# Knowledge Organization = Information Organization?

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**Abstract:**

Are the terms "information organization" (IO), "organization of information" (OI) and "information architecture" (IA) synonyms for knowledge organization (KO)? This study use bibliometric methods, among others, to determine some relations between these terms and their meanings. Apparently the data shows that these terms should not be considered synonyms because each of the terms IO, OI, IA and KO produce a different set of high ranked authors, journals and papers. In many cases the terms are, however, used interchangeably (and thus indicating synonymity) and it is argued that the underlying theoretical principles are identical but that the different terms has a tendency to be applied in different context: KO in the library context; IA in the web-context and IO and OI in more unspecified ways.

## Introduction

The present study is concerned with the relations between four terms from the literature of library and information science (LIS):

- Information organization (IO),
- Organization of information (OI),
- Information architecture (IA) and
- Knowledge organization (KO)

More precisely, it is about whether or not these terms should be considered synonyms? Synonymity being defined as the semantic relation that holds between two terms that can—in a given context—be said to express the same meaning. The term KO is well established and *the International Society for Knowledge Organization* (ISKO) and its publications, including the journal *Knowledge Organization*, are among the core actors in this field. IA, on the other hand, is a rather new term, which in some contexts seems to be more "hot," technological advanced or prestigious term. The two other terms: IO and OI are included in this examination in order to clarify the meaning of closely related terms. Are there differences in meaning or are the different expressions attributable, in part, to what Konrad (2007) termed "poor terminological hygiene"? The methodology applied in this study is also suggested for examining concepts and relations in other fields and it is therefore an approach to KO applied on the field itself.

## Method

Each of these four terms were searched in *Social Science Citation Index* (SSCI) both in the whole database (Table 1) and limited to LIS (Table 2) in January 2011. For each term and each database was ranked 1) the most cited authors 2) the most cited journals or works and 3) the most cited references. The content in these tables is analyzed. Core texts in KO and IA are also examined in order to compare the theoretical issues involved.

## Results

The rankings of the bibliometric investigation are displayed below.

| Table 1: Top 5 Rankings of authors, works and papers in Knowledge Organization and Information Organization in SocialSciSearch, all subject fields (January 2011) | | | | |
|---|---|---|---|---|
| | Knowledge Organization, KO | Information Organization, IO | Organization of Information, OI | Information Architecture, AI |
| Most cited authors | Rank #1<br>HJORLAND B<br>DAHLBERG I<br>BEGHTOL C<br>CHI MTH<br>KOGUT B | Rank #4<br>MILLER GA<br>SVENONIUS E<br>BADDELEY A<br>PORTER ME<br>ZAND DE | Rank #7<br>DUNCAN J<br>WILLIAMSON OE<br>ALCHIAN AA<br>POSNER MI<br>KAHNEMAN D | Rank #10<br>ROSENFELD L<br>NIELSEN J<br>BRANCHEAU JC<br>WURMAN RS<br>MARCHIONINI G |
| Most cited journals/works | Rank #2<br>J DOC<br>KNOWL ORGAN<br>J AM SOC INFORM SCI<br>COGNITIVE PSYCHOL<br>ACAD MANAGE REV | Rank #5<br>PSYCHOL REV<br>J AM SOC INFORM SCI<br>PSYCHOL BULL<br>COGNITIVE PSYCHOL<br>J EXP PSYCHOL LEARN | Rank #8<br>PSYCHOL REV<br>COGNITIVE PSYCHOL<br>J EXP PSYCHOL GEN<br>PERCEPT PSYCHOPHYS<br>J EXP PSYCHOL H | Rank #11<br>INFORMATION ARCHITEC<br>COMMUN ACM<br>J AM SOC INFORM SCI<br>INFORM ARCHITECTURE<br>MIS QUART |
| Most cited references | Rank #3<br>HJORLAND B, 1995, V46, P400, J AM SOC INFORM S<br>CHI MTH, 1981, V5, P121, COGNITIVE SCI<br>HJORLAND B, 2002, V58, P422, J DOC<br>KOGUT B, 1992, V3, P383, ORGAN SCI<br>LAKOFF G, 1987, WOMEN FIRE DANGEROUS | Rank #6<br>SVENONIUS E, 2000, INTELLECTUAL FDN INF<br>ZAND DE, 1981, INFORMATION ORG POWE<br>MILLER GA, 1956, V63, P81, PSYCHOL REV<br>WILLIAMSON OE, 1985, EC I CAPITALISM<br>HANSEN MT, 1999, V44, P82, ADMIN SCI QUART | Rank#9<br>DUNCAN J, 1984, V113, P501, J EXP PSYCHOL GEN<br>ALCHIAN AA, 1972, V62, P777, AM ECON REV<br>EGLY R, 1994, V123, P161, J EXP PSYCHOL GEN<br>KRAMER AF, 1991, V50, P267, PERCEPT PSYCHOPHYS<br>WILLIAMSON OE, 1985, EC I CAPITALISM | Rank #12<br>ROSENFELD L, 1998, INFORMATION ARCHITEC<br>NIELSEN J, 1993, USABILITY ENG<br>ROSENFELD L, 2002, INFORM ARCHITECTURE<br>BRANCHEAU JC, 1996, V20, P225, MIS QUART<br>ROSENFELD L, 2002, INFORMATION ARCHITEC |

| | Knowledge Organization | Information Organization | Organization of Information | Information Architecture |
|---|---|---|---|---|
| | **Table 2:** **Top 5 Rankings of authors, works and papers in Knowledge Organization and Information Organization in SocialSciSearch, Information and Library Science (January 2011)** | | | |
| Most cited authors | Rank #13 HJORLAND B DAHLBERG I BEGHTOL C RANGANATHAN SR SOERGEL D | Rank #16 SVENONIUS E BELKIN NJ CHOO CW INGWERSEN P TAYLOR AG | Rank #19 CASE DO DAVENPORT TH FIDEL R KWASNIK BH PATTON MQ | Rank #22 ROSENFELD L NIELSEN J BRANCHEAU JC DILLON A MARCHIONINI G |
| Most cited journals/ works | Rank #14 J DOC KNOWL ORGAN J AM SOC INFORM SCI J AM SOC INF SCI TEC CATALOGING CLASSIFIC | Rank #17 J AM SOC INFORM SCI INFORM PROCESS MANAG COMMUN ACM J AM SOC INF SCI TEC J DOC | Rank #20 HARVARD BUS REV J AM SOC INFORM SCI INFORM SYST RES J INFORM SCI MANAGE SCI | Rank #23 INFORMATION ARCHITEC J AM SOC INFORM SCI INFORM ARCHITECTUR E INFORM PROCESS MANAG MIS QUART |
| Most cited references | Rank #15 HJORLAND B, 1995, V46, P400, J AM SOC INFORM S HJORLAND B, 2002, V58, P422, J DOC LAKOFF G, 1987, WOMEN FIRE DANGEROUS BLISS HE, 1929, ORG KNOWLEDGE SYSTEM SVENONIUS E, 2000, INTELLECTUA L FDN INF HJORLAND B, 1992, V48, P172, J DOC | Rank #18 SVENONIUS E, 2000, INTELLECTUA L FDN INF ROWLEY J, 2000, ORG KNOWLEDGE INTRO STAR SL, 1996, V7, P111, INFORM SYST RES BATES MJ, 1989, V13, P407, ONLINE REV BELKIN NJ, 1982, V38, P61, J DOC | Rank #21 CASE DO, 1986, V12, P97, J INFORM SCI KWASNIK BH, 1991, V47, P389, J DOC BURNS T, 1961, MANAGEMEN T INNOVATIO CASE DO, 1991, V42, P657, J AM SOC INFORM SCI COASE RH, 1937, V4, P386, ECONOMICA | Rank #24 ROSENFELD L, 1998, INFORMATION ARCHITEC BRANCHEAU JC, 1996, V20, P225, MIS QUART ROSENFELD L, 2002, INFORM ARCHITECTUR E GULLIKSON S, 1999, V17, P293, ELECTRON LIBR NIELSEN J, 1993, USABILITY ENG |

## Data analysis

If we compare the five most cited authors in the whole of SSCI the first observation is that there is no overlap: Each of the four concepts has a unique set of most cited authors (which of course change if more than just the top five is considered; data not shown), seemingly indicating that we are dealing with four separate fields.

a) The term KO is dominated by authors from LIS: The three most cited researchers in rank #1 often attend the same conferences and publish in the same journals. Dahlberg is the founder of the International Society for Knowledge Organization (ISKO) and the journal Knowledge Organization. In rank #1 only Chi et al. (1981) and Kogut & Zander (1992) are from outside LIS (respectively from cognitive science and knowledge management) indication that the term is also used in those fields. The three first are well known researchers in LIS as are all researchers in rank #13. The three most cited journals are from LIS: J.Doc, Knowledge Organization and JASIST. The fourth and fifth most cited journals are from psychology (Cognitive Psychology) and Management (The Academy of Management Review).

b) Concerning the term IO: Cognitive psychologist G.A. Miller was most cited in rank #4 (however in a new search made on 2012-01-02 Svenonius and Miller switched place). Elaine Svenonius is a well know scholar in KO. Her book *The Intellectual Foundation of Information Organization* (2000) is clearly a work from the tradition of LIS and KO, which has chosen the label IO rather than KO (and therefore indicating synonymity between these terms).  Her book appears under both KO (rank 15) and IO (rank 6+18). Returning to rank #4: A. Baddeley is a cognitive psychologist, while M.E. Porter and D.E. Z and are management scholars. In the social sciences, the term IO is thus not dominated by LIS researchers, and within LIS (rank #16) Nicolas  Belkin and Peter Ingwersen are not foremost known for their contributions to KO.  C.W. Choo is researcher in knowledge management. Arlene G. Taylor is a well-known textbook author in KO (Taylor & Joudrey, 2009). It appears that IO is sometimes used as synonym for KO, but in general it is very mixed what is found by that term.

c) The term OI is mostly used by psychologists and cognitive scientists (whether or not cognitive science is a fruitful theoretical basis for KO cannot be discussed in the present paper). In Rank #7 none of the researchers are from LIS. In rank #19 Raya Fidel and Barbara Kwasnik are from KO, the others from other subfields of LIS. This term is therefore the term with the weakest link to KO and it is also very mixed, what is found by it.

d) Finally, the term IA designates what appears to be a "new" field.  A core text is Morville & Rosenfeld (2006) (1st edition: Rosenfeld & Morville, 1998) and this text is the highest ranking in both rank #11 and #23 just as one of the authors is the highest ranking author in both rank #10 and #22. Although this book is focusing on web-design, it contains a lot of traditional topics from KO, such as hierarchy, folksonomies, metadata, thesauri, and facetted classification. I am not saying that nothing is new in this field (and it is certainly attracting some talented people), but I would say that it is exaggerated to speak of a new field because the overlap to KO is too big, and the intellectual basis is too closely related (in other words: each field is too small in substantial content to be separated from the other). In my opinion IA is to some extent "old wine in new bottles" and the tendency to create new labels may have some negative effects in fragmenting the field.

## Discussion

Does KO = IO? What differences does it make whether we prefer the term *knowledge* or the term *information* in LIS and in KO? There are different views on this issue in the literature. D. A. Kemp (1988, p. 3) argued that "knowledge retrieval" should substitute "information retrieval" Van Rijsbergen and Lamas, on the other side, wrote:

> "In the early days of Information Retrieval (van Rijsbergen, 1979), people used to qualify their statements about information retrieval (IR) by saying that really they were working on document retrieval. It was denied strenuously that information was being retrieved. As Lancaster (1968) wrote, "An information retrieval system does not inform (i.e., change the knowledge of) the user on the subject of his inquiry. It merely informs on the existence (or non-existence) and whereabouts of documents relating to his request."
>
> The situation has changed. We believe that the purpose of an information retrieval system is to provide information about a request and that a request is a representation of an information need that an IR system attempts to satisfy." (van Rijsbergen & Lalmas, 1996, p. 386).

There are strong indications that the term "information" became popular with library science and documentation more because of its appeal than for its scientific merits (cf. Capurro & Hjørland, 2003; Hjørland, 2000; Furner, 2004). These authors, among others, argue against van Rijsbergen & Lamas' point of view. A document can be said to materialize the knowledge produced and thus to represent knowledge. Documents may also be said to have the potential to inform people. The criteria of when documents represent knowledge (what is knowledge?) or when documents inform people (what is information?) have been the focus of much discussion. Buckland (2012), for example finds that information science is concerned with what people know (i.e., with knowledge), and his arguments are related to a deeper concern about the fruitful development of LIS: it is rather important issues that are at stake. It may be argued that knowledge and information can be used as synonyms in LIS, and a textbook such a Rowley & Hartley (2008) used the title *Organizing knowledge* but adds the subtitle: *An Introduction to Managing Access to Information*. In this way some authors may try to attract people whatever of these terms they might prefer and again indicating the connection between the terms IO, OI, IA and KO. I'll argue, however, that knowledge should be the preferred term in LIS—and thus that KO should be preferred among the four terms considered in this article.

The present study has used bibliometric methods and has considered different disciplines, which is a concept in the sociology of science. The methods and theories used here are thus much more related to fields like "the theory of knowledge" and "the sociology of knowledge" than to "information theory", indicating an important relation to other disciplines concerned with knowledge. My suggestion is, in other words, that the term "knowledge" moves us relatively away from fields like information theory and computer science towards fields such as social semiotics, science studies and the study of documents and their role in human activities ("activity theory"). I believe that such a "social turn" is very important for developing LIS as a scholarly discipline.

Subject terminology should not be used as buzzwords. There is a tendency to change terminology in this way. Sheila Webber shows how many courses in England shift

titles from 'information science' to 'information management' simply because the word science is not popular among the students that one wish to attract. She wrote:

> "In course names, Information Management is the phrase in the ascendant. This is most obvious when looking at UK undergraduate course titles . . 'Engineering: Electrical and Information Sciences', which is the only course [out of 74] to mention IS. None of the other courses use this phrase. 'Information management' is the title of 38 courses. There are 18 course titles using the word 'studies', e.g. 'Information Studies', 'Information and Library Studies'. Of the 56 courses mentioning information management or studies, 45 are dual degrees with a subject obviously outside the discipline, e.g. 'Information Management and Business Studies (the most popular combination)." (Webber, 2003, 325-326).

Webber finds that this tendency is an expression of a fad and an indication that the term "management" is popular among students going to choose an education while the term "science" not has the same appeal. She further puts the question (p. 328): ""Library and Information Management": is it merely an umbrella term and administrative convenience? Is it a new name for IS [information science]? Is it a different discipline?" In a similar way may many phrases containing the word 'information' (i.e. 'information retrieval, information organization etc.) be chosen more because of their appeal than of their scientific merits. At the School of Information Studies at the University of Wisconsin-Milwaukee, for example, the name of the subject has recently changed from KO to IO. This is just a change in name, not a change in what is being taught. I do not believe that it is healthy for scholarship to use terminology as buzz-words in order to attract students, to try to raise the image of a dusty profession, to follow fad or whatever. I do not believe that science and scholarship should be constructed on the basis of what can be sold. It is the other way round: Things should be sold because they have inherent qualities, which the broader society learns to respect and in this way making the names of the fields popular.

An analysis of the theoretical problems involved demonstrates that all of the fields: KO, IO, OI and AI are primarily concerned with subjects, concepts, and semantic relations between concepts. The basic theoretical knowledge is therefore the same in the fields covered by the four terms, although IA is more about organizing subjects and concepts on the web, whereas KO has traditionally been more (but not exclusively) related to libraries and bibliographic databases. However, from the perspective of academic research, such differences are superficial, not essential.

In a thesaurus for the domain of LIS, Knowledge organization (KO) should therefore be the preferred term (descriptor), while the other examined terms: IO, OI and IA should be lead-in terms (also termed non-preferred terms, synonyms, non-descriptors or entry terms).

## Conclusion

This study has argued that it might be a good idea to continue to use the term *knowledge organization* and to connect KO better with other disciplines devoted to the study of knowledge.

The study has also explored the contextual issues related to the use of the four terms KO, IO, OI and AI. Philosopher Wittgenstein is famous for his "use theory" of meaning: You have to study the use of language in order to understand its meanings. Miller & Leacock (2000) raised the following question: "Why isn't a dictionary a good theory of the lexical component of language?" The answer they provide is that dictionaries lack contextual information that would enable a user to make the correct association between senses and actual contexts. They provide the example *Our families erodes a lot*, which sounds bizarre until you read the definition of *erode*: 'eat out, eat away'. Thesauri—and most kinds of knowledge organization systems (KOS)—also lacks such contextual knowledge (this is not, however, the case with, for example, historical dictionaries which may provide detailed information about how words have been used).

The shortcoming of traditional KOS may be countered by bibliometric studies such as the one made in the present article: this is a way to examine the terms in different contexts in which their meanings are negotiated and may be more or less stabilized (KO and IA seems rather stabilized compared to IO and OI). The study has thus demonstrated how bibliometrics ─ accompanied with a study of the contents of the most cited works ─ may be used in order to study how concepts are used in different fields and thereby as a tool for organizing knowledge.

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