



Publishing SSHOC Multilingual Terminologies

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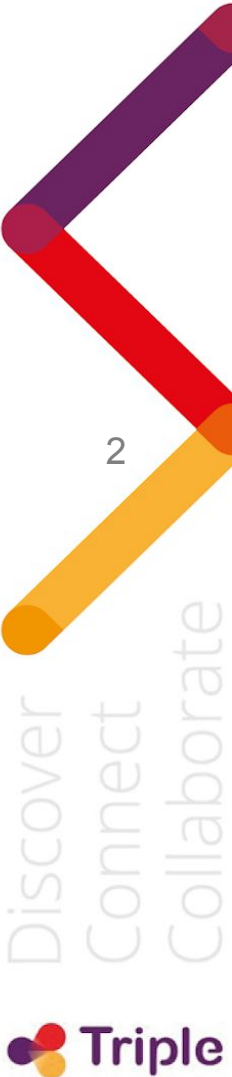
Use of vocabularies for metadata curation and quality assessment in
Social Sciences and Humanities | **TRIPLE** | 26/3/23 | Berlin

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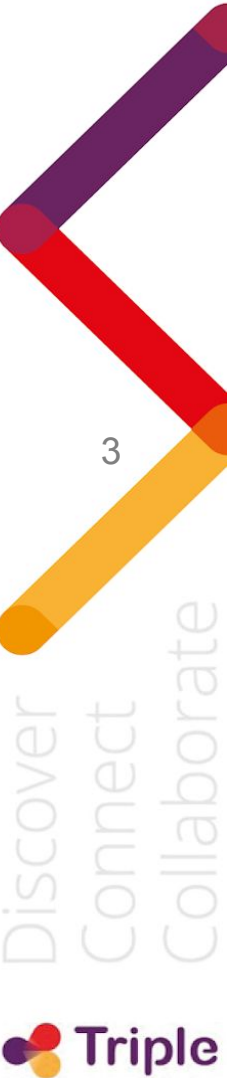
Objectives of the SSHOC activities on Multilingual Terminologies

- Test state of the art Terminology Extraction and Machine Translation
- **Use state of the art technologies to speed up and optimise the creation and publishing of multilingual vocabularies**
- Produce interoperable multilingual resources
- Make them available via the CLARIN ERIC, CLARIN-IT and SSHOC channels



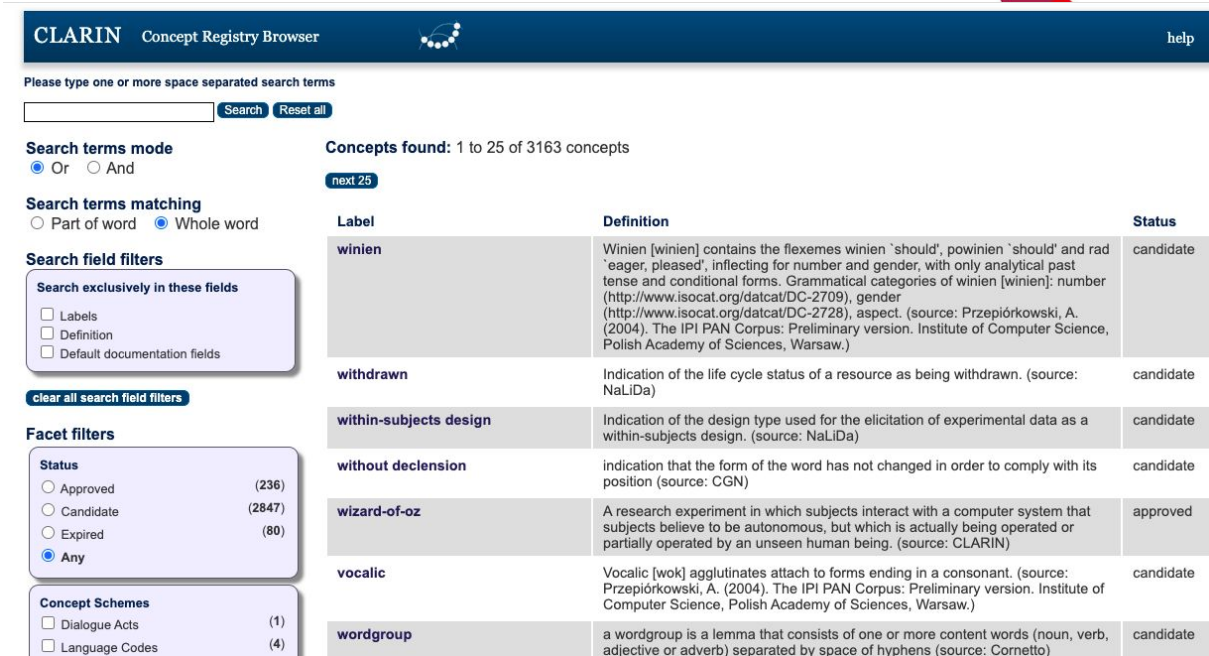
SSHOC Multilingual Terminologies: case studies

- Case study 1: translating CLARIN Core metadata
- Case study 2: creating and translating a terminology for Data Stewardship



Case study 1- Multilingual Metadata

- Translating CLARIN Core metadata
 - 232 approved metadata concepts from the CLARIN Concept Registry
 - Dutch, French, Greek, Italian
- MT services used
 - Google Translate, DeepL
 - CUNI, Reverso
- Evaluation method:
 - Assessment of translations by experts



The screenshot displays the CLARIN Concept Registry Browser interface. At the top, the header reads "CLARIN Concept Registry Browser" with a logo and a "help" link. Below the header, there is a search bar with the text "Please type one or more space separated search terms" and buttons for "Search" and "Reset all".

On the left side, there are several filter sections:

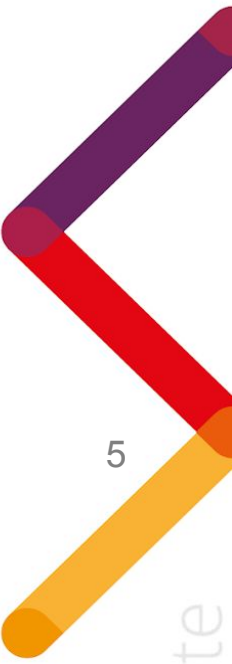
- Search terms mode:** Radio buttons for "Or" (selected) and "And".
- Search terms matching:** Radio buttons for "Part of word" and "Whole word" (selected).
- Search field filters:** A box titled "Search exclusively in these fields" with checkboxes for "Labels", "Definition", and "Default documentation fields".
- Facet filters:** A section for "Status" with radio buttons for "Approved" (236), "Candidate" (2847), "Expired" (80), and "Any" (selected).
- Concept Schemes:** Checkboxes for "Dialogue Acts" (1) and "Language Codes" (4).

On the right side, the main content area shows "Concepts found: 1 to 25 of 3163 concepts" with a "next 25" button. Below this is a table with three columns: "Label", "Definition", and "Status".

Label	Definition	Status
winien	Winien [winien] contains the flexemes winien 'should', powinien 'should' and rad 'eager, pleased', inflecting for number and gender, with only analytical past tense and conditional forms. Grammatical categories of winien [winien]: number (http://www.isocat.org/datcat/DC-2709), gender (http://www.isocat.org/datcat/DC-2728), aspect. (source: Przepiórkowski, A. (2004). The IPI PAN Corpus: Preliminary version. Institute of Computer Science, Polish Academy of Sciences, Warsaw.)	candidate
withdrawn	Indication of the life cycle status of a resource as being withdrawn. (source: NaLiDa)	candidate
within-subjects design	Indication of the design type used for the elicitation of experimental data as a within-subjects design. (source: NaLiDa)	candidate
without declension	indication that the form of the word has not changed in order to comply with its position (source: CGN)	candidate
wizard-of-oz	A research experiment in which subjects interact with a computer system that subjects believe to be autonomous, but which is actually being operated or partially operated by an unseen human being. (source: CLARIN)	approved
vocalic	Vocalic [wok] agglutinates attach to forms ending in a consonant. (source: Przepiórkowski, A. (2004). The IPI PAN Corpus: Preliminary version. Institute of Computer Science, Polish Academy of Sciences, Warsaw.)	candidate
wordgroup	a wordgroup is a lemma that consists of one or more content words (noun, verb, adjective or adverb) separated by space of hyphens (source: Cornetto)	candidate

Case study 1- Validation

UFAL		DEEP-L (https://www.deepl.com/en/tra)		Google translate (https://translate.goo)		REVERSO		List better system												
term	definition	soi	term translat	te definition	translation (UFAL)	def	definition val	ter	definition tr	def	term translatio	terr	definition t	definitio	term (U,D,G, R)	definition (U,D,G, R)				
wizard-of-oz	A research experiment i	(soi	magicien de	N	Expérience de recherche dans laquel	Y	magicien d'oz	N	Une expérienc	Y	magicien d'oz	N	Une expérie	Y	magicien de l'oz	N	Une expérie	Y	//	D,G,R
writing systems	The visual representatic	(soi	systèmes d'é	Y	La représentation visuelle de la langu	Y	systèmes d'écri	Y	La représentat	Y	systèmes d'écriture	Y	La représent	Y	systèmes d'écritu	Y	La représent	Y	D,G,R	D,G,R
persistent identifi	Specification of a persisi	(soi	identifiant pi	M	Spécification d'un identificateur pers	M	identifiant pers	M	Spécificatio	Y	identifiant persistant	M	Spécificatio	M	identifiant persi	M	Spécification	Y	//	D,R
public	The access to the comm	(soi	public	Y	L'accès à l'événement de communica	Y	public	Y	L'accès à l'évé	Y	publique	Y	L'accès à l'év	Y	public	Y	L'accès à l'év	Y	D,G,R	D,G,R
address	The address of an organ	(soi	adresse	Y	L'adresse d'une organisation qui a pa	Y	adresse	Y	L'adresse d'un	Y	adresse	Y	L'adresse d'i	Y	adresse	Y	Adresse d'une	Y	D,G,R	D,G,R
age	The number of years thi	(soi	âge	Y	Le nombre d'années de vie de quelq	Y	âge	Y	Le nombre d'a	Y	âge	Y	Le nombre c	Y	âge	Y	Le nombre d	Y	D,G,R	D,G,R
elicited	Investigator asks speak	(soi	élimé	N	L'enquêteur demande au ou aux locu	Y	a suscité	M	L'enquêteur d	Y	suscité	M	L'enquêteur	Y	obtenue	M	L'enquêteur	Y	//	D,G,R
email	The email address of a ç	(soi	courriel	M	L'adresse électronique d'une person	Y	email	Y	L'adresse élec	Y	email	Y	L'adresse e-i	Y	courriel	M	L'adresse cou	Y	D,G	D,G,R
event structure	Indicates the structure c	(soi	structure évé	Y	Indique la structure de l'événement	Y	structure des é	M	Indique la stru	Y	structure de l'événé	M	Indique la st	Y	structure d'événe	M	Indique la sti	Y	//	D,G,R
execution location	Identification of the loc	(soi	lieu d'exécut	Y	Identification de l'endroit où l'outil o	Y	lieu d'exécutio	Y	Identification	Y	lieu d'exécution	Y	Identificatio	Y	emplacement d'ε	M	Identificatio	Y	D,G	D,G,R
experimental sett	A transmission of the cc	(soi	cadre expéri	Y	Une transmission du contenu se dérc	Y	milieu expérim	M	Une transmiss	Y	cadre expérimental	Y	Une transmi	Y	cadre expérimen	Y	Transmission	Y	G,R	D,G,R
face to face	The transmission of the	(soi	face à face	Y	La transmission du message assure u	Y	face à face	Y	La transmissio	Y	face à face	Y	La transmiss	Y	face à face	Y	La transmissi	Y	D,G,R	D,G,R
false	Contrary to what is true	(soi	faux	Y	Contrairement à ce qui est vrai, error	Y	faux	Y	Contraire à ce	Y	faux	Y	Contraireme	Y	faux	Y	Contraireme	Y	D,G,R	D,G,R
family	The access to the comm	(soi	famille	Y	L'accès à l'événement de communica	Y	famille	Y	L'accès à l'évé	Y	famille	Y	L'accès à l'év	Y	famille	Y	L'accès à l'év	Y	D,G,R	D,G,R
fax number	The Fax number of a pe	(soi	numéro de t	M	Le numéro de télécopieur d'une pers	M	numéro de fax	Y	Le numéro de	Y	numéro de fax	Y	Le numéro c	Y	numéro de téléc	M	Numéro de t	M	D,G	D,G
monologue	Communication event v	(soi	monologue	Y	Événement de communication avec	Y	monologue	Y	Événement de	Y	monologue	Y	Événement	Y	monologue	Y	Événement c	Y	D,G,R	D,G,R
morphology	The study of the structu	(soi	morphologie	Y	L'étude de la structure et de l'électo	N	morphologie	Y	L'étude de la s	Y	morphologie	Y	L'étude de la	Y	morphologie	Y	L'étude de la	Y	D,G,R	D,G,R
planned	The speaker prepares in	(soi	prévu	N	L'intervenant prépare en détail la str	Y	prévu	N	L'orateur prép	Y	prévue	N	L'orateur pri	Y	prévue	N	L'orateur pré	Y	//	D,G,R
planning type	Indicates in how far the	(soi	type de plan	Y	Indique dans quelle mesure le consu	Y	type de planific	Y	Indique dans	Y	type de planification	Y	Indique dan	Y	type de planificat	Y	Indique dans	Y	D,G,R	D,G,R



Case study 1- the SSHOC Multilingual Metadata

English				Dutch		French		Greek		Italian	
term	definition	source	URI	term	definition	term	definition	term	definition	term	definition
wizard-of-oz	A research experiment	(source: CLARIN)	http://hdl.handle.net/11459/1	tovenaar van Oz	Een onderzoeks	expérience du M	Une expérience	Τεχνική wizard	Ένα ερευνητικ	esperimento de	Un esperimento
writing systems	The visual representati	(source: CLARIN)	http://hdl.handle.net/11459/2	schrijfsystemen	De visuele weer	systemes d'écrit	La représentatic	συστήματα γραφ	Η οπτική αναπαρ	sistemi di scritt	La rappresentazi
persistent identi	Specification of a persi	(source: CLARIN)	http://hdl.handle.net/11459/3	permanente ide	Specificatie van	identifiant pére	Spécification d'u	μόνιμο αναγνωσ	Προσδιορισμό	identificatore pe	Specificazione di
public	The access to the comr	(source: CLARIN)	http://hdl.handle.net/11459/4	openbaar	De toegang tot	public	L'accès à l'événe	δημόσια	Η πρόσβαση ο	pubblico	L'accesso all'ev
address	The address of an orga	(source: PWittenburg)	http://hdl.handle.net/11459/5	adres	Het adres van e	adresse	L'adresse d'une	διεύθυνση	Η διεύθυνση ε	indirizzo	L'indirizzo di un'
age	The number of years th	(source: www.macmi)	http://hdl.handle.net/11459/6	leeftijd	Het aantal jaren	âge	Le nombre d'ani	ηλικία	Ο αριθμός των	età	Il numero di ann
elicited	Investigator asks speak	(source: CLARIN)	http://hdl.handle.net/11459/7	uitgelokt	Onderzoeker vr	élicite	L'enquêteur der	προκλητός	Ο ερευνητής	elicitato	Lo sperimentato
email	The email address of a	(source: CLARIN)	http://hdl.handle.net/11459/8	e-mail	Het e-mailadres	email	L'adresse électro	email	Η διεύθυνση r	email	L'indirizzo e-mail
event structure	Indicates the structure	(source: CLARIN)	http://hdl.handle.net/11459/9	evenement stru	Aanduiding van	structure événe	Indique la struct	δομή εκδήλω	Υποδεικνύει τ	struttura dell'ev	Indica la structur
execution locati	Identification of the loc	(source: CLARIN)	http://hdl.handle.net/11459/10	uitvoeringslocat	Identificatie van	lieu d'exécution	Identification de	τοποθεσία εκ	Προσδιορισμό	luogo di eseguzi	Identificazione d
experimental se	A transmission of the c	(source: CLARIN)	http://hdl.handle.net/11459/11	experimentele s	Een transmissie	cadre expérim	Une transmissio	Πειραματικό τ	Μετάδοση το	impostazione sp	Una trasmission
face to face	The transmission of the	(source: CLARIN)	http://hdl.handle.net/11459/12	face-to-face	De transmissie v	face à face	La transmission	πρόσωπο με π	Η μετάδοση τι	faccia a faccia	La trasmissione



Case study 2- Corpus

- Creating and translating a terminology for Data Stewardship
 - 211 domain-specific concepts were automatically extracted from a corpus of Data Curation and Stewardship (English)
 - Translated into Dutch, French, German, Greek, Italian, Slovenian
- Terminology extraction methods used:
 - TermoStat (Drouin, 2003) statistical and linguistic
 - TBXTools (Oliver and Vázquez, 2015)
- MT:
 - DeepL



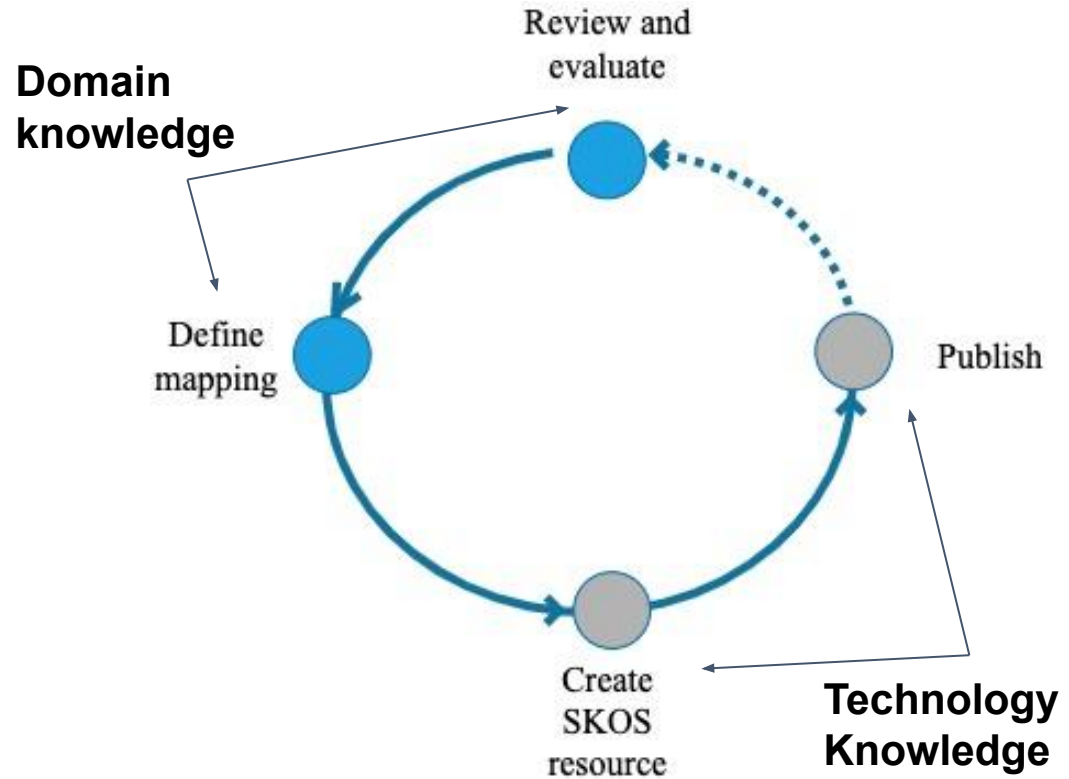
Case study 2- Corpus

- 70 open access documents
 - standards and recommendations for Data Stewardship and Curation
 - deliverables
 - technical documents
- Source: RDA and OpenAIRE
- All documents included are in English, and they amount to a total of 746,084 tokens

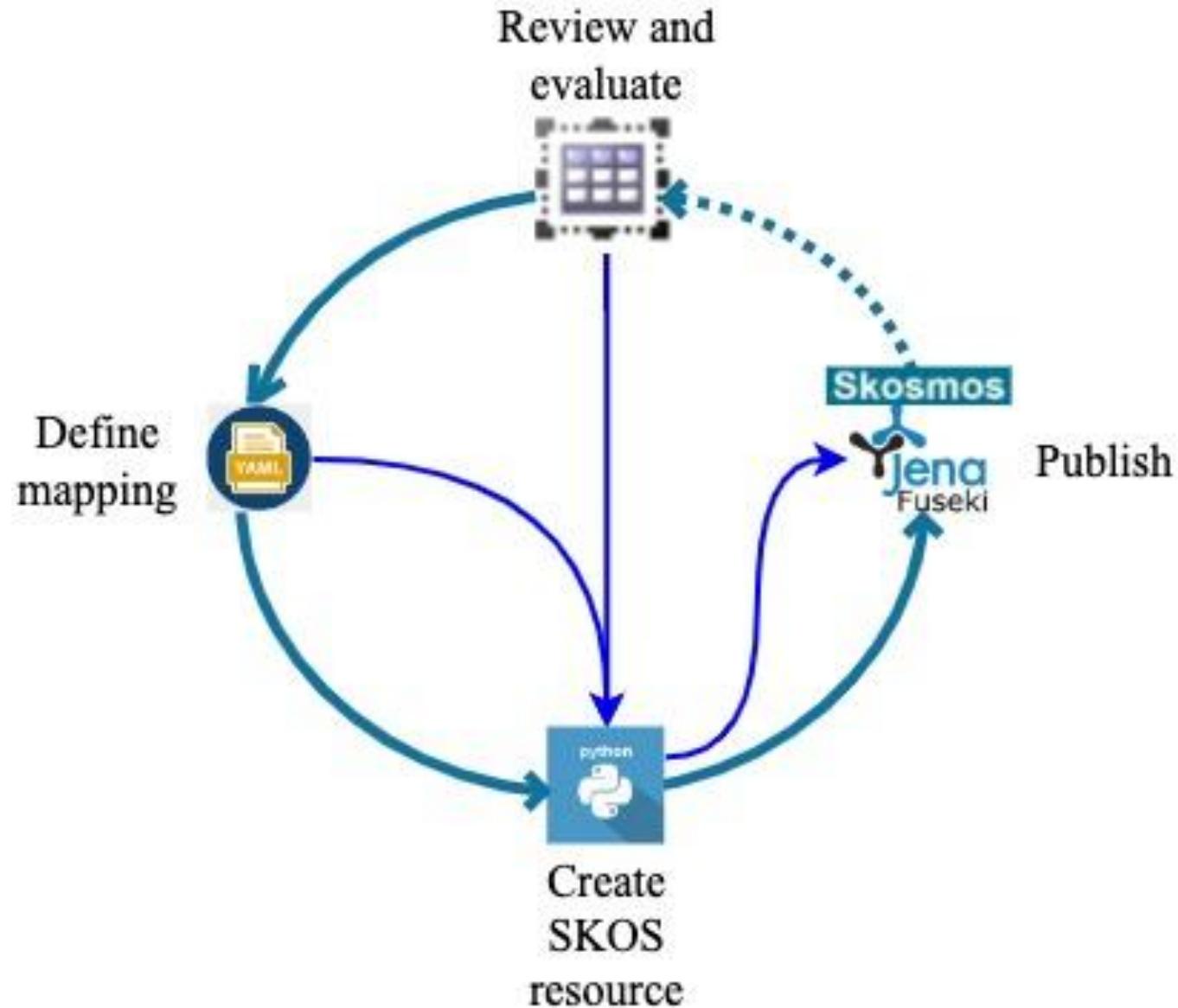


Publishing the vocabularies: workflow

- Review the source vocabulary, individuate: entities, classes, properties, individuals...
- Define mapping rules:
Source format → SKOS
- Create the SKOS resource
- Publish the SKOS resource



Publishing the vocabularies: technologies



Define mapping rules

- [RDF Mapping Language](#) (RML)
 - based on the W3C standard R2RML
 - may process flat files (json, csv,...)
- [YARRRML](#), text-based representation for declarative RML rules
 - uses the YAML syntax
 - JS parser, Web UI

```
prefixes:  
  ex: "http://example.com/"  
  schema: "https://schema.org/"  
  
sources:  
  books:  
    table: books_table  
    queryFormulation: mysql  
  
mappings:  
  BookMapping:  
    sources: books  
    s: ex:$(book_id)  
    po:  
      - [a, schema:Book]  
      - [schema:name, $(name)]  
      - [schema:isbn, $(isbn)]  
      - [schema:author, $(author)]
```


prefixes:

```
dc: http://purl.org/dc/elements/1.1/  
skos: http://www.w3.org/2004/02/skos/core#  
sshoccmd: https://vocabs.sshopencloud.eu/vocabularies/sshocterm/  
xsd: http://www.w3.org/2001/XMLSchema#
```

mappings:

conceptscheme:

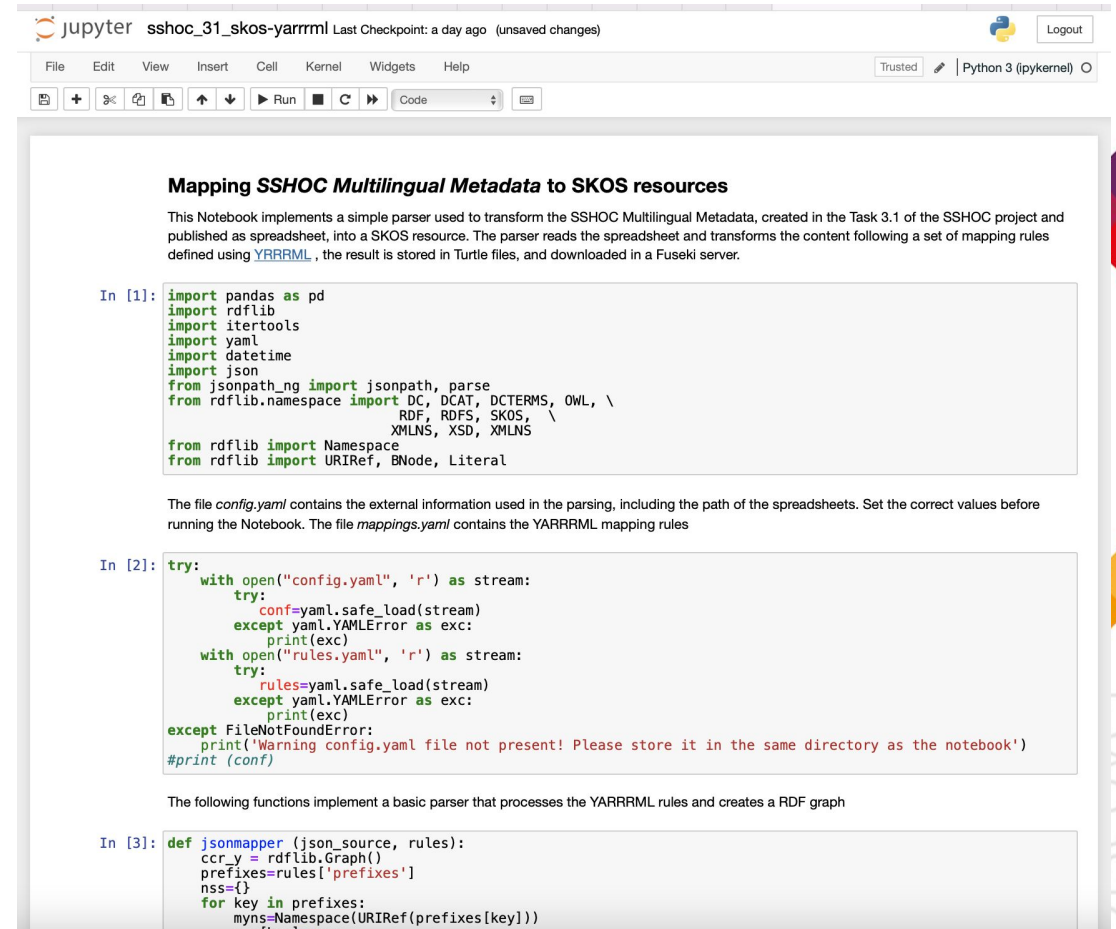
```
sources:  
  - [resourcemd.json~jsonpath', '$']  
s: skos:  
po:  
  - [a, skos:conceptScheme]  
  - [dc:title, $(title), en~lang]  
  - [dc:description, $(description), en~lang]  
  - [dc:version, $(version), xsd:integer]
```

concept:

```
sources:  
  - ['metadata.csv~csv']  
s: sshoccmd:$(ConceptId)  
po:  
  - [a, skos:Concept]  
  - [skos:exactMatch, $(URI)]  
  - [dct:source, $(source) ]  
  - [skos:preflabel, $(Englishterm), en~lang]  
  - [skos:definition, $(Englishdefinition), en~lang]  
  - [skos:preflabel, $(Dutchterm), nl~lang]  
  - [skos:definition, $(Dutchdefinition), nl~lang]  
  ...
```

Create SKOS resource and publish it

- Transformation code implemented in Python, as a Jupyter Notebook
- The SKOS resource is stored in *turtle* format and uploaded on Fuseki
- A local SKOSMOS instance is used by domain experts to evaluate results



Mapping SSHOC Multilingual Metadata to SKOS resources

This Notebook implements a simple parser used to transform the SSHOC Multilingual Metadata, created in the Task 3.1 of the SSHOC project and published as spreadsheet, into a SKOS resource. The parser reads the spreadsheet and transforms the content following a set of mapping rules defined using [YARRRML](#), the result is stored in Turtle files, and downloaded in a Fuseki server.

```
In [1]: import pandas as pd
import rdflib
import itertools
import yaml
import datetime
import json
from jsonpath_ng import jsonpath, parse
from rdflib.namespace import DC, DCAT, DCTERMS, OWL, \
    RDF, RDFS, SKOS, \
    XMLNS, XSD, XMLNS
from rdflib import Namespace
from rdflib import URIRef, BNode, Literal
```

The file *config.yaml* contains the external information used in the parsing, including the path of the spreadsheets. Set the correct values before running the Notebook. The file *mappings.yaml* contains the YARRRML mapping rules

```
In [2]: try:
    with open("config.yaml", 'r') as stream:
        try:
            conf=yaml.safe_load(stream)
        except yaml.YAMLError as exc:
            print(exc)
    with open("rules.yaml", 'r') as stream:
        try:
            rules=yaml.safe_load(stream)
        except yaml.YAMLError as exc:
            print(exc)
except FileNotFoundError:
    print('Warning config.yaml file not present! Please store it in the same directory as the notebook')
#print (conf)
```

The following functions implement a basic parser that processes the YARRRML rules and creates a RDF graph

```
In [3]: def jsonmapper (json_source, rules):
    ccr_y = rdflib.Graph()
    prefixes=rules['prefixes']
    nss={}
    for key in prefixes:
        myns=Namespace(URIRef(prefixes[key]))
```

Case study 1- SKOS Resource



Vocabularies About Editor SPARQL API

Help

SSHOC Multilingual Metadata

Content language English

Alphabetical Hierarchy

A B C D E F G H I L M N O P Q R
S T U V W

address
age
annotation format
annotation level type
annotation mode
annotation stand-off
annotation workflow
anonymization flag
anthropological linguistics
applied linguistics
audio
audio file format
availability

PREFERRED TERM

availability

DEFINITION

A description of the terms of availability of the resource in simple words.

SOURCE

CLARIN

IN OTHER LANGUAGES

beschikbaarheid	Dutch
disponibilité	French
διαθεσιμότητα	Greek
disponibilità	Italian

URI

https://vocabs.sshopencloud.eu/vocabularies/sshocmsshoc_CCR_C-2453_1f0c3ea5-7966-ae11-d3c6-448424d4e6e8

DOWNLOAD THIS CONCEPT:

[RDF/XML](#) [TURTLE](#) [JSON-LD](#)

Last modified 12/17/21

EXACTLY MATCHING CONCEPTS

availability availability

Metadata

```

1 @prefix dc: <http://purl.org/dc/elements/1.1/> .
2 @prefix dct: <http://purl.org/dc/terms> .
3 @prefix skos: <http://www.w3.org/2004/02/skos/core#> .
4 @prefix sshoccmd: <http://sshoc.eu/XXX/> .
5 @prefix xsd: <http://www.w3.org/2001/XMLSchema#> .
6
7 sshoccmd:CCR_C-2452_604f0c0f-a038-746c-d585-268642eaaba7 a skos:Concept ;
8   dct:source "CLARIN" ;
9   skos:definition "Free"@en,
10  "libre"@fr,
11  "libero"@it,
12  "Gratis"@nl ;
13   skos:exactMatch "http://hdl.handle.net/11459/CCR_C-2452_604f0c0f-a038-746c-d585-268642eaaba7" ;
14   skos:prefLabel "free"@en,
15  "libre"@fr,
16  "δωρεάν"@gr,
17  "libero"@it,
18  "gratis"@nl .
19
20 sshoccmd:CCR_C-2453_1f0c3ea5-7966-ae11-d3c6-448424d4e6e8 a skos:Concept ;
21   dct:source "CLARIN" ;
22   skos:definition "A description of the terms of availability of the resource in simple words."@en,
23  "Une description des conditions de disponibilité de la ressource en mots simples."@fr,
24  "Una descrizione dei termini di disponibilità della risorsa in parole semplici."@it,
25  "Een beschrijving van de voorwaarden voor beschikbaarheid van de bron in eenvoudige woorden."@nl ;
26   skos:exactMatch "http://hdl.handle.net/11459/CCR_C-2453_1f0c3ea5-7966-ae11-d3c6-448424d4e6e8" ;
27   skos:prefLabel "availability"@en,
28  "disponibilité"@fr,
29  "διαθεσιμότητα"@gr,
30  "disponibilità"@it,
31  "beschikbaarheid"@nl .
32
33 sshoccmd:CCR_C-2454_e0e88868-2fc6-a87e-cd0d-d8f69c85b41d a skos:Concept ;
34   dct:source "CLARIN" ;
35   skos:definition "The name of the person that can be contacted to get access to the resource or to the tool/service."@en .

```

Discover
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Case study 2- SKOS Resource



Vocabularies About Editor SPARQL API

Help | Interface language: English ▾

SSHOC Multilingual Data Stewardship Terminology

Content language English ▾

- Alphabetical
 - Hierarchy
- A B C D E F H I L M N O P R S T U V

- access data → data access
- accessibility → data accessibility
- accessible data
- administrative data
- aggregate data → data aggregation
- anonymisation**
- anonymised data
- anonymization → anonymisation
- anonymized data → anonymised data
- auxiliary data
- availability of (research) data → data availability
- available data

PREFERRED TERM **anonymisation**

DEFINITION Anonymisation is the process of removing any information that could lead to the identification of the data subject.

ENTRY TERMS *anonymization*

NOTE ISO/TS 17975:2015(en), 3.1

SOURCE Eurito. (2019). D3.1 Design of Data Collection Phase. Zenodo. <https://doi.org/10.5281/zenodo.3243500>.

IN OTHER LANGUAGES

anonimiserung	Dutch
anonymisation	French
Anonymisierung	German
ανωνυμοποίηση	Greek
anonimizzazione	Italian
anonimizacija	Slovenian

URI https://vocabs.sshopencloud.eu/vocabularies/sshocterm/anonymisation_3

DOWNLOAD THIS CONCEPT: [RDF/XML](#) [TURTLE](#) [JSON-LD](#) Last modified 12/17/21

EXACTLY MATCHING CONCEPTS

Anonymisation Activity	w3id.org
http://data.loterre.fr/ark:/67375/TSO-VNNFL8WB-H	data.loterre.fr

```

42     "ontree:administratives"@it,
43     "dati amministrativi"@it,
44     "administratieve gegevens"@nl,
45     "uradni podatki"@sl ;
46 skos:topConceptOf sshocterm: .
47
48 sshocterm:anonymisation_3 a skos:Concept ;
49 dct:source "Eurito. (2019). D3.1 Design of Data Collection Phase. Zenodo.
https://doi.org/10.5281/zenodo.3243500."^^xsd:string ;
50 skos:altLabel "anonymization"@en ;
51 skos:definition "Unter Anonymisierung ist das Entfernen aller Informationen zu verstehen, die zur Identifizierung des
Datensubjekts führen könnten."@de,
52 "Η ανωνυμοποίηση είναι η διαδικασία αφαίρεσης κάθε πληροφορίας που θα μπορούσε να οδηγήσει στην ταυτοποίηση του
υποκειμένου των δεδομένων."@el,
53 "Anonymisation is the process of removing any information that could lead to the identification of the data
subject."@en,
54 "L'anonymisation est le processus qui consiste à supprimer toute information pouvant conduire à l'identification
du sujet concerné (par ex. une personne, une institution, etc.)."@fr,
55 "L'anonimizzazione è il processo di rimozione di qualsiasi informazione che potrebbe portare all'identificazione
dell'interessato."@it,
56 "Anonimiserung is het proces waarbij alle informatie die tot identificatie van de betrokkene kan leiden, wordt
verwijderd."@nl,
57 "Anonimizacija je postopek odstranjevanja vseh informacij, na podlagi katerih bi bilo mogoče identificirati
posameznika, na katerega se nanašajo osebni podatki."@sl ;
58 skos:exactMatch <http://data.loterre.fr/ark:/67375/TSO-VNNFL8WB-H>,
<https://w3id.org/GDPROV#AnonymisationActivity> ;
59
60 skos:inScheme sshocterm: ;
61 skos:note "ISO/TS 17975:2015(en), 3.1" ;
62 skos:prefLabel "Anonimiserung"@de,
63 "ανωνυμοποίηση"@el,
64 "anonymisation"@en,
65 "anonymisation"@fr,
66 "anonimizzazione"@it,
67 "anonimiserung"@nl,
68 "anonimizacija"@sl ;
69 skos:topConceptOf sshocterm: .
70
71 sshocterm:anonymised_data_4 a skos:Concept ;
72 dct:source "ISO 5127:2017(en), 3.1.10.15"^^xsd:string ;

```

Discover
Connect
Collaborate



Lessons learned

- For small/medium size terminologies the tabular format is a good choice in terms of evaluation/curation tasks and as input format for transformation process
- The mapping process has a crucial role, YARRRML is an interesting candidate but requires some technical knowledge
 - Create templates
- The use of Notebooks for implementing the transformation process helps to document computational steps and improves reproducibility



Next steps

- Build a complete YARRRML parser in Python
- Use the framework to create the SKOS resource for Pan-Latin Textile Fibres Vocabulary (Lessico panlatino delle fibre tessili), developed within the [Realiter network](#)
- Ongoing: creation of a CLARIN terminology (English and Italian) to improve indexing and search of CLARIN content, to be published on the vocabulary platform.



Thank you!

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- Trupiano, Luca and Concordia, Cesare, 2021, SSHOC Data Stewardship terminology and Metadata SKOSifying mapping, ILC-CNR for CLARIN-IT, <http://hdl.handle.net/20.500.11752/ILC-566>
- Code: <https://gitea-s2i2s.isti.cnr.it/concordia/sshoc-skosmapping>

