Software for management of knowledge organization systems

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This report is much more usable in HTML at https://bartoc.org/software!

The terminology registry **BARTOC** collects information about all kinds of **knowledge organization systems** (KOS) such as controlled vocabularies, classifications, ontologies, and other semantic artifacts. This report summarizes information about software for KOS management.

Scope

This report is limited to **specialized KOS software for editing, vizualizing and/or analyzing terminologies.** The term "terminology" in this document is used as synonym for all kinds of KOS. Software is excluded if:

- it is not aimed at KOS management in particular but more generic software such as database management systems, content management systems and text editors,
- it is more specific software, restricted to a limited type of KOS, such software for linguistic terminology management and identifier systems,
- it cannot be used as stand-alone application, like programming libraries, and hosted services.

Software for **ontology alignment** is only included if it is more then a research prototype and if we managed to get it running. See Bergman (2018) for a comprehensive list of software in this category. The Ontology Alignment Evaluation Initiative (OAEI) motivates the creation of tools for automated ontology alignment.

KOS software

This report includes **71** instances of KOS software so far. The list is managed in a JSON file as array of CodeMeta records with fields as described below. Applications without license or repository are closed source. Deprecated applications are included for historical reference.

Table 1

name	system	edit	api	languages	license	repository	update	category
Semantic MediaWiki	Web			PHP	GPL	github	2025	editor
Wikibase	Web			PHP	GPL	wikimedia	2025	database, editor
TemaTres	Web			PHP	GPL	github	2025	editor
iQvoc	Web			Ruby	Apache	github	2025	editor
VocBench	Web			Java, JavaScript	BSD	bitbucket	2025	editor
Skosmos	Web	-		PHP	MIT	github	2025	viewer
Cocoda	Web		-	JavaScript	MIT	github	2025	mapping editor
MSCR	Web			Java	MIT	github	2025	mapping editor
JSKOS Server	Web			JavaScript	MIT	github	2025	database
SkoHub Vocabs	Web			JavaScript	Apache	github	2025	viewer
OpenTheso	Web			Java	GPL	github	2025	editor
Ontology Lookup Service (OLS)	Web	-		JavaScript, Java	Apache	github	2025	viewer
OntoPortal Alliance	Web	-		Ruby	BSD	github	2025	viewer
ShowVoc	Web	-	-	JavaScript	BSD	bitbucket	2025	viewer
voc4cat-tool	CLI, GitHub, Excel	-	-	Python	BSD	github	2025	converter
VocExcel	Excel, CLI	-	-	Python	BSD	github	2025	converter
Protégé	JVM		-	Java	BSD	github	2025	editor
jskos-cli	CLI	-	-	JavaScript	MIT	github	2025	converter, validator
TS4NFDI API Gateway	Web	-		Java, JavaScript	MIT	github	2025	viewer, converter
jskos-proxy	Web	-		JavaScript	MIT	github	2025	viewer, converter
sssom-py	CLI	-	-	Python	MIT	github	2025	converter
sssom-java	CLI	-	-	Java	GPL	github	2025	converter
sssom-js	CLI	-	-	JavaScript	MIT	github	2025	converter
Network of Terms	Web	-		Typescript	EUPL	github	2025	converter
TerminoloGit	Web, git	-	-	Python	GPL	gitlab	2025	converter
Chowlk	Web	-	-	Python	Apache	github	2025	converter
Ontology Development Kit	CLI	-	-	Python	BSD	github	2025	converter, validator
O'FAIRe	Web	-		Java	MIT	github	2025	validator
EVOKS	Web		-	Python	MIT	github	2025	editor, converter
OOPS!	Web	-	-	Java	?	github	2025	viewer
WIDOCO	JVM	-	-	JavaScript, Java	Apache	github	2025	viewer
FOOPS!	Web	-	-	Java, JavaScript	Apache	github	2025	validator
Jekyll RDF	Web	-		Ruby	MIT	github	2024	viewer
Atramhasis	Web			Python	GPL	github	2024	editor
Snowstorm	Web	-		Java	Apache	github	2024	viewer
OnToology	Web, git	-	-	Python	Apache	github	2024	viewer, validator
SkoHub Shapes	RDF	-	-	SHACL	?	github	2024	validator
OxO	Web	-		JavaScript	Apache	github	2024	viewer

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Onto4ALL Editor	Web		-	JavaScript, PHP	Apache	github	2024	editor
VocPrez	Web	-		Python	GPL	github	2024	viewer
qSKOS	CLI	-		Java	GPL	github	2024	validator
VocPub Profile	RDF	-	-	SHACL	CC	github	2024	validator
Vocabseditor	Web		-	Python	MIT	github	2024	editor
ODM2 Controlled Vocabularies	Web			Python	BSD	github	2024	editor
Neologism	Web			JavaScript	MIT	github	2023	editor
Django Controlled Vocabularies	Web			Python	BSD	github	2023	editor
Web Protégé	Web		-	Java	BSD	github	2023	editor
Alignment API and Alignment Server	CLI	-		Java	GPL	inria	2023	database
Amalgame	Web		-	prolog	BSD	github	2023	mapping editor
Wandora	JVM		-	Java	GPL	github	2023	editor
Ginco	Web			Java	GPL	github	2022	editor
SKOSjs	Web		-	JavaScript	Apache	github	2022	editor
WebVOWL	Web	-	-	JavaScript	MIT	github	2022	viewer
VoCol	Web		-	JavaScript	MIT	github	2021	editor
mc2skos	CLI		-	Python	Unlicense	github	2021	converter
Skosify	CLI	-		Python	MIT	github	2021	converter, validator
Themis	Web	-		Java	Apache	github	2021	validator
LODE	Web	-		Java	ISC	github	2020	viewer
OpenSKOS	Web	-		PHP	GPL	github	2020	viewer, editor
SISSVoc	Web	-		XSLT	Apache	github	2019	viewer
OntoBee	Web	-		PHP, JavaScript	Apache	github	2018	viewer
SKOS Play	Web	-	-	Java	CC	bitbucket	2018	viewer, converter
SKOS Editor	Web			Java	LGPL	github	2016	editor
HIVE Vocabulary Server	Web		-	Java	BSD	github	2015	viewer
COMA	Web		-	Java	AGPL	sourceforge	2013	mapping editor, viewer
ASKOSI	Web	-	-	Java	GPL	askosi	2011	viewer
THManager	JVM		-	Java	LGPL	sourceforge	2006	editor
OntoServer	Web				-	-		viewer
PoolParty Thesaurus Server	Web				-	-		editor
Lexasaurus	Web				-	-		editor
Fiblio	Web		-		-	-		editor

Please open an issue if some relevant software is missing or data seems invalid!

Metadata

Machine-readable description of the software is based on CodeMeta plus custom fields `api` and `edit`.

Field	Purpose
`name`	name with link to homepage
`operatingSystem`	operating system or similar dependency (Web, CLI…)
`api`	whether a web service or similar API is provided to connect to
`edit`	whether vocabularies can be modified with the software
`programmingLanguage`	programming language(s)
`license`	license of the software (if free software)
`codeRepository`	source Code repository (if open source)
`dateModified`	year of most recent update
`applicationSubCategory`	type of KOS software

KOS software categories

- **viewer**: to display terminologies (23)
- **editor**: to create and modify terminologies (24)
- **mapping editor**: to create and modify mappings/alignments (3)
- **converter**: to convert from one format into another (15)
- **validator**: to check terminologies (10)
- **database**: to store terminologies (3)

Related software

Knowledge organization systems can also be managed with other types software excluded from this report.

More generic software

Simple terminologies can be managed in a **spreadsheet** (LibreOffice Calc, Excel, Google Sheets…). This software lacks most special functionality for terminology management but the usability and accessibility is very high. Some tools in the list above (VocExcel, voc4cat-tool) enhance standard spreadsheets with terminology management functionalities.

The same applies to **database management systems** (RDBMS, NoSQL, RDF triple stores, property graph databases…) with some additional features such as unique key constraints but less usability. An edge case might be systems for management of knowledge graphs (such as Wikibase), included above.

Tools for personal **knowledge management** (such as Obsidian and Notion) help to structure ideas and concepts. Similar tools exist for enterprises to support data integration, knowledge management and/or business intelligence of an organization (for instance PoolParty Semantic Suite).

Several **Content Management Systems** (CMS) allow to manage a list or hierarchy of topics or other entities for knowledge managements. If these lists can be exported, the CMS can be applied to manage terminologies. An example is Drupal, which was used for the first version of BARTOC terminology registry.

Terminologies can also directly be managed in **files** for instance in RDF/Turtle syntax. This only requires a **text editor** but the risk is high to introduce errors. A **version control system** such as git can be used on top to track changes.

More specific software

The term **terminology management** is also used for systems to organize the terms, definitions, and translations used in an organization. See Montoro (2018) for a list of terminology management systems. The focus of these systems is more on translation but there is some overlap with KOS management. Software aimed at simple lists of terms, definitions, glossaries and similar is also excluded from this report.

Several systems and applications exist to manage identifiers (Domain Name System, w3id…). These **identifier systems** are relevant to manage KOS but they are rarely enough for KOS management alone. See Bioregistry for a registry of identifier systems used with KOS.

Several tools, frameworks and programming languages exist for **data transformation** between different formats and/or models (XSLT, jq, Catmandu, DTL, LinkML-map, QVT…). These transformations often imply or make use of terminology mappings.

Some tools for **data curation** also make use of or require terminologies, for instance OpenRefine and mix'n'match. The latter comes close to a mapping editor but it is limited to mappings with Wikidata.

Limited use

Some organizations run **hosted services** for KOS management or related services. Examples include DANTE, xTree and Linked Open Vocabularies (LOV). More examples may be found in the BARTOC list of terminology registries.

programming libraries such as cocoda-sdk, TSS Widgets, jskos-vue, SeMRA, and ng-skos are used to build KOS software.

Other software

The following do not fit into the software categories above or there was not enough information:

- Scripts to analyze concept drift as part of a research project (Open Source)
- TopBraid EDG is a commercial knowledge graph editor
- Apelon DTS (Distributed Terminology System) and Apelon TermManager are commercial terminology editors. An earlier version from 2013 is available as Open Source.
- Grafo is a collaborative knowledge graph editor, available as commercial web application
- Vitro is a framework for semantic web applications, used in VIVO

Related works

This report is based on two reports (Voß 2016a, 2016b) from the beginning of project coli-conc that led to a a wiki page managed between 2020 and 2024. See also Miles and Bechhofer (2009) for a report created during the specification of SKOS W3C Recommendation, the corresponding wiki pages at https://www.w3.org/2001/sw/wiki/Category:Editor, and Bergman (2018) for a list of software for ontology alignment.

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