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ISKO 10's Bookshelf

An Editorial

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The 10th International ISKO Conference is now history, and it was a dynamic bit of history at that. Knowledge organization (the domain) is lively and engaged and engaging, and all of us who work in the domain are in a good spot to benefit from the new trajectories provided by the scholars who brought their research forward this year. As is our custom in this journal, I will leave it to the Classification editor to prepare a full report on the conference. But the *Proceedings* volume (Arsenault and Tennis 2008), as usual, is a rich resource for analysis of the domain at this particular moment in time. By studying the contents, and in particular by applying bibliometric techniques, we can gain useful insight into the direction of the evolution of knowledge organization. Hjørland (2002) includes bibliometric techniques in his list of eleven approaches to domain analysis because, as he says (p. 436), "it is empirical and based on detailed analysis of connections between individual documents." With reference (and due deference) to White's (2003) analysis of authors as citers, I hereby present this brief analysis of what one might find on the bookshelves of this year's ISKO authors.

1. About the Conference Papers

The conference itself included 53 papers; the *Proceedings* contained also 5 papers not presented at the conference. Of these, one paper had no citations at all. And the keynote address was not included in the *Proceedings* and so was not a part of the present analysis. There were, then, 57 papers available for bibliometric analysis. As Hjørland (among others) pointed out, one weakness of bibliometric technique is the quality of the available data. Often bibliometric analyses depend upon the products of indexing services. In this case, the data were compiled manually from the *Proceedings*. Because the references were not structured uniformly, the process of converting the references from the 57 papers into usable data took rather a long while. For those who wish to replicate this work I have posted the basic Excel spreadsheet of citations on my website (go to http://smiraglia.org and look for ISKO).

Co-word analysis of the abstracts, or even of the full texts of the papers (perfectly feasible given that the documents are available to ISKO members in electronic form) would be a good way of approaching the detailed analysis of intellectual threads in the conference. However, a very simple analysis of title keywords is sufficient here to set the stage for the rest of this recitation. After removing articles and prepositions 45 key terms remained, of which only two—"design and development" and "facet"—were used more than once. This simple result is a good demonstration of the breadth of the content of the conference. There was no particular depth focus, meaning there was more extension than intension, which is fitting for the cutting edge report of the latest research in a discipline. (It is important to acknowledge the likelihood that what we see here is somehow a reflection of naming conventions, and perhaps is even related to the conference call-for-papers.)

We can achieve a similar result by looking at thematic headings in the programme (Table 1):

KO for information management and retrieval	11
Epistemological foundations in KO	11
Models and methods	10
Users and social context	8
KO in multilingual and multicultural environments	5
KO for libraries, archives, and museums	5
Discourse communities and KO	3
Evaluation, Systems and tools	3
Non-textual materials	2

Table 1. *Conference papers by programme theme*

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There is nothing unusual here. Rather it is what should be expected from an active domain. The main thrust is epistemology, models, and IR—in other words, depth of intension—but there is also significant outreach to new user groups, such as the hearing-impaired, children, and people with Alzheimer's disease. Still, this will be useful for comparison at the end of our analysis. We turn next to works cited by this year's authors.

2. Cited References from ISKO 10

The authors of the 57 papers in the *Proceedings* employed 793 references. The mean was 13.6 per paper, ranging from 0 (Tebe and Marcos) to 34 (Howarth). The median was 17 and the mode was 13, which suggests again that there is great breadth and little overlap in the references across all of the papers. The distribution of resource types shows heavy reliance on monographic literature (Table 2).

journal articles, technical reports, papers online	381	.48
monographs	234	.30
chapters in anthologies, encyclopedias, etc.	56	.07
papers in proceedings	100	.13
other	22	.02
total	793	1.0

Table 2. *Distribution of resource types*

There are a couple of interesting points here. First, nearly a quarter of the scientific papers cited were in conference proceedings and not in journals. Lisée, Larivière and Archambault (2008, 1781) report the proportion of proceedings cited in library and information science at 7.3%. The proportion here is slightly higher (12%) but nowhere near the high end reported for computer science (20%). This suggests that our ISKO 10 authors have turned to proceedings for source material that has not yet reached peer-reviewed journals. Second, the 234 monographs cited represent almost 1/3 of the total. Such a large reliance on monographic sources usually is associated with humanistic disciplines. So this tells us that at this moment in time, this particular segment of our domain has clear characteristics of the humanistic side of a social science.

The majority of citations are, as might be expected, to recent works, most dating from 2000 to the present. The mean age of a cited work was 10.49 years, but the mode was 2 and the median was 5. Or, to look at it another way, the median year for citations was 2003 and the mode year was 2006; the mean

occurred in 1997. So, while there is great breadth in the citations, and while there is a decidedly humanistic bent, the date distribution suggests heavy reliance on recent work—a hallmark of the sciences.

2.1 Most Cited Journals

Our authors cited a remarkable 129. Table 3 shows the very high end of the distribution. The following were the most cited:

Knowledge Organization	21
Journal of the American Society for Information Science and Technology	18
Journal of documentation	15
Cataloging & Classification Quarterly	14
Alzheimer's & Dementia	7
Library & Information Science Research	7
Information Processing & Management	5
Journal of Information Science	5
Library Resources & Technical Services	5
Library Quarterly	4
Library Trends	4

Table 3. *Most-cited journals*

Of course, the list of journals was remarkable for its disciplinary breadth. In the tail of the distribution were found *Weather and forecasting, Nursing philosophy, Control engineering,* and *Bioinformatics* to name just a few of the more colorful titles.

2.2 Most-Cited Monographs

To get a glimpse of just what was on ISKO's bookshelf, the monographs were sorted and duplicates counted. The 234 references were to 53 monographs. Table 4 includes the top end of that distribution—that is, the 6 texts that were cited more than twice.

Functional requirements for bibliographic records: Final report.	4
Olson. *The power to name*	4
Blair. *Language and representation in information retrieval*	3
Hjørland. *Information seeking and subject representation*	3
Ranganathan. *The colon classification*	3
Svenonius. *The intellectual foundation of information organization*	3

Table 4. *Most-cited monographs*

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I suppose there is no surprise *FRBR* should top the list this year, nor are there really any surprises on the list. The most interesting result likely is the fact that, despite the large number of monographic citations, there was actually rather a lot of scatter. That is, the domain is reliant on texts both old and new, but the authors at this conference were using a broad spectrum of sources.

2.3 What Conferences Are Represented?

100 citations were made to papers in the proceedings of 83 conferences, which again demonstrates a remarkable degree of scatter. The organizations most represented were ACM, ASIST, and ISKO, as might have been expected, with a respectable showing as well for CAIS/ACSI, Extreme Markup Languages, IFLA, and TREC. However, only a few specific conferences received multiple citations. These are listed in table 5.

International ISKO Conference, 7th, 2002 (Granada, Spain)	5
ISKO Spain, 8th 2007 (León)	4
ASIST Annual 2006	2
Authority Control in the 21st Century: An Invitational Conference	2
Conference on Email and Anti-Spam (CEAS)	2
Hawaii International Conference on Systems Sciences, 32nd Annual	2
International Conference on Semantic Web & Digital Libraries 2007	2
International ISKO Conference, 3rd, 1994 (Copenhagen)	2
International ISKO Conference, 8th, 2004 (London)	2
SIGCHI conference on Human factors in computing systems 2004	2
69th IFLA General Conference and Council), 2003 (Berlin)	2

Table 5. *Most-cited conferences*

2.4 Most Cited Authors

There were 700 unique author citations, meaning single authors or the first listed in a collaborative group. This is the clearest indication of scatter, or breadth, across the conference. In other words, the contributors to this conference were citing large numbers of unique resources. When all single occurrence authors were removed, the list yielded 100 names of authors cited two or more times. The top tier of this distribution, those cited 3 or more times, included 41 names, as shown in table 6.

Hjørland, B.	18
Neelameghan, A.	9
Beghtol, C.	8
Buckland, M.	8
Svenonius, E.	7
Kipp, M.	6
Ranganathan, S.	6
Aitchison, J.	5
Andersen, J.	5
Broughton, V.	5
Hansson, J.	5
Hudon, M.	5
Shiri, A.	5
Blair, D.	4
Dahlberg, I.	4
Dahlström, M.	4
Electronic Cultural Atlas Initiative.	4
Foucault, M.	4
Gnoli, C.	4
Green, R.	4
IFLA Study Group FRBR.	4
Marcoux, Y.	4
Olson, H. A.	4
Renear, A.	4
Shirky, C.	4
Abbas, J.	3
Carlyle, A.	3
Chatman, E.	3
Frohmann, B.	3
Greenberg, J.	3
Jörgensen, C.	3
Massa, P.	3
Munk, T.	3
Murphy, G.	3
Nilsson, M.	3
Oliveira, M.	3
Smiraglia, R.	3
Szostak, R.	3
Weibel, St.	3
Wittgenstein, L.	3
Yates, J.	3

Table 6. *Most-cited authors*

This distribution includes a core of foundational authors such as Hjørland, Neelameghan, Buckland, Aitchison, Beghtol, Svenonius and Dahlberg; a group of essential classical authors such as Foucault, Ranganathan, Wittgenstein; a group of authors whose works are both foundational and current, such as Broughton, Green, Gnoli and Hudon; and a group of recent entrants into the field who are working on 'hot' topics, such as Kipp, Abbas, Andersen, and Shiri. This group of authors was used to generate author co-citation analysis.
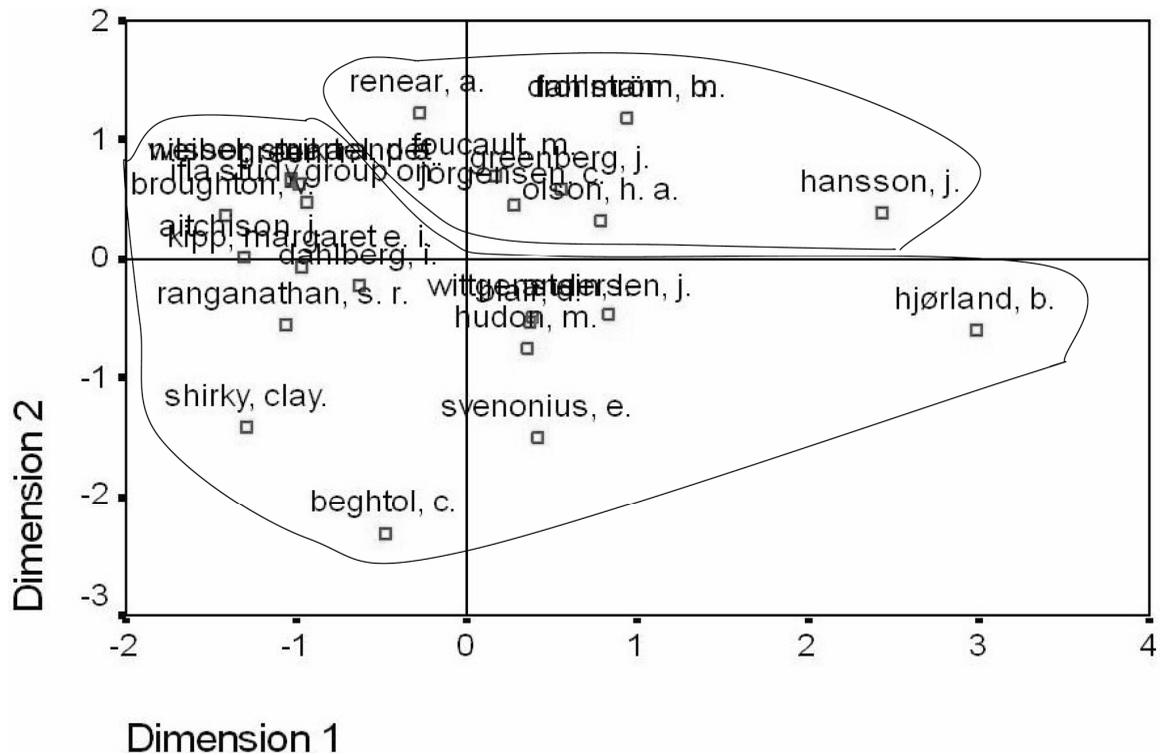
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Figure 1. *ACA Plot of Most Cited Authors*

2.5 Author Co-citation Analysis

Using the 41 most-cited authors yielded a fairly flat distribution, by which I mean that there was actually little co-citation—many cells were empty. Several iterations were required (removing authors with small co-citation totals) before a useful plot (one that fits the data reasonably well) was arrived at. This plot, shown in Figure 1, included 30 authors Stress was .15 (which is acceptably low) and R-squared was .88 (which is acceptably high).

There really are two large clusters. The first stretches from Jörgensson to Renear but is anchored internally by Olson, Green, and Greenberg, and is associated with Foucault. And the second, which is represented by Hjørland and Andersen at one end closely associated with Wittgenstein, and Beghtol and Broughton at the other end closely associated with Ranganathan.

It is important to remember that we are looking at the subjective point of view of the citing authors, in this case, the authors whose papers constitute the 10th International ISKO Conference. For these authors, then, there appear to have been some solid anchors in the domain—Hjørland, of course, also Beghtol and Svenonius. Each cluster also is associated with some classical texts in knowledge organiza-

tion—Ranganathan, for example—and some seminal philosophers—Wittgenstein, for instance. Whereas our earlier, more empirical, observations suggested scatter and lack of depth, in this case, the subjective observation demonstrates a fairly well-grounded domain. These authors, even those on the cutting edge, consider their intellectual roots carefully, and inculcate the values of their predecessors.

3.0 Conclusion: ISKO 10's Bookshelf

ISKO 2008's bookshelf looks a little like the photograph in Figure 2.

The distribution of resources relied upon by the conference authors is post-millenial for sure, with most citations to works within the last few years. A science that is growing is rapidly cumulative, and a good indicator of that is currency of cited research. The breadth of the conference domain is impressive, and it shows the wide range of research being carried out in knowledge organization around the world today. The relatively heavy reliance on monographs is a sign of the influence of humanistic thought—likely rooted in the strong connection between philosophy and concepts of ontology. We saw that echoed in the author co-citation analysis as well, where each of the clusters includes a network of prominent scholars

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Figure 2. *ISKO 10's Bookshelf*

joined together with prolific newcomers and rooted in classical (for the domain) philosophical points of view. The relative youth of the domain, as well as its attention to currency, is reflected in the proportions of resources found in proceedings, Festschrifts, and thematic anthologies. It would be interesting to know how many papers that appear in ISKO international conference proceedings eventually form the basis of formal papers in peer-reviewed journals.

It is important to bear in mind that we are looking at a snapshot of a single point on a continuum. Knowledge organization has a very long history, even given the relative youth of ISKO, and is likely to have a long future as well. What we see here is just one moment in the life of knowledge organization. It suggests relative health for the larger domain, and it also suggests the need for more integral analysis of the domain—perhaps the collective use of more of Hjørland's 11 points—to monitor our progress as a science.

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