Stratified semantic relations

for

Information retrieval and knowledge exploration in distributed knowledge organization systems

RESEDA

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Premisses

- Ø In knowledge organisation formal systems are to support cognitive interpretation.

- Ø Integration of machine-assisted reasoning and cognitive interpretation is possible.

- Ø Coherences and relations between concepts are vital to the understanding and interpretation of complex themes and subjects and the creation of personal knowledge.

- Ø The end-users personal knowledge of a subject field is a valuable resource that needs to be fostered by offereing him an explorative approach towards indexing languages.

- Ø Knowledge organization systems can facilitate an explorative approach to a subject area.

- Ø structural, linguistic and typological differences of various indexing languages have to be taken into acount when designing and defining mapping relations.

knowledge exploration I

Ø Characteristics:

- Relational structure
- Coherence
- Multidimensionality
- Complexity

Ø Requirements:

- Transparency
- Orientation
- Navigation
- Thematic selection

knowledge exploration II

Context: linked heterogeneous indexing languages and KOS

Ø   Functional integration of several heterogeneous systems.

Ø   Providing transparent and intuitive structures facilitating the users' orientation and navigation.

Ø   Naviagation and exploration across the systems' boundaries via typed intersystem mappings.

Ø   Exploration and understanding of complex conceptual constellations in transparent and expressive relational systems.

Goals

Ø Facilitating advanced forms of focussed and efficient information retrieval

Ø Supporting strategies of knowledge exploration

Ø Enabling the end-user to integrate new information into his own cognitive structures as a preparation for retrieval and exploration

in a

Ø Comprehensive international knowledge organisation system

Types of relations

Inter-concept relations   (between conceptual elements within individual systems)

Ø   Semantic content à thematic orientation and exploration.
Ø   Logical characteristics à machine-based inferencing

Inter-system relations   (between concepts pertaining to different systems)

Ø   Formal and typological specifications can contain ? propositions regarding structural and relational characteristics of the systems involved.

Defining relations I

Ø   Defining formal / typological specifications

  Ø   Different relational structures of different indexing languages require different strategies of orientation, navigation and searching.

  Ø   Appropriate strategies for interpreting individual concepts and concept relations may differ in verbal and classificatory systems

  Ø   Typological differences between various systems have to be made explicit.

  Ø   Formal /typological specifications are crucial for inter-system relations.

Defining relations II

Ø   Defining logical characteristics

  Ø   Small set of logical characteristics of semantic relations which are
      relevant for retrieval and knowledge exploration

  Ø   Logic is the basis for all inferential reasoning.

  Ø   The claim to logical validity may render the entire model
      contestable

  Ø   The logical validity of the modelled structures is limited.

Defining relations III

Ø   Defining semantic content

  Ø   Unlike the inventory or the description of the logical characteristics of inter-concept and inter-system relations, the inventories for the semantic relations can be quite large.

  Ø   relations asserted between concepts must provide relevant information for the subject area.

  Ø   semantic content of the relations should reflect a relevant aspect of the subject area.

  Ø   The definition of a priori relations provides an objective externalisation of the propositions on a subject area.

  Ø   Hierarchically structured inventories of specified relation-types allow for further functionalities

Inventories for semantic relations

Ø   Specifying semantic relations results in a larger amount of more complex
    relations

Suggestion:

Ø   Hierarchically structured inventories

Ø   Semantic content and logical characteristics can be inherited

Ø   Interdependencies between semantic content, logical characteristics and
    formal specifications can be defined and represented appropriately

Resumeé

Ø   The combination of inter-concept and inter-system relations with minutely specified semantic content, logical characteristics and the necessary typological specifications can provide neatly structured and expressive indexing languages interconnected in an international comprehensive KOS.

Ø   If the relation types of the indexing languages are coordinated and matched to the types of the core system this model offers good foundations to implement semantic interoperability as an important feature for information retrieval and knowledge exploration in an international comprehensive KOS.

….. to assess implementations and use-cases it is still a long way to go.

Thank you for your attention.

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Overview

- Ø Information retrieval vs. knowledge exploration

- Ø comprehensive international systems

- Ø Typification in

- Ø stratified typification in taxonomic inventories.