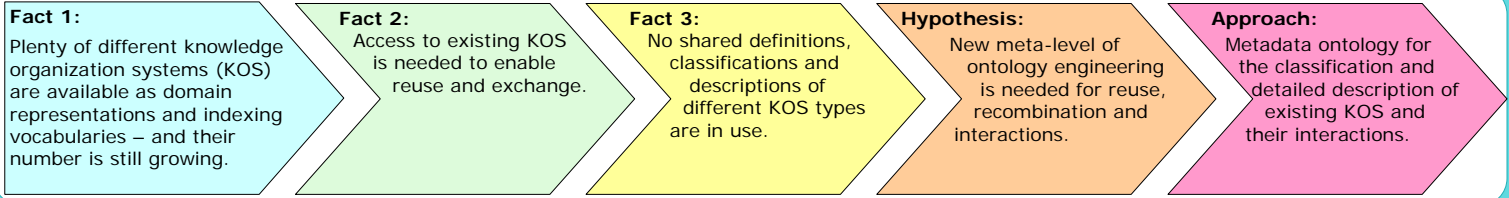


KOSO – A Metadata Ontology for Knowledge Organization Systems

Katrin Weller, M.A.

Heinrich-Heine-University Düsseldorf, Germany
Institute for Language and Information
Department of Information Science

weller@uni-duesseldorf.de



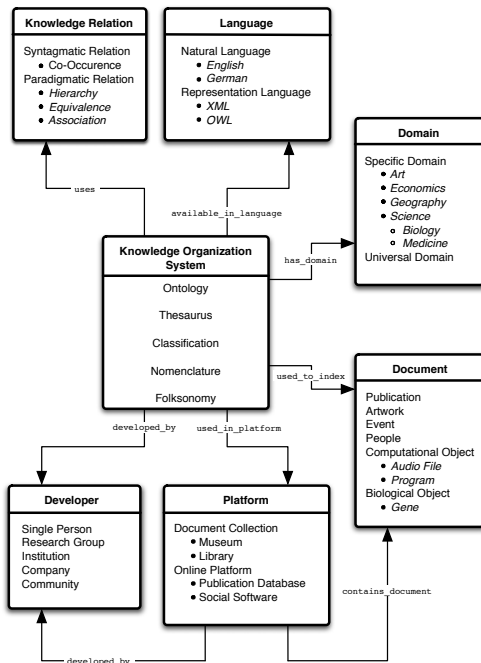
Aim

KOSO (Knowledge Organization Systems Ontology) wants to support knowledge exchange and reuse of existing KOS by
→ providing a set of descriptive metadata.
→ defining and classifying different types of KOS.
→ specifying modes of KOS interactions.

Implementation

- KOSO has been implemented in OWL-DL.
- Key concept is KnowledgeOrganizationSystem. Six main modules are build around it to describe KOS.
- Additional datatype properties, e.g. `has_release_date`, `has_number_of_relations`, `provides_usage_guidelines`.

Basic Structure of the Ontology



Example:

International Patent Classification (IPC)
→ `is_a Classification`
(`is_a KnowledgeOrganisationSystem`)
→ `has_version: IPC2006, ...`
→ `available_in_language: English, French`
→ `uses_notations = true`
→ `is_developed_by:`
WorldIntellectualPropertyOrganization
→ `has_number_of_concepts: 50,000-100,000`
→ `uses_relation: Hierarchy`
→ `has_domain: IntellectualProperty`
→ `is_used_to_index: InternationalPatents`

Details

Defining different KOS types

Ontology	<ul style="list-style-type: none"> • Explicitly specified semantic relations. • Formal representation language (for automatic reasoning). • Distinguishing concepts and individuals. • <i>Example: Cyc</i>
Thesaurus	<ul style="list-style-type: none"> • Focus on elaborated vocabulary control: meronymy, hyponymy, equivalences and unspecific associative relations. • <i>Example: Medical Subject Headings (MeSH)</i>
Classification	<ul style="list-style-type: none"> • Mainly hierarchical structure, equivalence relations. • Subtypes, e.g. decimal classification, faceted classification. • Uses notations. • <i>Example: International Patent Classification (IPC)</i>
Nomenclature	<ul style="list-style-type: none"> • Controlled keyword indexing with focus on equivalence relations (synonyms), additional associations possible. • <i>Example: CAS Registry File</i>
Folksonomy	<ul style="list-style-type: none"> • No concept interrelations. • Developed by community, bound to platform. • Subtypes: broad and narrow folksonomy. • <i>Examples: Flickr Folksonomy, Del.icio.us Folksonomy.</i>

→ The types of semantic relations within a KOS are one key factor to determine the semantic complexity.

Properties to specify interactions of different KOS

Versioning	Interlinking different (release) versions: <code>has_version</code> , <code>is_prior_version_of</code> , <code>is_later_version_of</code> , <code>is_language_version_of</code> .
Modularization	KOS and components: <code>consists_of_module</code> , <code>is_component_of</code> . <i>Example: Gene Ontology consists of three modules Biological Process, Cellular Component and Molecular Function.</i>
Resources and Reuse	Reuse of existing resources: <code>is_resource_for</code> and <code>reuses</code> . May be specified to complete and partly reuse. <i>Example: SmartSUMO ontology reuses DOLCE and SUMO.</i>
Cross-references	Established cross-references between concepts of two different KOS: <code>has_concordances_to</code> . <i>Example: Standard Thesaurus Wirtschaft has_concordances_to NACE.</i>
Multi-representation	Independent KOS within the same platform, may represent different points of view: <code>used_in_combination_with</code> .

Discussion

Discussions with an interested community should particularly focus on:

- Accurate definition of ontologies and types of ontologies.
- Classification of application fields for ontologies.
- Additional types of KOS interactions.
- The role of relations for emergent semantics.
- Interrelations with other approaches to establish ontology metadata.

Future Work

Future work will comprise:

- Broadening the concept of KnowledgeOrganizationSystem to KnowledgeResource to include EncyclopedicResources (glossaries, wikis etc.) and LinguisticResources (linguistic thesauri, dictionaries). Specific properties will have to be defined.
- Inclusion of new modules for engineering methodologies and tools.
- Inclusion of standards and norms.
- Complementary platform for documenting and retrieving KOS.

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