Rutherford Appleton Laboratory

Semantic Web Best Practices and Deployment

SKOS Core

Update on W3C's Simple Knowledge Organisation Systems (SKOS) Core NKOS-2005 Vienna

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Overview

- Goals
- Basics & Features
- Status and Future
- Issue: Mapping & Multilinguality
- Issue: Process & Versioning
- Issue: Services
- Extensibility Preview

- N.B. requirements specified by NKOS community are primary design motivators for SKOS Core

Requirements

1. I want to send my thesaurus/taxonomy/classification scheme/subject heading system/controlled vocabulary from one database/application to another.

2. I want to publish my thesaurus/taxonomy/… in an 'electronic' form, so that it can become part of a distributed information network/environment

Goals

- The **goal** of **SKOS Core** is…
  - to provide a **simple**, **machine-understandable**, **representation framework** for Knowledge Organisation Systems (KOS)…
  - that has the **flexibility** and **extensibility** to cope with the **variation** found in KOS idioms…
  - that is fully capable of supporting the **publication** and **use** of KOS within a **decentralised**, **distributed**, **information environment** such as the world wide (semantic) web.

Scope

- In scope…
  - **controlled vocabularies**
  - **thesauri**
  - **taxonomies**
  - **classification schemes**
  - **subject heading systems**
- Grey area…
  - terminologies (sensu ISO TC37 SC4)
  - wordnets
  - lexical databases
  - synonym rings
  - glossaries
  - dictionaries
  - ‘ontologies’

Basics

- SKOS Core is…
  - an application of the **Resource Description Framework (RDF)**

- Why choose RDF as the basis for a standard?

Most compelling reasons…

1. Ease of combination with other meta-information standards
2. Flexibility and ease of extension, to cope with variations in KOS structure and style

E.g. Thesaurus

Economic cooperation

UF Economic co-operation

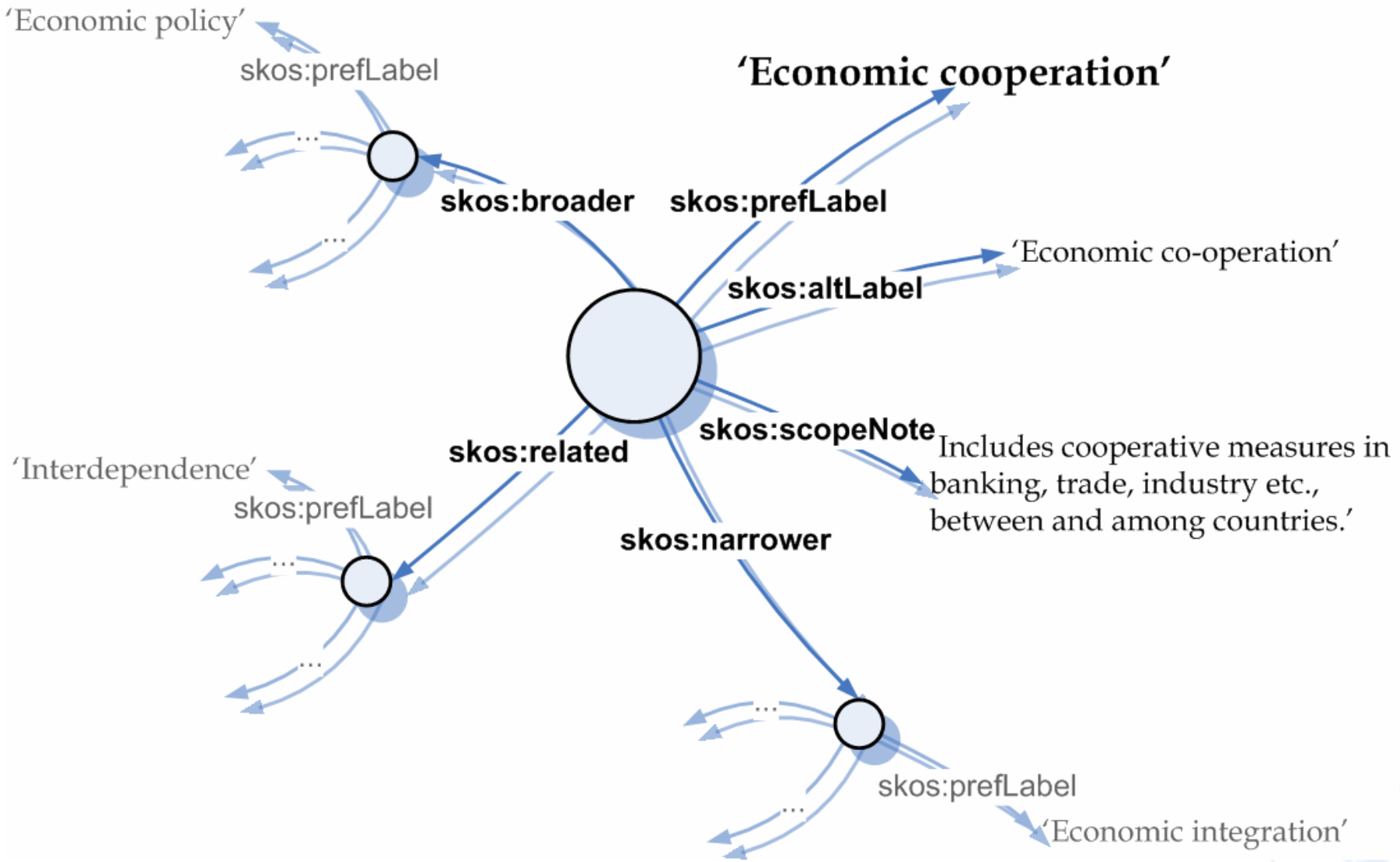
SN Includes cooperative measures in banking, trade, industry etc., between and among countries.

BT Economic policy

NT Economic integration

RT Interdependence

E.g. Thesaurus



Features

- SKOS Core allows you to…
  - **identify** concepts with **URIs**
  - (URIs for computers, words for people)
  - **label** concepts with **literals** (e.g. 'love'@en), **symbols** (e.g. ), sounds? other?
  - **document** concepts with definitions, examples, scope notes, history notes, editorial notes…
  - **semantically relate** concepts
  - **organise** concepts into **concept schemes**, and into **smaller meaningful groupings** ('arrays')
  - **use** concepts to **subject-index** documents

Further Reading

- **SKOS Core Guide**

  http://www.w3.org/TR/swbp-skos-core-guide

- **SKOS Core Vocabulary Specification**

  http://www.w3.org/TR/swbp-skos-core-spec

Extensibility FAQ

- Can I extend SKOS Core?
  - **YES**
- How do I do it?
  - … **coming soon** I promise (probably as appendix to SKOS Core Guide)

Development

- **N.B. SKOS Core is an Evolving Vocabulary**
- SKOS Core is maintained by W3C SWBPD-WG
- Public, consensus-driven, design by open community
- All discussion in public, via
  public-esw-thes@w3.org
- Review proposals for change every ~3 months
  http://www.w3.org/2004/02/skos/core/proposals
- Publish revised working drafts
  http://www.w3.org/TR/swbp-skos-core-guide
  http://www.w3.org/TR/swbp-skos-core-spec
- Change management policy
  http://www.w3.org/TR/swbp-skos-core-spec/#secChange

Status

- **SKOS Core Guide** and **SKOS Core Vocabulary Specification** are **W3C First Public Working Drafts**
- Currently second review is underway
- Plan 3rd review December 2005

Future?

- Should SKOS become a **W3C Recommendation Track** work item?
- (…or is it OK for it to end up as a **Working Group Note**?)
- If your organisation wants to use SKOS Core, but needs it to be a W3C REC, please let us know.

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Issue: Mapping

- Requirement: how do I transfer/publish (semantic) mappings between KOS?

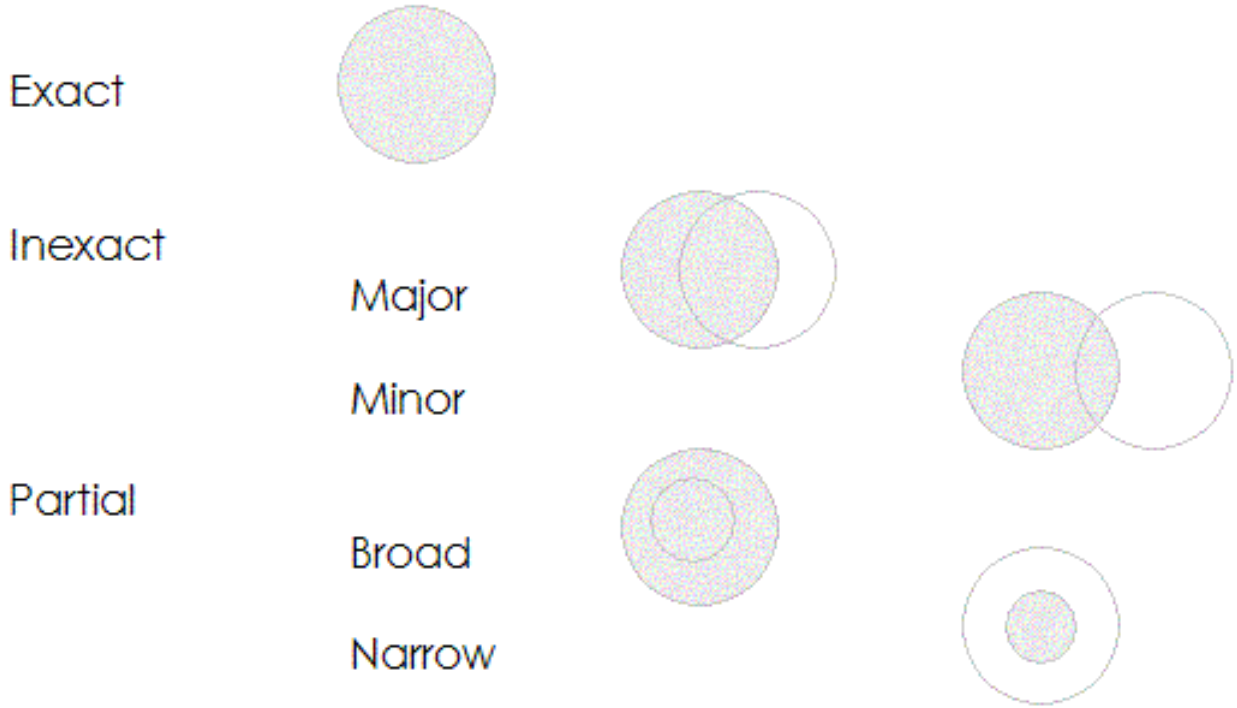
- SKOS Mapping
  - http://www.w3.org/2004/02/skos/mapping/
  - product of SWAD-Europe
  - RDF expression of Doerr's Semantic Mapping approach (see Jodi paper)
  - … which refines ISO 5964
  - no work since ~2004-04 (focus on SKOS Core)

SKOS Mapping

(From SWAD-Europe 2004)

- An RDF expression for KOS mapping

SEMANTIC MAPPINGS



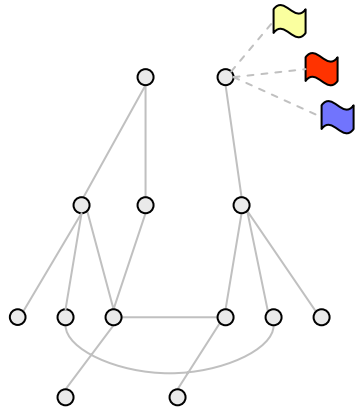
AND, OR, NOT combinations

Multilinguality

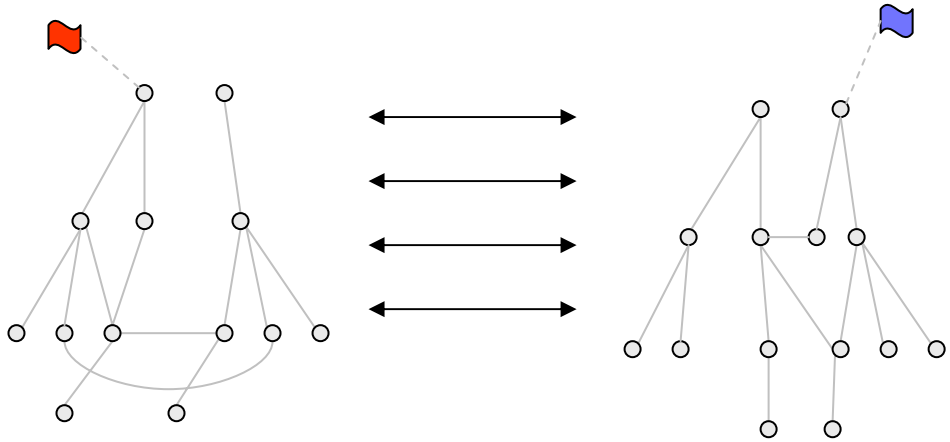
(From SWAD-Europe 2004)

Analyse each language component

Multilingual Labelling



Interlingual Mapping



Mapping Questions

- Semantic vs. other types of mapping?
- Mapping is hard to do and expensive!
- Should we try to standardise a representation framework for (semantic) mappings?
  - I.e. should we do more work on SKOS Mapping?

Issue: Process & Versioning

- Requirement: I want to representing information to do with stability, evolution, change, development, process and versioning of my KOS…

- … depends on standard development methodologies, standard versioning strategies … ?

Issue: Services

- Requirement: How do I interact programmatically with a KOS datasource?

- SWAD-Europe – did SKOS API (2004)
- NBII, Glamorgan …

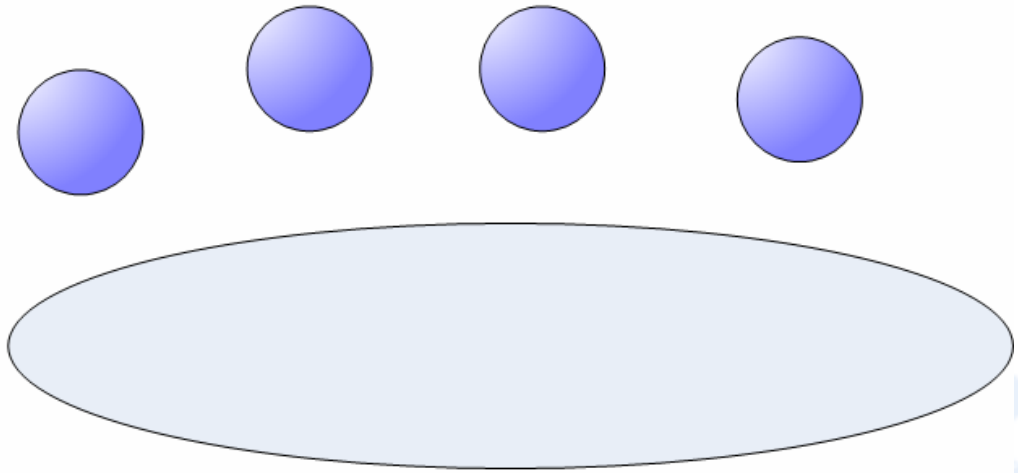
- But now we have W3C SPARQL (RDF) Query language and Protocol …
  - (can do all SKOS API method calls via SPARQL plus a few custom functions)
- … but perhaps still value in a KOS-specific API/protocol?

Services: Perspective

Services

Network thinking: services as wrappers for islands of data

Web thinking: services as components that add value to the web of data



Decouple services from databases

Pic'n'Mix

- N.B. RDF allows you to Pic'n'Mix …
  - 'Take what you want, add what you need.'
  - (or 'Don't throw the baby out with the bathwater.')

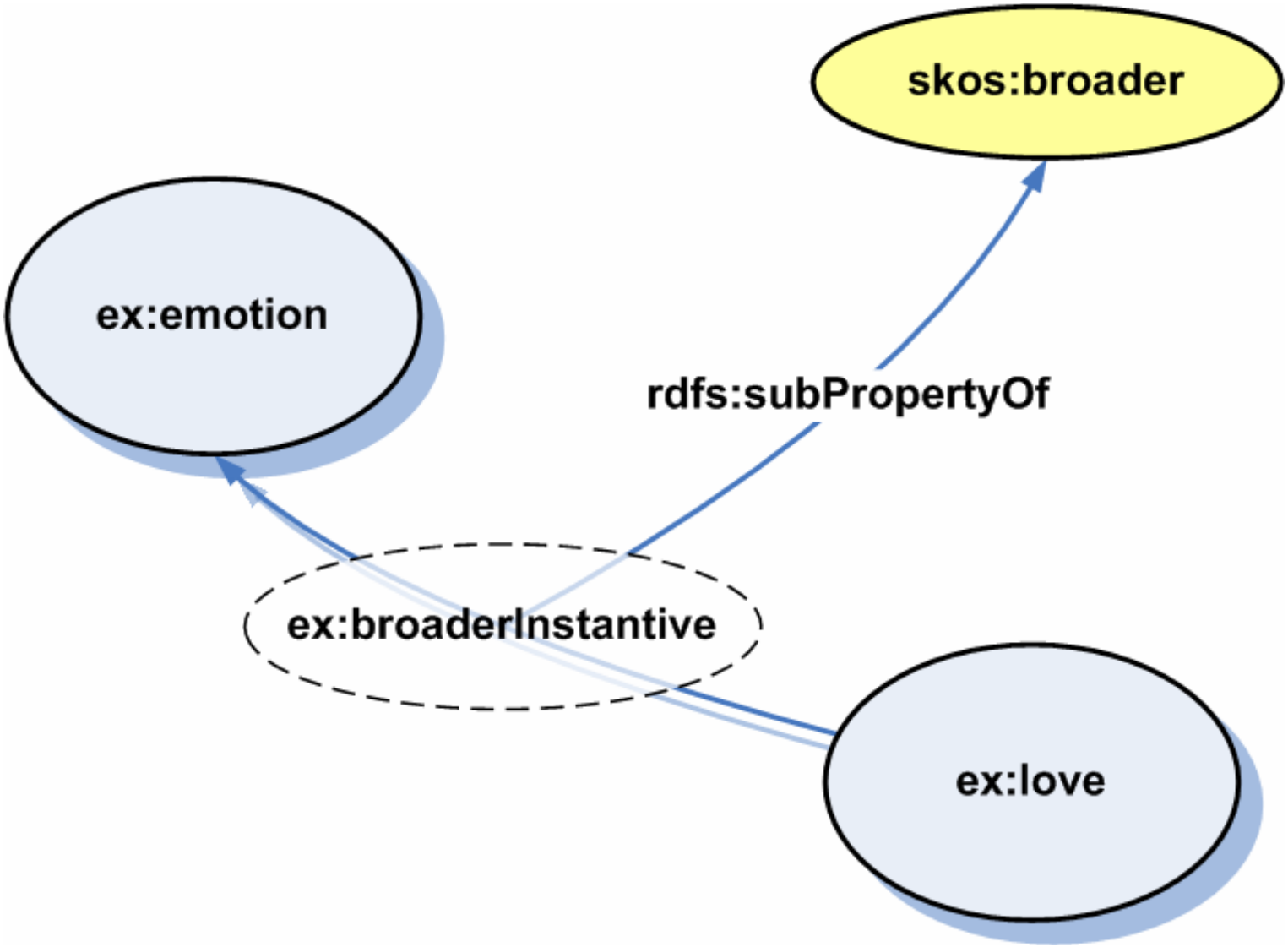
Extension by Refinement

- Extension by refinement…
  - Custom labelling
  - Custom documentation
  - Custom semantic relations
  - Fundamental facets
  - Post-coordinate indexing
  - (See DC2005 tutorial for more detail)

Extension by Refinement

- N.B. extension by refinement uses RDF Schema's sub-property & sub-class mechanism…
- …which means can use standard RDFS inference to get generic SKOS Core representation from custom extensions ('dumb-down') …
- …which means you can have your cake and eat it.
- (**Layered semantics**, **SKOS Core** as a **basis** for **maximising semantic interoperability**)

Extension by Refinement



Hybrid Ontologies

- Extension by refinement allows…
- …hybrid SKOS/RDFS/OWL ontologies
  - Explore cost/benefit trade-off between detailed modelling and utility to users…
  - …within a single ontology!

- E.g. the SWED portal (http://www.swed.org.uk) uses a hybrid SKOS/RDFS/OWL ontology to support a faceted browser for a directory of environmental organisations.

Extensions with Rules

- More complex representations (inluding e.g. layers of lexical information) can be related to SKOS Core via simple **rules**...
- ...however, there is as yet no standard W3C rules language (although there very probably will be soon)
- (... although several major RDF toolkits have rule implementations)

Other Issues

- Towards a continuous representation framework for the continuum of KOS types …
- Explore relationship to OWL, combined & mapped representations …
- N.B. next review of SKOS Core will be done by OEP task force (the guys who did OWL)

Other Issues

- Lexical information
  - ISO TC37 SC4 Terminology Markup Framework
  - Princeton Wordnet, RDF/OWL expression
  - dictionaries, glossaries … ?

- Should SKOS Core include support for representation of more lexical information? What are the requirements?

Thanks

- Comments, suggestions and feedback:

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