

# Epistemic Constructs in the Design, Study, and Critique of Knowledge Organization Structures

Joseph T. Tennis  
University of British Columbia

# Outline

- Knowledge Organization Structures - definition
- Three threads of research in KOS: design, study, and critique
- Epistemic constructs of these threads

Joseph T. Tennis "Epistemic Constructs in the Design, Study, and Critique of Knowledge Organization Structures" Information Resources Management Association, International Conference (Vancouver, British Columbia), May 2007.



# Knowledge Organization Structures

# Knowledge Org. Structures

- Knowledge Organization Structures are used for indexing/classification, display, and sense-making [1, 2, 3].

# Knowledge Org. Structures

- Indexing/classification - process of tagging information (documents, parts of documents, explicit knowledge) for future use
- Tools used in this process are taxonomies, ontologies, classification schemes, term lists, etc.

# Knowledge Org. Structures

- Display - process of presenting information in an orderly and systematic fashion
- Tools used - information architecture navigation tools, visual metaphors, indexing/classification tools.

# Knowledge Org. Structures

- Sense-making - process of making meaning
- Tools used - indexing/classification tools and display tools (people as well... but we'll leave that for now).

# Knowledge Org. Structures

```
<owl:Class rdf:about="http://www.holygoat.co.uk/owl/redwood/0.1/tags/Tag">  
  <label xml:lang="en">Tag</label>  
  <subClassOf  
    rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>  
  <skos:definition xml:lang="en">A natural-language concept which is used  
    to annotate another resource.</skos:definition>  
</owl:Class>
```

```
<owl:Class  
  rdf:about="http://www.holygoat.co.uk/owl/redwood/0.1/tags/Tagging">  
  <comment xml:lang="en">A reified class which defines an instance of a  
    tagging by an agent of a resource with one or more tags.</comment>  
  <label xml:lang="en">tagging</label>  
  <vs:term_status>testing</vs:term_status>  
</owl:Class>
```

File View Bookmarks Resource Holder Advanced About

Address: <http://www.holygoat.co.uk/owl/redwood/0>

Ontology List

- rda-elements.rdf
- tags

Show Imports
  QNames
 No Reasoner

T owl:Thing
 

- C Agent
- ▼ C Concept
  - C Tag
- ▼ C Tagging
  - C RestrictedTagging

**OWL-Class: [Tag](#)**

**Annotations:**  
rdfs:label (en) : Tag

**Subclass of:**  
[Concept](#)




**Domain of:**  
[relatedTag](#)  
[name](#)  
[isTagOf](#)  
[tagName](#)  
[equivalentTag](#)

**Range of:**  
[associatedTag](#)  
[relatedTag](#)  
[taggedWithTag](#)  
[equivalentTag](#)

^ Address: <http://www.holygoat.co.uk/owl/redwood/0.1/tags/Tag>

### Ontology List

rda-elements.rdf  
tags

Add Add Add 

Add GCI

Remove

Rename







 Show Imports QNames

No Reasoner

Class Tree

Property Tree

List

-  owl:Thing
  -  Agent
  - ▼  Concept
    -  Tag
  - ▼  Tagging
    -  RestrictedTagging

Concise Format

Abstract

```

Namespace(owl = <http://www.w3.org/2002/07/owl#>)
Namespace(core = <http://www.w3.org/2004/02/skos/core#>)
Namespace(foaf = <http://www.holygoat.co.uk/foaf.rdf#>)
Namespace(terms = <http://purl.org/dc/terms/>)
Namespace(rdfs = <http://www.w3.org/2000/01/rdf-schema#>)
Namespace(rdf = <http://www.w3.org/1999/02/22-rdf-syntax-ns#>)
Namespace(foaf0 = <http://xmlns.com/foaf/0.1/>)
Namespace(ns = <http://www.w3.org/2003/06/sw-vocab-status/ns#>)
Namespace(xsd = <http://www.w3.org/2001/XMLSchema#>)
Namespace(dc = <http://purl.org/dc/elements/1.1/>)
Namespace(tags = <http://www.holygoat.co.uk/owl/redwood/0.1/tags/>)

```

Ontology( <http://www.holygoat.co.uk/owl/redwood/0.1/tags/>

```

Class (tags:Tag partial
  annotation(rdfs:label "Tag"@en)
)

```

```

Class (tags:Tag partial
  core:Concept
)
)

```

~ Address: http://www.holygoat.co.uk/owl/redwood/0.1/tags/Tag

## Ontology List

rda-elements.rdf  
tagsAdd Add Add 

Add GCI

Remove

Rename







 Show Imports QNames

No Reasoner

Class Tree

Property Tree

List

-  owl:Thing
  -  Agent
  - ▼  Concept
    -  Tag
  - ▼  Tagging
    -  RestrictedTagging

Concise Format

Abstract Syntax

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE rdf:RDF [
  <!ENTITY owl "http://www.w3.org/2002/07/owl#">
  <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#">
  <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#">
  <!ENTITY tags "http://www.holygoat.co.uk/owl/redwood/0.1/tags/">
  <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#">
]>
<rdf:RDF xml:base="&tags;"
  xmlns:owl="&owl;"
  xmlns:rdf="&rdf;"
  xmlns:rdfs="&rdfs;">
  <owl:Class rdf:about="Tag">
    <rdfs:label xml:lang="en">Tag</rdfs:label>
    <rdfs:subClassOf>
      <owl:Class rdf:about="http://www.w3.org/2004/02/skos/core#ConciseFormat">
        </rdfs:subClassOf>
      </owl:Class>
    </rdfs:subClassOf>
  </owl:Class>

  <owl:AnnotationProperty rdf:about="&rdfs:label" />
</rdf:RDF>




```

◀ ▶ ^ Address: <http://www.holygoat.co.uk/owl/redwood/0.1/tags/Tag>

## /// ▲ Ontology List

rda-elements.rdf

tags

Add Add Add 

Add GCI

Remove







Rename

 Show Imports  QNames No Reasoner ▼

Class Tree

Property Tree

List

 owl:Thing Agent▼  Concept Tag▼  Tagging RestrictedTagging

Concise Format

Abstract Sy

```
@prefix owl: <http://www.w3.org/2002/07/owl#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix : <http://www.holygoat.co.uk/owl/redwood/0.1/tags/#> .
```

```
:Tag a owl:Class;
    rdfs:label "Tag"@en;
    rdfs:subClassOf :Concept .
```

```
:relatedTag rdfs:domain :Tag .
:name rdfs:domain :Tag .
:isTagOf rdfs:domain :Tag .
:tagName rdfs:domain :Tag .
:equivalentTag rdfs:domain :Tag .

:associatedTag rdfs:range :Tag .
:relatedTag rdfs:range :Tag .
:taggedWithTag rdfs:range :Tag .
:equivalentTag rdfs:range :Tag .
```



# Threads in Knowledge Organization Research

# Threads in Knowledge Organization Research

- Three major threads in KO research:
  - Design
  - Study
  - Critique

# Threads in Knowledge Organization Research

- Design Research on KOS: asks how to build them?
- Study Research: asks what is the nature, extent, and process of existing KOS?
- Critique Research: asks what does it mean? How does it affect work and life?

# Threads in Knowledge Organization Research

- Each of these requires its own epistemic stance
- In the first instance we have to lay the groundwork for evaluation
- It is only through expressing the explicit epistemic stance and constructs that will allow us to say whether these KOS are *good*.

# Threads in Knowledge Organization Research

- Much of KO research concerns itself with the design of indexing languages, catalogues, and other descriptive apparatus. Key thinkers in the field, like S. R. Ranganathan, have contributed a great deal of thought to the design of schemes for classification. Design research operates in a small and particular set of epistemologies, and a diverse set of theories and methods.

# Threads in Knowledge Organization Research

Design:

- Pragmatic Rationalism  
(Postulationism)
- Domain Essentialism

# Threads in Knowledge Organization Research

- Pragmatic Rationalism (Postulationism)
  - S. R. Ranganathan and the CRG, in their philosophical approach to classification theory, postulate basic categories and methods for interpreting and representing categories. To postulate categories, in this case, is to create epistemic constructs for classification - in R's systems we have PMEST postulated.
- For example:

# Threads in Knowledge Organization Research

- Prevention of virulence of the rice plant in the Madras in 1967.
- P = rice plant
- M = virulence
- E = prevention
- S = Madras
- T = 1967

# Threads in Knowledge Organization

- Colon Classification:
- J381,4;4;0c7:5;3:7;5.4411.e50c'N67'el
- In 'English':
- Agriculture (BF), Rice Plant [1P1], Stem [1P2], Disease [1M1], Virulence [1M2], Prevention [1E], Chemicals [2M1], Distribution [2E], Sprayer [3M1], Madras [S1], Cauveri Delta [S2], 1967 [T1], Dry Period [T2].

# Threads in Knowledge Organization

- Domain Essentialism
  - Methodological Collectivism
  - Methodological Individualism
  - Expertism
  - Userism
- *The truth is out there...in the domain!*

# Threads in Knowledge Organization Research

Study:

- Casual Empiricism
- Analytical
- Socio-Cognitive Approaches

# Threads in Knowledge Organization Research

- Casual Empiricism
  - Removes the problematic of language and observation bias - what you see is what you get
  - Appears as a journalistic study of KOS, and is not linked to larger knowledge claims about the phenomenon (it's isolated research).

# Threads in Knowledge Organization Research

- Analytical (specifically Socio-Cognitive Approaches) wed the mind and rhetorical discourse together - taking logical argumentation as proof of findings about empirical events.
- Interesting work, but creates a disconnect between observation and argumentation.

# Threads in Knowledge Organization Research

## Critique

- Deep Structure (meaning is there to be found and represented)
- Critical Theory
- Marxist

Joseph T. Tennis "Epistemic Constructs in the Design, Study, and Critique of Knowledge Organization Structures" Information Resources Management Association, International Conference (Vancouver, British Columbia), May 2007.



# Epistemic Constructs

# Epistemic Constructs

- Valid Source(s) of Evidence
- Method of Research
- Stopping Measures

# Epistemic Constructs

- Valid Source(s) of Evidence
  - Postulated
- Method of Research
  - Postulational Method (name, use)
- Stopping Measures
  - Postulated findings stand until proven unsatisfactory

# Epistemic Constructs

- Valid Source(s) of Evidence
  - What I see
- Method of Research
  - A case or situation
- Stopping Measures
  - When I get tired



Thank you

Joseph T. Tennis  
University of British Columbia



# References

1. Carlyle, A. Developing Organized Information Displays for Voluminous Works: A Study of User Clustering Behavior. *Information Processing & Management*, 35, 5 (July 2001): 677-699.
2. ANSI/NISO. (2005). Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabularies. Available: <http://www.niso.org/standards/>
3. Golder, S. A. and Huberman, B. A. (2006). Usage patterns of collaborative tagging systems. In *Journal of Information Science*, 32(2): 198-208.
4. Weik, K., Sutcliffe, K. and Obstfeld, D. (2005). Organizing and the process of sense-making. *Organizational science* 16(4):409-421.