

## **Birger Hjørland Intervention au colloque EPICIC 8 avril University of Lyon 3 - France**

### **1. Is "information science" about "information"?**

This question sounds like a logical truism or a tautology, that is, an evident truth, which need no empirical investigations. I will demonstrate that this is not the case. We may seriously discuss what information is, what information science is and what the connections between these two concepts are.

There has been an endless stream of books and papers about "what is information" and what is information science". Before writing more papers and books about these issues, I believe we should consider what we still need to know? How can we add something given this complexity of ideas is already put forward?

It is well known that a definition is not wrong or right, it is just more or less fruitful for a given purpose. The purposes we are talking about are theories and theoretical arguments: We construe meanings (concepts) as part of our development of theories and arguments. We may therefore ask:

- What theories (plural) is the concept of information part of?
- What theories are fruitful conceptual frames for "information science"?
- Which (if any) of the theories of information are fruitful conceptual frames for information science?

It has been suggested that we can have "information studies without information" (Furner, 2004). I tend to agree. However, since we have termed the field "information science" (or "information studies") we should at least consider an understanding of the concept that supports our aims.

### **2. Defining information**

Within information technology (IT) in particular as well as in fields inspired by IT the concept of information has been influenced by Shannon & Weaver's information theory from 1949, which made the measure BIT possible. A derivate definition is:

"In automatic data processing the meaning that a human assigns to data by means of the known conventions used in its representation. Note: The term has a sense wider than that of ordinary information theory and nearer to that of common usage". IFIP-ICC Vocabulary (1968).

Qvortrup (1993) provides an overview of the controversy over the concept of information and writes:

"Thus, actually two conflicting metaphors are being used: The well-known metaphor of information as a quantity, like water in the water-pipe, is at work [see

also conduit metaphor], but so is a second metaphor, that of information as a choice, a choice made by an information provider, and a forced choice made by an information receiver. Actually, the second metaphor implies that the information sent isn't necessarily equal to the information received, because any choice implies a comparison with a list of possibilities, i.e. a list of possible meanings. Here, meaning is involved, thus spoiling the idea of information as a pure "Ding an sich". Thus, much of the confusion regarding the concept of information seems to be related to the basic confusion of metaphors in Shannon's theory ["information theory"]: is information an autonomous quantity, or is information always *per se* information to an observer? Actually, I don't think that Shannon himself chose one of the two definitions. Logically speaking, his theory implied information as a subjective phenomenon. But this had so wide-ranging epistemological impacts that Shannon didn't seem to fully realize this logical fact. Consequently, he continued to use metaphors about information as if it were an objective substance. This is the basic, inherent contradiction in Shannon's information theory." (Qvortrup, 1993, p. 5).

Buckland (1991) analyses the concept of information. The word information can be used about things, about processes and about knowledge:

According to Buckland things can be informative. A stump of a tree contains information about its age on its rings - as well as information about the climate during the lifetime of the tree. In similar ways, everything can be informative: "We conclude that *we are unable to say confidently of anything that it could not be information*" (Buckland, 1991, p. 50. Underlining in original).

But if everything is information, then the concept of information is all-embracing. If the concept of information has no limits, it becomes too vague and useless. What kind of advice can that concept provide with regard to what to represent in information systems?

For a thing to be informative means that the thing may answer a question for somebody. The informativeness is thus a relation between the question and the thing. No thing is inherently informative. To consider something as information is thus *always* to consider it as informative in relation to some possible questions. We do not always realize this because it is mostly implied. It is implied, for example, that a paper about a disease may help answering questions about that disease. It is less obvious, however, that a meteorite from outer space may answer questions about the origin of life. A good deal of scientific knowledge is needed to understand why this is the case (and a claim about the informativeness of something is theory-dependent and may turn out to be wrong). In the wider sense background knowledge is *always* important to establish the informativeness of any object (including documents and texts).

Buckland (1991, p. 50) finds, that "It follows from this that the capability of being informative, the essential characteristic of information-as-thing, must also be *situational*".

Hjørland used this view as point of departure:

"The domain analytic view develop this view further: users should be seen as individuals in concrete situations in social organizations and domains of knowledge. A stone on a field could contain different information for different people (or from one situation to another). It is not possible for information systems to map *all* the stone's possible information for every individual. But people have different educational backgrounds and play different roles in the division of labor in society. A stone in a field represents typical one kind of information for the geologist, an other for the archeologist. The information from the stone can be mapped into different collective knowledge structures produced by e.g. geology and archaeology. Information can be identified, described, represented in information systems for different domains of knowledge. Of course, there are much uncertainty and many and difficult problems in determining whether a thing is informative or not for a domain. Some domains have a high degree of consensus and rather explicit criteria of relevance. Other domains have different, conflicting paradigms, each containing its own more or less implicate view of the informativeness of different kinds of information sources.

Conclusion: The analysis of the concept of information made above implies that informational objects should not only be analyzed and described according to an objectivistic epistemology. It is not sufficient to describe information according to *universalistic* principles, as permanent, inherent characteristics of knowledge. Instead, information must be analyzed, described and represented in information systems according to situational, pragmatic and domain-specific criteria." (Hjørland, 1997, p. 111).

A similar theoretical position was independently developed by Goguen, 1997, who used the following incipt:

It is said that we live in an Age of Information, but it is an open scandal that there is no theory, nor even definition, of information that is both broad and precise enough to make such an assertion meaningful.

Since I developed that understanding of information Karpatschof (2000) developed an understanding which is more general and supplements my original understanding:

Karpatschof introduces the concept of release mechanisms, being systems or organisms having at their disposal a store of potential energy; the systems are "designed" to let this energy out in specific ways, whenever triggered by a signal fulfilling the specifications of the release mechanism. The signal that triggers a certain release mechanism is a low energy phenomenon fulfilling some release specifications. The signal is thus the *indirect cause*, and the process of the release mechanism *the direct cause* of the resulting reaction, which is a high-energy reaction compared to the energy in the signal. *Information is thus defined as a quality by a given signal relative to a certain mechanism.* The release mechanism has a double function: (1) it reinforces the weak signal and (2) it directs the reaction by defining the functional value of a signal in the predesigned system of the release mechanism. (see further discussion in Hjørland, 2007).

A simple suggestion is: *Information is what is helping answering questions*. This underlines that something is only information in relation to a given or potential question. The nature of that question must be considered in any study of information. This is equivalent with Bateson's (1973) famous definition "*information is a difference that makes a difference*" (for somebody or something).

### 3. The discipline(s) studying information

The *American Society for Information Science and Technology* (ASIST) is probably the most important organization in information science. It was originally termed *American Documentation Institute* (founded in 1937) but shifted its name to "*American Society for Information Science*" / "ASIS" in 1968 and shifted again to its present name in 2000.

Such name shifts are seldom motivated by theoretical arguments put forward in the literature. They seem often tactically motivated. The word information has (or has had?) an aura of prestige. As Spang-Hanssen wrote in 1968:

"It might be that the word information is useful in particular when we try to raise our professional status in relation to other professions; it sounds smart and imposing and gives an air of technicality. I find no moral objections to this sort of use of words; language is certainly not only for informative uses"

And further:

"The word information – and combinations like information retrieval, information center – have definitely contributed to raise the public opinion of library and documentation work, which is generally held to be a little dull, dusty and distant from what is actually going on in society. Maybe it should be wise to leave the word information there, were it not for the fact – already mentioned – that several attempts *have* been made to define information as a formal term relative to documentation and information work, and there have even been attempts to define information as some *measurable* quantity, corresponding to questions of the type: *How much* information was retrieved by the search?" (Spang-Hanssen, 2001).

I do *not* agree with Spang-Hanssen that it is OK to use scientific terminology in a way that is not theoretically founded, but just tactically motivated. I believe much confusion and harm have been done in the history of the field because of this irresponsible use of terminology. A field should not be dominated by what Sparck Jones (1988) termed "Fashionable trends and feasible strategies," but should be developed by scientific findings and academic arguments.

This tactical dissemination of confusion continues today:

Sheila Webber is concerned with the tendency to change the titles in courses offered by British Universities on the masters level from 'information science' to 'information management':

”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).

She finds that this tendency is connected to fads and social trends, that the term "management" is popular whereas the term "science" is not popular when it comes to attracting students. She further asks (p. 328) ”’Library and Information Management’: is it merely an umbrella term and administrative convenience? Is it a new name for IS? Is it a different discipline?“

The same question may be put to a lot of fields using words like “knowledge” and “information”; there is a tendency to change the term from knowledge organization to information organization or information architecture. The term IO is now used, for example, at the School of Information Studies at the University of Wisconsin-Milwaukee, which a few years ago termed the same field knowledge organization. Other examples are information management and knowledge management etc. When is a field an identity different from another field?

Søren Brier’s (2008) book *Cybersemiotics: Why Information Is Not Enough* got very fine book reviews and certainly deserved so. However, the question of identity pops up again. One reviewer wrote:

“This is, to my knowledge, the best book in the field. I recommend it emphatically. But the question has to be answered: What is the field in which this book excels so outstandingly?” (Hofkirchner, 2009, 179).

The papers citing Brier (2008) were 2011-04-01 distributed as follows (duplicates included):

DIALOG RANK Results

-----  
 RANK: S1/1-30 Field: SC= File(s): 7,439,34  
 (Rank fields found in 17 records -- 6 unique terms) Page 1 of 1  
 RANK No. Items %Ranked Term

RANK No.	Items	%Ranked	Term
1	10	58.8%	PHYSICS, MULTIDISCIPLINARY
2	3	17.6%	PHILOSOPHY
3	1	05.9%	BIOLOGY
4	1	05.9%	RELIGION
5	1	05.9%	SOCIAL ISSUES
6	1	05.9%	SOCIAL SCIENCES, INTERDISCIPLINARY

---end of results---

Library and information science is not represented!!

4. **Some names used for ‘the discipline(s)’** (the same discipline??)

In table one is a list of near synonyms to the discipline library and information science. The first time the term was used is indicated (but almost all terms are still in use). Their definitions and relations are not well considered in the literature. For example is Bottle’s article “Information Science” (2003) in *International Encyclopedia of Information and Library Science* and Fourman’ (2003) article “Informatics” in the same encyclopedia written without indication of the relation between these terms. It is as if the authors do not know each others’ labels and write as if their own label alone covers the study of information phenomena.

I find the situation somewhat problematic, and also unethical: students offering a grade have a right to expect that there is some clarity about what that grade is, and how it is related to other fields of study.

<p><b>Table 1</b> <b>Some synonyms or near synonyms to ‘library and information science’</b> (Based on Olausen, 2004, pp. 99-135)</p>
<ul style="list-style-type: none"><li>• Library Science<sub>1</sub>/Library Studies/Librarianship, about 1800.</li><li>• Bibliography/Science of bibliography, about 1900.</li><li>• Documentation/Documentation Science/Documentation Studies, about 1900.</li><li>• Information Technology (IT)/Information and Communication Technology, (ICT), about 1945.</li><li>• Information Science (IS); Information Sciences; Information Studies/Information Science and Technology, about 1955.</li><li>• Informatics, about 1962.</li><li>• Communication Studies/Scholarly Communication/Professional Communication/Scientific Communication/Media Studies, about 1962.</li><li>• Cultural Science(s), about 1970.</li><li>• Library and Information Science (LIS), Library and Information Sciences<sub>2</sub> or Library and Information Studies, about 1970.</li><li>• Information Resources Management (IRM)/Information Management, IM/ Library and Information Management/ Knowledge Management (KM), about 1975/about 1995.</li><li>• Library, Information and Documentation Science (LID), about 1980.</li><li>• Archives, Library and Museum Studies (ALM), about 2000</li></ul>

These names are related to metatheories and disciplines in the way that a given name indicates (implicitly) some views about the content, the approaches and the related fields.

## 5. “Metatheories” in library and information science

Bates (2005) presents 13 metatheories in *Library and Information Science* (LIS):

1. A historical approach.
2. A constructivist approach
3. A constructionist or discourse-analytic approach
4. A philosophical-analytical approach.
5. A critical theory approach.
6. An ethnographic approach.
7. A socio-cognitive approach.
8. A cognitive approach. NB!
9. A bibliometric approach.
10. A physical approach.
11. An engineering approach.
12. A user-centered design approach.
13. An evolutionary approach.

---

These metatheories may be supplemented with others, ‘A behavioral approach’ (cf., Bates, 2007) and ‘pluralism’ (Mai, 2010).

## 6. Related fields

Which related disciplines LIS draws on can be analyzed empirically through maps based on co-citation analysis. However it depends on the researchers’ theoretical orientations and thus on the dominating “paradigms” in the field. The related disciplines include:

- Computer science (including “Artificial Intelligence”)
- Communication studies
- Epistemology
- Linguistics (including computer linguistics, languages for special purposes, and lexicography, semantics)
- Mathematics and statistics
- Psychology and “cognitive science”
- Science studies
- Semiotics
- Sociology (especially the sociology of science)
- etc.

## 7. Conclusion

Concepts, such as “information” are constructed within social discourses, often scientific and scholarly disciplines. They are often exchanged across the borders of discourses and disciplines, but each field has to select and develop concepts that support its goals and values. Concepts are not constructed one at a time, but when a new theory or “paradigm” appears, the set of fundamental concepts is changed.

Therefore, we cannot start by defining “information” and then proceed from that definition. We have to consider which field we are working in, and what kind of theoretical perspectives are best suited to support our goals.

There has been a tendency to regard natural sciences, especially physics, the ideal science and to borrow its concepts also in discourses about human and social issues. There is a clear ideological tendency and danger considering in human beings objects rather than subjects. This has been the case first with behaviorism, later with cognitive science, the field that made the concept of information and information processing central in many social sciences, including library and information science. There have been many debates about this, and I put myself in line with Frohman (1990, 2004) and Brier (2008) and thus consider alternatives such as discourse analysis and semiotics important alternatives to all theories derived from or associated with an objective understanding of information (as often associated with Shannon’s information theory).

## 8. References

Bates, M. J. (2005). An Introduction to Metatheories, Theories and Models. IN: Fisher, K. E., Erdelez, S. & McKechnie, L. (eds.). *Theories of information behavior*. Medford, NJ: Information Today.

Bateson, G. (1973). *Steps to an Ecology of Mind*. Paladin.

Bottle, R. T. (2003). Information Science. I: International Encyclopedia of Information and Library Science. 2nd. ed. Ed. by John Feather & Paul Sturges. London: Routledge (s. 295–297).

Brier, Søren (2008). *Cybersemiotics: Why information is not enough. A Trans-Disciplinary Approach to Information, Cognition and Communication Studies, through an Integration of Niklas Luhmann’s Communication Theory with C. S. Peirce’s Semiotics*. University of Toronto Press; <http://books.google.dk/books?id=Ueiv9cRR9OQC&printsec=frontcover&dq>

Buckland, M. (1991). *Information and information systems*. New York: Greenwood Press.

Capurro, R. & Hjørland, B. (2003). The Concept of Information. *Annual Review of Information Science and Technology*, Vol.37, Chapter 8, pp. 343-411.

Fourman, M. P. (2003) Informatics. I: International Encyclopedia of Information and Library Science. 2nd. ed. Ed. by John Feather & Paul Sturges. London: Routledge (s. 237–244).

Frohmann, B. (1990). Rules of indexing: A critique of mentalism in information retrieval theory. *Journal of Documentation*, 46(2), 81-101.

Frohmann, Bernd (2004). *Deflating information. From science studies to documentation*. Toronto: University of Toronto Press.

Furner, J. (2004). Information studies without information. *Library Trends*, 52(3), 427-446.

Goldman, Alvin I. & Whitcomb, Dennis (eds.). (2011). *Social epistemology. Essential readings*. New York: Oxford University Press.

Goguen, J. A. (1997). Towards a Social, Ethical Theory of Information. IN: *Social Science Research, Technical Systems and Cooperative Work: Beyond the Great Divide*, edited by Geoffrey Bowker, Les Gasser, Leigh Star and William Turner, Erlbaum, 1997, 27-56. Available at: <http://www-cse.ucsd.edu/~goguen/ps/sti.pdf>

Hjørland, B. (1997): *Information Seeking and Subject Representation. An Activity-theoretical approach to Information Science*. Westport & London: Greenwood Press.

Hjørland, B. (2000). Documents, Memory Institutions, and Information Science. *Journal of Documentation*, 56(1), 27-41.

Hjørland, B. (2000). Library and Information Science: Practice, theory, and philosophical basis. *Information Processing and Management*, 36(3), 501-531.

Hjørland, B. (2002). Principia informatica. In: *Emerging frameworks and methods : CoLIS 4 : proceedings of the Fourth International Conference on Conceptions of Library and Information Science*, Seattle, Wa, USA, July 21-25, 2002. Greenwood Village, Colo. Libraries Unlimited, Incorporated. (Pp. 109-121). Manus available at: [http://www.db.dk/bh/Core%20Concepts%20in%20LIS/articles%20a-z/principia\\_informatica.htm](http://www.db.dk/bh/Core%20Concepts%20in%20LIS/articles%20a-z/principia_informatica.htm)

Hjørland, B. (2007). Information: Objective or subjective/situational? *Journal of the American Society for Information Science and Technology*, 58(10), 1448-1456.

Hjørland, B. & Albrechtsen, H. (1995). Toward a New Horizon in Information Science: Domain-Analysis. *Journal of the American Society for Information Science*, 46(6), 400-425.

Hjørland, B. & Hartel, J. (2003). Ontological, Epistemological and Sociological Dimensions of Domains. *Knowledge Organization*, 30(3/4), 239-245.

Hofkirchner, Wolfgang (2009). Reviews of Brier (2008): Cybersemiotics. Why Information is not enough! *Cybernetics and Human Knowing*, 16(1-2), 179-183. <http://www.brier.dk/SoerenBrier/09/W.Hofkirchner.Review.Brier.Cybersemiotics.pdf>

IFIP-ICC Vocabulary (1968) of Information Processing. 1. ed. 3.printing. Amsterdam: North-Holland Publ. Co.

Karpatschof, B. (2000). *Human activity*. Contributions to the Anthropological Sciences from a Perspective of Activity Theory. Copenhagen : Dansk Psykologisk Forlag.

Leckie, Gloria J., Lisa M. Given, and John E. Buschman (eds). (2010). *Critical Theory for Library and Information Science: Exploring the Social from Across the Disciplines*. Westport, Conn.: Libraries Unlimited.

Machlup, F. (1983). Semantic quirks in studies of information. IN: *The Study of Information. Interdisciplinary Messages*. Ed. by Fritz Machlup & Una Mansfield. New York: John Wiley, pp. 641-671).

Nepper Larsen, Steen (2009). Reviews of Brier (2008): Cybersemiotics. Why Information is not enough! *Cybernetics and Human Knowing*, 16(1-2), 183-191. <http://www.brier.dk/SoerenBrier/09/S.NepperLarsenReviewCybersemiotics.htm>

Nørretranders, T. (1999): *The User Illusion: Cutting Consciousness Down to Size*. New York: Penguin.

Olausen, C. (ed.) (2004). Utvärdering av ämnen arkivvetenskap, biblioteks- och informationsvetenskap, bok- och bibliotekshistoria, informations- och medievetenskap, kulturvård och museologi vid svenska universitet och högskolor. Stockholm: Högskoleverket. Available in full text: [Högskoleverkets%20rapport\\_komplet.pdf](#)  
Appendix: En historisk och kritisk belysning av ämnet biblioteks- och informationsvetenskap (B&I) med fokus på dess identitet och olika benämningar. [A Historical and Critical Examination of the Discipline Library and Information Science (LIS) with focus on its identity and different designations]. (Pp. 99-135). (In Swedish).

Peters, J. D. (1988). Information: Notes toward a critical history. *Journal of Communication Inquiry*, 12(2), 9-23.

Qvortrup, L. (1993). The controversy over the concept of information. An overview and a selected and annotated bibliography. *Cybernetics and Human Knowing*, 1(4), 3-24.

Salthe, Stanley N. (2009). Biosemiotics, 2, 247–253. <http://www.springerlink.com/content/9012075874723554/fulltext.pdf>

Spang-Hanssen, H. (2001). How to teach about information as related to documentation. *Human IT*, (1), 125-143 [originally written in 1968]. <http://www.hb.se/bhs/ith/1-01/hsh.htm>

Sparck Jones, K. (1988). Fashionable trends and feasible strategies in information management. *Information Processing and management*, 24(6), 703-711.

Tredinnick, L. (2006). Digital information contexts: theoretical approaches to understanding digital information. Oxford: Chandos Publishing.

Webber, S. (2003). Information science in 2003: a critique. *Journal of Information Science*, 29(4), 311-330.

Ørom, A. (2007). The concept of information versus the concept of document. IN: *Document (re)turn. Contributions from a research field in transition*. Ed. By Roswitha Skare, Niels Windfeld Lund & Andreas Vårheim. Frankfurt am Main: Peter Lang. (Pp. 53-72).