

# Examining Social and Technological Research in Library and Information Science

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## ABSTRACT

In this paper we employ a philosophical-historical approach toward understanding (Library and) Information Science as both a social and a technological science. We do this, via Martin Heidegger's works, by returning to the etymological roots of *technique* and *technology*, the Ancient Greek term *techne*, and through this we see how this term has been diametrically characterized in the Western philosophical tradition. We propose an account of socio-technical and technological causality that explains (L)IS technical and technological research in terms of cultural-social, as well as material and professional, affordances, rather than as determinative causation. Our argument aims not only to contribute an understanding of the role of social and technological research in the field, but also to begin a critique of some quantitative and qualitative research in the field.

## Categories and Subject Descriptors

K.7.0 [The Computing Profession]: General.

## General Terms

Documentation, Standardization, Languages, Theory

## Keywords

Information Research, Critical Information Theory, Social Informatics, Technology, Affordances

## 1. INTRODUCTION

It is well-known that there is a wide spectrum of what can be characterized as 'information research.' In the field of (Library and) Information Science ((L)IS) there are such research areas as user studies, information behavior, information architecture, information representation and organization, information retrieval, and so on. Information research has also been undertaken by scholars in the social studies of science and technology, particularly in the area of information infrastructure (for example, Bowker and Star 2000; Bowker, 2005) and artificial intelligence, such as medical informatics (for example, Forsythe 2001). More recently, there has been concern about the *social* importance of information research, and as a result, the

emergence of the research area of social informatics. But, what is the relationship between information research and the 'social'? And, how is the 'social' important for information research?

## 2. INFORMATION AND TECHNOLOGY

Information research, by its very name, sounds to be engaged in research about information. Consequently, it is natural that much of the conceptual and critical work in information research during the past thirty or so years has focused on definitions of information and information science (for example, Bates 1999, 2005, 2006; Brookes 1980; Buckland 1991; Hjørland 2006; Saracevic 1991, 1999). The discussion of the concept of information is very important—for an articulation of the epistemological and ontological assumptions of the concept of information would explicate how the concept has informed information research, and an analysis of the uses of the word "information" would show how it has shaped a certain kind of thinking and ideology in our day-to-day activities and in our professional activities as information professionals and information researchers (see, for example, Day 2001; Frohmann 2004).

Most of the research in (L)IS, however, is not purely conceptual and it is usually not critical. Rather, it involves the study of the use and/or efficiency of various types of information and of information technology. For example, information architecture is concerned with the design of information infrastructure, with this latter term meaning entities such as web pages and databases; information representation and organization are concerned with how data are represented and organized in a systematic way for computerized systems; information retrieval is concerned with devising algorithms for the successful retrieval of information. In other words, most of information research is not an analysis of information as a term, but rather, it is an analysis of different things called "information" in their design, configuration and use, often involving technologies that are then referred to as 'information technologies.' As such, information research is often seen in terms of 'user' research into information problem solving, particularly, problem solving in different social spaces: organizations, public spaces, virtual spaces, schools, etc. In turn, however, information research also involves problem solving in designing and troubleshooting technological systems that aid the problem solving of users. Thus, technological problem solving in

information science doesn't just involve engineering skills in system building and troubleshooting, but it tends to begin and end with the problems that users and producers encounter.

Can we conceive of a manner of conceptually analyzing these two aspects of information science 'empirical' research? If we could we would be opening up a conceptual 'meta-theoretical' avenue other than that of a critique of the obfuscation and reification of the term 'information' in the midst of a plethora of its social and professional deployments.

We would like to open up such an analysis by explicating the 'social' in terms other than that of determinative causality between 'users' and 'technology,' and, 'technology' and 'users.' We seek an analysis that can provide a unitary framework for analyzing both 'social' and 'technological' research in information science. Given that social analysis is often viewed in causal terms borrowed from physics—that is, causation understood as the determinate force exerted by one body upon another, and as such, 'users' making use of technologies to 'effect' resulting products, technology's 'effects' upon society, and so forth—is there a way of rethinking social causation in other terms than causes and effects? Such an analysis would, as well, give us a different interpretation of social informatics than has been the traditional understanding and it would open social informatics to new (and to previous, akin) research projects. It would inject more a form of cultural analysis into analyzing 'social situations.' Together, cultural forms and social situations form two durational axes—a long duration (tradition) and a short duration (site specificity)—that are necessary for considering meaningful action. (We here include Harré's (2004) third axis of indexicality as a combination of the two previous in moments of radical temporality governed by, on the one hand, necessity, and on the other hand, choice.) Social Informatics is doomed if it treats actors as mere determinate causes or effects of 'technology' or 'information' without accounting for the intentionality of the actors and the affordances for their expressive production.

In the following we offer a starting point for rethinking the social in relation to techniques and to technologies. We do so from the viewpoint of rethinking social causation according to what Aristotle termed "formal" causation, rather than according to the "efficient" causation that we discussed above, as the norm for social analysis. In this manner, we will also be asking that social research take into greater account those practices of cultural research approaches, namely, those that stress forms or "affordances" for expression and emergence. We wish to emphasize rethinking the *techne* of (Library and) Information Science according to their affordances.

In this paper, we will begin such an analysis through a reading of the beginning of the German philosopher, Martin Heidegger's, 1953 article, "The Question Concerning Technology" [1977b]. Heidegger's analysis offers an understanding of technique and technology as emergences and expressions indebted to four types of affordances. Whatever the limitations of Heidegger's account may be, it does provide a substantial, historically grounded account of the cultural meaning of technology over a long duration, and, thus, provides a useful and rare account of the role of cultural meaning in our understanding of human and technological interaction and co-development.

### 3. TECHNE

The relation between 'technique' and 'technology' warrants our consideration, not the least because in many modern Western European languages the difference between these two terms is not as strong as in English, deviating less from the original Ancient Greek term, *techne*, which etymologically unites the two former terms. "*Techne*" in the Ancient Greek means an art or craft whereby something emerges into appearance (*poiesis*). Thus, from the perspective of Ancient Greek philosophy up through the use of many modern Western European languages, in speaking about any production we must start with the relation of *techne* to creation.

In his lecture and then essay, "The Question Concerning Technology" [1977b], Heidegger discusses *techne*'s role in expression and production, and he does so by examining the philosophically and culturally important Aristotelian discussion of the four types of causality (the first or formal, the material, the efficient, and the final causes) in Aristotle's *Physics*. In Heidegger's essay [1977b], Aristotle's four causes are reinterpreted from their understanding in Latin and modern philosophy as *causa* back to what Heidegger claims is their proper understanding in Ancient Greek philosophy, understood in terms of the Greek, *aition*. Heidegger reads *aition* in terms of indebtedness. This reading goes against the grain of the philosophical tradition since, at least, the period of Latin philosophy. It is a reading that reinterprets Aristotle's four causes and the meaning of *techne* and *poiesis* according to the four causes' interdependences on one another. It also stresses the causes as mutually important, co-responsible *affordances* to which the emergent thing is indebted. This reading stands in contrast to the traditional deterministic and teleological reading of the four causes (where an ideal "first cause" is understood as an origin that is fulfilled in the final product (the "final cause"), vis-à-vis efficient and material causes, with each cause being read as a determinate force; hence, with the efficient cause—understood as determinate force—being understood as the dominant characteristic cause throughout the teleological chain of causation.)

In the Latin tradition, Aristotle's four causes are read as teleological and determinative of each upon the other as a sequence of events. Such a reading would yield, for example, the following analysis of creation or production (to use an easy-to-understand example): the blueprint for a house (first or formal cause: an ordinary form or *idea* to be completed in an actualization), the material causes (bricks, plumbing, etc.), the efficient cause (labor), and the final 'cause' or result (the actual house itself as an actual fulfillment of the original idea). In contrast, according to Heidegger's [1977b] rereading of *causa* by *aition*, the four causes are read as follows: Aristotle's "first" or "formal" cause is understood as the cultural 'context' or forms, social situation and needs, and the resulting plan for what is to be created; the efficient cause is understood as the craftsman or other human agency for bringing about the object; the material cause is understood as the matter that makes up the object; and the final cause is understood as the reception and purpose for which the thing is brought forward. Together, these are understood as a total assemblage of socio-cultural, material, and labor affordances that allow an object to emerge. Such an object

is the product of a craft or art (*techne*), which is the human manner of bringing things forth (*poiesis*). The object is indebted to these affordances for its emergence. It is an expression through these affordances.

The pivotal point in this argument is that Aristotle's first cause is reread by Heidegger as meaning forms for emergence and expression—affordances—rather than being an ideal blueprint for an actual product, as in the Platonic tradition or, equally, in the Latin tradition. This rereading of the first cause also permeates Heidegger's rereading of all the other causes, that is, his reading of them as different types of affordances. Determinate causes are replaced by a notion of cause as affordance. Affordances are forms that the object is indebted to for emerging as a certain type of thing—with material properties, social intentions, cultural expressions, and a site-specificity and time-value to its production and use. Heidegger's analysis reinserts situated action into production. He returns historicity—and, consequently, historical analysis—to the produced object. But a reread notion of “formal causes”—that is, as affordances—allows situated action to be understood in a non-mentalistic manner.

It should be mentioned that one of the consequences of Heidegger's interpretation is that content-container metaphors that function in the idealist Latin understanding of the four causes—that is, the four causes as the teleological realization of a ‘first,’ ideal essence contained in a representation—are left behind. Textual or other representations, instead of “containing” a ‘theoretical’ idea that is then realized in ‘practice,’ are viewed as cultural forms for expression, themselves being forms of practice. In Heidegger's analysis, there is no “epistemic content” [Frohmann 2004] in formal plans, which is then realized in an object.

It would be taking us a bit afield and would require too in-depth an analysis for this paper to retrace the important relationships between our modern understandings of art and other types of works and *techne* in Heidegger's oeuvre [for this, see Day 2008]. What is necessary, here, however, is to recognize what is most at stake for our present topic in Heidegger's reinterpretation of the four causes: 1) production is re-understood culturally-socially, and 2) social events are understood in terms of mutual affordances, rather than as determinate forces or causes of agents acting upon one another and upon objects or vice versa. This affects modern technological and technical studies in that *techne* is understood to underlie both. Both technique and technology in (L)IS are cultural-social in nature, being made up of actions and parts arranged and used for producing meaningful acts and products. For Heidegger, technological modernity is characterized as the metaphysical understanding of creation as determinative and teleological, leading from ideal frames for knowledge and object production to the realization of those ‘theories’ in actual ‘practices’ and ‘products.’ It is a production that privileges an ideal and reproducible production over a site-specific and time-valued, self-reflective, historical praxis.

The result of this critique is strongly felt in a very late essay, “The End of Philosophy and the Task of Thinking” [Heidegger 1977a], where Heidegger contrasts this analysis of *techne* against what he terms, “the thesis of the precedence of method,” a phrase that he uses to characterize the nature of modern research, as well as modern life dominated by scientific-technological production. The “thesis of the precedence of method,” for Heidegger, is the

modern assumption that method assures an ‘objective’ and reproducible ‘truth’ in research, just as technological production assures the reproducible certainty of the object's production. Social research and technological production proceed by establishing frames for research and production and attaining products based on strict methods. Those methods may involve material or semiotic tools of any sort. What is not as of much importance in modern research and technological production is the critical evaluation of the relation of production to its affordances or a cultural understanding of the affordances themselves.

For Heidegger, the mistaken importance of modern research is that of the precedence of method as an assurance for rigor and reproducibility in its research production. In turn, such methods themselves must be rigorous and reproducible. Standardization is thus assured, even if this means turning the cultural affordances of things and events into *causa* for attaining results in research or technological production. Often, social science research involves treating meaning as quantifiable and attributing determinate causes (physiological or social) to intentions (see not only Heidegger's work, but with a much clearer epistemological focus, Rom Harré's work as well (for example, Harré, 2004)). For Heidegger, in fact, all of modernity, including modern research, is involved in modern technological production, in the sense that it is involved in the production of products that rigorously and consistently follow from the guiding frames of theoretical ‘blueprints.’ What is lacking, Heidegger is arguing, is an awareness of the cultural affordances that underlie this, including the cultural metaphysics that reach from the Latin period through modernity. The Latin rereading of *aition* by *causa* must, for Heidegger, be seen as cultural affordances that allow the metaphysical tradition to emerge and embed itself in our understandings of technique and technology. Philosophical metaphysics is, thus, only one—though a condensed and thus exemplary substantiation—of what we might call a “cultural metaphysics.”

Studies of the concept of information in (L)IS often begin with different ontologies of information—following from the different senses given to the word “information” in ordinary and/or (L)IS discourses—and then they proceed to show how these different ontologies or senses of “information” cannot be unified, but are supported by different research “approaches.” Such research has difficulty linking ontological critique to epistemological critique. In the sciences, “approaches” are called “methods,” and they tend toward internal consistency and rigor, as well as—sometimes and ideally (depending on the discipline—a priori or a posteriori)—toward external consistency and rigor in application. From the perspective of Heidegger's analysis, at the least, it may be more beneficial to view ontologies of information as arising from methods and epistemologies within the sciences, as well as from a broader range of discourses in popular culture. Ontological critique follows from an epistemological critique of the ‘approaches’ adopted.

We would be amiss, however, not to point to a recent expressionist and emergence tradition in information research wherein affordances are accounted for, even if the full consequences for the social science tradition, and, possibly, the technological traditions, in (L)IS are not fully acknowledged. This

is a view of the social sciences that sees social research as qualitative and ethnographic (we recognize some of this occurring very lately in ‘information behavior’ research, particularly in its constructionist occurrences, and in the theorization of ‘positioning theory’ [Given, 2005]). Here, agents, materials, and objects are seen as forms for expression and emergence. In LIS, however, we have also seen some poor and misleading examples of ethnographic research, with the old specters of universalist claims and determinative causality haunting qualitative research, as much as it did previous quantitative research.

Further, what has been lacking in (L)IS research as a whole has been the awareness that critical conceptual research in (L)IS has been, essentially, the forcing of a cultural-historical mode of analysis back onto the term “information” itself as well as other foundational terms and concepts in the field. Such a misunderstanding has, perhaps, occurred because some of the conceptual studies in (L)IS are not nothing other than attempts to provide (L)IS with some sort of ‘philosophical’ or academic ‘foundations.’ These latter attempts are done for political or sociological reasons, not for philosophical ones, for the functions of philosophy in regard to (L)IS are to clear up conceptual confusions and/or to create concepts that aid in our understanding of what such a field may and may not be or what the term “information” can or cannot mean, socially, culturally, and professionally.

#### 4. CONCLUSION

In this paper we employ a philosophical-historical approach toward understanding (Library and) Information Science as both a social and a technological science. We have done this, via Martin Heidegger’s works, by returning to the etymological roots of *technique* and *technology*, the Ancient Greek *techne*, and we have seen how this term has been diametrically characterized in the Western philosophical tradition. We have proposed an account of socio-technical and technological causality that explains (L)IS technical and technological research in terms of cultural-social, as well as material and professional, affordances, rather than as determinative causation.

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