



# **SKOS: Past, Present Future\***

**\*and a little bit of History, Architecture and Engineering**

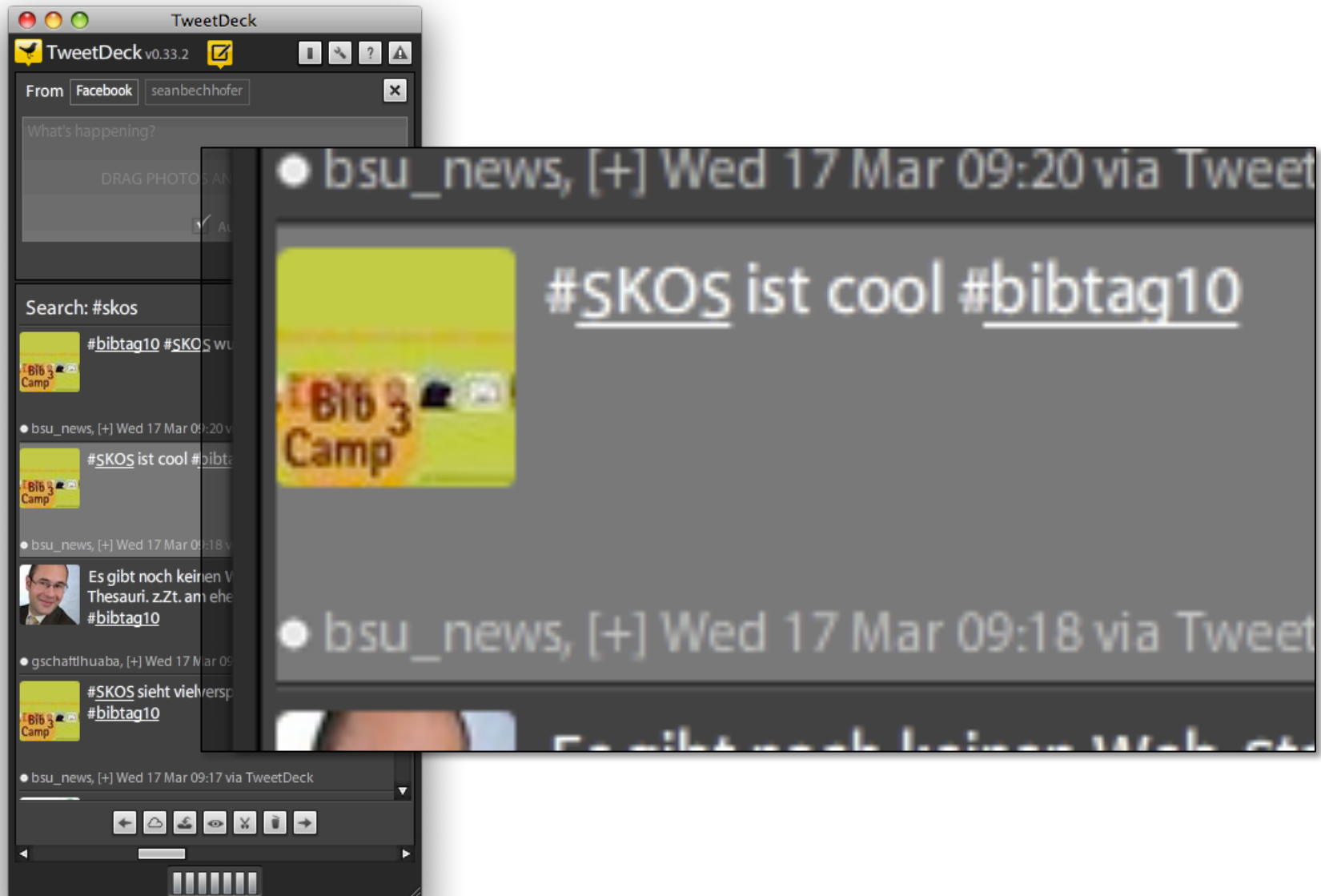
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[@seanbechhofer](https://twitter.com/seanbechhofer)

# The view from the twitterati



# SKOS

- Simple Knowledge Organisation System
- A common data model for sharing and linking knowledge organization systems via the Web.
- Why should *you* care?





- Publication of knowledge organisation systems
- Low cost entry to participation in the Semantic Web/Data Web
- Lightweight integration capabilities
- Mapping support

**Simplicity**  
**Standardisation**  
**Extensibility**

# Bridging the Gap

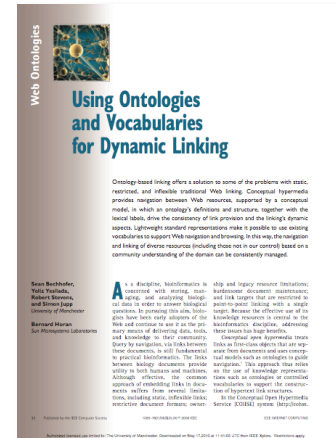
- *Bridging the Gap:*  
Bates, Marchionini etc.
- My introduction to Library Sciences and Thesauri
- Facilitating communication and sharing between people with possibly differing viewpoints
- “...*Bridge* between different communities of practice...”
- A metaphor to (ab)use....
  - “don’t look a gift metaphor in the mouth” (a meta-metaphor?)



*SKOS REC*

# Personal History

- Conceptual Hypermedia
- Conceptual models generating link structures for hypermedia
- Use of DAML+OIL/OWL
  - Standardised, published sources, existing infrastructure and tooling
  - But not appropriate *navigational* structures
- The need for SKOS



S. Bechhofer, Y. Yesilada, R. Stevens, S. Jupp, and B. Horan. **Using Ontologies and Vocabularies for Dynamic Linking** *IEEE Internet Computing* 12(3), p.32--39 2008  
<http://dx.doi.org/10.1109/MIC.2008.68>

# What goes around comes around

The screenshot shows a web browser window with the following elements:

- Browser Tab:** Glossary - PoolParty Blog
- Address Bar:** <http://poolparty.punkt.at/glossary?filter=84>
- Header:** The PoolParty logo is on the left, and a navigation menu with buttons for OVERVIEW, WHAT'S NEW?, LEARN, PRICING, TRY IT, DOWNLOADS/LINKS, COMPANY, and CONTACT is on the right. Below the logo is the tagline "THESAURUS MANAGEMENT FOR THE SEMANTIC WEB".
- Main Content:**
  - GLOSSARY:** A section with a dashed line separator. It contains a paragraph explaining the glossary's purpose and a list of terms: tag recommender, tagging, taxonomies, taxonomy, text extractor, thesauri, thesaurus, thesaurus import, thesaurus importer, thesaurus management, thesaurus management system, thesaurus specification, and thesaurus validator.
  - SEARCH:** A search bar with a "GO" button.
  - TOURS:** A section with a dashed line separator containing links for Screen Casts and Screen Shots.
  - CUSTOMERS:** A section with a dashed line separator containing a link for Application Scenarios & Use Cases.
  - RESOURCES:** A section with a dashed line separator containing links for User Manual, Training, FAQs, and Az Glossary.

# SKOS the Brave

W Bro-Skos - Wikipedia

http://br.wikipedia.org/wiki/Bro-Skos

Amprouiñ Beta Krouiñ ur gont pe kevreañ

[pennad](#) [kaozeadenn](#) [kemmañ](#) [istor](#)

## Bro-Skos


Diwar Wikipedia, an holloueziadur digor


 **Labour zo d'ober c'hoazh a-raok peurechuiñ ar pennad-mañ.** Ma fell deoc'h reiñ un tamm skoazell, krogit e-barzh. Mar karfec'h reiñ hoc'h ali ha netra ken, grit 'ta e [pajenn ar gaozeadenn](#).

**Skos** pe **Bro-Skos**, pe c'hoazh **Alba**, **Alban** diwar hec'h anv [gouezelek](#), a zo ur vro geltiek e lodenn norzh [Breizh-Veur](#). En tu-hont d'an douar bras ez eus 790 [enezenn](#) bennak. [Dinedin](#) eo ar gêrbenn, met [Glasgow](#) eo ar gêr vrasañ. [Aberdeen](#) ha [Dundee](#) eo an div gêr bouezusañ war-lerc'h, dirak [Stirling](#), [Perth](#), hag [Inverness](#).


Ouzhpenn saozneg e vez komzet gouezeleg, en inizi ar c'hornog dreist-holl, ha [skoteg](#), ur yezh kar d'ar saozneg. [Robert Burns](#), barzh brudetañ **Bro-Skos**, a skrive e saozneg.

**Scotland** ([Saozneg](#) ha [skoteg](#))  
**Alba** ([Gouezeleg Skos](#))

  
Banniel Skos

  
Skoed Skos

*Ger-stur: Nemo me impune lacessit*  
(*brezhoneg: Den ne'm dae hep droug*)





# Midwifery



# Knowledge Organisation Systems

*Thesaurus*: Controlled vocabulary in which concepts are represented by preferred terms, formally organised so that paradigmatic relationships between the concepts are made explicit, and the preferred terms are accompanied by lead-in entries for synonyms or quasi-synonyms.

Thesaurus

Taxonomy

Authority File

Synonym Ring

Controlled Vocabulary

Related Terms

Hierarchy

Preferred Terms

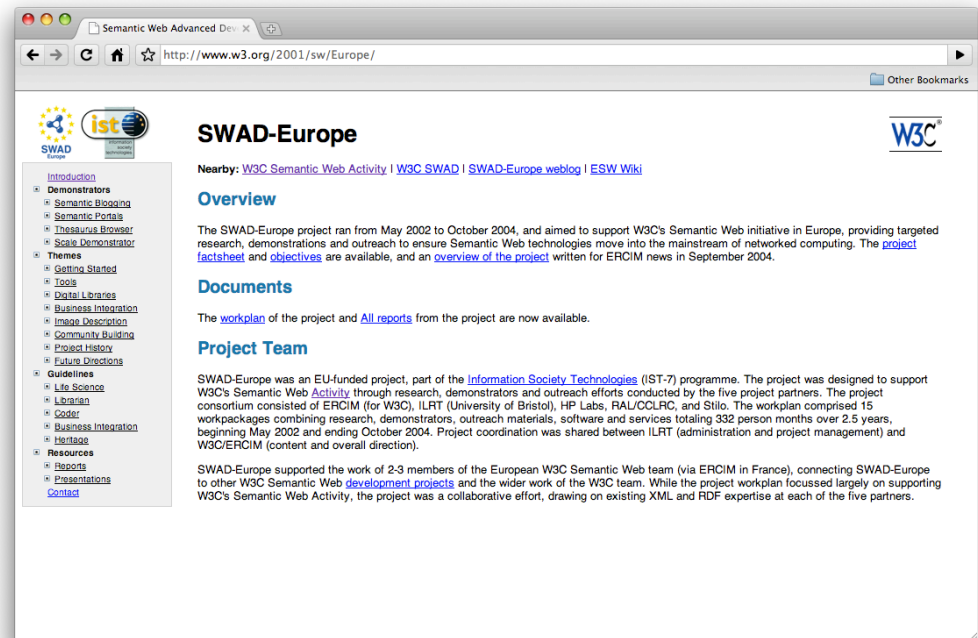
Equivalent Terms

Collection of Terms

*Controlled vocabularies*: designed for use in classifying or indexing documents and for searching them.

# SWAD Europe

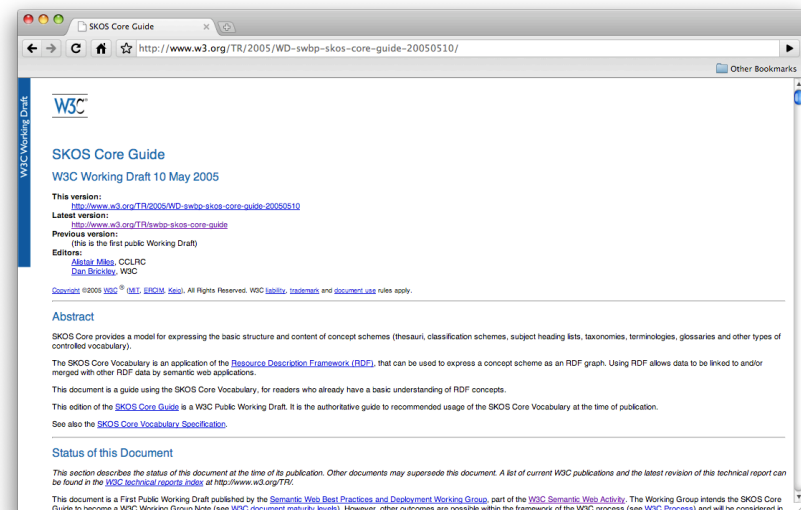
- SWAD Europe Thesaurus Activity
- Early work on RDF vocabularies for describing thesaurus data
  - SKOS Core
  - Usage guides
- Implementation work
  - Thesaurus services



# Sem Web Best Practices & Deployment

*...hands on support for developers of Semantic Web Applications*

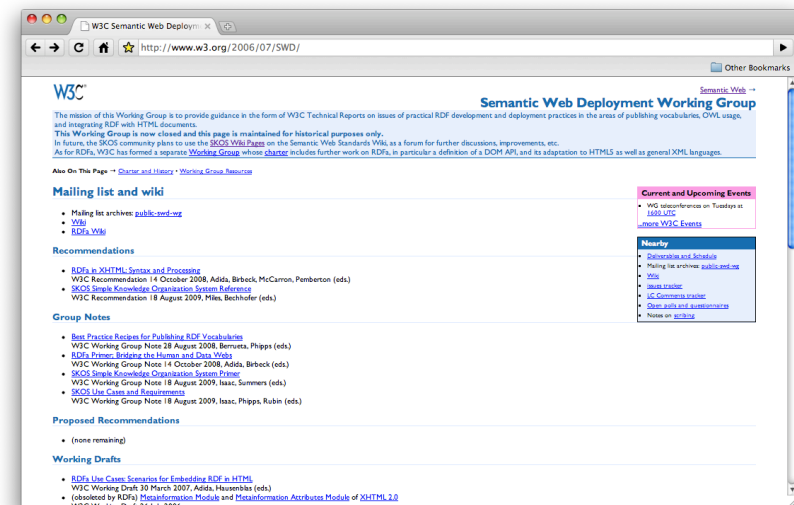
- SKOS Core Vocabulary Specification
- SKOS Core Guide
- Working Drafts (rather than Rec track documents)



# Semantic Web Deployment

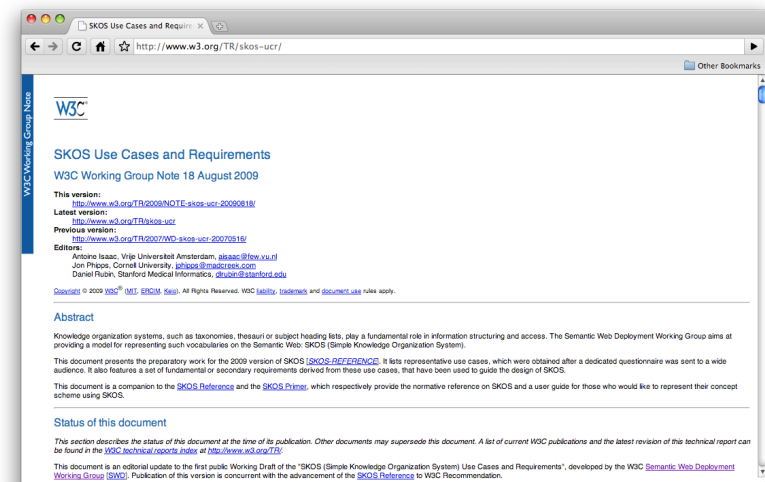
...provide guidance in the form of W3 Technical Reports on issues of practical development and deployment practices in the area of publishing vocabularies...and integrating RDF with HTML documents

- In effect, SKOS and RDFa.
  - SKOS Reference
  - SKOS Primer
  - Best Practice Recipes for Publishing RDF Vocab.



# SKOS Use Cases

- Access to image collections.
- Search across (multi-lingual) mapped thesauri.
- Product Lifecycle
- Metadata Registry
  
- Cultural Heritage, Medicine, Agriculture, TV/Radio
  
- Not explicitly “Linked Data”



# Bridge 77, Macclesfield Canal



*William Crosley  
Macclesfield Canal Company 1825-1831*

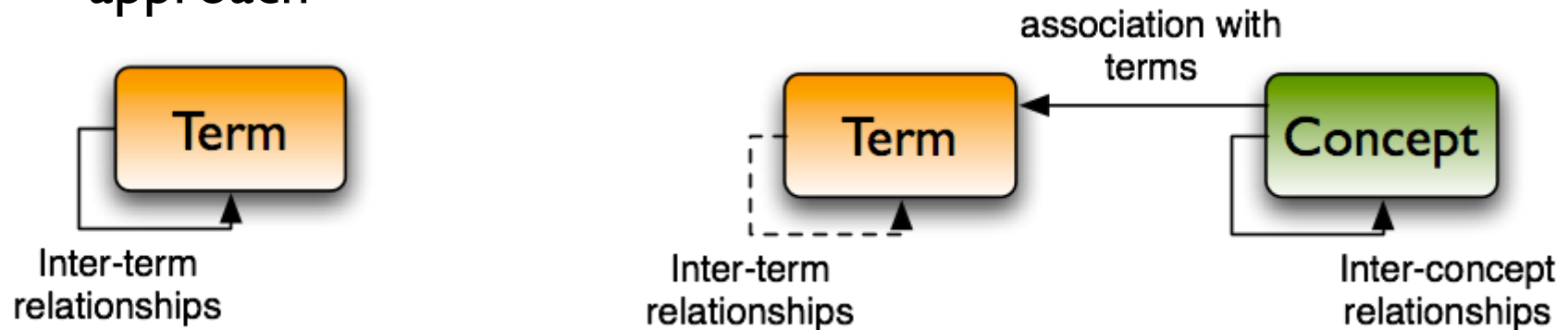
# SKOS Goals

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



# Concepts vs Terms

- SKOS adopts a concept-based (as opposed to term-based) approach



- Concepts associated with lexical labels
- Relationships expressed between concepts.
- Possibility of expressing relationships between terms through SKOS-XL.

# SKOS Example

**animals**

**NT cats**

**cats**

**UF domestic cats**

**RT wildcats**

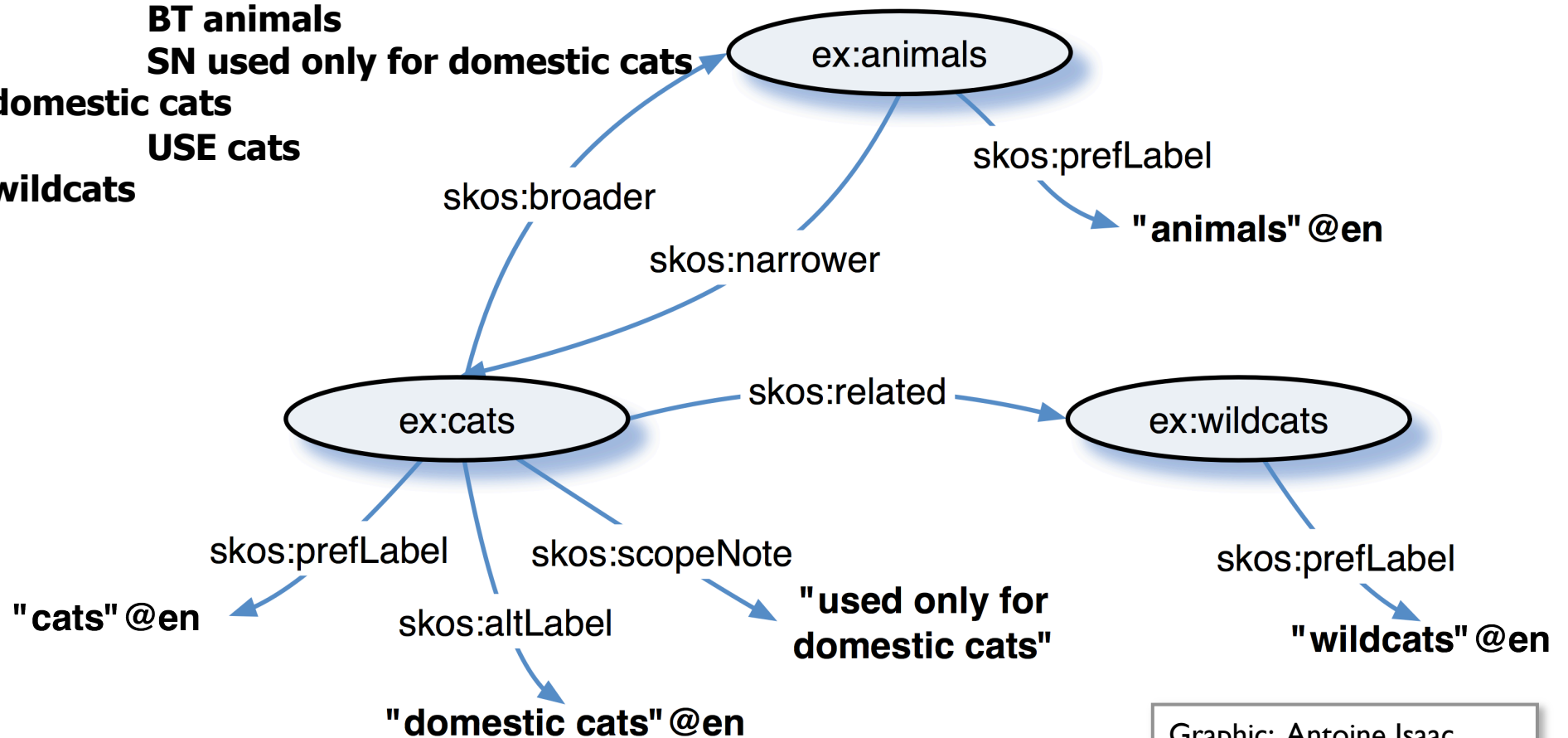
**BT animals**

**SN used only for domestic cats**

**domestic cats**

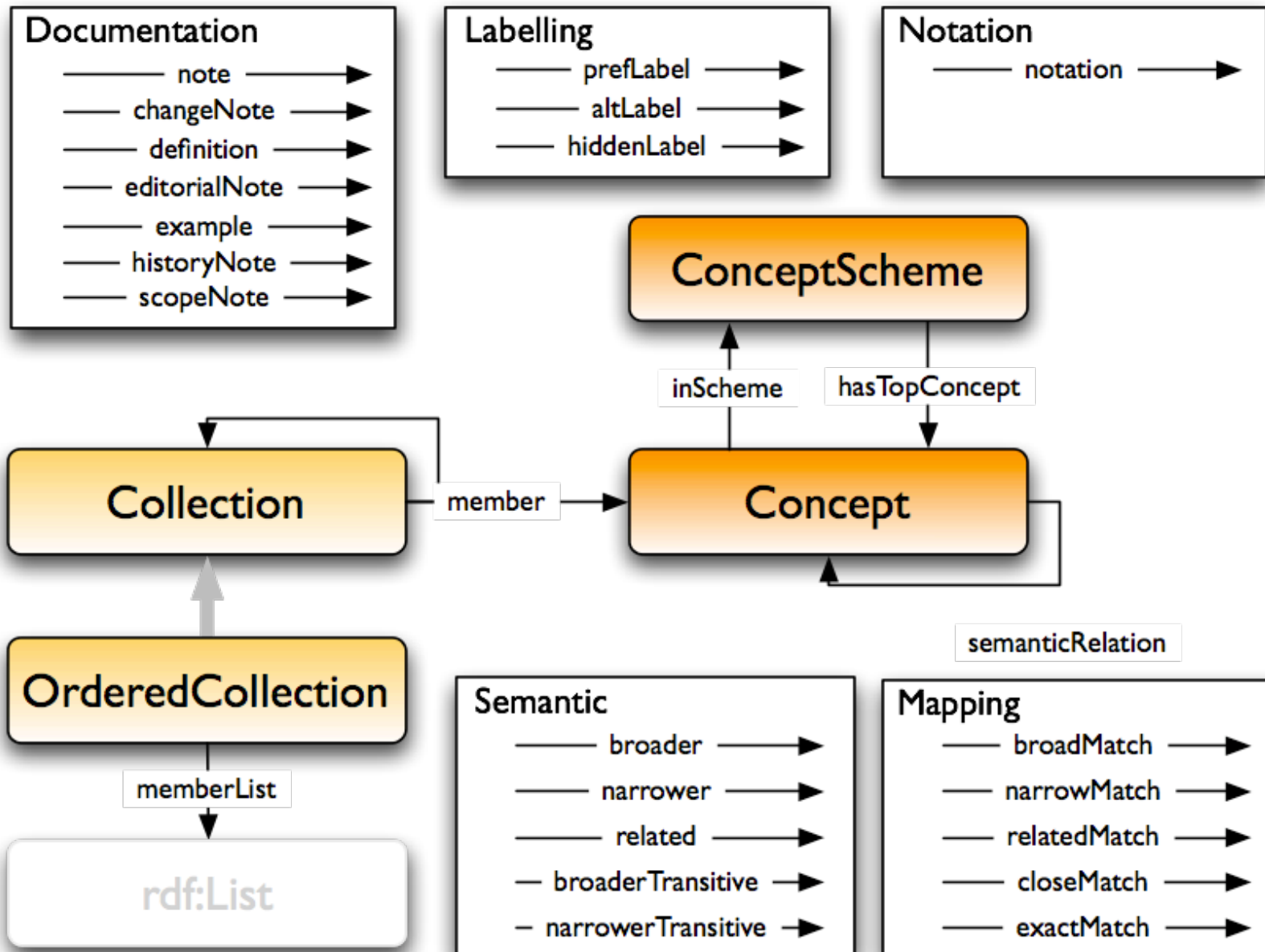
**USE cats**

**wildcats**



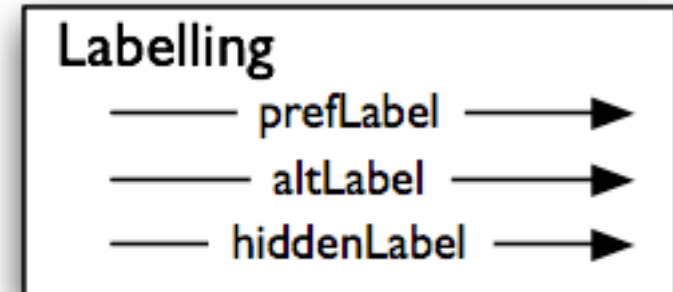
Graphic: Antoine Isaac

# SKOS Model



# Labelling

- Lexical Labels associated with Concepts
  - Preferred: one per language
  - Alternate: variants,
  - Hidden: mis-spellings
- No domains stated, so usage possible on any resource.
- Labels pairwise disjoint.
- Label Extension (SKOS-XL) provides additional support for descriptions of labels and links between them
  - E.g. acronyms, abbreviations



# Documentation

- A number of documentation properties
- Not intended to be comprehensive
- *Extension* points

## Documentation

—— note ———▶  
—— changeNote ———▶  
—— definition ———▶  
—— editorialNote ———▶  
—— example ———▶  
—— historyNote ———▶  
—— scopeNote ———▶

# Semantic Relations

- Hierarchical and Associative
- Broader/Narrower
- Loose (i.e. no) semantics
  - A publishing vehicle, not a set of thesaurus construction guidelines
- Domain/Range restrictions on semantic relations
- broader/narrower not transitive in SKOS

## Semantic

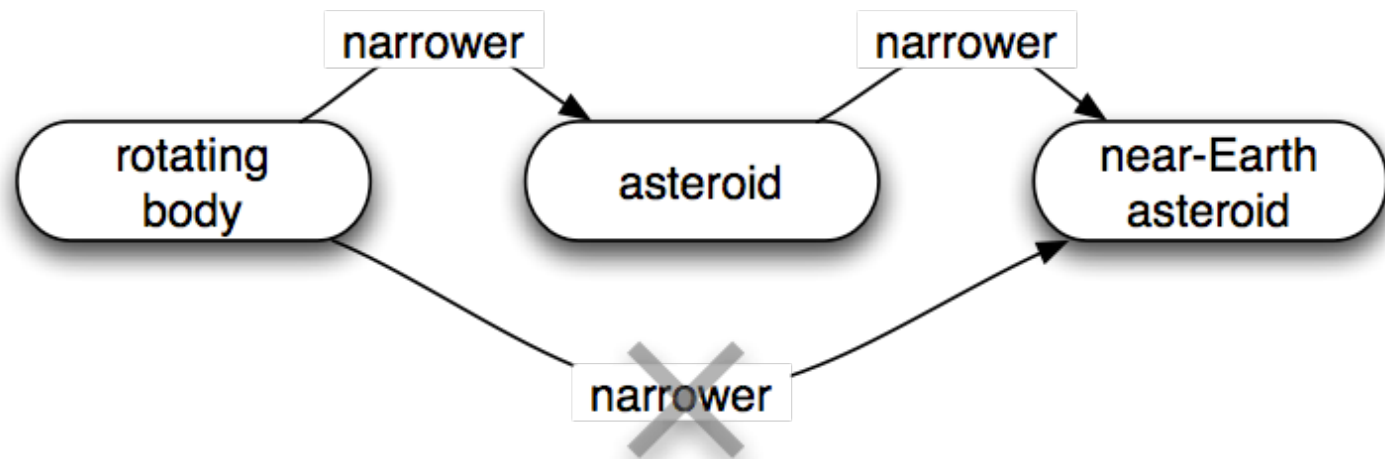
— broader →

— narrower →

— related →

— broaderTransitive →

— narrowerTransitive →



# Mapping Relations

- Subproperties of Semantic Relations
- Intended for cross-scheme usage
  - Although no formal enforcement

## Mapping

—— broadMatch —→

—— narrowMatch —→

—— relatedMatch —→

—— closeMatch —→

—— exactMatch —→

# Collections

- Support definition of “arrays” with node labels
- Node Labels not concepts
- Systematic or hierarchical displays can then be created based on Collections
  - Application choice as to how to do this.

```
milk
  <milk by source animal>
    cow milk
    goat milk
    buffalo milk
```



# What's not there?

- Subject indexing properties
  - Focus on vocabulary publication
- Co-ordination
  - No mechanisms in SKOS that support combinations of terms in *pre-coordination*.
  - *Post-coordination* possible through query
- Support for rich linguistic structures.
- Versioning

# Stockport Viaduct



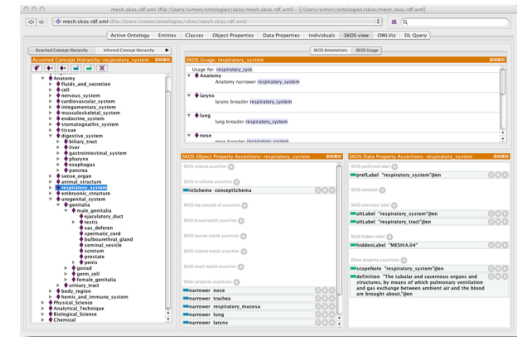
*George Watson Buck  
1840*

# Bricks all the way through

- Triples all the Way!
- SKOS is “SW tech” from the ground up
  - URIs for concept identifiers
  - RDF Vocabulary
  - Defined as OWL Ontology
- Use of common infrastructure and off the shelf tooling for delivery, storage and query.
- SPARQL Queries for validation
  - Simple Services for checking labels in vocabs (validation via ASK: IPSV)
  - ZBW Experiences

# SKOS and OWL

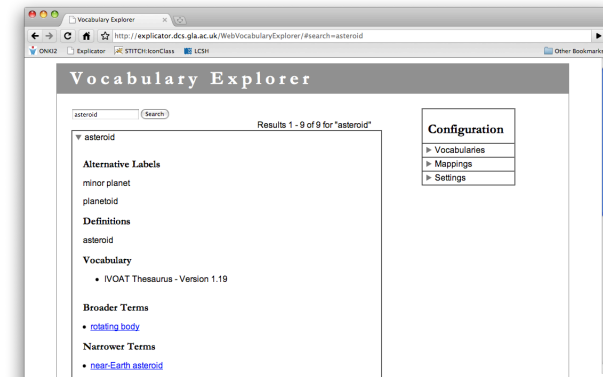
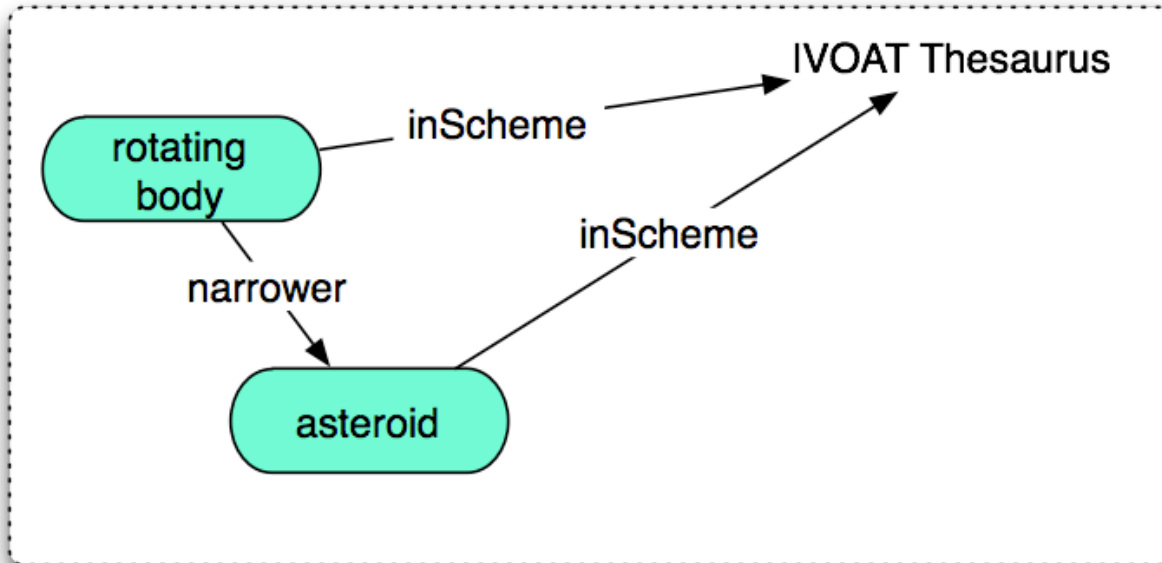
- SKOS itself is defined as an OWL ontology.
- A particular SKOS vocabulary is an instantiation of that ontology/schema
  - SKOS Concept is a Class, particular concepts are instances of that class
- Allows use of OWL mechanisms to define properties of SKOS (e.g. the querying of the transitive closure of broader).
  - E.g. SKOSEd built on Protege



S. Jupp, S. Bechhofer and R. Stevens **A Flexible API and Editor for SKOS**  
ESWC2009 [http://dx.doi.org/10.1007/978-3-642-02121-3\\_38](http://dx.doi.org/10.1007/978-3-642-02121-3_38)

# Containment

- Representation of Semantic Relationships within Schemes
- Can only relate Concepts to the ConceptSchemes in which they occur.
- Named Graphs



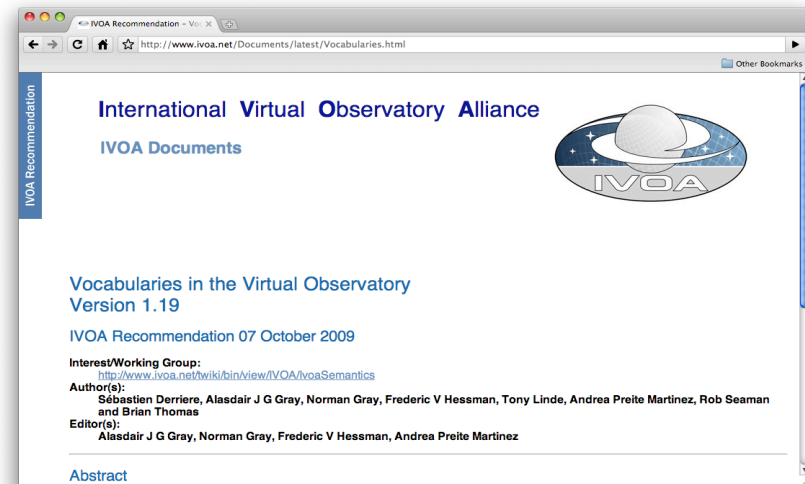
# Ashness Bridge



*Unknown  
c. 17<sup>th</sup> Century*

# IVOA: A Bridge to the Stars

- *International Virtual Observatory Alliance (IVOA)* early adopters of SKOS
- Word lists presented in specifications.
  - Hard coded into applications.
  - SKOS allows explicit representation of that information
- “SKOS to help find data, not describe it – vocabularies rather than ontologies”



**IVOA Vocabularies in the Virtual Observatory**  
<http://www.ivoa.net/Documents/latest/Vocabularies.html>

# I/OA Vocabularies

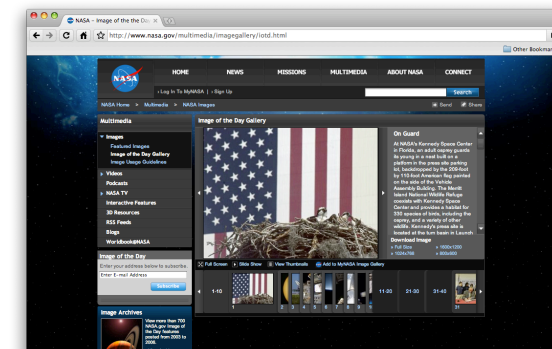
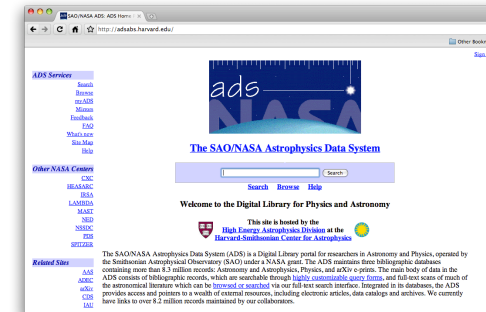
- Multiple Sub-communities
- UCD Universal [Column/Content] Descriptors
  - Observed/Collected from survey of datasets
- IAU “Proper” thesaurus. Proprietary tools/formats
  - Little usage (too big?)
- Keywords lists for papers (Web pages)
- SIMBAD

A. Gray, N. Gray, C. Hall and I Ounis **Finding the right term: Retrieving and exploring semantic concepts in astronomical vocabularies** *Information Processing and Management* (2009) <http://dx.doi.org/10.1016/j.ipm.2009.09.004>



# IVOA Scenario

- ADS article archive.
- Journal keywords scraped from papers/PDF metadata.
- Mapping to AVM (used for, e.g. NASA images of the day)
- *Simple* mechanism supporting navigation from papers to images.
- *Mapping* is key here.
  - Communities continue to use their own vocabularies
  - Cross-walking
- SKOS as *glue* in Linked Data



- This is SW 101, but still useful!
- A conservative community – resistant to change, very long term view.
- A techie community, but they don't like to do it.
  - Vocab construction is not their core business (but useful)
- Timely: SKOS fits the (current) metadata needs of this community.

# Europeana

- Access to millions of digital items from multiple collection
- Multiple KOS used
- *SKOSification* of sources: SKOS as a common format supporting integration and mapping/alignment between terminologies.
- Thought-Lab
  - Auto completion
  - Clustering
  - Label Matching
- Linked Data publication



S. Gradmann **Europeana White Paper I**

<http://www.scribd.com/doc/32110457/Europeana-White-Paper-I>

# Examples: LCSH

- Thesaurus used for bibliographic records
- Not an *ontology*, but an indexing scheme
- Ed Summers [<http://inkdroid.org/>] provided a Linked Data version, <http://lcsch.info>
- Features/Functions/Labels mapped to SKOS Properties
- Delivery as Linked Data
  - Cool URIs
  - Content Negotiation
- lcsch.info URIS used elsewhere
- Applications consumed the data.



E. Summers, A Isaac, C. Redding, and D. Krech. **LCSH, SKOS and linked data**  
*International Conference on Dublin Core and Metadata Applications 2008* <http://arxiv.org/abs/0805.2855v3>

# Scary Bridge



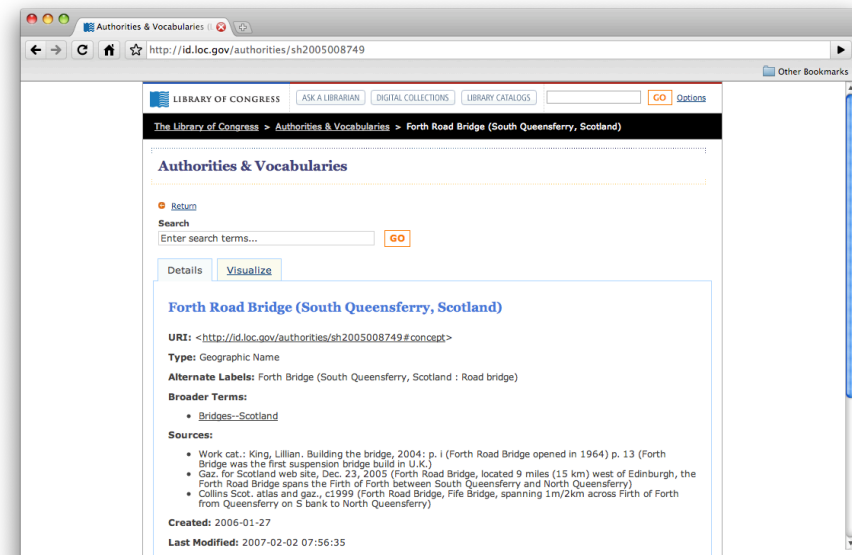
*Unknown, Dalat, Vietnam  
20<sup>th</sup> Century*

- Taken down by LC (boo!)
- Why?
  - “Confusing”?
  - Licensing issues?
  - Scared to step out?
- Convincing organisations of the benefit of opening data.

*Dan Chudnov: “It was an important enough success that it was taken down. If it never gained notice, if it weren’t useful, if it didn’t promise something bigger, if it didn’t make sense, if nobody cared, it would still be up. Yknow?”*

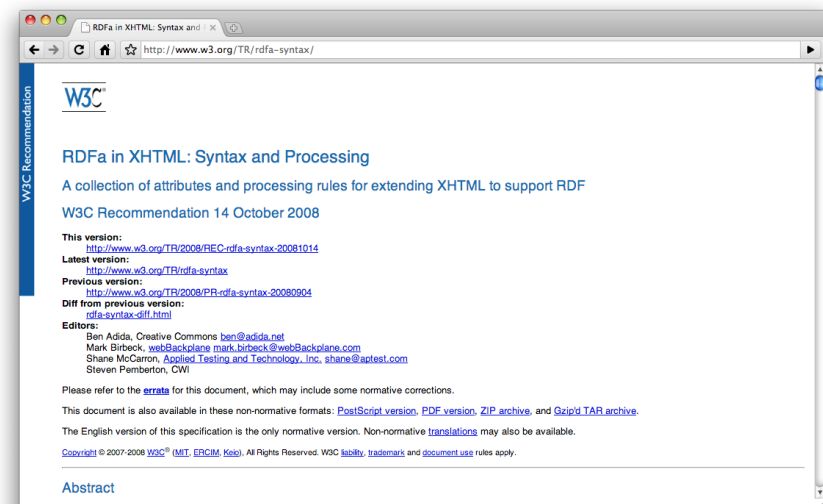
# A happy ending: id.loc.gov

- Now up as <http://id.loc.gov/authorities/>
  - With redirects from original URIs....
- Exposed using RDFa (as are many SKOS vocabularies)
- Additional vocabs
  - Graphic materials
  - Preservation metadata



# RDFa

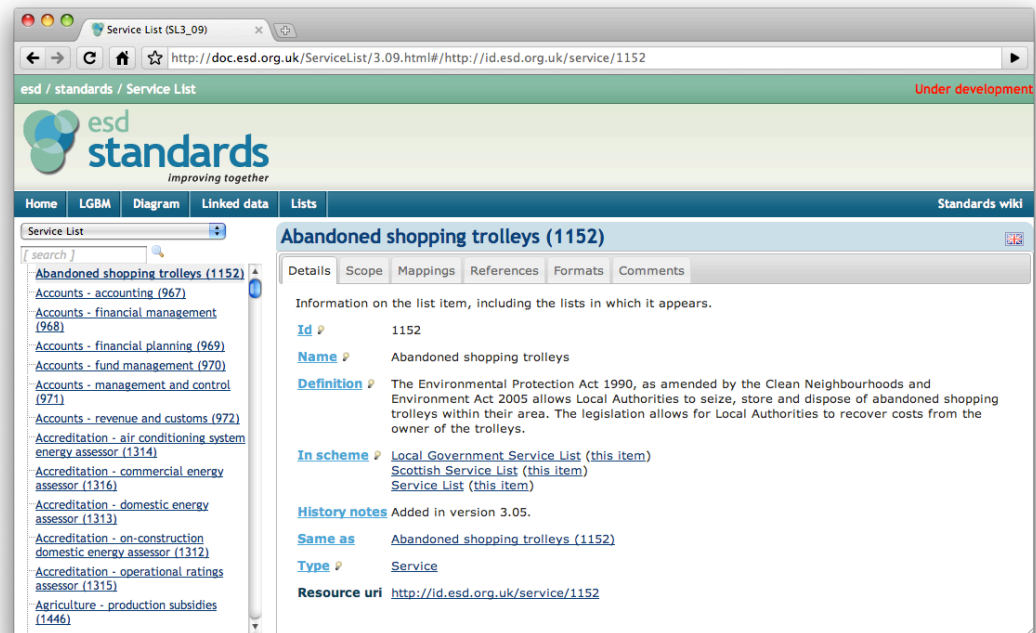
- Embedding structured data in markup (e.g. HTML Pages).
- Another bridge bringing people into the SW world.
- RDFa a nice fit with SKOS publication.
  - Structured information
  - Chunked
  - Essentially “parallel” human and machine readable aspects to the data





# Electronic Service Delivery (ESD)

- Local Authority Service classification
- Integrated Public Service Vocabulary
- Service List
- Local Government Service List



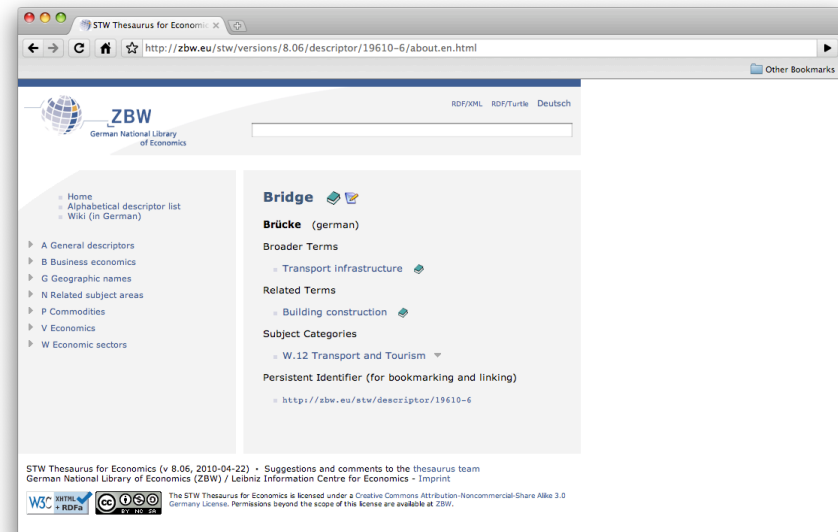
The screenshot displays a web browser window with the URL <http://doc.esd.org.uk/ServiceList/3.09.html#/http://id.esd.org.uk/service/1152>. The page is titled "Service List" and features the "esd standards" logo with the tagline "improving together". The navigation menu includes "Home", "LGBM", "Diagram", "Linked data", "Lists", and "Standards wiki". A search bar is located at the top left of the main content area. The main content area is divided into two columns. The left column contains a list of service categories, with "Abandoned shopping trolleys (1152)" selected. The right column displays the details for this service, including its ID (1152), name ("Abandoned shopping trolleys"), definition, and in-scheme information. The details are as follows:

Property	Value
<b>Id</b>	1152
<b>Name</b>	Abandoned shopping trolleys
<b>Definition</b>	The Environmental Protection Act 1990, as amended by the Clean Neighbourhoods and Environment Act 2005 allows Local Authorities to seize, store and dispose of abandoned shopping trolleys within their area. The legislation allows for Local Authorities to recover costs from the owner of the trolleys.
<b>In scheme</b>	<a href="#">Local Government Service List (this item)</a> <a href="#">Scottish Service List (this item)</a> <a href="#">Service List (this item)</a>
<b>History notes</b>	Added in version 3.05.
<b>Same as</b>	<a href="#">Abandoned shopping trolleys (1152)</a>
<b>Type</b>	Service
<b>Resource uri</b>	<a href="http://id.esd.org.uk/service/1152">http://id.esd.org.uk/service/1152</a>

# ZBW Economics

## Desiderata:

1. Web-based Presentation
2. Preferred term suggestion
3. Integration with other environments
4. Foster third party reuse
5. Links to other data sets



J. Nuebert. **Bringing the "Thesaurus for Economics" on to the Web of Linked Data** LDOW2009

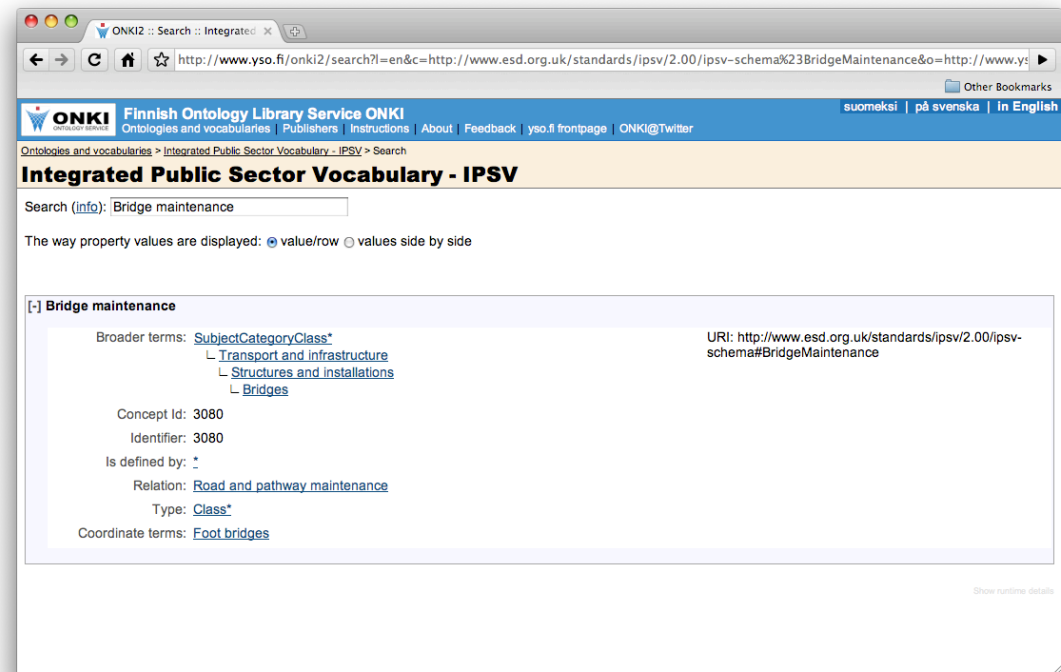
[http://events.linkeddata.org/ldow2009/papers/ldow2009\\_paper7.pdf](http://events.linkeddata.org/ldow2009/papers/ldow2009_paper7.pdf)

# ZBW Economics

- Extension via:
  - Mix in of vocabularies (DC)
  - Subclassing of skos:Concept
  - Subproperties of skos:note
- RDFa presentation of content.
- SPARQL, RDFa, off-the-shelf integration/components
- Standardisation...

# ONKI:Finland

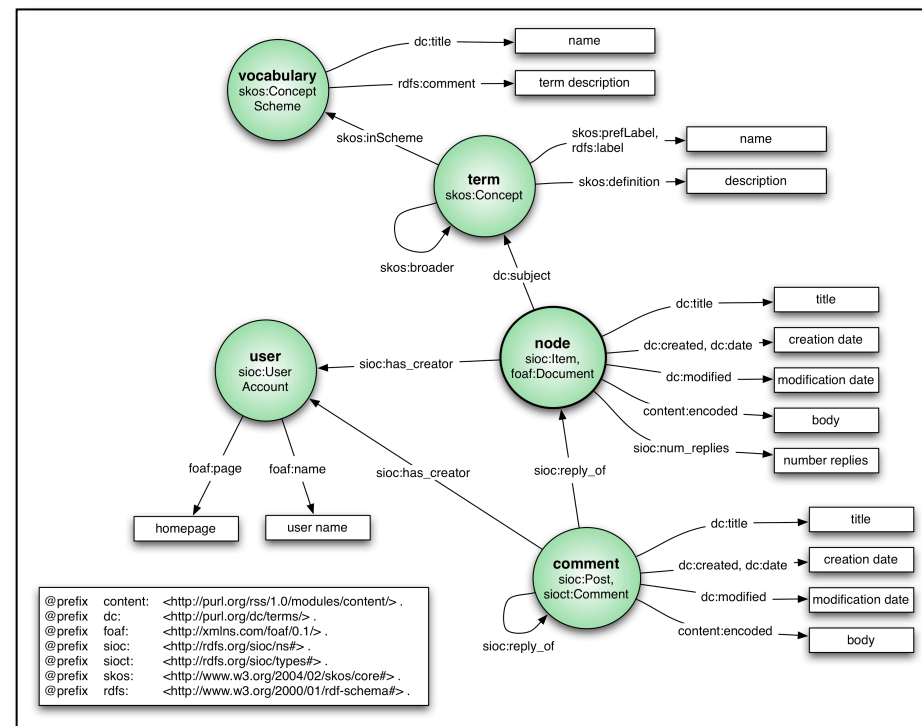
- ONKI SKOS Server
- Delivering SKOS Vocabularies as Services
- Widgets for user interaction and concept selection



Jouni Tuominen, Matias Frosterus, Kim Viljanen, and Eero Hyvonen **ONKI SKOS Server for Publishing and Utilizing SKOS Vocabularies and Ontologies as Services** ESWC2009 [http://dx.doi.org/10.1007/978-3-642-02121-3\\_56](http://dx.doi.org/10.1007/978-3-642-02121-3_56)

# Drupal, RDFa and SKOS

- Drupal exposing information using RDFa
- Use of SKOS for representation and exposure of taxonomic information
- SW “by stealth”.
- Another “bridge” bringing users in.



S. Corlosquet, R. Delbru, T. Clark, A. Polleres and S. Decker. **Produce and Consume Linked Data with Drupal!** ISWC2009

[http://dx.doi.org/10.1007/978-3-642-04930-9\\_48](http://dx.doi.org/10.1007/978-3-642-04930-9_48)

# SKOS as a Gateway Drug



# Tooling

**ONKI Finnish Ontology Library Service ONKI**  
Ontologies and vocabularies | Publishers | Instructions | About | Feedback | yso.fi frontpage | ONKI@Twitter

Ontologies and vocabularies > Integrated Public Sector Vocabulary - IPSV > Search

## Integrated Public Sector Vocabulary - IPSV

Search (info):

The way property values are displayed:  value/row  values side by side

**[ - ] Bridge maintenance**

Broader terms: [SubjectCategoryClass\\*](#)  
    ↳ [Transport and infrastructure](#)  
        ↳ [Structures and installations](#)  
            ↳ [Bridges](#)

Concept Id: 3080  
Identifier: 3080  
Is defined by: **\***  
Relation: [Road and pathway maintenance](#)  
Type: **Class\***  
Coordinate terms: [Foot bridges](#)

**Related Terms**

- **MINOR PLANETS**

► near-Earth asteroid  
► 2.3. Asteroid  
► NEAR EARTH AST  
► Minor planets, aster...

**W3C Semantic Web Activity**

SKOS: Simple knowledge organization for the Web

### Validation Services

**SKOS 2009 Validator (PoolParty)**

PoolParty offers a free [SKOS Thesaurus Consistency Checker](#) service that lets you upload a thesaurus file in SKOS format and checks if the data is consistent. Consistency conditions defined in the SKOS specification are checked as well as some conditions that are mandatory for a thesaurus to be compatible for the PoolParty thesaurus management software. Check out this [page on the SKOS wiki](#) for most recent information and links.

**SKOS 2005 Validator (for legacy data)**

**N.B. THIS SERVICE IS HIGHLY EXPERIMENTAL!** See the [notes on using](#) below.

**Test Data**

URL:

RDF Syntax:

**Test Case**

Basic integrity test case  
 Thesaurus compatibility test case (includes basic integrity tests)

Try e.g.:

- <http://isegserv.itd.rl.ac.uk/cvs-public/-checkout-/skos/schemarama/data/baddatabasic.turtle> [Turtle]
- <http://isegserv.itd.rl.ac.uk/cvs-public/-checkout-/skos/schemarama/data/baddatabase.turtle> [Turtle]

# Union Chain Bridge



*Captain Samuel Brown,  
Adam Clark, 1820*



# SKOS and Linked Data

- Linked Data standardised “guidelines” for publishing data
  - URIs for identification
  - Provide useful information when dereferenced
  - Link to other URIs
- SKOS as lightweight semantics for LD
- Facilitating publication of existing KOS/data.

<b>SKOS</b>	<b>LD</b>
Indexing/Retrieval	Discovery
Semantic Relations	Navigation
Mapping	Linking and Integration beyond URI matching

# sameAs vs mapping

- SKOS mapping properties less “dangerous” than sameAs?
- SKOS mapping properties closer to some interpretations of sameAs?
- What about the domain and range restrictions?



H.Halpin, P Hayes. **When owl:sameAs isn't the Same: An Analysis of Identity Links on the Semantic Web** LDOW2010 [http://events.linkedata.org/ldow2010/papers/ldow2010\\_paper09.pdf](http://events.linkedata.org/ldow2010/papers/ldow2010_paper09.pdf)

# The Mancunian Way



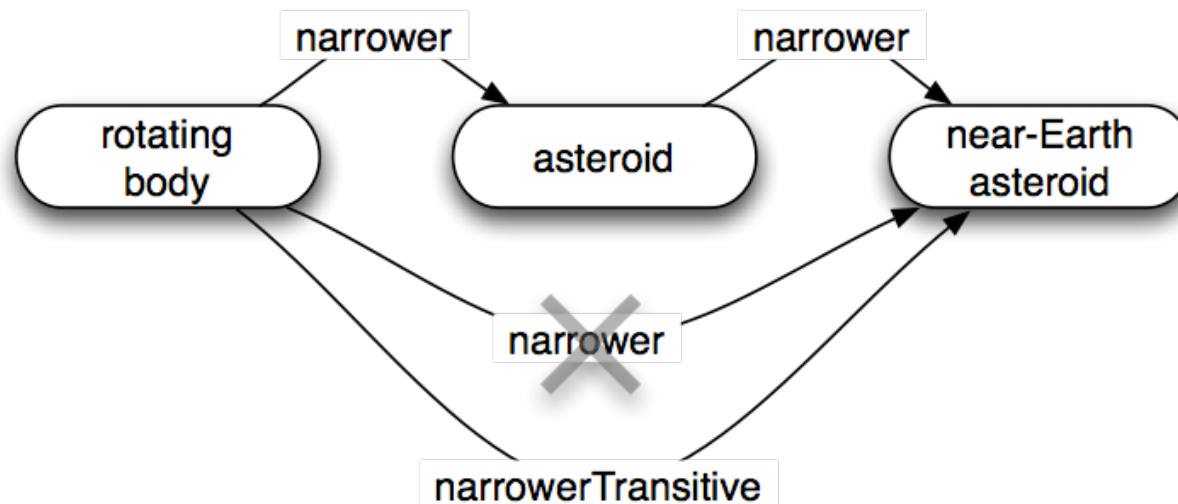
*Unknown  
Opened 1967*

# SKOS Namespace

- Original documents used
  - <http://www.w3.org/2004/02/skos/core#>
- Proposal was made to change to
  - <http://www.w3.org/2008/05/skos#>
- Final decision (See ISSUES 153 & 175) *kept* the original namespace
  - Changes to the semantics of broader/narrower. No longer transitive, but transitive super
  - Difficult trade-off. Changing names would negate the benefit of maintaining the namespace.
  - Changes reflected in the machine readable schema, so tooling *should*, in principle be able to pick this up.

# Transitivity of Semantic Relations

- Broader/narrower not transitive in SKOS
  - Addition of broaderTransitive
- Separate *assertions* from *inferences*
- Thus can still query across transitive closure of broader.
  - User confusion with transitivity and inheritance.

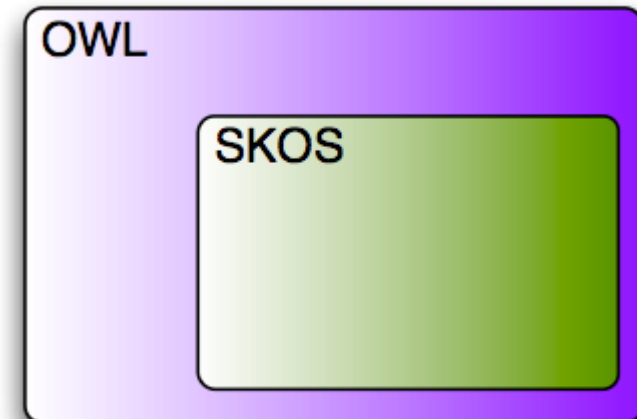


# skos:subject

- Previous versions included skos:subject
- Issue 77 (cf. 48)
- RESOLVED to not include the SKOS indexing properties because 1) it's the role of SKOS to publish vocabularies and not to indicate how they should be used for indexing purposes 2) there appear to be enough support from existing metadata vocabularies to handle links between resources and SKOS concepts
- But actually used heavily out there in the wild...

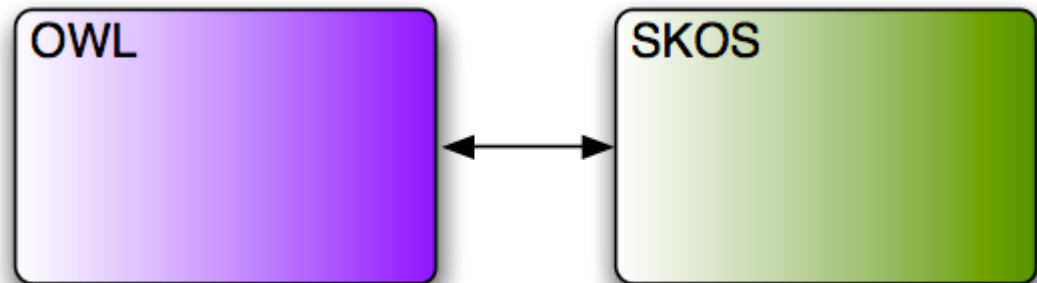
# SKOS and OWL

- SKOS as OWL Full Ontology
- Steps outside of the bounds of OWL
  - Property disjointness
  - Annotation subproperties
  - Restrictions on preferred Labels.
  - “Pruned” RDF schema.
- OWL2 can represent some of this
  - But not all...



# SKOS and OWL

- SKOS and OWL are intended for different purposes.
  - OWL allows the explicit modelling/description of a domain
  - SKOS provides vocabulary and navigational structure
- Interactions between representations
  - Presenting OWL ontologies as SKOS vocabularies
  - Enriching SKOS vocabularies as OWL ontologies.
  - Use of SKOS as annotation vocabulary





# The Forth Rail Bridge



*John Fowler & Benjamin Baker  
Built by William Arrol & Co. 1883-1890*

# Are we done yet?

- A Working Group is a constrained exercise
- Chasing Specs
  - OWL/OWL2/RIF/Named Graphs
- Some aspects may be considered out of scope
- Standardisation is necessarily a compromise.
  - Everyone equally unhappy = success!
- A number of issues were *postponed*, due to
  - Lack of time
  - Lack of implementation experience

# Postponed Issues

## 35 RulesAndConformance

- Rules not explicitly mentioned in REC
- No Rule REC at the time

## 38 CompatabilityWithOWL DL

- Synchronisation with OWL WG
- OWL DL “pruned” schema

## 40 ConceptCoordination

- Lack of time and implementation experience.

## 45 NaryLinksBetweenDescriptors AndNonDescriptors

- USE “X + Y” , “X OR Y”
- Lack of time and implementation experience.

## 56 ReferenceSemanticRelationship Specializations

- broaderGeneric etc.
- Insufficient information on how to embed them in the data model

## 84 ConstructionOfSystematic DisplaysFromGroupings

- No changes needed to vocabulary
- Implementation is feasible
- Lack of time

# Postponed in Last Call

## I31 mappings with a boolean expression (LC)

- Requires substantial additions to foundations
- Could be handled via extensions

## I36 plain literal ranges and internationalisation

- Constraints not expressed in OWL

## I37 property disjointness

## I38 SI4 skos:prefLabel

## I55 SKOS in OWL 2

- OWL 2

## I49 Asymmetric associations

- Possible through extensions

## I76 Mapping vocabulary constraints

- Insufficient experience

## I78 PFWG: Semantic Relations

- Cf 56.

## I80 PFWG: skosxl:Label class

- XL as basis for extensions

# Who's under there?



## Simple Knowledge Organisation System

- Is it too *simple*?
  - Three relations plus some attributes
- Is there enough *knowledge*?
  - No formal semantics
  - Very little inference capability
  - What's a concept?
- Is there sufficient *organisation*?
  - Containment in schemes



# W3C Library Linked Data Incubator

W3C Library Linked Data Incubator

W3C Activities

- Incubator Activity
  - Library Linked Data XG
    - Participants
    - Member Mailing List
    - Public Mailing List
    - Member-only XG
    - Home Page
    - Charter

Search Incubator Activity

## [Incubator Activity](#) > W3C Library Linked Data Incubator Group

The mission of the Library Linked Data incubator group is to help increase global interoperability of library data on the Web, by bringing together people involved in Semantic Web activities—focusing on Linked Data—in the library community and beyond, building on existing initiatives, and identifying collaboration tracks for the future.

The group will explore how existing building blocks of librarianship, such as metadata models, metadata schemas, standards and protocols for building interoperability and library systems and networked environments, encourage libraries to bring their content, and generally re-orient their approaches to data interoperability towards the Web, also reaching to other communities. It will also envision these communities as a potential major provider of authoritative datasets (persons, topics...) for the Linked Data Web. As these evolutions raise a need for a shared standardization effort within the library community around (Semantic) Web standards, the group will refine the knowledge of this need, express requirements for standards and guidelines, and propose a way forward for the library community to contribute to further Web standardization actions.

See the [charter](#) for more information.

- [News](#)
- [Deliverables](#)
- [Meetings](#)
- [Minutes](#)
- [About the Library Linked Data XG](#)

W3C Advisory Committee Representatives may [join this XG](#) on behalf of their organizations by completing this [online form](#). Non-Members may [join W3C](#) or ask the Chair of an Incubator Group to participate as an [Invited Expert](#), subject to W3C's [policy for approval of Invited Experts](#).

Participants are automatically subscribed to the Member and public mailing lists when they join the group Non-Participants may also subscribe. Please read more about W3C [mailing list and archive usage](#).

## News

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## Deliverables

---

## Meetings

---

See [Wiki](#).

## Minutes

# Community Wiki

The image shows a screenshot of a web browser displaying the SKOS (Simple Knowledge Organization System) Semantic Web Standards Wiki page. The browser's address bar shows the URL <http://www.w3.org/2001/sw/wiki/SKOS>. The page features the W3C Semantic Web logo on the left and a navigation menu with links for 'Main Page', 'Recent changes', 'Tools', 'Books', and 'Validators'. The main content area is titled 'SKOS' and 'Simple Knowledge Organization System (SKOS)'. It includes an 'Overview' section, a 'Recommended Reading' section, and a 'Welcome to the SKOS community wiki!' section. A sidebar on the right contains metadata: 'Publication date: 2009-08-18', 'Created by: Semantic Web Deployment Working Group', and 'List of documents at: http://www.w3.org/standards/techs/skos'. The page also has a search box and a 'toolbox' with links like 'What links here', 'Related changes', 'Special pages', and 'Printable version'.

SKOS – Semantic Web Standards

http://www.w3.org/2001/sw/wiki/SKOS

Other Bookmarks Log in

W3C Semantic Web

navigation

- [Main Page](#)
- [Recent changes](#)
- [Tools](#)
- [Books](#)
- [Validators](#)

other w3c resources

- [Activity news](#)
- [Publications](#)
- [Logos, buttons](#)
- [Activity home page](#)

w3c rss feeds

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- [W3C blogs](#)
- [Use cases, case studies](#)

account request

- [W3C Member](#)
- [Public](#)

search

Go Search

toolbox

- [What links here](#)
- [Related changes](#)
- [Special pages](#)
- [Printable version](#)

page discussion view source history

## SKOS

### Simple Knowledge Organization System (SKOS)

Publication date: 2009-08-18  
Created by: [Semantic Web Deployment Working Group](#)  
List of documents at: <http://www.w3.org/standards/techs/skos>

### Overview

SKOS is a common data model for sharing and linking knowledge organization systems via the Web.

Many knowledge organization systems, such as thesauri, taxonomies, classification schemes and subject heading systems, share a similar structure, and are used in similar applications. SKOS captures much of this similarity and makes it explicit, to enable data and technology sharing across diverse applications.

The SKOS data model provides a standard, low-cost migration path for porting existing knowledge organization systems to the Semantic Web. SKOS also provides a lightweight, intuitive language for developing and sharing new knowledge organization systems. It may be used on its own, or in combination with formal knowledge representation languages such as the [Web Ontology language \(OWL\)](#).

### Recommended Reading

The official [SKOS](#) documents, published in 2009, include a [SKOS Primer](#). The SWD Working Group, that published this Recommendation is now closed.

A number of textbooks have been published on [RDF](#), [RDFS](#), and on Semantic Web in general. Please, refer to a [separate page](#) listing some of those, as maintained by the community. That list also includes references to conference proceedings and article collections that might be of general interest.

## Welcome to the SKOS community wiki!

This site is a collaborative space open to the entire SKOS community. It complements the official [W3C SKOS web site](#) and the [SKOS mailing list](#).

It is aimed at (slowly!) replacing the old [ESW SkosDev wiki](#), taking into account that SKOS is now an [official W3C standard](#) and has evolved since the SkosDev wiki was started.

Your contributions are most welcome!

### Content

- [Specifications, Documentation and References](#)
- [RDF Vocabularies](#)





- Publication of simple knowledge sources
- Low cost entry to participation in the Semantic Web/Data Web
- Lightweight integration capabilities
- Mapping support
  
- Significant takeup and usage

**Simplicity**  
**Standardisation**  
**Extensibility**

# Thanks!

- Manchester Information Management and Bio Health Informatics Groups
- W3C SW Working Group, Guus Schreiber, Tom Baker, Ralph Swick
- Alistair Miles, Antoine Isaac, Norman Gray

# Image Sources

- British Library: <http://www.flickr.com/photos/stevecadman/486261295/>
- Forth Bridge: <http://www.flickr.com/photos/sjbradshaw/2261522652/>
- Stockport Viaduct: <http://en.wikipedia.org/wiki/File:Stockportviaduct.jpg>
- Ashness Bridge: <http://www.flickr.com/photos/steinsky/2630767772/>
- Bridge 77: <http://www.flickr.com/photos/sjorford/3222988204>
- Shrek: [http://commons.wikimedia.org/wiki/File:Shrek\\_Hollywood.JPG](http://commons.wikimedia.org/wiki/File:Shrek_Hollywood.JPG)
- Mancunian Way: <http://www.flickr.com/photos/guitarfish/235179419/>
- Spanner: <http://www.flickr.com/photos/lwr/468913340/>
- Nuts and Bolts: <http://www.flickr.com/photos/cmatsuoka/2581876397/>
- Hoover Dam: <http://www.flickr.com/photos/squeaks2569/3700355684/>
- Scary Bridge: <http://www.flickr.com/photos/bennbeck/47685371/>
- Union Chain Bridge: [http://en.wikipedia.org/wiki/File:055167\\_union\\_bridge.jpg](http://en.wikipedia.org/wiki/File:055167_union_bridge.jpg)
- THC: <http://www.flickr.com/photos/wonderal/2333550713/>
- Robin Hood and Little John:  
[http://commons.wikimedia.org/wiki/File:Little\\_John\\_and\\_Robin\\_Hood\\_by\\_Frank\\_Godwin.jpg](http://commons.wikimedia.org/wiki/File:Little_John_and_Robin_Hood_by_Frank_Godwin.jpg)
- Others: author

Let's grab one of these.....



...some of these...



...and do this

