University of Basel

# Describing Knowledge Organization Systems in BARTOC and JSKOS

Andreas Ledl, Jakob Voss, Uma Balakrishnan
TKE 2016, 23.6.2016

VZG | Verbundzentrale des GBV
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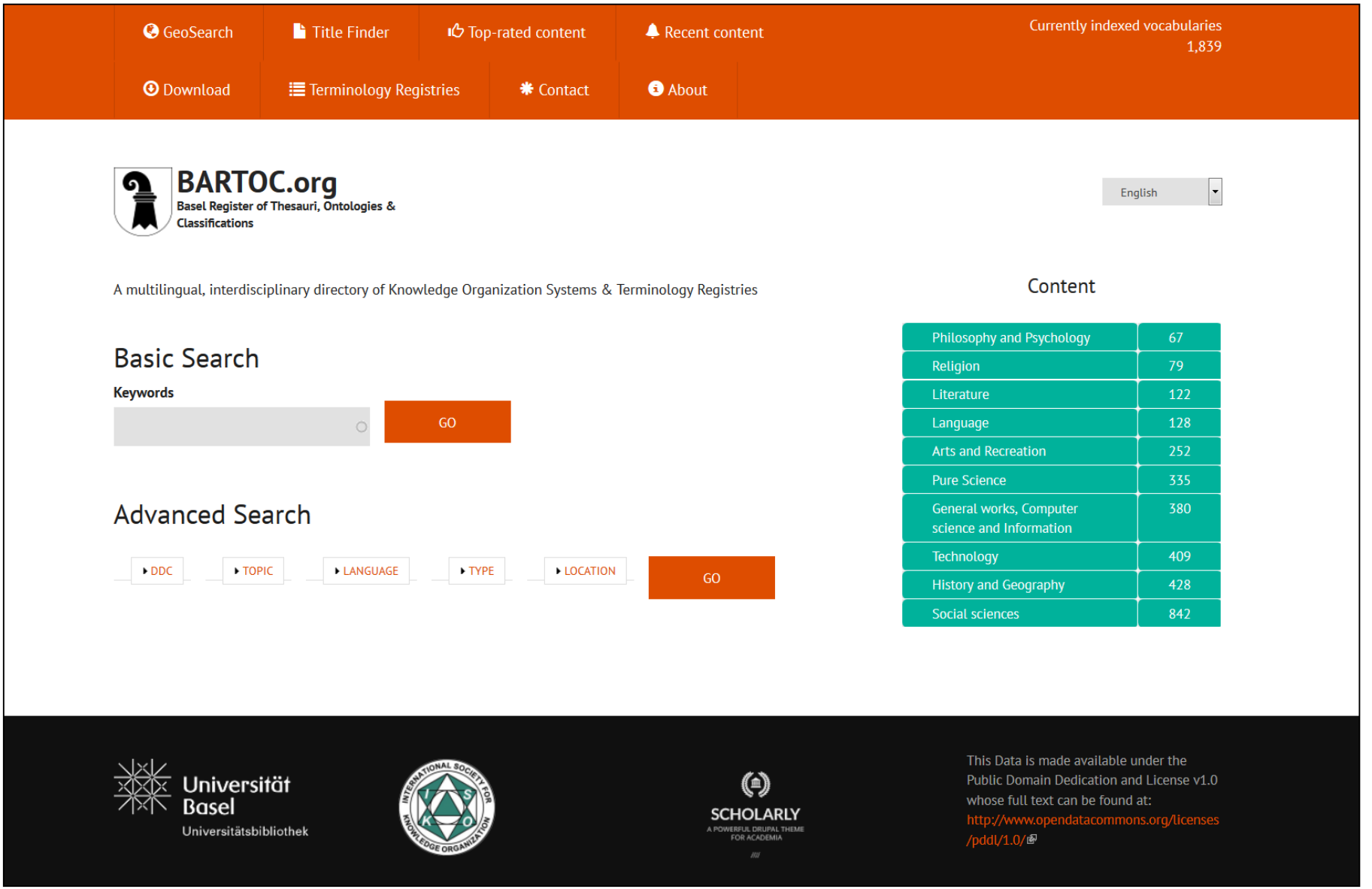
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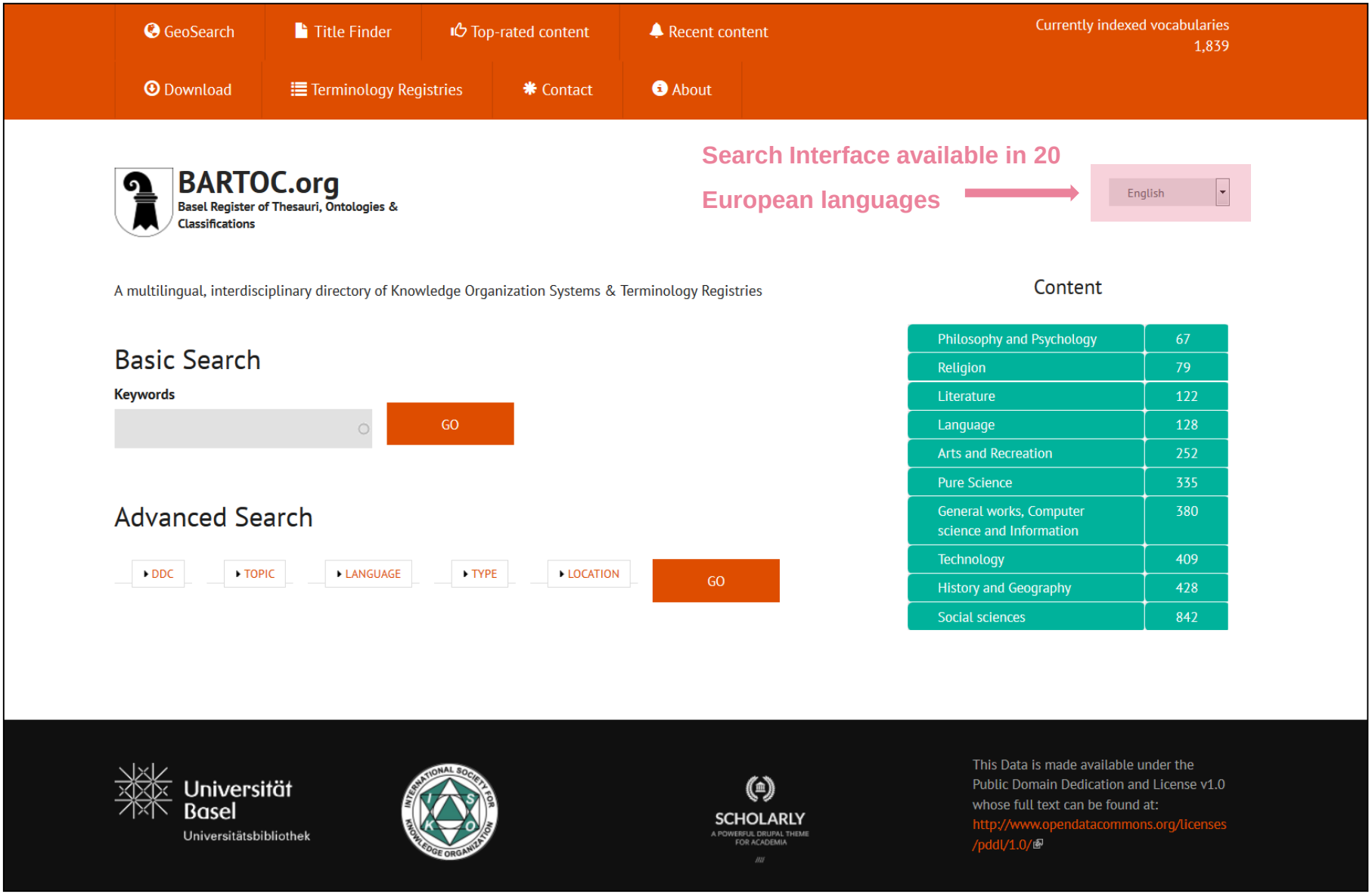
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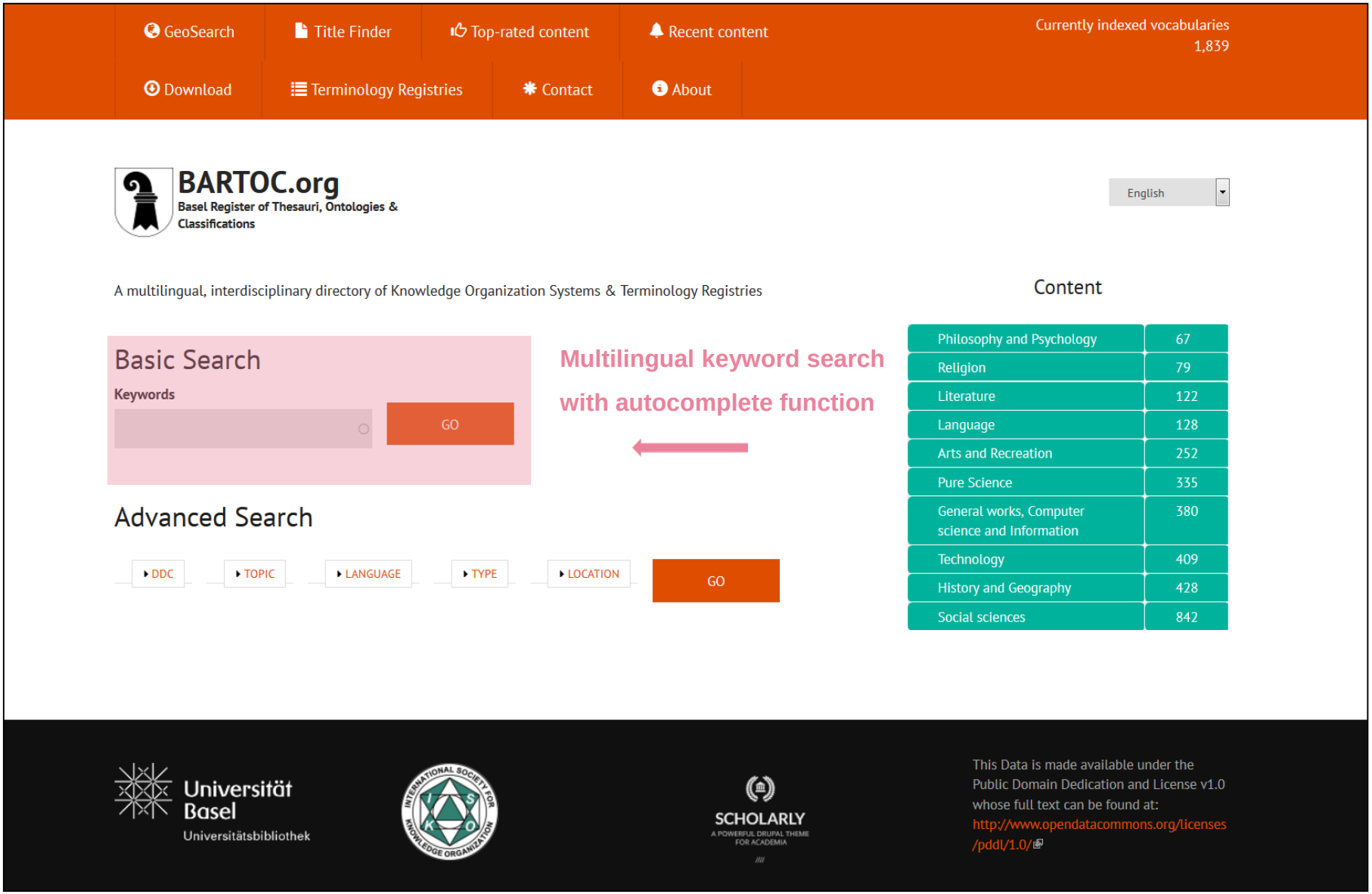
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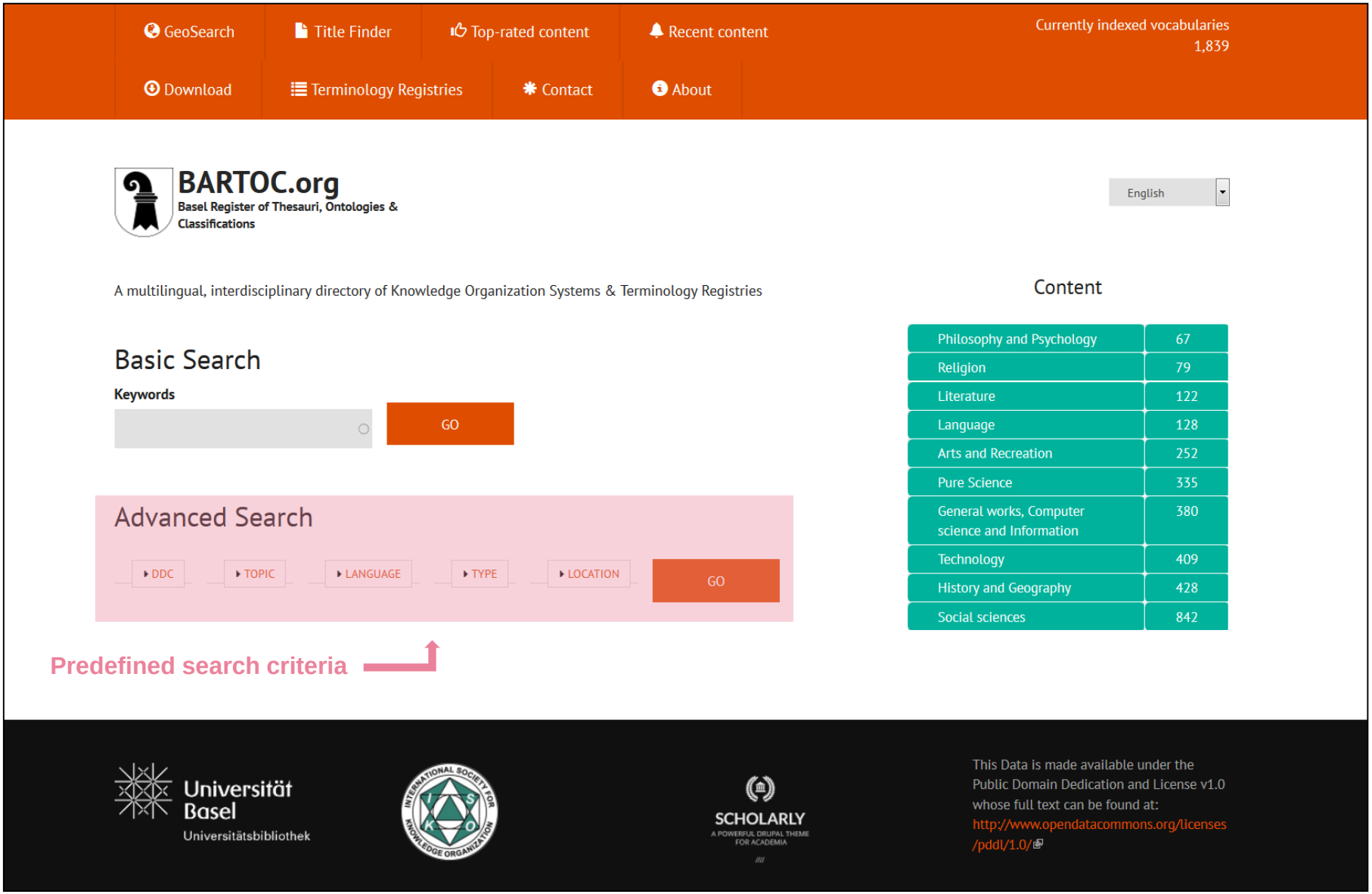
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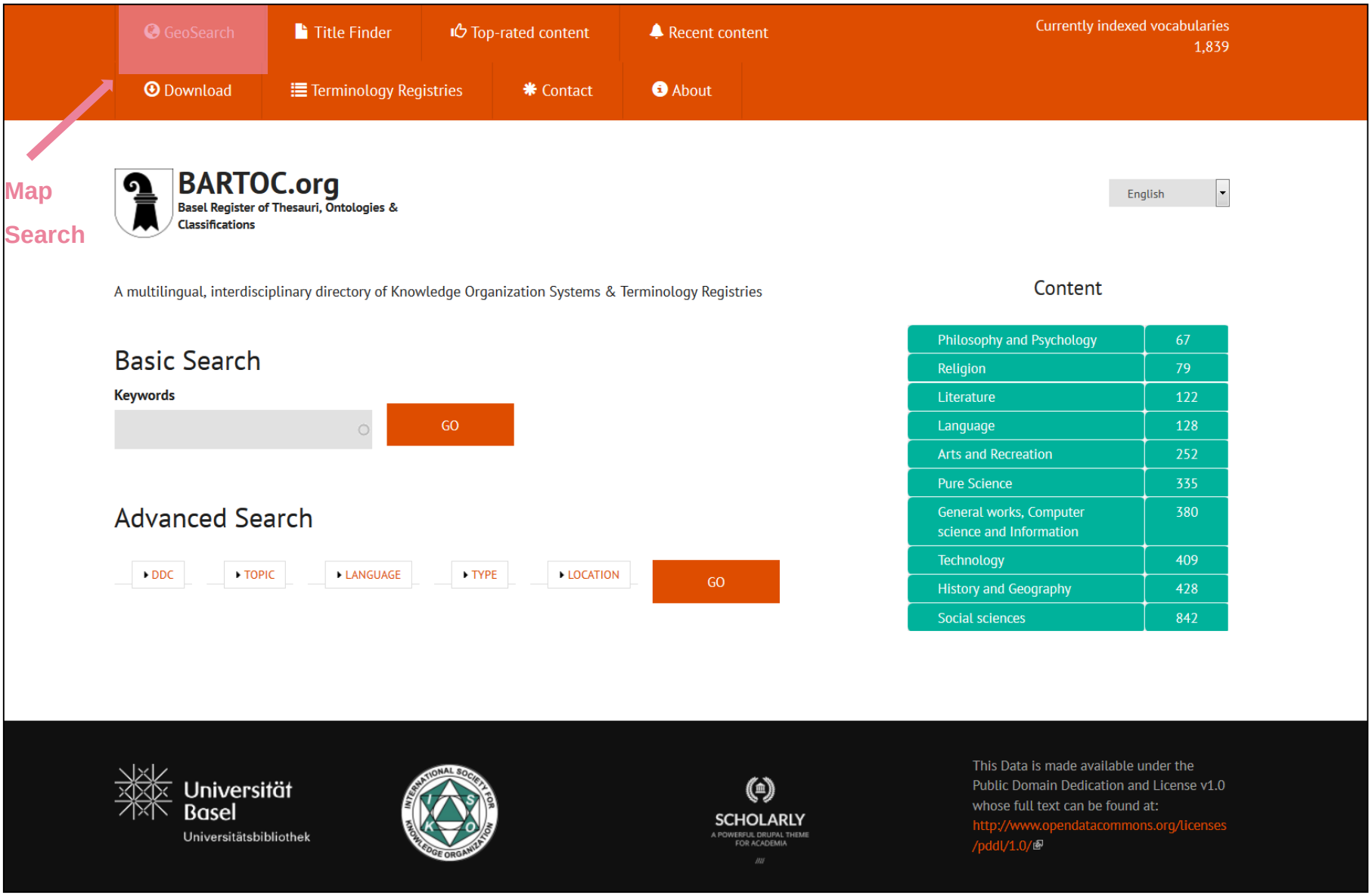
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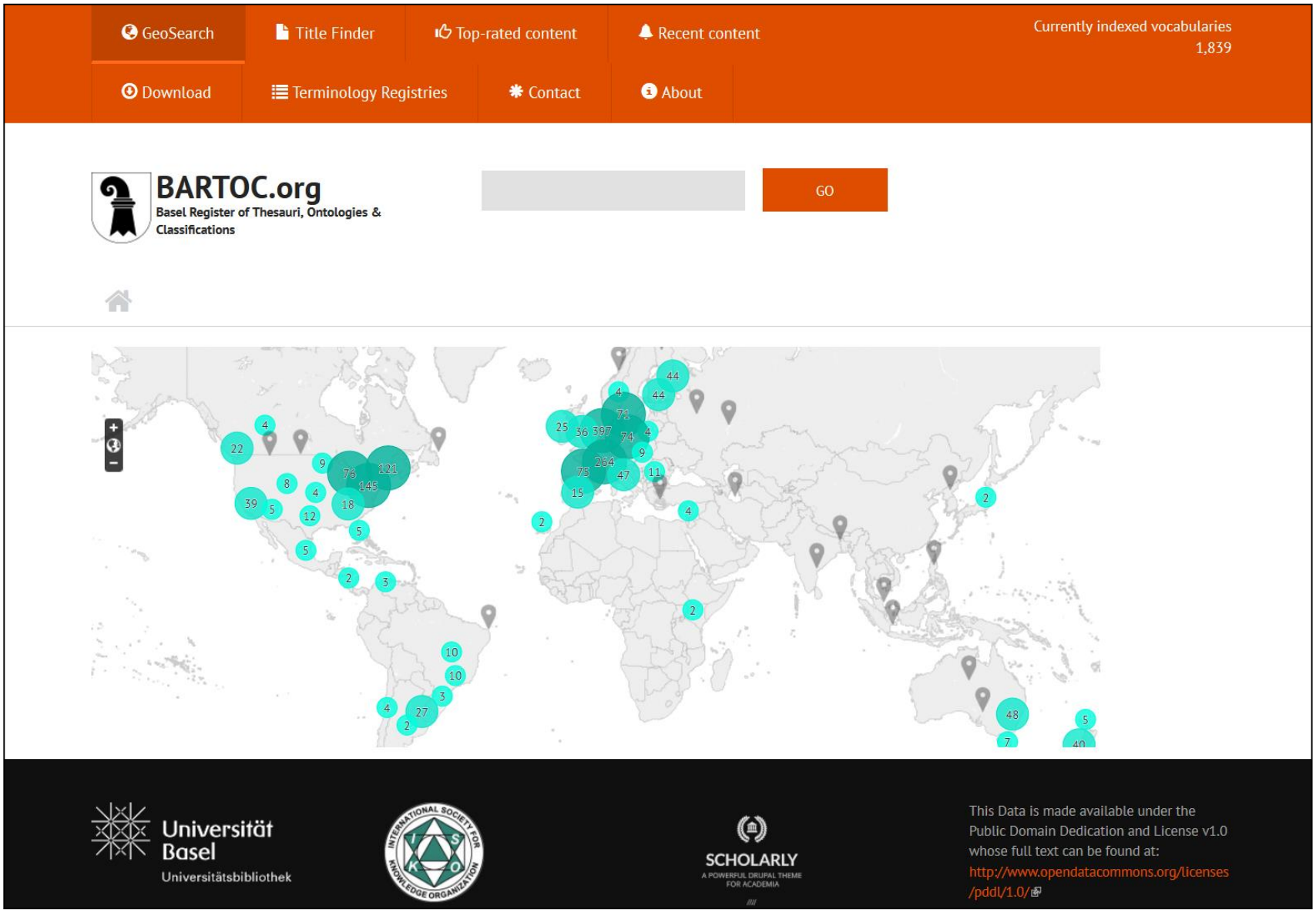
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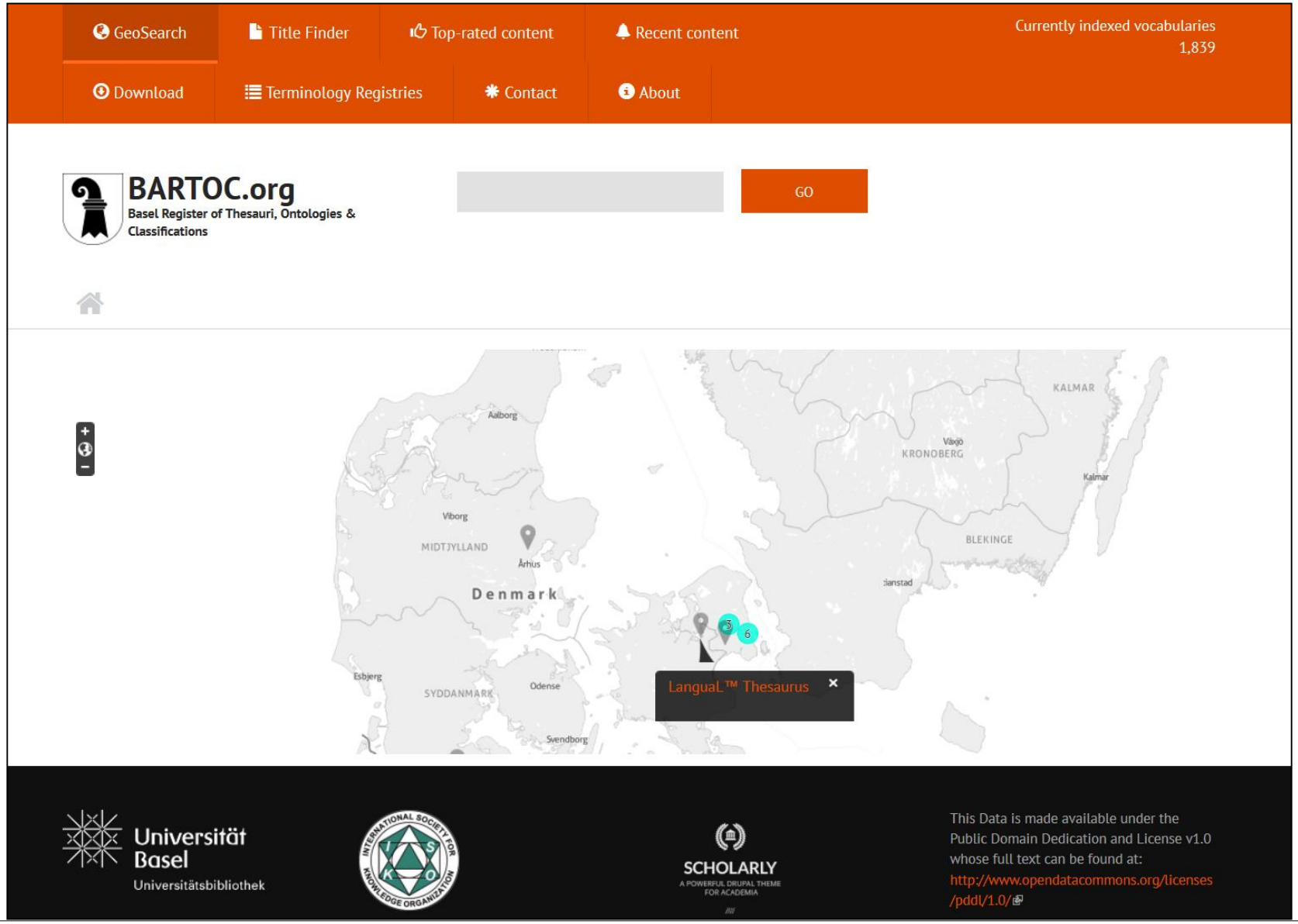
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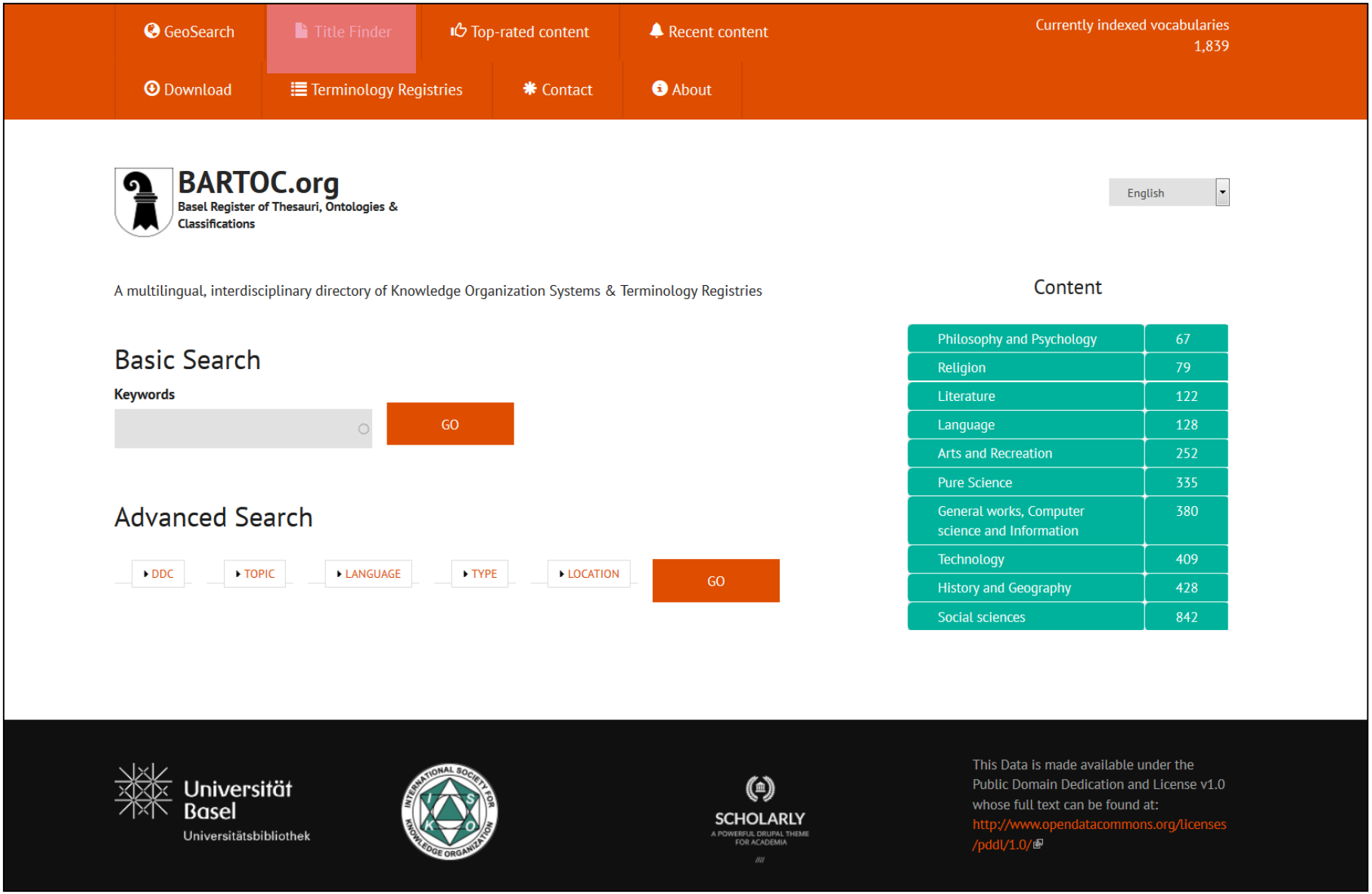

# KOS Registries.

# Founding Reasons.

- Make traditional resources more visible
- Provide key characteristics of resources
- Encourage human assessment of these resources by applicability to semantic projects
- Promote information exchange and knowledge sharing

Hlava, Marjorie: Developing an eclectic terminology registry, 2011.

- Any kind of KOS
- Any subject area
- Any language
- Any publication format
- Any form of accessibility

# Unique Selling Points.

- Wide approach
- Maintenance by community
- Approved by the International Society for Knowledge Organization (ISKO)
- “(...); it is the system’s advantage that it specializes in supplementing Dewey’s decimal classification terms (up to the third hierarchic level) (…), as well as providing the multilingual EUROVOC thesaurus descriptors.”

  Bratková et al.: Knowledge Organization Systems and Their Typology, 2014.

# Editorial Offices.

# Metadata Schema.

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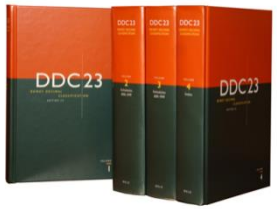


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Inter-Active Terminology for Europe

## Inter-Active Terminology for Europe

View | Voting results

**Abstract:**

"In IATE you can find EU-specific terminology and jargon, as well as terms from all sorts of areas, such as law, agriculture, information technology and many others. IATE has 8.4 million terms, including approximately 540 000 abbreviations and 130 000 phrases, and covers all 23 official EU languages.
New terms are added every day and the contents are constantly updated. IATE plays a major role in ensuring the quality of the written communication of the EU institutions and bodies."

**Alternative Title:** IATE
**Size:** 8.4 million terms, including approximately 540 000 abbreviations and 130 000 phrases (2016-06)
**Year of Creation:** 1999
**Author:** Translation Centre for the Bodies of the European Union
**VIAF:** Translation Centre for the Bodies of the European Union
**Link:** http://iate.europa.eu
**Topic:** European Union
**DDC:** 001 Knowledge
**ILC:**
s: civil society, communities, groups, people | t: governments, political power, political units, sovereign states | u: economies, economic systems | v: technologies, technological systems, production systems | tUE: European Union, EU
**Access:** Free
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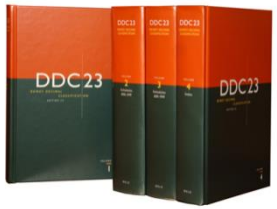


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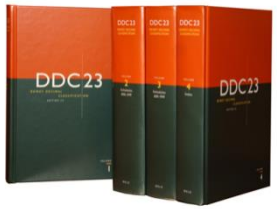


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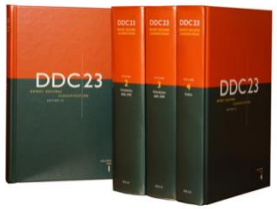


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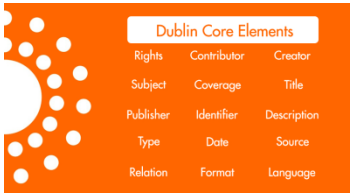

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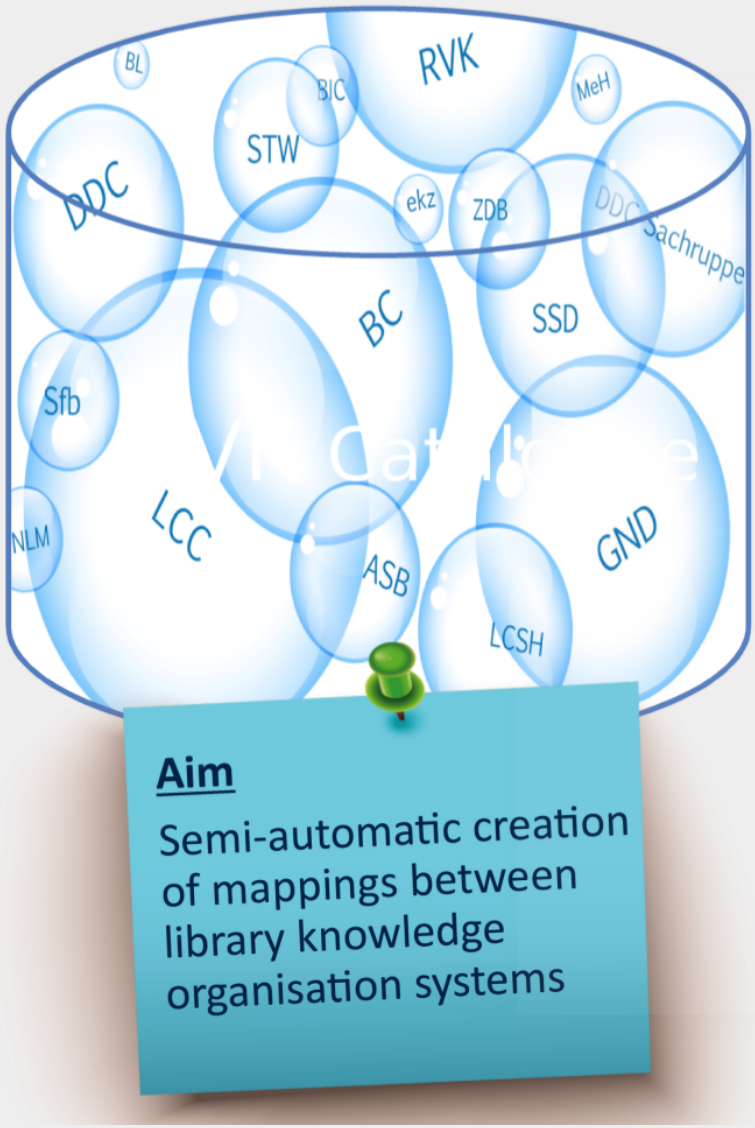
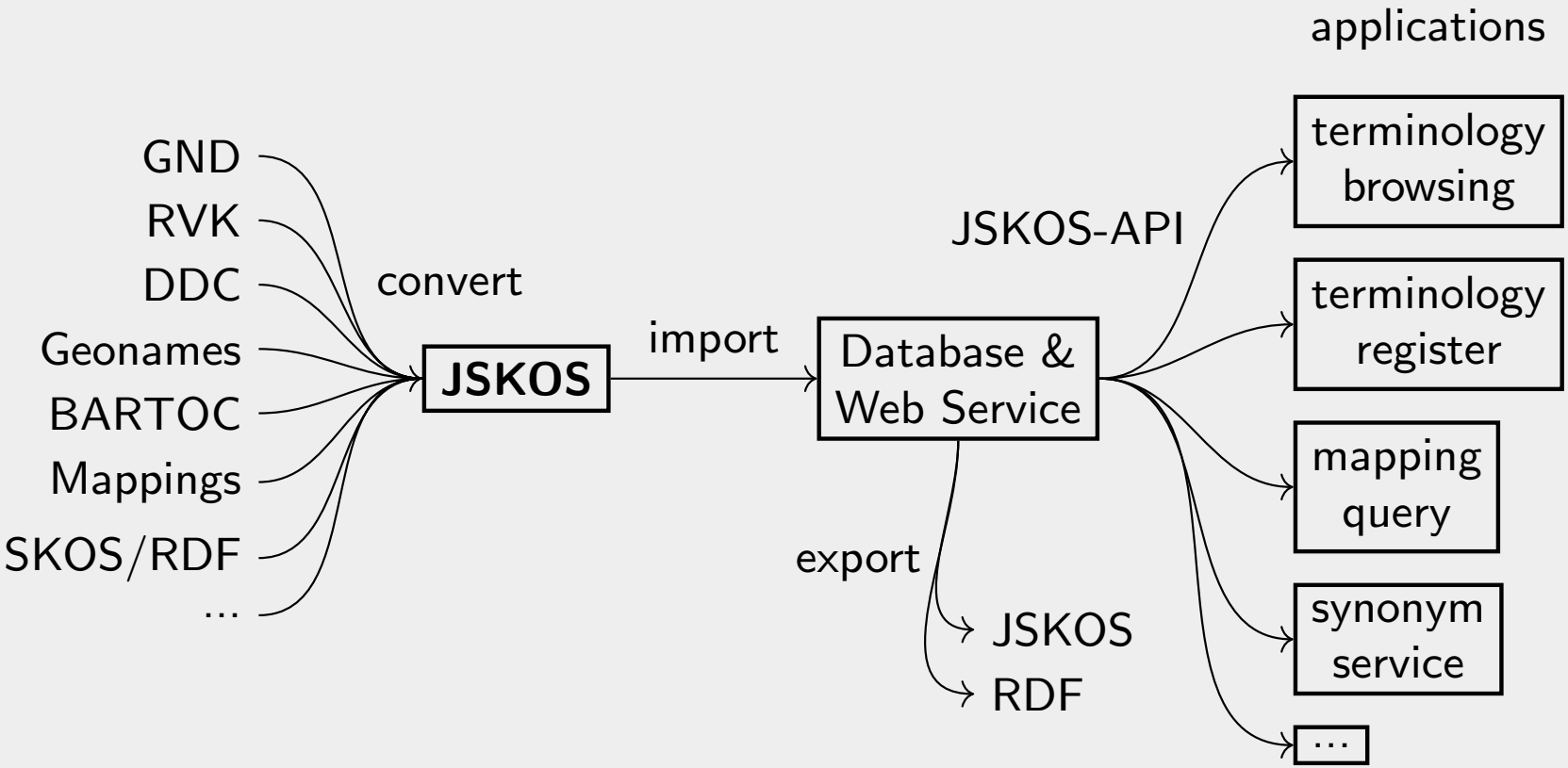
http://nkos.slis.kent.edu/nkos-ap.html

# Project coli-conc




| Classification systems in German speaking regions | |
|---|---|
| **Universal Classification Systems** | **No. of classes** |
| UDC (Universal Decimal Classification ) | ca. 65.000 classes (English version) |
| DDC (Dewey Decimal Classification) | over 44.000 classes with 10 main classes |
| RVK (Regensburg Classification) | 850.000 classes with 33 main classes |
| BC (Basic Classification) | 2100 classes with 89 main classess |
| LCC (Library of Congress Classification) | 21 main classes |
| **Subject classification** | **No. of classes** |
| DDC-Sachgruppen der DNB | 10 main classes with 94 subclasses |
| MSC (Mathematics Subject Classification) | 87 main classes |
| PACS (Physics and Astronomy Classification Scheme) | 10 main classes |
| FKDigBib (Subject classification for digital library) | 10 main classes |
| KfM (Classification for music library) | ca. 800 classes |
| **Subject Classification at the Universities** | **No. of classes** |
| TUM-classification (Science and technologyl classification of the TU Munic) | 52 classes each with 999 notations |
| Subject classification of the University library Duesseldorf | 45 classes |
| Bremer classification of the State and University library Bremen | ca. 57 main classes |
| GOK (Goettingen Online Classification) | ca. 33 main classes |
| Standard-Thesaurus Wirtschaft von der ZWB | 6.000 Terms and notations |
| Subject classification University library Trier | 36 main classes |
| Technical University Dortmund | 28 main classes |
| University library Paderborn | 26 main classes |
| University library Marburg | 35 main classes |
| University library Bonn | 24 main classes |
| University library Heidelberg | 22 main classes |
| Subject classification and nomenclature of individual languages Library of the Institute of General Linguistics at the Uni Münster | 23 main classes |
| **Subject Classification at the public libraries** | **No. of classes** |
| SEB (Scheme for protestant libraries) | |
| SKB-E (Scheme for catholic public libraries) | |
| KfKJ (Scheme for children and youth libraries) | Less than 1.000 classes |
| ASB (General classification for public libraries) | ca. 2.200 classes with 23 main classes |
| ÖSÖB (Austrian classification for public libarries) | |
| SfB (Classification for libraries) | ca 14.400 classes with 30 main classes |
| KAB (Classification for general libraries) | ca. 2.700 classes |
| SSD (Classfication of the city library Duisburg) | |
| ESSB (Single classfication for South Tyrolean) | 16 main classes |

# System overview



# JSKOS data format

Requirement: uniform access to KOS data

- based on RDF (SKOS & Dublin Core)
  . . . but more restrictive (unification)
- based on JSON-LD
  . . . extended by language ranges and closed world statements

main goal: **easy use of KOS data in web applications**

Specified at `https://gbv.github.io/jskos/`

# JSKOS beyond JSON-LD: closed world statements

narrower concepts may exist (open world assumption)

- `{ }`

$\exists$: narrower concepts exist (but not included here)

- `{ "narrower": [ null ] }`

$\nexists$: no narrower concepts exist

- `{ "narrower": [] }`

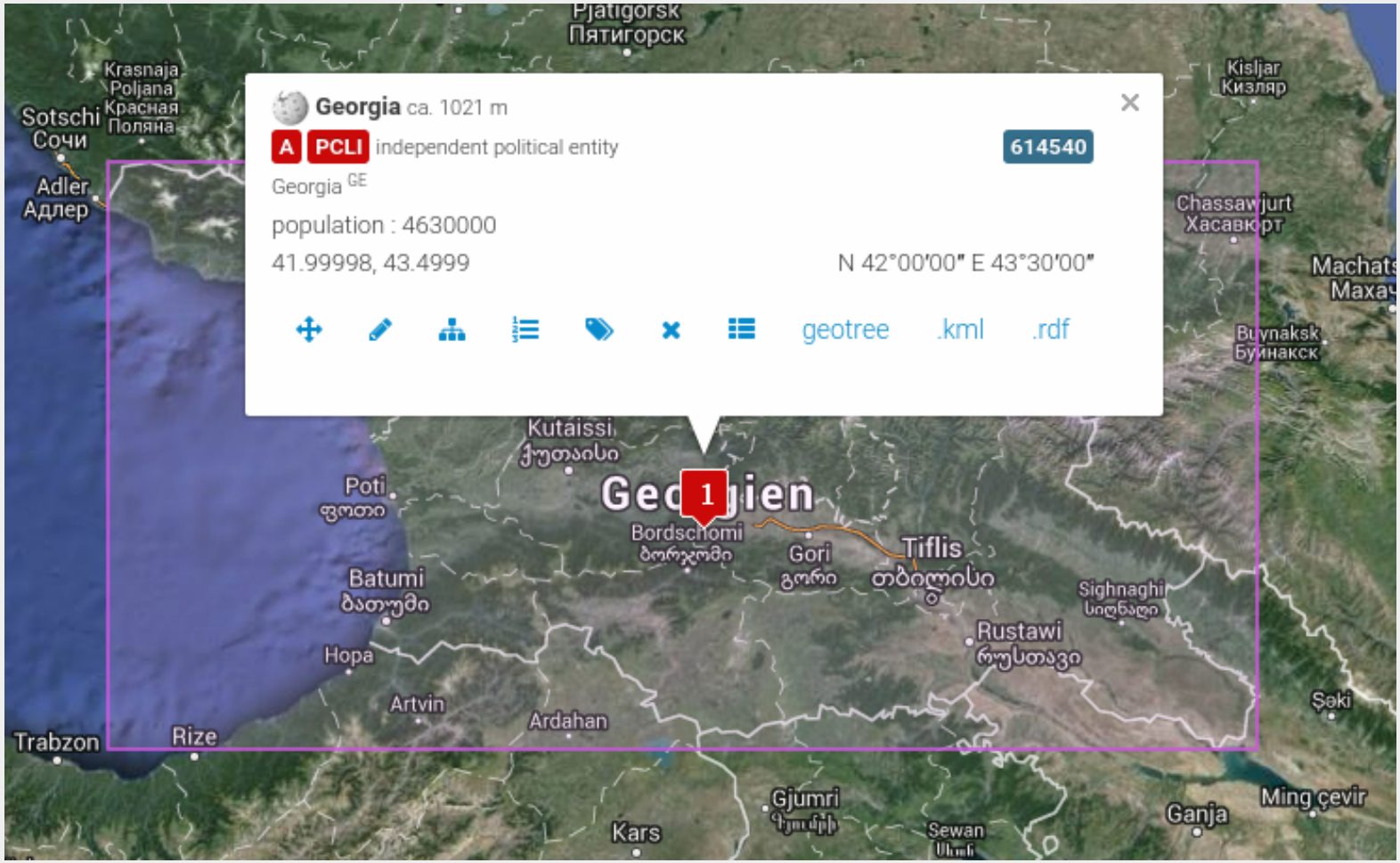
language ranges state that more labels in other languages exist

- `{"en": "english label", "-": "..." }`

# JSKOS beyond SKOS: data and object types

| data types | object types |
|---|---|
| URI | Concept |
| URL | Concept Type |
| date | Concept Scheme |
| list | Registry |
| set | Concordance |
| language range | Concept Mapping |
| language map | Concept Bundle |

# Concept example from GeoNames




http://sws.geonames.org/614540/

# JSKOS concept example from GeoNames (abbreviated)

```
{
  "type": ["http://www.w3.org/2004/02/skos/core#Concept"],
  "uri": "http://sws.geonames.org/614540/",
  "inScheme": [
    { "uri": "http://bartoc.org/en/node/15" }
  ],
  "prefLabel": {
    "en": "Georgia",
    "fr": "Géorgie",
    "de": "Georgien",
    "_": "..."
  },
  "broader": [
    { "uri": "http://sws.geonames.org/6255147/" }
  ],
  ...
```

# BARTOC in JSKOS

KOS can also be expressed in JSKOS

- Mapping of BARTOC fields to JSKOS
- BARTOC JSKOS export available:
  https://github.com/gbv/bartoc-dumps/

# BARTOC example: Eurovoc

## Multilingual Thesaurus of the European Union

View | Voting results

**Abstract:**

"EuroVoc is a multilingual thesaurus which was originally built up specifically for processing the documentary information of the EU institutions.
It is a multi-disciplinary thesaurus covering fields which are sufficiently wide-ranging to encompass both Community and national points of view, with a certain emphasis on parliamentary activities. EuroVoc is a controlled set of vocabulary which can be used outside the EU institutions, particularly by parliaments.
The aim of the thesaurus is to provide the information management and dissemination services with a coherent indexing tool for the effective management of their documentary resources and to enable users to carry out documentary searches using controlled vocabulary.
The EuroVoc ontology is an extension of SKOS (Simple Knowledge Organization System) - W3C recommendation, including appendix B, SKOS eXtension for Labels (SKOS-XL)."

**Alternative Title:** EuroVoc
**Author:** Publications Office of the European Union
**VIAF:** Publications Office of the European Union
**Link:** http://eurovoc.europa.eu/
**Topic:** European Union | politics
**DDC:** 001 Knowledge
**Access:** Registered | Free
**Format:** Online | OWL | Printed | RDF | SKOS | XML
**Type:** ontology | thesaurus
**Wikidata:** http://www.wikidata.org/entity/Q1370467
**Wikipedia:** ca | de | en | eo | hr | lt | nl | pt | ro | uk
**Language:**
Bulgarian | Catalan | Croatian | Czech | Danish | Dutch | English | Estonian | Finnish | French | German | Greek | Hungarian | Italian | Latvian | Lithuanian | Macedonian | Maltese | Polish | Portuguese | Romanian | Serbian | Slovak | Slovenian | Spanish | Swedish

### EuroVoc URIs

http://eurovoc.europa.eu/4060
http://eurovoc.europa.eu/4704

### ISO 639-2 URIs

http://id.loc.gov/vocabulary/iso639-2/bul
http://id.loc.gov/vocabulary/iso639-2/cat
http://id.loc.gov/vocabulary/iso639-2/hrv
http://id.loc.gov/vocabulary/iso639-2/cze
http://id.loc.gov/vocabulary/iso639-2/dan
http://id.loc.gov/vocabulary/iso639-2/dut
http://id.loc.gov/vocabulary/iso639-2/eng
http://id.loc.gov/vocabulary/iso639-2/est
http://id.loc.gov/vocabulary/iso639-2/fin
http://id.loc.gov/vocabulary/iso639-2/fre
http://id.loc.gov/vocabulary/iso639-2/ger
http://id.loc.gov/vocabulary/iso639-2/gre

# JSKOS BARTOC example: Eurovoc record (abbreviated)

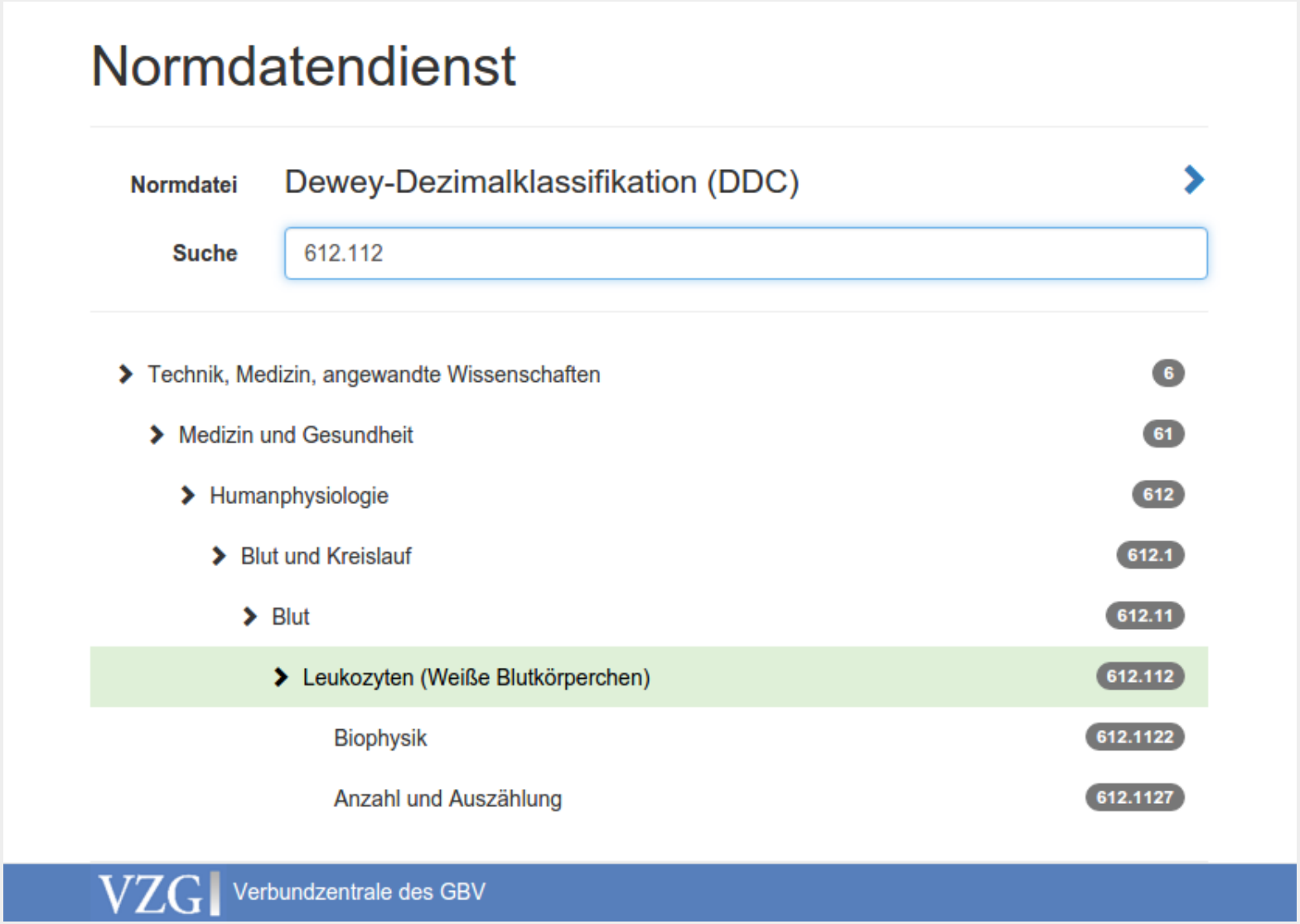

```
{
  "type": ["http://www.w3.org/2004/02/skos/core#ConceptScheme"],
  "uri": "http://bartoc.org/en/node/15",
  "url": "http://eurovoc.europa.eu/",
  "identifier": [
     "http://www.wikidata.org/entity/Q1370467"
  ],
  "prefLabel": {
    "en": "Multilingual Thesaurus of the European Union"
  },
  "altLabel": { "en": [ "EuroVoc" ] },
  "languages": [ "bg", "ca", "cs", "da", "de", "el",
                 "en", "es", "et", "fi", "fr",
  ...
```

# JSKOS-API/ELMA

- HTTP API to query KOS data in JSKOS
- Entity Lookup Microservice API (ELMA)
  as most relevant subset of JSKOS-API

  entity lookup `?uri=http://sws.geonames.org/614540/`
  entity search `?search=Georgia` (labels, notations, notes. . . )
- more use cases will be covered by full JSKOS-API
- public demo of terminology wrappers:
  https://jskos-php-examples.herokuapp.com/
  (BARTOC, Wikidata, GND, ORCID, GeoNames, VIAF . . . )

# Terminology Browsing



# Example: Dewey Decimal Classification (DCC)

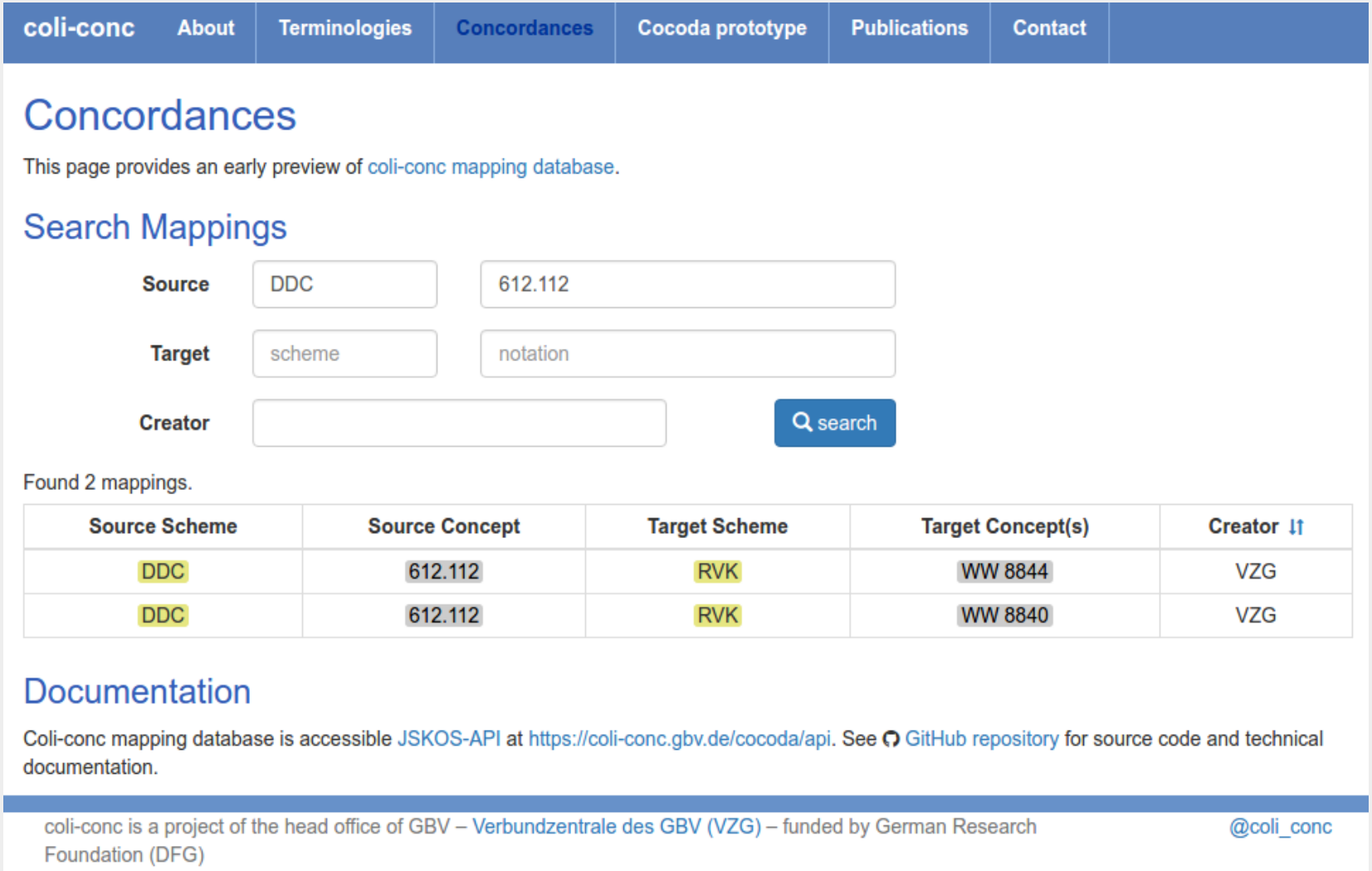
DDC in BARTOC (http://bartoc.org/en/node/241) → concept scheme

```
{
  "type": ["http://www.w3.org/2004/02/skos/core#ConceptScheme"],
  "uri": "http://bartoc.org/en/node/241",
  "prefLabel": { "en": "Dewey Decimal Classification" }
}
```

DDC in MARCXML (MARC 21 format for classification data) → concepts

```
{
  "type": ["http://www.w3.org/2004/02/skos/core#Concept"],
  "uri": "http://dewey.info/class/612.112",
  "prefLabel": { "en": "leucocytes" },
  "notation": [ "612.112" ],
  "inScheme": [ { "uri": "http://bartoc.org/en/node/241" } ]
}
```

# Mapping Database



# JSKOS mapping example

```
{
  "creator": { "notation": [ "VZG" ] },
  "mappingMethod": "...",
  "fromScheme": {
     "uri": "http://bartoc.org/en/node/241",
     "notation": [ "DDC" ]
  },
  "from": { "members" : [
    { "uri:": "http://dewey.info/class/612.112" }
  ] },
  "toScheme" : {
     "uri": "http://bartoc.org/en/node/533",
     "notation": [ "RVK" ]
  },
  "to": { "members" : [
    { "uri": "http://uri.gbv.de/terminology/rvk/WW8844" }
  ] }
}
```

# Other possible applications

- semantic tagging of documents with identified concepts:
  `http://sws.geonames.org/614540/` ⇒ “Georgia”
- statistical analysis of terminologies:
  compare size, hierachy, density of links. . .
- enrichment of concepts from multiple KOS
- . . .

*foster the visibility, availability and usefulness of KOS in general*

# Thanks! Questions?

- Follow us on Twitter
  - @BARTOC_UBBasel
  - @coli_conc
- More information
  - http://bartoc.org/
  - https://coli-conc.gbv.de/
  - https://gbv.github.io/jskos/
  - https://gbv.github.io/elma/

*Feedback and contribution is appreciated!*

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