

Známé ontologie



ISKM89 Organizace dat - sémantický web | podzim 2023
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Ontologie (informatika)

Explicit, formal specification of a shared conceptualization.

(Thomas R. Gruber, 1993)

- konceptualizace - abstraktní model (jak rozumíme konceptům v doméně a vztahům mezi nimi)
- všechno musí být explicitní (koncepty, vlastnosti, vztahy) - počítač sám od sebe ničemu nerozumí
- formální - počítačově zpracovatelné (logicky konzistentní)
- sdílené - shoda na konceptech a jejich vlastnostech (co s kontroverzemi?)

Hierarchie ontologií

Top
Ontology
(vrcholová)
žádná
doména

Doménová
ontologie

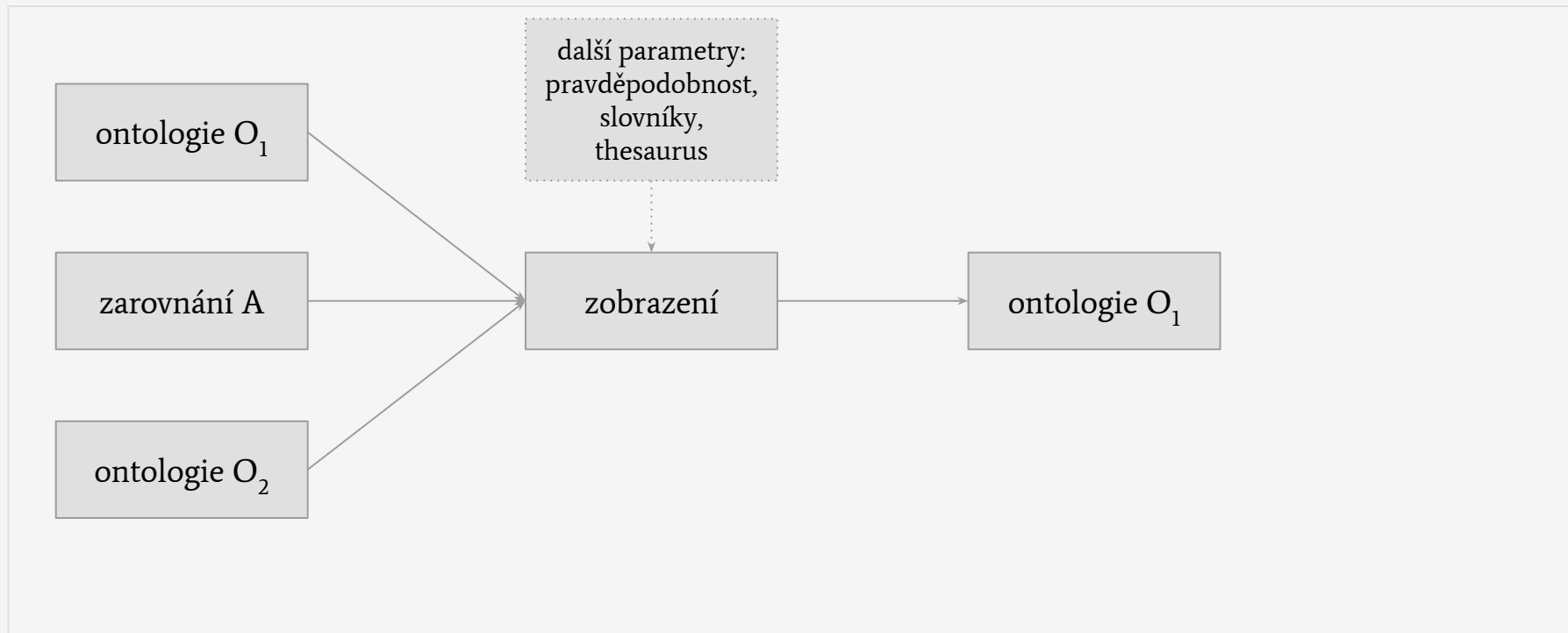
Task
Ontology
(o. aktivit)

Application
Ontology
(aplikační)
specifický
účel

Rozdíly mezi ontologiemi

- stejný termín pro rozdílné věci (title - academic - book, author - creator)
 - různé termíny pro stejnou věc (author - writer)
 - různé způsoby modelování (time point - time interval)
 - různá granularita (pes - psovitá šelma - šelma - masožravec - savec - strunatec)
 - různé pokrytí
 - různý pohled na svět
- syntax (jiný formát)
 - terminologie (+ jiné jazyky)
 - sémantika (stejná doména, jiné koncepty, rozdílná granularita, rozdílný pohled na svět)
 - pragmatika (rozdílná interpretace)

Spojování ontologií - zobrazení (mapping)

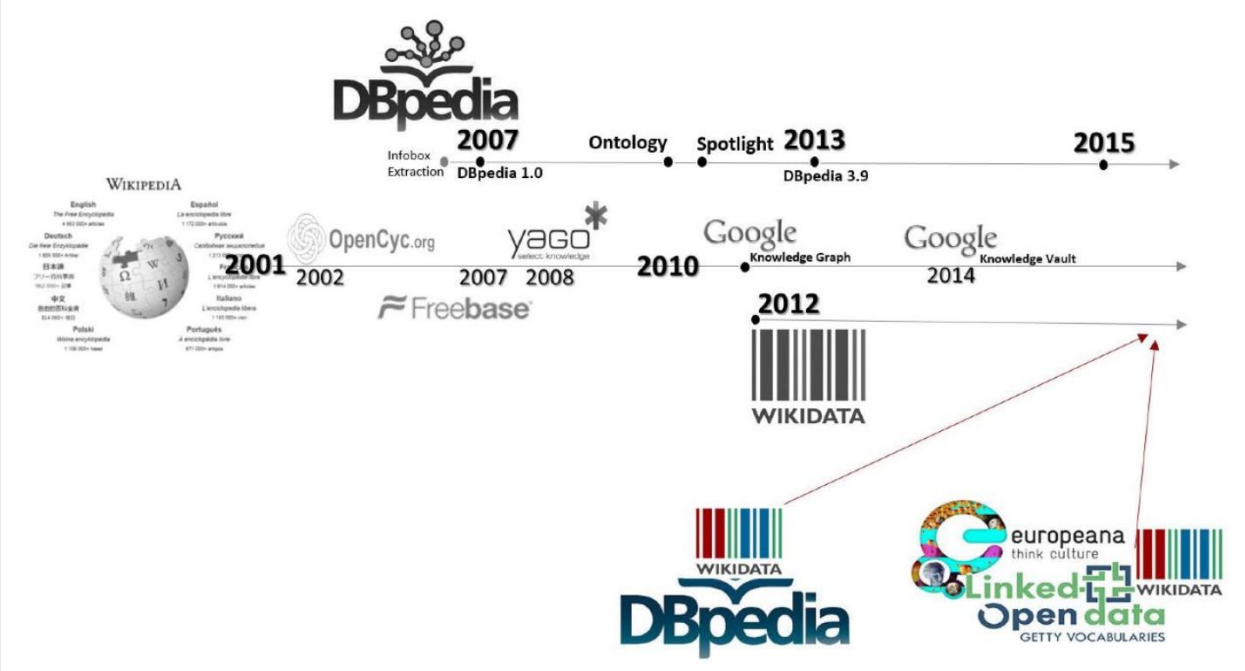


Známé ontologie (skoro standardy)

- dbo, dbp, dbr - DBpedia
- wd - Wikidata
- schema - schema.org
- dc, dcterms - Dublin Core, DC terms
- foaf - Friend of a Friend
- geodata - GeoNames
- vcard - VCF
- skos - Simple Knowledge Organization System

https://www.w3.org/wiki/Good_Ontologies

DBpedia - historie

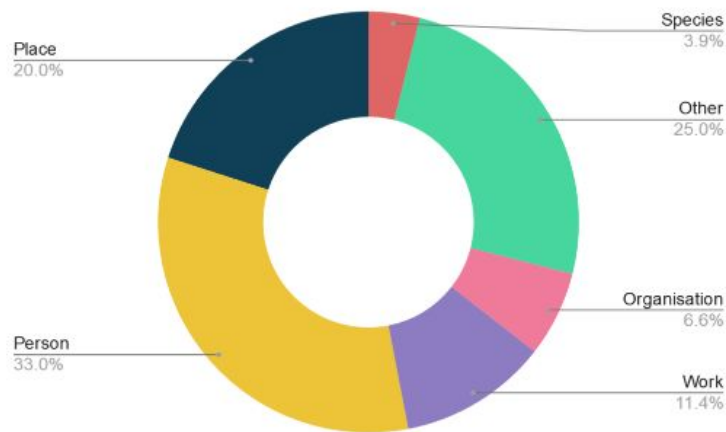


Harald Sack, Tabea Tietz: Knowledge Graphs 2023. FIZ Karlsruhe. On-line course.
<https://open.hpi.de/courses/knowledgegraphs2023/items/7zgZAtXgoj5CxfiX8Yb0Q0>

DBpedia - počty instancí

denní snapshots

měsíční vydání (dataset release)



Instances per Class

Class	Instances
Resource (overall)	4,828,418
Place	967,491
Person	1,592,912
Work	552,115
Species	190,369
Organisation	317,867
Other	1,207,664

DBpedia

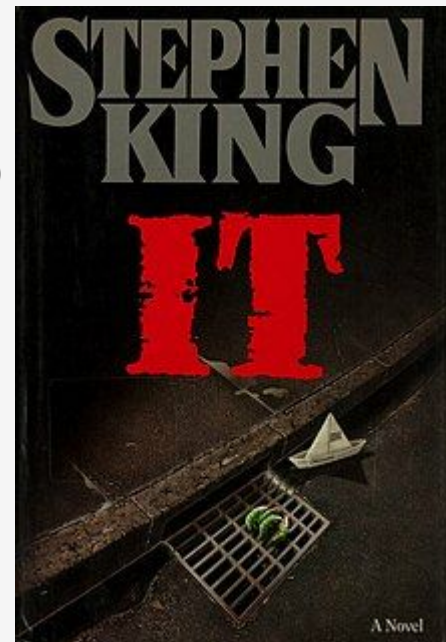
https://en.wikipedia.org/wiki/It_%28novel%29 - stránka na Wikipedii

Rozdílné reprezentace entity

[https://dbpedia.org/resource/It_\(novel\)](https://dbpedia.org/resource/It_(novel)) - identifikátor entity (věci)

[https://dbpedia.org/data/It_\(novel\)](https://dbpedia.org/data/It_(novel)) - data o věci (RDF/XML)

[https://dbpedia.org/page/It_\(novel\)](https://dbpedia.org/page/It_(novel)) - stránka o věci (HTML)



Wikidata Knowledge Graph



Rozdíl oproti DBpedii:

- identifikátory nejsou kvalifikovaná jména (QNames)
- Q-item - pro věci, P- pro vlastnosti, L- pro lexémy
 - např. [P569](#) = dateOfBirth
- reference (původ informace)
- kvalifikátory (např. startDate-endDate - jak dlouho nějaká informace platí?)

Wikidata Knowledge Graph



Wikidata není znalostní báze:

- není plně W3C compliant
 - nepoužívá RDF, RDFS, OWL
- je to databáze, která má jeden z formátů RDF a umožňuje dotazy (také) přes SPARQL
- Wikidata je odvozená z databáze Wikimedia

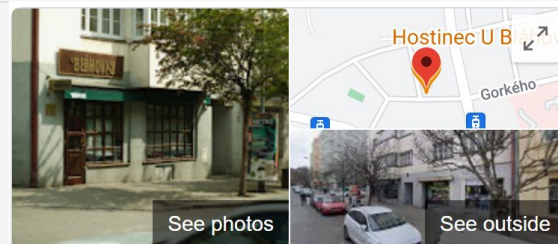
schema.org

Thing Types:

- Action
- BioChemEntity
- CreativeWork
- Event
- Intangible
- MedicalEntity
- Organization
- Person
- Place
- Product
- Taxon

Data Types:

- Boolean
- Date
- DateTime
- Number
- Text
- Time



Hostinec U Bláhovky

Website

Directions

Save

Call

4.7 ★★★★★ 2,020 Google reviews ⓘ

\$\$ · Brewpub

Service options: Dine-in · Takeaway · No delivery

Address: Gorkého 96, 602 00 Brno-střed

Hours: Thursday 12 PM–12 AM

Friday 12 PM–12 AM

Saturday 12 PM–12 AM

Sunday 12 PM–12 AM

Monday 12 PM–12 AM

Dublin Core - ontologie zdrojů (resources)

- Contributor - An entity responsible for making contributions to the resource
- Coverage - The spatial or temporal topic of the resource, the spatial applicability of the resource, or the jurisdiction under which the resource is relevant
- Creator - An entity primarily responsible for making the resource
- Date - A point or period of time associated with an event in the lifecycle of the resource
- Description - An account of the resource
- Format - The file format, physical medium, or dimensions of the resource
- Identifier - An unambiguous reference to the resource within a given context
- Language - A language of the resource
- Publisher - An entity responsible for making the resource available
- Relation - A related resource
- Rights - Information about rights held in and over the resource
- Source - A related resource from which the described resource is derived
- Subject - The topic of the resource
- Title - A name given to the resource
- Type - The nature or genre of the resource

<https://www.dublincore.org/>
<https://www.dublincore.org/specifications/dublin-core/dces/>

Dublin Core - ontologie zdrojů (resources) - DC Terms

abstract, accessRights, accrualMethod, accrualPeriodicity, accrualPolicy, alternative, audience, available, bibliographicCitation, conformsTo, contributor, coverage, created, creator, date, dateAccepted, dateCopyrighted, dateSubmitted, description, educationLevel, extent, format, hasFormat, hasPart, hasVersion, identifier, instructionalMethod, isFormatOf, isPartOf, isReferencedBy, isReplacedBy, isRequiredBy, issued, isVersionOf, language, license, mediator, medium, modified, provenance, publisher, references, relation, replaces, requires, rights, rightsHolder, source, spatial, subject, tableOfContents, temporal, title, type, valid

<https://www.dublincore.org/>

<https://www.dublincore.org/specifications/dublin-core/dcmi-terms/>

SKOS - Simple Knowledge Organization System (standard W3C)

- koncepty a schémata Concept, ConceptScheme; notace Notation
- kolekce Collection
- vlastnosti (properties):
 - broader, narrower, broaderTransitive ...
 - related
 - mappingRelation
 - definition, example
 - altLabel, prefLabel, hiddenLabel

<https://www.w3.org/2004/02/skos/>

```
<MyResource>
  skos:prefLabel "animals"@en ;
  skos:altLabel "fauna"@en ;
  skos:hiddenLabel "aminals"@en ;
  skos:prefLabel "animaux"@fr ;
  skos:altLabel "faune"@fr .
```

FOAF

Agent Person: name, title, img, knows, interest, publications

OnlineAccount: accountName

Project Organization Group: member, theme, fundedBy

Document Image: topic, thumbnail

<http://xmlns.com/foaf/0.1/>

FOAF-a-Matic: <http://ldodds.com/foaf/foaf-a-matic.html>

vCard

Kind: Individual, Organization, Location, Group

Gender: Male, Female, Other, None, Unknown

Type: Internet, Postal, Work, Phone

VCard

Relation Type: Agent, Child, Contact, Crush, Coworker, Neighbor

has address

has calendar busy

logo

has name, has nickname,

has language

has geo

<https://www.w3.org/TR/vcard-rdf/>

Geonames

Feature: name, alternateName, countryCode, population, postalCode, parentCountry

Class: A (country, state, region), H (stream, lake), L (park, area), P (city, village), R (road, railroad), S (spot, building), T (mountain), U (undersea), V (forest),

Code

wgs84_pos: lat, long (Basic Geo WGS84 <https://www.w3.org/2003/01/geo/>)

<https://www.geonames.org/ontology/documentation.html>

Příklady: <https://www.geonames.org/export/geonames-search.html>

Ontologie v humanitních vědách

<https://github.com/CLARIAH/awesome-humanities-ontologies>

- Kulturní dědictví
 - [CIDOC Conceptual Reference Model \(CRM\)](#)
 - Rozšíření: Linked Art Data Model pro kulturní dědictví
 - Rozšíření: CRM Archeo Excavation Model pro archeologii
 - Getty Art and Architecture Thesaurus <https://www.getty.edu/research/tools/vocabularies/aat/>
 - Agregátor Europeana <https://www.europeana.eu/en/search?query=&view=grid&page=1>
 - STITCH (Semantic Interoperability to access Cultural Heritage) <https://www.cs.vu.nl/STITCH/>
- Lexicon modeling - [Lemon](#)
- Theme Ontology - <https://www.themeontology.org/>
- Music Ontology - <http://musicontology.com/>
- ECPO Enumeration and Chronology of Periodicals Ontology
<https://cklee.github.io/ecpo/ecpo.htm>

CIDOC CRM

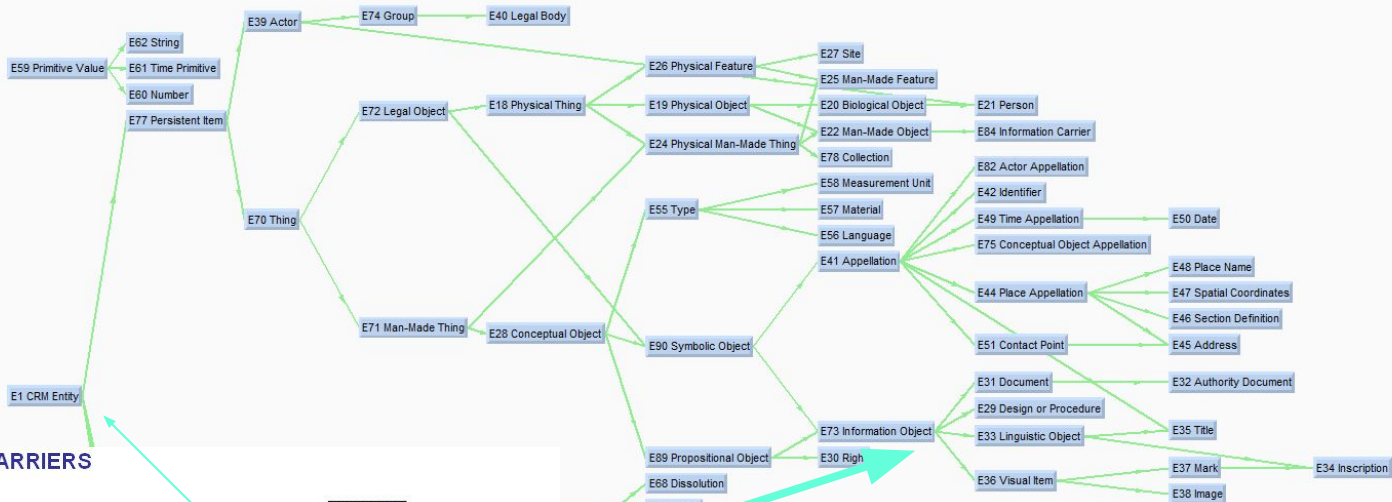
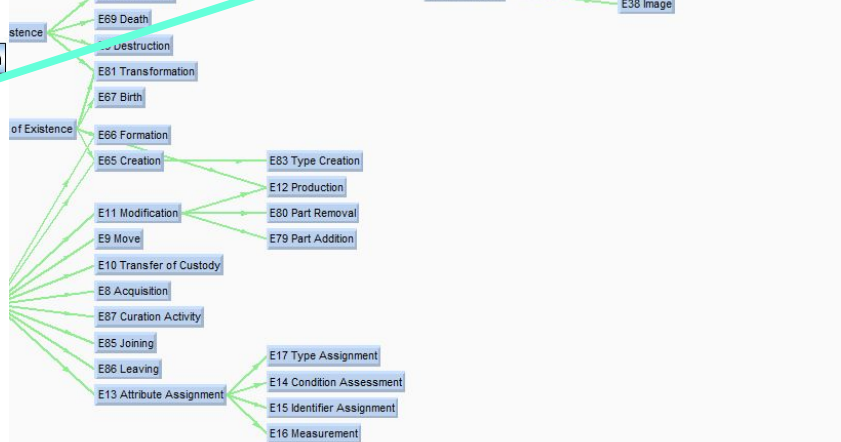
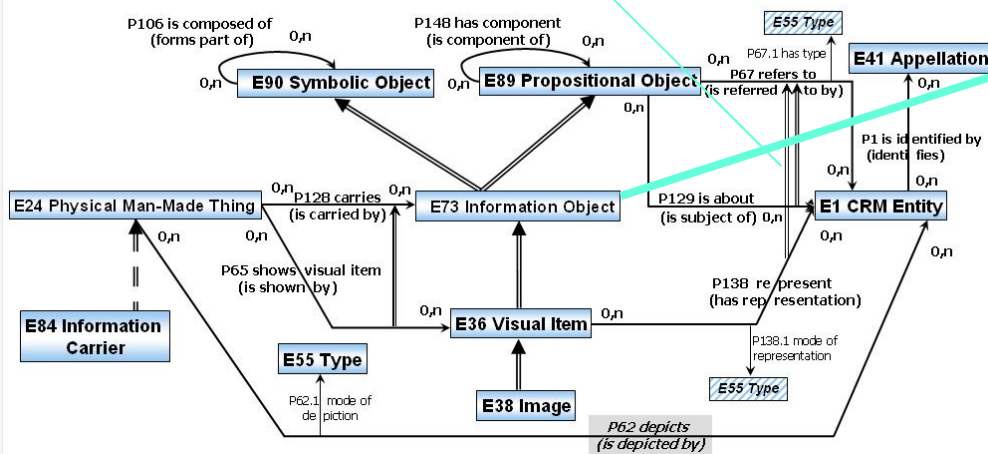


IMAGE INFORMATION, OBJECTS AND CARRIERS



Getty - Art and Architecture Thesaurus Online



People, Organizations, Living Organisms

Objects: Build Works, Costume, Tools, Weapons, Containers, Sound Devices, Visual Works

Attributes: Design, Color, Conditions

Styles and Periods

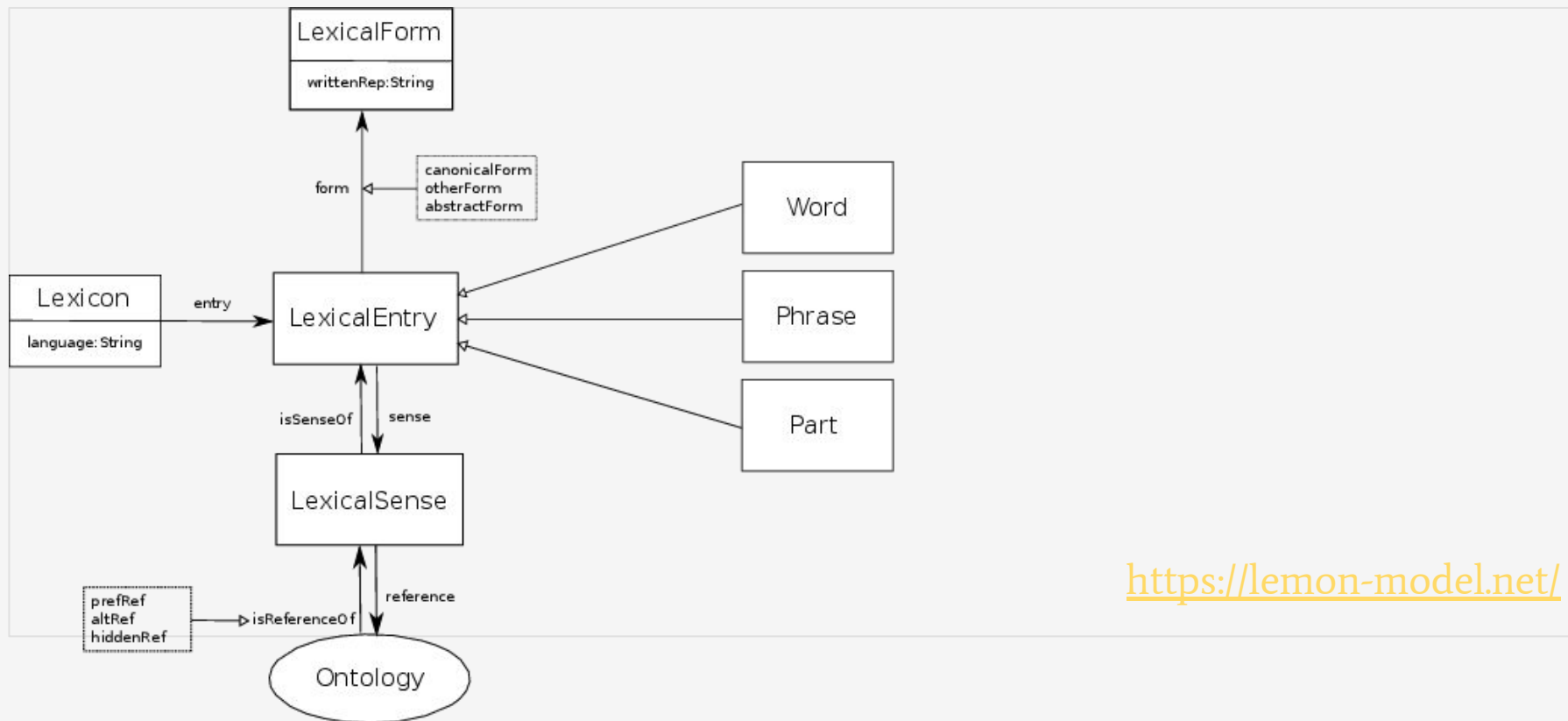
Materials

Brand Names

Příklad:

https://www.getty.edu/vow/AATFullDisplay?find=kilt&logic=AND¬e=&english=N&prev_page=1&subjectid=300209920

Ontologie Lemon



<https://lemon-model.net/>

Theme Ontology

betrayal	choice
the dangers of unchecked ambition	choice
the lust for power	choice
civil war	major
destiny	major
high treason	major
husband and wife	major
loyalty to a friend	major
loyalty to a leader	major
regicide	major
second guessing one's self	major

Music Ontology

MusicGroup, MusicArtist

Composition, Arrangement: Instrumentation, Orchestration

MusicalExpression: Libretto, Lyrics, Score, Sound

Medium: CD, DVDA, MagneticTape

Festival

Label

Instrument

MusicalManifestation: Record, Release, Track

<http://musicontology.com/specification>

Spojování ontologií - zobrazení - interoperabilita ontologií

