Hermeneutic approaches in KO: an analysis of their possible value

Abstract: This paper considers how hermeneutics and other related theories may bring new insights into KO. They provide a most realistic representation of the complexity of knowledge and meaning according to which new forms of KOSs could be designed. Computational and conceptual aspects of these issues are discussed taking into account a number of case studies.

Introduction
The development of knowledge organization (KO) has strongly been influenced by empiricism and logical positivism. However, an increasing attention to other theoretical approaches, and in particular to hermeneutics, can be found in many theoretical studies in KO and related fields (Chalmers, 2004; Cole & Avison, 2007; Fonseca & Martin, 2005; Hansson 2004; Hjørland, 2007). With its basic idea of the ‘situatedness’ of understanding, contemporary hermeneutics has the potential to become a theoretical background on the basis of which new forms of knowledge organization systems (KOSs) are conceived. Wittgenstein’s late philosophy, which shares some similarities with parts of hermeneutics, is also considered for such a purpose. The possibility of applying these approaches to KO issues is then investigated, both in their computational and conceptual aspects, by analyzing some case studies.

1. Towards hermeneutic approaches in KO: computational applications
1.1 The heuristic approach for the development of IS methodology
Information systems (IS) using thesauri, classifications and other KOSs adopt from their beginnings a heuristic model of reasoning deeply influenced by logical positivism. This includes, for example, attempts to codify human reality into formal definitions. Accordingly, representations of phenomena are fixed and based on logics and exclude representations of individuals’ context and situation (Chalmers, 2004).

The concept of heuristics refers to a reasoning that advances learning in basic principles to progress in knowledge through successive stages, as to enable the accumulation of successes and learning from errors. The reasoning counts on fundamental concepts that enable coding the well-known. This codification provides the possibility of extending, strengthening, or revealing what is known, thus creating the foundations of new knowledge in relation to the already known.

The development of IS with a heuristic model follow two knowledge representation methodologies: the Procedural form and the Declarative form. In the former, knowledge is integrated into the computer program. The knowledge representation is independent from the computational process: the computer program is seen as a collection of functions or instructions given to the computer. In the latter, a computer program is as a set of interacting individual units or objects, where any object can manage its own state and operations. Both methodologies, although implying different implementation systems, have three logical steps in common:
1. Conceptual scheme construction: representation of the system domain in terms of identifiable objects or elements with their properties and attributes.
2. Enunciation of general rules of behavior and listing of the relationships between the objects or elements of the conceptual scheme applicable to the situations upon which the system sets out to act.
3. Rule application in order to get to conclusions and modifications induced by successes and errors.

These logical steps presuppose the concepts of essence, success and truth, as well as an ideal construction of the reality upon which the IS operates (Bosch, 2006).

The heuristic approach has enabled very important advances in information systems. However, at present heuristic models are finding it very difficult to maintain their consistence and stability, since the resources to which heuristic analysis is applied include non-textual materials, multilingual environments, and important cultural differences in user profiles. In addition, the subject structures of KOSs call for multidisciplinary knowledge organization.

1.2 Towards hermeneutic approaches: spoken prose without knowing it

The hermeneutic approach is mainly rooted in Gadamer’s philosophy, who insists on the ‘situatedness’ and historicity of human understanding and its priority as an interpretative and dialogic activity. Meaning is inter-subjectively created and acquired through interpretation experiences. However, if our understanding always depends on a given fore-structure, any act of interpretation can itself contribute to changing this structure, in a process described as the hermeneutic circle (Chalmers, 2004).

Figure 1. The hermeneutic circle as a practical research framework (Avison & Cole, 2007: 824)

The information in IS development with a hermeneutic approach is not merely data and facts, but also representations built through interpretation and dialogue supplying meaning and context to actions. Like heuristic models, they use conceptual schemes. But these are not necessarily hierarchical and can instead be cross-sectional or integrated, featuring simultaneously different structures. (Winograd & Flores, 1986)

With the advent of the Web 2.0, various types of circulation of meaning, supported by partial, individual, and sectorial interpretations, have arisen. For example, the user is no longer one that only uses: he now becomes a protagonist. As a negative consequence, this new situation has brought about an explosion of identification of forms of knowledge, with overlaps in a jungle of labels. At the same time, it has also given room to innovation by and for users. This innovation comes not from the experts,
but from people with investigatory interest, who use individual and partial forms of reasoning (Von Hippel, 2007).

Like Moliere's *Bourgeois Gentilhomme*, the application experiences of the hermeneutic approach in IS surpass the explicitly enunciated theory. It is therefore necessary to identify the major characteristics of the hermeneutic and the heuristic approach in IS and then to investigate how they possibly apply to concrete experiences.

### 1.3 Heuristics and hermeneutics features of ISs using KOSs

To the main features of the heuristic approach belong: hierarchical organization; separation of developers and users; closed systems and being strongly result-oriented.

The hermeneutic approach, instead, includes primarily: pragmatic forms of knowledge classification; contextual aspects of application domain; innovative experiences of software engineering; open systems with strong user participation; and tendency to collaborative construction of knowledge.

#### 1.3.1 A case study based on the analysis of knowledge generators

An analysis of heuristic and hermeneutic features in computer applications of KOSs has been made on selected samples from the European area, especially Italy. The knowledge generators have been chosen as dimension of analysis. We have considered the use of IT in experiences of collaborative construction of knowledge. Following the stages of the hermeneutic circle (fig.1), we have tried to explicate our pre-understandings and established a dialog with colleagues, leading to reflection and reconstruction. The result is a scheme suggesting an approach according to types of organizations and technologies, their participants, ways of interacting and surroundings.

### Table 1. Comparative scheme with possible approach

<table>
<thead>
<tr>
<th>Organizational modality</th>
<th>Participants</th>
<th>Interaction</th>
<th>Surroundings</th>
<th>Technologies</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communities of interest</td>
<td>volunteers and amateurs</td>
<td>Coordinated interaction</td>
<td>self-convocation</td>
<td>blogs, wiki, file sharing</td>
<td>HERMEN</td>
</tr>
<tr>
<td>Communities of practice</td>
<td>technological, economical &amp; social areas operators</td>
<td>Coordinated interaction</td>
<td>self-convocation and ONG</td>
<td>blogs, wiki, free &amp; paid reservoirs and Web Portals</td>
<td>HEURIST &amp; HERMEN</td>
</tr>
<tr>
<td>Invisible colleges</td>
<td>professionals, technicians, specialists, scientists</td>
<td>not evident collaboration, but reciprocal influences</td>
<td>Academics and ONG</td>
<td>Local Networks (LN), intranet: KMS, CMS, LMS, Web 2.0 growth</td>
<td>HEURIST</td>
</tr>
<tr>
<td>Research &amp; Development teams</td>
<td>professionals, technicians, specialists, scientists</td>
<td>little coordinated interaction, primarily hierarchical structure</td>
<td>Academics and ONG</td>
<td>LNs, intranet: KMS, CMS, LMS, Web 2.0 growth</td>
<td>HEURIST</td>
</tr>
<tr>
<td>Groups of diffusion and communication</td>
<td>journalists, writers, artists</td>
<td>coordinated and cooperative interaction</td>
<td>enterprise, academics, ONG</td>
<td>blogs, wiki, file sharing and CMS</td>
<td>HERMEN</td>
</tr>
<tr>
<td>Communities of protagonists</td>
<td>special need people, war, abuse or disease victims, women, migrants, homosexuals</td>
<td>coordinated and cooperative interaction</td>
<td>self-convocation-ONG</td>
<td>blogs, wiki, file sharing and CMS</td>
<td>HERMEN</td>
</tr>
<tr>
<td>Communities of formation</td>
<td>teachers &amp; students, e-learning &amp; support of face-to-face training</td>
<td>little coordinated interaction, primarily hierarchical structure</td>
<td>enterprise, academics, ONG, public administration</td>
<td>LMS, Web 2.0 growth</td>
<td>HEURIST</td>
</tr>
</tbody>
</table>
2. Semantics in KOSs and language games

Knowledge representations incorporated in retrieval languages are often derived from assumptions originating from an empiricist view of knowledge, and from logical positivism (Svenonius, 2004). This is quite visible in the adopted approaches to meaning: operationalist, essentialist or referential. And consequently in how KOSs - semantic tools providing meaning representation for operational purposes - are conceived. Thesauri standards, for example, emphasize the need to include in a thesaurus only logically-based relationships among terms, which are considered permanent and valid in all contexts (a priori), such as genus-species.

Contemporary hermeneutics, instead, conceives knowledge as occurring always from within a situated perspective, a given horizon. Accordingly, meaning is not regarded as a fixed entity, but as socially and culturally constructed, open to interpretation and changeable according to different contexts (Hjørland, 2007).

The philosophy of the late Wittgenstein (1953) shares some similarities with parts of hermeneutics (above all Gadamer’s theories). Insisting on the fact that speaking language is a social action, he did not conceive the meaning of a word as an essence (i.e., a number of key conceptual features linked to a linguistic expression) or a referent, but rather as its use (as part of an activity) according to the rules of a given language game. Language is, thus, regarded as formed by an indefinite, however extensible variety of substructures (language games). Meaning is multidimensional, (to some extent) contextually determined and variable.

Together with hermeneutics, Wittgenstein’s theories, can be highly relevant to a series of issues in IS and KO (Andersen & Christensen, 1999; Blair, 1990; Hjørland, 1998). Above all, they can foster an idea of semantics in KOSs that, instead of searching an ‘out of context’ validity, attempts rather to represent (taking into account the actual needs of users) the complexity of knowledge and meaning as this occurs within different knowledge domains, and cultural and linguistic environments.

2.1 Possible applications to multilingual KOS development

In Wittgenstein’s view, concepts and meanings are created in the framework of social practices. Language games are, in fact, inscribed in forms of life, i.e. patterns of socially determined behaviours that encapsulate how we act and relate to the world as cultural communities and in which language arises and acquires meaning. Each culture is, thus, engaged in its own language games intertwined with their corresponding forms of life. In a way, expressing how words are used, and therefore their meaning, implies to depict a culture.

Hence, moving from a language setting to another could entail not only differences in the relations between concepts and their verbal expressions, but also at a conceptual level, since concepts and semantic structures are always developed according to the viewpoint of a given culture (or form of life).

In designing multilingual KOSs, such as thesauri, this should, thus, be taken into consideration. Hudon (2001) has extensively explored this topic. As an example she provides the case of the French term éducation and of the English term education, which should not be regarded as exactly equivalent. The latter, in fact, has a broader meaning than the former, and is less clearly distinguished from the concept of teaching than éducation and enseignement are in French.
Table 2. (Partial) equivalence between education and éducation (Hudon, 2001:74)

<table>
<thead>
<tr>
<th>English (source)</th>
<th>French (target)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Éducation</td>
</tr>
<tr>
<td>Teaching</td>
<td>Enseignement</td>
</tr>
<tr>
<td>Instruction</td>
<td>Instruction</td>
</tr>
</tbody>
</table>

When comparing concepts/terms in different languages not only the semantics of the single terms should be considered, but more holistically also the way in which they interact with the semantic structure they directly take part in.

According to the semantic field theory of the structural linguist Trier (1931), a lexicon is, in fact, organized in clusters of semantically related and interdefined words. Similarly to Wittgenstein’s language games, this theory conceives meaning as arising from the wider context in which words are located: the semantics of any word results from the network of relationships among this word and others of the same field.

In this sense, each difference or modification occurring at the level of single terms can affect (and reorganize) the whole semantic field to which they belong. Therefore, interlinguistic equivalence should not be evaluated solely at a single term level. What matters is also how, moving from a language to another, the local semantic arrangement varies.

Overlooking the fact that diverse languages use differently terms which apparently express an identical concept could have consequences for the thesaurus semantic arrangement and lead to the establishment, for example, of controversial hierarchical structures, as shown below:

Table 3. Possible narrower terms of education and éducation (Hudon, 2001: 77)

<table>
<thead>
<tr>
<th>EDUCATION</th>
<th>EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>adult education</td>
<td>éducation des adultes</td>
</tr>
<tr>
<td>agricultural education</td>
<td>enseignement agricole</td>
</tr>
<tr>
<td>career education</td>
<td>Préparation à une carrière</td>
</tr>
<tr>
<td>civic education</td>
<td>instruction civique</td>
</tr>
<tr>
<td>compulsory education</td>
<td>scolarité obligatoire</td>
</tr>
<tr>
<td>cooperative education</td>
<td>formation en alternance</td>
</tr>
<tr>
<td>Free education</td>
<td>enseignement gratuity</td>
</tr>
<tr>
<td>higher education</td>
<td>enseignement supérieur</td>
</tr>
<tr>
<td>Private education</td>
<td>enseignement privé</td>
</tr>
<tr>
<td>progressive education</td>
<td>pédagogie progressiste</td>
</tr>
<tr>
<td>vocational education</td>
<td>enseignement professionne</td>
</tr>
</tbody>
</table>

As stressed by Hudon (2001), French native speakers going through the French structure may doubt of its correctness and usefulness for meaning representation and navigation. In fact, having (erroneously) established a full equivalence between education and éducation, this has been transferred to the following level of specificity.

This is what is likely to occur when the multilingual thesaurus is obtained by ‘translating’ in one or more languages an already existing monolingual (usually English) thesaurus, creating identical and symmetrical structures for all its linguistic
versions. Hence, while NTs of *education* are correctly placed, in reason of their semantics, many of the Terms Spécifiques (TS) of *éducation* should instead be subordinated to other terms. *Education* and *éducation* are used differently in their respective languages. In a sense, we may say that they are part of not (totally) equivalent language games. In the two languages the correspondent semantic field is differently carved.

To support effective multicultural indexing and retrieval, in developing the vocabulary and the semantic organization of the different linguistic versions of a KOS, the way in which each language is structured into its specific language games should be taken into consideration and (reasonably) represented, according to the real IR needs.

In order to reach such a purpose, the idea of a non-symmetrical multilingual thesaurus - i.e., consisting of independent terminological and semantic structures for each linguistic version (Hudon, 2001) - seems worth a further investigation. The notions of language games and semantic fields, together with hermeneutics, can contribute to reinforce the theoretical background according to which these new forms of multilingual thesaurus are designed. In any case, when structures are allowed to differ, they are likely to better reflect the conceptual and terminological settings with which potential users coming from different cultures are most familiar.

**Conclusion**

In this paper, we have tried to show how hermeneutics and other related theories could supply new insights into KO. Above all, they can provide a more realistic representation of the complexity of knowledge and language, which occur according to a variety of viewpoints, language games and forms of life. And consequently catalyze the creation of systems which incorporate this vision.

**References**


