

Digital Information Contexts: Theoretical Approaches to Understanding Digital Information

Luke Tredinnick

Chandos Publishing

Oxford

2006

328 pp.

ISBN 184334159X

Keywords Digital libraries, Philosophy, Information science

Review DOI 10.1108/00220410710827817

It is a most important task of information science to develop a theoretical framework, and a book such as this one, which provides critical analyses of current perspectives, is a most welcome contribution. It deserves serious discussion, which I shall initiate in this review.

This book is organized in ten chapters (in addition to front matters and end matters):

- (1) The meaning of information.
- (2) Librarianship and print culture.
- (3) Digital information, science and the social sciences.
- (4) Digital information and computer science.
- (5) Digital information, language and representation.
- (6) Digital information and semiotics.
- (7) Digital information and post-structuralism.
- (8) Digital information and post-modernism.
- (9) Digital information and complexity.
- (10) Understanding digital information.

In the preface is the selection of the contents discussed: some content has been left out because another book *Digital Information Culture* is soon going to be published by the same author. Nonetheless, the breath and focus of this book is impressive. In the special issue of *Journal of Documentation* about "Information science and the philosophy of science" (Hjørland, 2005) we had proponents of different philosophical approaches in information science presenting and discussing their views. In this book are many of the same views presented and discussed by the author, in addition to other views such as semiotics and complexity theory. This is often done very well with a discussion of the implications for information science and also with fine critical evaluations of the presented theories.

Tredinnick's own theoretical view

On p. xiii it is stated that the book is written from the perspective of critical theory. However, although many different views are presented and discussed in the book, this is not the case with the author's own view! There is not a chapter or section about critical theory, nor is critical theory in the index of the book. Although the different positions are often being analyzed and criticized from a Marxist/critical view, it is in different ways a problem that the authors own view is nowhere directly presented or defended.

In my opinion is critical theory related to a family of approaches such as activity theory, critical hermeneutics, critical realism, feminist epistemology, pragmatism (especially in the version of John Dewey's late work) and social semiotics (Wilson, 2006; Wikgren, 2005; Olson, 1997, 2002; Hjørland and Nicolaisen, 2005). It is a shame that the author do not relate to those approaches, which may have provided a better suggestions on how to cope with information problems, and which may also provide a sharper criticism of the different approaches presented in the book. Finally, such a presentation would have integrated this book with related approaches which have been presented in the literature on digital information.

The meaning of information

The author has a good feeling of the fundamental problems in defining information, including the question concerning the subjectivity or objectivity of the notion of information (Hjørland, 2007c). However, this chapter does not offer any specific understanding (not to say definition) of information. This sentence (pp. 20-21): "To the author's mind it does not seem possible to conceptualize information independent of its meaning . . ." is for me without meaning (although it is further discussed in Chapter 8). I have elsewhere expressed the view that Karpatschof's (2000) definition of information for me seems to be the most fruitful understanding of information, which allows us to speak in meaningful ways of information systems and information processes. Although Tredinnick cites Capurro and Hjørland (2003) in which this definition is presented, the book shows no sign that the author has actually read it.

I agree very much with what the author writes about the need for theory (pp. 22-23):

Do we need theory; does it serve any function? . . . In the first place, the role of theory in organizing web sites, managing digital archives or creating databases may not seem immediately apparent, but these activities can never be performed outside a theoretical position of one kind or another. Hypertext, for example, is pregnant with a particular epistemological and ontological stance, as we shall come to see. To refuse to theorise is not to do without theory, but to accept without question the tactic assumptions in the field within which one works. The information profession is generally a social situated practice, and therefore the study of information should be a socially situated discipline . . . The issue is not then whether we can do without theory, but whether the theories with which we already work are adequate for the tasks we wish to perform.

Librarianship and print culture

It is a good idea to include this chapter and to try to uncover some underlying philosophies and cultural ideas in librarianship and the print culture which may or may not influence digital information environments. I shall not here provide an analysis of whether or not I agree with the author about his specific claims. Many of

the points raised are important and in any case raises important questions for further research.

Digital information, science and the social sciences

One part of this chapter is about "The progress of science" (pp. 54-62). The author presents the development in the view of the scientific method from Francis Bacon over David Hume to Karl Popper and Thomas Kuhn. This is done very well and provides a clear view of the classical view of the scientific method and the problems it faces in the twentieth century in particular by the criticism provided by Popper and Kuhn. Popper's view led to the introduction of the hypothetical-deductive method. Kuhn, however, did not contribute with specific methodological proposals. What methodological implications does Kuhn's view suggest? Tredinnick draws no conclusion. In my opinion is the implication of Kuhn's insight that the research method should be hermeneutic: researchers must consider the theoretical traditions which have been at play. Rationalism, empiricism and positivism are not enough. Although Tredinnick writes that the book is informed by critical theory, the implication of this theory for the scientific method is not considered. If we do that, yet another dimension regarding the scientific method is implied. When, for example, women are underrepresented in powerful positions, empirical research tends to explain this by findings that confirm that women are less qualified. If the goal is to make women more equal, a critical perspective must be built into the research methods themselves. We badly need good textbooks on research methods in the social sciences, which are based on solid epistemological understanding and Tredinnick seems not to have realized that any epistemological position has implications for research methods.

The rest of this chapter is about information science.

This discussion is based on an understanding of information science as based on two paradigms: the physical paradigm and "the cognitive shift in information science." The main message of this chapter is that although the two paradigms differ in perspective, they both share a problematic understanding of information as objective. This message might have been better substantiated by considering the domain-analytic and activity – theoretical alternative to both the physical and the cognitive view. In short: both users and systems are formed by specific "discourse communities" why the interpretation of informative objects is related to such communities. This is a third paradigm in information science which is much more in correspondence with Tredinnick's own view and much more elaborated in sources not considered by this book.

Digital information and computer science

This chapter introduces logic, syllogisms, digital computing, algorithms, etc. The aim is to demonstrate built-in limitations in the underlying framework of digital computers, but it is, in my opinion, not convincingly done. In the end of the chapter are added some remarks on copyright and copyleft. In my review of David Blair's book on Wittgenstein and Information (Hjørland, 2007a) I developed the argument that Blair's critique of computers as based on narrow logical principles is a straw man, which I cannot recognize in the real world. This chapter reminded me of that feeling. It seems too much as kinds of traditional textbook reading, and too little like stuff introduced in order to argue critically for better ways of understanding digital information. A really

critical examination of this stuff should have introduced controversies within the science of logic, such as this:

Boole's algebraic methods of development and elimination led to modern normal forms and decision procedures, and designers of digital computers use improved Boolean methods for realizing logical functions by minimal chains of operations. Edmund Husserl's criticism of Schröder for favoring extensional logic opened a controversy about a "logic of content" (Inhaltslogik), a controversy which was however ultimately bypassed by another style of doing logic with "implicational" calculi. It seems that metaphysical and even ontological considerations have played a motivational part in this development, and separated logicians according to their interpretation of logical systems (the most interesting question being that of "existential import"), but that they have not influenced the development of (Boolean or general) algebra of logic in any significant way (Thiel, 1991).

Winograd and Flores (1987) is one of the most important sources criticizing the "rationalist" epistemology of computer science and trying to provide a different framework based on, among others, hermeneutics. But Winograd and Flores is not discussed or even mentioned in this book. The most important lesson from this chapter is that algorithms represent theories of the people who make them. The most important idea I remember from Winograd and Flores is that a computer consists of many layers of programming each providing constraints of a certain nature and each having a limited understanding of all the layers.

Digital information, language and representation

Language is important for information science, and this fact is generally neglected. That does not mean that information sciences are not influenced by implicit theories of language, but that they may not be aware that they are implicitly influenced by views of language related to analytical philosophy, and that this view may turn out to be problematic in relation to the challenges that information science faces. This, I believe, is Tredinnick's basic argument in this chapter, and I agree 100 percent with it.

In developing this argument some philosophers and linguists are selected and discussed. Others could have been discussed, both negatively and positively. Again, if Tredinnick subscribe to "critical theory" it would be obvious to examine views of language developed within this theoretical frame, such as Volosinov (1986) *Marxism and the Philosophy of Language*, Kramsch (2002) *Language and Culture. A Social Semiotic Perspective* and Hodge and Kress (1988) *Social Semiotics* and Thibault (1993) *Social Semiotics*.

I also believe that further discussions of this subject need to be more specific or empirical. What specific implications do a specific view implies. I believe my own research on the subject is more specific in this respect (Hjørland, 2007b).

Digital information and semiotics

This chapter presents three classical figures in Semiotics: Ferdinand de Saussure, Charles Sanders Peirce and Roman Jakobson. It is important stuff and well presented. It is however, not sufficient for the kinds of problems for which Tredinnick uses it. As formerly stated should social semiotics in my opinion also be included, and a discussion of this would probably put new light on this chapter. In the end of the chapter is semiotics related to digital information, hypertext and classification. In my opinion, there are some fatal errors in Tredinnick's understanding:

Fatal error no. 1

We have seen how enumerated classification schemes, such as the Dewey Decimal, incorporate a basic assumption about the mimetic nature of information and the progressive nature of knowledge (p. 168).

Fatal error no. 2

Faceted classification, as opposed to enumerated classification, exemplifies a semiotic view of information. Information is not slotted into a priory structure, but the structure of the collection is created out of the relationships between information itself (p. 169).

Concerning fatal error no. 1

A classification system is based on interest in, and/or on a theoretical view on what is classified, not by mimesis. This is the case with enumerative as well as faceted classification. To take one extreme example: a manufacturer may classify other manufacturers as competitors according to their possible danger for himself. In such a system, the classifier is classifying manufacturers by criteria that cannot be said to mimic what is classified. How different classification systems classify the arts based on different theories of art is demonstrated by Ørom (2003). A difference between enumerative and faceted classifications is rather, that the latter are more flexible in providing new classes (thesauri are yet more flexible).

Concerning fatal error no. 2

It is in my opinion a fatal error to regard faceted classification as related to semiotics. Faceted classifications are in my opinion related to classical rationalism, while semiotics is related to pragmatism, a quite different philosophy. The facet structure is an a priory structure. In Hjørland (2007b) as well as in other papers, I have argued that facet analysis is related to the theory of semantic primitives, that they share the view that meaning can be constructed based on a combination of a set of fundamental units of meaning.

Digital information and post-structuralism

This chapter presents a clear and open-hearted presentation and discussion of post-structuralism as an intellectual movement.

The most interesting discussion is how the information profession has traditionally considered itself gatekeeper of information and knowledge but at the same time situated itself outside of discourse. By doing so, it probably does not maintain its claimed neutrality, but tacitly accepts the dominant cultural values.

Tredinnick writes, however, that the writings of the post-structuralists theorists are difficult to confront, and that it is hard to avoid the suspicion that this difficulty is deliberate ... an example of style above substance, and is understood by many to retreat into nonsense:

The value of post-structuralism is perhaps, then, not its ability to articulate alternatives to current [informational] practices, but its ability to provide frameworks through which the limitations of existing practices can be explored (pp. 19-196).

I do not believe that this can be the case: if a theoretical perspective is able to provide “frameworks through which the limitations of existing practices can be explored,” then it is also able to articulate alternatives, and vice versa: if it is not able to articulate alternatives, it is not able either to provide “frameworks through which the limitations of existing practices can be explored.” Perhaps Tredinnick should search in other theoretical movements more related to the term he used to characterize his position: critical theory?

Digital information and post-modernism

This chapter is also very well written, and one understands that the author finds that postmodernism is a critical position. An important issue is how information and knowledge from the post-modern perspective is seen as less connected to truth and veracity and more with “exchange value” and as a means to commercial ends. The arguments against post-modernism are also briefly presented and discussed.

Among the implications of post-modernism is presented the view that information professionals have to become scholar-librarians and active participants in the discourses that surround particular collections. This is a change that requires fundamental changes in the professions dominating beliefs.

Digital information and complexity

I shall not go into details with this chapter. Together with Chapter 4 it is for me the least important chapter in the book. It provides some useful concepts and ideas about complexity, but in my opinion does not provide something which can be termed a theory, which contribute to the understanding of information in society. Probably an inclusion of Nuklas Luhmann’s theory of social systems and Qvortrup (2003, 2006) could provide a stronger theoretical basis.

Understanding digital information

This short concluding chapter provides nothing new, but summarizes a few important points: the discourse of the information profession can lead to the impression that information is something that should be contained, locked away, kept under control. Yes, the dominant parts of the discourse, but Tredinnick is certainly not the first person to problematize this view.

The most important statement is:

The means by which we approach an understanding of information is a hair’s breath apart from the means by which we approach an understanding of knowledge production and dissemination (pp. 261-2).

Yes, the theory of knowledge, also known as epistemology, is important for the understanding of information and generally neglected by the information profession. This is in line with what was written in the introduction:

... it should become evident that the author has some sympathy with the description of the study of information as “a kind of applied epistemology”... (Hjørland, 1998, p. xv).

A very important claim throughout the book is that different kinds of knowledge organizing systems such as library classification systems or web pages are based on different epistemologies and that the organizing of information in such systems needs

to consider the underlying theory (which, we may suppose are the theories presented by this book). I both agree and disagree, why I shall use a little space on this issue.

The basic agreement between Tredinnick and myself is that we both believe that different epistemological perspectives make a difference. Tredinnick makes a basic distinction between “analytic philosophy” and “critical theory” and I make a similar distinction between “positivism” and “pragmatism.” The important thing is not how you name this difference but to consider that it is at play at different levels in almost any kind of thinking. If we, for example, consider art, this difference has its expression in how art is represented in exhibitions, in books on art and in library classifications (as demonstrated by Ørom, 2003). Then by implication, an enumerated classification system is not in itself reflecting a particular epistemology, but may be used to classify according to different epistemologies. We may distinguish two levels: the literature (or “information”) represented in an information system and the representation made by information professionals. The literature may be more or less influenced by “analytical philosophy” or by “critical theory.” And the way information professionals represent “information” may too be more or less influenced by “analytical philosophy” or by “critical theory” (even if the persons so influenced are not aware of this). In information representation the “analytical” approach may imply the view that information professionals should not consider the contents of the books, they should consider themselves outside the discourses connected with the contents. The “critical” approach would imply the opposite. A first thought might be that the best thing to do is to represent “analytic” literature/information in an “analytic” way and to represent “critical” literature/information in a critical way. A second thought reveals however, that this is not the way forward. If we believe that a given epistemology is better to help us solve a problem, this epistemology should be preferred consequently (although it involves what Ørom, 2003, term “bricolage” in classification).

Although I thus disagree that enumerative classification systems represent a particular epistemology as claimed by Tredinnick, I agree that every act of classifying and every act of designing or evaluating a system for representing information is always influenced by epistemological views and that these views are the most important theoretical issue to consider. In my analysis of the facet-analytic tradition, I found that it is based on “rationalism” (and thus related to “analytic philosophy”) while Tredinnick found that it is related to semiotics (and thus related to “critical theory”). One of us must be wrong about this particular question, but we agree what the basic theoretical issue to consider is.

Conclusion

The strength in this book is its broad inter-disciplinary perspective and its serious attempt to base theories of digital information on such perspectives. The weakness of the book is the author’s lack of deep knowledge of problems in information science as they present themselves in the literature. He tends to make postulates about “aboutness,” classification and so on without relating to specific papers about these problems in the research literature. There is also a lack of examination of empirical research in the field.

I agree, however, in the importance of approaching these specific issues from the kinds of perspectives, which this book tries to uncover. Information science has too

long been without proper theoretical frameworks because it has neglected epistemological issues.

I do not believe, however, that people, who have read this book, become better organizers of web-pages, and although I agree that the book is important, it is somewhat unclear how and for whom. The most concrete and important example provided is that the internet tend to remove some characteristics from the print culture and provide something that is closer to the manuscript culture that existed before print came to dominate, why information professionals have to reconsider their practices, which were developed to manage information in print form.

The present book is no small contribution as it stands. We badly need insights of this nature in our field. The book would be very useful in a course about the epistemology of information science/information management. I highly recommend it and I also recommend a further discussion and development of the theoretical basis of our field.

Birger Hjørland

Royal School of Librarianship and Information Science, Copenhagen, Denmark

References

- Capurro, R. and Hjørland, B. (2003), "The concept of information", *Annual Review of Information Science and Technology*, Vol. 37, pp. 343-411.
- Hjørland, B. (1998), "Theory and metatheory of information science: a new interpretation", *Journal of Documentation*, Vol. 54 No. 5, pp. 606-21.
- Hjørland, B. (2005), "Library and information science and the philosophy of science", *Journal of Documentation*, Vol. 61 No. 1, Special issue, pp. 1-162.
- Hjørland, B. (2007a), "Book review of D.C. Blair: Wittgenstein, language and information: 'back to the rough ground!'", *Journal of Documentation*, Vol. 63 No. 2, pp. 281-6.
- Hjørland, B. (2007b), "Semantics and knowledge organization", *Annual Review of Information Science and Technology*, Vol. 41, pp. 367-405.
- Hjørland, B. (2007c), "Information: objective or subjective/situational?", *Journal of the American Society for Information Science and Technology*, Vol. 58 No. 10, pp. 1448-56.
- Hjørland, B. and Nicolaisen, J. (Eds) (2005), "The epistemological lifeboat", *Epistemology and Philosophy of Science for Information Scientists*, available at: www.db.dk/jni/lifeboat/home.htm
- Hodge, R. and Kress, G. (1988), *Social Semiotics*, Cornell University Press, New York, NY.
- Karpatschhof, B. (2000), *Human Activity: Contributions to the Anthropological Sciences from a Perspective of Activity Theory*, Dansk Psykologisk Forlag, Copenhagen, available at: www.db.dk/bh/lifeboat_ko/HISTORY%20&%20THEORY/karpatschhof_2000.htm
- Kramsch, C. (2002), "Language and culture: a social semiotic perspective", *ADFL Bulletin*, Vol. 33 No. 2, pp. 8-15, (Association of Departments of Foreign Languages), available at: www.adfl.org/adfl/bulletin/v33n2/332008.htm
- Olson, H.A. (1997), "The feminist and the emperor's new clothes: feminist deconstruction as a critical methodology for library and information studies", *Library & Information Science Research*, Vol. 19 No. 2, pp. 181-98.
- Olson, H.A. (2002), *The Power to Name: Locating the Limits of Subject Representation in Libraries*, Kluwer Academic Publishers, Dordrecht.
- Qvortrup, L. (2003), *The Hypercomplex Society*, Peter Lang Publishing, New York, NY.

- Qvortrup, L. (2006), *Knowledge, Education and Learning. E-learning in the Knowledge Society*, Samfundslitteratur Press, Frederiksberg.
- Thibault, P.J. (1993), "Editorial: social semiotics", *The Semiotic Review of Books*, Vol. 4 No. 3, p. 1, available at: www.chass.utoronto.ca/epc/srb/srb/4-3edit.html (accessed 6 April 2007).
- Thiel, C. (1991) in Burkhardt, H. and Smith, B. (Eds), *Boolean Algebra Handbook of Metaphysics and Ontology. Vol. 1/2, Vol. 1*, Philosophia Verlag, Munich, pp. 96-8.
- Volosinov, V.N. (1986), *Marxism and the Philosophy of Language*, Harvard University Press, Cambridge, MA, (Translated from Russian by L. Matejka and I.R. Titunik).
- Wikgren, M. (2005), "Critical realism as a philosophy and social theory in information science?", *Journal of Documentation*, Vol. 61 No. 1, pp. 11-22, available at: www.abo.fi/~mwikgren/Wikgren_critical_realism.pdf
- Wilson, T. (2006), "A re-examination of information seeking behaviour in the context of activity theory", *Information Research*, Vol. 11 No. 4, Paper 260, available at: <http://InformationR.net/ir/11-4/paper260.html>
- Winograd, T. and Flores, C.F. (1987), *Understanding Computers and Cognition: A New Foundation for Design*, Addison-Wesley, Reading, MA.
- Ørom, A. (2003), "Knowledge organization in the domain of art studies – history, transition and conceptual changes", *Knowledge Organization*, Vol. 30 Nos 3/4, pp. 128-43.

Further reading

- van Rijsbergen, C.J. (1979), *Information Retrieval*, 2nd ed., Butterworths, London, available at: www.dcs.gla.ac.uk/Keith/Chapter.3/Ch.3.html (accessed 15 December 2005).