



# Towards VocBench 3

## Pushing Collaborative Development of Thesauri and Ontologies Further Beyond

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3. GODAN secretariat, c/o CABI Head Office



# Outline



- VocBench I&2, (quick) history and lessons learned
- Evaluation of VB2
- Requirements for VB3
- The Platform



# VOCBENCH (1 & 2)

## Collaborative Development of Multilingual Thesauri

VocBench is an open source web application for editing of multilingual SKOS and SKOS-XL thesauri, with a strong focus on collaboration, supported by workflow management for content validation and publication.

All editing actions inside VocBench undergo a validation and publication workflow

The screenshot displays the VocBench web application interface. At the top, there's a navigation bar with 'Concepts', 'Properties', 'Schemes', 'Validation', 'SPARQL', and 'ICV'. The main area is divided into several panels:

- Concepts Panel:** Lists various concepts such as 'Altereffects (of residues)', 'groups', 'location', 'methods', 'objects', 'phenomena', 'biological phenomena', 'chemical phenomena', 'Damage', 'Deficiencies', 'Deterioration', 'development', 'Disasters', and 'dosage effects'. Each concept has a status icon (e.g., Proposed, Validated, Published).
- Term Editor Panel:** Shows a table for editing terms in multiple languages. The table has columns for 'Language' and 'Term'. For 'Altereffects (of residues)', terms are provided in English, Spanish, French, Arabic, Chinese, and Russian, with checkboxes for 'Preferred' and 'W' (work in progress).
- SPARQL Query Editor:** A text area for writing SPARQL queries. It includes a 'Query language' dropdown (set to SPARQL 1.1 Query) and a 'Query' text area containing a query for 'residual effects'. Below the query is a 'Powered by Fast SPARQL Editor' logo.
- Recent Changes Log:** A table showing a history of actions performed on the system. The table has columns for 'Concept / Term / Relationship / Status', 'Change', 'Old value', 'Action', 'User', and 'Date'. It lists various actions like 'validation-accepted', 'concept-create', 'concept-delete', 'term-add', 'user-create', 'user-delete', 'concept-add-relationship-create', 'concept-create', 'concept-delete', and 'user-create'.

SPARQL Editing with syntax completion and highlight

The full history of actions per each project is stored inside VB and can be inspected by users (clients may also subscribe to its associated RSS feed)

Powered by Semantic Turkey!





# Why was it built?



Maintenance of:

**AGROVOC** (big agriculture vocabulary developed by FAO)

- >32 000 concepts in up to 22 languages
- A global group of terminologists.
- No tool to support their work
- No existing tool that met all of FAO's needs



# VocBench → VocBench 2



- VocBench was an internal FAO project (originally called Agrovoc Concept Server)
- VocBench 2 (a collaboration between FAO and Tor Vergata University) has been the first attempt at an open source collaborative platform for thesauri management



# The VocBench2 Team



[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.*



[Johannes Keizer](#)

PhD, FAO Team Leader  
Food and Agriculture Organization of the United Nations

*He dreamed it, he wanted it, he made it real.*



[Sachit Rajbhandari](#)

PhD Student, University of Tasmania, Australia  
FAO Information Management Specialist

VocBench GWT WebApp Main Developer

*He created it, he was there at the beginning and even before.*



[Yves Jaques](#)

FAO Information & Knowledge Management Officer  
Food and Agriculture Organization of the United Nations

*He raised it and drove it all the way to glory.*



[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!"*



[Caterina Caracciolo](#)

PhD, FAO Senior Information Specialist  
Food and Agriculture Organization of the United Nations

*The [Agrovoc](#) Queen, she's continuously trying to make sense of all the weird people here.*

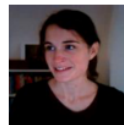


[Manuel Fiorelli](#)

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.*



[Sarah Dister](#)

FAO Knowledge Management Specialist  
Food and Agriculture Organization of the United Nations

*A new blossom in the [Agrovoc](#) garden, but already sweet nectar for VocBench!*



[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!*



# Requirements for VB2



- R1.** Multilingualism
- R2.** Controlled Collaboration
- R3.** Data Interoperability and Consistency
- R4.** Software Interoperability/Extensibility
- R5.** Scalability
- R6.** Under-the-hood data access/modification
- R7.** Ease-of-use for users and system admin.



# ...and here it was VB2



Signed in as Administrator (Administrator) to: Eurovoc-Euvoc

Global data management Administration About VocBench English RSS feed Preferences Help Sign out

VocBench VERSION 2.3 [Build 20150423] [DEVELOPMENT]

Exact word Go Advanced search

Recent changes Concepts Properties Schemes Validation SPARQL ICV

Concept navigation history Content language

Concepts Show URI Show non-preferred

- currency reform (en); currency situation (en); monetary policy (en); money policy (en); política monetaria (es); reforma monetaria (es); situación monetaria (es); politica monetaria (it); riforma monetaria (it); situazione monetaria (it); stabilità monetaria (it)
- bank of issue (en); central bank (en); federal bank (en); national bank (en); banco central (es); Banco de España (es); banco emisor (es); banco federal (es); banco nacional (es); banca centrale (it); banca d'emissione (it); banca federale (it); banca nazionale (it); istituto d'emissione (it)
- currency adjustment (en); ajuste monetario (es); aggiustamento monetario (it); rettifica monetaria (it)
  - currency revaluation (en); revaluation (en); revalorización monetaria (es); revaluación (es); revaluación monetaria (es); rivalutazione (it); rivalutazione della moneta (it); rivalutazione monetaria (it)
  - devaluation (en); depreciación monetaria (es); devaluación (es); deprezzamento della moneta (it); svalutazione (it); svalutazione monetaria (it)
- issuing of currency (en); emisión de moneda (es); emisión monetaria (es); emissione di moneta (it); emissione monetaria (it)
- liquidity control (en); open-market operations (en); open-market policy (en); control de liquidez (es); mercado abierto (es); open market (es); operación de mercado abierto (es); política de mercado abierto (es); controllo della liquidità (it); operazione di mercato libero (it); politica di mercato libero (it)
- Economic and Monetary Union (en); EMU (en); Werner plan (en); Werner report (en); Informe Werner (es); Plan Werner (es); UEM (es); Unión Económica y Monetaria (es); piano Werner (it); rapporto Werner (it); UEM (it); Unione economica e monetaria (it)
- coordination of EMU policies (en); coordinación de políticas UEM (es); coordinamento delle politiche UEM (it)
  - multilateral surveillance (en); vigilancia multilateral (es); sorveglianza multilaterale (it)
  - Stability and Growth Pact (en); stability pact (en); pacto de estabilidad (es); Pacto de Estabilidad y Crecimiento (es); patto di stabilità (it); patto di stabilità e crescita (it)
  - Economic and Financial Committee (en)
  - ESCB (en); European System of Central Banks (en); SEBC (es); Sistema Europeo de Bancos Centrales (es); SEBC (it); Sistema europeo di banche centrali (it)
  - single exchange-rate policy (en); política de cambios única (es); politica unica dei cambi (it)
  - single monetary policy (en); política monetaria única (es); politica monetaria unica (it)
  - timetable for EMU (en); calendario de la UEM (es); calendario dell'UEM (it)

coordination of EMU policies (en); coordinación de políticas UEM (es); coordinamento delle politiche UEM (it)

Show inferred and explicit Show/hide tabs

Terms (27) Definition (0) Attribute (0) Relationships (5) Alignment (0) Note (0) Annotation (0) Image (0) Schemes (2) Hierarchy History (0)

Add new term

| Language                 | Term   |
|--------------------------|--|
| English (en)             | <input checked="" type="checkbox"/> <input type="checkbox"/> coordination of EMU policies (Preferred) W  |
| Español (es)             | <input checked="" type="checkbox"/> <input type="checkbox"/> coordinación de políticas UEM (Preferred) W   |
| Français (fr)            | <input checked="" type="checkbox"/> <input type="checkbox"/> coordination des politiques UEM (Preferred) W   |
| Português (pt)           | <input checked="" type="checkbox"/> <input type="checkbox"/> coordenação das políticas UEM (Preferred) W   |
| Cesky (cs)               | <input checked="" type="checkbox"/> <input type="checkbox"/> koordinace politik v Evropské měnové unii (Preferred) W   |
| Deutsch (de)             | <input checked="" type="checkbox"/> <input type="checkbox"/> Koordinierung der WWU-Politiken (Preferred) W   |
| Hungarian (hu)           | <input checked="" type="checkbox"/> <input type="checkbox"/> GMU-politikák összehangolása (Preferred) W  |
| Italiano (it)            | <input checked="" type="checkbox"/> <input type="checkbox"/> coordinamento delle politiche UEM (Preferred) W   |
| Polski (pl)              | <input checked="" type="checkbox"/> <input type="checkbox"/> koordynacja polityk UGW (Preferred) W   |
| Slovak (sk)              | <input checked="" type="checkbox"/> <input type="checkbox"/> koordinácia politik EMÚ (Preferred) W   |
| Swedish (sv)             | <input checked="" type="checkbox"/> <input type="checkbox"/> samordning av EMU-politik (Preferred) W   |
| suomi, suomen kieli (fi) | <input checked="" type="checkbox"/> <input type="checkbox"/> EMU-politiikkujen yhteensovittaminen (Preferred) W  |
| српски језик (sr)        | <input checked="" type="checkbox"/> <input type="checkbox"/> координација политика ЕМУ (Preferred) W   |
| Nederlands (nl)          | <input checked="" type="checkbox"/> <input type="checkbox"/> coördinatie van EMU-beleid (Preferred) W  |
| македонски јазик (mk)    | <input checked="" type="checkbox"/> <input type="checkbox"/> координација на политиките на Економската и монетарната унија (Preferred) W<br><input checked="" type="checkbox"/> <input type="checkbox"/> координација на политиките за ЕМУ W |

Legend Proposed Validated Published Revised Proposed deprecated Depreciated

Show more





# Functional Comparison (performed in 2014, for VB2)



Example 9 (non-entailment)  
 <A> skos:narrower <B> .  
 <A> skos:inScheme <MyScheme> .  
*does not entail*  
 <B> skos:inScheme <MyScheme> .

| Name       | License   | Free to use | Deployment          | Data Models                                | Import/Export  | Scheme Management         | Custom Relations      | Reasoner                        | Data quality             | Extendibility / Interoperability | ACL          | Workflow Management | Collaboration, Content Validation  | RDF Middleware  | RDF Backend                              | SPARQL Querying  | Semantic Integration  |
|------------|---|-------------|---------------------|--|--|---------------------------|-----------------------|---------------------------------|--------------------------|----------------------------------|--------------|---------------------|------------------------------------|---|--|--|---|
| VocBench   | GNU GPLv3 (web application), Mozilla Public License MPL (Semantic Turkey) | Yes         | Web application     | SKOS-XL, SKOS through offline scaling tool | SKOS(-XL), versatile spreadsheet import (through ST Firefox UI)                      | Yes                       | Creation, Import, use | Depends on triple store         | Metrics                  | API, shared backend, pluggable   | Yes          | Yes                 | Change feed, validation            | OWL ART API (connectors to others: Sesame2 bundled)         | provided by Sesame2, or other connectors | Yes  | assisted (browse&search) linking of resources from other projects / manual linking of LOD resources. Extensions for RDF lifting from unstructured content |
| PoolParty  | Proprietary   | No          | Web application     | SKOS, SKOS-XL add-on                       | SKOS(-XL), static spreadsheet import   | Only top concepts         | Creation, Import, use | Depends on triple store         | Metrics Validation rules | REST API                         | Yes          | Yes (addon)         | History, versioning, validation    | Sesame SAIL API   | provided by Sesame2                      | Yes  | Linking Text Mining & Entity Extraction, Search function  |
| WebProtégé | Mozilla Public License (MPL)  | Yes         | Web application     | OWL 2, OBO                                 | OWL  | Not applicable            | Creation, Import, use | No, external reasoning possible | Metrics                  | API, shared backend, pluggable   | Yes          | No                  | Discussion, watching, changes feed | OWL API   | provided by Protégé 3                    | No   | linking to BioPortal  |
| TemaTres   | GNU General Public License version 2.0 (GPLv2)                            | Yes         | Web application     | Term based thesaurus organization          | MADS, SKOS-Core, Zthes, Others Import from: Skos-Core, tabulated or tagged text file | One scheme per vocabulary | Creation, use         | No                              | Metrics, Reports         | API                              | Yes; limited | Yes; limited        | Limited validation                 | No RDF Middleware, SKOS RDF/XML available only as an export | Relational database (MySQL by default)   | Not native, no realtime, can export data to a SPARQL endpoint through ARC2 (RDF library for PHP) | Linking between vocabularies, Entity Extraction (via addon)   |
| SKOSEd     | GNU Lesser GPL  | Yes         | Desktop application | SKOS                                       | SKOS   | Only top concepts         | Creation, Import, use | Depends on available plugins    | KB consistency           | Pluggable                        | No           | No                  | No                                 | OWL API (used by Protégé 4)                                 | provided by Protégé 4 (OWL API)          | Yes (inherited from Protégé 4)   | N/A   |



# User Community and Evaluation

Online Questionnaire:

[http://vocbench.uniroma2.it/purl/VocBench-User-Questionnaire\\_2014-10.zip](http://vocbench.uniroma2.it/purl/VocBench-User-Questionnaire_2014-10.zip)

**USE\*** questionnaire: <http://hcibib.org/perlman/question.cgi?form=USE>  
values ranging from 1 to 7

Lund, A.M. (2001) *Measuring Usability with the USE Questionnaire*. STC Usability SIG Newsletter, 8:2.

collected 11 anonymous responses

## USE Values

|               | Usefulness | Ease of use | Ease of learning | Satisfaction |
|---------------|------------|-------------|------------------|--------------|
| Global        | 5,34       | 4,49        | 5,11             | 4,93         |
| Experienced   | 5,58       | 4,66        | 5,18             | 5,02         |
| Inexperienced | 4,97       | 4,19        | 5,00             | 4,79         |

## Feature Evaluation

|                                 | easy to use | effective | interesting |
|---------------------------------|-------------|-----------|-------------|
| History                         | 5,38        | 5,50      | 6,33        |
| SPARQL Querying                 | 4,00        | 5,40      | 6,29        |
| Publication Workflow Management | 5,50        | 5,63      | 6,22        |
| Collaborative Management        | 5,75        | 5,88      | 6,11        |
| Scheme Management               | 4,83        | 5,17      | 5,57        |
| Role-based Access Control       | 5,33        | 5,22      | 5,40        |
| Reasoning                       | 4,29        | 4,43      | 5,38        |
| Triple Store Connectivity       | 3,67        | 4,50      | 5,00        |



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:

- Author
- :send SOME :Registration\_form
- :occupy SOME :Presenter\_house
- :prepare SOME :Transparency
- :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...

# TOWARDS VOCBENCH 3



# 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.*

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<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

ISA<sup>2</sup>

Interoperability solutions for public administrations, businesses and citizens

other users (just some of them, pls forgive any omission!)



Food and Agriculture Organization of the United Nations



IEDA  
INTERDISCIPLINARY  
EARTH DATA ALLIANCE



INRA  
SCIENCE & IMPACT



Senato della Repubblica



Scottish Government  
Riaghaltas na h-Alba  
gov.scot



www.cabi.org



UNCCD



United Nations  
Environment Programme



# Requirements for VB2



- R1.** Multilingualism
- R2.** Controlled Collaboration
- R3.** Data Interoperability and Consistency
- R4.** Software Interoperability/Extensibility
- R5.** Scalability
- R6.** Under-the-hood data access/modification
- R7.** Ease-of-use for users and system admin.



# Requirements for VB3

**R1.** Multilingualism

**R2.** Controlled Collaboration

**R3.** Data Interoperability and Consistency

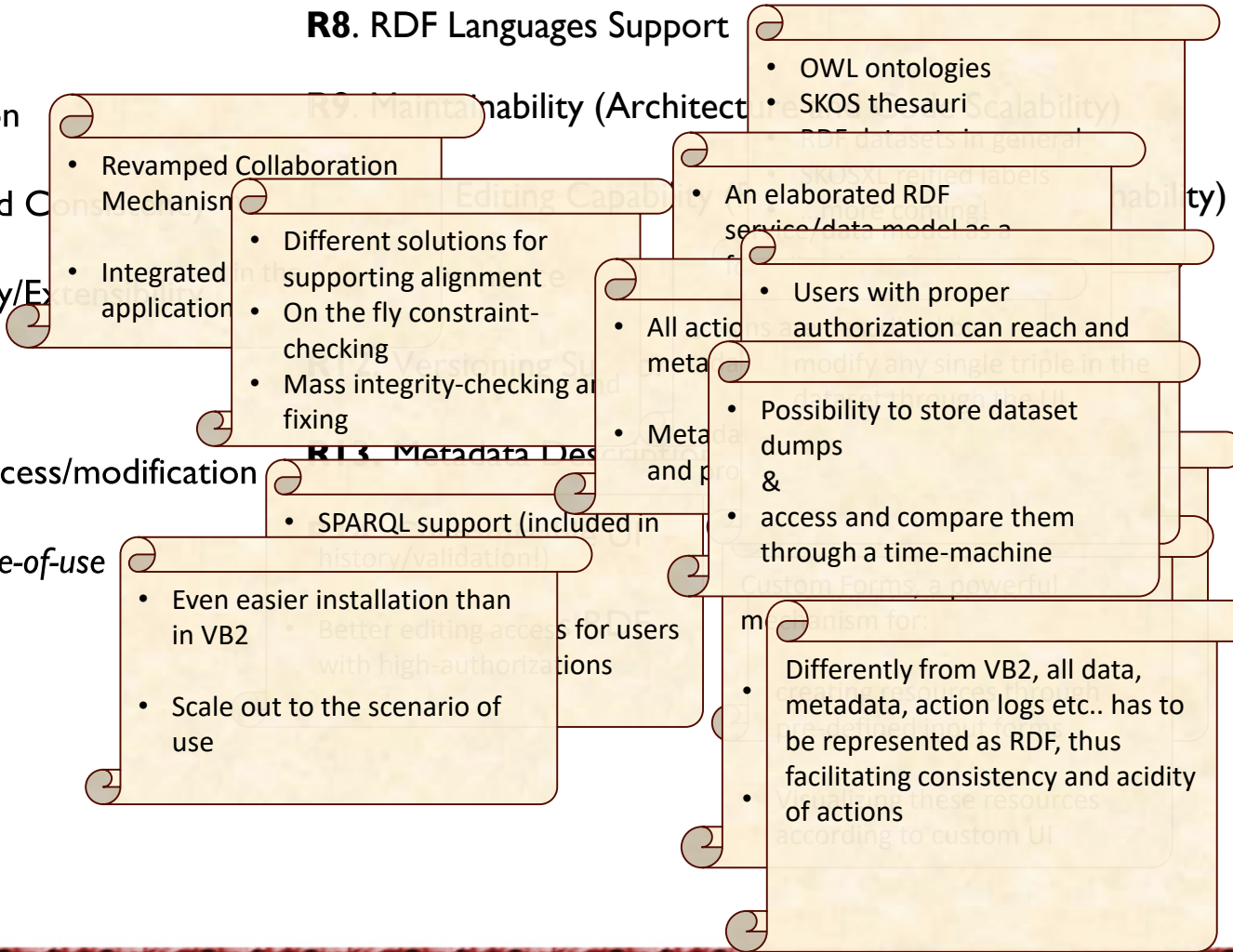
**R4.** Software Interoperability/Extensibility

**R5.** Data Scalability

**R6.** Under-the-hood data access/modification

**R7.** Adaptive Context and Ease-of-use

**R8.** RDF Languages Support







# Technological Stack in VB3: Changes



## Lightweight Presentation Layer

- Angular (previously known as Angular 2)

## Business Logic all in ST, including:

- User Management/Auth
- Data Validation/History

## Commit to Sesame framework

- Nowadays (a) winning middleware
- No relevant triple store is incompatible with Sesame
- Recently rebaptized as RDF4J, under the Eclipse umbrella
- Maintaining a neutral middleware such as OWLART is no more cost-effective

Presentation (Angular)

Semantic Turkey

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

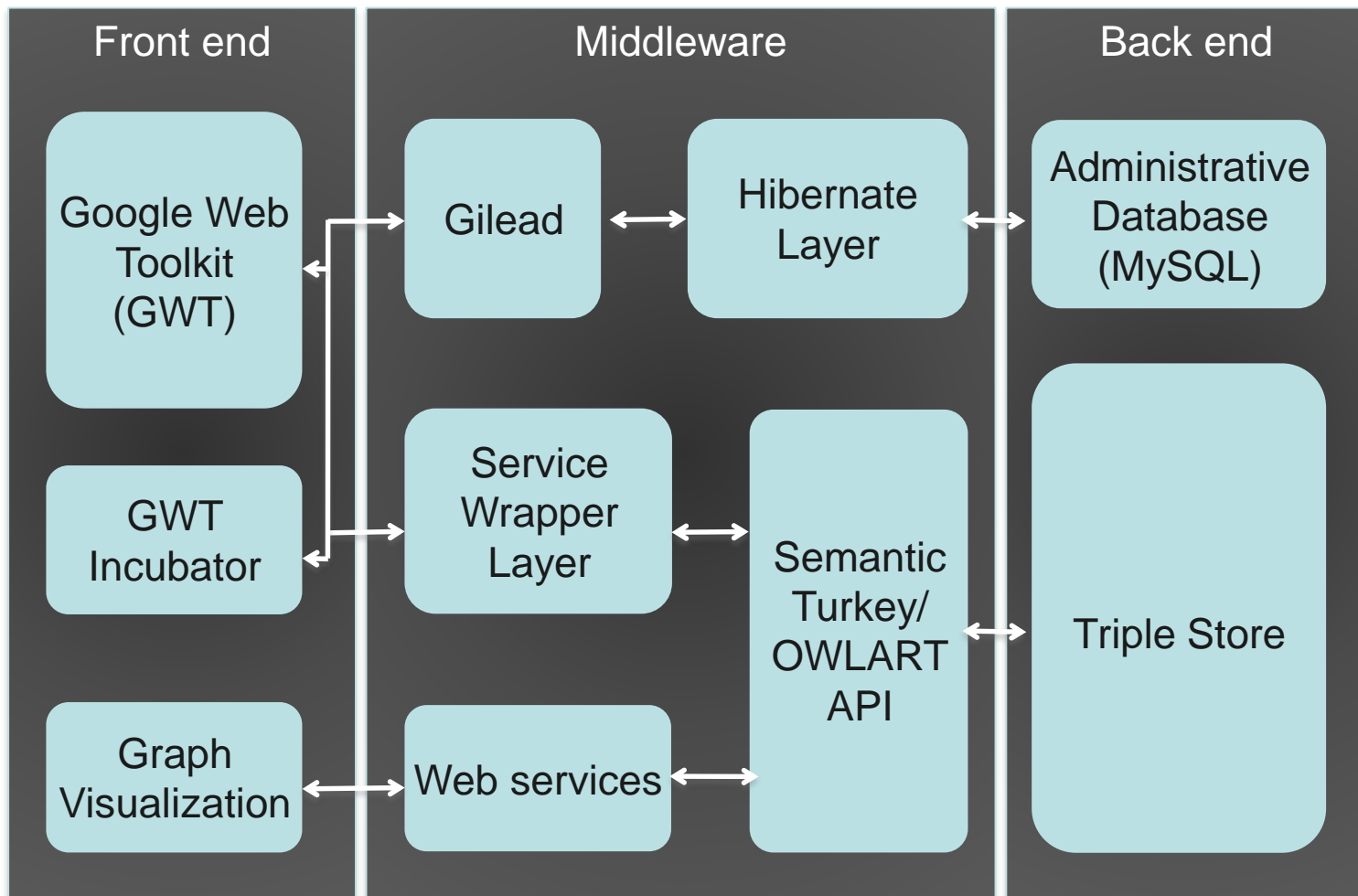
Specific Triple Store  
Optimizations (e.g. Search)

RDF4J

Vendor Triple store



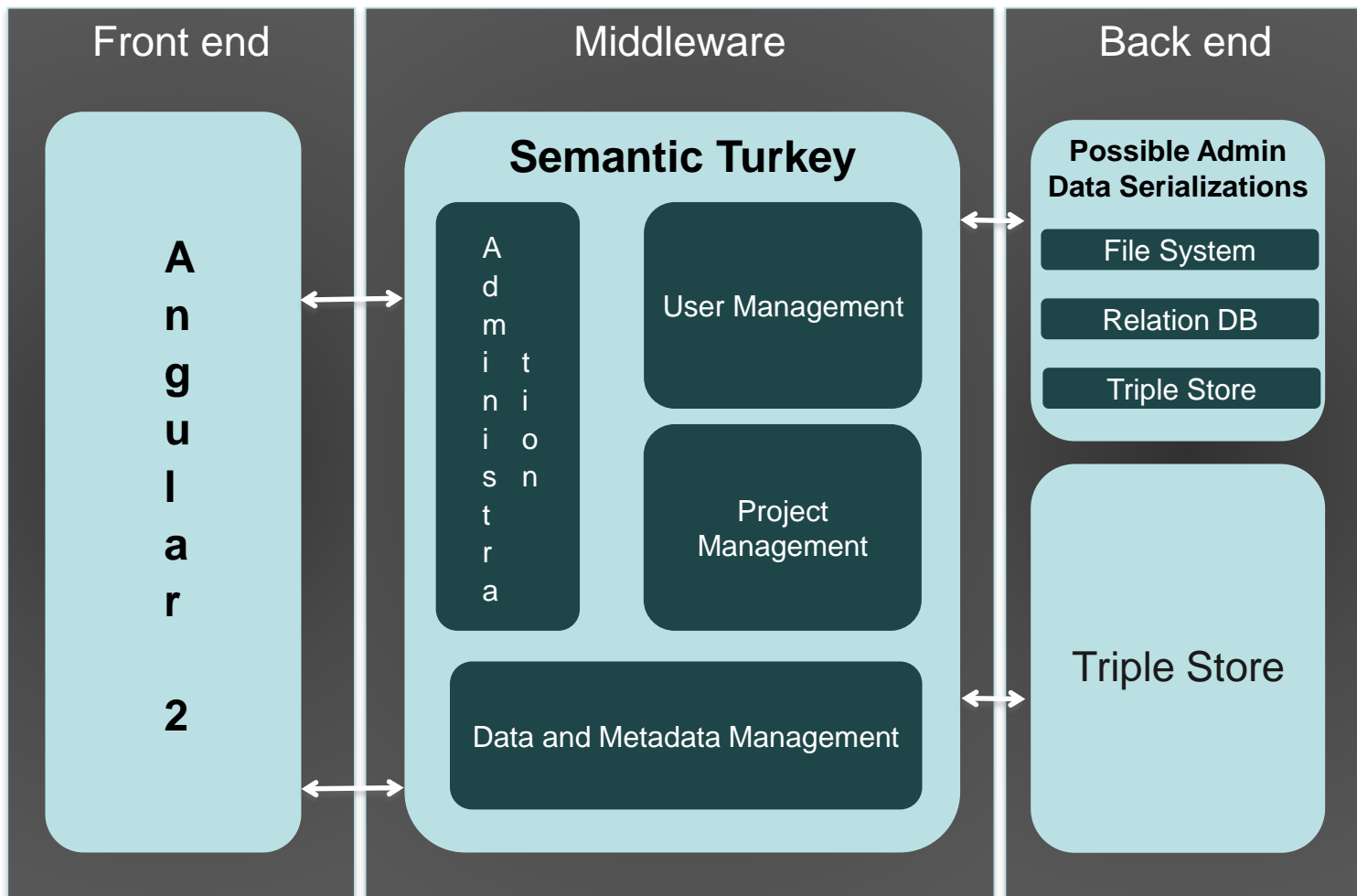
# From Vocbench 2.0 Components...





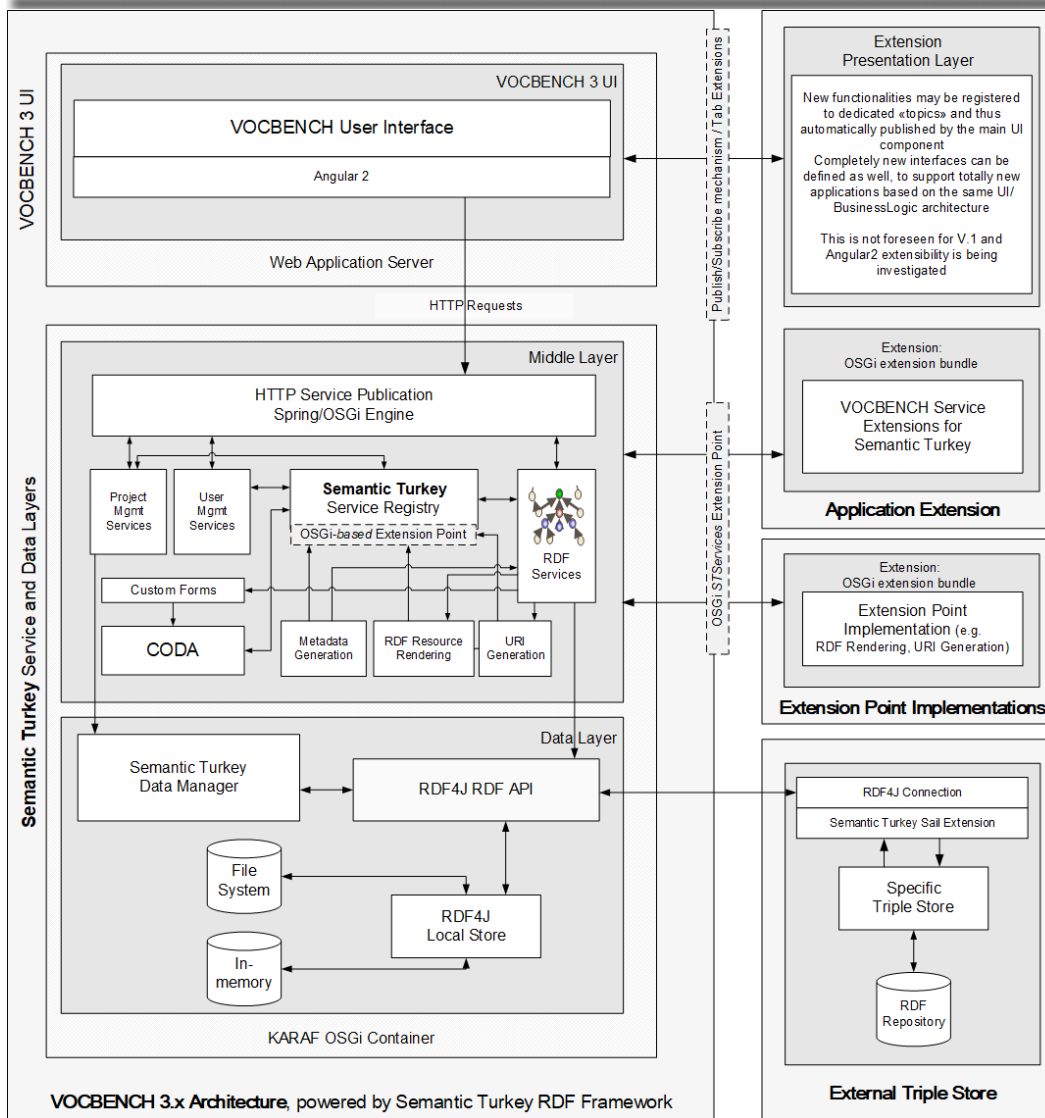


# ...to VB 3





# 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



# ..AND FEATURES



# A new User Interface

- **Technology: Angular**
- **Approach**
  - **A single resource-view showing every**
  - vs**
  - VB2's several tabs**
  - **Serving any kind of resource**
  - **Inspecting any detail of them**
  - **Custom Forms**

R14. Customizable UI

R10. Full Editing Capability (RDF Observability&Reachability)

The screenshot shows a web browser displaying a SKOS concept page for 'agricultural performance (en, risultato dell'attività agricola (it))'. The page includes a breadcrumb trail, a title bar, and several sections: 'Types' (skos:Concept), 'Top Concept of' (EuroVoc, 5616 farming systems), 'Schemes' (EuroVoc, 5616 farming systems), 'Broaders', 'Lexicalizations' (a list of translations in various languages), 'skos:altLabel' (mezőgazdasági hatékonyság), and 'skos:related' (profit, economic accounts for agriculture). The URL is http://eurovoc.europa.eu/3005.



# A new UI

The screenshot shows the VocBench web application interface. The browser address bar displays `localhost:1979/vocbench3/#/Data`. The application has a navigation menu with tabs for **VocBench**, **Projects**, **Data**, **SPARQL**, and **Tools**. The **Data** tab is active, showing a class hierarchy on the left and a detailed view of a selected class on the right.

**Class Hierarchy (Left Panel):**

- Class: **administrative law (en), diritto amministrativo (it)** (selected)
- Subclasses:
  - administrative contract (en), contratto amministrativo (it)
  - administrative measure (en), atto amministrativo (it)
    - circular (en), circolare (it)
  - administrative offence (en), infrazione amministrativa (it)
  - administrative powers (en), competenza amministrativa (it)
  - administrative procedure (en), procedura amministrativa (it)
  - administrative responsibility (en), responsabilità amministrativa (it)
  - administrative sanction (en), sanzione amministrativa (it)
  - delegation of power (en), delega di potere (it)



# UI and Multilingualism (R1)

The screenshot shows the VocBench web application interface. The browser address bar displays `localhost:1979/vocbench3/#/Data`. The current project is set to `EUROVOC`. The main navigation bar includes `VocBench`, `Projects`, `Data`, `SPARQL`, and `Tools`. A message at the top right states: `...we lost multilingual UI...will come back soon!`

The interface is divided into several sections:

- Left Panel (Class/Concept/Scheme/Collection/Property):** A tree view of concepts. The `financial accounting (en), contabilità generale (it)` concept is selected and highlighted with a red box.
- Right Panel (Concept Details):** A detailed view of the selected concept. It includes sections for `Types` (showing `skos:Concept`), `Top Concept of`, `Schemes` (showing `EuroVoc (en), EuroVoc (it)` and `4026 accounting (en), 4026 gestione contabile (it)`), `Broaders` (showing `accounting (en), contabilità (it)`), and `Lexicalizations` (showing various language labels like `общо счетоводство`, `finanční účetnictví`, `eksternt regnskab`, `allgemeine Buchhaltung`, `γενική λογιστική`, and `financial accounting`).
- User Profile (Armando Stello):** A dropdown menu with options: `View profile`, `Preferences` (highlighted with a red box), `Administration`, and `Log out`.

Annotations with red lines and arrows point to specific features:

- `...and visualization` points to the `Types` section.
- `multilingual editing` points to the `Lexicalizations` section.
- `Language preferences` points to the `Preferences` option in the user profile menu.

The footer of the application displays `© ART Group, 2016`.



# UI and Multilingualism (R1)

The screenshot shows the VocBench web application interface. The browser address bar indicates the URL is localhost:1979/vocbench3/#/Preferences. The page title is "VocBench Preferences". The main content area is titled "VocBench Preferences" and contains several sections:

- Resource view mode:** A dropdown menu set to "Splitted". Below it, a blue box explains: "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." To the right, three icons represent different view modes: a tree view, a "Res. View" card, and another "Res. View" card.
- Rendering Languages:** A list of languages with checkboxes. The "en" (English) checkbox is checked. A red box highlights this section.
- Other preferences:** A section with checkboxes for "Show flags" (checked) and "Show instances number" (checked). Below this is a "Project theme" section with a color palette. A red box highlights the "Show flags" checkbox.

A red box labeled "Language preferences" points to the "Rendering Languages" section. Another red box labeled "Language preferences" points to the "Show flags" checkbox.

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# Custom Forms



**Create Custom Form**

ID:  Person \*

Name:  \*

Description:  \*

Type:  \*

Ref:  \*

```
18
19 //uri of the new resource
20 resource uri stdForm/resource .
21
22 //in case of SKOS project, the label of the resource is a simple literal
23 label literal stdForm/label .
24
25 //in case of SKOSXL project, the label of the resource is a skosxl:Label composed by its URI and a
26 skos:literalForm
27 xLabel uri stdForm/xLabel .
28 lexicalForm literal stdForm/lexicalForm .
29
30 //language tag of the label
31 labelLang literal stdForm/labelLang .
32
33 //the user logged in the current session can be referenced too
34 user uri session/user .
35
36 }
```

Show property chain:  \*

Ok Cancel

A feature-structure-based language<sup>1</sup> 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

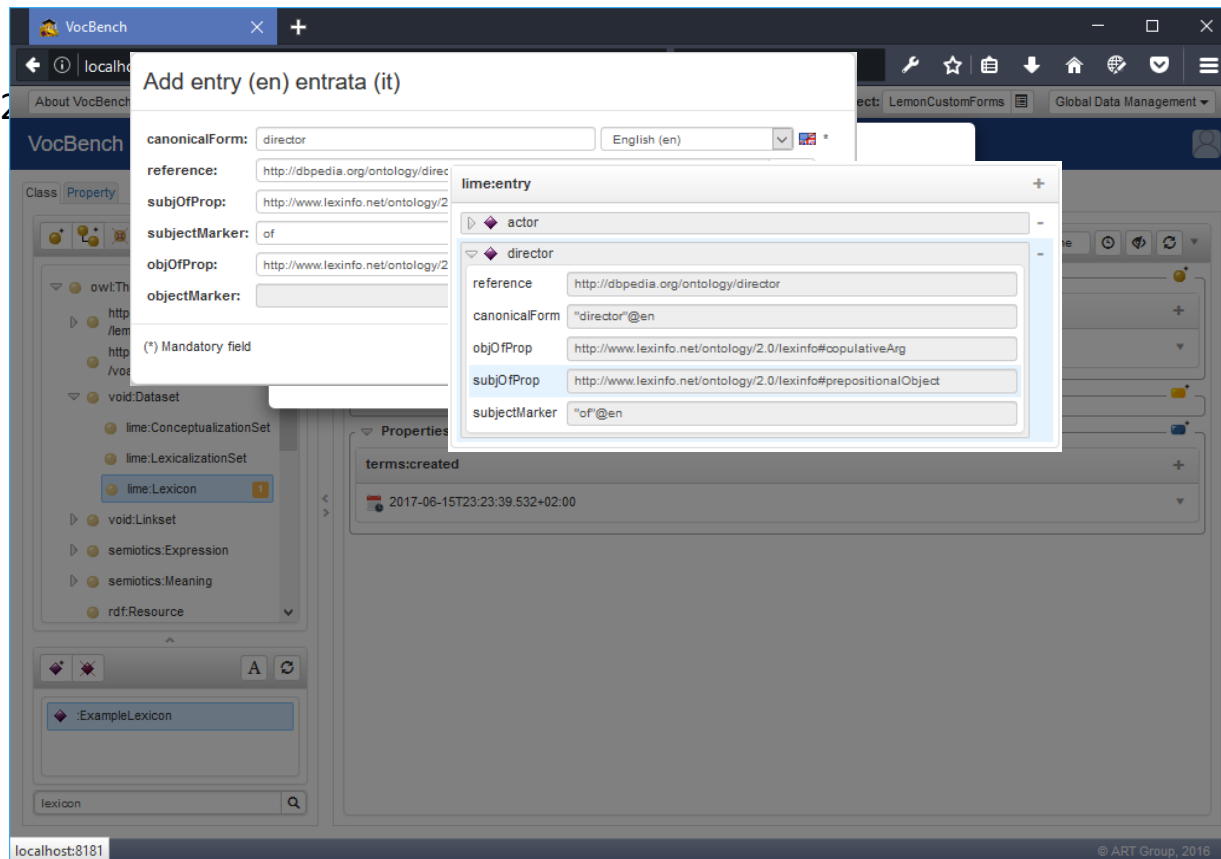




# Custom Forms

- 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/2011/02/lexinfo/>



\* 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)

R2. Controlled Collaboration!

## 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

R9. Maintainability (Architecture and Code Scalability)

The screenshot shows the VocBench web interface. On the left, a sidebar lists projects: EUROVOC, Little\_SKOS\_Test, and LittleOWLTest. The main area shows a list of roles, with 'lex\_contributor' selected. A modal dialog box titled 'Add capability to lex\_contributor' is open, showing the following configuration:

- Topic: (empty)
- Area:  RDF,  RBAC,  PM,  UM,  CFORM,  SYS
- Subject and scope:
- CRUDV:  Create,  Read,  Update,  Delete,  Validate
- Capability expression: `capability(rdf(lexicalization),"CR")`

Buttons for 'Ok' and 'Cancel' are at the bottom right of the dialog.

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



# Advanced History and Change Tracking mechanism



The screenshot shows the VocBench web application interface. The main content area displays a list of terms for the class 'contract staff (en), personale a contratto (it)'. The terms are listed with their respective language codes and flags. Two terms are highlighted with red boxes and annotations:

- contrattisti**: Annotated with a red box and a red arrow pointing to the text "In green, italic, suggested added content".
- ~~personale non statuario~~: Annotated with a red box and a red arrow pointing to the text "In red, strike-through, suggested content to be deleted".

Other terms in the list include: personal eventual, koosseisuvälised töötajad, henkilöstösääntöjen soveltamisalaan kuulumaton henkilöstö, ulkopuolinen henkilöstö, personnel externe, personnel non statuaire, osoblje zaposleno na temelju ugovora, határozott időre kinevezett tisztviselők, a személyzeti szabályzat hatálya alá nem tartozó alkalmazottak, külső személyzet, laisvai samdomi darbuotojai, sutarfiniai darbuotojai, and ārštata darbinieki.

The interface also shows a left sidebar with a class hierarchy, a top navigation bar with tabs for Projects, Data, SPARQL, History, Validation, and Tools, and a bottom status bar with the text "© ART Group, 2016".



# Advanced History and Change Tracking mechanism

## Landscape analysis for realizing H&TC

Fiorelli, M., Paziienza, 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* triples
    - reified *historied* triples
- fine-grained representation complemented with rich metadata about invoked 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

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 |
|---|-----------------------|--|---|---|--------------------|----------|
| <a href="http://eurovoc.europa.eu/metadata#a9b7589c-0eb9-4146-8f44-9f9c9e6924b6">http://eurovoc.europa.eu/metadata#a9b7589c-0eb9-4146-8f44-9f9c9e6924b6</a> | 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 | -----    |
| <a href="http://eurovoc.europa.eu/metadata#a3ffab79-da68-4f15-8838-f1f00b0a435f">http://eurovoc.europa.eu/metadata#a3ffab79-da68-4f15-8838-f1f00b0a435f</a> | SKOSXL/addAltLabel    | concept: <http://eurovoc.europa.eu/5784> | literal: "contrattisti"@it ...            | Armando Stellato <stellato@uniroma2.it> | 18/9/2017 14:47:29 | -----    |

1 of 1 Accept all Reject all Validate

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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



# Advanced History and Change Tracking mechanism



The screenshot shows the VocBench web application interface. A modal dialog titled "SKOSXL/addAltLabel parameters" is open, displaying a table of parameters:

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

The background interface shows a "Staged commits" table with two entries:

| Commit  |
|---|
| <a href="http://eurovoc.europa.eu/metadata#a9b7589c-0eb9-4146-8f44-...">http://eurovoc.europa.eu/metadata#a9b7589c-0eb9-4146-8f44-...</a> |
| <a href="http://eurovoc.europa.eu/metadata#a3ffab79-da68-4f15-8838-...">http://eurovoc.europa.eu/metadata#a3ffab79-da68-4f15-8838-...</a> |

At the bottom right of the interface, there are buttons for "Accept all", "Reject all", and "Validate".



# Advanced History and Change Tracking mechanism



Operation sort: Unordered ↓ Time sort: Descending ↓ Show filters ▼

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

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

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# Advanced History and Change Tracking mechanism



The screenshot shows the VocBench web interface. A modal window titled "Commit details" is open, displaying a table of commit changes. The table has four columns: Subject, Predicate, Object, and Context. The first row shows a modification to the dct.modified property. The second row shows the addition of an skosxl:altLabel. The third and fourth rows show the addition of an skosxl:Label with a specific type and literal form.

|   | Subject         | Predicate          | Object  | Context |
|---|-----------------|--------------------|---|---------|
| + | :5784           | dct.modified       | "2017-09-18T14:47:29.353+02:00"^^xsd:dateTime | :       |
| + | :5784           | skosxl:altLabel    | :xl_it_5452e517                               | :       |
| + | :xl_it_5452e517 | rdf:type           | skosxl:Label                                  | :       |
| + | :xl_it_5452e517 | skosxl:literalForm | "contrattisti"@it                             | :       |

The background interface shows a list of commits with columns for Date and a 'Show filters' button. The current project is EUROVOC\_HV.

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



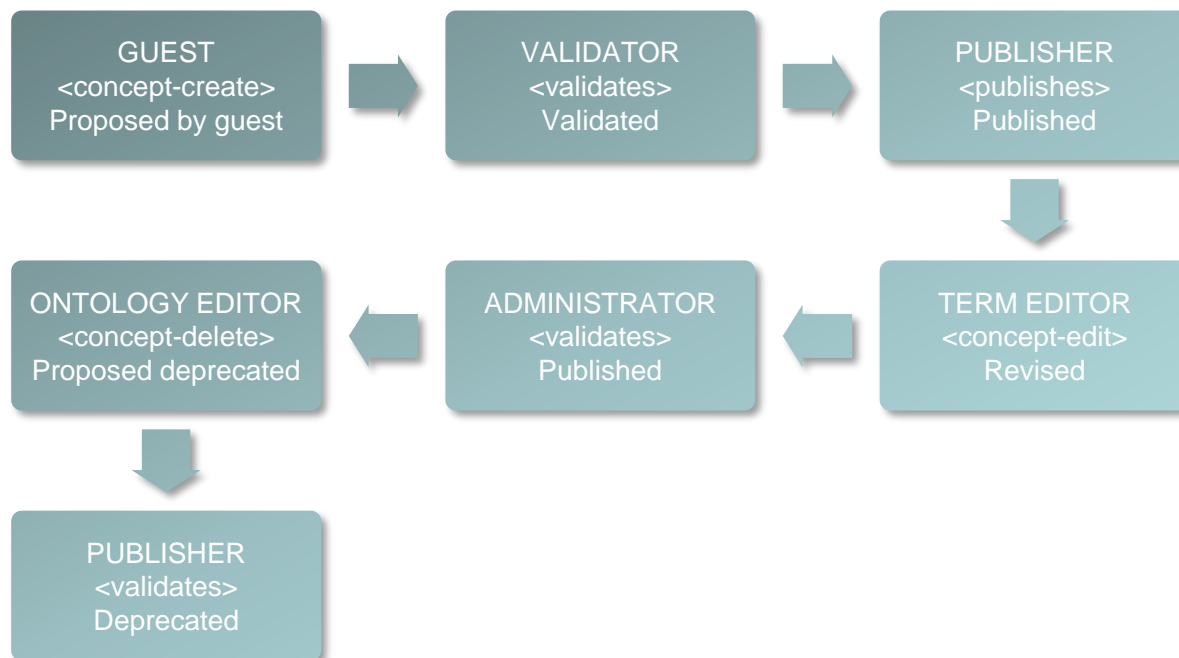


# More Powerful yet Streamlined Workflow Management

## 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



# Improved and More Complete Support for SKOS



## Support for viewing multiple schemes

The screenshot shows the VocBench web application interface. The browser address bar displays `localhost:1979/vocbench3/#/Data`. The application has a navigation menu with '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)', and '5211 natural environment (en), 5211 ambiente naturale (it)'. A search bar is located at the bottom of the list.

| Concept ID | English Label                               | Italian Label                         |
|------------|---|---------------------------------------|
| 4811       | organisation of transport (en)              | organizzazione dei trasporti (it)     |
| 4816       | land transport (en)                         | trasporti terrestri (it)              |
| 4821       | maritime and inland waterway transport (en) | trasporti marittimi e fluviali (it)   |
| 4826       | air and space transport (en)                | trasporti aerei e spaziali (it)       |
| 5206       | environmental policy (en)                   | politica dell'ambiente (it)           |
| 5211       | natural environment (en)                    | ambiente naturale (it)                |
| 5216       | deterioration of the environment (en)       | degrado ambientale (it)               |
| 5606       | agricultural policy (en)                    | politica agricola (it)                |
| 5611       | agricultural structures and production (en) | produzione e strutture agricole (it)  |
| 5616       | farming systems (en)                        | orientamento produttivo agricolo (it) |
| 5621       | cultivation of agricultural land (en)       | coltivazione di terreni agricoli (it) |
| 5626       | means of agricultural production (en)       | mezzo di produzione agricola (it)     |
| 5631       | agricultural activity (en)                  | attività agricola (it)                |
| 5636       | forestry (en)                               | foresta (it)                          |
| 5641       | fisheries (en)                              | pesca (it)                            |
| 6006       | plant product (en)                          | prodotto vegetale (it)                |
| 6011       | animal product (en)                         | prodotto animale (it)                 |
| 6016       | processed agricultural products (en)        | prodotti agricoli trasformati (it)    |

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# Improved and More Complete Support for SKOS

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

**Create a skos:narrower** (skos:Concept)

Label:  English (en)

URI:  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



# Improved and More Complete Support for SKOS



## Support for Collections (Unordered and Ordered)

The screenshot shows the VocBench web interface in a browser window. The address bar shows `localhost:1979/vocbench3/#/Data`. The current project is `EUROVOC`. The interface is divided into several sections:

- Left Panel:** A tree view showing the hierarchy of classes. `Countries (en)` is selected, and it contains a sub-class `Republics (en)`.
- Right Panel:** A detailed view of the selected `Countries (en)` class. It shows the following properties:
  - Types:** `skos:Collection`
  - Lexicalizations:** `skosxl:prefLabel` with the value `Countries`.
  - Notes:** (Empty)
  - Members:** `skos:member` with two members:
    - `Republics (en)`
    - `Luxembourg (en), Lussemburgo (it)`
    - `Italy (en), Italia (it)`
  - Properties:** `dct:created` (2017-09-18T16:42:41.964+02:00) and `dct:modified` (2017-09-18T16:52:01.234+02:00).

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# OWL Support

R8. RDF Languages Support

Class Tree, Instance List, OWL Editing Support

The screenshot shows the VocBench web interface. On the left is a class tree with 'ist:Speaker' selected. The main area displays the 'Class axioms' for 'ist:Speaker', where a red box highlights the 'rdfs:subClassOf' section containing Manchester expressions: 'ist.give SOME ist.Lecture', 'ist.write SOME ist.Final\_manuscript', and 'ist.Delegate'. A red arrow points from this box to the text 'Support for Manchester expressions' at the bottom. The right panel shows the 'ist.write SOME ist.Final\_manuscript' property configuration, including 'owl:someValuesFrom' and 'owl:onProperty'.

Support for Manchester expressions



# OWL Support



## «Inferred» View

The screenshot shows the VocBench web interface. The browser address bar indicates the URL `localhost:1979/vocbench3/#/Data`. The current project is `My_Personal_Ontology`. The interface is divided into several panels:

- Class Hierarchy:** A tree view on the left shows the class `ist:Speaker` selected, with its subclasses `ist:Author`, `ist:Lecturer`, `ist:Plenary_lecturer`, `ist:Tutorial_speaker`, `ist:Reviewer`, `ist:Technical_committee_member`, and `ist:Sponsor`.
- Class Properties:** The main panel displays the inferred properties for `ist:Speaker`. It includes:
  - Types:** `rdf:type` with values `Class`, `Resource`, and `Thing`.
  - Class axioms:** `rdfs:subClassOf` with values including `ist:go_through SOME ist:Registration`, `ist:pay SOME ist:Registration_fee`, `ist:occupy SOME ist:Presenter_house`, `ist:Person OR ist:Item`, `ist:Delegate`, `ist:is_present_in SOME ist:Conference_days`, `ist:is_present_in SOME ist:Conference_building`, `ist:Activity OR ist:Person`, `ist:need SOME ist:Viza`, and `ist:send SOME ist:Registration_form`.
  - owl:disjointWith:** `ist:Non_speaker`.
- Property Properties:** The right panel shows the inferred properties for the property `ist:write SOME ist:Final_manuscript`. It includes:
  - Types:** `rdf:type` with values `Thing`, `Class`, `Resource`, `Restriction`, and `Class`.
  - Class axioms:** `rdfs:subClassOf` with values `ist:write SOME ist:Final_manuscript` and `Thing`.
  - owl:equivalentClass:** `ist:write SOME ist:Final_manuscript`.
  - Lexicalizations:** (empty).
  - Properties:** `owl:sameAs` with value `ist:write SOME ist:Final_manuscript`, and `owl:someValuesFrom` with value `ist:Final_manuscript`.

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# SPARQL Querying and Update



The screenshot shows the VocBench web interface. The browser address bar displays `localhost:1979/vocbench3/#/Sparql`. The current project is `My_Personal_Ontology`. A modal window is open for the `Person` class, showing its properties and axioms.

**Person** `http://xmlns.com/foaf/0.1/Person`

- 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 background shows a SPARQL query editor with the following query:

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

Buttons for `Submit`, `Clear`, and `Include inferre` are visible. The bottom right corner of the interface shows `© ART Group, 2016`.





# 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



The screenshot shows the VocBench web application interface. A modal window titled "Select aligned resource" is open in the center. The modal contains the following fields and options:

- Project:** Teseo
- Align with:** Concept
- Concept Scheme:** <http://www.senato.it/teseo/tes>
- Concept List:**
  - 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)** (highlighted)
      - FUNERALI (it)
      - NOMADI (it)
      - QUALITA' DELLA VITA (it)

- Search:** folklore
- Buttons:** Ok, Cancel

The background interface shows a list of concepts on the left, including "regional culture (en), cultura regionale (it)", "customs regulations (en), regolamentazione doganale (it)", etc. The right side shows a list of aligned resources, including "popular culture (en), cultura popolare (it)".

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# Alignment Validation



VocBench Repositories | GraphDB V

localhost:1979/vocbench3/#/AlignmentValidation

Current project: **Iasted** Global Data Management

VocBench Projects Data SPARQL Tools

Alignment Validation: A Settings

Alignment file:

Source ontology baseURI:

Target ontology baseURI:

| 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                       | =           |                     | Accept  Reject |        |
| :Place                                   | http://sigkdd#Place                        | >           |                     | Accept  Reject |        |
| :Registration_fee                        | http://sigkdd#Registration_fee             | <           |                     | Accept  Reject |        |
| :Review                                  | http://sigkdd#Review                       | %           |                     | Accept  Reject |        |
| :Speaker                                 | http://sigkdd#Speaker                      | HasInstance |                     | Accept  Reject |        |
| :Sponsor                                 | http://sigkdd#Sponsor                      | InstanceOf  |                     | Accept  Reject |        |
| :Sponsor                                 | http://sigkdd#Sponsor                      | = (0.9)     |                     | Accept  Reject |        |

Quick Actions:

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# Declarative Service Implementation



## Previous service implementation

```
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();

    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);
    }
}
```

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

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

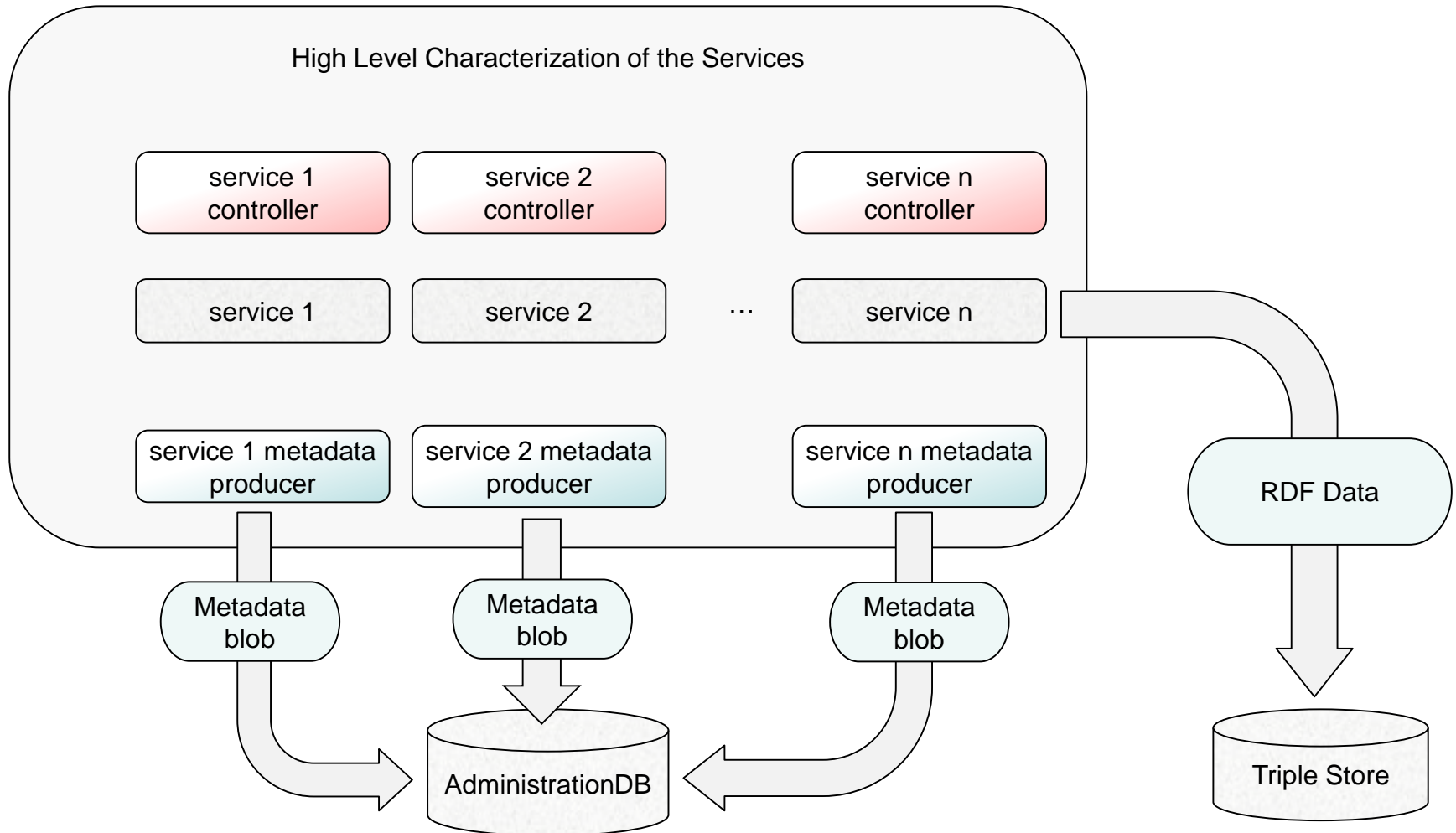
## Separation of service method-controller / automatic generation of controller

```
@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

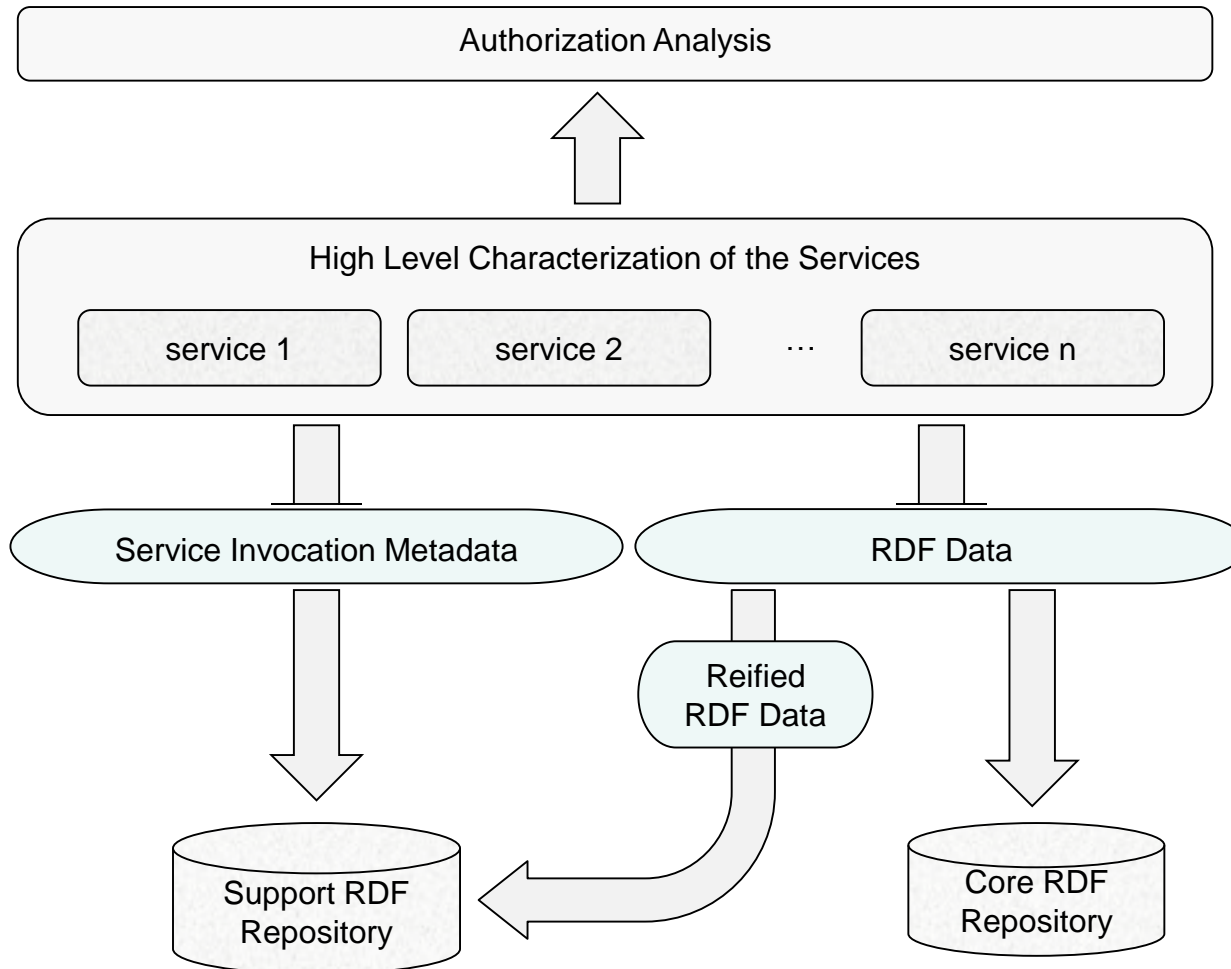


# Declarative Service Implementation





# Declarative Service Implementation





# Versioned datasets and metadata

## R12. Versioning Support

The screenshot shows the VocBench web interface. The browser address bar displays `localhost:1979/vocbench3/#/Data`. The current project is `My_Personal_Ontology`. The interface is divided into several sections:

- Left Panel (Class Hierarchy):** Shows a tree view of classes under `owl:Thing`. The `.Person` class is selected.
- Right Panel (Class Details):** Shows details for the `.Person` class (`http://my.pers.ont# Person`).
  - Types:** `rdf:type` is `Class`.
  - Class axioms:** `rdfs:subClassOf` is `Thing`.
  - Lexicalizations:** Two entries are shown:
    - `http://purl.org/dc/terms/created` with date `2017-09-18T17:50:50.936+02:00`
    - `http://purl.org/dc/terms/modified` with date `2017-09-18T18:11:47.580+02:00`

A text box overlaid on the right panel contains the following text: "The different versions can be switched globally, but can also be inspected locally, so 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

The screenshot shows the VocBench web interface for configuring metadata exports. The left sidebar contains sections for 'Namespaces and Imports', 'Metadata Vocabularies', 'Exporter Configuration', and 'Settings'. The 'Metadata Vocabularies' section is active, showing configuration for 'if.uniroma2.art.semanticurkey.plugin'. The 'Settings' section includes fields for 'dataset\_description\_baseUri\*', 'dataset\_localName\*', 'dataset\_title\*', 'dataset\_description\*', 'dataset\_homePage\*', 'dataset\_creators', 'dataset\_publisher', 'dataset\_contributors', and 'dataset\_source'. A note indicates that fields with an asterisk are mandatory.

The main content area displays the generated Turtle code for the metadata description, including namespace declarations and dataset properties. The code is as follows:

```

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 _:nodelbqd6cle2x203 , _:nodelbqd6cle2x204 , _:nodelbqd6cle2x205 ;
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 _:nodelbqd6cle2x203 void:class <http://www.w3.org/2004/02/skos/core#Concept> ;
27   void:entities 7154 .
28
29 _:nodelbqd6cle2x204 void:class <http://www.w3.org/2004/02/skos/core#Collection> ;
30   void:entities 0 .
31
32 _:nodelbqd6cle2x205 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/vocabularies/LCSH#hungarian> ;
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 interface. The browser address bar displays `localhost:1979/vocbench3/#/lcv/TopConceptWithBroader`. The page title is "Top concepts with broader". Below the title, there is a search bar containing the query: `skos:Concept(s) that are skos:topConceptOf a skos:ConceptScheme and have some broader concept in the same skos:ConceptScheme`. The main content area displays a table with the following columns: "Concept", "Scheme", and "Action".

| Concept   | Scheme  | Action   |
|---|---|--|
| <a href="http://eurovoc.europa.eu/6131">http://eurovoc.europa.eu/6131</a> | <a href="http://eurovoc.europa.eu/100288">http://eurovoc.europa.eu/100288</a> | <input type="button" value="Remove broader(s)"/> <input type="button" value="Remove as topConceptOf"/> |

At the bottom right of the interface, there is a "Quick action" dropdown menu. The footer of the page indicates "© ART Group, 2016".



# 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 servers), better performance, etc...



# Conclusions



VB2 has been out for 3 years, seeing a community arise and gather around this open source project, providing feedback and ideas

VB3 starts exactly from the VB2 legacy:

- learned lessons
- observed limits
- gathered feedback

Key Achievement

- not the (though many) new features!
- it is the ultimate version of its core platform (Semantic Turkey) which, in our view, provides a solid foundation for the realization of a new range of services spacing from knowledge acquisition, evolution and management in the European and worldwide scenario

"That's all Folks!"



12/1/01



# Contacts



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

VocBench pages@FAO: <http://aims.fao.org/vest-registry/tools/vocbench>

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>