Principles of knowledge organization: analysis and structures in the networked environment

0. Abstract

Knowledge organization in the networked environment is guided by standards. Standards in knowledge organization are built on principles. For example, NISO Z39.19-1993 Guide to the Construction of Monolingual Thesauri (now undergoing revision) and NISO Z39.85-2001 Dublin Core Metadata Element Set are two standards used in many implementations. Both of these standards were crafted with knowledge organization principles in mind. Therefore it is standards work guided by knowledge organization principles which can affect design of information services and technologies. This poster outlines five threads of thought that inform knowledge organization principles in the networked environment. An understanding of each of these five threads informs system evaluation. The evaluation of knowledge organization systems should be tightly linked to a rigorous understanding of the principles of construction. Thus some foundational evaluation questions grow from an understanding of standards and principles: on what principles is this knowledge organization system built? How well does this implementation meet the ideal conceptualization of those principles? How does this tool compare to others built on the same principles?

1. Context of discussion

- Knowledge Organization in the networked environment is guided by standards
- Standards in knowledge organization are built on principles

Existing standards built on principles:
- NISO Z39.19-1993 Guide to the Construction of Monolingual Thesauri
- NISO Z39.85-2001 Dublin Core Metadata Element Set

Future standards work, crafted on principles:
- NISO Z39.19 is under revision
- Dublin Core provides "Semantic Recommendations"

Knowledge organization principles can affect design of information services and technologies through standards work.

2. Definition of principles

Principles are laws, assumptions standards, rules, judgments, policy, modes of action, as essential or basic qualities. They can also be considered goals or values in some knowledge organization theories. (Adapting the definition from the American Heritage Dictionary).

3. Principles

Five principles are presented below. Each of these principles is drawn from the work of S. R. Ranganathan, M. A. Broadfield, Patrick Wilson, D. W. Langridge, and Birger Hjørland respectively. These are not mutually exclusively principles.

Types knowledge organization theories:
1. Normative Principles
2. Principles of Definition and Differentiation
3. Principles of Explicitness and Control
4. Principles of Analysis
5. Epistemological Positions

Questions for system design:
1. Do you want to base your system on principles? If so which principles? And what is the justification for your choice?
2. What are these principles called and how are they defined? How are they different from other principles you could have chosen?
3. How have you made these principles explicit and how do you account for the control they have over the information in your system?
4. How will you analyze the universe of knowledge you have available and how will you maintain the integrity of other types of analysis (subject analysis) in relation to the analysis of the universe of knowledge?
5. What philosophical commitments have you made to this universe and this tool?

Questions for system evaluation:
1. In general, what principles guide your work? What principles tell you you have built a *good* knowledge organization tools?
2. How are those principles defined, and how are the components of your tool/system defined?
3. How do you make your principles explicit, and what do they control in this knowledge organization system?
4. All knowledge organization tools are based on analysis. What kinds of analysis was done for this knowledge organization tool?
5. Since we are dealing with knowledge organization, we are dealing with knowledge. What tacit and explicit philosophical commitments does this knowledge organization structure make? Is it based on facets that never evolve because the designer has chosen these facets as never changing? Or is the structure based on an ever-widening natural language base?

4. Metadata Thesaurus as an Example

DC-2003
28 September - 2 October 2003
Seattle, Washington USA

View RDF Source

RDF Ontology
DC Documents
TIFS Thesaurus
FOAF Agents
XRBR Query

Figure 1. Sample of the key elements from the DC-2003 Online Proceedings - these make explicit what is done in this knowledge organization tool.

4.1. Principles in the Dublin Core Proceedings Example

A. Normative Principles - this tool uses an ontology, rdf, thesauri, and foaf - we should expect references to and conformance with recommendations that will provide this tool with normative principles

B. Principles of Definition and Differentiation - because rdf, foaf, etc. are being used they should be defined. Further a definition of the thesaurus used here should be provided.

C. Principles of Explicitness and Control - this tool organizes knowledge - we should see how this tool organizes knowledge, what it organizes, and what powers we have over that knowledge when using this tool.

D. Principles of Analysis - how were the documents here analyzed? What kind of analysis went into the construction of the thesaurus?

E. Epistemological Positions - what assumptions are made in this tool about the universe of knowledge in general and in this particular literature?

5. References

Broadfield, M. A. (1946). *Philosophy of classification*. (London: Grafton and Co.).
Hjørland, B. (1997). *Information seeking and subject representation*. (London: Greenwood Press).
Langridge, D. W. (1989). *Subject analysis: principles and procedures*. (London: Bowker-Saur).
Ranganathan, S. R. (1967). *Prolegomena to library classification*. 3rd ed. (Bombay: Asia Publishing House).
Wilson, P. (1968). *Two kind of power: an essay on bibliographical control.* (Berkeley CA: University of California Press).

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