

EnTag

Enhanced Tagging for Discovery

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Introduction and demonstration



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Project context

- Partners
 - UKOLN
 - University of Glamorgan
 - STFC
 - Intute
 - Non-funded
 - OCLC Office of Research, USA
 - Danish Royal School of Library and Information Science
- Funders: JISC
- Period: 1 Sep 2007 -- 31 Oct 2008



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Purpose

- Investigate the combination of controlled and folksonomy approaches to support resource discovery in repositories and digital collections
- Aim
Investigate whether use of an established controlled vocabulary can help improve social tagging for better resource discovery



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Objectives

- Investigate indexing aspects when using only social tagging versus when using social tagging with suggestions from a controlled vocabulary
- Investigate above in two different contexts: tagging by readers and tagging by authors
- Investigate influence of only social tagging versus social tagging with a controlled vocabulary on retrieval



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Overall approach



- Main focus:
 - free tagging with no instructions
versus
 - tagging using a combined system and guidance for users
- Two exploratory demonstrators
 - **Intute digital collection** <http://www.intute.ac.uk>
 - Major development
 - Tagging by reader
 - DDC
 - **STFC repository** <http://epubs.cclrc.ac.uk/>
 - Complementary development
 - Tagging by author



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Intute demonstrator: searching

EnTag Project **ST**

Current Location: [Document Search and Browsing Page](#)

Current User:

[Log Out](#)

[Help](#)

[Post-Task Questionnaire](#)

Filter By: [Everyone's Tags](#)

Taggers

Search For Documents

Search In

Tags

Titles

Descriptions

Enter your search terms

[Start Search](#)

Displaying Documents Tagged by: Alex

Main Tag Cloud

[efms Migration Report](#)
[European Integration](#)
[European Integration and the State](#)
[German Unification Case Study](#)
[Institute of European Affairs \(IEA\)](#)
[Ministry of Foreign Affairs and European Integration](#)
[Republic of Croatia](#)
[Osteuropa-Netzwerk](#)
[Trans European Policy Studies Association](#)
[Uneasy Allies: British-German Relations and European Integration since 1945](#)
[Versailles Treaty \(1919\)](#)
[Voices from the wall: Personal stories about the fall of the Berlin wall](#)
[English or Croatian](#)
[Enlargement european integration bureau](#)
[Insurgency in the Muslim World](#)
[leadership dialogue transnational environment](#)
[108](#)
[108 journals](#)
[14 countries](#)
[1869-1883](#)
[1948](#)
[1956](#)
[1960s political movements](#)
[1989-1994](#)
[1990-1996](#)
[1998 publications](#)
[2001-2008](#)
[2002 elections](#)
[2005](#)
[2nd edition book](#)
[4205 Issues](#)

[Adamcok](#) [Adviya](#) [Alex](#) [Alicohn](#) [Alonso](#)
[Amy878](#) [Bozwell](#) [Cehbeh](#) [Ckkern](#) [Clare](#)
[Dji](#) [Donnie1](#) [Emloff](#) [Eve](#) [Gautam](#) [Gemma](#)
[Gigi131](#) [Gkr365](#) [Jay](#) [John](#) [Katy](#) [Kkrish](#)
[Laura82](#) [Liam](#) [Logic](#) [Louise](#) [Matt](#) [Maubry](#)
[Maz](#) [Megan11](#) [Meng](#) [Mike](#) [Mikeg](#) [Mouz](#)
[Noel](#) [Palmexo](#) [Plemai](#) [Proximo](#) [Randvar](#)
[Ricey](#) [Rkanani](#) [Shannon](#) [Squelci](#) [Tato](#)

Results

Title (Click to Open)	Description	Tags	Add Tags
50th anniversary of the 1956 Hungarian revolution: Canadian Embassy	This site has been created by the Canadian Embassy in Hungary to commemorate the 50th anniversary...	1956, Canada, Canadian Embassey in Hungary, commemoration, Hungarian Revolution, Links, refugees	Tag
Canadian Defence and Foreign Affairs Institute	The Canadian Defence and Foreign Affairs Institute (CDFAI) is an independent research institute wh...	archives, Canada, conferences, courses, defence, foreign affairs, journalism, media, newsletter, obama, polls, Relations - US - Canada, research, submissions, turkey	Tag
Canadian Dimension	Canadian Dimension is a left wing Canadian journal that examines world events from a Socialist pe...	academic journal, blog, Canada, Canadian Dimension, left-wing persepective, NDP - New Democratic Party of Canada	Tag
Canadian Illustrated News 1869-1883	This site offers access to a searchable database of almost 4,000 images and cartoons taken from t...	1869-1883, archives, Canada, Canadian Illustrated News, Library and Archives Canada	Tag
Canadian Pamphlets and Broad sides	This site provides access to the full-text of over 500 pre-1930s Canadian pamphlets and broadside...	archives, Canada, Canadian Pamphlets and Broad sides Online Collection, database, pre-1930, Thomas Fisher Rare Book Library, University of Toronto	Tag
Canadian Parliamentary Review: Revue Parlemaire Canadienne	Canadian Parliamentary Review publishes information on Canadian legislation and the activities of...	academic journal, Book Review, Canada, Canadian Parliamentary Review, Canadian Politics - Domestic, Commonwealth Parliamentary Association, Legislative Reports	Tag

1 2 3 4 5

Intute demonstrator: simple tagging

EnTag Project **ST**

Current Location: [Document Tagging Page](#)

Current User:

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Filter By: [Everyone's Tags](#)

Main Tag Cloud

[efms Migration Report](#)
[European Integration](#)
[European Integration and the State](#)
[German Unification Case Study](#)
[Institute of European Affairs \(IEA\)](#)
[Ministry of Foreign Affairs and European Integration](#)
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[English or Croatian](#)
[Enlargement](#)
[european integration bureau](#)
[Insurgency in the Muslim World](#)
[leadership dialogue](#)
[transnational environment](#)
[108](#)
[108 journals](#)
[14 countries](#)
[1869-1883](#)
[1948](#)
[1956](#)
[1960s](#)
[political movements](#)
[1989-1994](#)
[1990-1996](#)
[1998](#)
[publications](#)
[2001-2008](#)
[2002 elections](#)
[2005](#)
[2nd edition book](#)
[4205 Issues](#)

Taggers

[Adamcok](#) [Adviya](#) [Alex](#) [Alicohn](#) [Alonso](#)
[Amy878](#) [Bozwell](#) [Cehbeh](#) [Ckern](#) [Clare](#) [Dij](#)
[Donnie1](#) [Emloff](#) [Eve](#) [Gautam](#) [Gemma](#) [Gigi131](#)
[Gkr365](#) [Jay](#) [John](#) [Katy](#) [Kkrish](#) [Laura82](#) [Liam](#)
[Logic](#) [Louise](#) [Matt](#) [Maubry](#) [Maz](#) [Megan11](#)
[Meng](#) [Mike](#) [Mikeg](#) [Mouz](#) [Noel](#) [Palmexo](#)
[Plemai](#) [Proximo](#) [Randvar](#) [Ricey](#) [Rkanani](#)
[Shannon](#) [Squelci](#) [Tato](#) [Thei75](#) [Tom](#) [Urs1981](#)

All Alex's Tags

[1869-1883](#) [1956](#) [2001-2008](#) [academic journal](#) [academic paper](#) [achieve of european integration](#) [afghanistan](#) [Alphabetical Listing](#) [annual report](#) [Archieve of European Integration](#) [archive](#)
[archive - audio](#) [archives](#) [ARENA](#)
[attitudes to european integration](#)
[bibliography](#) [blog](#) [Book Review](#) [briefing](#)

My Tags For This Document

[1956](#) [Canada](#) [Canadian Embassey in Hungary](#) [commemoration](#) [Hungarian Revolution](#) [Links](#) [refugees](#)

Document Details

Title	50th anniversary of the 1956 Hungarian revolution: Canadian Embassy
URL	http://geo.international.gc.ca/canada-europa/hungary/right_nav/1956-en.asp
Description	This site has been created by the Canadian Embassy in Hungary to commemorate the 50th anniversary of the 1956 Hungarian revolution. In addition to a listing of events, it also provides free access to some interesting full text publications about Canadian involvement in the events. These include booklets about Canadian diplomacy. There are also links to other websites from canadian organisations which include eye-witness accounts.

[Add a Tag](#)

[Remove Tag](#)

[Return To Search Results](#)

Intute demonstrator: enhanced tagging

EnTag Project **ST**

Current Location: [Document Tagging Page](#)

Current User:

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Filter By: [Everyone's Tags](#)

[Main Tag Cloud](#)

[Do We Need Mass Immigration? Electronic Immigration Network](#)
[Evolution of US Immigration and Refugee Policy: Public Opinion, Domestic Policies and UNHCR](#) by Michael McBride (1999)
[Immigration: United States Government Accounting Office](#) [JOLIS](#) [Why Has UK Net Immigration Increased?](#) [United Nations Peacekeeping Force in Cyprus](#)
[1917-1991](#) [1948-2003 info](#) [1948-2007](#) [1964](#) [1974](#) [ceasefire](#) [1992 - 1995](#) [trafficking era with the investigation commencing in 1999](#) [1994](#) [Moscow Agreement](#) [2000-2008](#) [2001-2008 archive](#) [2005](#) [UK election](#) [2008 American Presidential Election](#) [2008](#) [US presidential elections](#) [404](#) [60th anniversary of United Nations peacekeeping](#) [9/11](#) [9/11 academic essays](#) [9/11](#) [Essays](#) [9/11 for High Schools](#) [9/11 papers](#) [A](#) [variety of articles on disability](#)

Taggers

[Adamcok](#) [Adviya](#) [Alex](#) [Alicohn](#) [Alonso](#) [Amy878](#) [Bozwell](#) [Cehbeh](#) [Ckkern](#) [Clare](#) [Dij](#) [Donnie1](#) [Erloff](#) [Eve](#) [Gautam](#) [Gemma](#) [Gigi131](#) [Gkr365](#) [Jay](#) [John](#) [Katy](#) [Kkrish](#) [Laura82](#) [Liam](#) [Logic](#) [Louise](#) [Matt](#) [Maubry](#) [Maz](#) [Megan11](#) [Meng](#) [Mike](#) [Mikeg](#) [Mouz](#) [Noel](#) [Palmexo](#) [Plemai](#) [Proximo](#) [Randvar](#) [Ricey](#) [Rkanani](#) [Shannon](#) [Squelci](#) [Tato](#) [Thei75](#) [Tom](#) [Urs1981](#)

All Alex's Tags

[Academic Papers](#) [advocacy](#) [Afghan War, 2001-](#) [Armed Forces - Political activity](#) [Arms control](#) [Arms control - Europe](#) [art](#) [Asia for Educators](#) [bibliography](#) [british foreign policy](#) [Buddhism - China - Tibet](#) [buffer zone](#) [canada](#) [Carnegie](#) [Endowment](#) [casualties figures](#) [cease fire](#)
[China - Politics and](#)

My Tags For This Document

[Disarmament and arms control](#) [human rights](#) [media](#) [podcast](#) [Sino-American Summits](#) [Sino-US specialists](#) [Taiwan - 20th century](#) [Tiananmen Square](#) [United States - Foreign relations - China](#)

Document Details

Title	1998 Sino-Soviet Summit by Robert S. Ross
URL	http://www.asiasociety.org/publications/sino_american_summit.html
Description	This site contains the full-text of the paper by Robert Ross which was originally published by the Asia Society, a non-profit educational institution, in June 1998. It examines US-China relations in the period after the Tiananmen Square massacre in 1989, focusing on such issues as human rights, international trade, nuclear weapons and arms control. Consideration is then turned to what the 1998 Sino-Soviet Summit hopes to achieve in these areas. An additional feature of the article is an appendix listing contact addresses for specialists on US-China relations.

[Suggest](#)

[Add a Tag](#)

[Remove Tag](#)

[Return To Search Results](#)

Automatically suggested matches

Find appropriate context(s)

[Soviet Union - Foreign relations](#)
[African American women legislators-biography](#) [Eastern Europe-politics](#) [Kommunisticheskaia partiaa Sovetskogo Soiuz](#) [Marzism-Leninism](#) [Relation of federal to state, regional, provincial g](#) [United States-foreign relations-Eastern Europe](#) [----- End of Political Science -----](#) [1945](#) [1999](#)

Explore hierarchy around the selected context

[International relations](#)
[Soviet Union - Foreign relations](#)

Select/edit relevant tags

[Eastern Europe - foreign relations](#) [Europe](#) [Eastern - Foreign relations - Soviet Union](#) [Europe, Eastern - Politics and government - 1945-1989](#) [Foreign relations - Eastern Europe](#) [Foreign relations - Russia](#) [Foreign relations - Soviet Union](#) [International relations](#) [Russia - foreign relations](#) [Russia - Foreign relations - 1894-1917](#) [Russia \(Federation\) - Foreign relations](#) [Russia \(Federation\) - Foreign relations -](#)



Intute demonstrator user study



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Test setting and data collection



- Test setting
 - 28 UK students in political science
 - 60 documents, covering 4 topics of relevance for the students
 - 2 controlled tasks
 - 2 free tasks
 - Rotation
 - Instructions and training documents
- Data collection
 - Logging
 - Pre- and post-questionnaires



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Task example



Task 1: Simple Tagger, “European integration”

Imagine that as part of one of your courses, you are asked to write a four-page essay on the **topic of European integration**, as a joint project in groups of four. The essay should critically discuss existing theories about the creation of the European Union and its institutions. Your lecturer has instructed you to look for resources in the EnTag system. Since you will be working together with three other students, you should tag the documents you retrieve with tags that would be useful to you but would also enable other students to find those documents in EnTag and understand from your tags what the documents are about.

Go to the EnTag login page*, choose **Task 1** and **Simple Tagger Log In** and in the "Search for Documents" box enter these words: **European integration**.

Then, tag the **first 15 retrieved documents**. Do only the ones you can open - if a URL is unavailable move on to the next document in the Results.

Tagging each document should on average take between **5 and 10 minutes**. Please describe as many aspects and topics as you think appropriate for the task. Remember to open the URL, but you do not need to follow further internal links within a Web site. If the document is very long, focus on its abstract, introduction, conclusion, headings and table of contents.



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Pre-study questionnaire

- 28 participants
 - Equal distribution of gender
 - Majority solid subject experience
 - Majority experienced Web users
 - Majority without Intute use
 - Half with tagging experience before but little tagging
 - A third some acquaintance with DDC



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Example of a session

- Enhanced tagging of first document in controlled task →



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Log On	
Document Search (peacekeeping)	
Open Document (http://www.cordaid.nl/Upload/publicatie/RAPPORT%20CMR.pdf)	
Dewey Suggest Button Clicked	NGO
Add Tag	NGO
Dewey Suggest Button Clicked	civil-military relations
Dewey Suggest TreeView Clicked	Foreign policy and specific topics in international relations
Dewey Hierarchy Clicked	International conflict
Dewey Suggestion Cloud Clicked	Conflict - international politics
Add Tag	Conflict - international politics
Dewey Suggestion Cloud Clicked	Foreign policy and specific topics in international relations
Dewey Suggest Button Clicked	liberia
Dewey Hierarchy Clicked	1945-
Dewey Suggestion Cloud Clicked	Liberia - History - Civil War, 1989- - Peace
Dewey Suggestion Cloud Clicked	Liberia - 20th century
Add Tag	Liberia - 20th century
Dewey Suggestion Cloud Clicked	Liberia - History - Civil War, 1989-
Add Tag	Liberia - History - Civil War, 1989-
Dewey Suggest Button Clicked	afghanistan
Dewey Hierarchy Clicked	1919-
Dewey Hierarchy Clicked	2001-
Dewey Suggestion Cloud Clicked	Afghan War, 2001-
Add Tag	Afghan War, 2001-
Dewey Suggestion Cloud Clicked	Afghan War, 2001-
Dewey Suggest Button Clicked	isaf
Add Tag	isaf
Add Tag	UNMIL
Add Tag	NATO
Dewey Suggest Button Clicked	nato
Dewey Suggestion Cloud Clicked	North Atlantic Treaty Organization
Add Tag	North Atlantic Treaty Organization
Dewey Suggest Button Clicked	development
Add Tag	development
Add Tag	cordaid
Dewey Suggest Button Clicked	cordaid
Dewey Suggest Button Clicked	civil society
Dewey Suggest TreeView Clicked	Armed services
Dewey Suggestion Cloud Clicked	Armed Forces - Political activity
Add Tag	Armed Forces - Political activity
Dewey Suggestion Cloud Clicked	Civil supremacy over the military
Add Tag	Civil supremacy over the military
Goto Searching	



Number of tags

	Simple	Enhanced
Tags in total	4022	3546
Controlled task	2025	1688
Free task	1997	1858
Tags per document (controlled)	49 (41 docs)	32 (53 docs)
Tags per document (free)	5 (374 docs)	5 (377 docs)
Tags per tagger (controlled)	72	63
Tags per tagger (free)	74	69



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Choosing a tag

Activity	Simple		Enhanced	
Typing Own Tag	3656	90.90%	2525	71.21%
Main Tag Cloud	94	2.34%	88	2.48%
Own Tag	0	0.00%	32	0.90%
Another Tagger's Tag	272	6.76%	303	8.54%
Dewey Tag			598	16.86%
In Total	4022	100.00%	3546	100.00%



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Browsing-based tagging

activity	Simple	Enhanced
Main Tag Cloud Clicked	16.78%	5.11%
Own Tag Clicked	10.26%	2.71%
Tagger Cloud Clicked	18.89%	3.65%
Taggers Tag Clicked	54.07%	14.51%
Dewey Hierarchy Clicked		3.20%
Dewey Suggest Button Clicked		28.89%
Dewey Suggest TreeView Clicked		13.70%
Dewey Suggestion Cloud Clicked		28.24%
	100.00%	100.00%



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Document parts in which tags appear



	Simple		Enhanced	
Tags in Title	502	12.48%	423	11.93%
Tags in Description	1209	30.06%	829	23.38%
Tags in URL	114	2.83%	128	3.61%
Tags in Total	4022	45.38%	3546	38.92%



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Post-task questionnaire

	Simple	Enhanced
Familiarity with tasks	majority familiar or very familiar	
Easy to choose tags	majority easy or very easy	
Satisfaction with tags assigned	majority satisfied or very satisfied	
Certainty that tags assigned correctly	majority certain or very certain	
Main Tag Cloud	helpful to half, unhelpful to half	
Clickable Names of Others	helpful to half, unhelpful to half	unhelpful to majority
Listing of Own Tags	helpful to majority	
Dewey Tree Disambiguation	n/a	helpful to majority
Dewey Hierarchy	n/a	helpful to half, unhelpful to half
Dewey/LCSH suggestions	n/a	helpful to majority



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Post-study questionnaire

- Majority enjoyed the study
- Majority thought it extremely or very easy to learn and use Simple Tagger
- Majority thought it somewhat or very easy to learn and use Enhanced Tagger
- Interface usability has high impact on use
- Majority think a similar system would be useful in real life



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Initial conclusions from Study

(Intute System: only preliminary data analysis)



- **Approx 42% tags from Title and Description (Simple System) and slightly less (35%) from Enhanced System**
- **More tags taken from Another than Global/Own tag clouds but most from typing own tags**
- **Majority selected some auto suggestions (17% Enhanced tags) and considered the suggestions potentially useful in real life**
- **Suggestions sometimes useful and sometimes far off the mark**
- **Not much use of Dewey hierarchy browsing**
- **Users see relevance of control and consistency**



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Initial conclusions overall

(Intute System: only preliminary data analysis)

- Results support the potential of enhanced tagging approach

Future work:-

- Simplify user interface (less clutter, auto-completion?)
- Consider (non?) utility of global tag cloud in this context
- Consider best presentation of DDC context and hierarchies
- Refine default DDC class selections for disambiguation
- Refine selection of suggestions to reduce clearly non-relevant
- Refine the suggestion strings (not just 'raw Dewey')
- Refine the existing simple automatic classification source of possible suggestions (based on document title)

Questions:-

- Motivation for users-as-searchers
 - general/group altruism vs personalisation?



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EnTag: More info

- Further results > November 2008
- <http://www.ukoln.ac.uk/projects/enhanced-tagging/>



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Controlled subject/topical vocabulary in metadata:
developing best practices related to semantic web
usages (SKOS etc.)

THE REGISTRY AS VOCABULARY MANAGEMENT ENVIRONMENT

A Semantic Web perspective

- ⦿ RDF oriented
- ⦿ Linked data oriented
- ⦿ ‘Vocabulary’ has more than one meaning
 - Value vocabularies (VES)
 - Class/Property vocabularies (metadata schema)
- ⦿ Experience from building the NSDL metadata registry
 - <http://metadataregistry.org>
- ⦿ Semantic Web Deployment Working group
 - <http://www.w3.org/2006/07/SWD/>

Vocabulary Development is a group activity

- ⦿ There may be many stakeholders
- ⦿ Role-based user management necessary
- ⦿ Open discussion environment allowing granular focus
- ⦿ The group should be able to define the process

Stability is crucial

- ⦿ Vocabulary users must be able to depend on vocabulary
- ⦿ Clearly articulate maintenance policy
 - What will be stable
 - What can change
 - How will changes be handled

Change is inevitable

- ◎ Versioning is essential
 - Provide an audit trail
 - Named releases
 - Timeslices and snapshots
- ◎ Provide user-configurable change notification
 - Subscriptions for vocabulary implementors
 - Notifications for implementors and development group

Limits of change

- URIs
- Deprecation vs. deletion
- Relationships
- Semantic redefinition
- When do you need to re-identify?
- Need an Admin or Editor in Chief to control?

Balancing machine and human intervention

- ⦿ Data validation
 - Duplicate identifiers
 - Duplicate labels/terms
 - Circular relationships
- ⦿ Standards compliance
 - What standards?
 - Is human review necessary or desirable?

Identifier assignment

- ⦿ Persistence
- ⦿ Coherent strategy
 - Numeric vs. semantically meaningful
 - Domain assignment
- ⦿ Cool URIs

Availability

- ⦿ Public vs. private
 - Open vs. licensed
- ⦿ Content negotiation
- ⦿ Multiple serializations
 - RDF
 - XML
 - Text, others?
- ⦿ Linked data support

Multi-lingual Strategy

- Coherent strategy
- Single vocabulary with multiple languages per identifier?
or
- Multiple vocabularies lexically or semantically linked?
- Management and retrieval issues affect this decision

Extending existing vocabularies

- ⦿ Political and IP issues
 - Term/concept re-use or redefinition
 - Licensing/copyright issues
- ⦿ Re-use of 'orphaned' vocabularies
 - Domain ownership
 - 'Dead' or no URIs
- ⦿ Other ethical issues?

Registries also support discovery and re-use

- ◎ Search
 - Term-based
 - Vocabulary-level metadata-based
- ◎ Community and Federation
- ◎ Common discovery APIs
- ◎ Support for inter-vocabulary mapping (SKOS mapping vocabulary)
- ◎ Authenticity and authority

Some documents

- ◎ Principles of Good Practice for Managing RDF Vocabularies and OWL Ontologies
 - <http://www.w3.org/2006/07/SWD/Vocab/principles>
- ◎ SKOS Use Cases and Requirements
 - <http://www.w3.org/TR/skos-ucr/>
- ◎ Best Practice Recipes for Publishing RDF Vocabularies
 - <http://www.w3.org/TR/swbp-vocab-pub/>
- ◎ Cool URIs for the Semantic Web
 - <http://www.w3.org/TR/cooluris/>

“New Dimensions in KOS”

CENDI/NKOS Workshop

September 11, 2008
Washington, DC, USA

SKOS: New Dimensions in Interoperability

Ed Summers

Jon Phipps

*An international conference to share and advance knowledge and experience about standards;
the technologies that build upon them, and implementation experiences.*

What is it?

Simple Knowledge Organisation System(s)

- SKOS is ...
- for ***declaring*** and ***publishing taxonomies, thesauri*** or ***classification schemes***, for use in a distributed, decentralised information system (I.e. a semantic web).
- for **describing Concepts** and **creating relationships between Concepts and Terms**
- A practical application of **RDF**
- the application of library science to the semantic web.
 - SKOS provides a **formal language** for representing **controlled, structured vocabularies**



The SKOS data model

...views a knowledge organization system as a **concept scheme** comprising a set of **conceptual resources** (*concepts*).

- These concept schemes and conceptual resources are identified by URIs.
- The model is multilingual and extensible

Concepts can be...

labeled with any number of strings. One label, in any given language, can be indicated as the "preferred" label for that language, and all others as "alternate" labels, "hidden" labels, or using a notation:

- **skos:prefLabel**
- **skos:altLabel**
- **skos:hiddenLabel**
- **skos:notation**

Concepts can be...

documented with any number of notes of various types. This is intended to provide an extensible framework for more specific types of notes:

- **skos:note**
- **skos:changeNote**
- **skos:definition**
- **skos:editorialNote**
- **skos:example**
- **skos:historyNote**
- **skos:scopeNote**

Concepts can be...

linked to one or more concept schemes.

- **skos:inScheme**, a property of a concept
- **skos:hasTopConcept**, a property of a ***concept scheme***. (replaces skos:topConcept, a property of a ***concept***)

Concepts can be...

linked to other concepts within the same concept scheme.

- Hierarchical links:
 - **skos:broader** and **skos:narrower**
 - **skos:broaderTransitive** and **skos:narrowerTransitive**
- Associative links:
 - **skos:related**



Concepts can be...

grouped into **collections**, which can be labeled and/or ordered.

- **skos: Collection**
- **skos: OrderedCollection**
- **skos: member**
- **skos: memberList**

Concepts can be...

mapped to other concepts in *different* concept schemes.

- Hierarchical mapping:
 - **skos:broadMatch**
 - **skos:narrowMatch**
- Associative mapping:
 - **skos:relatedMatch**
 - **skos:closeMatch**
 - **skos:exactMatch**

skosxl...

allows labels to be resources:

skosxl:Label	The skosxl:Label Class
skosxl:literalForm	The literal form of the label
skosxl:prefLabel	Preferred skosxl:Label
skosxl:altLabel	Alternate skosxl:Label
skosxl:hiddenLabel	Hidden skosxl:Label
skosxl:labelRelation	Links Between skosxl:Labels

Going, going...

- Symbols:
 - **skos:prefSymbol**
 - **skos:altSymbol**
- Subject Indexing:
 - **skos:subject**
 - **skos:isSubjectOf**
 - **skos:primarySubject**
 - **skos:isPrimarySubjectOf**
 - **skos:subjectIndicator**





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- Subjects/Content
- Full Record
- MARC Tags

Weaving the Web : the original design and ultimate destiny of the World...

Relevance: ●●●

LC Control No.: 00039593

LCCN Permalink: <http://lccn.loc.gov/00039593>

Type of Material: Book (Print, Microform, Electronic, etc.)

Personal Name: [Berners-Lee, Tim.](#)

Main Title: Weaving the Web : the original design and ultimate destiny of the World Wide Web by its inventor / Tim Berners-Lee with Mark Fischetti ; [foreword by Michael Dertouzos].

Edition Information: 1st pbk. ed.

Published/Created: New York : HarperCollins Publishers, 2000.

Description: ix, 246 p. : ill. ; 21 cm.

ISBN: 006251587X (pbk.)

CALL NUMBER: TK5105.B88 .D46 2000



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Relevance: ●●●

LC Control No.: 00039593

LCCN Permalink: <http://lccn.loc.gov/00039593>

Type of Material: Book (Print, Microform, Electronic, etc.)

Personal Name: [Berners-Lee, Tim.](#)

Main Title: Weaving the Web : the original design and ultimate destiny of the World Wide Web by its inventor / Tim Berners-Lee with Mark Fischetti ; [foreword by Michael Dertouzos].

Edition Information: 1st pbk. ed.

Published/Created: New York : HarperCollins Publishers, 2000.

Description: ix, 246 p. : ill. ; 21 cm.

ISBN: 006251587X (pbk.)

CALL NUMBER: TK5105.988 .D46 2000



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- Subjects/Content**
- Full Record
- MARC Tags

Weaving the Web : the original design and ultimate destiny of the World...

Relevance:

LC Control No.: 00039593

LCCN Permalink: <http://lcn.loc.gov/00039593>

Type of Material: Book (Print, Microform, Electronic, etc.)

Subjects: [Berners-Lee, Tim.](#)

[World Wide Web --History.](#)

LC Classification: [TK5105.888](#)

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- [Subjects/Content](#)
- [Full Record](#)
- [MARC Tags](#)

Weaving the Web : the original design and ultimate destiny of the World...

Relevance:

LC Control No.: 00039593

LCCN Permalink: <http://lccn.loc.gov/00039593>

Type of Material: Book (Print, Microform, Electronic, etc.)

Subjects: [Berners-Lee, Tim](#)

[World Wide Web --History.](#)

LC Classification: [TK5105.888](#)

CALL NUMBER: [TK5105.888 .B46 2000](#)

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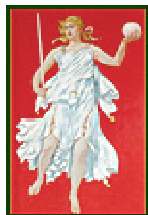
SOURCE OF HEADINGS: Library of Congress Online Catalog

INFORMATION FOR: World Wide Web.

Please note: Broader Terms are not currently available

Select a Link Below to Continue...
Authority Record
Narrower Term: Mashups (World Wide Web)
Narrower Term: Semantic Web.
Narrower Term: Web 2.0.
Narrower Term: WebDAV (Standard)
Narrower Term: WebTV (Trademark)
See Also: Internet.

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55000260044355000130046967002700048267002570075267001200100967001570112967500320
1286953001501318^^4865449^^20011001235750.0^^950125|| anannbabn la ana
^^ ^_a(DLC)sh 95000541^^ ^_a(DLC)5086766^^ ^_a(DLC)sp 95000541^^ ^_a(DL
C)258303^^ ^_t0019^_ute07^_v0^^ ^_ash 95000541 ^^ ^_aDLC^_cDLC^_dDLC^^ 0^_aTK
5105.888^_cTelecommunication^^ 0^_aZA4195^_bZA4235^_cInformation resources^^ ^_
aWorld Wide Web^^ ^_aW3 (World Wide Web)^^ ^_aWeb (World Wide Web)^^ ^_wnne^_
aWorld Wide Web (Information retrieval system)^^ ^_aWWW (World Wide Web)^^ ^_w
g^_aHypertext systems^^ ^_wg^_aMultimedia systems^^ ^_aInternet^^ ^_aWork cat
.: 94067520: December, J. The World Wide Web Unleashed, c1994^_b(WWW, the Web, a
distributed hypermedia system, a collection of interconnected hardware, softwar
e, and networked systems, it is a concept, not a program, system, or protocol, i
t is an interface)^^ ^_a94234135: Brown, S. The Internet via Mosaic and World W
ide Web, c1994^_b(WWW, the Web) p. 35 (Although the WWW is primarily used on a g
lobal scale as a part of the Internet, it is feasible for a two-machine network
to run the WWW client/server software)^^ ^_aInternet publishing handbook, c1995
:^_bp. 15 (World-Wide Web system is known by its various names: WWW, W3, and Web
)^^ ^_aMAGS, Dec. 8, 1995:^_barticle by Robert M. Metcalfe (first generation of
WWW based on Hypertext Transfer Protocol and Hypertext Transfer Markup Language
)^^^ ^_aASTI;^_aEngr. index;^_aWeb. 3^^ ^_ajf08^_bta25^^^]
~
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04200228150001900270450002400289450002500313450005500338450002500393550002500418
55000260044355000130046967002700048267002570075267001200100967001570112967500320
1286953001501110011001235750.0^^950125|| anannbabn la ana
^^ ^_a(DLC)sh 95000541^^ ^_a(DLC)5086766^^ ^_a(DLC)sp 95000541^^ ^_a(DL
C)258303^^ ^_a(DLC)5086766^^ ^_a(DLC)sp 95000541^^ ^_a(DL
5105.888^^ ^_a(DLC)5086766^^ ^_a(DLC)sp 95000541^^ ^_a(DL
aWorld Wide Web^^ ^_aW3 (World Wide Web)^^ ^_aWeb (World Wide Web)^^ ^_wnne^^
aWorld Wide Web (Information retrieval system)^^ ^_aWWW (World Wide Web)^^ ^_w
g^^ ^_aHypertext systems^^ ^_wg^^ ^_aMultimedia systems^^ ^_aInternet^^ ^_aWork cat
.: 94067520: December, J. The World Wide Web Unleashed, c1994^^ ^_b(WWW, the Web, a
distributed hypermedia system, a collection of interconnected hardware, softwar
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to run the WWW client/server software)^^ ^_aInternet publishing handbook, c1995
:^^ ^_bp. 15 (World-Wide Web system is known by its various names: WWW, W3, and Web
)^^ ^_aMAGS, Dec. 8, 1995:^^ ^_barticle by Robert M. Metcalfe (first generation of
WWW based on Hypertext Transfer Protocol and Hypertext Transfer Markup Language
)^^ ^_aASTI;^^ ^_aEngr. index;^^ ^_aWeb. 3^^ ^_ajf08^^ ^_bta25^^]
~
```

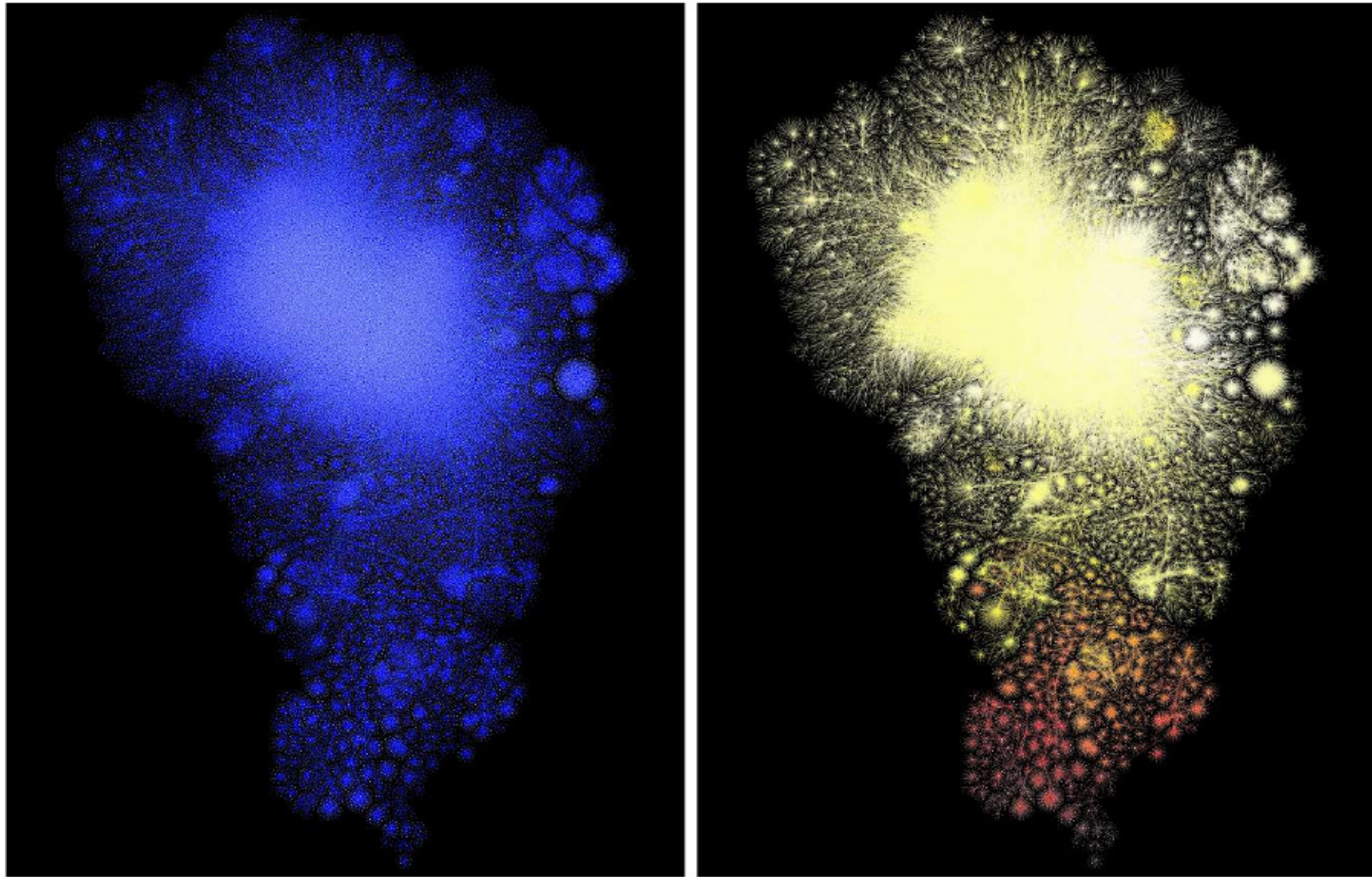



Figure 3.2: The layout computed by the lgl program shows more tangible structure. The colors of the left figure are drawn as in figure 3.1, whereas the edges in the right figures are drawn based on the distance from the root of the spanning tree used for the layout. Yellow indicates an edge close to the root and red indicates an edge far from the root. This figure shows the tree-like structure and a core-region of the LCSH graph.

- <http://lcsb.info/sh95000541#concept>



World Wide Web

Use For: W3 (World Wide Web), WWW (World Wide Web), Web (World Wide Web), World Wide Web (Information retrieval system),

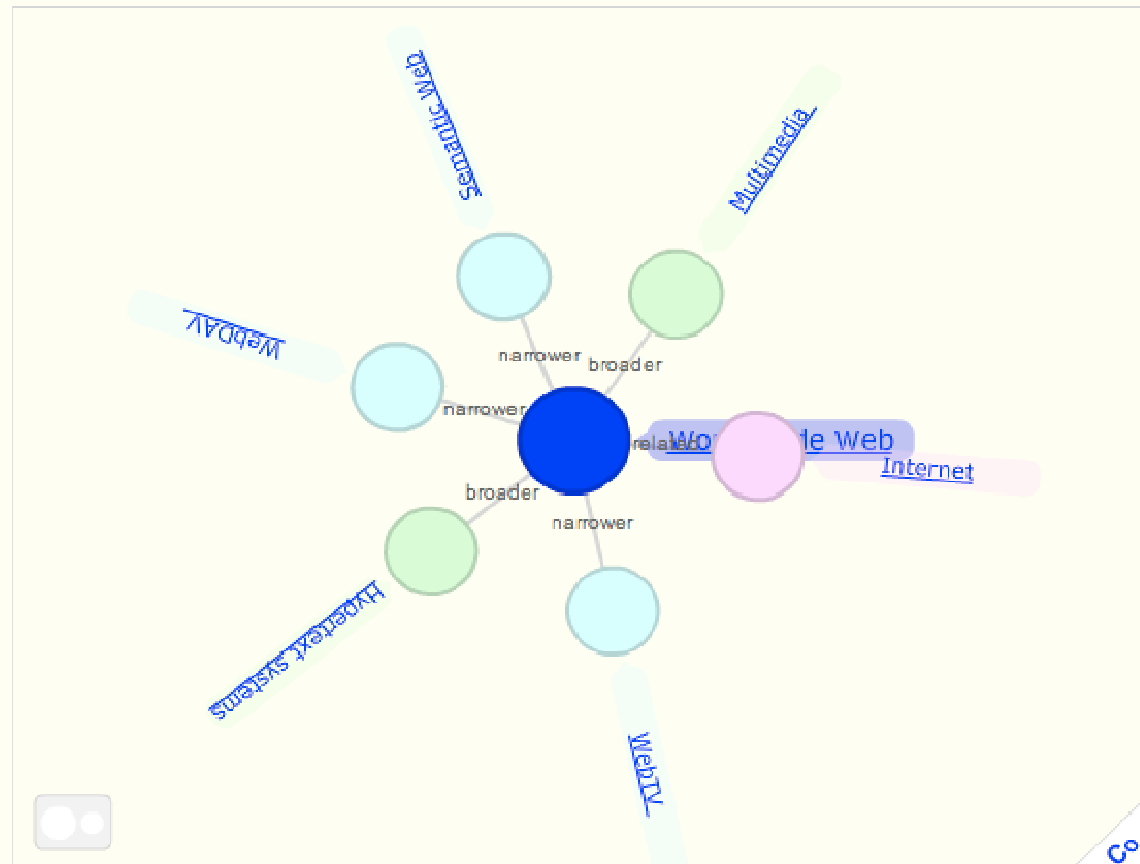
Broader Terms: [Hypertext systems](#), [Multimedia systems](#),

Narrower Terms: [Semantic Web](#), [WebDAV \(Standard\)](#), [WebTV \(Trademark\)](#),

Related Terms: [Internet](#),

Editorial Notes:

- 94234135: Brown, S. The Internet via Mosaic and World Wide Web, c1994 (WWW, the Web) p. 35 (Although the WWW is primarily used on a global scale as a part of the Internet, it is feasible for a two-machine network to run the WWW client/server software)
- ASTI; Engr. index; Web. 3
- Internet publishing handbook, c1995: p. 15 (World-Wide Web system is known by



World Wide Web

Use For: W3 (World Wide Web), WWW (World Wide Web), Web (World Wide Web), World Wide Web (Information retrieval system),

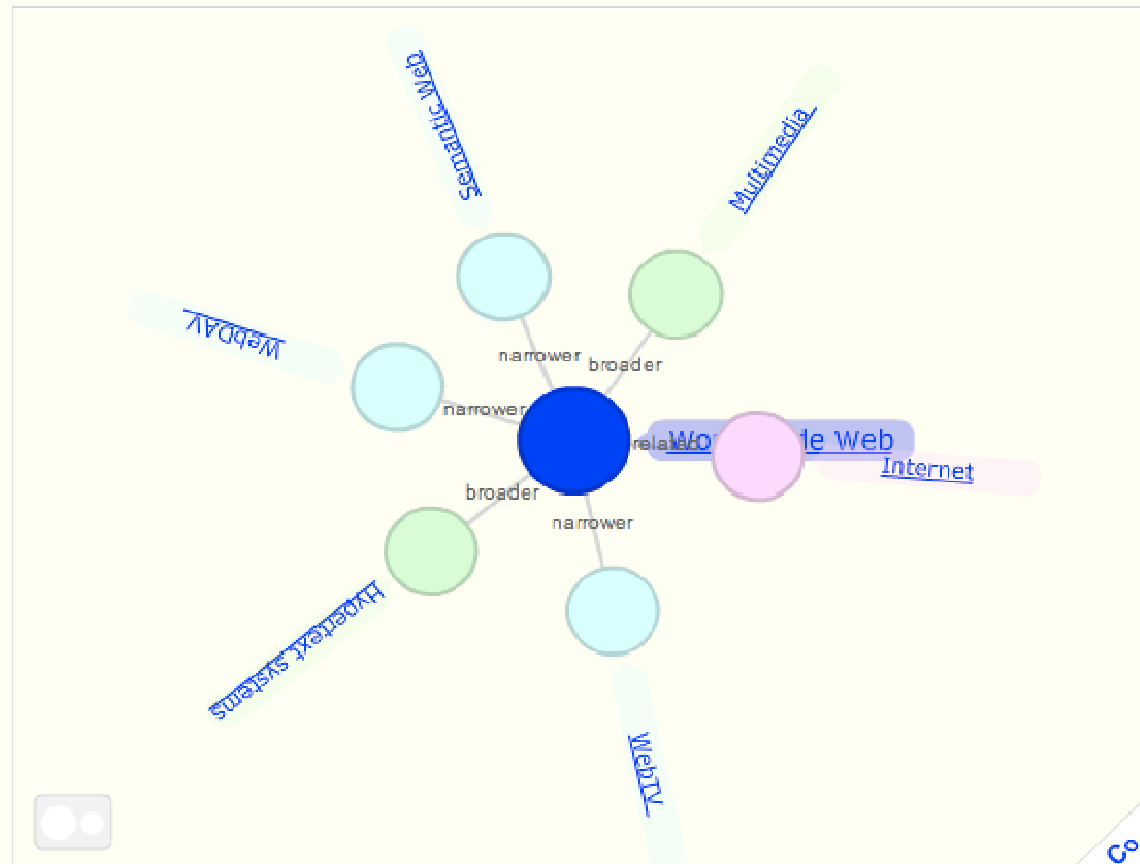
Broader Terms: [Hypertext systems](#), [Multimedia systems](#),

Narrower Terms: [Semantic Web](#), [WebDAV \(Standard\)](#), [WebTV \(Trademark\)](#),

Related Terms: [Internet](#),

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- ASTI; Engr. index; Web. 3
- Internet publishing handbook, c1995: p. 15 (World-Wide Web system is known by



```
Default
Default
<rdf:RDF
  xmlns:dcterms="http://purl.org/dc/terms/"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:skos="http://www.w3.org/2004/02/skos/core#"
>
  <rdf:Description rdf:about="http://lcsh.info/sh95000541#concept">
    <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
    <skos:broader rdf:resource="http://lcsh.info/sh88002671#concept"/>
    <skos:broader rdf:resource="http://lcsh.info/sh92002381#concept"/>
    <skos:prefLabel xml:lang="en">World Wide Web</skos:prefLabel>
    <skos:related rdf:resource="http://lcsh.info/sh92002816#concept"/>
    <skos:narrower rdf:resource="http://lcsh.info/sh2002000569#concept"/>
    <skos:narrower rdf:resource="http://lcsh.info/sh97003254#concept"/>
    <skos:narrower rdf:resource="http://lcsh.info/sh2003001415#concept"/>
    <dcterms:created rdf:datatype="http://www.w3.org/2001/XMLSchema#date">2000-0
4-28</dcterms:created>
    <dcterms:modified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2
001-10-01T09:56:06</dcterms:modified>
    <skos:inScheme rdf:resource="http://lcsh.info/" />
    <skos:altLabel xml:lang="en">World Wide Web (Information retrieval system)</
skos:altLabel>
    <skos:altLabel xml:lang="en">WWW (World Wide Web)</skos:altLabel>
    <skos:altLabel xml:lang="en">W3 (World Wide Web)</skos:altLabel>
```

```
Default
Default
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix dcterms: <http://purl.org/dc/terms/> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .

<http://lcsh.info/sh95000541#concept>
  dcterms:created "2000-04-28"^^<http://www.w3.org/2001/XMLSchema#date> ;
  dcterms:modified "2001-10-01T09:56:06"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
  a skos:Concept ;
  skos:altLabel "W3 (World Wide Web)"@en, "WWW (World Wide Web)"@en, "Web (World Wide Web)"@en, "World Wide Web (Information retrieval system)"@en ;
  skos:broader <http://lcsh.info/sh88002671#concept>, <http://lcsh.info/sh92002381#concept> ;
  skos:inScheme <http://lcsh.info/> ;
  skos:narrower <http://lcsh.info/sh2002000569#concept>, <http://lcsh.info/sh2003001415#concept>, <http://lcsh.info/sh97003254#concept> ;
  skos:prefLabel "World Wide Web"@en ;
  skos:related <http://lcsh.info/sh92002816#concept> .

~
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```

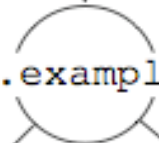
`http://www.example.com/about#alice`



Automatic truncation of fragment



`http://www.example.com/about`



application/rdf+xml wins

content negotiation

text/html wins



Content-Location:

`http://www.example.com/about.rdf`

Content-Location:

`http://www.example.com/about.html`



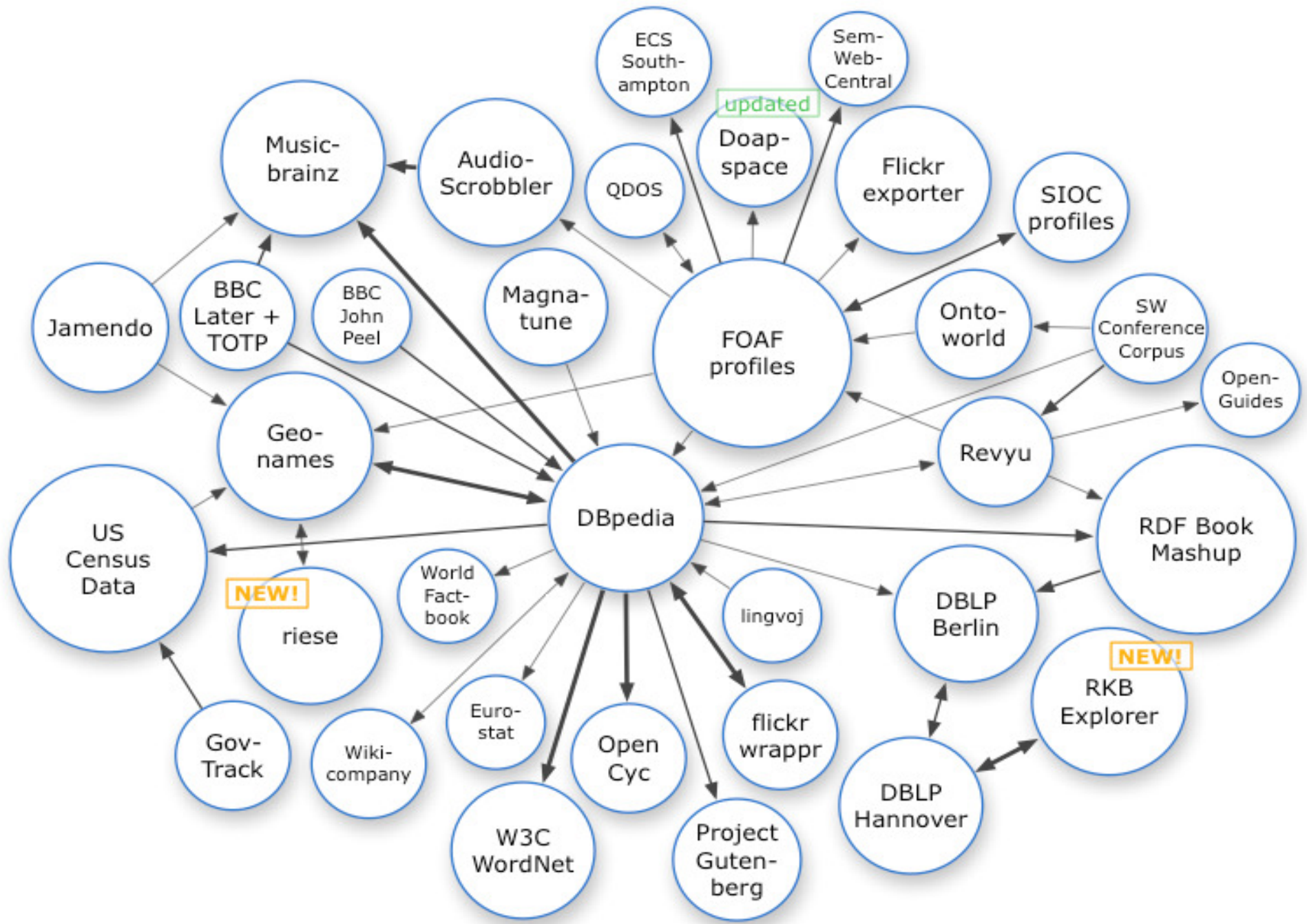
- **Cool URIs for the Semantic Web**

- <http://www.w3.org/TR/cooluris/>



•Yeah, but so what ...







SKOS Documentation

- **W3C Semantic Web Deployment Working Group**
 - W3C Recommendation Track
<http://www.w3.org/2006/07/SWD/>
- **SKOS Use Cases and Requirements**
 - First Working Draft Published (2007-05-16)
<http://www.w3.org/TR/skos-ucr/>
- **SKOS Reference and Primer**
 - Last Call Working Draft published August 2008
<http://www.w3.org/TR/2008/WD-skos-reference-20080125/>
<http://www.w3.org/TR/2008/WD-skos-primer-20080221/>
 - W3C Recommendation by December 31, 2008
- **SKOS Web Site**
 - <http://www.w3.org/2004/02/skos/>

Links

SKOS Homepage

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

SKOS Primer

<http://www.w3.org/TR/2008/WD-skos-primer-20080221/>

SKOS Reference

<http://www.w3.org/TR/2008/WD-skos-reference-20080125>

SWD-WG Home Page

<http://www.w3.org/2006/07/SWD/>

SWD-WG Mailing list

<mailto:public-swd-wg@w3.org>

<http://lists.w3.org/Archives/Public/public-swd-wg/>

NSDL Metadata Registry

<http://metadataregistry.org>

Jon Phipps

<mailto:jhipps@madcreek.com>

Thanks for listening ☺

RECENT CHANGES TO SKOS

Overview

- The latest version of the the SKOS vocabulary (SKOS2008) is defined in a new namespace <http://www.w3.org/2008/05/skos#>.
- The previous one (SKOS2004) is still available and valid <http://www.w3.org/2004/02/skos/core#>; however users of SKOS are encouraged to migrate towards SKOS2008.
- Typically you might hear SKOS2008 referred to as SKOS instead of SKOS Core.

Overview

- The majority of the changes in SKOS2008 involve the increased use of OWL for modeling. SKOS2008 vocabulary elements are now defined to be of type `owl:Class`, `owl:DatatypeProperty`, `owl:ObjectProperty` instead of `rdfs:Class` and `rdf:Property`, as they were in SKOS2004.
- Using OWL allows for more expressivity about the components of the SKOS vocabulary. (what's the best way to explain this?)

Overview

- The SKOS2008 vocabulary is much more compact: 347 triples as compared with 844 for SKOS2004.
- Interestingly SKOS2008 also uses features from the skos vocabulary itself such as `skos:changeNote` and `skos:definition`.

Overview

- The SKOS Reference is currently in Last Call, and the SWD WG are actively seeking feedback on the public-swd-wg@w3.org discussion list.
- It's very important to the w3c recommendation process that the working group get all kinds of feedback.

Concepts and Concept Schemes

- The SKOS resources `skos:Concept`, `skos:ConceptScheme`, `skos:Collection`, `skos:OrderedCollection` are now of type `owl:Class` instead of `rdfs:Class`.
- This allows `skos:Concept` to be defined as disjoint with `skos:ConceptScheme`, which is a useful way of constraining concepts so that they cannot also be concept schemes.
- In addition `skos:inScheme` is now of type `owl:ObjectProperty` instead of `rdf:Property`.

Concepts and Concept Schemes

- ⦿ Both `skos:TopConcept` and `skos:CollectableProperty` were dropped.
- ⦿ However `skos:hasTopConcept` was introduced to indicate that a concept scheme has a particular concept as a top level concept.

Labels

- ⦿ The lexical labeling properties `skos:prefLabel`, `skos:altLabel`, `skos:hiddenLabel` are now of type `owl:DatatypeProperty`.
- ⦿ They are also likely to be subclasses of `rdfs:Label` as they were in SKOS2004.

Documentation Properties

- ⦿ The `skos:note`, `skos:changeNote`, `skos:definition`, `skos:example`, `skos:historyNote`, `skos:scopeNote`, `skos:editorialNote` were changed from being of type `rdf:Property` to `owl:ObjectProperty`.
- ⦿ `skos:privateNote` and `skos:publicNote` which were marked as deprecated in SKOS2004 have been removed.
- ⦿ Since they are object properties these note relationships can point at resources which have additional metadata associated with them.

Documentation properties

- In addition `skos:symbol`, `skos:prefSymbol` and `skos:symbol` have been dropped because there were no use cases or requirements for it, so they were deemed out of scope.

Semantic Relations

- ⦿ The semantic relation properties `skos:broader`, `skos:narrower` and `skos:related` have been updated to be of type `owl:ObjectProperty`.
- ⦿ The `skos:broader` and `skos:narrower` properties are no longer transitive, and instead extend two new properties `skos:broaderTransitive` and `skos:narrowerTransitive`, both of which are also transitive.
- ⦿ The reason for this is to allow these relations to be used in vocabularies that are less rigorous than standard thesauri, while still allowing the `narrowerTransitive` and `broaderTransitive` properties to be inferred in applications that want them.
- ⦿ In addition `skos:related` is no longer a sub-property of `rdfs:seeAlso`.

Semantic Relations

- Some deprecated relations such as `skos:broaderGeneric`, `skos:broaderInstantive`, `skos:broaderPartitive`, `skos:related`, `skos:relatedHasPart`, `skos:relatedPartOf` have been removed from the new namespace.

Mapping Relations

- SKOS2008 includes some new vocabulary elements for mapping concepts from one concept scheme to another: `skos:exactMatch`, `skos:broadMatch`, `skos:narrowMatch`, `skos:relatedMatch`.
- All of them are sub-properties of `skos:mappingRelation`, which has `skos:Concept` as both its domain and range.

Subjects

- SKOS2004 had vocabulary elements like `skos:subject`, `skos:isSubjectOf`, `skos:isPrimarySubjectOf` and `skos:subjectIndicator`, but they have been removed in the latest version of SKOS since they were deemed out of scope.
- Also, there are other vocabularies like DublinCore where relations of this kind are in scope.

Notations

- A new owl:DatatypeProperty skos:notation was introduced to allow concepts to be associated with notations such as classification codes. Notations are different from labels in that they tend not to be recognizable as a sequence of words in any natural language.

SKOS eXtension for Labels (skos+xl)

- XL is a separate vocabulary with its own URI namespace <http://www.w3.org/2008/05/skos-xl#>.
- The idea behind XL is to allow lexical labels to be resources, which in turn allows them to be related together.

SKOS eXtension for Labels (skos+xl)

- XL includes the `skosxl:prefLabel`, `skosxl:altLabel`, `skosxl:hiddenLabel` which mirror the lexical labeling properties in SKOS proper, but are of type `owl:ObjectProperty` instead of `owl:DatatypeProperty`.
- In addition `skosxl:labelRelation` allows labels to be related together.
- The intent is for users to extend `skos:labelRelation` to build up vocabularies of relations between labels, like acronymy etc.

Data

Metadata

Terminologies

Services

Collections

-- Synergies and Differences

Registries

Marcia Zeng

Registry defined

Registry: authoritative, centrally controlled store of information

– *W3C Web Services Glossary, 2004*

<http://www.w3.org/TR/ws-gloss/>

Primary functions

- ◆ Registering
- ◆ Publishing
- ◆ Managing

- ◆ Data Storage
- ◆ User Services via a Web Interface
 - Navigation
 - Searching
 - Browsing

- M2M Services
 - ◆ Querying
 - ◆ Using an API to programmatically create, view, and modify contents
- Crosslinking
- Crosswalking
- Schema translation

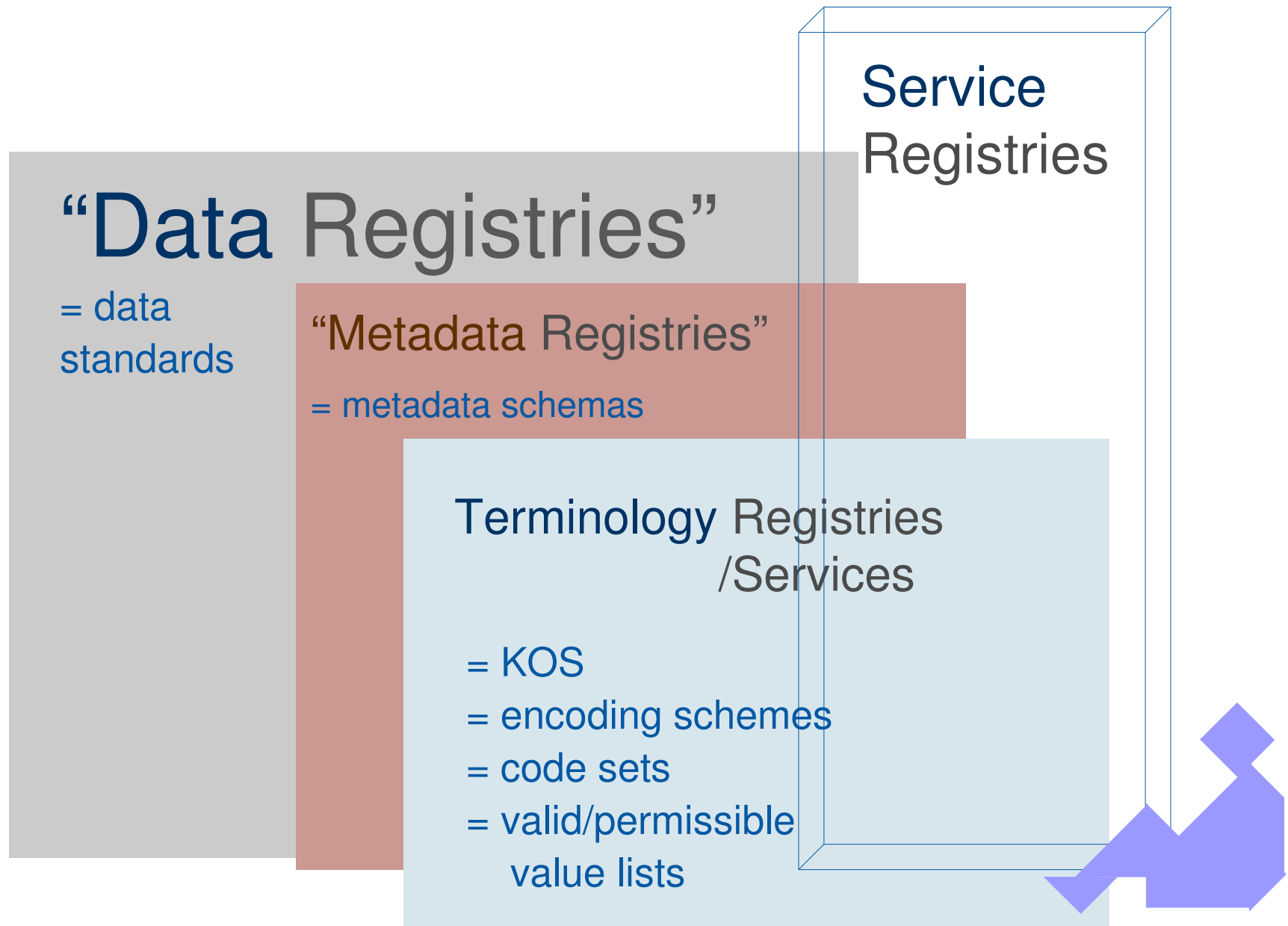
And many more



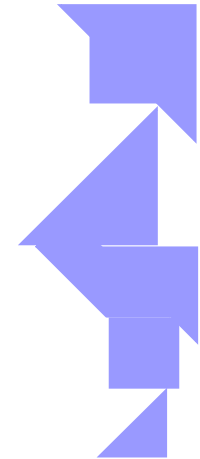
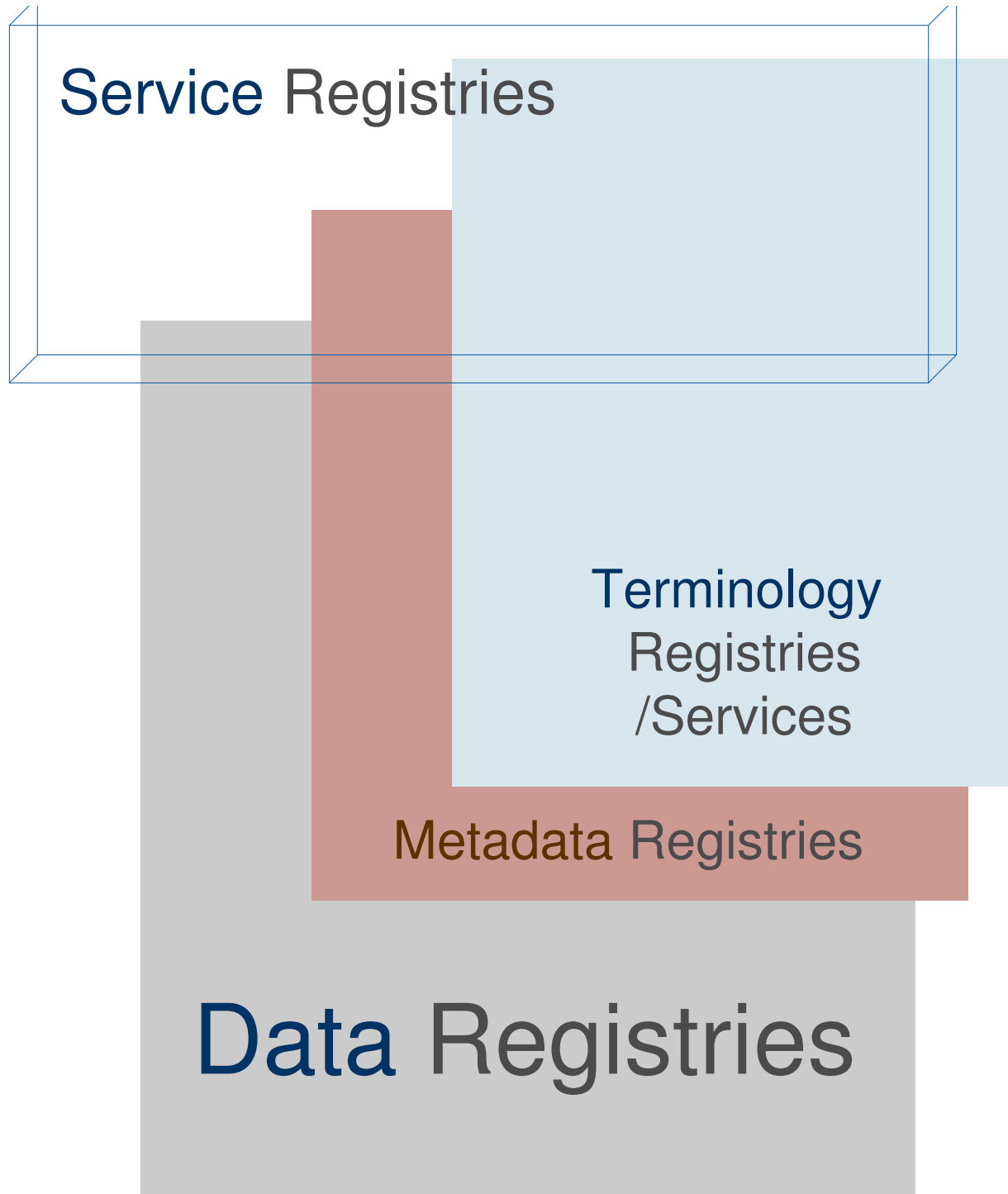
Registry Types

- ◆ Metadata [Schema] Registries
 - Elements and refinements, application profiles, schemas in different bindings ...
 - ◆ e.g., UKOLN CORES Registry
- ◆ Terminology Registries / Repositories
 - Registries for schemes' metadata only
 - Registries of the entries of vocabularies (usually accompanied by scheme's metadata)
 - ◆ e.g., OCLC Terminologies Service; BioPortal ontology repository
 - Terminology services may be listed in a terminology registry or separately hosted in a service registry
- ◆ Service [/ Collection] Registries
 - “[D]atabases of descriptions of available services and, where appropriate, associated collections” -- UKOLN 2005 workshop
 - ◆ E.g., **JISC Information Environment Service Registry (IESR)**
- ◆ Data [Standards] Registries
 - Registries/repositories of all kinds of data standards (e.g., data dictionaries, data models, schemas, and code sets)

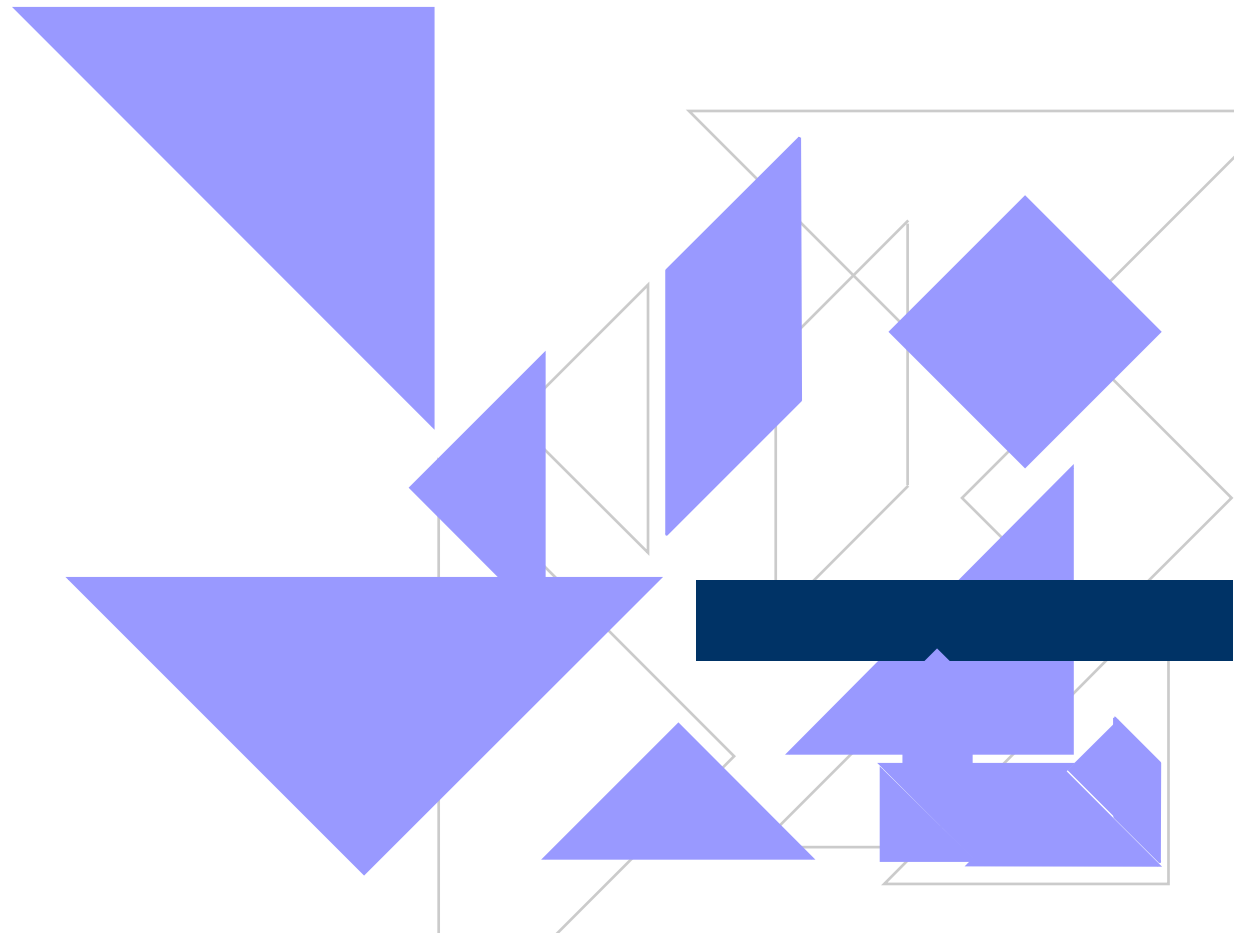
Registry Types – Perspective 1



Registry Types – Perspective 2



Metadata Registries



Metadata Registries

◆ Purpose:

- to collect data related to metadata schemas

◆ Functions:

- to store data elements
 - ◆ include both **semantics** and **representations**
- to provide the means
 - ◆ to identify and refer to established schemas and application profiles
 - ◆ to crosswalk and map among different schemas



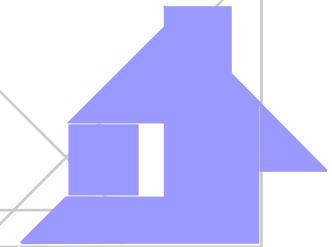
Primary functions

- ◆ Discovery of vocabularies and terms
- ◆ Verification of the status of vocabularies and terms
- ◆ Access to machine-processable descriptions of vocabularies and terms
- ◆ Location of related resources such as information on different syntactic bindings
- ◆ Navigation of the relationships between terms and vocabularies (or between terms)
- ◆ Inferencing and mapping based on knowledge of the nature of the relationships between terms
 - ◆ -- Johnston, Pete. 2004. *Functions of the IE Metadata Schema Registry*. UKLON. Available at <http://www.ukoln.ac.uk/projects/iemsr/wp2/function/>

Metadata Registries

Examples:

- ◆ Cross-domain and cross-schema registries,
 - e.g., UKOLN's SCHEMAS Registry → CORES Registry
 - JISC IE Metadata Schema Registry (IEMSR)
- ◆ Domain-specific, cross-schema registries,
 - e.g., UKOLN's MEG (Metadata for Education Group) Registry
 - Australian Institute of Health and Welfare - Metadata Online Registry (METeOR)
- ◆ Project-specific registries,
 - e.g. The European Library (TEL) metadata registry, whose purpose is recording all metadata activities associated with TEL
- ◆ Standard-specific registries
 - e.g., DCMI Metadata Registry



Metadata Registries

Components: (examples from CORES Registry)

◆ Registry Data Server

- an RDF application providing a persistent data store and APIs for uploading data (application profiles) to the data store and for querying its content

◆ Data Creation Tool

- supports the creation of RDF Data Sources (application-specific profiles) for use by the Registry Data Server

◆ User Website Server

- allows a human user to browse and query the data (terms and application profiles) that are made available by the IEMSR Registry Data Server

-- JISC IE Metadata Schema Registry. Phase 3 Project Plan.
<http://www.ukoln.ac.uk/projects/iemsr/documents/plan3/plan3.pdf>



CORES Registry

Download schema creation tool you are
 Help on using the registry

Index

- Agencies:** [Browse](#) - [Search](#)
- Element Sets:** [Browse](#) - [Search](#)
- Elements:** [Browse](#) - [Search](#)
- Encoding Schemes:** [Browse](#) - [Search](#)
- Application Profiles:** [Browse](#) - [Search](#)
- Element Usages:** [Browse](#) - [Search](#)

[Sandbox registry](#) - [Index](#) - [Agencies](#) - [Element Set](#)
[Application Profiles](#) - [Element](#)

Elements

Name	Element Set	
Abstract	The Dublin Core Terms Element Set	Detail
Access Conditions	The RSLP Collection Description	Detail

Element:: Abstract@en-US

ID	http://purl.org/dc/terms/abstract	Detail
Name	Abstract	Detail
Definition	A summary of the content of the resource.	
Comment		Detail
Data type	string	
Obligation	optional	Detail
Maximum Occurrence	unbounded	Detail
Refines	Description	
Element Set	The Dublin Core Terms Element Set	Detail
Annotations	There are no annotations for this resource. Add new annotation.	Detail
Administrative metadata	List administrative metadata for this resource. (0)	Detail

Element Usages

Name	Application Profile	
Abstract	The Qualified Dublin Core Application Profile	Detail
Abstract	The British Library Application Profile	Detail

Refines

Name	Element Set	
Description	The Dublin Core Element Set v1.1	Detail

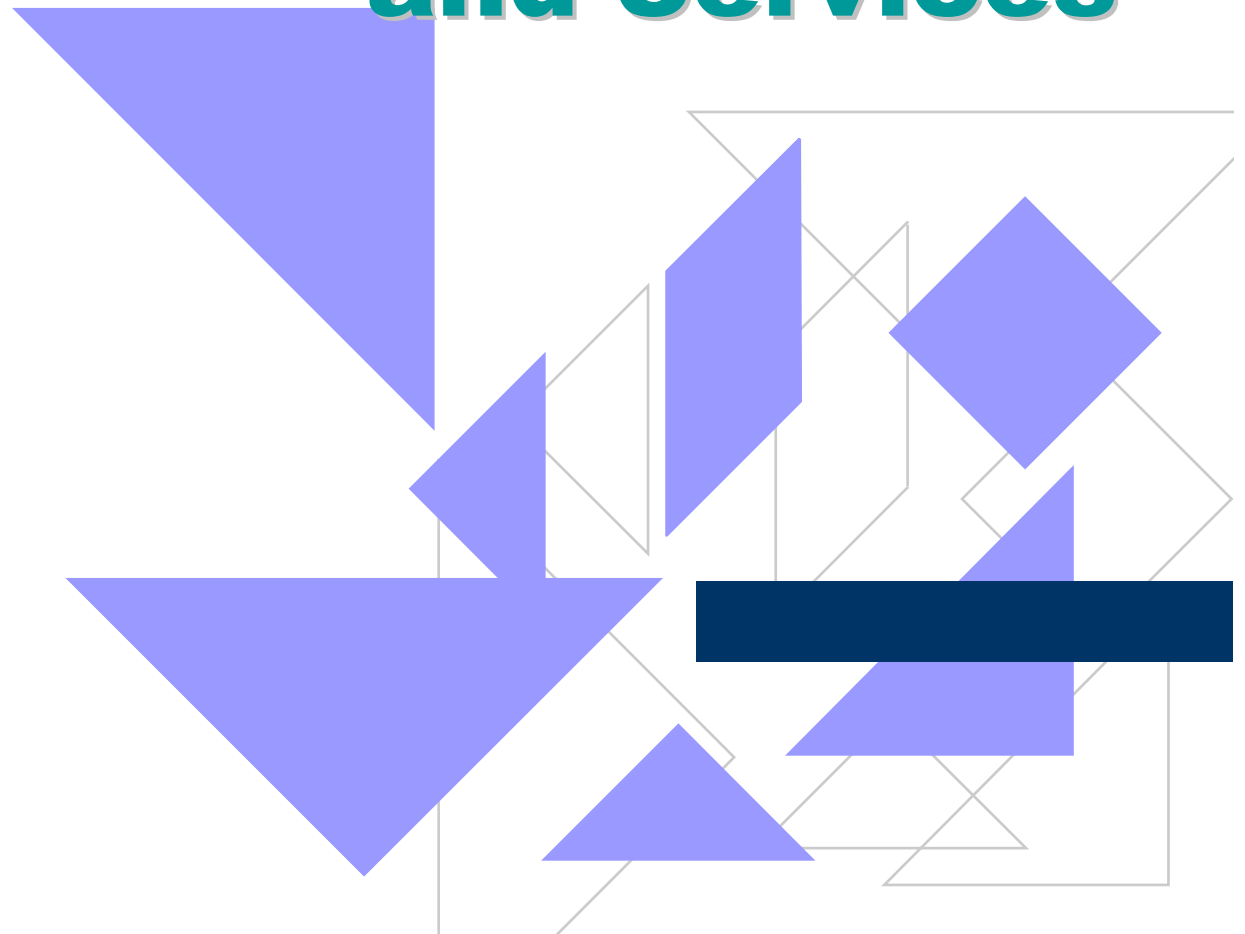
Functional Requirements for CORES Schema Creation and Registration Tool

The registry will provide access to information on

- ◆ element sets
- ◆ the elements in those element sets
- ◆ application profiles
- ◆ element usage which make up those application profiles
- ◆ encoding schemes
- ◆ values within those encoding schemes
- ◆ the agencies who own, create, or maintain these resources
- ◆ commentaries (contextual annotations) outlining deployment of the element sets, application profiles, and schemes
- ◆ links to user guidelines for the element sets and application profiles or schemes

-- Rachel Heery. 2002. <http://www.cores-eu.net/registry/d22/funcreq.html>

Terminology Registries and Services



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

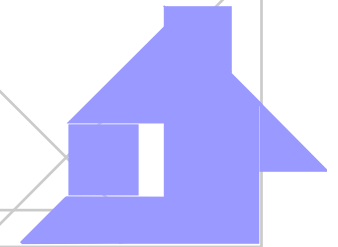
- hold the member terms, classes, concepts, and relationships contained in a vocabulary (either monolingual or multilingual)

-- based on several UKOLN studies, TRSS project, etc.

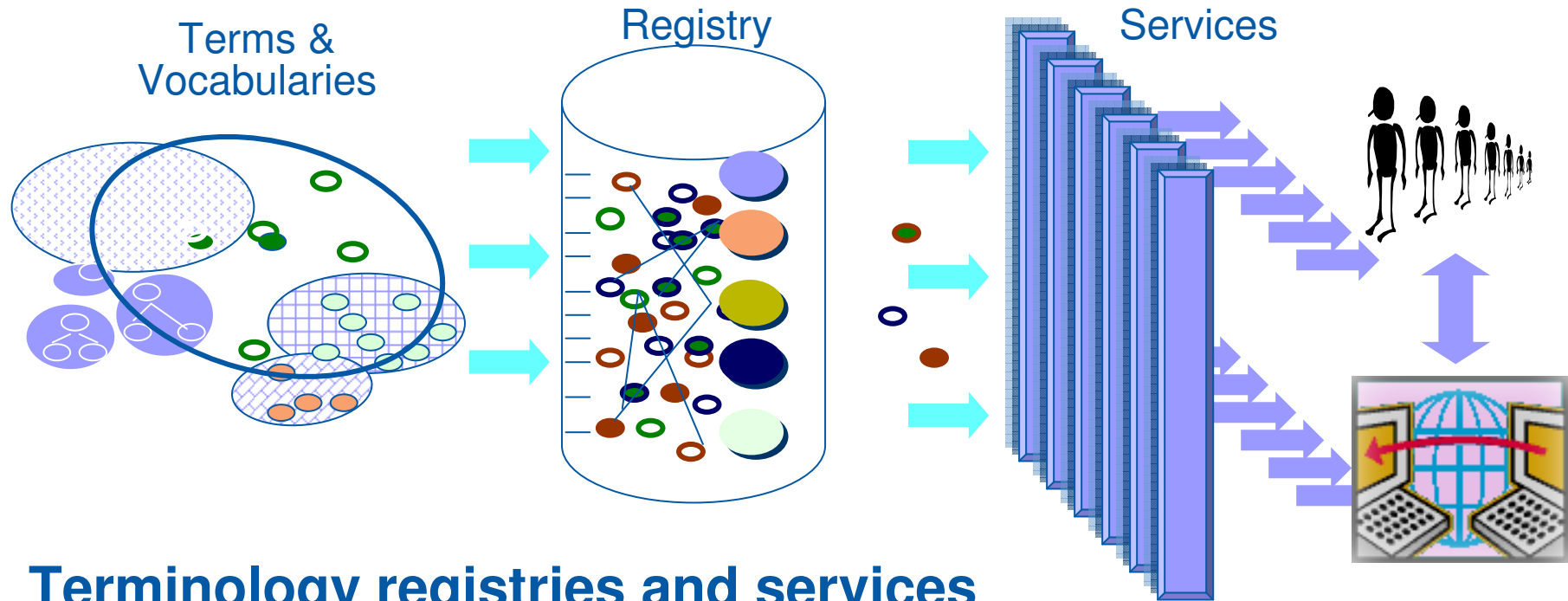


Terminology Services

- ◆ Web services based on terminology are used for automatic classification, term expansion, disambiguation, translation, and semantic reasoning.



A simplified illustration



Terminology registries and services

- registering machine-accessible KOS
- mapping among concepts/terms
- making KOS content available in different kinds of tools via terminology (web) services

Terminology Registries and Services (1): HILT



High-Level Thesaurus

Welcome to the website of the High-Level Thesaurus Project (HILT). The HILT project, which is now in phase IV, aims to research, investigate, pilot, and develop solutions for, problems pertaining to cross-searching multi-subject scheme information environments.

<http://hilt.cdlr.strath.ac.uk/index.html>

Dennis Nicholson, University of Strathclyde

HILT uses and experiments with a variety of terminologies. The project team is grateful to editors and agencies for allowing HILT to use their terminologies for research. Terminological data served by HILT demonstrators or pilots is derived from the terminologies listed below; however, terminology editors and agencies may **not** be held responsible for any errors found in data served by HILT demonstrators or pilots.

Acknowledgements:

Art and Architecture Thesaurus (AAT), The J. Paul Getty Trust.

CAB Thesaurus, CABI

Dewey Decimal Classification (DDC), OCLC

Global Change Master Directory (GCMD) (Science Keywords), NASA

HASSET Thesaurus, UK Data Archive at the University of Essex

Integrated Public Sector Vocabulary (IPSV), e-Government Unit (UK)

Joint Academic Coding System (JACS), Universities and Colleges Admission Service (UK)

JITA Classification Schema, E-Prints in Library and Information Science (E-LIS)

Library of Congress Subject Headings (LCSH), Library of Congress (USA)

Medical Subject Headings (MeSH), National Library of Medicine (USA)

National Monuments Record Thesaurus (NMR), English Heritage

UNESCO Thesaurus, UNESCO and the University of London Computer Centre

Site menu:

[Home](#)

[HILT IV](#)

[HILT III](#)

[HILT M2M FS](#)

[HILT II \(archived\)](#)

[HILT I \(archived\)](#)

[Dissemination](#)

[Contact](#)

Quick links

- HILT III demonstrators
- HILT M2M demonstrators
- HILT II pilot terminologies server
- Terminology acknowledgements
- HILT usage statistics

Large structured vocabularies, each containing thousands of controlled terms/classes and the relationships among terms/classes.

Funded by [UK Joint Information Systems Committee JISC](#)



The HILT terminologies server aims to identify JISC services and/or collections likely to have resources relevant to any subject query you may have. The process has three steps:

1. You enter your search term (or browse the subject hierarchy)
2. HILT looks for the best matches for your subject and subject hierarchy
3. You choose the most appropriate subject.
4. HILT tells you about possible services or collections use (if it can). It also allows you to connect through the terminologies server.

Enter your search term here...

Use Double Quotes for a phrase search (Eg: "biology and life science") See [search tips](#) for details

...or browse by category

- [Arts & recreation](#) → [Architecture](#) , [Arts](#) , [Drawings & decorative arts](#) , [Graphic arts](#) , [Landscaping & area planning](#) , [Music](#) ...
- [Computers, information & general reference](#) → [Associations, organizations & museums](#) , [Bibliographies](#) , [Computers, Internet & systems](#) , [Encyclopedias & books of facts](#) , [Journalism, publishing & news media](#) , [Library & information science](#) ...
- [History & geography](#) → [Biography & genealogy](#) , [Geography & travel](#) , [History](#) , [History of Africa](#) , [History of Asia](#) , [History of Europe \(ca. 500 A.D.- \)](#) ...
- [Language](#) → [Classical & modern Greek languages](#) , [English & Old English languages](#) , [French & related languages](#) , [German & related languages](#) , [Italian, Romanian & related languages](#) , [Language](#) ...
- [Literature](#) → [American literature in English](#) , [Classical & modern Greek literatures](#) , [English & Old English literatures](#) , [French & related literatures](#) , [German & related literatures](#) , [Italian, Romanian & related literatures](#) ...
- [Philosophy & psychology](#) → [Ancient, medieval & eastern philosophy](#) , [Astrology, parapsychology & the occult](#) , [Epistemology](#) , [Ethics](#) , [Logic](#) , [Metaphysics](#) ...
- [Religion](#) → [Christian denominations](#) , [Christian pastoral practice & religious orders](#) , [Christian practice & observance](#) , [Christianity & Christian theology](#) , [Church organization, social work & worship](#) , [History of Christianity](#) ...
- [Science](#) → [Animals \(Zoology\)](#) , [Astronomy](#) , [Biology & life sciences](#) , [Chemistry](#) , [Earth sciences & geology](#) , [Fossils & prehistoric life](#) ...

HILT III pilots and demonstrators...

- [HILT SOAP client demonstration](#)
- [HILT SRW client demonstration \(HILT II emulation using SRW and SKOS Core\)](#)
- [HILT SRW client 'scheme specific browse' demonstrator \(using SKOS Core\)](#)
- [GoGeo! keyword search demonstrator](#)

HILT phase I: mapping between schemes
HILT phase II: terminologies server
HILT phase III: M2M pilot demonstrator
HILT phase IV: transition to service testbed and future requirements study

(2): BERC DataGrid Vocabulary Server Explorer

British Oceanographic Data Centre
NATURAL ENVIRONMENT RESEARCH COUNCIL

Home Contact us Glossary Site map Bookmark Site styles Search

About us Data Projects Partners **Products** Help and hints

NERC DataGrid vocabulary server

The [NERC DataGrid \(NDG\) vocabulary server](#) gives data managers the means to access lists of controlled terms to describe data, thus saving the time and costs associated with unraveling the meaning of a given data set.

- [Introduction](#) — a brief summary of the value of implementing the vocabulary server
- [Caveats for the V1.1 Vocabulary Server release](#) — warnings for the latest vocabulary server release
- [List and term URIs](#) — summary of lists and terms as URIs
- [Connectivity](#) — consumer access options for the vocabulary server
- [XML data types](#) — summary of the major data types of the service
- [Vocabulary server methods](#) — summary of the Web Service methods including parameters, outputs and examples

Introduction

The NDG vocabulary server provides access to lists of standardised terms that cover a broad spectrum of disciplines of relevance to the oceanographic and wider community.

Using standardised sets of terms (otherwise known as "controlled vocabularies") in metadata and to label data solves the problem of ambiguities associated with data markup and also enables records to be interpreted by computers. This opens up data sets to a whole world of possibilities for computer aided manipulation, distribution and long term reuse.

(2): BERC DataGrid Vocabulary Server

Internet Explorer



Google G

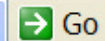


Bookmarks

1001 blocked

Settings

Address <http://vocab.ndg.nerc.ac.uk/>



Links

- [vocabServer.jsp](#) — includes whatListsCat, whatLists, verifyTerm, searchVocab and getList

Version 1.1

The WSDL is available at

- http://vocab.ndg.nerc.ac.uk/1.1/VocabServerAPI_dl.wsdl (Document/literal wrapped)

Available clients:

- Method calls
 - [whatLists](#) (catalogue of lists available on server)
 - [getList](#) (access to a specified list, including subsets)
 - [searchVocab](#) (search for occurrences of text strings in entries)
 - [verifyTerm](#) (metadata entry checker)
 - [whatListsCat](#) (catalogue of list categories available on the server)
 - [getMap](#) (access to full mappings between lists)
- Semantic search client
 - [getRelated](#)

© NERC, 2007. Last updated August 4, 2008

start



I...

3

3

m..

EN



5:42 PM

(2): OCLC Terminology Services



United States

a worldwide library cooperative

Terminology Services

← Projects

Terminology Services

Terminology Services ▶

- Terminologies Services Pilot
- DCMI Type Vocabulary Resource
- GSAFD Vocabulary Resource
- MeSH Vocabulary Resource
- MeSH Sample Vocabulary Resource
- NGL Vocabulary Resource
- info:kos Application Notes
- Project-Related Standards
- Project-Related RSS Feeds

Cross Vocabulary Mappings

From	Vocabulary	To							
		DDC	ERIC	GSAFD	LCC	LCSH	LCSHac	MeSH	NLMC
	DDC (Dewey Decimal Classification)				Direct	Direct & Co-occur	Direct & Co-occur	Direct	Direct
	ERIC thesaurus					Direct			
	GSAFD (Genre terms for fiction)					Direct	Direct		
	LCC (Library of Congress Classification)	Direct							
	LCSH (LC Subject Headings)	Direct & Co-occur	Direct	Direct	Co-occur			Direct	
	LCSHac (LC Children's Headings)	Direct & Co-occur							
	MeSH (Medical Subject Headings)	Direct				Direct			
	NLMC (National Library of Medicine Classification)								

Research: <http://www.oclc.org/research/projects/termservices/>

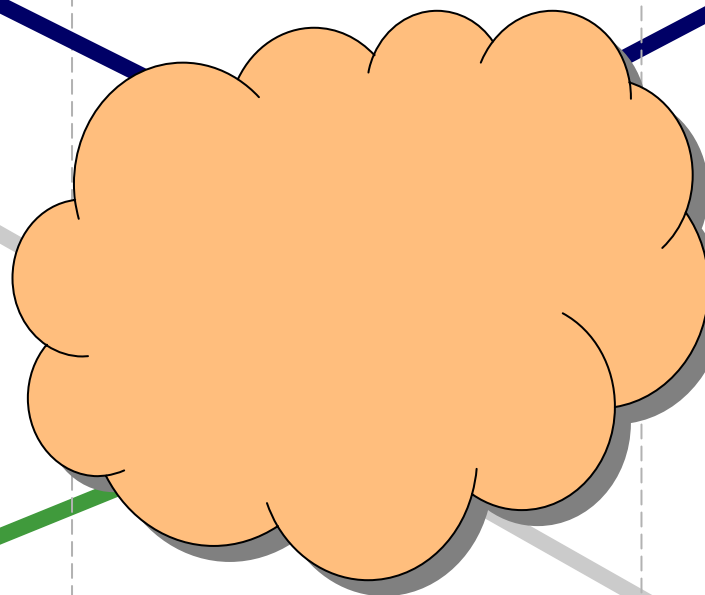
Service: <http://www.oclc.org/terminologies/default.htm>

OCLC Research Office: [Diane Vazine-Goetz \(Lead\)](#)

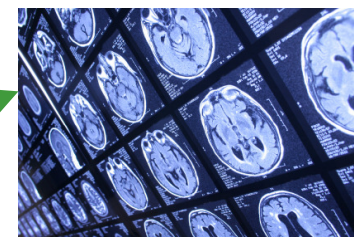
Content

Web Services

Applications



Query Expansion



Searching Heterogeneous Collections



Metadata Creation

Using MS Office Research Task Pane, provides 10 vocabularies for tagging, searching, translation, etc.

Research

Search for: mercury

OCLC: All - All OCLC Terminolo

All Reference Books

- Encarta Dictionary: English (North America)
- OCLC: All - All OCLC Terminologies
- OCLC: aat - Art and Architecture thesaurus
- OCLC: dct - Dublin Core Initiative Type Vocabulary
- OCLC: gmGPC - Thesaurus for Graphic Materials, TGM II, Genre and Physical Characteristic Te
- OCLC: gsafd - Guidelines on Subject Access to Individual Works of Fiction, Drama, Etc.
- OCLC: lctgm - Thesaurus for Graphic Materials, TGM I, Subject Terms
- OCLC: mesh - MeSH(R) (Medical Subject Headings)
- OCLC: ngl - Newspaper Genre List
- OCLC: reo - Māori Subject Headings / Ngā Ūpoko Tukutuku
- OCLC: tgn - Thesaurus of Geographic Names
- OCLC: ulan - Union List of Artist Names(R)
- Thesaurus: English (U.S.)
- Thesaurus: French (France)
- Thesaurus: Spanish (Spain-Modern Sort)
- Translation

All Research Sites

- Encarta Encyclopedia: English (North America)
- Factiva iWorks™
- HighBeam Research
- MSN Search

Azogues [tgn]

B & B Mine [tgn]

Get updates to your services...

Get services on Office Marketplace

Research options...

Session Timer: 22:51

Research

Search for: mercury

OCLC: All - All OCLC Terminolo

Back

Submit

Help

- Acrodynia [mesh]
- Alkylmercury Compounds [mesh]
- Almadén [tgn]
- amalgam [aat]
- amalgam gilding [aat]
- amalgam silvering [aat]
- Apārangi [reo]
- Aydin Ili [tgn]
- Azogues [tgn]
- B & B Mine [tgn]

UKOLN: DC-dot Dublin Core metadata editor - Microsoft Internet Explorer provided by OCLC, Inc.

Vocabularies are provided for tagging, searching, translation, etc.

Search: gsaafd:GSAFD0000

OCLC Pilot: GSAFD - Guidelines on subject access to individual works of fiction, drama, etc. (1 of 1)

Other application

Love stories

- + Non-preferred Terms
- + Related Terms
- Mapped Terms
 - lcs**
 - Love stories
 - Romance fiction
 - lcsnac**
 - Love — Fiction
- Notes
 - Use for works dealing primarily with romantic love.

re-submit

Display format: XHTML

Metadata language:

Help New URL

Title: Romance novel - Wikipedia, the free encyclopedia

Creator (author):

Subject or keywords: Romance novel

2005-09-08

Love stories
Romance fiction

DCMI Type: [None]

text/html; charset=utf-8 | 20938 bytes

Identifier: http://en.wikipedia.org/wiki/Romance_novel

Internet

Start | Inbox - ... | Termin... | UKOLN... | CONTE... | CONTE... | Docum... | Roman... | 3:55 PM

Highlights

- Search descriptions of controlled vocabularies
- Search for concepts/headings in a controlled vocabulary
- Retrieve a single concept/heading by its identifier
- View relationships for a concept/heading including equivalence, hierarchical, and associative
- Retrieve concepts/headings in multiple representations including HTML, MARC XML, SKOS, and Zthes.
- Search using SRU CQL syntax

Technical Resources

- Overview ([pdf](#), [ppt](#))
- URI-patterns
- [Indexing](#)
- [Standards](#)
- [Issues](#)
- [Roadmap](#)

Vocabulary Resources

Jump to: [meta](#) [fast](#) [qsafd](#) [lcshac](#) [lcsh](#) [mesh](#) [lct:](#) <http://tspilot.oclc.org/resources/index.html>



Vocabulary Resources

Jump to: [meta](#) [fast](#) [gsafd](#) [lcshac](#) [lcsh](#) [mesh](#) [lctqm](#) [gmgpc](#)

Name:	Controlled Vocabulary Metadata
Description:	Descriptions of controlled vocabularies
Date:	2008-03
Identifier:	meta
Links:	About SRU Interface Examples MARC Statistics

Name:	Faceted Application of Subject Terminology (FAST subject headings)
Description:	A controlled vocabulary based on the terminology of Library of Congress Subject Headings (LCSH)
Date:	2008-03
Identifier:	fast
Links:	About SRU Interface Examples MARC Statistics

Name:	Form and genre headings for fiction and drama
Description:	Form and genre terms from the Guidelines On Subject Access To Individual Works Of Fiction, Drama, Etc., 2nd ed.
Date:	2008-03
Identifier:	gsafd
Links:	About SRU Interface Examples MARC Statistics

Name:	Library of Congress AC Subject Headings
Description:	Headings for juvenile literature created for the Annotated Card (AC) program. Must be used in conjunction with LCSH
Date:	2008-03
Identifier:	lcshac
Links:	About SRU Interface Examples MARC Statistics

Name:	Library of Congress Subject Headings
Description:	A general subject heading vocabulary maintained by the U.S. Library of Congress
Date:	2008-03
Identifier:	lcsh
Links:	About SRU Interface Examples MARC Statistics

Name:	Medical Subject Headings (MeSH®)
-------	---

(Cont.)
<http://tspilot.oclc.org/resources/index.html>

Terminology Services

Experimental Services for Controlled Vocabularies

a project of OCLC Research

lctgm — Thesaurus for graphic materials: TGM I, Subject terms

Search

Search

Index	Relation	Term	Boolean
cql.resultSetId	exact		and
cql.serverChoice	=		and
dc.identifier	exact		and
oclcts.alternativeTerms	=		and
oclcts.expandedHeading	exact		and
oclcts.facets	=		and
oclcts.hierarchyId	exact		
oclcts.mappedIdentifier	exact		
oclcts.mappedTerms	=		
oclcts.marcTags	=		
oclcts.notes	=		
oclcts.preferredTerm	=		and
oclcts.rootHeading	exact		and
oclcts.terms	=		and
oclcts.vocabularyId	exact		and

Browse

Browse

Index	Relation	Term
cql.resultSetId	=	

Response Position: 1

Maximum Terms: 100

Browse

<http://tspilot.oclc.org/lctgm/?operation=explain&version=1.1>
Type 'temples' in the oclcts.expandedHeading box → search.



Terminology Services

Experimental Services for Controlled Vocabularies

a project of OCLC Research

Links: << Back to Search

Ictgm — Thesaurus for graphic materials: TGM I, Subject terms

Results for Search: oclcts.expandedHeading exact "temples"

Result Set Identifier: 2s4hxx

Records found: 1

Record: 1 of 1

Schema: MARC XML

LDR 00570cz a2200229 4500

001 Ictgm010644

003 DLC

005 20080505213847.9

008 850227i| anznnbabn || |n| |

009 (DLC)Ictgm010644

039 _ _ \$a (DLC)Ictgm-010644

039 _ _ \$a (DLC)Ictgm-10644

040 _ _ \$a DLC \$b eng \$c OCoLC \$d OCoLC \$d OCoLC-O \$f Ictgm \$g Ictgm

150 _ _ \$a Temples \$9 temples

550 _ _ \$w g \$a Religious facilities \$0 (DLC)Ictgm008761 \$9 religious facilities

550 _ _ \$w h \$a Buddhist temples \$0 (DLC)Ictgm001379 \$9 buddhist temples

550 _ _ \$w h \$a Confucian temples \$0 (DLC)Ictgm002437 \$9 confucian temples

550 _ _ \$w h \$a Greek temples \$0 (DLC)Ictgm004717 \$9 greek temples

550 _ _ \$w h \$a Hindu temples \$0 (DLC)Ictgm004994 \$9 hindu temples

550 _ _ \$w h \$a Roman temples \$0 (DLC)Ictgm008977 \$9 roman temples

550 _ _ \$w h \$a Taoist temples \$0 (DLC)Ictgm010519 \$9 taoist temples

550 _ _ \$a Churches \$0 (DLC)Ictgm002048 \$9 churches

550 _ _ \$a Pagodas \$0 (DLC)Ictgm007367 \$9 pagodas

550 _ _ \$a Pronaoi \$0 (DLC)Ictgm008289 \$9 pronaoi

550 _ _ \$a Torii \$0 (DLC)Ictgm010868 \$9 torii

856 4 _ \$3 HTML document \$q text/html \$u <http://scholar.google.com/scholar?ie=UTF-8&oe=UTF-8&q=Temples> \$y Search Google Scholar

856 4 _ \$3 HTML document \$q application/xhtml+xml \$u <http://worldcat.org/search?q=su%3ATemples> \$y Search WorldCat

856 4 _ \$3 HTML document \$q application/xhtml+xml \$u <http://tspilot.oclc.org/Ictgm/Ictgm010644.html> \$y Concept description \$z OCLC Research Terminology Services concept description document.

856 4 _ \$3 HTML document \$q application/xhtml+xml \$u <http://tspilot.oclc.org/Ictgm.html> \$y Vocabulary description \$z OCLC Research Terminology Services vocabulary description document.

Results for Search: oclcts.expandedHeading exact "temples" - Microsoft Inter...

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Mail Print Mail New Tab Settings

Address <http://tspilot.oclc.org/lctgm/?query=oclccts.expandedHeading+exact+%22temples%22&version=1.1&...> Go Links

Google [oclc terminology services](#) Go Bookmarks 999 blocked Check Settings

550 __ \$a Churches \$0 (DLC)lctgm002048 \$9 churches

550 __ \$a Pagodas \$0 (DLC)lctgm007367 \$9 pagodas

550 __ \$a Pronaoi \$0 (DLC)lctgm008289 \$9 pronaoi

550 __ \$a Torii \$0 (DLC)lctgm010868 \$9 torii

856 4 _ \$3 HTML document \$q text/html \$u <http://scholar.google.com/scholar?ie=UTF-8&oe=UTF-8&q=Temples> \$y Search Google Scholar

856 4 _ \$3 HTML document \$q application/xhtml+xml \$u <http://worldcat.org/search?q=su%3ATemples> \$y Search WorldCat

856 4 _ \$3 HTML document \$q application/xhtml+xml \$u <http://tspilot.oclc.org/lctgm/lctgm010644.html> \$y Concept description \$z OCLC Research Terminology Services concept description document.

856 4 _ \$3 HTML document \$q application/xhtml+xml \$u <http://tspilot.oclc.org/lctgm.html> \$y Vocabulary description \$z OCLC Research Terminology Services vocabulary description document.

856 4 _ \$3 HTML document \$q text/html \$u <http://www.oclc.org/research/researchworks/terms.htm> \$y OCLC ResearchWorks Terms of Use \$z Use of this resource is governed by the OCLC ResearchWorks terms of use.

952 __ \$a GMGcomp: i

Internet

Terminology Web Services

Experimental Services for Controlled Vocabularies

a project of OCLC Research

Temples

Vocabulary: [lctgm](#)
Type: Topic

<http://tspilot.oclc.org/lctgm/lctgm010644.html>

Broader Concepts

[Religious facilities](#)

Narrower Concepts

[Buddhist temples](#) | [Confucian temples](#) | [Greek temples](#) | [Hindu temples](#) | [Roman temples](#) | [Taoist temples](#)

Related Concepts

[Churches](#) | [Pagodas](#) | [Pronaoi](#) | [Torii](#)

Links

1. [Search WorldCat for Temples](#)
2. [Search Google Scholar](#)
3. [Search WorldCat](#)
4. [Vocabulary description](#)
5. [OCLC ResearchWorks Terms of Use](#)

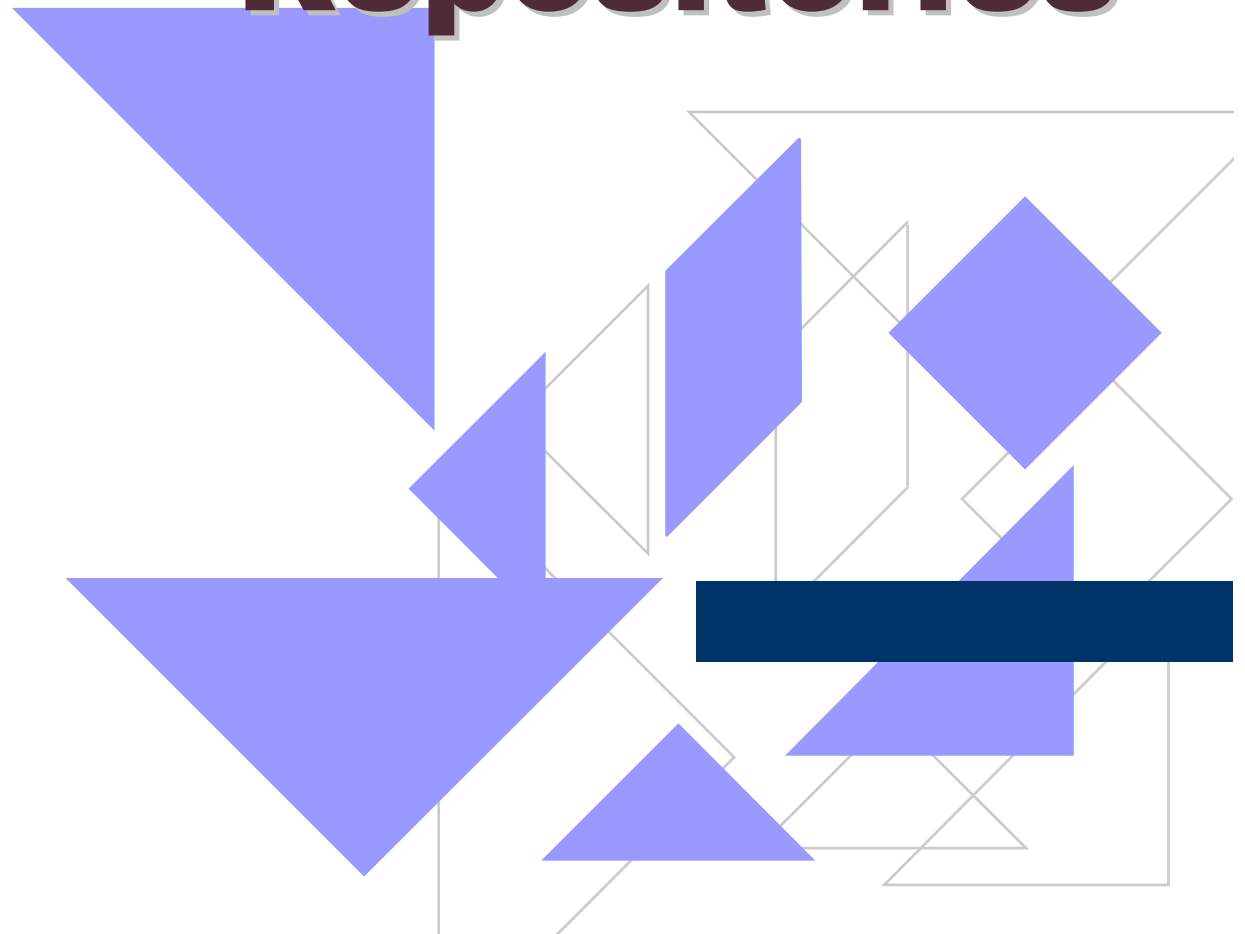
```
<?xml version="1.0" encoding="utf-8" ?>
- <record xmlns="http://www.loc.gov/MARC21/slim" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.loc.gov/MARC21/slim http://www.loc.gov/standards/marcxml/schema/MARC21slim.xsd">
  <leader>00570cz a2200229 4500</leader>
  <controlfield tag="001">lctgm010644</controlfield>
  <controlfield tag="003">DLC</controlfield>
  <controlfield tag="005">20080505213847.9</controlfield>
  <controlfield tag="008">850227il aznphbn ll ll L</controlfield>
  <controlfield tag="009">(DLC)lc</controlfield>
- <datafield ind1="" ind2="" tag="009">
  <subfield code="a">(DLC)lctgm</subfield>
</datafield>
- <datafield ind1="" ind2="" tag="039">
  <subfield code="a">(DLC)lctgm-10644</subfield>
</datafield>
- <datafield ind1="" ind2="" tag="040">
  <subfield code="a">DLC</subfield>
  <subfield code="b">eng</subfield>
  <subfield code="c">OCoLC</subfield>
  <subfield code="d">OCoLC</subfield>
  <subfield code="d">OCoLC-O</subfield>
  <subfield code="f">lctgm</subfield>
  <subfield code="9">lctgm</subfield>
</datafield>
- <datafield ind1="" ind2="" tag="150">
  <subfield code="a">Temples</subfield>
  <subfield code="9">temples</subfield>
</datafield>
- <datafield ind1="" ind2="" tag="550">
  <subfield code="w">g</subfield>
  <subfield code="a">Religious facilities</subfield>
  <subfield code="0">(DLC)lctgm008761</subfield>
  <subfield code="9">religious facilities</subfield>
</datafield>
- <datafield ind1="" ind2="" tag="550">
  <subfield code="w">h</subfield>
  <subfield code="a">Buddhist temples</subfield>
  <subfield code="0">(DLC)lctgm001379</subfield>
  <subfield code="9">buddhist temples</subfield>
</datafield>
```

http://tspilot.oclc.org/lctgm/lctgm010644.marcxml

```
<?xml version="1.0" encoding="utf-8" ?>
- <Zthes xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="http://zthes.z3950.org/schema/zthes-1.0.xsd">
- <term>
  <termId>lctgm010644</termId>
  <termName>Temples</termName>
  <termType>PT</termType>
  <termLanguage>eng</termLanguage>
  <termCategory>Topic</termCategory>
  <termStatus>active</termStatus>
  <termSortkey>temples</termSortkey>
  <termNote label="OtherResourceLocation">Search Google Scholar <http://scholar.google.com/scholar?ie=UTF-8&oe=UTF-8&q=Temples> [text/html]</termNote>
  <termNote label="OtherResourceLocation">Search WorldCat <http://worldcat.org/search?q=su%3ATemples> [application/xhtml+xml]</termNote>
  <termNote label="OtherResourceLocation">OCLC Research Terminology Services concept description document. <http://tspilot.oclc.org/lctgm/lctgm010644.html> [application/xhtml+xml]</termNote>
  <termNote label="OtherResourceLocation">OCLC Research Terminology Services vocabulary description document. <http://tspilot.oclc.org/lctgm.html> [application/xhtml+xml]</termNote>
  <termNote label="OtherResourceLocation">Use of this resource is governed by the OCLC ResearchWorks terms of use. <http://www.oclc.org/research/researchworks/terms.htm> [text/html]</termNote>
  <termNote label="Change">Original cataloging agency is DLC.</termNote>
  <termNote label="Change">Transcribing agency is OCoLC.</termNote>
  <termNote label="Change">Modifying agency is OCoLC.</termNote>
  <termCreatedDate>1985-02-27T00:00:00.0</termCreatedDate>
  <termCreatedBy>DLC</termCreatedBy>
  <termModifiedDate>2008-05-05T21:38:47.9</termModifiedDate>
  <termModifiedBy>OCoLC-O</termModifiedBy>
- <relation>
  <relationType>BT</relationType>
  <termId>lctgm008761</termId>
  <termName>Religious facilities</termName>
  <termType>PT</termType>
</relation>
- <relation>
  <relationType>RT</relationType>
  <termId>lctgm002048</termId>
  <termName>Churches</termName>
  <termType>PT</termType>
</relation>
```

http://tspilot.oclc.org/lctgm/lctgm010644.zthes

Ontology Registries / Repositories



of ontologies: 111
 • NCBO Library: 78
 • Remote Ontologies: 33

Home Browse Search All Mappings

Submit New Ontology

Ontology Name	Format	Version	Author	Uploaded On	
Event (INOH pathway ontology)	OBOF	See Remote Site	Event Administrators	08/22/2008	
Evidence codes	OBOF	1.17	Michael Ashburner	05/29/2008	Explore
eVOG (Expressed Sequence Annotation for Humans)	OBOF	See Remote Site	Evoc Administrators	08/22/2008	
Fly taxonomy	OBOF	1.1	Michael Ashburner	08/24/2007	Explore
FlyBase Controlled Vocabulary	OBOF	1.13	Evidence_code Administrators	07/30/2008	Explore
FMA	OWL-DL	1.4		01/16/2007	Explore
Foundational Model of Anatomy (subset)	OBOF	See Remote Site	Http://obo Administrators	08/22/2008	
Fungal gross anatomy	OBOF	1.1	Fungal_anatomy Administrators	07/30/2008	Explore
Galen	OWL-FULL	1.1		01/16/2007	Explore
Gene Regulation Ontology	OWL-FULL	See Remote Site	Vivian Lee	08/22/2008	
Gene Regulation Ontology (GRO)	OWL-DL	0.3	Vivian Lee	06/25/2008	Explore
Habronattus courtship	PROTEGE	See Remote Site	Http://www Administrators	08/22/2008	
Human developmental anatomy, abstract version	OBOF	1.3	EMAP Administrators	07/30/2008	Explore
Human developmental anatomy, timed version	OBOF	1.3	EM		
Human disease	OBOF	1.10	Human_disease Administrators	08/01/2008	Explore
ICD9	LEXGRID-XML	9		05/16/2008	Explore

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



Foundational Model of Anatomy (FMA) Ontology viewing from BioPortal

Attributes & values

Tree View

Tree view constructed based on *hasSubclass* hierarchy

- Anatomical entity
 - Non-physical anatomical entity
 - Physical anatomical entity
 - Immaterial physical anatomical entity
 - Material anatomical entity
 - Anatomical set
 - Anatomical structure
 - Acellular anatomical structure
 - Anatomical cluster
 - Anatomical compartment
 - Body part subdivision cluster
 - Cell cluster
 - Cell part cluster
 - Compartment subdivision
 - Heterogeneous cluster
 - Organ cluster
 - Cluster of meninges
 - Erector spinae muscle group
 - Iliopsoas
 - Intertransverse muscle group
 - Lacrimal apparatus
 - Pericardium
 - Pia-arachnoid
 - Rotatores muscle group
 - Transversospinales muscle group
 - Wall of intestine
 - Organ part cluster
 - Tissue cluster

Classes and relationships

Relationship types

Class/Type Details

General

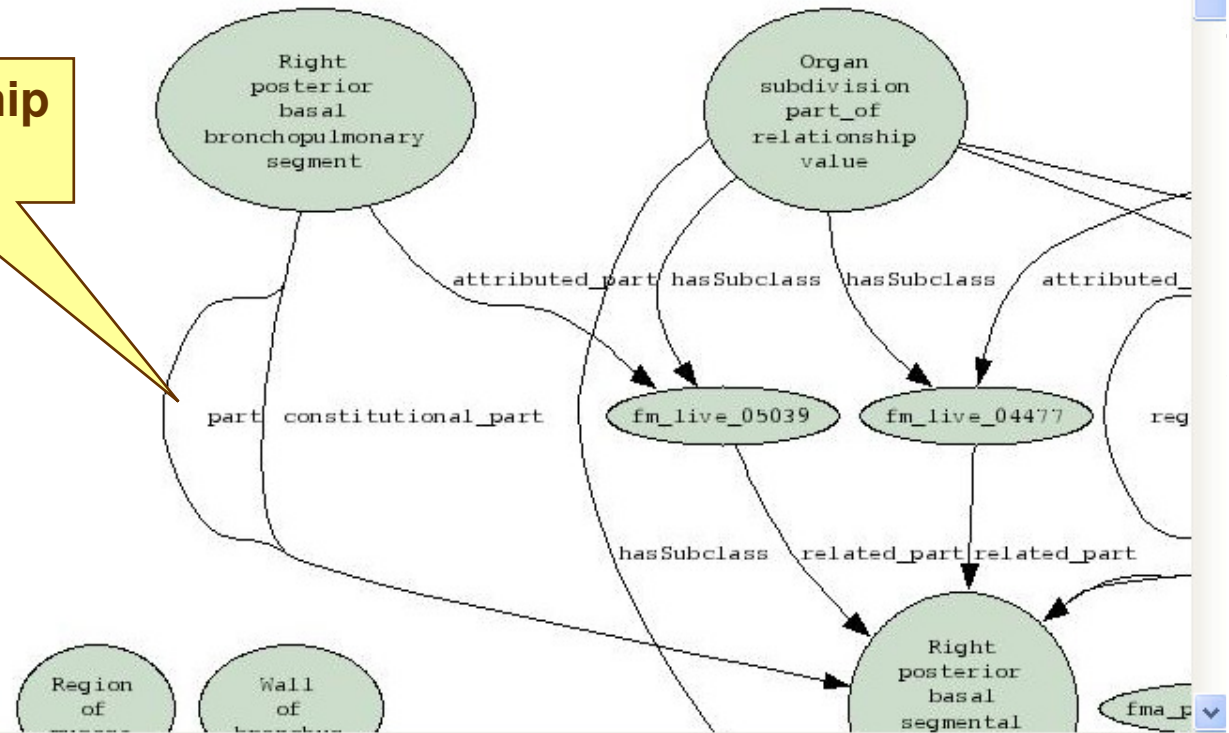
Class/Type Name	Organ cluster
Id	32406

Attributes

has_boundary	true
Definition	Anatomical cluster which consists of all
has_inherent_3-D_shape	true
dimension	3-dimension
has_dimension	true
has_mass	true

Graph View

Graph Type



[View Ontology Metadata](#)

- + SUPPLEMENTARY CLASSIFIC
- + SUPPLEMENTARY CLASSIFIC
- + PROCEDURES
- + DISEASES AND INJURIES

SUPPLEMENTARY CLASSIFICATION OF EXTERNAL CAUSES OF INJURY AND POISONING [\(Link To Concept\)](#)

- Details** Visualization Marginal Notes Mappings Resources

Class Name: SUPPLEMENTARY CLASSIFICATION OF EXTERNAL CAUSES OF INJURY AND POISONING

ID: E800-E999.9

Sib: DISEASES AND INJURIES , SUPPLEMENTARY CLASSIFICATION OF FACTORS INFLUENCING HEALTH STATUS AND CONTACT WITH HEALTH SERVICES , PROCEDURES

Par: V-ICD9CM

Umls Cui: C0376109

Semantic Type: Classification

Chd: OTHER ACCIDENTS , OTHER ROAD VEHICLE ACCIDENTS , Place of occurrence , LATE EFFECTS OF ACCIDENTAL INJURY , RAILWAY ACCIDENTS , SURGICAL AND MEDICAL PROCEDURES AS THE CAUSE OF ABNORMAL REACTION OF PATIENT OR LATER COMPLICATION, WITHOUT MENTION OF MISADVENTURE AT THE TIME OF PROCEDURE , ACCIDENTAL FALLS , ACCIDENTS DUE TO NATURAL AND ENVIRONMENTAL FACTORS , MOTOR VEHICLE NONTRAFFIC ACCIDENTS , DRUGS, MEDICINAL AND BIOLOGICAL SUBSTANCES CAUSING ADVERSE EFFECTS IN THERAPEUTIC USE , ACCIDENTS CAUSED BY FIRE AND FLAMES , SUICIDE AND SELF-INFLICTED INJURY , INJURY RESULTING FROM OPERATIONS OF WAR , MISADVENTURES TO PATIENTS DURING SURGICAL AND MEDICAL CARE , ACCIDENTAL POISONING BY OTHER SOLID AND LIQUID SUBSTANCES, GASES, AND VAPORS , HOMICIDE AND INJURY PURPOSELY INFLICTED BY OTHER PERSONS ,

OpenOntologyRepository



[WikiHomePage](#) | [RecentChanges](#) | [Page Index](#)

[Login](#) (create account)

Open Ontology Repository (OOR) Initiative - Home Page

(17YG)

Most Critical Task(s) At Hand: (17YH)

- prepare a status report, OOR rationale and requirements, and a proposed roadmap at the [OntologySummit2008 Apr-29 Workshop](#). (1DOF)
- start working on funding (1ANS)

What's New: (17YJ)

- **2008_04_10 - Thursday: Joint OOR-OntologySummit2008 Panel Discussion: "Developing an Ontology of Ontologies for OOR" - Co-chairs: [BarrySmith](#) & [MichaelGruninger](#); Panelists: [MichaelGruninger](#), [PeterHaase](#), [NatashaNoy](#) & [ElisaKendall](#) - [ConferenceCall_2008_04_10](#)** T (1BZ4)
- **next OOR-Team conference call: 2008_04_18 - Friday: OOR Project Team Member Conference Call - [OOR/ConferenceCall_2008_04_18](#)** T (1BZ1)
- 2008_04_03 - Thursday: Joint [OOR-OntologySummit2008](#) Panel Discussion: "An Open Ontology Repository: Rationale, Expectations & Requirements - Session-2" - Chair: [MichaelGruninger](#)

Your Visited Pages

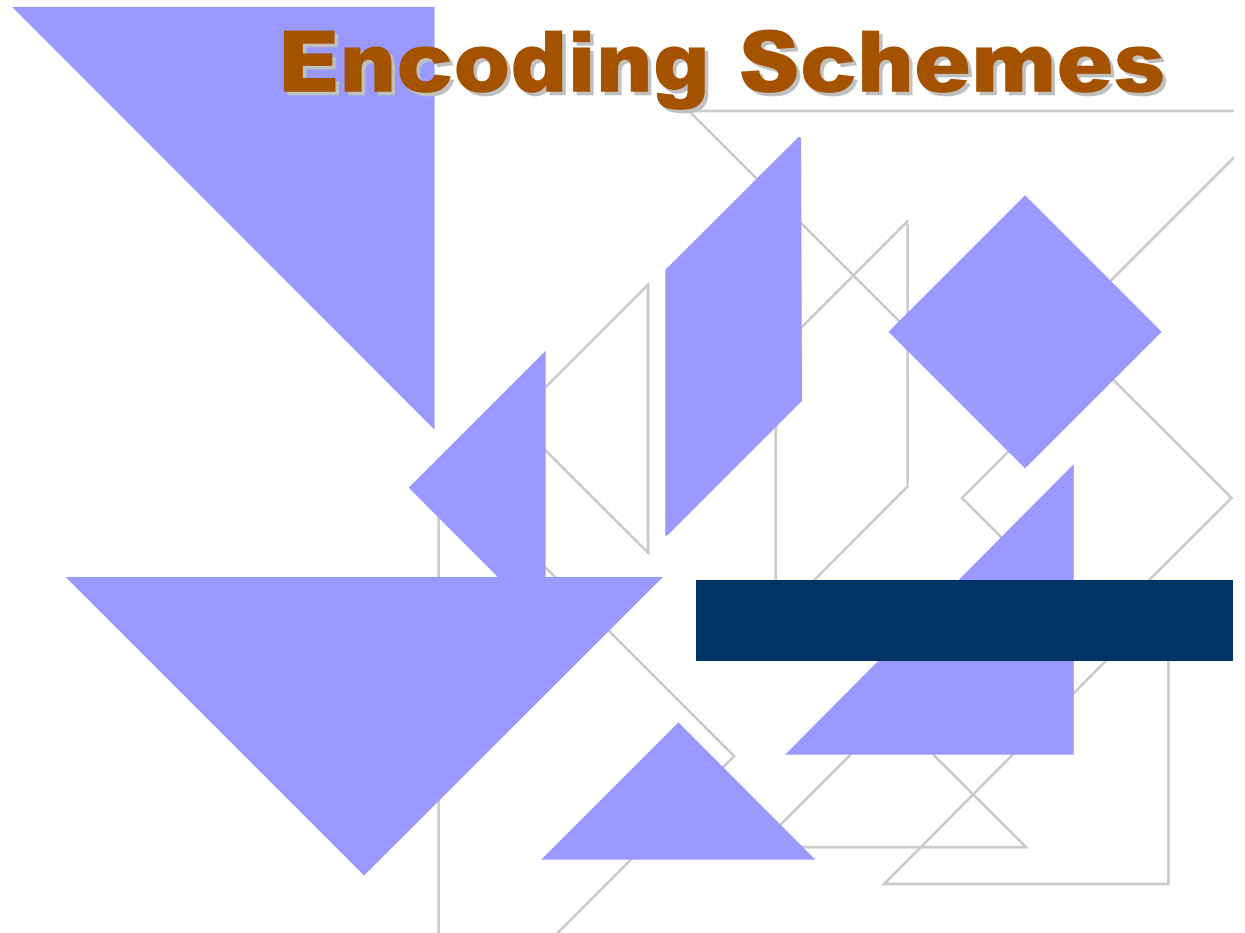
- [OpenOntologyRepository](#)
- [OntologySummit2008](#)
- [ConferenceCall 2008 04 24](#)
- [WikiHomePage](#)

[View Backlinks](#)

Wiki Search

Mixed / Integrated Models

Metadata Registries that Include Schemas and Related Encoding Schemes



(1): NSDL Registry

<http://metadataregistry.org/vocabulary/list.html>

The screenshot shows the NSDL Registry website interface. The main heading is "NSDL REGISTRY" with the tagline "Supporting Metadata Interoperability". A navigation menu includes "sign in / register" and "about". A search bar is present. On the left, a sidebar lists various vocabularies, with "NSDL Education Level Vocabulary" selected. The main content area displays "Vocabulary: NSDL Education Level Vocabulary Concepts" as a table with columns for Label, URI, Status, Last Updated, and Actions. A "Detail" pop-up window is open for the "Middle School" concept, showing its URI, status, and other properties. A text box at the bottom left provides information about the project's aims and contributors.

Label	URI	Status	Last Updated	Actions
Grades Pre-K to 12	http://metadataregistry.org/uri/NSDLEdLv/1023	Published		
Elementary School	http://metadataregistry.org/uri/NSDLEdLv/1024	Published		
Pre-Kindergarten	http://metadataregistry.org/uri/NSDLEdLv/1025	Published		
Middle School	http://metadataregistry.org/uri/NSDLEdLv/1026	Published		
Grade 6	http://metadataregistry.org/uri/NSDLEdLv/1027	Published		

Detail	
Label:	Middle School
URI:	http://metadataregistry.org/uri/NSDLEdLv/1023
Top Concept?:	
Status:	Published

Properties	
rower	Grade 6
rower	Grade 7
rower	Grade 8
note	Term Source: http://www.ed.gov
ader	Grades Pre-K to 12
alternative label	Junior High School

Aims: supporting registration of schemes and schemas; supporting the machine mapping of relationships among terms and concepts in those schemes and schemas.
U.Washington: [Stuart A. Sutton](#)
Cornell Univ: [Diane Hillmann](#), [Jon Phipps](#)

(1): NSDL Registry (cont.)

NSDL REGISTRY

Supporting Metadata Interoperability

The screenshot displays the NSDL Registry interface. On the left, a sidebar lists various schemas, with '9 results' shown. The main content area is titled 'Schema: Show detail for Dublin Core Elements' and features tabs for 'Detail', 'Properties', 'History', and 'Maintainers'. The 'Detail' tab is active, showing the following information:

- Owner:** Dublin Core Metadata
- Label:** Dublin Core Elements
- Namespace:**
 - Name:** dcterms
 - URI:** http://purl.org/dc/elements/1.1/
- Documentation:**
 - URL:**
 - Note:**
 - Tags:**
- Defaults:**
 - Status:** Published
 - Language:** English
- Users +**

On the right, a table lists 15 Dublin Core elements with their labels, URIs, and statuses. The table is titled '15 results'.

Label	URI	Status
Contributor	.../dc/elements/1.1/contributor	Published
Coverage	.../dc/elements/1.1/coverage	Published
Creator	.../dc/elements/1.1/creator	Published
Date	.../dc/elements/1.1/date	Published
Description	.../dc/elements/1.1/description	Published
Format	.../dc/elements/1.1/format	Published
Identifier	.../dc/elements/1.1/identifier	Published
Language	.../dc/elements/1.1/language	Published
Publisher	.../dc/elements/1.1/publisher	Published
Relation	.../dc/elements/1.1/relation	Published
Rights	.../dc/elements/1.1/rights	Published
Source	.../dc/elements/1.1/source	Published
Subject	.../dc/elements/1.1/subject	Published
Title	.../dc/elements/1.1/title	Published
Type	.../dc/elements/1.1/type	Published

<http://metadataregistry.org/vocabulary/list.html>

DCMI Open Metadata Registry Internet Explorer

File Edit View Favorites Tools Help



Google G DCMI Go Bookmarks 1001 blocked Check Settings

Address http://dcmi.kc.tsukuba.ac.jp/dcregistry/navigateServlet Go Links



The Dublin Core Metadata Registry

Promoting the discovery and reuse of metadata.

About
Browse | Search
Administration
Help

v 3.3.8

Browse | [Search](#)

[Language Preference](#)

Browse the registry by classification type

Browse the registry by classification type

Display: Vocabulary Encoding Schemes

Display:

Summary of All Terms

Summary of All Terms

Properties

Classes

Vocabulary Encoding Schemes

Syntax Encoding Schemes

Browse

Summary of DCMI Vocabulary Encoding Schemes

[dcterms:DCMIType](#)

[dcterms:DDC](#)

[dcterms:LCSH](#)

[dcterms:MESH](#)

[dcterms:NLM](#)

[dcterms:TGN](#)

[dcterms:UDC](#)

Please direct questions, comments and suggestions to: webmaster@dublincore.org

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http://dcmi.kc.tsukuba.ac.jp/dcregistry/navigateServlet

2:20 PM



The Dublin Core Metadata Registry

Promoting the discovery and reuse of metadata.

About
Browse | Search
Administration
Help

v 3.3.8

Browse | [Search](#)

[Language Preference](#)

Browse the registry by classification

Display:

Summary of All Terms

[Browse](#)

Properties from different namespaces

Properties that serves as a refinement of another property

Properties (71)

dcterms:abstract	dcterms:accessRight	dcterms:accrualMethod	dcterms:accrualPeriodicity
dcterms:accrualPolicy	dcterms:alternative	dcterms:audience	dcterms:audience
dcterms:bibliographicCitation	dcterms:conformsTo	dc:contributor	dcterms:contributor
dc:coverage	dcterms:coverage	dcterms:created	dc:creator
dcterms:creator	dc:date	dcterms:date	dcterms:dateAccepted
dcterms:dateCopyrighted	dcterms:dateSubmitted	dc:description	dcterms:description
dcterms:educationLevel	dcterms:extent	dc:format	dcterms:format
dcterms:hasFormat	dcterms:hasPart	dcterms:hasVersion	dc:identifier
dcterms:identifier	dcterms:instructionalMethod	dcterms:isFormatOf	dcterms:isPartOf
dcterms:isReferencedBy	dcterms:isReplacedBy	dcterms:isRequiredBy	dcterms:issued

<http://dcmi.kc.tsukuba.ac.jp/dcregistry/navigateServlet>

Vocabulary Encoding Schemes (9)

[dcterms:DCMIType](#)

[dcterms:DDC](#)

[dcterms:IMT](#)

[dcterms:LCC](#)

[dcterms:LCSH](#)

[dcterms:MESH](#)

[dcterms:NLM](#)

[dcterms:TGN](#)

[dcterms:UDC](#)

Syntax Encoding Schemes (11)

[dcterms:Box](#)

[dcterms:ISO3166](#)

[dcterms:ISO639-2](#)

[dcterms:ISO639-3](#)

[dcterms:Period](#)

[dcterms:Point](#)

[dcterms:RFC1766](#)

[dcterms:RFC3066](#)

[dcterms:RFC4646](#)

[dcterms:URI](#)

[dcterms:W3CDTF](#)

Collections (4)

<http://purl.org/dc/dcam/>

<http://purl.org/dc/dcmitype/>

<http://purl.org/dc/elements/1.1/>

<http://purl.org/dc/terms/>

Classes (35)

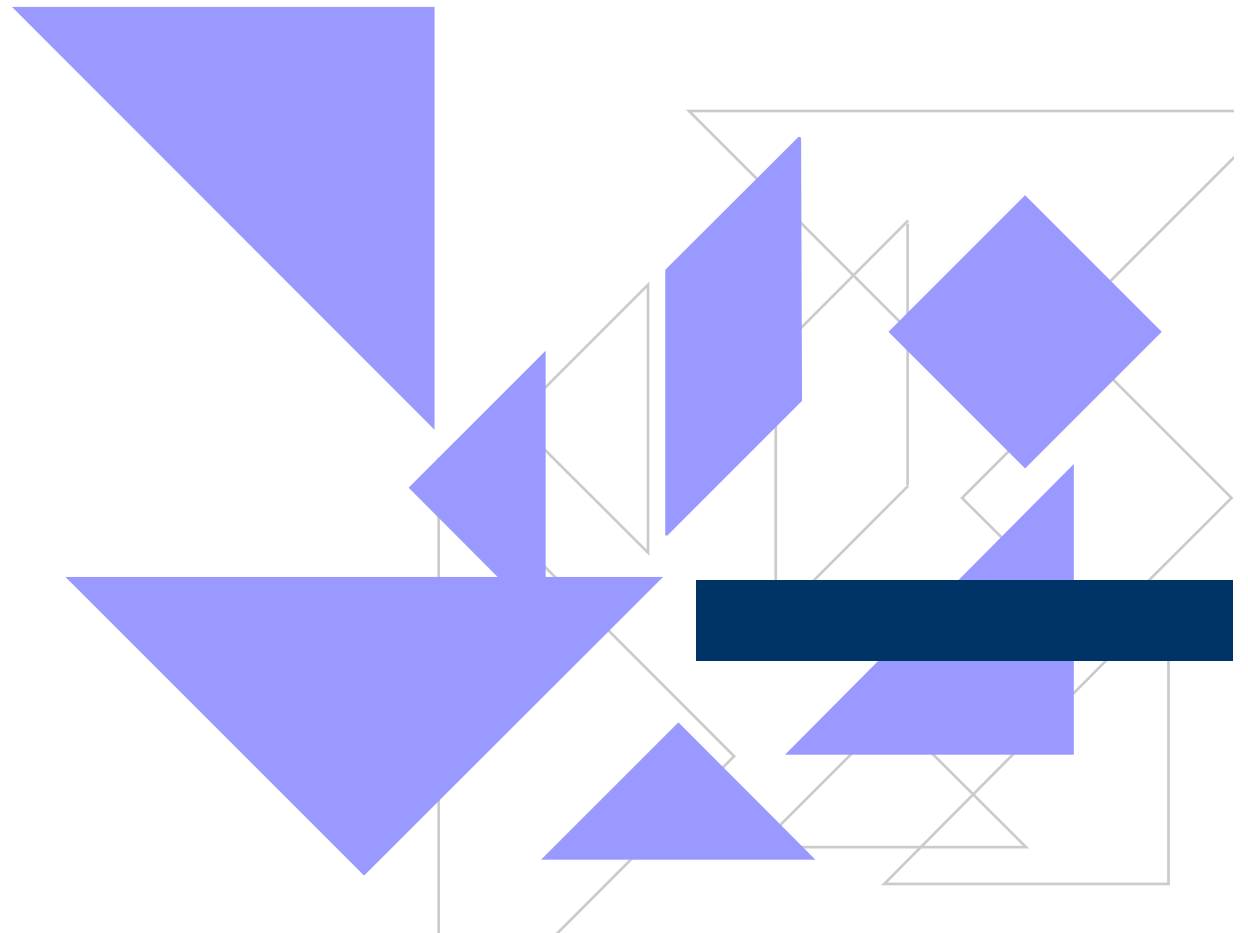
<u>dcterms:Agent</u>	<u>dcterms:AgentClass</u>	<u>dcterms:BibliographicResource</u>
<u>dcmitype:Dataset</u>	<u>dcmitype:Event</u>	<u>dcterms:FileFormat</u>
<u>dcmitype:Image</u>	<u>dcmitype:InteractiveResource</u>	<u>dcterms:Jurisdiction</u>
<u>dcterms:LinguisticSystem</u>	<u>dcterms:Location</u>	<u>dcterms:LocationPeriodOrJurisdiction</u>
<u>dcterms:MediaTypeOrExtent</u>	<u>dcterms:MethodOfAccrual</u>	<u>dcterms:MethodOfInstruction</u>
<u>dcterms:PeriodOfTime</u>	<u>dcterms:PhysicalMedium</u>	<u>dcmitype:PhysicalObject</u>
<u>dcterms:Policy</u>	<u>dcterms:ProvenanceStatement</u>	<u>dcterms:RightsStatement</u>
<u>dcterms:SizeOrDuration</u>	<u>dcmitype:Software</u>	<u>dcmitype:Sound</u>
<u>dcmitype:StillImage</u>	<u>dcmitype:Text</u>	<u>dcam:VocabularyEncodingScheme</u>

Vocabulary Encoding Schemes (9)

<u>dcterms:DCMIType</u>	<u>dcterms:DDC</u>	<u>dcterms:IMT</u>	<u>dcterms:LCC</u>
<u>dcterms:LCSH</u>	<u>dcterms:MESH</u>	<u>dcterms:NLM</u>	<u>dcterms:TGN</u>
<u>dcterms:UDC</u>			

<http://dcmi.kc.tsukuba.ac.jp/dcregistry/navigateServlet>

Integrated Registries



ISO/IEC 11179 Metadata Registry (MDR)

◆ *Framework (Part 1)*

- introduces fundamentals that are essential to the understanding of the whole set of standards

◆ *Classification (Part 2)*

- discusses registering and administering all or part of a classification scheme
- (CLASSIFICATION schemes include: key words, thesauri, taxonomies, and ontologies)

◆ *Registry metamodel and basic attributes (Part 3)*

- specifies a conceptual model for a metadata registry

<http://metadata-standards.org/11179/>

ISO/IEC 11179 Metadata Registry (MDR)

- ◆ *Formulation of data definitions (Part 4)*
 - provides guidance on how to develop unambiguous data definitions
- ◆ *Naming and identification principles (Part 5)*
 - states the formal naming and identification of metadata items
- ◆ *Registration (Part 6)*
 - defines identification, quality, and provenance of metadata in a metadata registry

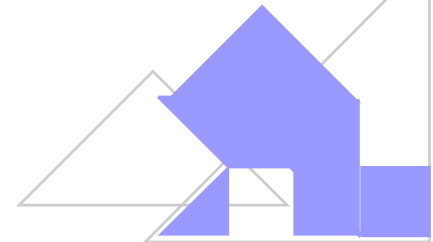
<http://metadata-standards.org/11179/>

Flexibility

- ◆ Recognizes that not all metadata registries will have the need (or the means) to support all of the attributes specified for the metadata model in ISO 11179 Part 3
- ◆ Allows sufficient flexibility for the Registration Authority to specify the requirements in accordance with the standard and “adopt a stricter or less strict level of conformance, levying corresponding requirements on Submitting Organizations”
-- ISO/IEC 11179, 2004: Part 6: 9

ISO 11179 Data Element Registries

- ◆ [US National Cancer Institute - Cancer Data Standards Repository \(caDSR\)](#) 
- ◆ [Australian Institute of Health and Welfare - Metadata Online Registry \(METeOR\)](#)
- ◆ [US Department of Justice - Global Justice XML Data Model GJXDM](#)
- ◆ [US Environmental Protection Agency - Environmental Data Registry](#)
- ◆ [US Health Information Knowledgebase \(USHIK\)](#)
- ◆ [US National Information Exchange Model NIEM](#)
- ◆ [Minnesota Department of Education Metadata Registry \(K-12 Data\)](#)
- ◆ [Minnesota Department of Revenue Property Taxation \(Real Estate Transactions\)](#)





RELATED LINKS

Infrastructure > caCORE > Cancer Data Standards Repository (caDSR)

- PUBLIC ACCESS: CDE Browser and Form Builder
- UML Model Browser
- NCI BioPortal
- NCI Thesaurus
- NCI Metathesaurus

- USER ACCOUNT ACCESS: Curation Tool
- Sentinel Tool
- caDSR Admin Tool
- caDSR Training

- SIW CURRENT RELEASE (Semantic Integration Workbench)
- Archived SIW 3.1
- caDSR HAPPY.jsp (caCORE caDSR API)
- caDSR Freestyle Search - Beta Release

DOWNLOADS [more...]

caDSR Repository

Cancer Data Standards Repository (caDSR)



The NCICB Resource for Common Data Elements

One of the problems confronting the biomedical data management community is the panoply of ways that similar or identical concepts are described. Such inconsistency in data descriptors (metadata) makes it nearly impossible to aggregate and manage even modest-sized data sets in order to be able to answer basic questions. The NCI, together with partners in the research community, develops common data elements (CDEs) that are used as metadata descriptors for NCI-sponsored research and for the caCORE applications. The caCORE objects are represented by UML Models. The UML Model is used to facilitate a semi-automated load from caCORE UML into ISO/IEC 11179 Administered Components. This is discussed in more detail in the [Software Developers Toolkit \(SDK\)](#). The caDSR is a database and tool set that the NCI and its partners use to create, edit and deploy the CDEs.

Delve deeper into "Cancer Data Standards Repository (caDSR)"

- [caDSR Content Creation](#)
- [Application Developer Zone](#)
- [ISO/IEC 11179 Standard](#)
- [Business Rules](#)
- [caCORE Software Planning](#)
- [FAQ](#)

Cancer Data Standards Repository (caDSR) --CDE (Common Data Element) Browser

The screenshot displays the CDE Browser interface. On the left is a tree view of caDSR Contexts, with a red box highlighting the 'caBIG (NCI cancer Biomedical Informatics...)' section, which includes 'Classifications', 'Protocol Forms', and 'Catalogue of Published Forms'. The main area features a 'Data Element Search' header and a search form with radio buttons for 'Exact phrase', 'All of the words', and 'At least one of the words'. Below the search form are 'Search', 'Clear', and 'New Search' buttons. A yellow callout box points to the search area with the text: 'supports browsing, searching, and exporting the CDEs (Common Data Elements) within or across contexts'. At the bottom, a red banner contains the URL: <http://umlimodelbrowser.nci.nih.gov/umlimodelbrowser/>

supports browsing, searching, and exporting the CDEs (Common Data Elements) within or across contexts

<http://umlimodelbrowser.nci.nih.gov/umlimodelbrowser/>

Cancer Data Standards Repository (caDSR) --CDE (Common Data Element) Browser

◆ Important additional items:

- Form -- a collection of CDEs
- Protocol -- a collection of Forms
- For clinical trials applications
 - ◆ Forms correspond to Case Report Forms (CRFs)
 - ◆ Protocols correspond to a clinical trial protocol

<http://umlmrowser.nci.nih.gov/umlmrowser/>

Cancer Data Standards Repository (caDSR) -- UML (Unified Modeling Language) Model Browser

The screenshot displays the UML Model Browser interface. On the left, a tree view shows the hierarchy of caDSR contexts, with 'BehavioralMeasure' under 'com.westat.cagrid.brpmeasures.domain' circled in blue. A blue arrow points from this circle to the search results. The main area shows a search for 'BehavioralMeasure' resulting in 3339 matches. Below the search bar, there are filters for Class Name, UML Project Name, Sub Project Name, and Package Name, all set to 'ALL'. A yellow callout box points to the search bar and contains the text: 'supports browsing, searching, and exporting the classes, attributes, and relationships between classes of a UML domain model'. Below the filters, there are tabs for 'Classes' and 'Attributes', with 'Classes' selected and circled in red. The results table shows the following data:

Class Name	Project Name	Project Version
ArrayDesign	caArray_1.1	1.1

At the bottom of the interface, there is a red banner with the URL: <http://umlmodelbrowser.nci.nih.gov/umlmodelbrowser/>



Classes

Attributes

Sort order : Class Name [Ascending]

1 - 40 of 3339 Next 40

model, please click "Refresh tree"

Refresh tree

caDSF Contexts

caDSF

BF

ca

InvasiveBreastCarcinomaNeoplasmHistologicType

GeneOntology

InvestigationalNewDrug

RadicalProstatectomyProstateSurgicalPathologySpecimen

Department

ChemicalClass

InvivoResult

TimeRecord

StudyOrganization

ExocrinePancreasAccessionCharacteristics

Study

entityDescription

Toxicity

SynopticSurgicalPathologyReport

VariationReporter

presentation

Class Name	Project Name	Project Version	Project Workflow Status	Sub Project Name	Package Name
ArrayDesign	caArray_1.1	1.1	RELEASED	mageom 1.1	gov.nih.nci.mageom.domain
Msi	CoCaNUT	1	RELEASED		edu.princeton.cocanut.domain
Atom	caCORE_3.2	3.2	RELEASED	EVS	gov.nih.nci.evs.domain
ActivitySummary	caTRIP Tumor Registry	1	RELEASED	Tumor Registry	edu.duke.cabig.tumorregist
ListProcessing	NHLBI	1	RELEASED	ProteinDB	edu.jhu.icm.proteindb
Experiment2DGelList	NHLBI	1	RELEASED	ProteinDB	edu.jhu.icm.proteindb
RnaAnnotation	CoCaNUT	1	RELEASED		edu.princeton.cocanut.domain
InvasiveBreastCarcinomaNeoplasmHistologicType	caTRIP Annotation Engine	1	RELEASED		edu.pitt.cabig.cae.domain
GeneOntology	caCORE_3.2	3.2	RELEASED	caBIO	gov.nih.nci.cabio.domain
InvestigationalNewDrug	caAERS	1	RELEASED		gov.nih.nci.cabig.caaers.dc
RadicalProstatectomyProstateSurgicalPathologySpecimen	CAP Cancer Checklists	1	RELEASED		edu.upmc.opi.cabig.caties.
Department	caTISSUE Core	1	RETIRED ARCHIVED		edu.wustl.catissuecore.dor
ChemicalClass	caMOD	2.1	RELEASED		gov.nih.nci.camod.domain
InvivoResult	caMOD_2.5	2.5	RELEASED		gov.nih.nci.camod.domain
TimeRecord	caNano	1	RELEASED	caNanoDB	edu.wustl.sccne.caNanoDB
StudyOrganization	C3PR	2	RELEASED		edu.duke.cabig.c3pr.domain
ExocrinePancreasAccessionCharacteristics	caTISSUE CAE	1.2	RELEASED		edu.pitt.cabig.cae.domain
Study	C3PR	2	RELEASED		edu.duke.cabig.c3pr.domain
entityDescription	LexBIG	2.2	RELEASED	LexBIGSlice_2.2	org.LexGrid.CommonTypes
Toxicity	Potential CDEs for Reuse	1	RELEASED	Hematopoietic Stem Cell Transplantation	net.agnis.outcomes.domain
SynopticSurgicalPathologyReport	CAP Cancer Checklists	1	RELEASED		edu.upmc.opi.cabig.caties.
VariationReporter	caIntegrator 2.1	2.1	RELEASED		gov.nih.nci.caintegrator.dor
presentation	LexBIG	2.2	RELEASED	LexBIGSlice_2.2	org.LexGrid.Concepts

<http://umlimodelbrowser.nci.nih.gov/umlimodelbrowser/>

Selected Project

Public ID:	2528431
Version:	3.2
Long Name:	caCORE 3.2
Short Name:	caCORE 3.2
Definition:	Version 3.2 of caCORE models.
Workflow Status:	Reviewed and approved administered component
Registration Status:	

Reference Documents

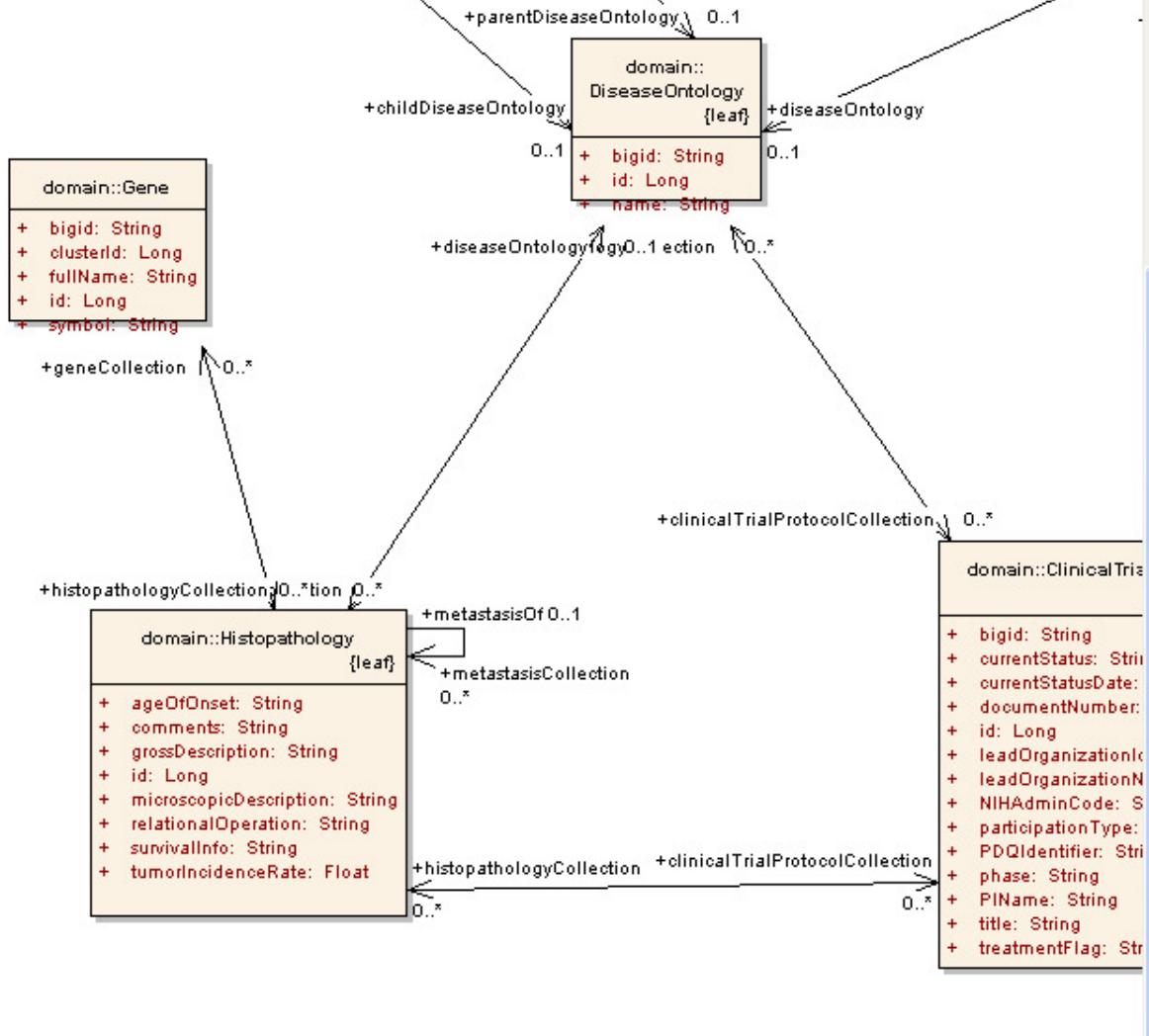
Document Name	Document Type	Document Text	URL	Attachments
caDSR/caBIO/COMMON 3.2 HTML	Class Diagram	caCORE 3.2 UML Model in HTML format for caDSR, COMMON and caBIO	http://ncicb.nci.nih.gov/NCICB/content/ncicblfs/EA/caCORE3-2Model/index.htm	
caDSR/caBIO/COMMON XMI	XMI File	The caCORE domain models in XMI.	http://ncicb.nci.nih.gov/NCICB/content/ncicblfs/caCORE32eapandxmi/caCORE3-2.xmi	
caDSR/caBIO/Common 3.2 EAP	REFERENCE	The caCORE .eap file containing the Data and Logical models for caDSR,	http://ncicb.nci.nih.gov/NCICB/content/ncicblfs/caCORE32eapandxmi/caCORE3-2.eap	



Logical View

- Data Model
- Logical Model
 - DIAGRAMS
 - CABIO
 - CADSR
 - COMMON
 - gov
 - java

- CABIO
- Agent-Anomaly
 - CDNA-Object
 - CDNA1
 - CDNAData
 - ClinicalTrialProtocol
 - CloneRelativeLocation
 - DatabaseGrossReference
 - DiseaseOntology
 - ExpressionFeature
 - Gene
 - Gene-ExpressionMeasurement
 - HomologousAssociation
 - GeneOntology
 - GeneRelativeLocation
 - GenericReporter
 - Histopathology-Disease
 - HomologousAssociation



class diagram: DiseaseOntology

Author: The Administrator
 Project: Version: 1.0; Locked: false
 Dates: Created: 2/3/2005 1:02:31 PM; Modified: 6/14/2005 12:21:06 PM;
 UUID: {47C124E7-3B2A-4cd3-A215-21CDCE0AAFFF}

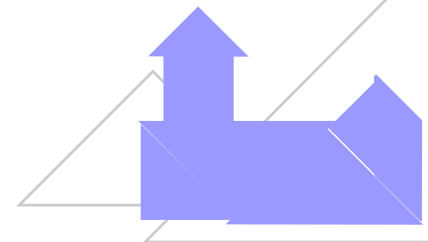
Projects extending ISO 11179

- ◆ XMDR (eXtended MetaData Registry [XMDR] Project)
- ◆ NIST XDS (Cross-Enterprise Document Sharing) Public Registry Test Facility

XMDR Project Goals

- **Extend ISO-IEC 11179 ed. 2 Metadata Registry Standard**
 - ◆ for increasingly large, complex databases and software systems
 - ◆ particularly for large organizations like EPA, NCI, DOD, etc.
- **Incorporate and manage evolution of concept information**
 - ◆ Code sets of valid values, terminologies, thesauri, ontologies
 - ◆ A shared metamodel for **both metadata and concepts**
- **support software inference, aggregation, and agent services**

*In fact concerning
registry of registries/collections*



XMDR Goals (cont.)

- ◆ **Improve representation of relationships**
 - between data (e.g., data elements and value domains)
 - and between concept structures (e.g., ontologies, taxonomies, thesauri, terminologies, etc.)

- ◆ **Register and manage complex semantic metadata** (i.e., concepts) in more formal, systematic ways (e.g., description logic) to facilitate machine processing of semantics in order to:
 - link together data elements and terms across multiple systems
 - discover relationships among data elements, terms, and concepts
 - create and manage names, definitions, terms, etc.
 - **support software inference, aggregation, and agent services**

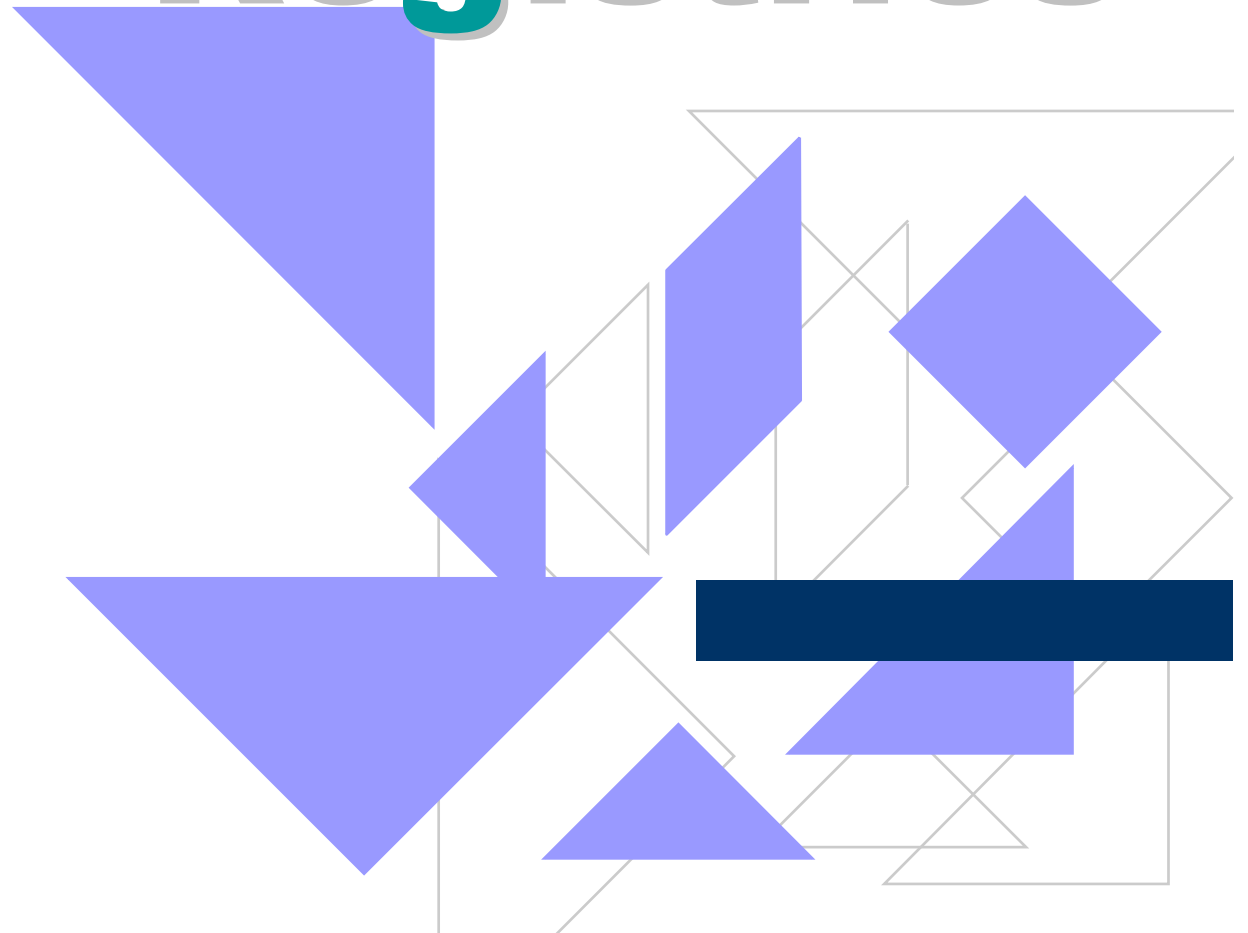
XMDR Goals (cont.)

- ◆ **Add more rigorous and formal specification for**
 - concepts and concept systems (including ontologies)
 - relationships between metamodel components
 - formal axioms for conceptual and structural relationships

- ◆ **Use concepts to unify different types of metadata**
 - evolution requires increasing granularity and detail
 - combine strengths of data dictionaries/registries and ontologies



Service Registries



Web Services defined

- ◆ A **Web service** is a software system designed to support interoperable machine-to-machine interaction over a network.
 - E.g., Web APIs that can be accessed over a network and executed on a remote system hosting the requested services.

-- <http://www.w3.org/TR/ws-gloss/>



Sometimes it is around collections' registrations

The JISC Information Environment Service Registry (IESR)

- machine readable registry of electronic resources
- contains *information about* these electronic resources, and details of *how to access* them

<http://iesr.ac.uk/>



The Nature of Web Services

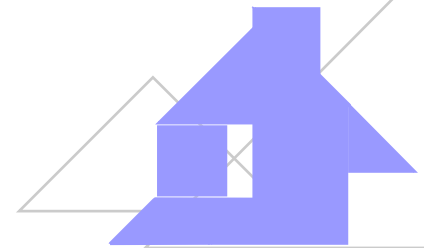
◆ Decentralized

- new operating systems, applications, and APIs are equipped with built-in functionalities or tools for allowing businesses or organizations to create their own business registries for intranet or extranet use

◆ More dynamic changes

- Tracking, managing, and differentiating the changes are essential

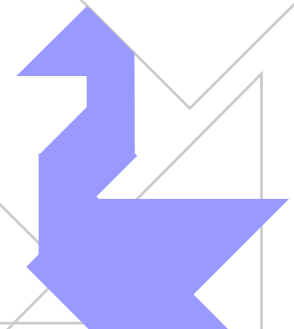
◆ More real-time search and discovery requests/responses



Terminology Services

- ◆ **Terminology Services (TS)** are a set of services that present and apply vocabularies, both controlled and uncontrolled, including their member terms, concepts and relationships.
 - searching, browsing, discovery, translation, mapping, semantic reasoning, subject indexing and classification, harvesting, alerting, etc.

-- Tudhope, Koch, and Heery, 2006.
Terminology Services and Technologies.
<http://www.ukoln.ac.uk/terminology/JISC-review2006.html>



Functions of terminology-based and ontology-based Services (1)

◆ User services

- Search, link, browse, identifying

◆ Machine user services

- querying using various query languages: SPARQL, REST, SOAP
- Using an API to programmatically create, view, and modify repository contents
- Defining machine services in appropriate machine interpretable format, such as OWL-S



Functions of terminology-based and ontology-based Services (2)

◆ Tool services

- Searching available tools
- Downloading
- Identifying

◆ Validation services

◆ OWL services

- Browsing, querying, indexing
- Services for external search engines and entity extractors to index and mine contents
- Visualization services
- Annotation services
- Semantic search
- Crawling and indexing of contents

◆ Reasoning services

- (ontologies)
- Import Services
 - ◆ Support importing of modular ontologies into larger ontologies

◆ Semantic Mapping Services

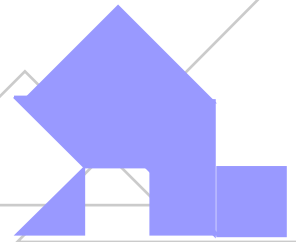
- Schema Translation
- Visually-aided Mapping
- Disambiguation
- Terminology to Concept Mapping Services

◆ Ontology and Instance Versioning Services

-- based on Leo *Obrst*, 2008, *Toward an Ontology Repository*

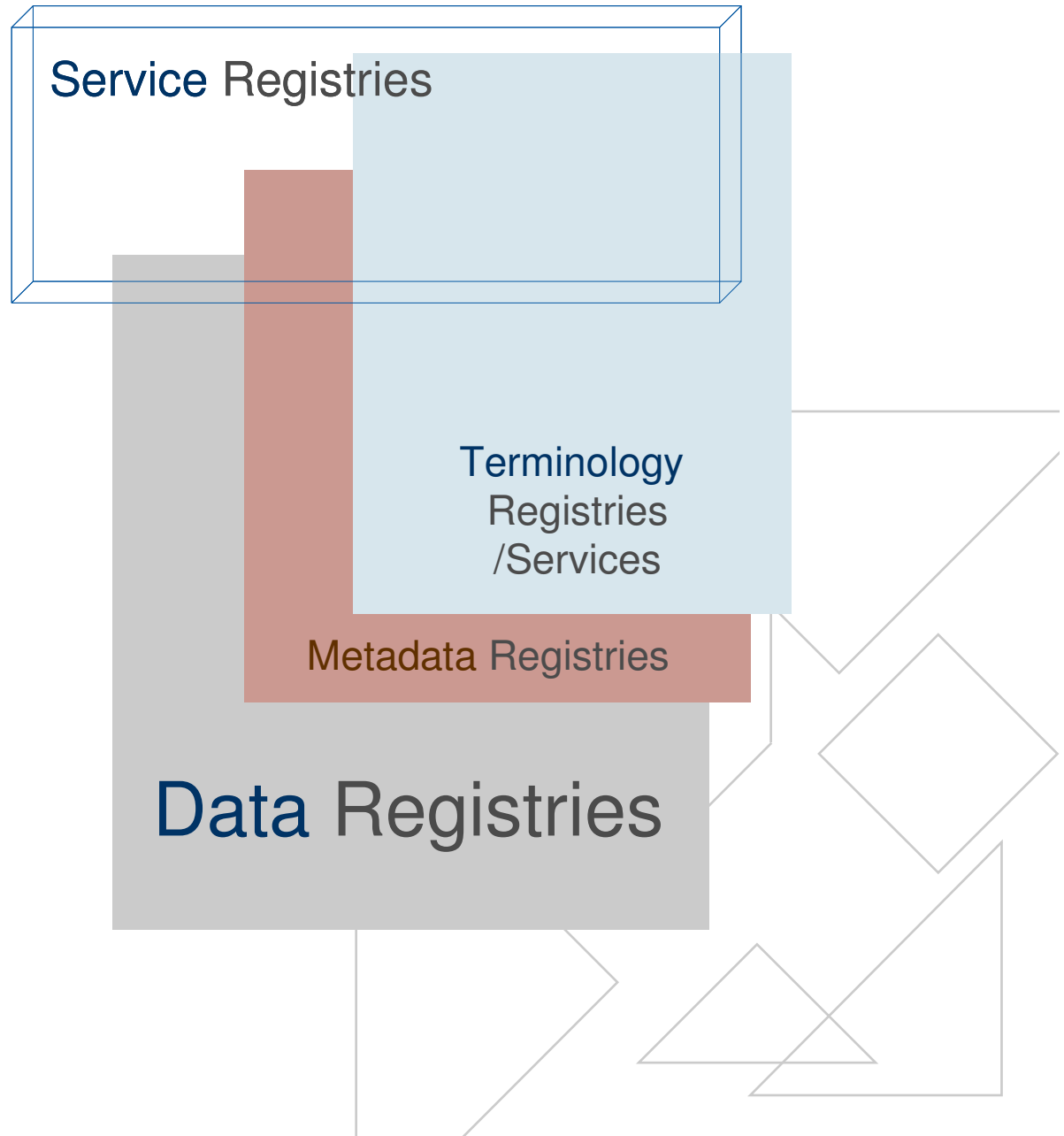
Reasons to have a service registry

- ◆ to provide information documenting Web services across stages
- ◆ to periodically keep track of the business and Web service life-cycle
- ◆ to aid in finding services of interest
- ◆ to support real-time search queries across multiple data registries and business registries



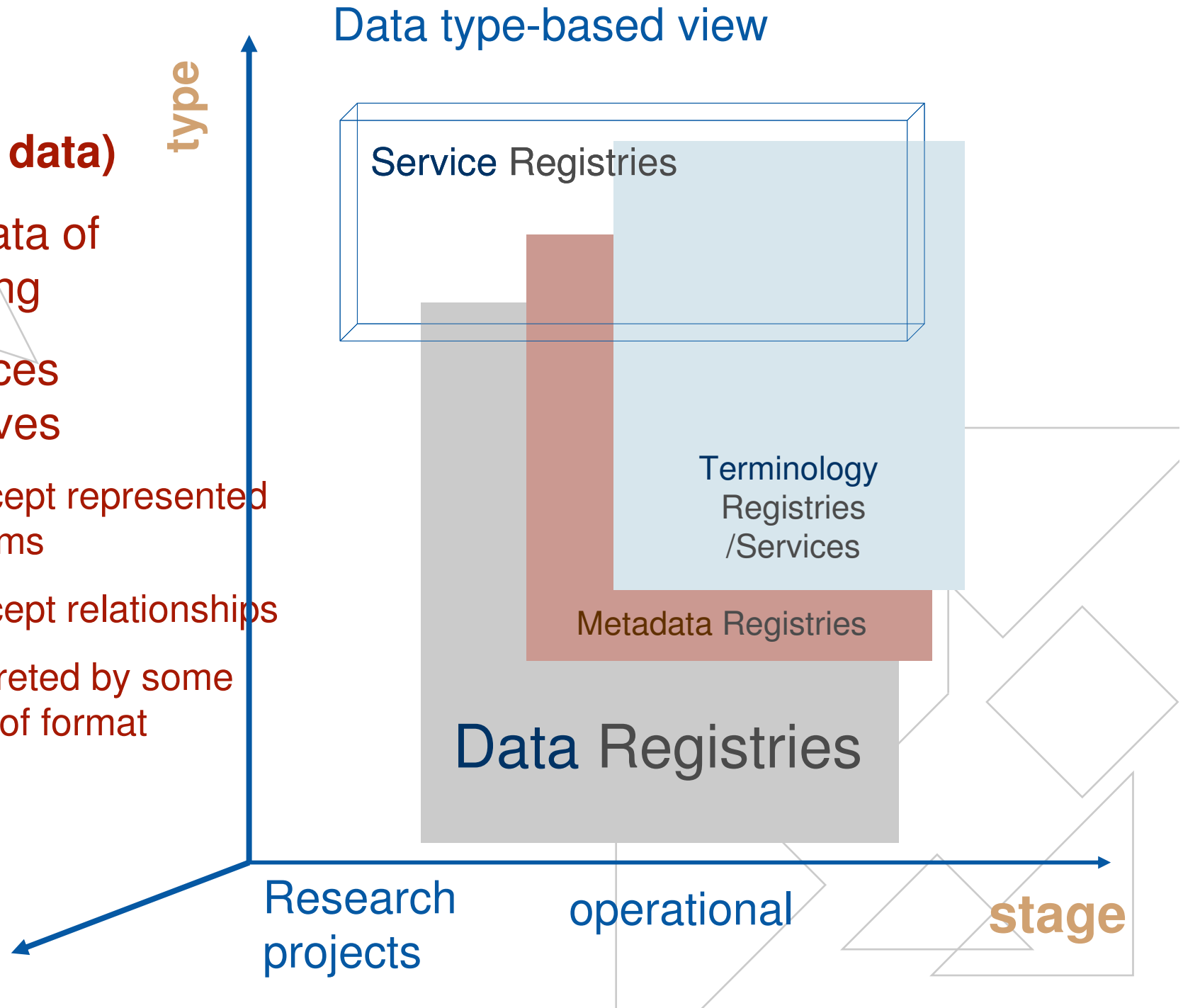
Summary

- ◆ Synergies and differences



WHAT (type of data)

- metadata of something
 - resources themselves
 - concept represented by terms
 - concept relationships
- interpreted by some kinds of format



Data type-based view

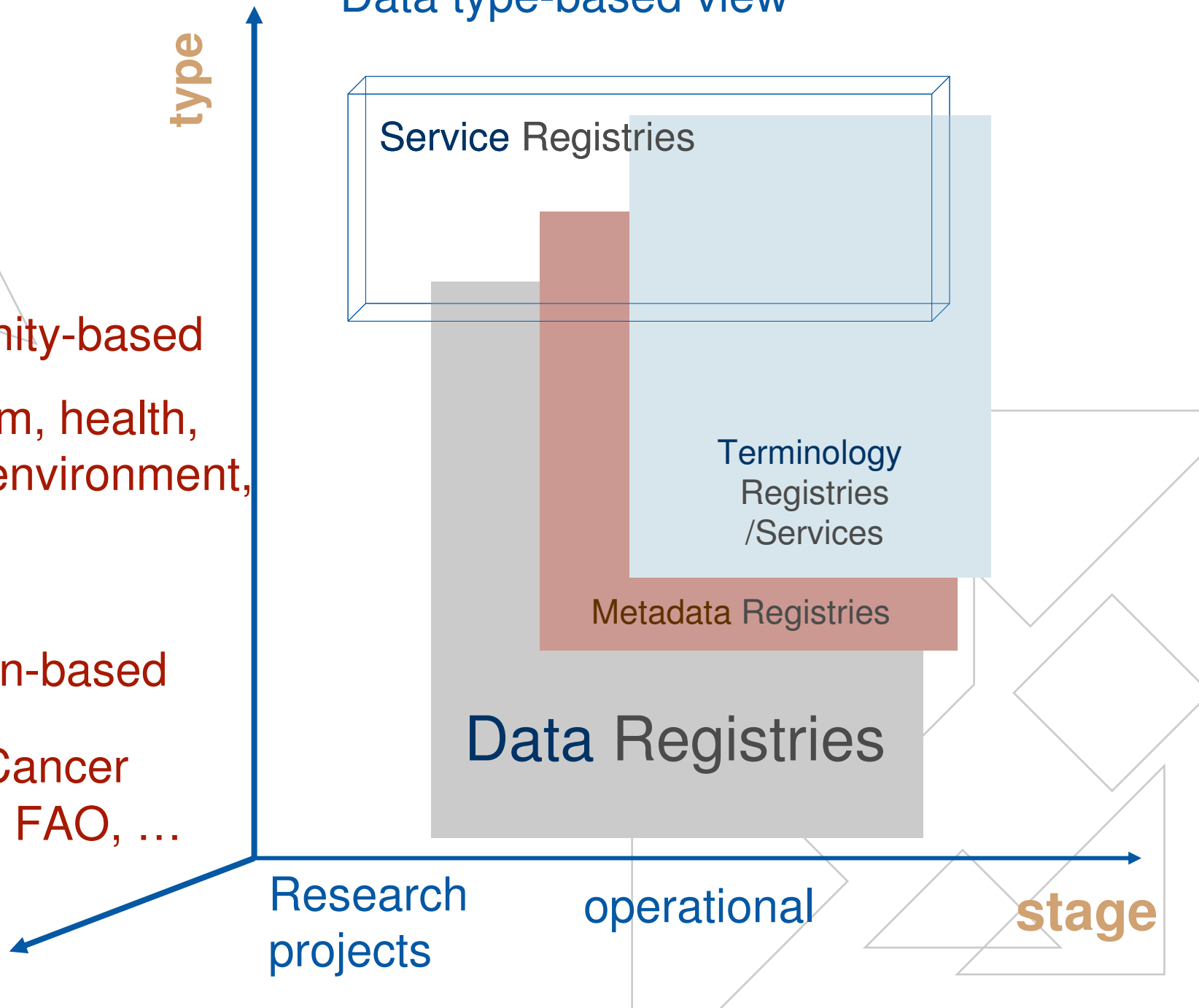
WHERE

Community-based

- museum, health, justice, environment, ...

Institution-based

- EPA, Cancer Institute, FAO, ...



Data type-based view

type

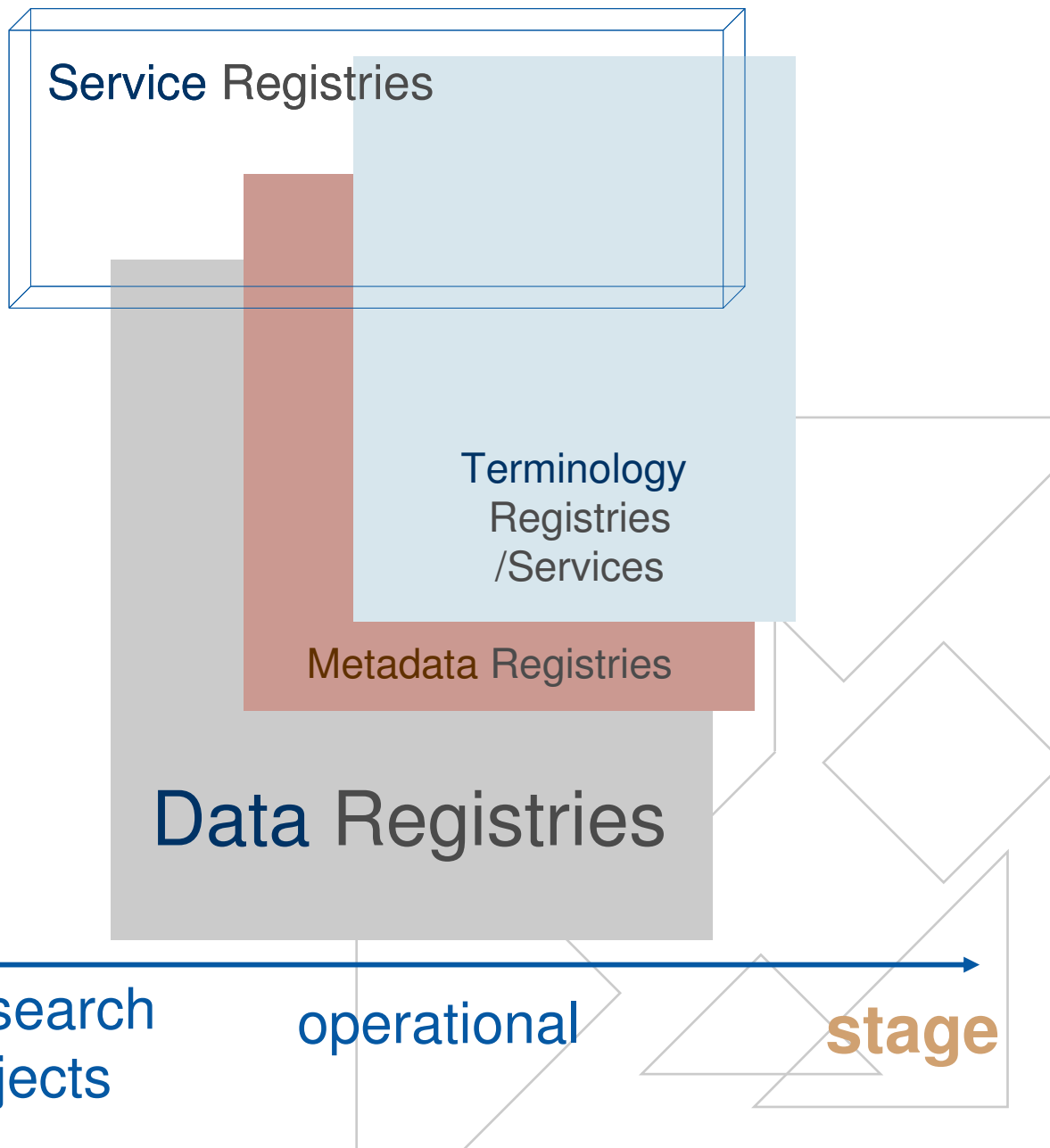
WHO (users and contributors)

- Application developers
- Vocabulary developers
- Content providers
- End-users
- Software agents

Research projects

operational

stage

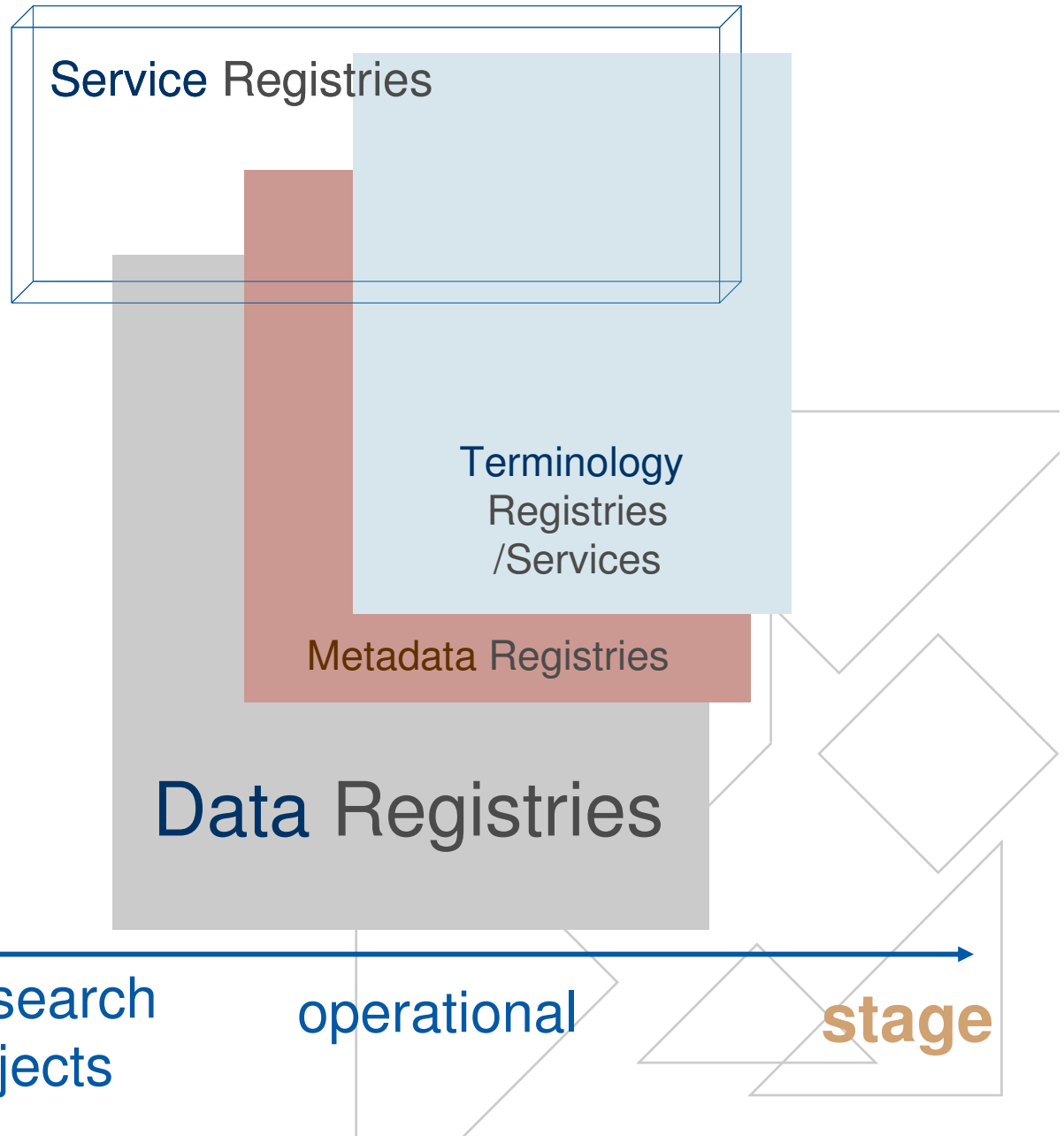


Data type-based view

type

WHEN
(when they are needed)

- Design time
- Run time
 - dynamic
 - real-time
 - on-the-fly

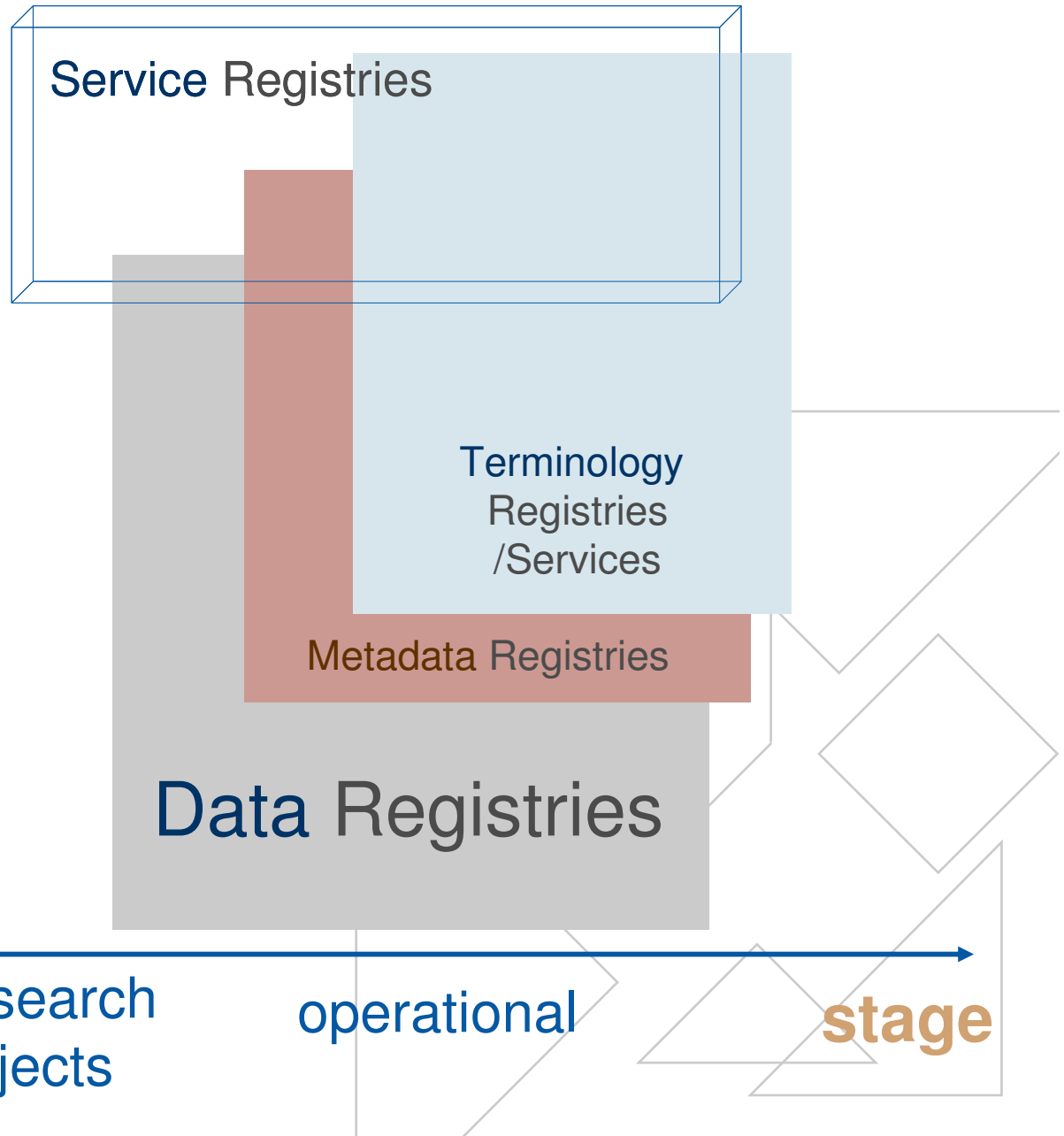


Data type-based view

type

HOW (functions)

- persistent storage
- management
- [M2M] services
- and



and many more variables

- ◆ Scale / size
- ◆ Data models to handle
 - Hidden semantics
 - Relationship types
- ◆ Indexing and analysis requirements
- ◆ Extracting and downloading capabilities
- ◆ Decentralization capabilities
- ◆



Open Questions

- ◆ Synergies and differences?
- ◆ Should registries be set by task/institutions or by types?
- ◆ Are upper registries needed?

