



D3.4: Vocabulary services

Authors:

Odo Benda, Astrid Höller and Gerda Koch

AIT Angewandte Informationstechnik Forschungsgesellschaft mbH

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Revision History

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| | | | | |

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Change Log

July 2014: LoCloud experimental vocabulary application eva, Version 1

August 2014: LoCloud experimental vocabulary application eva, Version 2

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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Executive summary

The aim of the work within Task 3.4 is to develop an experimental application for enabling local cultural institutions to collaborate in the development of multilingual vocabularies for local history and archaeology and allow the retrieval of terms to be integrated during semantic enrichment in the LoCloud aggregation process. Furthermore, this application should be made available for the local users as a cloud-based service.

Cultural heritage domain vocabularies can vary to a huge extent from country to country. Terms existing in one language might not be known in another language, or the hierarchies of the vocabularies in the various languages could vary. Hence, the main issues for multilingual vocabularies are:

- Structural problems: The conceptual systems can differ in the various languages
- Equivalence problems:
 - The lexicalization of concepts can differ in different languages (eg. bone – fish bone (en); Knochen – Gräten (de))¹
 - The translation of a thesaurus from one language to another does not make it a thesaurus for the other language (intra and inter-language equivalence problems, terms might differ in meaning etc.)

A good way to tackle these problems is to choose a federated model for thesaurus creation. With the federated model it is possible to have independent vocabularies for the various languages in the same domain. The alignment of the various vocabularies in the different languages is done via concept identifiers. The linking of vocabulary concepts makes it possible for the end-user to search in all linked indexing vocabularies using any one of the linked thesauri or subject heading lists. Thus, the LoCloud experimental vocabulary application is based on the federated model and a well-established platform, TemaTres², has been chosen as baseline for development.

The tool has been integrated in the LoCloud testlab where it can be accessed via <http://test113.ait.co.at/tematres/unesco/index.php> or via the testplatform of the microservices at <http://lc004.ait.co.at:8080/portal/site/wp3>. It supports the import of vocabularies and the online collaboration in the creation and updating of vocabularies. For these purposes the TemaTres software had to be extended. A rewritten SKOS importer was added and two new webservice calls were developed to allow importing data into a remote thesaurus.

This document describes the experimental vocabulary application Version 2 (eva 2) that has been set up to August 2014. The test phase of the microservices is a staged testing process to November 2014. Future test results or recommendations may lead to the updating of the tool.

¹ <http://www.dsoergel.com/cv/B67.pdf> 20th August, 2014

² <http://www.vocabularyserver.com/> 31th August, 2014

1. Introduction

Overview of the microservice

The vocabulary services are used:

- a) in the various enrichment workflows automatically through the generic enrichment service and
- b) through the Aggregator UI.

Regarding the first case, the generic enrichment service of LoCloud allows to orchestrate various REST micro-services into complex enrichment workflows. The user can create a workflow by selecting and combining the micro-services he wants. More specifically for the vocabulary service the user is able to select terms to attach to a harvested package. Regarding the latter, the user is presented with the various thesauri and is capable of searching and navigating through the concepts.

In order to minimize the effort for the development of the experimental vocabulary application various vocabulary tools that are currently available and open source have been evaluated. Research showed that the implementation and adaptation of the TemaTres tool, an open source vocabulary server and web application to manage and exploit vocabularies, thesauri, taxonomies and formal representations of knowledge would be a very appropriate starting point for the development, <http://www.vocabularyserver.com/>. Therefore it was decided to use TemaTres as starting application for shaping an experimental collaborative vocabulary tool for LoCloud purposes.

TemaTres supports the handling of vocabularies in accordance with standard thesaurus norms. It allows for import/export of data as simple text files or in SKOS³ format.

TemaTres is a “web application for managing formal representations of knowledge, thesauri, taxonomies and multilingual vocabularies”.⁴

Its main features are:

- SPARQL endpoint (SPARQL Protocol and RDF Query Language)
- Meta-terms: define facets, collections or arrays of terms
- Support for multilingual thesaurus
- Expose vocabularies with powerful web services
- Search terms suggestion (did you mean...?)
- Display terms in multiple deep levels in the same screen
- Search expansion
- Vocabulary harmonization features: equivalent, no equivalent and partial terms with other vocabularies

³ <http://www.w3.org/2004/02/skos/> 20th August, 2014

⁴ <http://sourceforge.net/projects/tematres/> 25th June, 2014

- Relationship between terms (BT/NT, USE/UF, RT)
- No limits to number of terms, alternative labels, levels of hierarchy, etc
- Systematic or alphabetic navigation
- Search
- Complete export in XML format (Zthes, TopicMaps, MADS, Dublin Core, VDEX, BS 8723, SiteMap, SQL)
- Complete export in RDF format (Skos-Core)
- Complete export in txt
- Scope notes, Historical and Bibliographical notes
- User management
- Terms and user supervision
- Duplicates terms control
- Free terms control
- Quality assurance functions (Duplicates and free terms, illegal relations)
- Multilingual interface
- Easy Install
- Utility to import thesauri from tabulated textfiles
- Unique code for each term
- "Edit in place" features for terms and codes.
- Terminology mapping
- multilingual terminology mapping
- Term reports for editors
- Workflow: candidate, accepted and rejected terms
- Allows user-defined relationships to be created
- Relationships between terms and web entities
- Allows published and hidden labels to be defined
- Export to WXP (WordPress XML)
- Import and export data in Skos-core

TemaTres can support distributed management models, ensuring consistency and integrity of data and relationships between terms. It has features specially designed to provide data traceability and quality control in the context of a controlled vocabulary.

Furthermore TemaTres supports the analysis and categorisation of terms for search. It enables vocabularies to be represented in a wide range of metadata standards relevant to knowledge management.

In August 2014 the tool was again updated:

Editors now can get terminological and conceptual suggestions from any tematres vocabulary (more than 300..). You can create terms or get recommendations provided by other vocabularies via web services. The Russian language was added and a Contact mail was added to exposed metadata about each vocabulary. The similar term search was improved and the steps to use and reuse vocabularies via web services have been described.

Overview of the development methodology

At <http://test113.ait.co.at/tematres/unesco/index.php> a test installation with a multilingual thesaurus was set up for the LoCloud staged testing phase in spring 2014. Furthermore the test vocabularies shown in Table 1 have been established with TemaTres. These vocabularies are used by the enrichment services developed in task T3.3 of LoCloud.

Table 1 Test vocabularies created with TemaTres

| Author | Name of vocabulary | URL | Subject | Language |
|---|---|---|--|----------|
| University of California, Santa Barbara | Alexandria Digital Library Feature Type Thesaurus | http://test113.ait.co.at/tematres/adl/index.php | Science & Technology: places, geographica | English |
| Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) | Archeological Objects Thesaurus Scotland | http://test113.ait.co.at/tematres/Archaeological_Objects | Objects made by human activity | English |
| English Heritage | Archeological Sciences Thesaurus | http://test113.ait.co.at/tematres/arch_sc | Techniques, recovery methods and materials associated with archaeological sciences | English |
| English Heritage | Building Materials Thesaurus | http://test113.ait.co.at/tematres/building_materials | Main constructional material types (eg. the walls) for indexing of monuments | English |
| English Heritage | Components Thesaurus | http://test113.ait.co.at/tematres/components | Terminology covering divisions and structural elements of a building or monument | English |
| American Folklore Society | Ethnographic Thesaurus | http://test113.ait.co.at/tematres/ethnographic | Social sciences: ethnographic, folklore, united states, etnomusicology | English |
| English Heritage | Event Type Thesaurus | http://test113.ait.co.at/tematres/event_type | Terminology used for recording archaeological and architectural | English |

| Author | Name of vocabulary | URL | Subject | Language |
|---|--|---|--|--|
| | | | investigative, data collection exercises; from intrusive interventions to non damaging surveys | |
| English Heritage | Evidence Thesaurus | http://test113.ait.co.at/tematres/evidence | Terminology covering the existing physical remains of a monument, or the means by which a monument has been identified where no physical remains exist | English |
| English Heritage | FISH Archeological Objects Thesaurus | http://test113.ait.co.at/tematres/FISH_arcobjects | Recording of archaeological objects in Britain and Ireland covering all historical periods | English |
| Eionet European Environment Information and Observation Network | General Multilingual Environmental Thesaurus GEMET | http://test113.ait.co.at/tematres/Gemet/index.php | environment, policies | Dutch, English, French, German, Italian, Portuguese, Spanish |
| Federation Internationale des Archives du Film (FIAF) | General Subject headings for Film Archives | http://test113.ait.co.at/tematres/fiaf/index.php | Arts & Humanities: films, films archives, cinema | English |
| The Discovery Programme | Irish Monuments | http://test113.ait.co.at/tematres/Irish_Monuments | Irish monuments | English |
| The Discovery Programme | Irish Periods | http://test113.ait.co.at/tematres/Irish_Periods | Irish periods | English |
| Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) | Maritime Craft Thesaurus Scotland | http://test113.ait.co.at/tematres/Maritime_Craft | Types of craft that survive as wrecks, or are documented as losses, in Scottish maritime waters | English |
| English Heritage | Maritime Craft Type | http://test113.ait.co.at/tematres/Maritime_Craft | Craft types which | English |

| Author | Name of vocabulary | URL | Subject | Language |
|--|--|--|---|---|
| | Thesaurus | o.at/tematres/maritime_craft_type | survive as wrecks in English Heritage's maritime record | |
| English Heritage and Royal Commission on the Historical Monuments of England | MDA Archaeological Objects Thesaurus | http://test113.ait.co.at/tematres/archaeological_objects/index.php | Social sciences: archaeological objects; museums; vocabulary | English |
| Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) | Monument Thesaurus Wales | http://test113.ait.co.at/tematres/Monument_Thesaurus_Wales | Classification of monument types in Wales by function | English |
| Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) | Monument Type Thesaurus | http://test113.ait.co.at/tematres/monument_type | Monument types relating to the archaeological and built heritage of Scotland | English, Scottish Gaelic for some terms |
| English Heritage | Period Thesaurus | http://test113.ait.co.at/tematres/period | English Heritage Periods List | English |
| Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW) | Period Thesaurus Wales | http://test113.ait.co.at/tematres/Period_Wales | A list of periods for use in Wales | English |
| Bibliographic Standards Committee of the Rare Books and Manuscripts Section (ACRL/ALA) | Relator Terms for Use in Rare Book and Special Collections Cataloguing | http://test113.ait.co.at/tematres/rbms/index.php | Arts & Humanities: Rare Book; Special Collection | English |
| Universidad de León | Tesauro de Ciencias de la Documentación | http://test113.ait.co.at/tematres/documentes/index.php | Social sciences: library sciences, information sciences, documentation, librarianship | Spanish |
| Library of Congress. Prints and Photographs | Thesaurus for Graphic Materials 1: Subject Terms | http://test113.ait.co.at/tematres/tgm1/index.php | Arts & Humanities: graphic materials, subject terms | English |

| Author | Name of vocabulary | URL | Subject | Language |
|--|--|---|--|------------------|
| Division | | | | |
| Library of Congress. Prints and Photographs Division | Thesaurus for Graphic Materials 2: Genre and Physical Characteristic Terms | http://test113.ait.co.at/tematres/tgm2/index.php | Arts & Humanities: graphic materials | English |
| Ministero per i Beni e le Attività Culturali | Thesaurus PICO 4.1 | http://test113.ait.co.at/tematres/pico/index.php | Arts & Humanities: italian culture, heritage | English, Italian |
| UKAT | UK Archival Thesaurus (UKAT) | http://test113.ait.co.at/tematres/ukat/index.php | General reference: archives, ukat, united kingdom | English |
| UNESCO | UNESCO thesaurus | http://test113.ait.co.at/tematres/unesco/index.php | General reference: education, culture, social and human sciences, information and communication, politics, law, economic science | English, Spanish |

For LoCloud purposes an extension to the core SKOS format is required that allows the storage of geo-coordinates and time periods. AIT developed an extension for TemaTres that allows metadata that exceeds SKOS-core to be stored in the vocabulary. This made it possible to implement the web services needed for the data enrichment. Another LoCloud extension to the tool was the development of an importer for multilingual vocabularies in skos and plain text format. For simplifying the import process of multilingual vocabularies a new identifier for concepts was introduced.

The vocabulary web services of the tool can be used for the integration of the vocabularies into remote local systems. And vice versa it is possible to integrate existing concepts from remote vocabularies via the web services into the cloud based vocabulary tool. Therefore the webservice calls *“import”* and *“linkTerm”* were added to TemaTres (see webservice call documentation in chapter 3. API Reference).

Two scenarios have been developed for testing purposes:

1. The tool was put on a virtual machine in the LoCloud testlab and is being tested there.
2. The collaborative vocabularies available via the tool are made available to the metadata enrichment process and the integration of the vocabularies via Web services can be tested this way.

The first test phase with selected end users from the LoCloud consortium started in July 2014. The tests focussed on the functional testing of the experimental vocabulary application. The second test

phase will start end of August and will concern the LoCloud specific adaptations of the tool (multilinguality extensions, geolocation information, import). In parallel, the results of the first test phase are being evaluated and the tool will be constantly enhanced and updated til November 2014.

2. Getting started

Terms of use

The experimental vocabulary application (eva) is freely available under GNU General Public License version 2.0 (GPLv2). This is the same licence as for the standard TemaTres tool. Once the LoCloud developments have been finalized and fine-tuned it is envisaged to contribute them to the TemaTres repository (<http://sourceforge.net/projects/tematres/>).

Authentication

Authentication for the test platform to access the vocabulary application is: test@ait.co.at/test (user account/password)

Base URL

Please go to <http://test113.ait.co.at/tematres/unesco/index.php> in your browser or enter the test platform for the microservices at: <http://lc004.ait.co.at:8080/portal/site/wp3> , user account/password: test/test, go to the work space > micro services and select “Vocabulary Tool”.

Using the LoCloud Vocabulary Management System based on TemaTres

The detailed user guidelines for the LoCloud experimental vocabulary application can be found in Annex 1.

3. API Reference

In the following section each TemaTres API request and its response is described.

PLEASE NOTE: The APIs *“import”* and *“linkTerm”* have been developed by AIT for LoCloud purposes.

fetch

Search and retrieve terms using exact matching.

Request

| Method | URL |
|------------|---|
| <i>GET</i> | http://test113.ait.co.at/tematres/unesco/services.php?task=fetch&arg=culture |

| Parameter | Datatype | Description |
|-----------|----------|----------------------|
| arg | string | exact matching terms |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the exact matching term.</p> <p>Example response:</p> <pre data-bbox="363 443 810 936">- <vocabularyservices> - <result> - <term> <term_id>142</term_id> <string>CULTURE</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <order>1</order> </term> - <term> <term_id>1650</term_id> <string>CULTURE</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <order>2</order> </term> - <term></pre> |

fetchAlt

The alternative or non-preferred terms for one vocabulary term ID are requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchAlt&arg=2575 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the alternative or non-preferred terms for one ID.</p> <p>Example response:</p> <pre>- <vocabularyservices> - <result> - <term> <term_id>4234</term_id> <code></code> <lang>en</lang> <string>Republic of Belarus</string> <relation_type_id>4</relation_type_id> <relation_type>UF</relation_type> <relation_code></relation_code> <relation_label></relation_label> </term> </result></pre> |
| 200 | <p>The response shows simple term date retrieved by code.</p> <p>Example response:</p> |

fetchDirectTerms

The alternative, related or direct hierarchical terms for a vocabulary term ID are requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchDirectTerms&arg=155 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the alternative, related or direct hierarchical terms one term ID.</p> <p>Example response:</p> <pre>- <vocabularyservices> - <result> - <term> <term_id>154</term_id> <code>http://iaaa.cps.unizar.es/thesaurus/EXHIBITIONS</code> <lang>en</lang> <string>EXHIBITIONS</string> <isMetaTerm>0</isMetaTerm> <relation_type_id>3</relation_type_id> <relation_type>BT</relation_type> <relation_code></relation_code> <relation_label></relation_label> </term></pre> |

fetchDown

More specific terms for one vocabulary term ID are requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchDown&arg=142 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the more specific terms for one ID.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>156</term_id> <string>HISTORY</string> <isMetaTerm>0</isMetaTerm> <lang></lang> <relation_type_id>3</relation_type_id> <relation_type>NT</relation_type> <relation_code></relation_code> <relation_label></relation_label> <hasMoreDown>1</hasMoreDown> </term> -<term> <term_id>143</term_id> <string>LINGUISTICS</string> <isMetaTerm>0</isMetaTerm> <lang></lang> <relation_type_id>3</relation_type_id> <relation_type>NT</relation_type> <relation_code></relation_code> <relation_label></relation_label> <hasMoreDown>1</hasMoreDown> </term> </result> </vocabularyservices></pre> |

fetchLast

Retrieve recent terms created.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchLast |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the lastest terms created.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>2575</term_id> <code></code> <lang>en</lang> <string>Republic of Belarus (UF)</string> <isMetaTerm>0</isMetaTerm> <date_create>2014-08-26 11:01:34</date_create> <date_mod></date_mod> </term> -<term> <term_id>4233</term_id> <code></code> <lang>de</lang> <string>Wirtschaft</string> <isMetaTerm>0</isMetaTerm> <date_create>2014-08-26 10:26:44</date_create> <date_mod></date_mod> </term></pre> |

fetchNotes

Retrieve notes for one term.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchNotes&arg=2575 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the notes for a term.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>2575</term_id> <string>BELARUS</string> <note_id>298</note_id> <note_type>NA</note_type> <note_lang>en</note_lang> <note_text>USE FOR EVENTS AFTER 1991.</note_text> </term> </result></pre> |

fetchRelated

The related terms for a vocabulary term ID are requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchRelated&arg=3173 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the related terms for one ID.</p> <p>Example response:</p> <pre>-<vocabularyservices> - <result> - <term> <term_id>2791</term_id> - <code> http://www.vocabularyserver.com/unesco/en/?tema=3910 </code> <lang>en</lang> <string>READING ABILITY</string> <isMetaTerm>0</isMetaTerm> <relation_type_id>2</relation_type_id> <relation_type>RT</relation_type> <relation_code></relation_code> <relation_label></relation_label> </term></pre> |

fetchRelatedTerms

The related terms for several vocabulary terms are requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchRelatedTerms&arg=3173,3248 |

| Parameter | Datatype | Description |
|-----------|------------------|-----------------------------|
| arg | list of integers | Term ID, separated by comma |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the related terms for more than one ID. Example response:</p> <pre>- <vocabularyservices> - <result> - <term> <term_id>3174</term_id> <string>APTITUDE</string> <isMetaTerm>0</isMetaTerm> </term> - <term> <term_id>3249</term_id> <string>CONTRACEPTION</string> <isMetaTerm>0</isMetaTerm> </term> - <term> <term_id>3400</term_id> <string>MATERNAL AND CHILD HEALTH</string> <isMetaTerm>0</isMetaTerm> </term></pre> |

fetchSimilar

Search and retrieve similar term for string search expression.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchSimilar&arg=kultu |

| Parameter | Datatype | Description |
|-----------|----------|--------------------|
| arg | string | similar expression |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the similar term for a string search expression</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> <string>culture</string> </result> -<resume> <status>available</status> -<param> <task>fetchSimilar</task> <arg>kultu</arg> </param> <web_service_version>1.4</web_service_version> <version>TemaTres 1.72</version> <cant_result>1</cant_result> </resume> </vocabularyservices></pre> |

fetchSourceTerms

Search and retrieve terms mapped in target vocabulary for a given term.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchSourceTerms&arg=cultura |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | string | term |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the terms mapped in a target vocabulary for a given term.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>142</term_id> <tema_id>142</tema_id> <code>http://iaaa.cps.unizar.es/thesaurus/T3_CULTURE</code> <lang>es</lang> <string>CULTURE</string> <isMetaTerm>0</isMetaTerm> <date_create>2014-02-25 09:53:48</date_create> <date_mod>2014-02-25 09:53:48</date_mod> </term> </result></pre> |

fetchTargetTerms

Search and retrieve data about target terms mapped via web services for one Term ID.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchTargetTerms&arg=142 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows data about target terms mapped via web services for one Term ID.</p> <p>Example response:</p> <pre>-<vocabularyservices> - <result> - <term> <string>DERECHOS HUMANOS</string> - <url> http://test113.ait.co.at/tematres/unesco_es/?tema=http://iaaa.cps.unizar.es/thesaurus/MT_6.1 </url> - <uri> http://test113.ait.co.at/tematres/unesco_es/services.php?task=fetchTerm&arg=http://iaaa.cps </uri> <term_id>142</term_id> <target_vocabulary_label>Tesauro de la UNESCO</target_vocabulary_label> <target_vocabulary_tag>EQ</target_vocabulary_tag> <target_vocabulary_title>Tesauro de la UNESCO</target_vocabulary_title> </term> </result></pre> |

fetchTerm

The data for a vocabulary term is requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchTerm&arg=142 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | Term ID |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the simple term data.</p> <p>Example response:</p> <pre>- <vocabularyservices> - <result> - <term> <term_id>142</term_id> <tema_id>142</tema_id> <code>http://iaaa.cps.unizar.es/thesaurus/T3_CULTURE</code> <lang>en</lang> <string>CULTURE</string> <isMetaTerm>0</isMetaTerm> <date_create>2014-02-25 09:53:48</date_create> <date_mod>2014-02-25 09:53:48</date_mod> </term></pre> |

fetchTerms

The data for several vocabulary terms is requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchTerms&arg=142,458 |

| Parameter | Datatype | Description |
|-----------|------------------|-----------------------------|
| arg | list of integers | Term ID, separated by comma |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows simple term data for more than one term.</p> <p>Example response:</p> <pre>- <vocabularyservices> - <result> - <term> <term_id>142</term_id> <string>CULTURE</string> <isMetaTerm>0</isMetaTerm> </term> - <term> <term_id>458</term_id> <string>PARTICLE ACCELERATORS</string> <isMetaTerm>0</isMetaTerm> </term> </result></pre> |

fetchTopTerms

The top terms of a vocabulary are requested.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchTopTerms |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the top terms of the complete vocabulary.</p> <p>Example response:</p> <pre>- <vocabularyservices> - <result> - <term> <term_id>161</term_id> <code>http://iaaa.cps.unizar.es/thesaurus/T1_EDUCATION</code> <lang>en</lang> <string>EDUCATION</string> <isMetaTerm>0</isMetaTerm> </term> - <term> <term_id>120</term_id> <code>http://iaaa.cps.unizar.es/thesaurus/T2_SCIENCE</code> <lang>en</lang> <string>SCIENCE</string> <isMetaTerm>0</isMetaTerm> </term> - <term> <term_id>142</term_id> <code>http://iaaa.cps.unizar.es/thesaurus/T3_CULTURE</code> <lang>en</lang> <string>CULTURE</string> <isMetaTerm>0</isMetaTerm> </term></pre> |

fetchUp

Request the hierarchical structure for one ID.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchUp&arg=163 |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | integer | term ID |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows the hierarchical structure for one term ID. Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>161</term_id> <string>EDUCATION</string> <isMetaTerm>0</isMetaTerm> <relation_type_id></relation_type_id> <order>1</order> </term> -<term> <term_id>163</term_id> <string>CURRICULUM</string> <isMetaTerm>0</isMetaTerm> <relation_type_id></relation_type_id> <order>2</order> </term> </result></pre> |

fetchVocabularyData

Request the data about a vocabulary.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=fetchVocabularyData |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the data about the vocabulary.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> <vocabulary_id>1</vocabulary_id> <title>UNESCO Thesaurus</title> <author>AIT</author> <lang>en</lang> <scope></scope> <keywords></keywords> <uri>http://test113.ait.co.at/tematres/unesco/</uri> <createDate>2014-02-21</createDate> <lastMod>2014-02-21 13:07:11</lastMod> <contributor></contributor> <publisher></publisher> <rights></rights> <cant_terms>4233</cant_terms> </result></pre> |

import

Import terms into the thesaurus. Currently this routine supports the data format "SKOS". This API call is used by the SKOS importer when importing multilingual concepts.

Request

| Method | URL |
|-----------------------------|---|
| POST multipart/form-data | http://test113.ait.co.at/tematres/unesco/services.php?task=import&arg=skos |

| URL-Parameter | Datatype | Description |
|---------------|----------|-----------------|
| arg | string | Fixed to "skos" |

| POST-Parameter | Datatype | Description |
|-----------------------|---------------|--|
| id_correo_electronico | string | Admin user account (email) |
| id_password | string | Admin user password |
| file | xml-skos-file | The import file. This XML file has to contain the skos:Concepts that will be added to the thesaurus. |

Response

| Status | Response |
|--------|--|
| 200 | The response shows a list of the imported terms and import problems if applicable. |

letter

Request terms by the initial letter.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=letter&arg=d |

| Parameter | Datatype | Description |
|-----------|-----------|----------------|
| arg | character | initial letter |

Response

| Status | Response |
|--------|--|
| 200 | <p>With this task terms with a certain initial letter can be searched and retrieved.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>193</term_id> <string>DAIRY INDUSTRY</string> <isMetaTerm>0</isMetaTerm> <no_term_string></no_term_string> <relation_type_id></relation_type_id> </term> -<term> <term_id>967</term_id> <string>DAIRY PRODUCTS</string> <isMetaTerm>0</isMetaTerm> <no_term_string></no_term_string> <relation_type_id></relation_type_id> </term> -<term> <term_id>3728</term_id> <string>DAMAGE</string> <isMetaTerm>0</isMetaTerm> <no_term_string></no_term_string> <relation_type_id></relation_type_id> </term> </result> </vocabularyservices></pre> |

linkTerm

Link one or more terms of two remote vocabularies. All resulting links with term equivalences (EQ). If you have for example an English and a Spanish vocabulary you can use this call to send the English vocabulary the equivalent terms in Spanish and vice versa. This API call is used by the SKOS importer when importing multilingual concepts.

Request

| Method | URL |
|-----------------------------|---|
| POST multipart/form-data | http://test113.ait.co.at/tematres/unesco/services.php?task=linkTerm |

| POST-Parameter | Datatype | Description |
|-----------------------|----------|--|
| id_correo_electronico | string | Admin user account (email) |
| id_password | string | Admin user password |
| vocab_url[] | string[] | The remote vocabulary base URL. This must already exist as a remote target vocabulary. You have to use the same URL provided in remote target vocabulary configuration |
| term[] | string[] | The remote term label. |
| remote_term_id[] | string[] | The identifier of the term in the remote vocabulary. |
| local_term_id[] | string[] | The identifier of the term you want to connect to the remote term. |

Response

| Status | Response |
|--------|---|
| 200 | The response shows a list of the connected terms or problems if applicable. |

search

Search and retrieve terms.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=search&arg=culture |

| Parameter | Datatype | Description |
|-----------|----------|--|
| arg | string | search term (automatically truncated on both ends) |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows the searched terms</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>142</term_id> <string>CULTURE</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index>142</index> <order>1</order> </term> -<term> <term_id>1650</term_id> <string>CULTURE</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index>1650</index> <order>2</order> </term></pre> |

searchNotes

Retrieve terms searching in notes.

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=searchNotes&arg=culture |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | string | search term |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows terms searching in notes.</p> <p>Example response:</p> <pre>-<vocabularyservices> -<result> -<term> <term_id>1693</term_id> <string>CULTURAL INEQUALITY</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index> 1650 1651 1689 1693</index> <order>1</order> </term> -<term> <term_id>1679</term_id> <string>SUBCULTURES</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index> 1650 1651 1672 1679</index> <order>2</order> </term></pre> |

suggest

Simple search and retrieve terms who start with string (only string).

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=suggest&arg=culture |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | string | search term |

Response

| Status | Response |
|--------|--|
| 200 | <p>The response shows terms starting with string.</p> <p>Example response:</p> <pre>--<vocabularyservices> - <result> <term>CULTURE</term> <term>CULTURE</term> <term>CULTURE</term> <term>CULTURE</term> <term>CULTURE AND DEVELOPMENT</term> <term>CULTURE OF PEACE</term> <term>CULTURE OF POVERTY</term> <term>CULTURE OF WORK</term> </result></pre> |

suggestDetails

Search and retrieve terms who start with string (term ID, term, and more data).

Request

| Method | URL |
|--------|---|
| GET | http://test113.ait.co.at/tematres/unesco/services.php?task=suggestDetails&arg=cul |

| Parameter | Datatype | Description |
|-----------|----------|-------------|
| arg | string | search term |

Response

| Status | Response |
|--------|---|
| 200 | <p>The response shows terms starting with string.</p> <p>Example response:</p> <pre>--<vocabularyservices> --<result> --<term> <term_id>639</term_id> <string>CULTIVATION</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index> 168 626 636 639</index> <order>1</order> </term> --<term> <term_id>1827</term_id> <string>CULTS</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index> 1650 1800 1824 1827</index> <order>2</order> </term> --<term> <term_id>2087</term_id> <string>CULTURAL ACTION</string> <isMetaTerm></isMetaTerm> <no_term_string></no_term_string> <index> 1650 2064 2087</index> <order>3</order> </term></pre> |

4. How to install the micro service

The LoCloud version of tematres can be downloaded from here:

<http://lc004.ait.co.at:8080/access/content/group/wp3/Vocabulary/tematres-1.7.2-ait1.zip>

The installation process is the same as the default tematres installation, see further descriptions at.

http://vocabularyserver.com/wiki/index.php?title=Install_TemaTres

You will need the common apache+php+mysql server stack.

5. How the micro service is installed in LoCloud

An instance of tematres is installed in the cloud testing lab at <http://test113.ait.co.at/tematres/> . To get a list of available vocabularies browse to <http://test113.ait.co.at/tematres/locloud-vocabularies/> and you can download a CSV file with the vocabulary URLs and names.

The technical infrastructure for running the service is an Ubuntu 12.04 LTS server machine with apache 2.2, php 5.3 and mysql 5.5 which run as a KVM guest in the OpenNebula cloud.

The vocabulary services are used in LoCloud:

- a) in the various enrichment workflows automatically through the generic enrichment service and
- b) through the Aggregator UI.

Regarding the first case, the generic enrichment service of LoCloud allows to orchestrate various REST micro-services into complex enrichment workflows. The user can create a workflow by selecting and combining the micro-services he wants. More specifically for the vocabulary service the user is able to select terms to attach to a harvested package. Regarding the latter, the user is presented with the various thesauri and is capable of searching and navigating through the concepts.

6. Troubleshooting / FAQ

Why does the subordination of an existing term not work?

It is possible that the term has already a broader term and only a polyhierarchical vocabulary can have terms with more than one broader term. To make the vocabulary polyhierarchical go to **Menu -> Administration -> Vocabulary configuration**, click on the name of the vocabulary and select “YES” with the drop-down-menu to “*Polihierarchical*” (compare Figure 22).

Where can I find the currently used version of the TemaTres software?

When clicking on “About...” at the top of the page an overview of the vocabulary is shown. At the bottom the used version of the software can be found (see Figure 1).

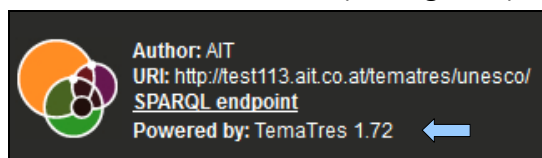


Figure 1 Version of TemaTres

Why does the SPARQL endpoint not work?

When clicking on “SPARQL endpoint” at the bottom of the “Home” screen it is possible that the following message appears (see Figure 2):

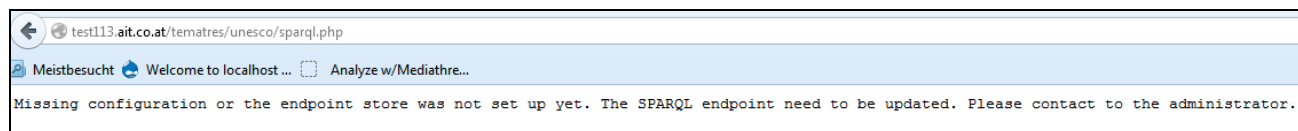


Figure 2 Missing configuration of SPARQL endpoint

The SPARQL endpoint needs to be updated by going to **Menu -> Administration -> Maintenance database -> Update SPARQL endpoint** and clicking on “Submit” (compare Figure 31). This procedure may take several minutes. When finished the SPARQL endpoint is opened (see Figure 3).



Figure 3 The SPARQL endpoint of the UNESCO Thesaurus

Can I change the name, author etc. of the vocabulary when it has already been established?

Yes, it is possible to change the vocabulary data afterwards by going to **Menu -> Administration -> Vocabulary configuration** and clicking on the name of the vocabulary that needs to be changed. Then name, author, language, creation date etc. can be changed. When finished click on “Save” (compare Figure 22).

What exactly are APIs and where can I find further information?

In computer programming, an *application programming interface* (API) specifies a software component in terms of its operations, their inputs and outputs and underlining types. Its main purpose is to define a set of functionalities that are independent of their respective implementation, allowing both definition and implementation to vary without compromising each other.⁵ APIs are a way to get data from the internet for your local applications and projects. With the API calls (URLs) you can receive a variety of formats depending on the service.

When entering <http://test113.ait.co.at/tematres/unesco/services.php> in your browser all TemaTres APIs are listed with description and example.

Why can a user not import a vocabulary?

The import of a vocabulary is only possible if a newly added user is defined as “admin” (compare Figure 25). To do this go to **Menu -> Administration -> Users** and click on the name of the user that needs to be changed or add a new one. The check box besides “Is admin” needs to be selected before clicking on “Submit”. Otherwise only terms can be added.

⁵ http://en.wikipedia.org/wiki/Application_programming_interface 27th August, 2014

What are Meta-terms and how can they be created?

A Meta-term is a term that cannot be used in the indexing process. It is a term to describe other terms, for example guide terms, facets, categories, etc.

When adding a new term it can be made a Meta-term by ticking the checkbox besides “Meta-term” (compare Figure 41).

When going to **Menu -> Administration -> Vocabulary configuration** and clicking on the name of the vocabulary the option “CFG_SEARCH_METATERM” can be found. To make Meta-terms searchable select “YES” from the drop-down menu (see Figure 4).

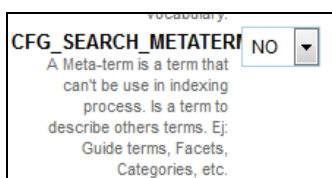


Figure 4 Option for making Meta-terms searchable

Can I add multiple terms at once?

Yes, it is possible to add multiple terms by putting one term per line (compare Figure 41).

Why are there no top terms at the “Home” screen?

It is possible to configure the appearance by going to **Menu -> Administration -> Vocabulary configuration** and clicking on the name of the vocabulary. There the option “_SHOW_TREE” can be found. When “NO” is selected in the drop-down menu no top terms are shown at the “Home” screen. Select “YES” and click on “Save” to change that (see Figure 5).

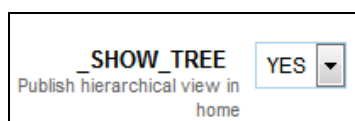


Figure 5 The option “_SHOW_TREE” in the configuration

7. References

Bégin, Laurent and de Smedt, John. SKOS Extensions for the EUROVOC Thesaurus. Mondeca Workshop Paris, June 2010

Guidelines for Multilingual Thesauri. Compiled by a Working Group on Guidelines for Multilingual Thesauri of IFLA Classification and Indexing Section chaired by: Gerhard J. A. Riesthuis and Patrice Landry The Hague, IFLA Headquarters, 2009. - 30p. 30 cm. (IFLA Professional Reports : 115) ISBN 978-90-77897-35-5. ISSN 0168-1931

INTERNATIONAL STANDARD ISO 25964-1 First edition 2011-08-15, Information and documentation — Thesauri and interoperability with other vocabularies — Part 1: Thesauri for information retrieval, Reference number ISO 25964-1:2011(E)

INTERNATIONAL STANDARD ISO 25964-2 First edition 2013-03-15, Information and documentation — Thesauri and interoperability with other vocabularies — Part 2: Interoperability with other vocabularies, Reference number ISO 25964-2:2013(E)

Mitre, María. TESQUAL: A micro-thesaurus for use in quality management in European Higher Education. *Revista Española de Documentación Científica*, 2009; 32 (2), pages 66-82

8. Glossary

| Term | Description |
|----------------------------|---|
| API | Application Programming Interface ⁶ |
| broader term | preferred term representing a concept that is broader than the one in question |
| BT | abbreviation for broader term |
| concept | unit of thought |
| instance relationship | links a general concept, such as a class of things or events, and an individual instance of that class, which is often represented by a proper name |
| meta-term | a term that cannot be used in the indexing process; it is a term to describe other terms, for example guide terms, facets, categories, etc. |
| narrower term | preferred term representing a concept that is narrower than the one in question |
| non-preferred term | non-descriptor term that is not assigned to documents but is provided as an entry point in a thesaurus or index |
| NT | abbreviation for narrower term |
| partitive relationship | A relation between two concepts where one of the concepts constitutes the whole and the other concept a part of that whole ⁷ |
| polyhierarchical structure | hierarchical arrangement of concepts , in a thesaurus or classification scheme, in which each concept can have more than one broader concept |
| preferred term | descriptor term used to represent a concept when indexing |
| RDF | a family of World Wide Web Consortium (W3C) specifications originally designed as a metadata data model; It has come to be used as a general method for conceptual description or modeling of information that is implemented in web resources, using a variety of syntax notations and data serialization formats ⁸ |

⁶ http://en.wikipedia.org/wiki/Application_programming_interface 1st September, 2014

⁷ http://www.iva.dk/bh/lifeboat_ko/concepts/partitive_relation.htm 25th June, 2014

⁸ http://en.wikipedia.org/wiki/Resource_Description_Framework 25th June, 2014

| | |
|-------------------|--|
| related term | covers associations between pairs of concepts that are not related hierarchically, but are semantically or conceptually associated to such an extent that the link between them needs to be made explicit in the thesaurus , on the grounds that it may suggest additional or alternative terms for use in indexing or retrieval |
| REST | Representational State Transfer ⁹ |
| RT | abbreviation for related term |
| Skos | Simple Knowledge Organization System : common data model for sharing and linking knowledge organization systems via the Web ¹⁰ |
| SPARQL | SPARQL Protocol and RDF Query Language : an RDF query language, that is, a query language for databases, able to retrieve and manipulate data stored in Resource Description Framework format ¹¹ |
| target vocabulary | name TemaTres uses for a reference vocabulary |
| taxonomy | the practice and science (study) of classification of things or concepts, including the principles that underlie such classification ¹² |
| term | word or phrase used to label a concept |
| thesaurus | controlled and structured vocabulary in which concepts are represented by terms, organized so that relationships between concepts are made explicit, and preferred terms are accompanied by lead-in entries for synonyms or quasi-synonyms |
| top term | Preferred term representing a concept that has no broader concept in the thesaurus |
| UI | User interface |
| use for | the term that follows the tag is a non-preferred term for which the preferred term preceding the tag should be used instead |
| USE/UF | abbreviation for used or use for |

Thesaurus/Vocabulary related terms of the glossary are based on the ISO 25964-2:2013 definitions.

⁹ http://en.wikipedia.org/wiki/Representational_state_transfer 1st September, 2014

¹⁰ <http://www.w3.org/2001/sw/wiki/SKOS> 25th June, 2014

¹¹ <http://en.wikipedia.org/wiki/SPARQL> 25th June, 2014

¹² <http://en.wikipedia.org/wiki/Taxonomy> 25th June, 2014

9. Conclusions

This deliverable describes the approaches that were taken in order to achieve two aims for LoCloud:

1. To provide a platform for multilingual vocabularies from which they can be retrieved and used by the LoCloud metadata enrichment services.
2. To provide for local content providers a cloud-based experimental vocabulary application that supports collaborative work and crowdsourcing efforts when creating multilingual vocabularies.

Initial research showed that the opensource software TemaTres would provide the most efficient starting point for the development. This software supports the necessary federal model for multilingual vocabularies and has then be extended with a LoCloud SKOS importer and two new webservice calls to allow import of data into a remote vocabulary. In addition, part of the application was extended in order to test the storage of geo-coordinates and time periods. At the writing of this deliverable a test installation with a multilingual vocabulary is accessible at the virtual machine in the LoCloud testlab (<http://test113.ait.co.at/tematres/unesco/index.php>) and still being used for the staged testing phase and fine-tuning which will last til November 2014. A large number of vocabularies has been established with TemaTres and made available at the cloud testlab for the metadata enrichment services.

Annex 1 - Using the LoCloud experimental vocabulary application based on TemaTres

Figure 6 shows the general functional options when opening TemaTres.¹³

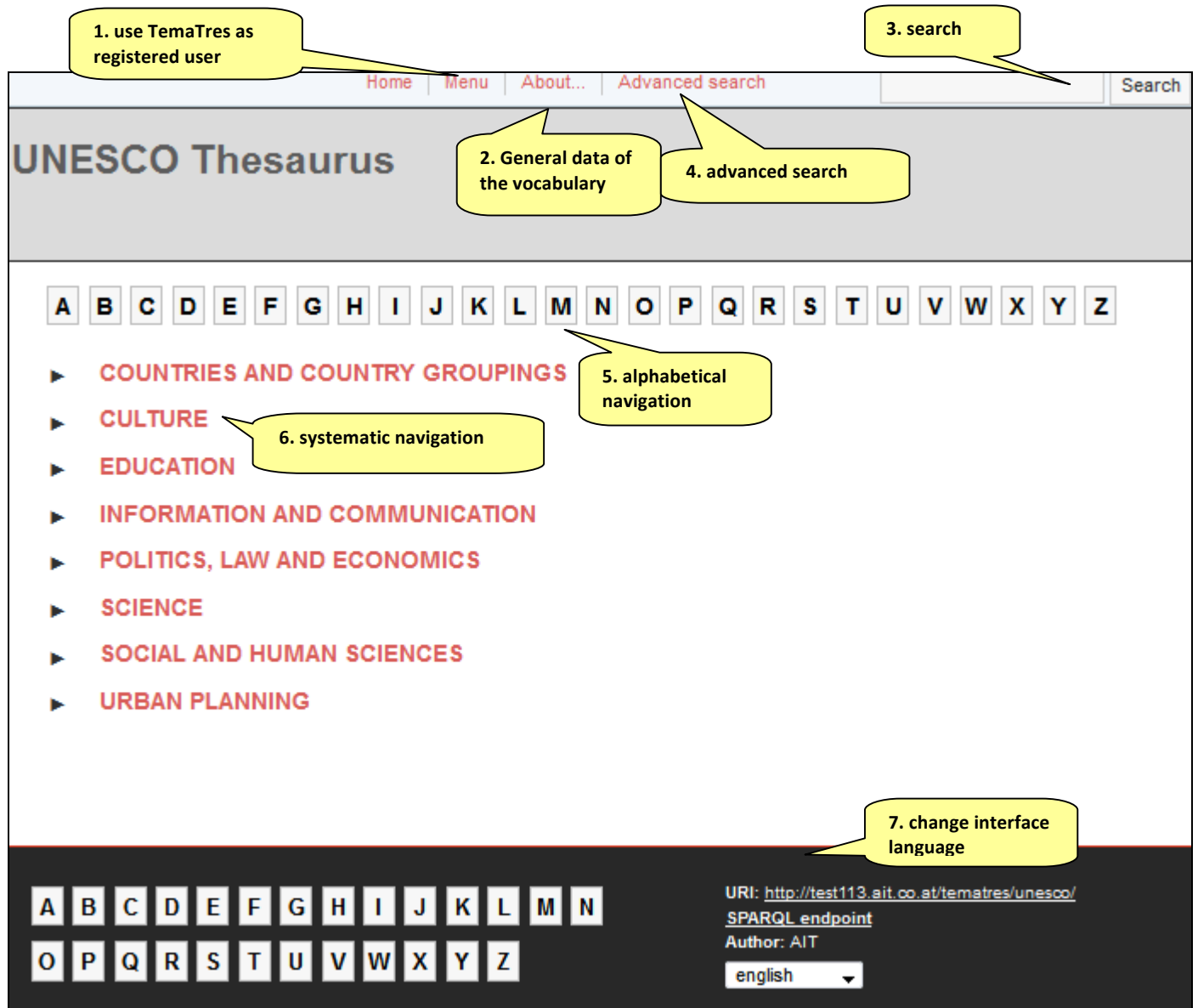


Figure 6 General functional options

1. After logging in (see Figure 7) a registered user has different options (see Figure 8) like adding a new term for example.

¹³ ¹³ http://r020.com.ar/tematres/manual/gestin_de_trminos.html 25th June, 2014

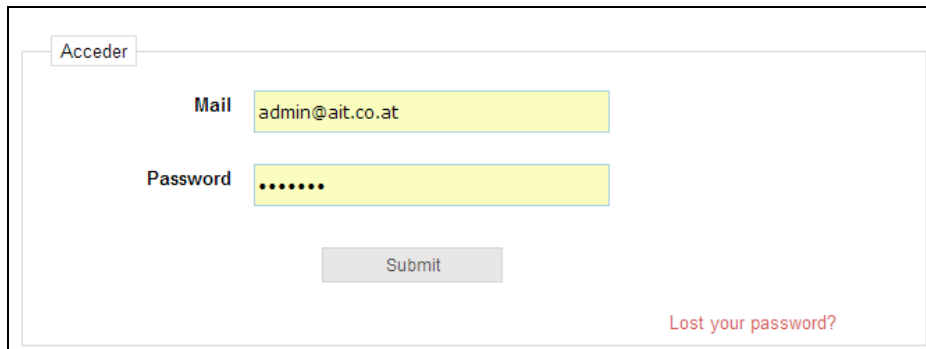


Figure 7 Logging in

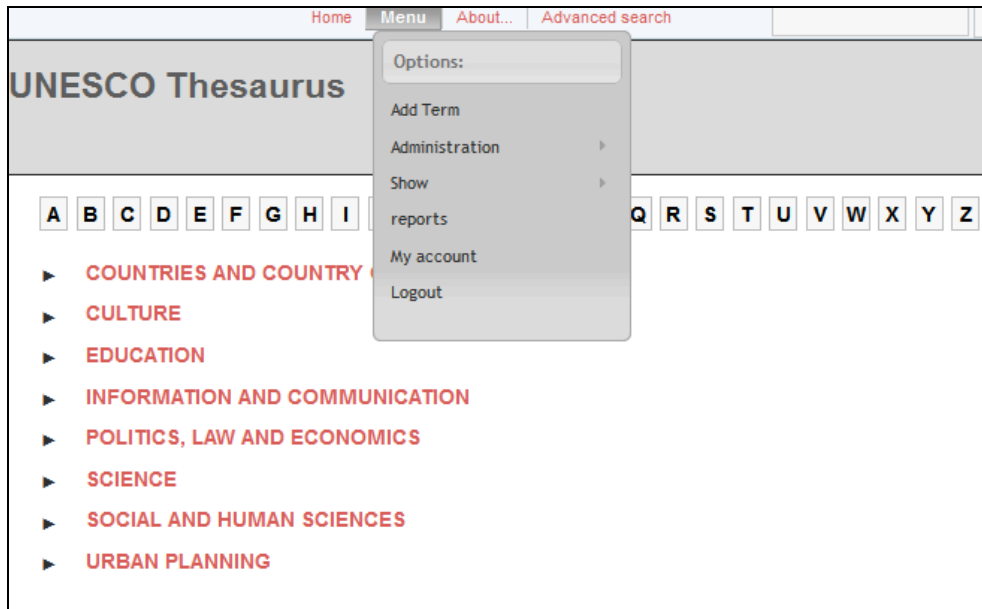


Figure 8 Menu as registered user

2. When clicking on "About" the following screen can be seen (see Figure 9). It gives information on the created vocabulary, like the URI and the number of terms.

| UNESCO Thesaurus | | |
|-------------------------------|---|-------|
| UNESCO Thesaurus / AIT | | |
| URI: | http://test113.ait.co.at/tematres/unesco/ | |
| Language: | en | |
| Date of creation: | 21/02/2014 | |
| Last change date: | 21/02/2014 | |
| Keywords: | | |
| Language type: | Controlled vocabulary | |
| Scope: | | |
| Terms: | 4230 | |
| Relations between terms: | 10655 | |
| Non preferred terms: | | |
| Scope note: | 509 | |
| Terms supervision | | |
| Year | Month | Terms |
| 2014 | Feb | 4230 |
| Total terms | | 4230 |

Figure 9 About the created vocabulary

3. With the “search” option terms can be searched. As can be seen in Figure 10 search terms are suggested while typing. When clicking on “search” the results are shown (see Figure 11).

| UNESCO Thesaurus | | educat | Search |
|------------------|------|----------------------------|--------|
| Home | Menu | Advanced search | |
| | | EDUCATION | |
| | | EDUCATIONAL ACCOUNTABILITY | |
| | | EDUCATIONAL ANTHROPOLOGY | |
| | | EDUCATIONAL BACKGROUND | |

Figure 10 Searching for “Education”

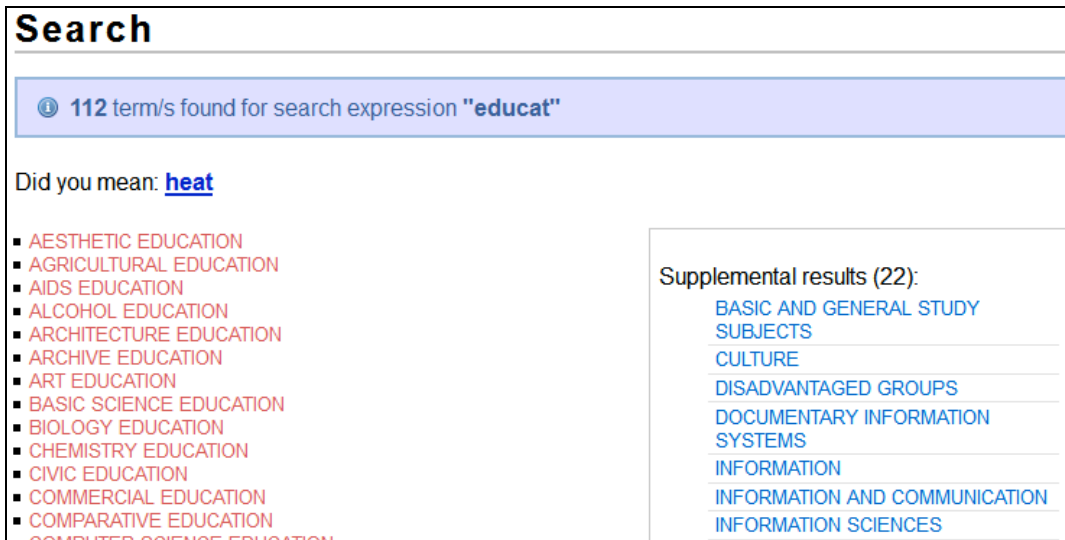


Figure 11 Search results for “Education”

2. With the “Advanced search” different types of terms, exact phrases, note types etc. can be searched (see Figure 12).

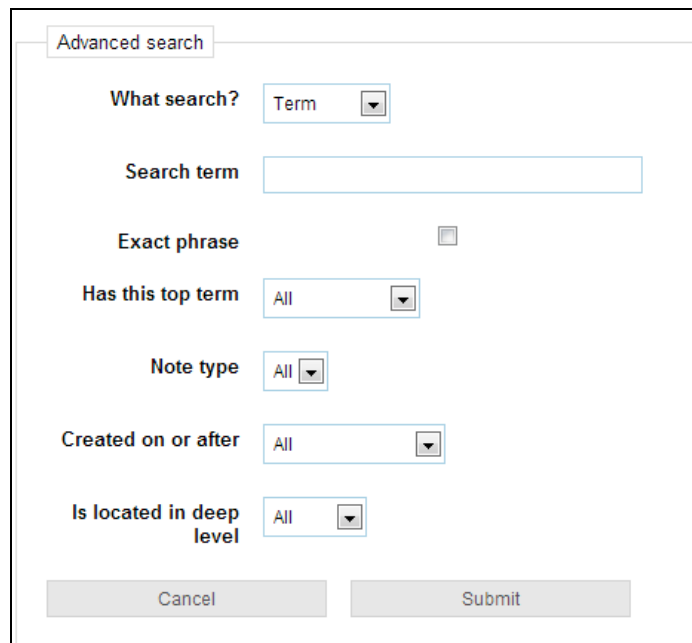


Figure 12 Advanced search

3. With the alphabetical navigation terms initiating with a specific letter can be searched (see Figure 13). As can be seen the total number of terms starting with “M” is given.



Figure 13 Part of all terms starting with “M”

4. With the systematic navigation terms are shown from top to narrower terms (see Figure 14 and Figure 15).

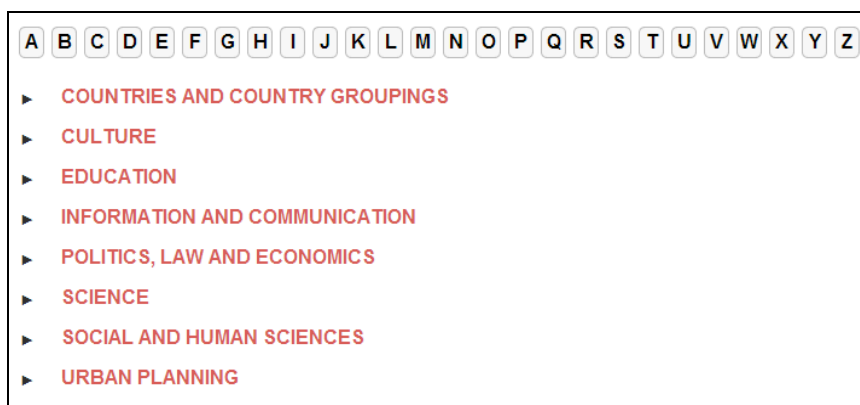


Figure 14 Systematic navigation showing the top terms

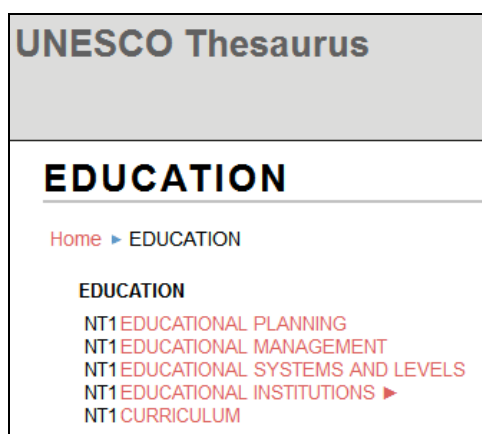


Figure 15 Narrower terms of “EDUCATION”

5. The interface language can be changed with the drop down button at the right bottom of the page (see Figure 16, compare Figure 6).



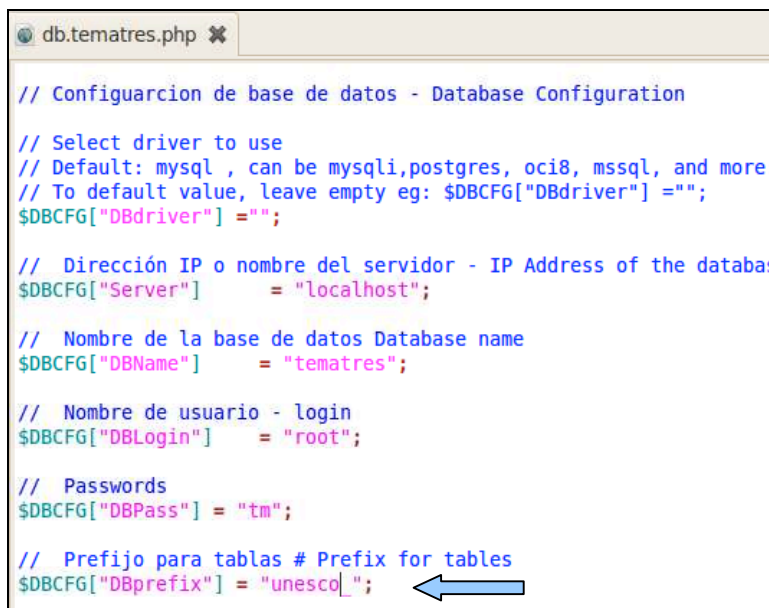
Figure 16 Changing the interface language

Creating a new vocabulary

To establish a completely new vocabulary in the LoCloud cloud environment you have to create the vocabulary configuration folder on the server. To do this open the server folder `sftp://tm@test113.ait.co.at:4113/var/www/tematres` and copy the default configuration folder

“vocab” to your new vocabulary configuration (f.i. “unesco”). You can do this using the program filezilla.¹⁴

Then the file *db.tematres.php* needs to be opened in the folder “unesco”. There the prefix for the tables needs to be changed to “unesco” (see Figure 17).



```
// Configuración de base de datos - Database Configuration

// Select driver to use
// Default: mysql , can be mysqli, postgres, oci8, mssql, and more:
// To default value, leave empty eg: $DBCFG[\"DBdriver\"] = \"\";
$DBCFG[\"DBdriver\"] = \"\";

// Dirección IP o nombre del servidor - IP Address of the database
$DBCFG[\"Server\"] = \"localhost\";

// Nombre de la base de datos Database name
$DBCFG[\"DBName\"] = \"tematres\";

// Nombre de usuario - login
$DBCFG[\"DBLogin\"] = \"root\";

// Passwords
$DBCFG[\"DBPass\"] = \"tm\";

// Prefijo para tablas # Prefix for tables
$DBCFG[\"DBprefix\"] = \"unesco_\";
```

Figure 17 Changing the prefix for the tables to “unesco”

When now entering the URL *test113.ait.co.at/tematres/unesco/index.php* a new thesaurus can be established and the UNESCO thesaurus can be imported (compare the chapter **Import**).

PLEASE NOTE: The name in the URL refers to the name of the folder (in this example the folder is named “unesco” and the URL contains “unesco”).

When now entering the base URL *test113.ait.co.at/tematres/* followed by the name of the newly created folder (*test113.ait.co.at/tematres/unesco/index.php*) the TemaTres setup page appears in Spanish. At the top of the page the language needs to be changed to English (see Figure 18).

¹⁴ <https://filezilla-project.org/> 1st September, 2014

Language

✔ File configuration for the database connection found.

✔ Connect to Server success

✔ Connect to database in server success.

Vocabulary metadata

Title

Author

Language

New user

Name

Surname

Mail

Password

Confirm password

Figure 18 TemaTres setup page

Title, Author, Language and User need to be filled in. Then click on “Submit”. The window shown in Figure 19 opens. Click on “Enjoy your Vocabulary Server” to finish the setup.

TemaTres Setup

Language

✔ File configuration for the database connection found.

✔ Connect to Server success

✔ Connect to database in server success.

📘 **Welcome to TemaTres Vocabulary Server**
Setup is completed. [Enjoy your Vocabulary Server](#)

Figure 19 Enjoy your Vocabulary Server

Administration

Vocabulary configuration

This section describes how to configure the UNESCO vocabulary. Before terms are added the vocabulary is set to be polyhierarchical. To achieve this go to **Menu -> Administration -> Vocabulary configuration** (see Figure 20).

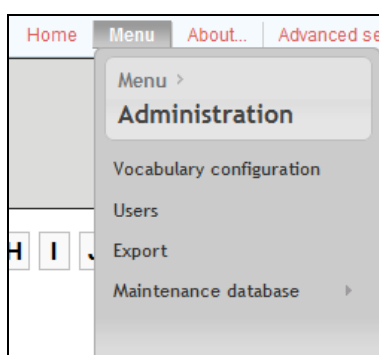


Figure 20 Going to “Vocabulary configuration”

When clicking on the name of the vocabulary (*UNESCO Thesaurus*) (see Figure 21) it can be configured. With the drop-down-menu to “*Polihierarchical*” “*YES*” needs to be chosen (see Figure 22).

UNESCO Thesaurus

vocabulary configuration · [Add target vocabulary]

| Title | Author | Type |
|-----------------------|--------|------------|
| UNESCO Thesaurus / en | AIT | vocabulary |
| 1 | | |

vocabulary configuration · [Add remote target vocabulary (web services)]

| Label for the reference | Title | Terms |
|-------------------------|-------|-------|
| 0 | | |

Configure types notes

| Note type | Alias: | Orden | |
|----------------------|----------------------|----------------------|---------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | Submit |
| Scope note | NA | 1 | 509 notes |
| Nota catalográfica | NC | 2 | 0 notes |
| Historic note | NH | 2 | 0 notes |
| Bibliographic note | NB | 3 | 0 notes |
| Private note | NP | 4 | 0 notes |

Figure 21 Clicking on UNESCO Thesaurus

Vocabulary configuration vocabulary

Vocabulary configuration vocabulary

title

Author

contributor

rights

publisher

Language

Date of creation

Keywords

Language type

URI

Scope

Polihierarchical ←

Figure 22 Configuring the vocabulary

Users

When going to **Menu -> Administration -> Users** (see Figure 23) the users can be administered. As can be seen in Figure 24 the name, organisation and date of creation of each user is given. Furthermore the number of terms created by the user is shown.

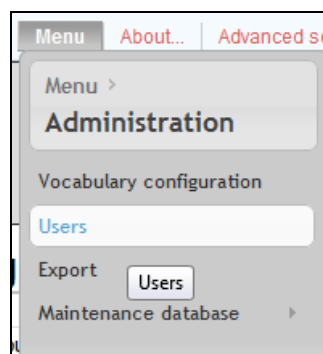


Figure 23 Going to user administration

| Users · [New user] | | | |
|--------------------|--------------|----------------------|-------|
| Surname, Name | Organization | Date of creation | Terms |
| , | | 27-Nov-2013 (enable) | 0 |
| locloud, locloud | LoCloud | 04-Jul-2013 (enable) | 1013 |
| Total users | 2 | | |

Figure 24 User management

When clicking on “New user” a new user can be created (see Figure 25).

Figure 25 Creating a new user

Export

When going to **Menu → Administration → Export** the vocabulary can be exported (see Figure 26).

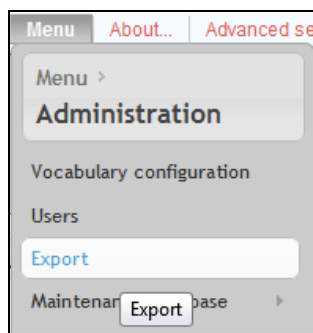


Figure 26 Going to “Export”

Figure 27 shows the possibilities for exporting the vocabularies. When one XML schema has been chosen with the drop-down menu click on “Save”.

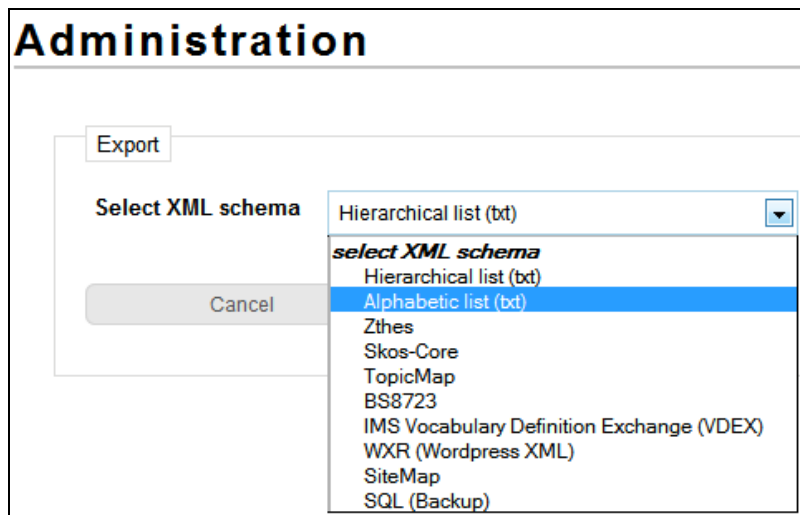


Figure 27 Exporting the vocabulary

An example for a hierarchical list (txt) can be seen in Figure 28.

```

Title: UNESCO Thesaurus
Author: AIT
Keywords:
Scope:
URI: http://test113.ait.co.at/tematres/unesco/
Powered by: TemaTres 1.72

EDUCATION
. EDUCATIONAL PLANNING
. EDUCATIONAL MANAGEMENT
. EDUCATIONAL SYSTEMS AND LEVELS
. EDUCATIONAL INSTITUTIONS
. . SCHOOLS
. CURRICULUM
SCIENCE
. PHYSICAL SCIENCES
. . OPTICS
. . PHYSICAL PROPERTIES
. . PHYSICS
. . RELATIVITY
. . THERMODYNAMICS
. SPACE SCIENCES
. GEOGRAPHY AND OCEANOGRAPHY
. . CHEMICAL OCEANOGRAPHY
. . DESERT SCIENCE
. METEOROLOGY
. . HYDROMETEOROLOGY
. ENVIRONMENTAL SCIENCES AND ENGINEERING
. . NATURAL HERITAGE
CULTURE
. HISTORY
. . HERALDRY
. . NATIONAL HISTORY
. LINGUISTICS
. . PSYCHOLINGUISTICS
. . . LANGUAGE BEHAVIOUR

```

Figure 28 Exporting a hierarchical list (txt)

In the list the XML scheme “BS8723” can be seen. It is the predecessor of the current ISO 25964.¹⁵

Maintenance database

When going to **Menu -> Administration -> Maintenance database** different options are shown (see Figure 29).

¹⁵ http://en.wikipedia.org/wiki/ISO_25964 27th August, 2014

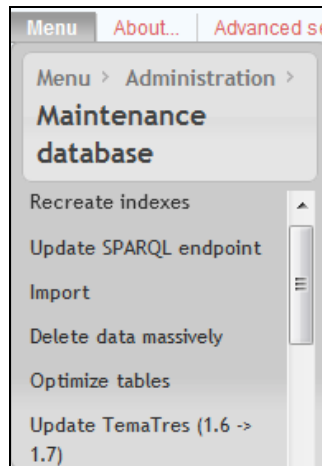


Figure 29 Maintenance database options

Recreate indexes

When clicking on “*Recreate indexes*” the complete number of records is shown (see Figure 30).



Figure 30 After recreating the index

Update SPARQL endpoint

With “*Update SPARQL endpoint*” the SPARQL endpoint can be actualised (see Figure 31). This can take several minutes. For multilingual thesauri this step has to be repeated for every thesaurus.

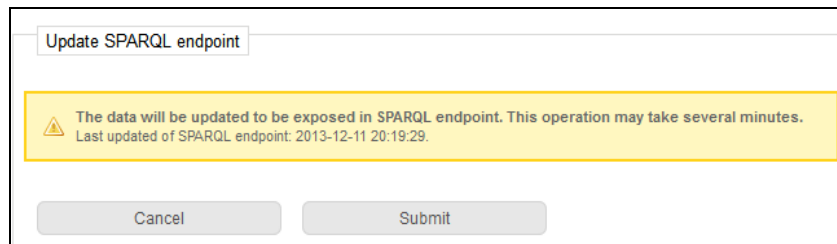


Figure 31 Updating the SPARQL endpoint

Import

With the “*Import*” option a thesaurus can be imported from a file (see Figure 32).

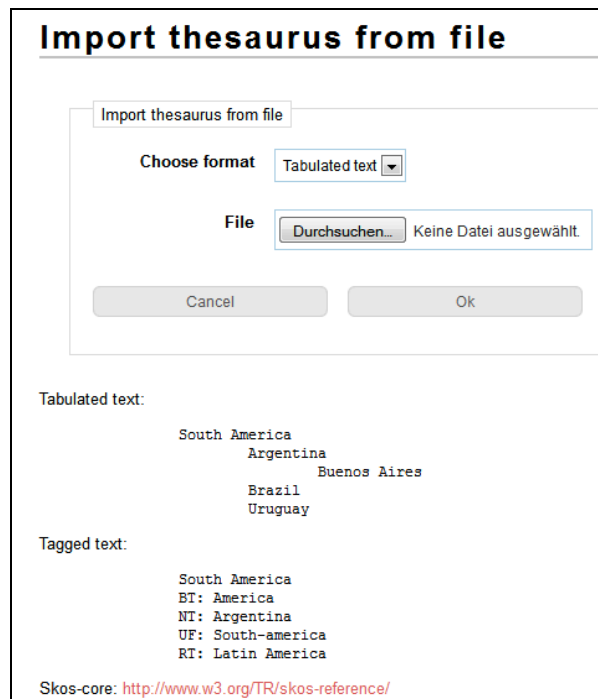


Figure 32 Importing a thesaurus from a file

As can be seen the user can choose between *tabulated text*, *tagged text* or *Skos-core* (examples are given at the bottom of Figure 32). Then a file can be chosen.

Figure 33 shows an example import of the UNESCO thesaurus in Skos-core.

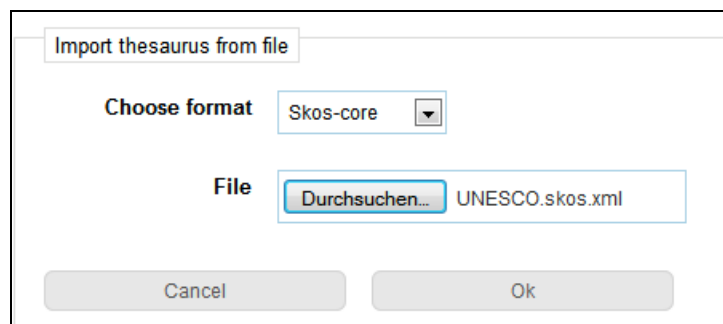


Figure 33 Importing the UNESCO thesaurus

After clicking on OK a second step during the Import process makes it possible to select the language terms (see Figure 35). The number of terms is given in brackets. Select "All" in the drop-down menu of "Choose concept scheme" and click on "Import".

PLEASE NOTE: This can take several minutes.

Import Settings for UNESCO.skos.xml

SKOS import options

| | | |
|----|-------------------------------------|------------------------------|
| en | <input checked="" type="checkbox"/> | (4395 terms are in the file) |
| es | <input checked="" type="checkbox"/> | (4190 terms are in the file) |
| fr | <input checked="" type="checkbox"/> | (4069 terms are in the file) |

Choose concept scheme: All

Figure 34 Second step during Import

After the Import is finished feedback on the process is given (see Figure 35). The error messages are merged in groups that can be scrolled if there are more. At the bottom of the page the number of the concepts stored is given and a message that says that the import task is finished.

Importing

[Error] No preferred label:

- 1 Concept [http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL COMMUNICATION](http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL_COMMUNICATION) has no prefLabel.
- 2 Concept [http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL RELATIONS](http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL_RELATIONS) has no prefLabel.
- 3 Concept [http://iaaa.cps.unizar.es/thesaurus/INTERNATIONAL SECURITY](http://iaaa.cps.unizar.es/thesaurus/INTERNATIONAL_SECURITY) has no prefLabel.
- 4 Concept [http://iaaa.cps.unizar.es/thesaurus/INTERNATIONAL TRAINING PROGRAMMES](http://iaaa.cps.unizar.es/thesaurus/INTERNATIONAL_TRAINING_PROGRAMMES) has no prefLabel.
- 5 Concept <http://iaaa.cps.unizar.es/thesaurus/INTUITION> has no prefLabel.

[Error] This thesaurus is not configured for some languages:

- 1 There is no remote/local thesaurus for language fr. 4069 terms in language 'fr' will not be stored.

[Error] Concepts that were not stored, due to previous errors:

- 1 Not stored [http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL COMMUNICATION](http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL_COMMUNICATION).
- 2 Not stored <http://iaaa.cps.unizar.es/thesaurus/INVENTORIES>.
- 3 Not stored <http://iaaa.cps.unizar.es/thesaurus/INTUITION>.
- 4 Not stored <http://iaaa.cps.unizar.es/thesaurus/INTOLERANCE>.
- 5 Not stored [http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL RELATIONS](http://iaaa.cps.unizar.es/thesaurus/INTERPERSONAL_RELATIONS).

Concepts stored: 4416

Import task finished

Figure 35 Import task finished

When now going to the “Home” screen the top terms of the newly imported thesaurus can be seen (see Figure 36



Figure 36 Top terms of UNESCO thesaurus

Delete data massively

With “Delete data massively” different data types can be deleted at once (see Figure 37). To achieve this the appropriate checkbox needs to be selected before clicking on “Submit”.

PLEASE NOTE: These actions are irreversible!

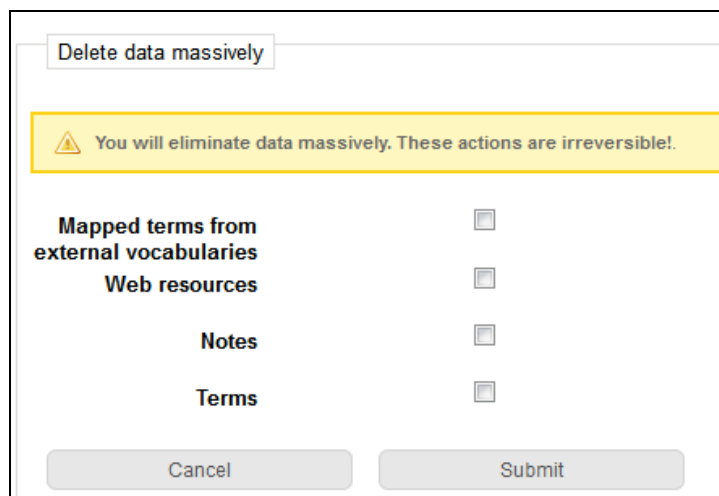


Figure 37 Deleting data massively

Optimize tables

When clicking on “Optimize tables” an overview of all the tables is given with status messages (see Figure 38).

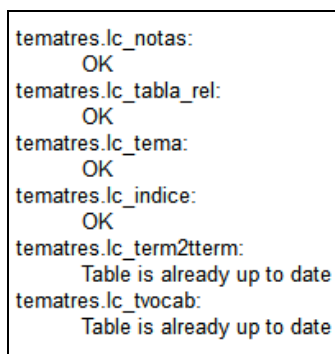


Figure 38 Optimizing tables

Update

Finally different update options are given (see Figure 39).

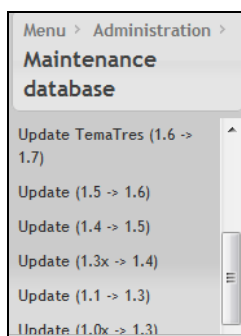


Figure 39 Updating TemaTres versions

Term Management

When the vocabulary is configured correctly different terms can be added.

Adding or creating a term

When going to **Menu > Add Term** one or more search terms can be created (see Figure 40). If more than one term is added one term per line must be entered. The term can also be created as candidate term or meta-term by ticking the appropriate box (see Figure 41).

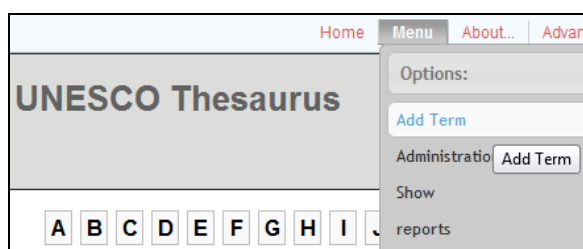


Figure 40 Adding a new term

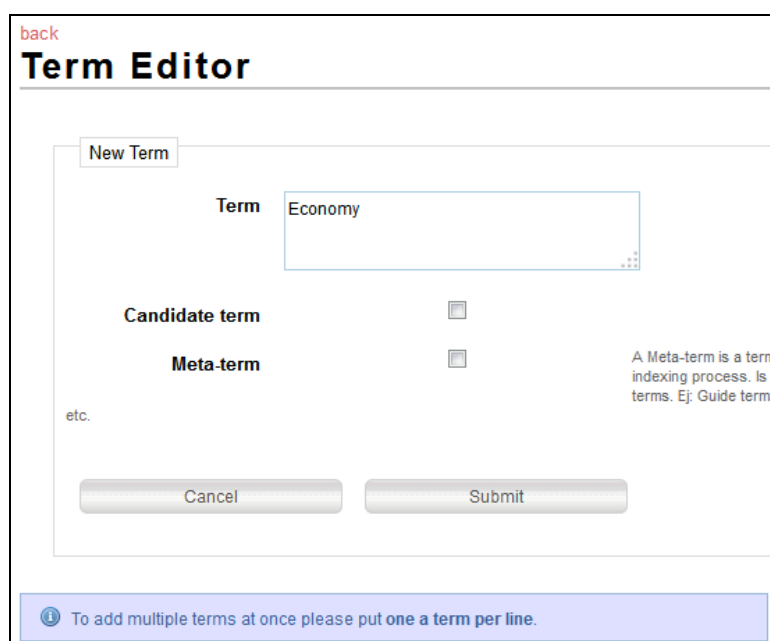
A screenshot of the 'Term Editor' web application. The page title is 'Term Editor'. There is a 'back' link in the top left. The main content area is titled 'New Term' and contains a text input field with the word 'Economy' entered. Below the input field, there are two checkboxes: 'Candidate term' and 'Meta-term', both of which are currently unchecked. To the right of these checkboxes, there is a small text box that reads: 'A Meta-term is a term indexing process. Is terms. Ej: Guide term'. At the bottom of the form, there are two buttons: 'Cancel' and 'Submit'. A blue information banner at the bottom of the page states: 'To add multiple terms at once please put one a term per line.'

Figure 41 Adding the term "Economy"

When the term is added (after clicking on "Submit") there are different options (see Figure 42).

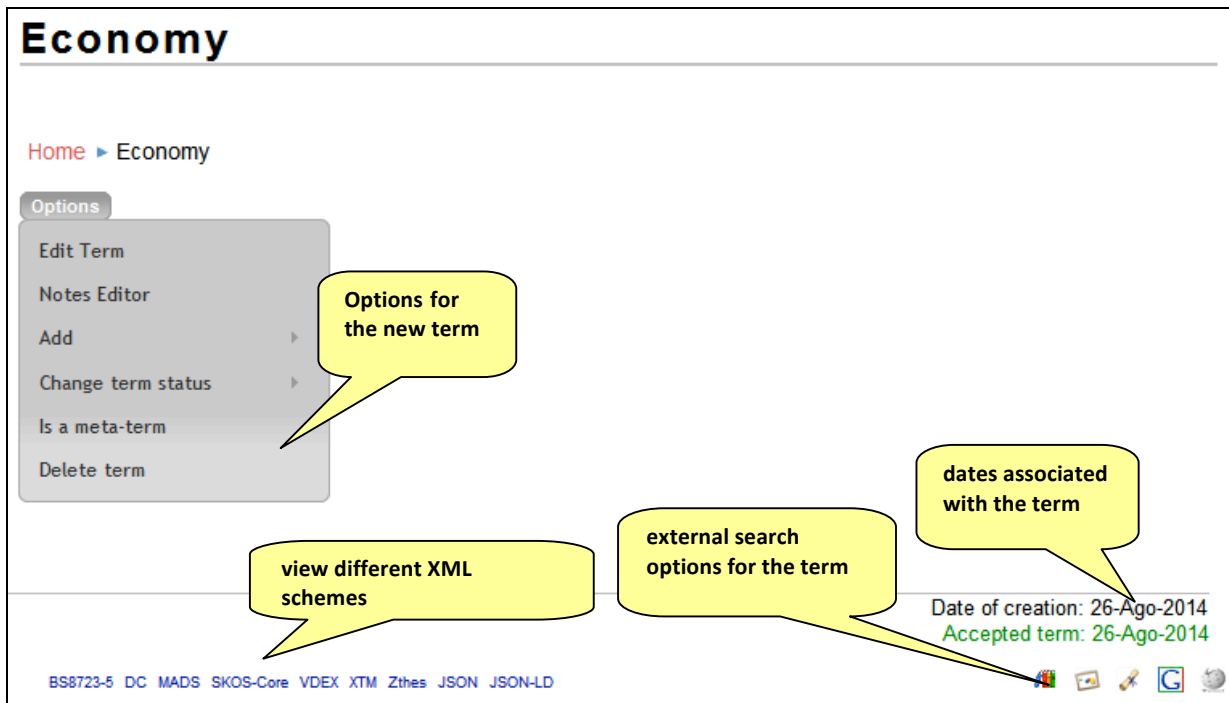


Figure 42 Options for the newly added term

Figure 43 shows the SKOS-Core¹⁶ scheme after clicking on “SKOS-Core” at the bottom (compare Figure 42).

```

- <rdf:RDF>
- <skos:ConceptScheme rdf:about="http://test113.ait.co.at/tematres/unesco/">
  <dc:title>UNESCO Thesaurus</dc:title>
  <dc:creator>AIT</dc:creator>
  <dc:contributor/>
  <dc:publisher/>
  <dc:rights/>
  <dc:subject/>
  <dc:description> </dc:description>
  <dc:date>2014-02-21</dc:date>
  < dct:modified>2014-02-21 13:07:11</dct:modified>
  <dc:language>en</dc:language>
</skos:ConceptScheme>
- <skos:Concept rdf:about="http://test113.ait.co.at/tematres/unesco/?tema=4231">
  <skos:prefLabel xml:lang="en">Economy</skos:prefLabel>
  <skos:inScheme rdf:resource="http://test113.ait.co.at/tematres/unesco/">
  < dct:created>2014-08-26 09:34:59</dct:created>
</skos:Concept>
</rdf:RDF>

```

Figure 43 SKOS-Core scheme of “Economy”

When clicking on the Wikipedia icon on the right bottom of “Economy” Wikipedia search results for Economy are shown (see Figure 44).

¹⁶ <http://www.w3.org/TR/swbp-skos-core-guide/> 13th January, 2014



Figure 44 Wikipedia search results for “Economy”

Creating specific terms

From the options menu of the term **Add > Subordinated Term > Add Term** needs to be selected (see Figure 45).

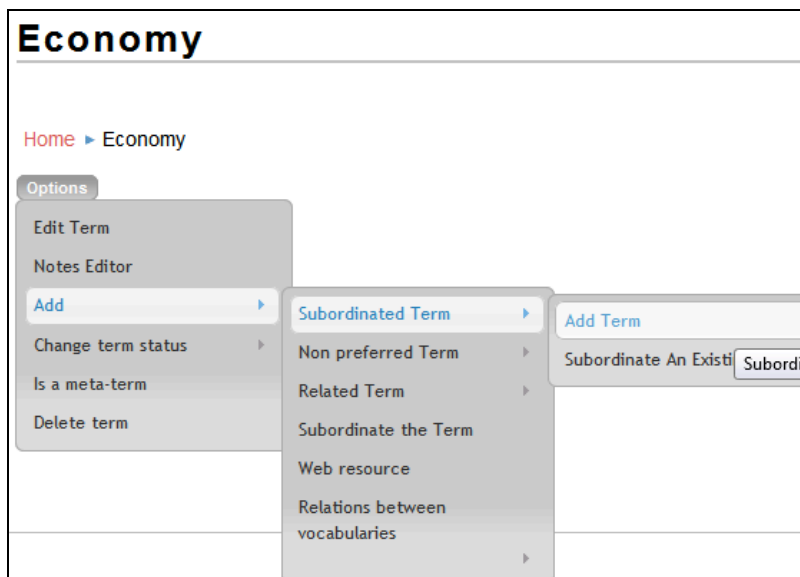


Figure 45 Adding a subordinated term

Then the terms can be added as done before (see Figure 46). Additionally the relation type can be selected (partitive or instance relationship).

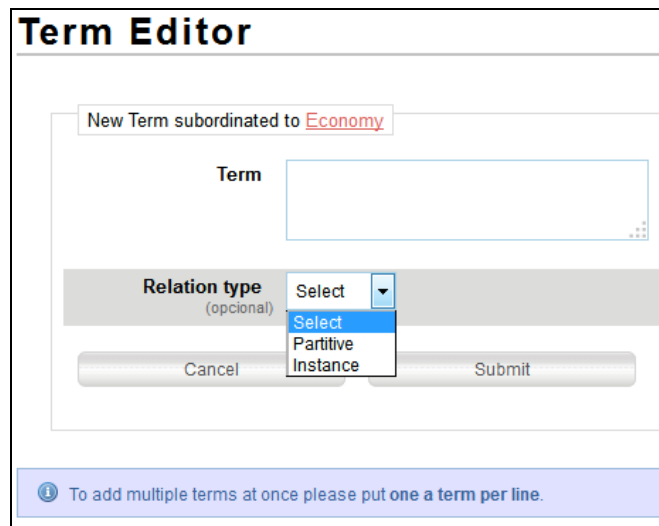


Figure 46 Adding a subordinated term to “Economy”

Converting a free term in a specific term

From the options menu of the term **Add > Subordinated Term > Subordinate An Existing Term** needs to be selected (see Figure 47).

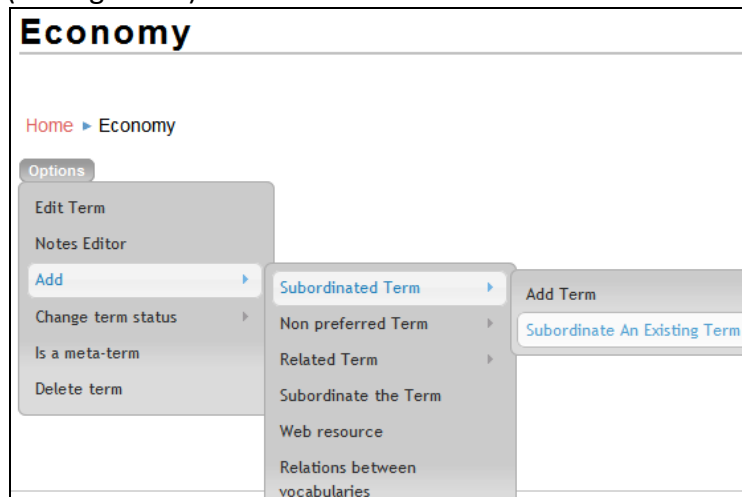


Figure 47 Subordinate an existing term

Then the term that needs to be subordinated is searched (see Figure 48). Only free terms – terms with no relationship – can be used.



Figure 48 Searching the term to be subordinated

Finally select the term to be subordinated (see Figure 49).

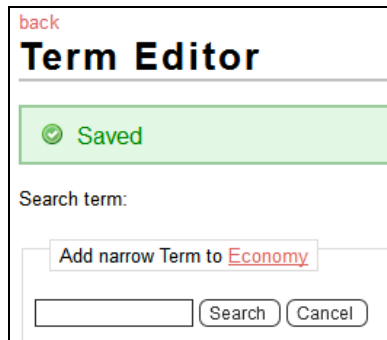


Figure 49 Saving the subordinated term “World economy”

Creating a non-preferred term

From the options menu of the term **Add > Non preferred Term > Add Term** needs to be selected (see Figure 50).

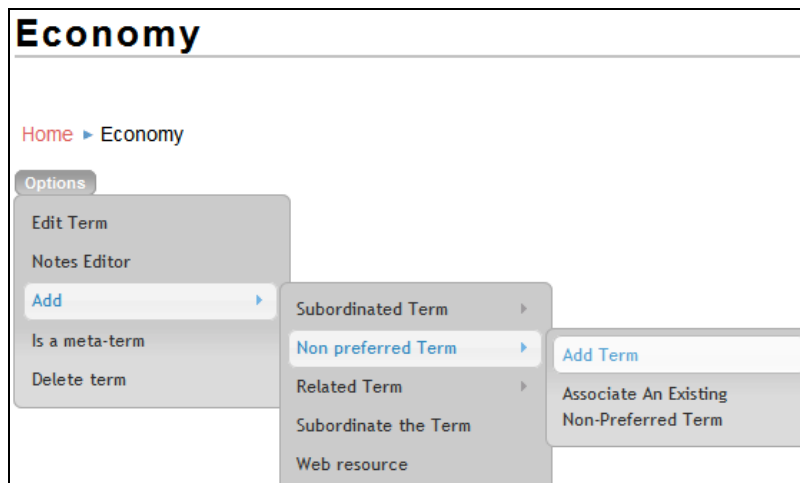


Figure 50 Adding a non-preferred term

Now one or more non-preferred terms can be added as done before. Similar to Figure 47 an existing free term can become a non-preferred term by selecting “Associate An Existing Non-Preferred Term” (compare Figure 50).

Creating a term associated or related

This action allows you to create new terms that will be automatically linked via an associative relationship. First from the options menu of the term **Add > Related Term > Add Term** needs to be selected (see Figure 51).

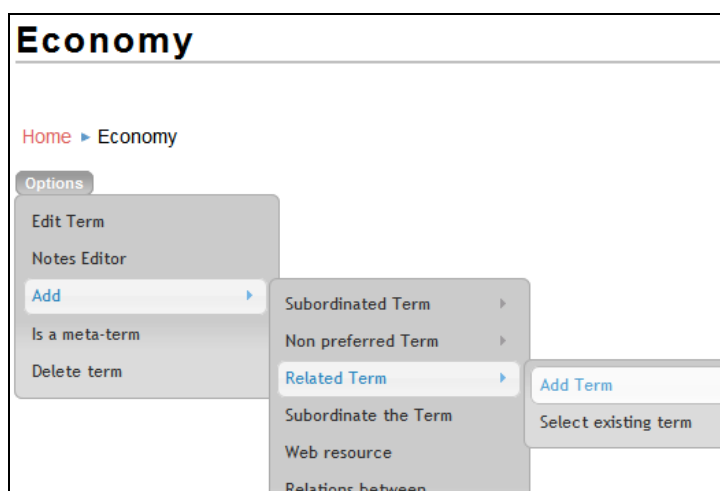


Figure 51 Adding a related term

Then one or more related terms can be created. As before an existing term can become a related term too.

Subordinating an existing term

From the options menu of the term select **Add -> Subordinate the Term** (see Figure 52). Then the broader term for the term that needs to be subordinated is searched – in this case *“POLITICS, LAW AND ECONOMICS”* (see Figure 53). When clicking on *“POLITICS, LAW AND ECONOMICS”* the term *“Economy”* is subordinated (see Figure 54).

Because the vocabulary is polyhierarchical a term can have more than one broader term. The above-mentioned procedure can be repeated as often as needed (see Figure 55).

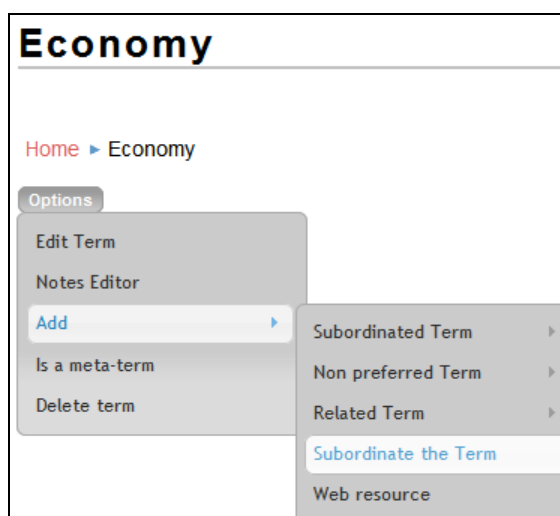


Figure 52 Subordinating a term



Figure 53 Searching for the broader term “POLITICS, LAW AND ECONOMICS”

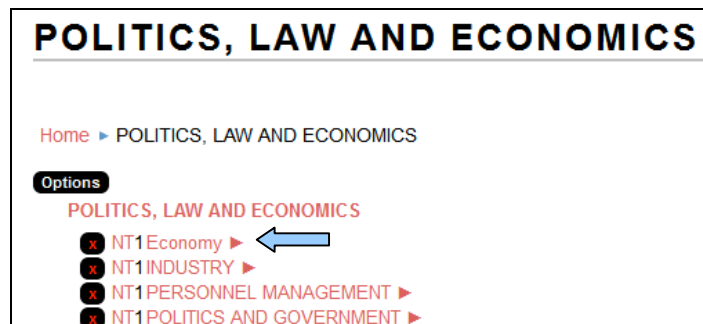


Figure 54 “Economy” subordinated to “ POLITICS, LAW AND ECONOMICS ”



Figure 55 “Economy” subordinated to more than one term

Deleting a relationship

When deleting a term or converting it to a rejected or candidate term, the term SHOULD NOT HAVE RELATIONS (TE / TG, UP / USE, TR). To remove the relations of a term, select the **X** located at the left of each term (see Figure 56).



Figure 56 Deleting a relationship

This action does not delete the term. It only removes the relationship.

Deleting a term

To delete a term go to **Delete term** in the options menu (see Figure 57).

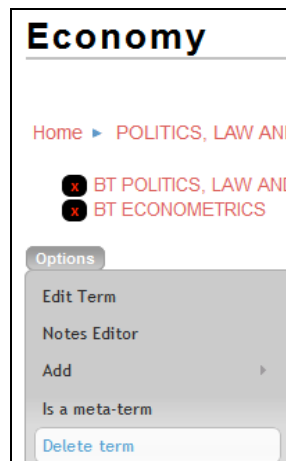


Figure 57 Deleting a term

Notes

TemaTres allows associating a term to an unlimited number of notes. The kind of notes included are:

- Scope note: provides information about the conceptual scope of the term.
- Historical Note: provides information about previous uses or meanings of a term or other terms that have been used before replacing it.
- Bibliographical Note: provides information on the reference sources used for the selection and wording of the term.
- Cataloguer's note: provides recommendations on the application context of term indexing processes, or arguments about how the term was written.
- Private Note: allows a user to enter notes visible only for registered users (publishers or administrators) of the controlled vocabulary.

It is also possible to write notes in different languages. When the notes are written in a language other than the vocabulary language, it is mentioned alongside the denomination type note.

Managing notes

First the "Notes Editor" from the options menu of a term needs to be selected (see Figure 58).

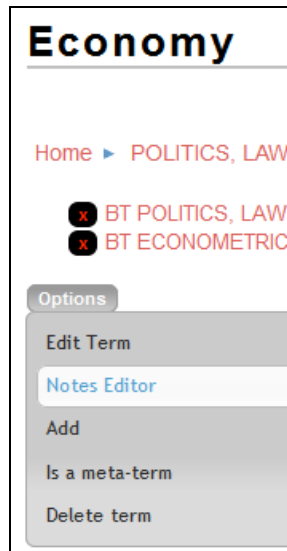


Figure 58 Opening the Notes Editor

Figure 59 shows the Notes Editor with its different functions.

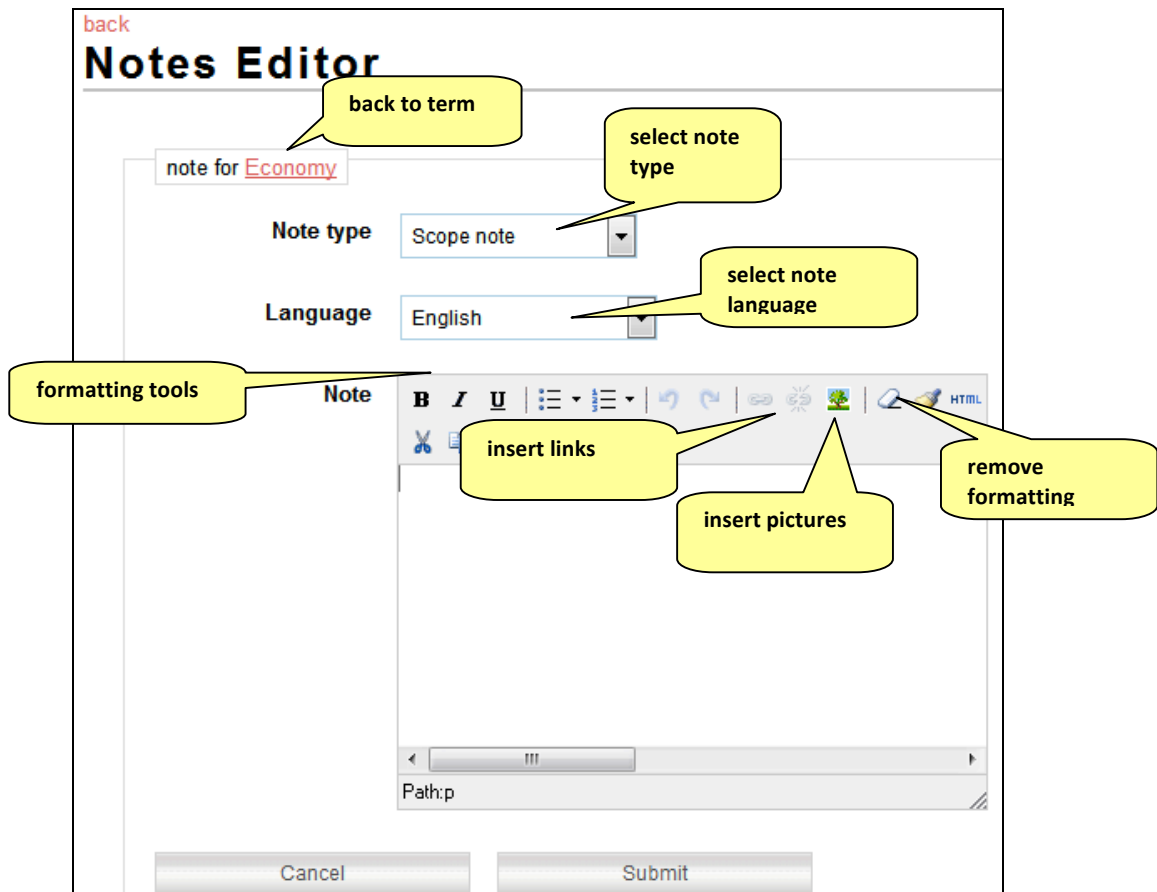


Figure 59 The Notes Editor

Reports

When going to **Menu -> reports** reports can be created (see Figure 60).

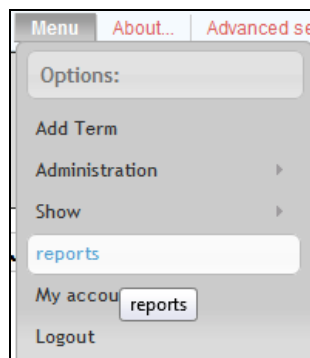


Figure 60 Selecting “reports”

TemaTres differentiates between reports and advanced reports (see Figure 61).

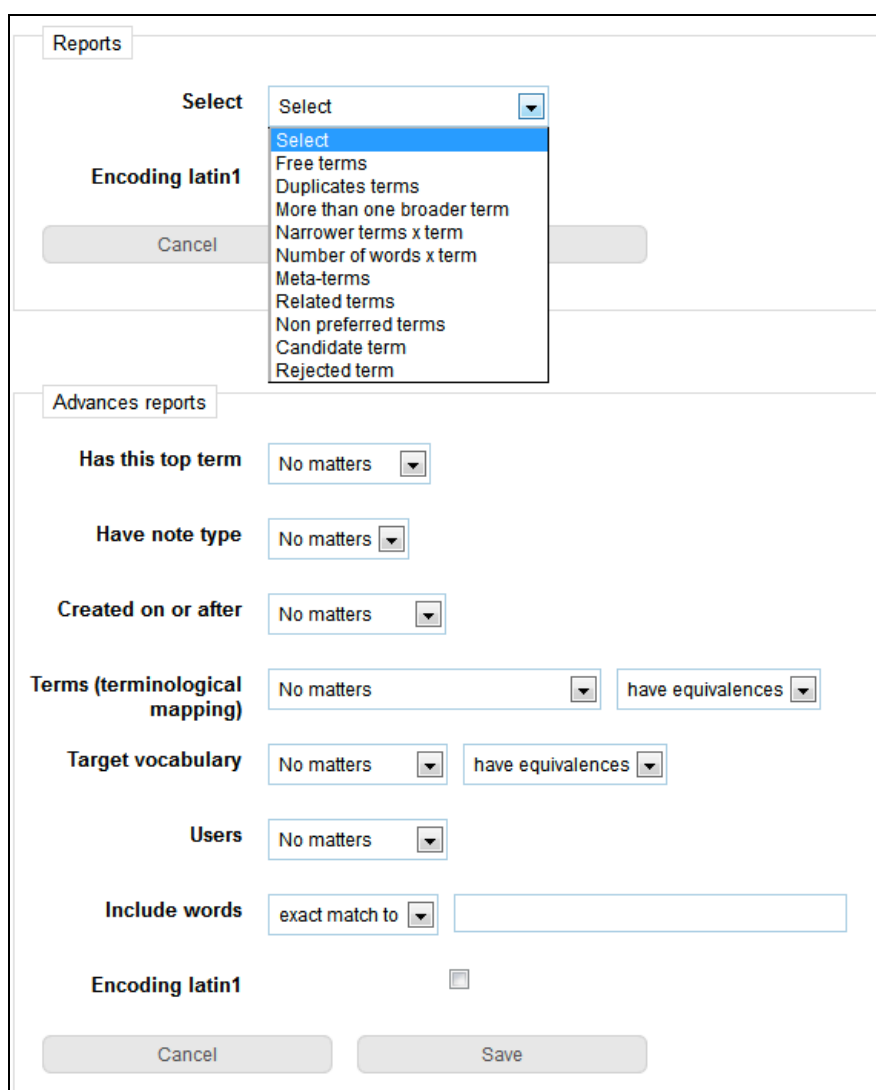
A screenshot of a web application form for creating reports. The form is divided into two sections: 'Reports' and 'Advanced reports'. In the 'Reports' section, there is a 'Select' dropdown menu with a list of options: 'Select', 'Free terms', 'Duplicates terms', 'More than one broader term', 'Narrower terms x term', 'Number of words x term', 'Meta-terms', 'Related terms', 'Non preferred terms', 'Candidate term', and 'Rejected term'. The 'Select' option is currently selected. Below this, there is a 'Cancel' button. In the 'Advanced reports' section, there are several dropdown menus and input fields: 'Has this top term' (No matters), 'Have note type' (No matters), 'Created on or after' (No matters), 'Terms (terminological mapping)' (No matters) and 'have equivalences' (have equivalences), 'Target vocabulary' (No matters) and 'have equivalences' (have equivalences), 'Users' (No matters), 'Include words' (exact match to) with an adjacent text input field, and 'Encoding latin1' (checkbox). At the bottom, there are 'Cancel' and 'Save' buttons.

Figure 61 Creating a report

As can be seen different term types for reports can be selected: free terms, duplicate terms, terms with more than one broader term, narrower terms x term, number of words x term, meta-terms, related terms, non-preferred terms, candidate terms and rejected terms.

In the “advanced reports” section reports can be created according to top-terms, note types, creation date, terminological mapping, target vocabularies, users and words included (compare Figure 61).

Vocabulary reference¹⁷

There are two possible models to implement multilingual vocabularies in TemaTres:¹⁸

1) Model with central vocabulary

This model contains in the same vocabulary the terms from source vocabulary and the equivalence to the terms in target vocabularies. All vocabularies (source and target vocabulary) are managed by the same instance of TemaTres. This option is useful if the target vocabulary does not exist or the terminology services are not available or there are incomplete terminological correspondences.

Advantages:

- Registers and establishes nominal reference mapping of vocabularies although they do not exist or are unavailable.
- The term mappings can be recovered in search operations and alphabetical navigation.
- The user has full control over the term management of the reference vocabulary.
- For the mapping the following relations are allowed: normalized, complete equivalence, partial or non-equivalence.

Disadvantages:

- Establishing nominal mappings on the resulting is complex and can lead to inferences on advanced processes.
- When many vocabularies are registered, irrelevant and inaccurate results can be generated, because the result of all reference vocabularies is included.
- If changes in the actual reference vocabulary occur there are no automatic alert or update mechanisms.

2) Federated Model

This model allows to establish independent relationships between different vocabularies or languages, whether equivalence relations between languages or other possible relationships between terms and concepts. Each of the vocabularies of destination (target vocabulary) should be able to offer web services according to the TemaTres pattern terminology services. Through these services, the source vocabulary can search terms in the target vocabularies and establish relationships between terms. This option can be useful for medium and large projects managed by multilingual terminologist team.

Advantages:

- Permits the establishment of complete terminological mappings and provides functional, logical and nominal capabilities. Each of these mappings has a unique URI in order to describe the relationships in terms of interoperability consistent with the model Linked data.
- An unlimited number of reference vocabularies can be entered without influencing the functionality and performance of each vocabulary.
- Because it is a federated model, it has a scheme of independent users for each vocabulary, being able to articulate terminologists according to language or domain equipment. It offers

¹⁷ http://www.r020.com.ar/tematres/manual/vocabularios_de_referencia.html 25th June, 2014

¹⁸ http://vocabularyserver.com/wiki/index.php?title=Multilingual_vocabularies 25th June, 2014

automated mechanisms for updating federated terms. When a term is modified or eliminated in the reference vocabulary, it is notified in the source vocabulary.

- The mapping relationships are not standardized, therefore it is possible to establish relationships of all kinds among vocabularies, translations, extensions etc.

Disadvantages:

- Requiring Web services terminology, is only possible with vocabularies that expose the same Web services terminology.
- Allowing denormalized relationships is at the discretion of vocabulary administrators for a cohesive and coherent development of terminology mapping.

The LoCloud vocabulary application should support the collaboration on multilingual vocabulary management and is therefore based on the federated model. Especially in the cultural heritage domain vocabularies can vary to a huge extend from country to country. Terms existing in one language might not be known in another language, or the hierarchies of the vocabularies in the various languages could vary.

The main issues for multilingual thesauri are:

- Structural problems: The conceptual systems can differ in different languages
- Equivalence problems:
 - The lexicalization of concepts can differ in different languages (eg. bone – fish bone (en); Knochen – Gräten (de))¹⁹
 - The translation of a thesaurus from one language to another does not make it a thesaurus for the other language (intra and inter-language equivalence problems, terms might differ in meaning etc.)

With the federated model it is possible to have indepent vocabularies for the various languages in the same domain. The alignment of the various vocabularies in the different languages is done via concept identifiers. The linking of vocabulary concepts makes it possible for the end-user to search in all linked indexing vocabularies using any one of the linked thesauri or subject heading lists.

In the following section the implementation of the federated approach is demonstrated.

Adding a target vocabulary

When going to “**Menu -> Administration -> Vocabulary configuration**” (see Figure 62) a new target vocabulary can be added (see Figure 63)

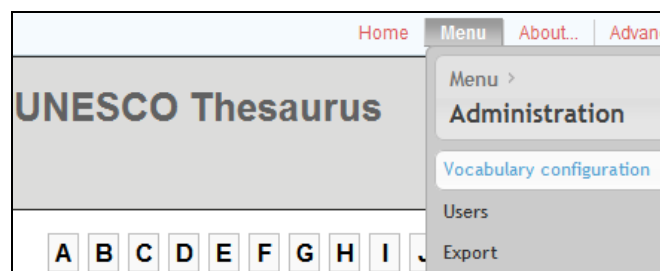


Figure 62 Going to “Vocabulary configuration”

¹⁹ <http://www.dsoergel.com/cv/B67.pdf> 20th August, 2014

| UNESCO Thesaurus | | |
|--|--------|--|
| vocabulary configuration · [Add target vocabulary] ← | | |
| Title | Author | |
| UNESCO Thesaurus / en | AIT | |
| 1 | | |
| vocabulary configuration · [Add remote target vocabulary (web services)] | | |
| Label for the reference | Title | |
| | | |
| 0 | | |

Figure 63 Adding a target vocabulary

Now the target vocabulary can be configured (see Figure 64). In this example the UNESCO Thesaurus is added in German. As can be seen Title, Author, Language, Date of creation and URI are filled in. After this click on “Save” at the bottom.

Vocabulary configuration target vocabulary

Vocabulary configuration target vocabulary

title

Author

contributor

rights

publisher

Language ▼

Date of creation ▼ ▼ ▼

Keywords

Language type

URI

Figure 64 Adding the German thesaurus “UNESCO Thesaurus_DE”

Now there are two vocabularies in the overview of the configuration (see Figure 65).

| UNESCO Thesaurus | | |
|--|--------|-------------------|
| vocabulary configuration · [Add target vocabulary] | | |
| Title | Author | Type |
| UNESCO Thesaurus / en | AIT | vocabulary |
| UNESCO Thesaurus_DE / de | AIT | target vocabulary |
| 2 | | |

Figure 65 Two vocabularies in the overview

When now clicking on one term (in this example “Economy”) a relation to the German vocabulary can be created by selecting “Options -> Add -> Relations between vocabularies -> Target vocabulary” (see Figure 66).

Figure 66 Adding a relation to the target vocabulary

Now an equivalence relationship between the two vocabularies can be established by filling in the German term (see Figure 67).

back

Term Editor

Relación con otro vocabulario [Economy](#)

Term

Target vocabulary

Equivalence type

Figure 67 Adding the equivalent term “Wirtschaft“

In the term overview the equivalent term can be seen (see Figure 68).

Economy

Home ► POLITICS, LAW AND ECONOMICS ► Economy

- BT POLITICS, LAW AND ECONOMICS
- BT ECONOMETRICS

Options

Economy

- NT2 World economy
- EQ Wirtschaft (UNESCO Thesaurus_DE)

Figure 68 Equivalent relationship of terms

Adding a remote target vocabulary (via Web service)

When going to “Menu -> Administration -> Vocabulary configuration” a remote target vocabulary can be added (see Figure 69).

| UNESCO Thesaurus | | |
|--|--------|-------------------|
| vocabulary configuration · [Add target vocabulary] | | |
| Title | Author | Type |
| UNESCO Thesaurus / en | AIT | vocabulary |
| UNESCO Thesaurus_DE / de | AIT | target vocabulary |
| 2 | | |
| vocabulary configuration · [Add remote target vocabulary (web services)] ← | | |
| Label for the reference | Title | Terms |
| 0 | | |

Figure 69 Adding a remote target vocabulary (web services)

Then the following information needs to be recorded (see Figure 70 for an example):

- Reference label: the label will be displayed next to each term
- Reference tag: a descriptive type of relationship terminology (eg EQ for equivalent, EQP for partial equivalent)
- Language: language code of the vocabulary reference (target vocabulary)
- URL for the web services reference: URL from which the reference vocabulary provides web services terminology. The service must be enabled on the target vocabulary.

Figure 70 Information on remote target vocabulary

When everything has been filled in correctly click *“Submit”*. Now the remote target vocabulary can be seen in the configuration overview (see Figure 71).

| UNESCO Thesaurus | | |
|--|---------------------------------|-------------------|
| vocabulary configuration · [Add target vocabulary] | | |
| Title | Author | Type |
| UNESCO Thesaurus / en | AIT | vocabulary |
| UNESCO Thesaurus_DE / de | AIT | target vocabulary |
| 2 | | |
| vocabulary configuration · [Add remote target vocabulary (web services)] | | |
| Label for the reference | Title | Terms |
| Tesauro Europeo de la Educación (EQ) | Tesauro Europeo de la Educación | ← |

Figure 71 Configuration overview with remote target vocabulary

When now clicking on one term (in this example *“CULTURE”*) a relation to the remote vocabulary can be created by selecting **“Options -> Add -> Relations between vocabularies -> Remote target vocabulary (web services)”** (see Figure 72).

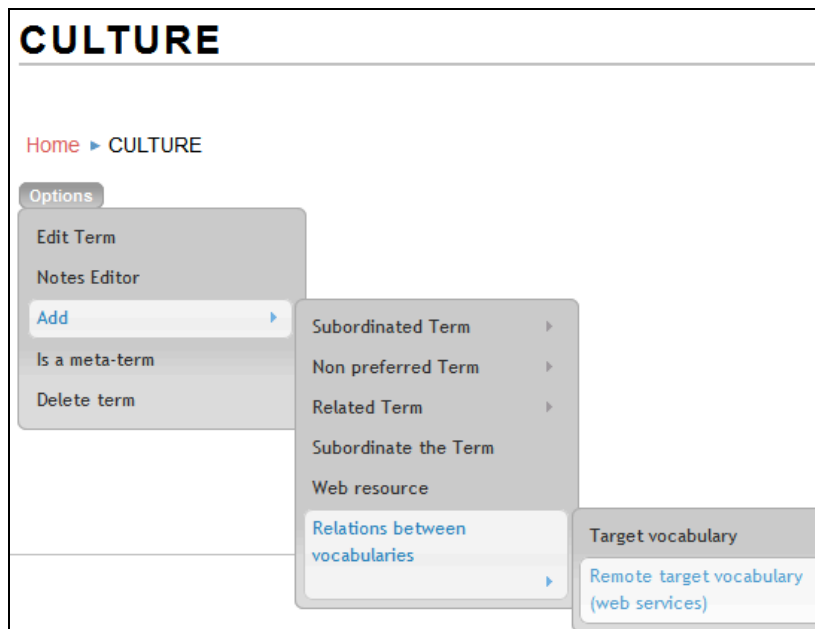


Figure 72 Establishing a relation to a remote target vocabulary

Now the target vocabulary and the terminological mapping method are selected before clicking on “Search”. The result is shown at the bottom (see Figure 73).



Figure 73 Searching for “Cultura” in remote vocabulary

When selecting one of the result terms it appears in the overview of the term (see Figure 74).



Figure 74 Link to remote target vocabulary

When clicking on the term of the remote target vocabulary the term in the original vocabulary can be seen (see Figure 75).



Figure 75 Term “cultura” in Tesauro Europeo de la Educación

Importing a multilingual vocabulary

When creating a multilingual vocabulary – like the UNESCO Thesaurus which is available in English, Spanish and French – first a thesaurus for each language needs to be established as described in the chapter Creating a new vocabulary. In our example the English and Spanish UNESCO Thesaurus have been created.

PLEASE NOTE: It is important to create all vocabularies with the same user account. Otherwise switching between the vocabularies will not work.

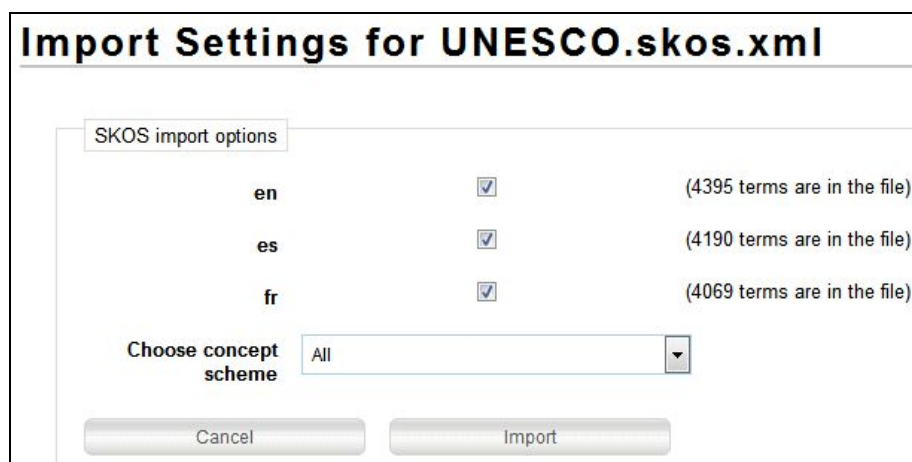
Now each vocabulary is defined as the remote target vocabulary of the other one (compare the chapter **Adding a remote target vocabulary (via Web service)**, see Figure 76).

| configuración · [Agregar Vocabulario externo via servicios web] | | |
|---|------------------|------------------|
| Leyenda de la referencia | Título | Términos |
| UNESCO Thesaurus (EQ) | UNESCO Thesaurus | Habilitado: 4248 |
| 1 | | |

Figure 76 English UNESCO Thesaurus as target vocabulary for Spanish UNESCO thesaurus

Finally, the UNESCO Skos file is imported in the English UNESCO Thesaurus as described in the chapter **Import**. A second step during the Import process makes it possible to select the language terms (see Figure 77). The number of terms is given in brackets. Select “All” in the drop-down menu of “Choose concept scheme” and click on “Import”.

PLEASE NOTE: This can take several minutes.

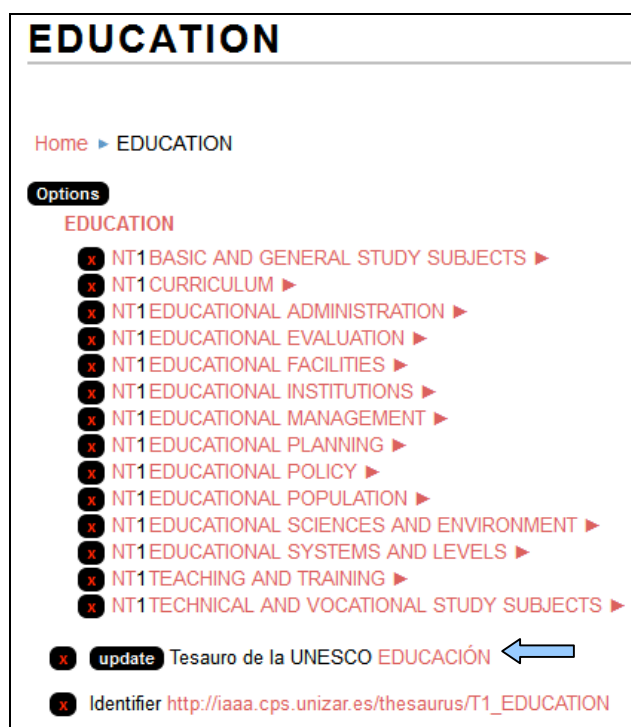


| Language | Number of terms |
|----------|----------------------------|
| en | 4395 terms are in the file |
| es | 4190 terms are in the file |
| fr | 4069 terms are in the file |

Figure 77 Second step during Import

When the Import is finished a message appears (compare Figure 35).

When now clicking on one term of the thesaurus there is a link to the term in the other language (see Figure 78).



EDUCATION

Home ► EDUCATION

Options

EDUCATION

- NT1 BASIC AND GENERAL STUDY SUBJECTS ►
- NT1 CURRICULUM ►
- NT1 EDUCATIONAL ADMINISTRATION ►
- NT1 EDUCATIONAL EVALUATION ►
- NT1 EDUCATIONAL FACILITIES ►
- NT1 EDUCATIONAL INSTITUTIONS ►
- NT1 EDUCATIONAL MANAGEMENT ►
- NT1 EDUCATIONAL PLANNING ►
- NT1 EDUCATIONAL POLICY ►
- NT1 EDUCATIONAL POPULATION ►
- NT1 EDUCATIONAL SCIENCES AND ENVIRONMENT ►
- NT1 EDUCATIONAL SYSTEMS AND LEVELS ►
- NT1 TEACHING AND TRAINING ►
- NT1 TECHNICAL AND VOCATIONAL STUDY SUBJECTS ►

update Tesouro de la UNESCO EDUCACIÓN ←

Identifier http://iaaa.cps.unizar.es/thesaurus/T1_EDUCATION

Figure 78 Link to Spanish UNESCO Thesaurus

When clicking on the Spanish term the Spanish UNESCO Thesaurus is opened (see Figure 79). By clicking on the English term it can be switched back to the English version of the thesaurus.

At the bottom an “Identifier” has been added that is taken from the Skos file that has been imported.

The screenshot shows the Spanish UNESCO Thesaurus interface for the term 'EDUCACIÓN'. At the top, the word 'EDUCACIÓN' is displayed in a large, bold, black font. Below it, there is a navigation path: 'Inicio ► EDUCACIÓN'. A button labeled 'Opciones' is visible. The main content area is titled 'EDUCACIÓN' and contains a list of 15 sub-terms, each preceded by a red 'x' in a black circle and followed by a right-pointing triangle. The sub-terms are: TE1 ADMINISTRACIÓN DE LA EDUCACIÓN ►, TE1 CIENCIAS DE LA EDUCACIÓN Y DEL MEDIO AMBIENTE ►, TE1 CURRÍCULO ►, TE1 EVALUACIÓN DE LA EDUCACIÓN ►, TE1 FORMACIÓN Y ENSEÑANZA ►, TE1 GESTIÓN EDUCACIONAL ►, TE1 INSTALACIÓN EDUCACIONAL ►, TE1 INSTITUCIÓN DE ENSEÑANZA ►, TE1 PLANIFICACIÓN DE LA EDUCACIÓN ►, TE1 POBLACIÓN EDUCATIVA ►, TE1 POLÍTICA EDUCACIONAL ►, TE1 SISTEMAS Y NIVELES DE LA EDUCACIÓN ►, TE1 TEMAS DE ESTUDIO GENERALES Y BÁSICOS ►, and TE1 TEMAS DE ESTUDIO VOCACIONALES Y TÉCNICOS ►. At the bottom of the interface, there are two more items: 'actualizar UNESCO Thesaurus EDUCATION' and 'Identifier http://iaaa.cps.unizar.es/thesaurus/T1_EDUCATION', both preceded by a red 'x' in a black circle.

Figure 79 The Spanish UNESCO Thesaurus

Abbreviations

The following table shows the abbreviations of tags used in TemaTres to display hierarchical relations between terms.

Table 2 Relationship indicators in TemaTres²⁰

| Basque | Catalan | Dutch | English | French | Galician | German | Italien | Polish | Portuguese | Spanish | Meaning |
|-------------------|--------------|---------------|------------|--------------------|-----------------|--------------------|---------------------|-----------------|----------------|-----------------|---------------|
| TG | TG | BT | BT | TG | TG | Oberbegriff | BT | BT | TG | TG | broader term |
| TE | TE | NT | NT | TS | TE | Unterbegriff | NT | NT | TE | TE | narrower term |
| TR | TR | RT | RT | TA | TR | Verwandter Begriff | RT | RT | TR | TR | related term |
| Irismen nabari du | Nota d'abast | Scope notitie | Scope Note | Note d'application | Nota de alcance | Definición | Nota di ambito (SN) | Nota o zakresie | Nota de escopo | Nota de alcance | Scope Note |
| USE | USEU | GEBR UIK | USE | USE | USE | siehe | USE | Użyj | USE | USE | use |

²⁰ compare <http://databases.unesco.org/thesaurus/help.html> 27th August, 2014