

Managing and Sharing KOS through Registries and RDFa/microdata Using a Metadata Application Profile

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with updates of the specification

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Outline

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 - Basic relationships
 - 2.3 Core elements
3. The KOS-AP for Embedded Metadata Use
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1. Background

What are Terminology Registries

- at a minimal level
 - hold scheme information
 - list, describe, identify, and point to sets of KOS and other types of vocabularies available for use in information systems and services
- at a higher level
 - hold the member terms, classes, concepts, and relationships contained in a vocabulary (either monolingual or multilingual)

-- based on several UKOLN studies,
[TRSS project](#), etc.

An Example of a Terminology Registry: BioPortal

bioportal.bioontology.org

BioPortal

Browse Search Mappings Recommender Annotator

Welcome to BioPortal! For help using BioPortal

Search all ontologies

Enter concept, e.g. Melanoma

Search

[Advanced Search](#)

Most Viewed Ontologies

Ontology	Views
SNOMED Clinical Terms	13,601
National Drug File	9,320
MedDRA	4,254
International Classification of Diseases	3,415
NCI Thesaurus	1,528

Statistics

Ontologies	361
Classes	6,032,759
Resources	39
Indexed Records	5,126,145
Direct Annotations	1,883,854,337
Direct Plus Expanded Annotations	24,828,631,205

<http://bioportal.bioontology.org/>

ONTOLOGY NAME	VISIBILITY	CLASSES
Adverse Event Reporting Ontology AERO	Public	398
African Traditional Medicine Ontology		
Allen Brain Atlas (ABA) ABA-AMB		
Alzheimer's disease ontology		
Amino Acid Ontology AAO		
Amphibian Gross Anatomy Ontology		
Amphibian Taxonomy Ontology		
Anatomic Pathology Lexicon		

[→](#) [↺](#) [bioportal.bioontology.org/ontologies/NCIT/?p=mappings](#)

National Cancer Institute Thesaurus

[Summary](#) [Classes](#) [Notes](#) [Mappings](#) [Widgets](#)

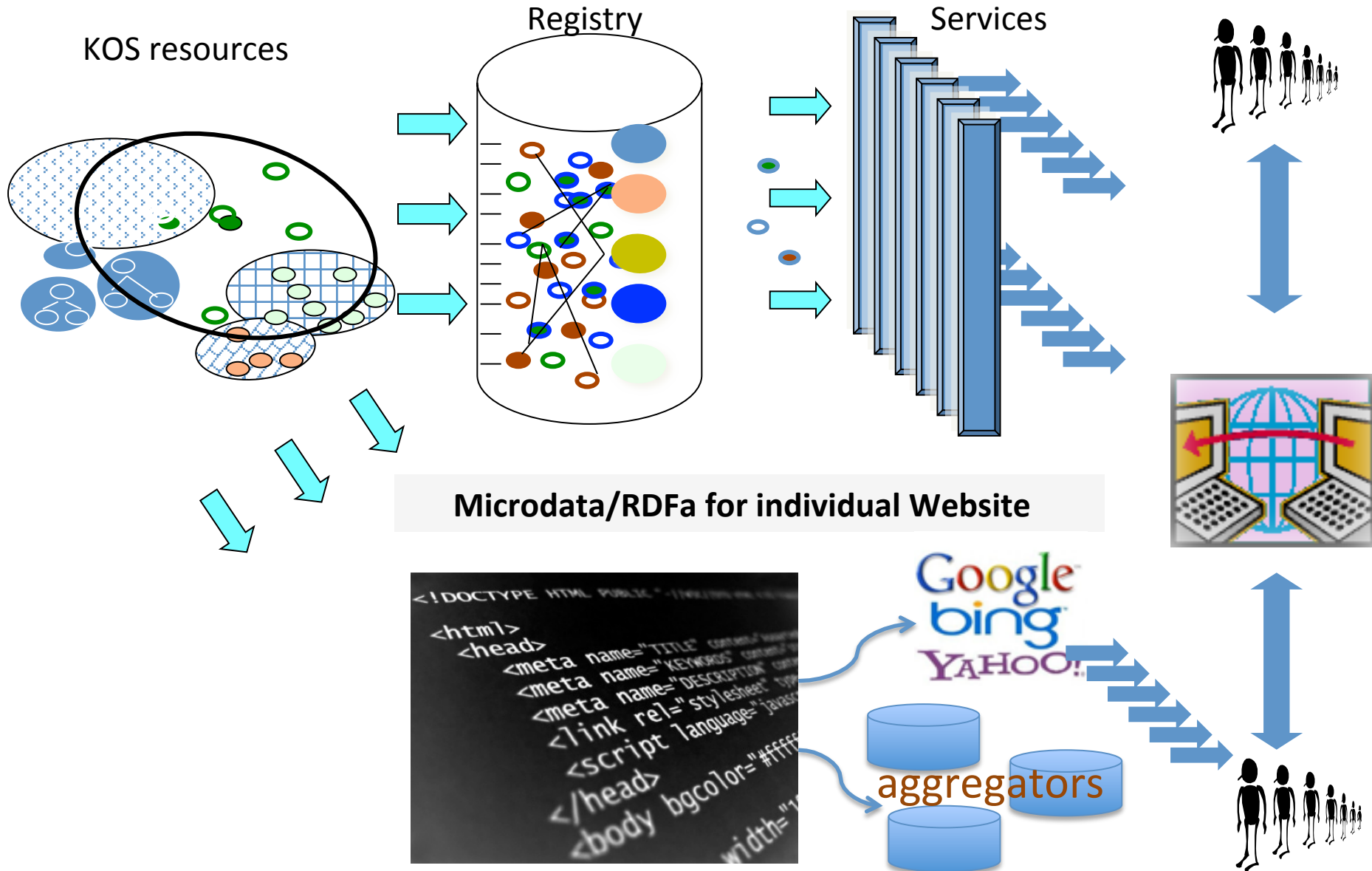
Mappings

ONTOLOGY	MAPPED CLASSES
Adverse Event Reporting Ontology	94
African Traditional Medicine Ontology	79
Allen Brain Atlas (ABA) Adult Mouse Brain Ontology	35
Alzheimer's disease ontology	556
Amino Acid Ontology	29
Amphibian Gross Anatomy Ontology	342
Amphibian Taxonomy Ontology	31
Anatomic Pathology Lexicon	283
Anatomical Entity Ontology	22

<http://bioportal.bioontology.org/>

The need for describing and accessing KOS resources

Terminology registries and services



Efforts of the NKOS Community

NKOS efforts for developing the specification of the minimum (core) set of data elements to be used to describe structured vocabularies in a KOS registry since 1998:

- *NKOS Registry – Draft Set of Thesaurus Attributes* of 1998 (NKOS, 1998)
- *Dublin Core (DC)-based NKOS Registry – Reference document for data elements* of 2001 (Vizine-Goetz, 2001)
- *JISC Terminology Registry Scoping Study (TRSS)* report (Golub and Tudhope, 2008)
- *DCMI-NKOS Application Profile Task Group* established in 2009 (Zeng & Hodge, 2011)
 - developing a Dublin Core application profile for describing and accessing KOS resources (KOS-AP) since 2009

2. Developing the KOS Application Profile

2.1 Use Scenarios

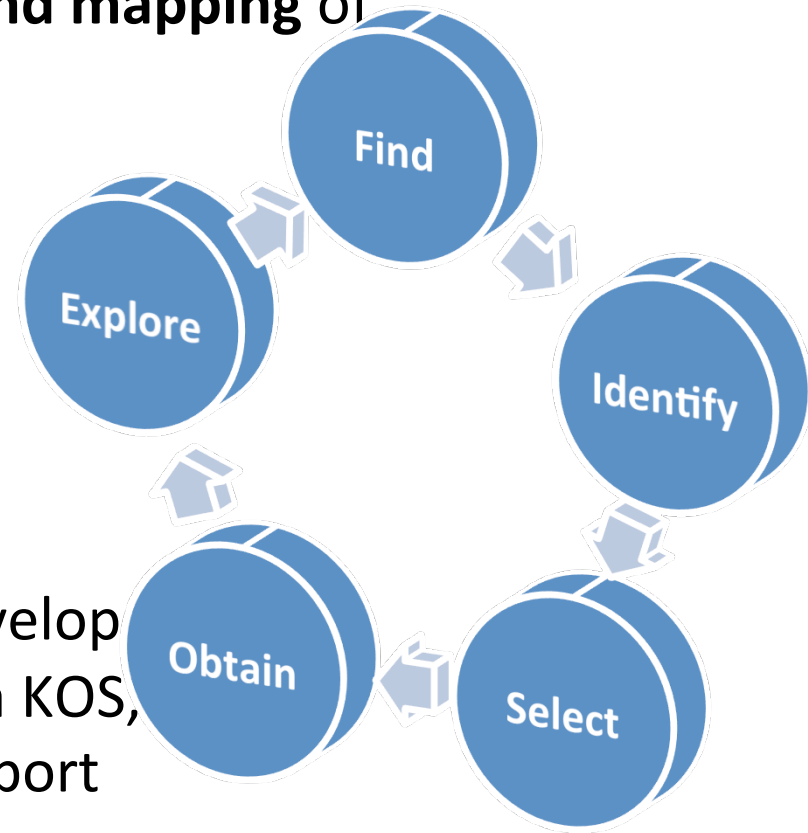
2.2 The Conceptual Model

- A model built based on the characteristics of the KOS resources
- Main entities of the KOS-AP conceptual mode
- Basic relationships

2.3 Core elements

2.1 Use Scenarios

- The owner(s)/creator(s) of a KOS:
 - **publish, share, and allow reuse and mapping** of their product(s);
 - **expose** the KOS product(s)
- Other KOS developers
 - **reuse** a KOS;
 - **get an example** of good practice.
 - They may create derivative works based on an existing KOS.
- Information retrieval system (IRS) develop
 - **reuse, implement, and evaluate** a KOS,
 - **apply** a KOS to a collection to support searching and/or navigation.
- End users and researchers
 - may be involved in terminology-related **research and exploration** within a subject domain
 - **evaluate, align, or compare** KOS resources



User tasks

- **FIND:** reduce the set of KOS resources to a manageable size using attributes and relationships
- **IDENTIFY:** understand exactly the nature of the KOS resource described by metadata
- **SELECT:** among the relevant KOS resources choose the ones which are suitable in a particular context
- **OBTAIN:** get access to the KOS resource
- **EXPLORE:** browse the collection to get acquainted with it and/or locate interesting resources

2.2 The Conceptual Model

- A model built based on the characteristics of the KOS resources
 - The **continuity** of KOS works
 - The **diversity** of the 'family' members
 - The **shared authorship**
 - The **complexity** of relations among KOS resources
 - **Tendency towards micro-level** management

continuity, diversity, shared authorship, complexity ... towards micro-level management

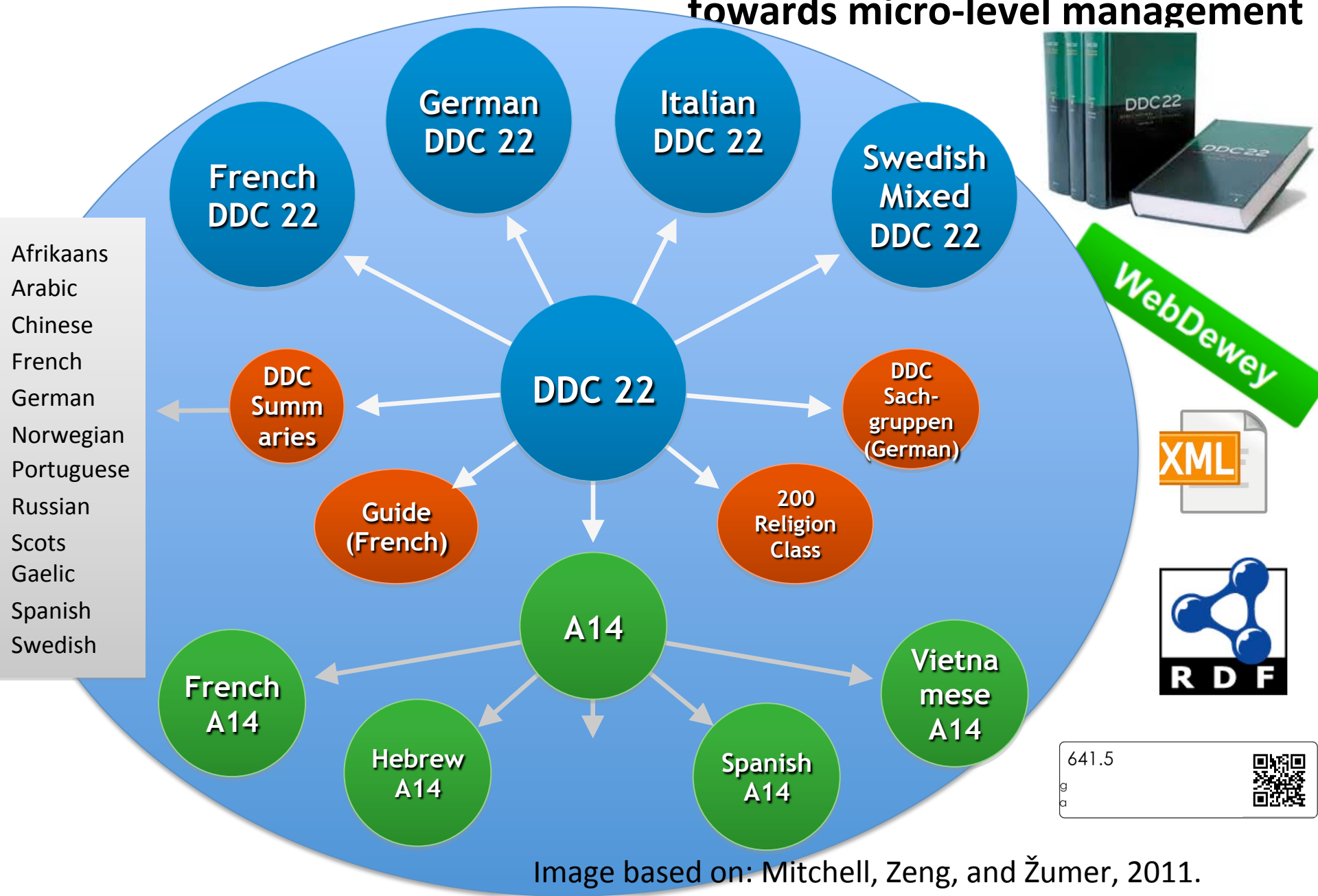
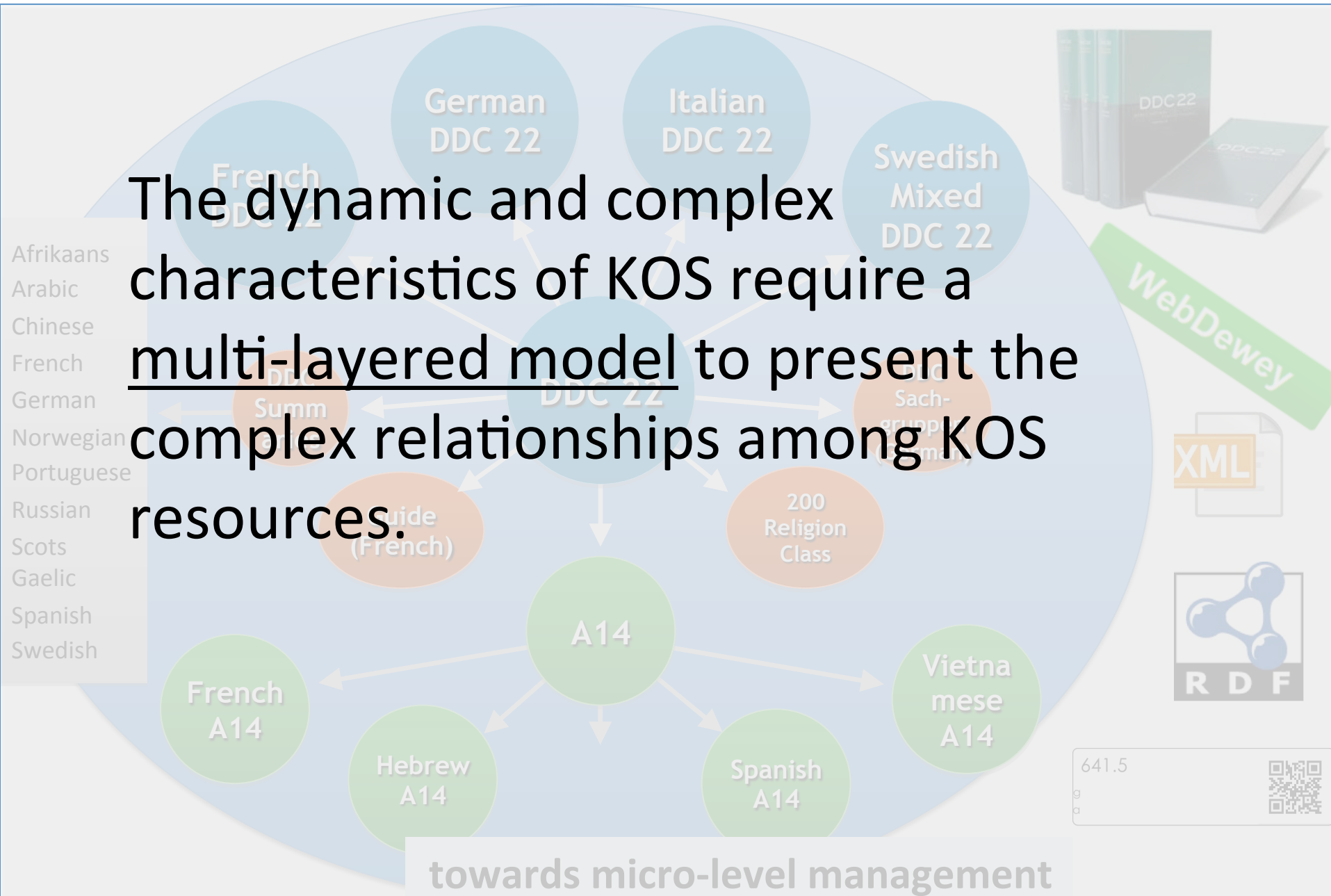
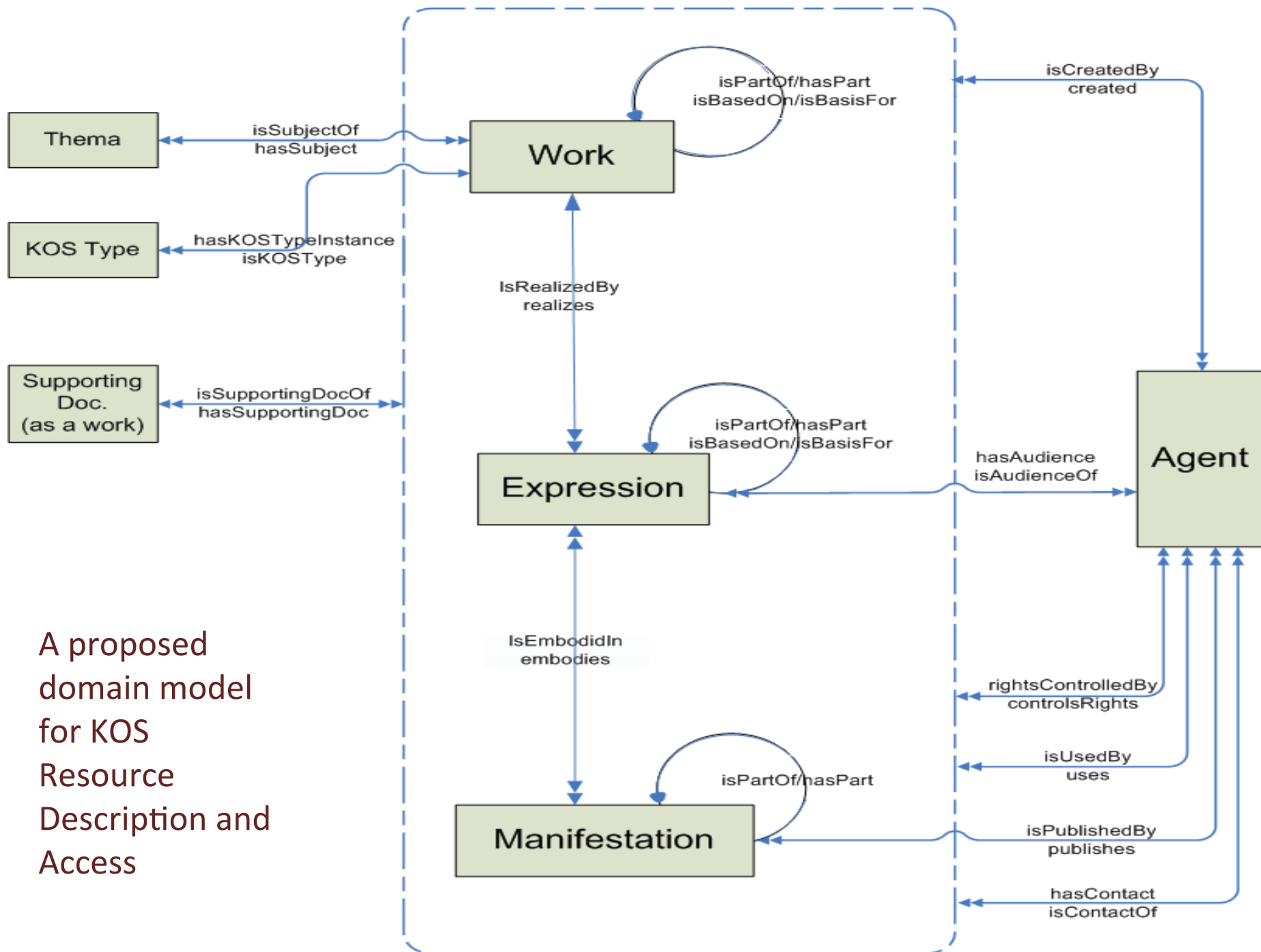


Image based on: Mitchell, Zeng, and Žumer, 2011.

continuity, diversity, shared authorship, complexity ...

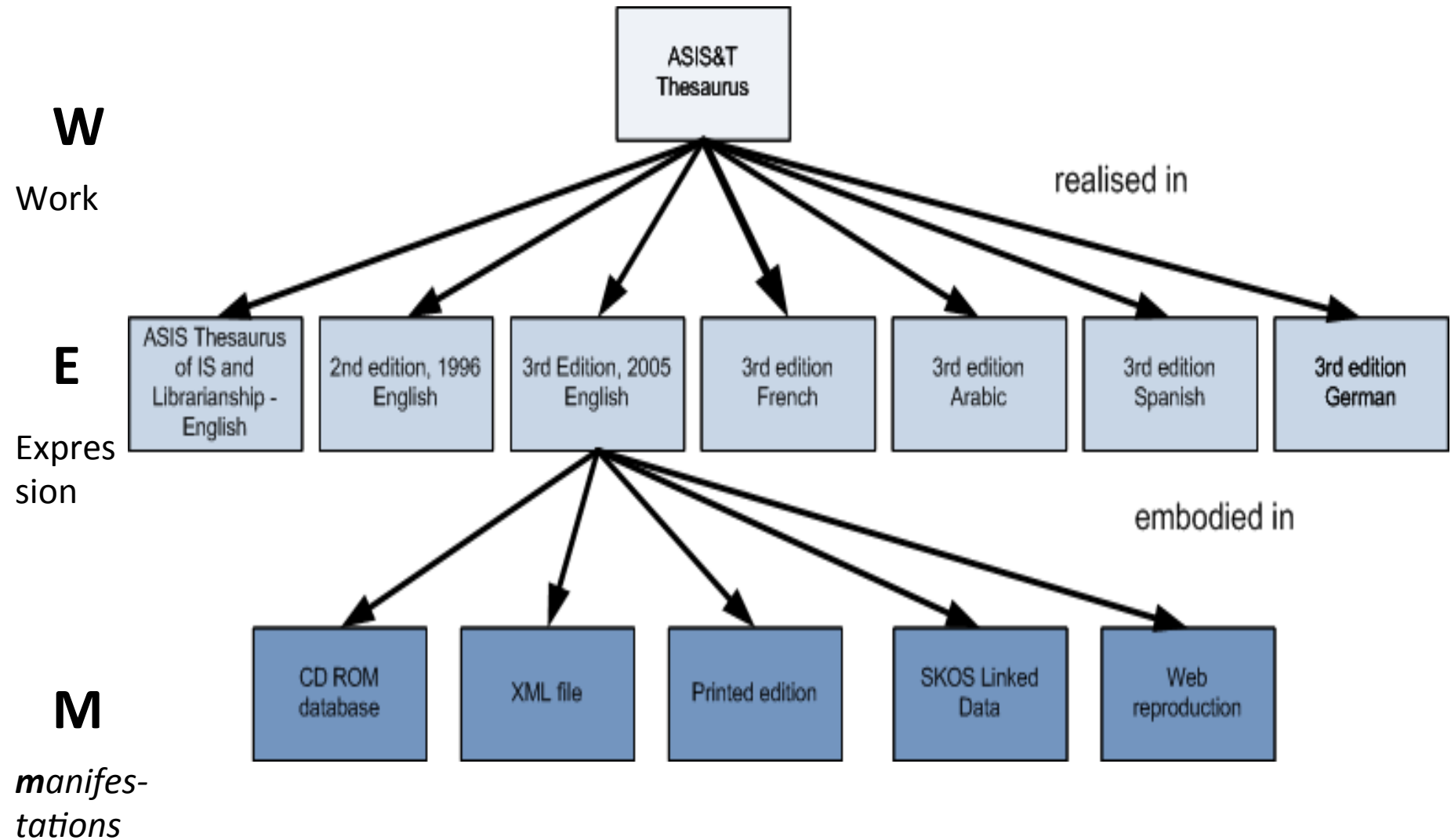
The dynamic and complex characteristics of KOS require a multi-layered model to present the complex relationships among KOS resources.





A proposed
domain model
for KOS
Resource
Description and
Access

Using ASIS&T Thesaurus as an example



The Entities and Relationships

Relationships between entities of the same type (W-W, E-E)


dct:relation

- part of
- based on
- other relation

Relation Type	Definition	Element	Example	
<i>part-of:</i>			A	B
is part of	A is part of B.	dct:isPartOf	Class H - Social Sciences of <i>Library of Congress Classification (LCC)</i>	<i>LCC</i>
	B has part A.	dct:hasPart		
. outline of	A is outline of B.	nkos:isOutlineOf	<i>DDC Summaries</i>	<i>DDC</i>
	B has outline A	nkos:hasOutline		
. excerpt of	A is excerpt of B.	nkos:isExerptOf	Table G (Geographic Notation) of the <i>National Library of Medicine (NLM) Classification</i>	<i>NLM Classification</i>
	B has excerpt A	nkos:hasExcerpt		
. fragment of	A is fragment of B.	nkos:isFragmentOf	entries from a scheme	a scheme
	B has fragment A	nkos:hasFragment		
. sample	A is sample of B.	nkos:isSampleOf	a sample entry or a page from a scheme	a scheme
	B has sample A.	adms:sample		

(cont.)Relationships between entities of the same type (W-W, E-E)

dct:relation



- **part of**
- **based on**
- **other relation**

Relation Type	Definition	Element	Example	
<i>based-on:</i>			A	B
is based on	A is based on B.	nkos:isBasedOn	<i>Canadian Subject Headings (CSH)</i>	<i>Library of Congress Classification(LCSH)</i>
is basis for	B is basis for A.	nkos:isBasisFor		
.translation of	A is translation of B.	nkos:isTranslationOf	<i>Dewey-Dezimalklassifikation 22</i>	<i>DDC 22</i>
	B has translation A.	adms:translation		
.abridgment of	A is abridgment of B.	nkos:isAbridgmentOf	<i>DDC Abridged Edition 15</i>	<i>DDC 23</i>
	B has abridgment A.	nkos:hasAbridgment		
.extension of	A is extension of B.	nkos:isExtensionOf	<i>A localized version of NLM Classification</i>	<i>NLM Classification</i>
	B has extension A.	nkos:hasExtention		
.version of	A is version of B.	dct:isVersionOf	<i>DDC 23</i>	<i>DDC</i>
	B has version A.	dct:hasVersion		

3. Core Elements

CORE ELEMENTS	NEEDED FOR:			TO SUPPORT USERS TO:				
	<i>Work</i>	<i>Expression</i>	<i>Manifestation</i>	Find	Identify	Select	Obtain	Explore
title	x	x	x	x	x			
identifier	x	x	x	x				
contact		x	x				x	
description	x	x	x		x	x		
type (of KOS)	x			x	x	x		
creator	x	x	x	x	x			
language		x		x	x	x		
publisher			x		x	x		
format			x	x	x	x		
size (of vocabulary)		x			x	x		
rights	x	x	x	x		x	x	
date (created)	x	x	x	x		x		
date (updated)		x		x		x		
subject	x			x	x	x		
relation (to other)	x	x	x					x
sample (a relation)					x	x		

Additional elements

CORE ELEMENTS		NEEDED FOR:			TO SUPPORT USERS TO:			
Additional elements (Could be included in 'description')								
services offered			X			X		
used by (a relation)		X	X			X		
frequency of update		X				X		
audience	X	X		X	X	X		
supplementary doc (a relation)	X	X	X			X		

five nkos elements (others are dcterms, adms, and frbrer)

proposed as <http://pur.org/nkos/terms/xxx>

e.g., <http://pur.org/nkos/terms/updateFrequency>

15 nkosType terms

proposed as <http://pur.org/nkos/nkostype/xxx>

e.g., <http://pur.org/nkos/nkostype/thesaurus>)



Leibniz-Informationszentrum
Wirtschaft
Leibniz Information Centre
for Economics

[RDF/XML](#) [RDF/Turtle](#) [Deutsch](#)

[Descriptor list](#)
[Download](#)
[Other versions](#)
[Wiki](#)
[STW Web Services](#)



- ▶ [A General descriptors](#)
- ▶ [B Business economics](#)
- ▶ [G Geographic names](#)
- ▶ [N Related subject areas](#)
- ▶ [P Commodities](#)
- ▶ [V Economics](#)
- ▶ [W Economic sectors](#)

STW Thesaurus for Economics

Version 8.10 (Changes)

Subthesauri

- [A General descriptors](#)
- [B Business economics](#)
- [G Geographic names](#)
- [N Related subject areas](#)
- [P Commodities](#)
- [V Economics](#)
- [W Economic sectors](#)

The *STW Thesaurus for Economics* might be helpful while searching ZBW's economics portal **EconBiz and the **ECONIS** catalogue on economic issues (simply via  or  icon).**

The thesaurus provides vocabulary on any economic subject: more than 6,000 standardized subject headings and about 19,000 entry terms to support individual keywords. You can also find technical terms used in law, sociology, or politics, and geographic names. When selecting terms from this vocabulary, you are sure to get results matching your search

Example of Describing "STW Thesaurus for Economics"@en

- dcterms:title "STW Thesaurus for Economics"
- dcterms:hasVersion <<http://zbw.eu/stw/version/8.10>>
- dcterms:publisher "ZBW - Leibniz Information Centre for Economics"
- nkos:updateFrequency "Currently, new versions roughly once a year."
- nkos:kosType <<http://pur.org/nkos/nkostype/thesaurus>>
- nkos:sizeNote "About 6,000 descriptors, organized in more than 500 subject categories."@en
- dcterms:hasVersion <<http://zbw.eu/stw/version/8.09>>
- dcterms:subject <<http://dbpedia.org/resource/Economics>>

3. The KOS-AP for Embedded Metadata Use

Q: Would this multi-layered model work with html <meta>, microdata, & RDFa on Webpages?

What an aggregator will get is usually manifestation-based

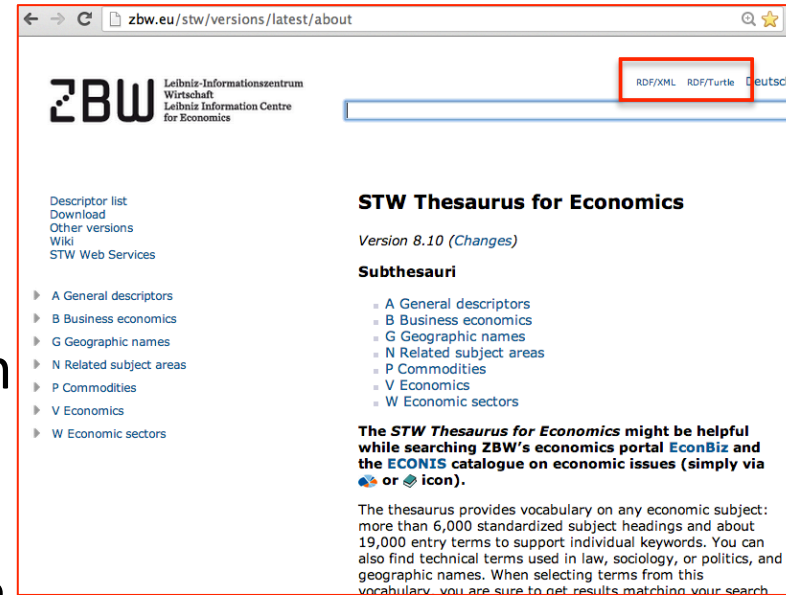
identification, publisher, format,
serviceOffered, [date]issued

Work and Expression data would be with some elements, e.g.:

title, subject, kosType, audience,
description, language, contact, sizeNote,
updateFrequency, sample

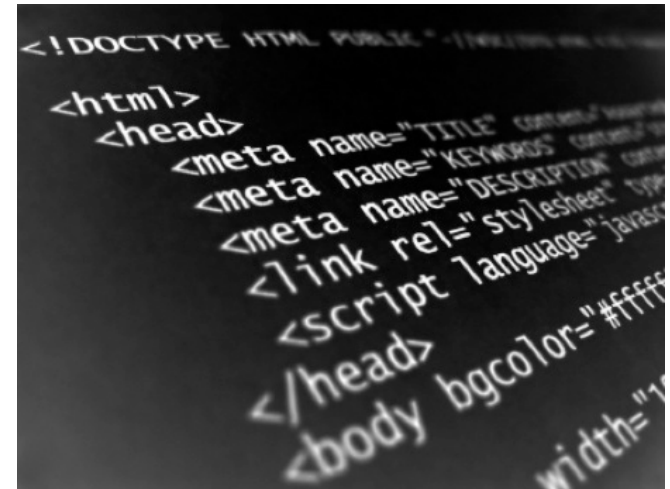
Alternative formats are available for the same expression:

N-Triples, RDF-XML, RDFa, turtle



Three Templates to be Tested:

1. html <meta> in <head> section

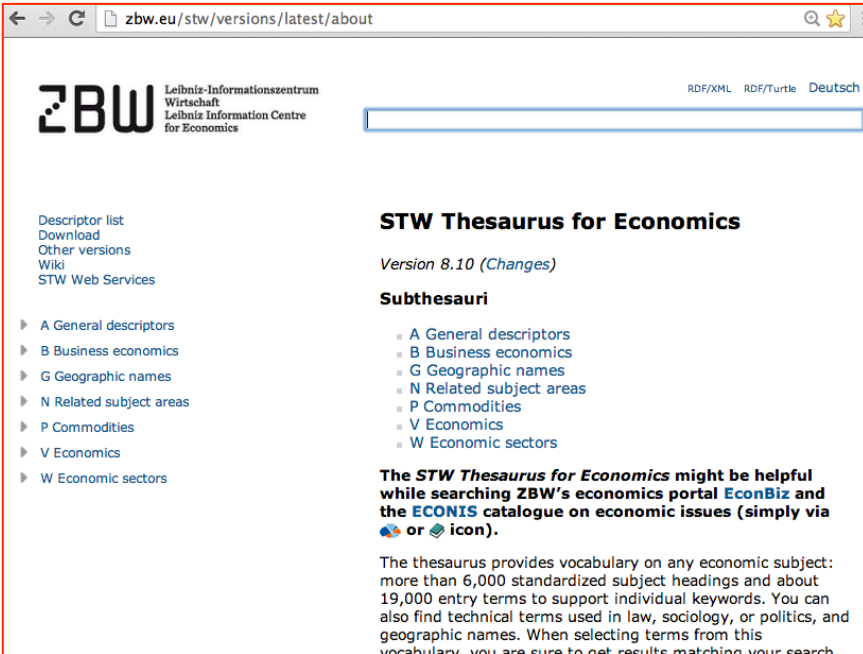


2. RDFa for html documents

RDFa

3. Microdata for html documents

microdata



4. Conclusion

- It is real: a Dublin Core Application Profile for KOS Resources (KOS-AP) developed by a DCMI Task Group is developed and will ask for comments soon.
- It is useful: in addition to general uses, it is essential for Linked Data, which success depends heavily on using, sharing, and interlinking of standardized value vocabularies.
- It is applicable for:
 - KOS registries,
 - RDFa, Microdata, html <meta> of individual KOS websites, &
 - other types of resources (frequently updated, translated, and derived handbooks, technical manuals, and schemas).

For more information

- DCMI NKOS Task Group Wiki site

http://wiki.dublincore.org/index.php/DCMI_NKOS_Task_Group

- KOS AP Worksheet (Last updated Sept. 2013)
http://wiki.dublincore.org/index.php/NKOS_AP_Worksheet
- Core Elements (Last updated Sept. 2013)
http://wiki.dublincore.org/index.php/Core_Elements
- KOS example
http://wiki.dublincore.org/index.php/KOS_example
- NKOS Vocabularies (Last updated Sept. 2013)
http://wiki.dublincore.org/index.php/NKOS_Vocabularies

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http://staff.oclc.org/~vizine/NKOS/Thesaurus_Registry_version3_rev.htm
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<http://dcpapers.dublincore.org/pubs/article/view/3656>
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- *Dewey Decimal Classification and Relative Index*. Ed. 22. (2003). Melvil Dewey. Edited by Joan S Mitchell *et al.* Dublin, Ohio: OCLC.

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- Traugott Koch, [former] Max Planck Digital Library, Germany
- & others who are active in NKOS activities.

Thank you!

For more information:

DCMI NKOS Task Group Wiki site

http://wiki.dublincore.org/index.php/DCMI_NKOS_Task_Group

- KOS AP Worksheet
- Core Elements
- KOS example
- NKOS Vocabularies