# Applications of NKOS: some examples and questions

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# Presentation

- Examples of pilot KOS-based web applications
  - FACET Web Demonstrator

  *Need for standard representations and protocols*

  - Pilot Web service thesaurus browser
    Based on SKOS API
- Uses of KOS in future metadata applications:
  issues and questions

# FACET - Faceted Access to Cultural hEritage Terminology

***FACET - a collaborative project investigating the potential of semantic term expansion in retrieval***

Aims:

- Integration of thesaurus into the interface
- Semantic query expansion and matching function taking advantage of facet structure

http://www.comp.glam.ac.uk/~FACET/

# FACET Web Demonstrator

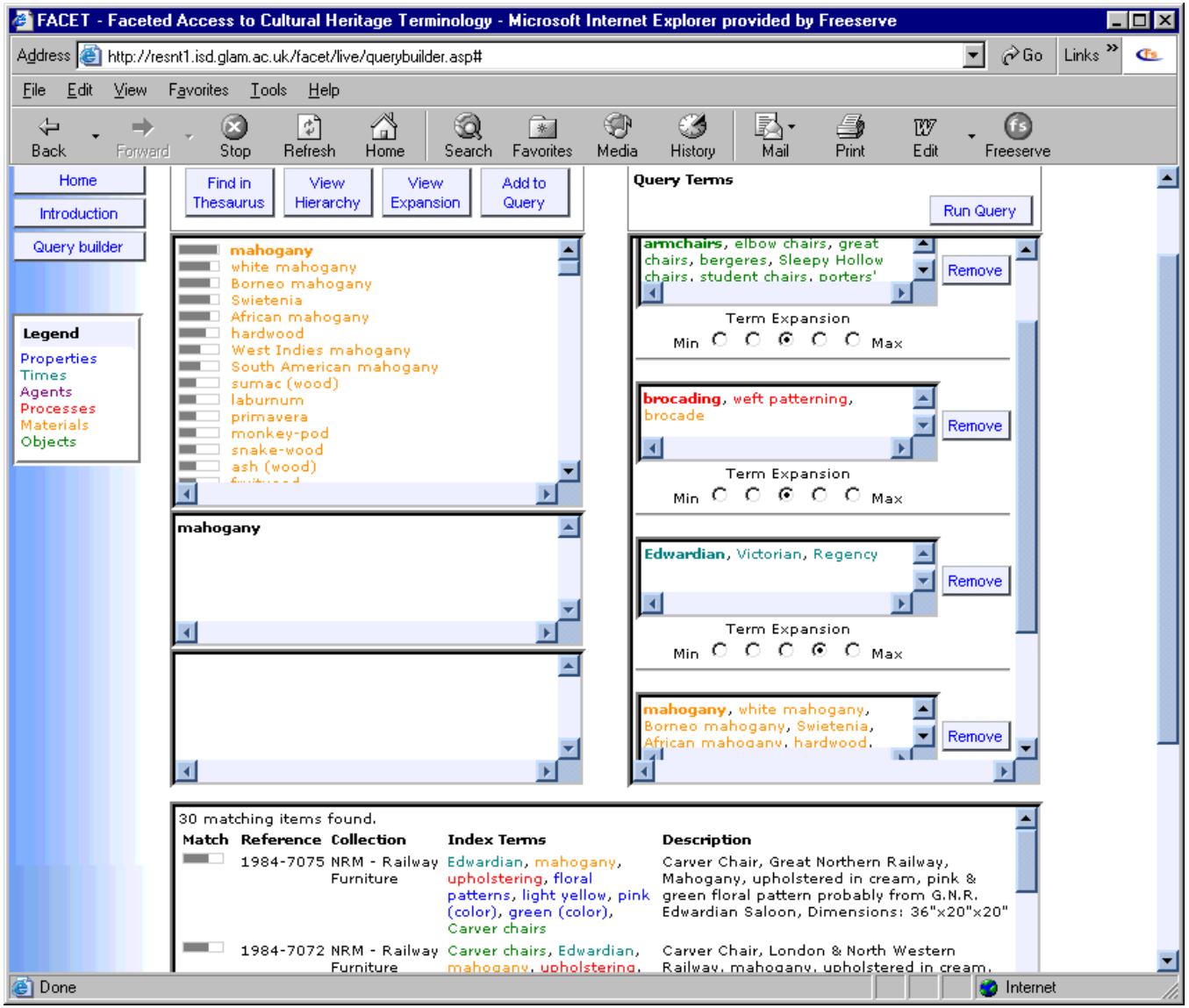
- illustrates thesaurus based semantic query expansion in a prototype Web application

- Not rely on pre-built static HTML pages -
  thesaurus content is generated dynamically

- Intended more as an exploration of FACET research outcomes as dynamically generated Web components than a general interface but suggestive of possible interface components

  http://www.comp.glam.ac.uk/~FACET/webdemo/

# FACET Web demonstrator



# Some lessons learned

- Results from FACET show potential of faceted KOS for
  - Query expansion (ranked results based on semantic closeness)
  - Semantic expansion as a browsing tool when wishing to use KOS behind the scenes

- Web demonstrator first step
  - Based on custom API
  - KOS and database on same server (but need not be)
  - *How to generalise these techniques?*

➔ *need for*

- Common KOS representations and APIs

  for general terminology (KOS) services

# KOS integration into DL services

from Hill et al Research Agenda (SigCR Workshop 2002)

Taxonomy of KOS - KOS types linked to DL service protocols

Registries of KOS and KOS-level metadata to represent them

RDF/XML KOS representations - customisable

Core set of relationship types across all KOS

General KOS service protocol

from which protocols for specific types of KOS can be derived

Robust linking model in which DL entities (collections, objects, and services) can refer to KOS entities (concepts, labels, and relationships)

Visualization tools that fully use and display the rich semantics embedded in KOS

# SKOS API

- SKOS Core (RDF/XML) Schema and SKOS API deliverables of SWAD-Europe Thesaurus Activity

- SKOS API designed to provide programmatic access to thesauri and related KOS in SKOS Core

- Example SKOS API calls
  - getConcept (uri)
  - getConceptsMatchingKeyword/*Regex* (string)
  - getAllConceptRelatives (concept)
  - getSupportedSemanticRelations
  - getAllConceptRelatives (concept, relation)
  - getAllConceptsByPath (concept, relation, distance)

# Pilot KOS Browser Client Web Service

- Developed pilot to work with DREFT server as an initial experiment with the SKOS API, a 'rich client' browser displaying details for thesaurus concepts via web service calls

- Uses GEMET - GEneral Multilingual Environmental Thesaurus

- DREFT demonstration web services server based on SKOS API developed at ILRT, Bristol University http://www.w3.org/2001/sw/Europe/reports/thes/dreft/

- Only a subset of SKOS API calls were available at time of work due to other requirements on server

So we investigated possibilities with just 2 API calls

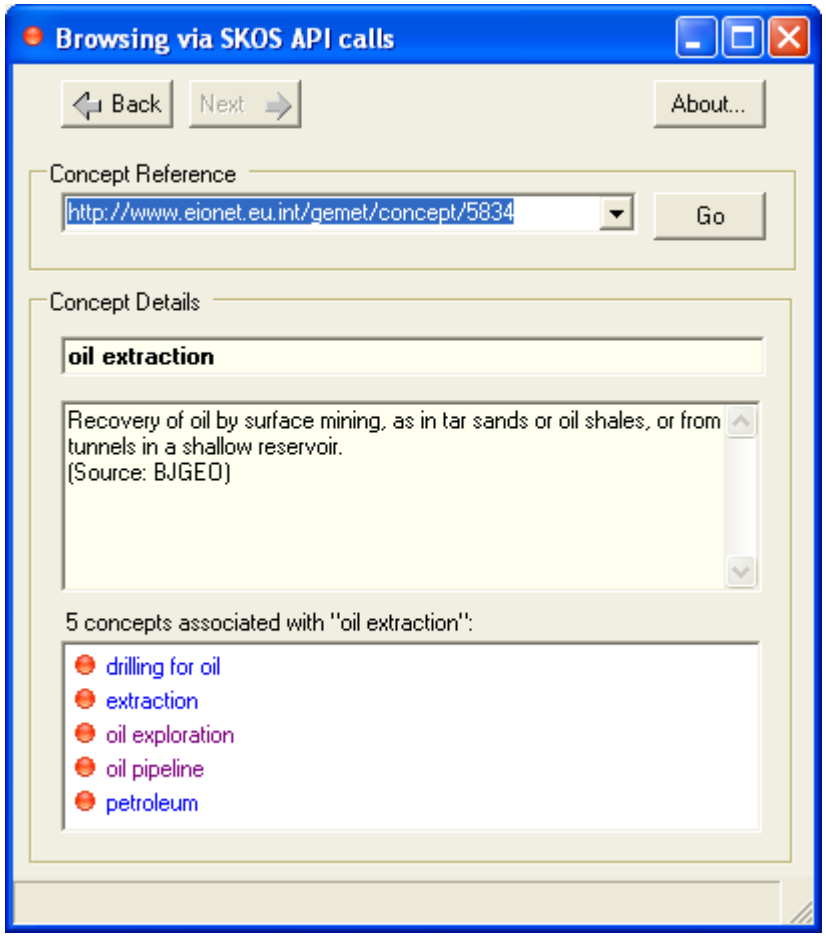
# Pilot SKOS API Web Service Browser

*getConcept*
*getAllConceptRelatives*
show semantically connected concepts but not relationships

Navigation history and
local cache of retrieved concepts
implemented

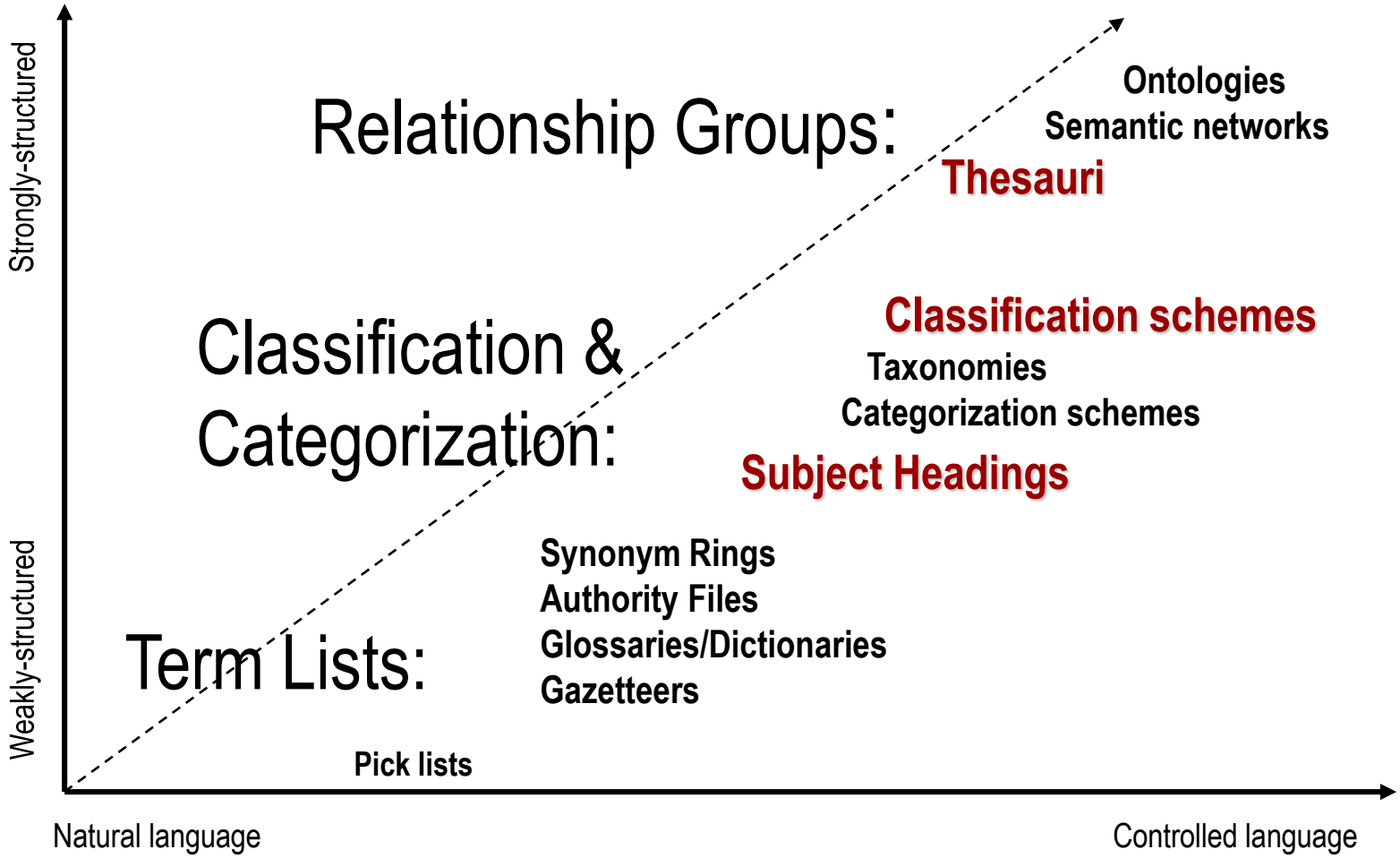
API needs more work
but is a basis for web services

*See also DC05 proceedings*



# Types of KOS

from Marcia Zeng & Athena Salaba: FRBR Workshop, OCLC 2005



# Bridge/migration between KOS and Ontologies

- KOS as elements of higher level ontologies and schemas
  - can help leverage them.
- Eg map a thesaurus to an Upper Ontology
- SKOS RDF/XML Schemas intended as initial bridging step
- Ontologies (taken as formal precise definition of relationships) can be combined with inference rules and logic systems in applications with well defined objects and operations
- ***Importance also of less formal knowledge representations***

# Uses of (N)KOS in future metadata applications

*Some confusion on application of KOS (thesauri) in new contexts?*

*Need for reflection on original KOS design context/purpose when applying in wider (DL, Semantic Web, Ontology) contexts*

*Issues:*

- Formal versus Informal knowledge organisation
  - modeling for purposes of retrieval
  - granularity of relationships
  - informal by design
- Open/Closed world
  - need context as a whole for KOS concepts?
- *SubjectOf* relationship
  - how used in indexing/searching
  - indexer (searcher) vocabulary consistency

# Informal by design

- KOS designed to assist generalised retrieval rather than modelling aspects of a domain per se
  - basis of KOS construction is intended assistance in indexing/ searching/browsing as much as logical properties of attributes
  - implications:

    levels of specialisation

    granularity of relationships

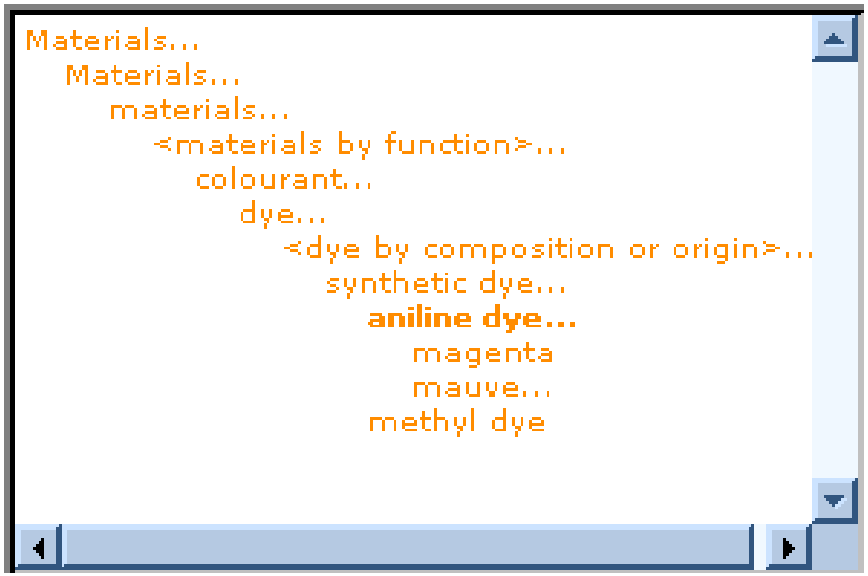
- Many KOS by design informal structures
  - pragmatic compromises
  - semantic relationships can be ‘fuzzy’

- Semantic structure is to some extent conventional
  - different viewpoints are possible
  - but users assisted to explore and appropriate

# KOS as an integral unit – Open/Closed World?

- Meaning of a topical concept depends partly on its semantic context within a KOS (and also indexing practice)

Getty AAT in
FACET Web Demonstrator




*Not necessarily straightforward*

- apply KOS concepts out of this context
- link in to other structures and contexts
- ‘open/closed world’ implications?

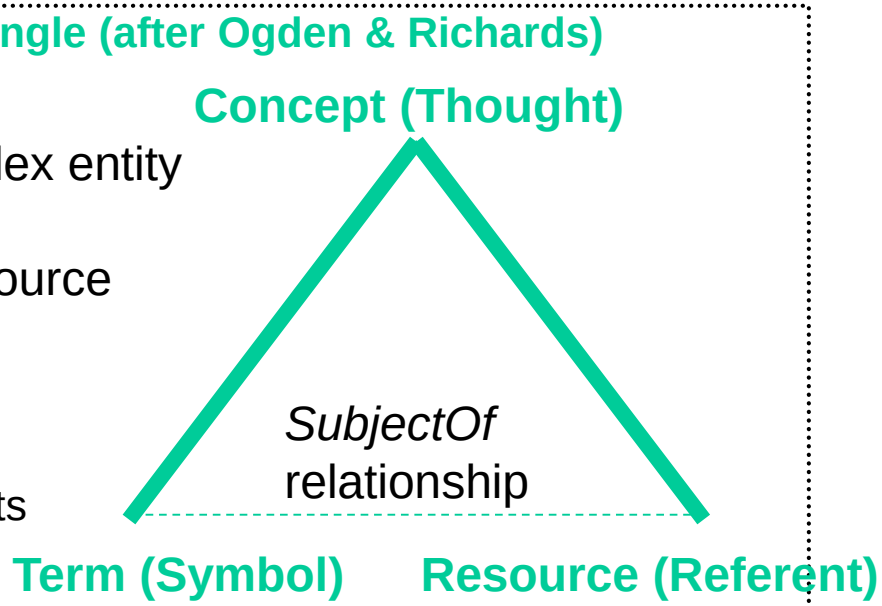
# KOS as metadata

## - Index (or classify) a resource

Indexed resource traditionally a complex entity such as a ‘document’ or image.
Semantic Web a wider context for resource

Resource probably about concept

- to some extent
- based on probable relevance judgments




- SubjectOf is via “aboutness” not a clear-cut instance relationship
- Indexer (searcher) vocabulary consistency (eg Bates 1986)
  - likely to differ in terminology judgments

- One reason for informal modelling approach of KOS

# How to apply KOS?

- Cost/benefit issues for KOS applications in granularity of relationships and degree of formalisation

- Domain dependent level of precision in concept use

  Important to consider how applications will process concepts

- Current KOS relationships at a useful level of generality for many applications (with some specialisation)?
  - where results based on probable relevance judgements
  - importance informal structures in semantic web (Hendler 2002)

- Balance automatic-interactive in knowledge-based tools

# NKOS Workshop at ECDL 2005

- NKOS Workshop –

  *Mapping Knowledge Organisation Systems:*
  *User-centred Strategies*

  EDCL2005, September 22nd, Vienna
  see http://www2.db.dk/nkos2005/

- Forthcoming NKOS special issue
  of journal New Review of Hypermedia and Multimedia
  on themes related to this session

  - see call for papers
  http://www.tandf.co.uk/journals/cfp/thamcfp.pdf

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