"
  targetDataset:
    @type: null
    @id: "http://example.org/3753f4f6-b68b-4c4a-a71b-2535718602da/void.ttl#a3f50b1e-5100-49a4-b703-40c6daad777f"
    uriSpace: "http://eurovoc.europa.eu/"
    sparqlEndpoint: "http://localhost:7200/repositories/EuroVoc_core"
  supportDatasets:
    0:
      @id: "http://example.org/3753f4f6-b68b-4c4a-a71b-2535718602da/void.ttl#a3f50b1e-5100-49a4-b703-40c6daad777f_it_Lexicalization_set"
      uriSpace: null
      sparqlEndpoint: "http://localhost:7200/repositories/EuroVoc_core"
      referenceDataset: "http://example.org/3753f4f6-b68b-4c4a-a71b-2535718602da/void.ttl#a3f50b1e-5100-49a4-b703-40c6daad777f"
      lexiconDataset: null
      lexicalizationModel: "http://www.w3.org/2008/05/skos-xl"
      lexicalizations: 18545
      references: 7282
      lexicalEntries: null
      avgNumOfLexicalizations: 2.546
      percentage: 1
      languageTag: "it"
      @type: "http://www.w3.org/ns/Lemon/Lime#LexicalizationSet"
    1:
      @id: "http://example.org/59a81cd5-cfd7-435b-8d65-e0f303e105f4/void.ttl#9a64ce19-27a0-48ca-9294-c13f823604e1_it_Lexicalization_set"
      uriSpace: null
      sparqlEndpoint: "http://localhost:7200/repositories/TESEO_core"
      referenceDataset: "http://example.org/59a81cd5-cfd7-435b-8d65-e0f303e105f4/void.ttl#9a64ce19-27a0-48ca-9294-c13f823604e1"
      lexiconDataset: null
      lexicalizationModel: "http://www.w3.org/2008/05/skos-xl"
      lexicalizations: 3378
      references: 3378
      lexicalEntries: null
      avgNumOfLexicalizations: 1
      percentage: 1
      languageTag: "it"
      @type: "http://www.w3.org/ns/Lemon/Lime#LexicalizationSet"
  pairings:
    0:
      score: 0.5716210939615214
      source:
        lexicalizationSet: "http://example.org/59a81cd5-cfd7-435b-8d65-e0f303e105f4/void.ttl#9a64ce19-27a0-48ca-9294-c13f823604e1_it_Lexicalization_set"
        synonymizer: null
      target:
        lexicalizationSet: "http://example.org/3753f4f6-b68b-4c4a-a71b-2535718602da/void.ttl#a3f50b1e-5100-49a4-b703-40c6daad777f_it_Lexicalization_set"
        synonymizer: null
```




...and, in VocBench,
what the user sees...



VocBench and MAPLE

VocBench

localhost:1979/vocbench3/#/AlignmentValidation

About VocBench

Current project: PMKI_EUROVOC_CUT300_REMOTE

Global Data Management

VocBench Projects Data SPARQL Tools

Alignment Validation:

Source: Genoma task

Tasks

Left	Right	Status	Start time	End time	
PMKI_EUROVOC_CUT300_REMOTE	PMKI_TESEO_CUT300_REMOTE	Completed	Sat Jun 01 00:41:25 +0000 2019	Sat Jun 01 00:41:37 +0000 2019	edit alignment

Alignments:

Source entity	target entity	Relation	Mapping Property	Action	Status
labour law (en), diritto del lavoro (it)	TUTELA DEI LAVORATORI (it)	= (1)		Accept Reject	
labour law (en), diritto del lavoro (it)	STATUTO DEI LAVORATORI (it)	= (1)		Accept Reject	
merchant fleet (en), flotta mercantile (it)	MARINA MERCANTILE (it)	= (1)		Accept Reject	
guarantee (en), garanzia (it)	CAUZIONI E DEPOSITI CAUZIONALI (it)	= (0.6537597)		Accept Reject	
political group (en), gruppo politico (it)	PARLAMENTARI (it)	= (0.69156724)		Accept Reject	
parliamentary immunity (en), immunità parlamentare (it)	PARLAMENTARI (it)	= (0.6405271)		Accept Reject	
parliamentary immunity (en), immunità parlamentare (it)	IMMUNITA' PARLAMENTARE (it)	= (0.91957235)		Accept Reject	
parliamentary immunity (en), immunità parlamentare (it)	INDENNITA' PARLAMENTARE (it)	= (0.6142857)		Accept Reject	
incompatibility (en), incompatibilità (it)	INCOMPATIRII ITA' PARI AMENTARE (it)	= (0.6101792)		Accept Reject	

Repositories
are profiled by
MAPLE

The
mapping is
performed
by the
remote
alignment
platform



Improved Alignment Validation ☐

Alignment Workbench

The Alignment Validation tool was meant to load files expressed in the EDOAL format (usually produced by external alignment tools) and support, in a seamless fashion, any of these objectives:

- Evaluate alignments
- Improve alignments
- Converting alignments (EDOAL ☐ OWL/SKOS alignments) and loading them into the managed dataset

"That's all Folks!"





Contacts

VocBench site: <http://vocbench.uniroma2.it/>

You can also follow VB by registering to:

- VocBench Mailing Lists:
 - User: <http://groups.google.com/group/vocbench-user>
 - Developer: <http://groups.google.com/group/vocbench-developer>
- Semantic Turkey Mailing Lists (only for backend related aspects) :
 - User: <http://groups.google.com/group/semanticturkey-user>
 - Developer: <http://groups.google.com/group/semanticturkey-developer>