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Common grounds and relationships between Information Technology and Philosophy

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The task of defining and establishing the practice of information systems (IS) as a profession has followed a rocky path. It is the stated purpose of the Association for Information Systems to help in this regard. One of several major and perennial issues has been whether the pratice of IS as a profession is a sientific one and whether its domain is a science. A second related issue has been the identification and the appropriate use of knowledge from neighboring disciplines (Keen, 1980). The title of our paper suggests the following ideas: (a) The status of IS as science is neither as obvious nor as central to its identity as might seem at first blush, and (b) Philosophy is one of several disciplines to which IS scholars and professionals ought to turn in order to help clarify their domain of practice. Our aim in this paper is to sketch out some common grounds and relationships between the technology of IS (information technology or IT) and Philosophy. By information technology (IT) we refer to the technology of concepts or ideas consisting of the design and construction of computer-based systems for generating, manipulating, distributing and using information. (The unambiguous use of the concept of concept, of idea, and of requires the help of Philosophy, as will be seen later on). We group this common ground into four categories. We consequently recognize that philosophy deals with a number of the identity problems which we consistently raise, even if, as often happens, philosophical answers to these are not absolute or even satisfactory. However, this simply urges us, philosophically speaking, to inquire further.

How does a philosopher of technology (for example, Bunge 1979), considering IS to be a technology rather than a science, respond the conundrum of "field identity"? First of all it should be noted that to a philosopher of technology every real modern technology is more or less and at least partly science-based. Thus the knowledge domain of every technology overlaps in part with a number of scientific domains. As a consequence, every technology comes bundled with a number of philosophical presuppositions. Thus, every technology has a metaphysics, an epistemology, a semantical theory, a methodology and an ethical theory partly different from those of the sciences and other technologies from which it borrows. For example, truth-finding is the primary task of science. In technology, truth is a secondary value, since knowledge is instrumental. Technologists are well justified when they sacrifice depth and breadth in a theory for the sake of efficiency, reduced costs, reliability, ease of use, repeatability, simplicity, and so on. From this perspective, technology would seem less rigorous than science. On the other hand, unlike science which seeks to explain and predict, technology seeks to build and change the world we live in. Thus whereas science commits us to a view of the world, technology commits us to a specific world rather than to another. This commitment to making, to using and to changing, on a philosophical level, begs for moral justification. It calls for external norms for which there is no counterpart in science. To the philosopher of technology, the task of making IT into a full-fledged technology is no less honorable than the mistaken one of trying to make it into a full-fledged science. And it has the added advantage of being philosophically consistent.

Philosophy As A Reference Discipline

Philosophy is relevant to IS professionals and for two very basic reasons. First, being a technology, IT inherits the philosophical problems raised by all technology in a general way. And in addition, it raises its own very special set which other technologies do not. Secondly, IT is has special filial ties to Philosophy in that both deal with systems of ideas. Notwithstanding the idea held by some philosophers that the purpose of philosophy is not to build philosophical systems but to construct a universal philosophy (Gilson, 1937), historically, philosophers have sought to construct consistent hyper-general knowledge systems. IT professionals do about the same, although their knowledge systems tend to be less "hyper-general". Yet, while philosophy tries to build, clarify and systematize ideational systems, IT tries to put them to good use as well.

Let us use the following imagery to illustrate the four categories of overlap we wish to outline: An IT practitioner and a philosopher walk towards each other. First, moving from left to right, the IT professional turn to the philosopher for help. Second, moving even further to the right, the IT professional makes explicit the implicit (spontaneous or tacit) philosophical biases and assumptions of his/her technology. Third, the IT professional meets the philosopher who has begun to reflect on the philosophy of IT as part of the philosophy of technology in general. Fourth, the philosopher turns to the original post to reflect upon the challenge that IT poses for philosophy. The remainder of the paper examines these four categories of interrelation.

Category 1. The Pragmatic Use Of Philosophy In Information Technology.

Since, by definition, technology seeks knowledge for the creation of valuable things, technological theories and technological method, unlike scientific theories and scientific method, seek useful knowledge (Mitcham and Mackey, 1972/1983). In other words, technology always involves improving the states of knowledge of an actor or a decision-maker. But this state of knowledge is accessible only through interpretation by an external observer. Unlike the scientific method, technological research involves an interpretative moment whence the state of knowledge of an agent is established. This does not commit us to subjectivism or to intuitionism but it does reject scientism in technology, and it does challenge philosophers and philosophically-minded technologists to build full-fledged theories of technological method as distinct from scientific method.

Bunge (1979) has coined the term 'epistechnologies' for the technologies of concepts, ideas, and information. Churchman (1971) proposed that IT knowledge systems be built from one of five different perspectives of constructung an "inquiring system." His work had the immense merit of making explicit and bringing to the attention of IT systems designers the range of implicit philosophical positions which underlay the design of any information system, not only the epistemological assumptions, but also the metaphysical, semantical, and ethical ones as well. It is clear that Churchman sought to make evident the epistemological nature of IT and making it the responsibility of the field to apply epistemological rigor. Yet it may be also argued that he stylized and relativized a number of different epistemological positions which suggest that technologists can design intelligence in different ways according to preferences for basic philosophical assumptions. Apart from a small number of heterodox relativists, philosophers in general, scientists, and even thoughtful technologists cannot accept the idea of relativistic epistemologies relying on style, preference, or authority.

Be that as it may, IT appears to the philosopher to be applied epistemology, and thus philosophy seems to be one of the roads to clarification.

Category 2. Making The Spontaneous Or Tacit Philosophy Of IT Explicit

Every technology sits on the shoulders of a number of sciences which in turn build on their special and general philosophies. Thus, every technology inherits either directly or indirectly, either in a recognized way or implicitly, a number of philosophical assumptions and presuppositions from the sciences on which it is based. The implicit (spontaneous or tacit) philosophical biases and assumptions of any technology must sooner or later be made explicit, must be critically examined, and must be built upon so as to remove impediments to reasoned progress. Here are some of the spontaneous biases which appear to the philosopher:

A. Spontaneous epistemological biases: (a) technology shares with science many of its epistemological assumptions, such as epistemological realism (namely, the existence and knowability of an external world and the improvability of this knowledge); (b) generally speaking the classical technologist is a naive realist in that he takes his representations to be accurate pictures of the things they represent; (c) to the technologist, knowledge is instrumental, it is an intermediate goal to be used as a means to attaining a practical one; he will evaluate knowledge, as Dewey put it, according to "its cash value" that is, according to its use; the technologist views every piece of knowledge as a resource; (d) typically, the technologist

holds an opportunistic and absolutist theory of truth; a proposition is true or it is not; this leads to a justification bias and to the use of knowledge in authoritarian and technocratic ways; (e) the technologist will favor theories "that work" over theories that are true; he will favor tried and true methods, reliability over depth, generality over specificity, and a simple half-truth to a fuller but more complex one.

B. Spontaneous metaphysics common to science and technology: (a) the world is composed of things; (b) things come together in systems, (c) all things, facts, and processes fit into patterns or "laws"; (d) nothing comes from nothing and nothing goes into nothingness; (e) determination, and causality which is one of its forms, is often multiple and probabilistic; (f) every change is a change of a property of thing or a system, some of these are new or emergent.

C) Spontaneous metaphysics peculiar to technology: (a) man can change or alter the "natural" flow of things by the creation of artifacts; (b) artifacts constitute a new "ontic" category, new forms of reality; (c) some of these artifacts are the unintended consequences of action whereas others can be produced with the help of deliberate planned action.

D) Spontaneous metaphysics current in IT: (a) whatever appears to behave like an intelligent being is intelligent; (b) whatever appears to be alive is alive; (c) information is independent of the brain; (d) knowledge is independent of the knower.

E) Spontaneous moral orientation of IT: (a) by definition, the practice of technology seeks the designing, making and using of valuable things; by definition then, every instance of technological practice involves valuation, evaluation and moral judgment; (b) the moral orientation of technology applies not only to technological practice but to technical knowledge as well; whereas to the scientist every thing is in principle equally worthy of study, the technologist partitions things into two classes: things that are potential resources or means, and are therefore of value, and those that are not. Every thing, every piece of knowledge is evaluated or evaluable.

Category 3. The Philosophy Of IT As Part Of The Philosophy Of Technology

Every technology contains the seeds of its own specific full-fledged philosophy (Seni, 1990, 1996). Every full-fledged philosophical system deals at least with the following items: (a) metaphysics or theory of its objects, (b) an epistemology or theory of what constitutes appropriate knowledge in the field, (c) a semantical theory or a theory of sense, reference, meaning, and truth conditions in the discipline, (d) a methodology or a normative epistemology specifying rules for research and inquiry, (e) an ethical theory or theory of the specific moral problems which the field raises.

Some of the hidden philosophical assumptions mentioned in number 2 above when studied by a philosopher, would belong to this category. In other words, when going beyond the recognition of hidden assumptions, a philosopher makes these assumptions the core of his or her study, one no longer speaks of a philosophically enlightened technology but of a philosophy of technology.

Category 4. The Challenge Of Information Technology For Philosophy

The artificial intelligence debate (Graubard, Stephen R. , 1988) is a good example of philosophers reacting favorably as well as unfavorably to philosophical assertions by zealous technologists. Again, it is not that philosophy resolves once and for all the fundamental problems posed by IT; simply, it is a matter of responsibility for clarifying the issues. Some of the issues raised by IT and addressed by philosophers are the following: (a) information with or without a brain; (b) artificial intelligence; (c) the brain-computer comparison on a material level; (d) artificial life, (e) old dichotomies such as natural/artificial, mind/brain, human/non-human; (f) the "end of work debate"; (g) the new robots; (h) special problems in ethics such as privacy, going public, being plugged-in.

Conclusion

This paper has attempted to paint an image of an IT practitioner looking at philosophy and a philosopher looking at IT, creating a complementarity of positions that leads to a contribution not otherwise possible. In the process, the IT practitioner develops a more examined (i.e. more scientific as well as more philosophical) view of his world and the philosopher participates in applying the technology and using the results to build a better philosophy.

References

Bunge, M. (1979), "Philosophical inputs and outputs of technology," in Bugliarello, G and D.B. Donner (eds.), The History and Philosophy of Technology, Urbana, Ill.: University of Illinois Press, pp. 262-281.

Churchman, C. West (1971), The Design of Inquiring Systems, New York: Basic Books.

Gilson, Etienne (1937), The Unity of Philosophical Experience, New York: Charles Scribner's Sons.

Graubard, Stephen R., ed. (1988), The Artificial Intelligence Debate: False Starts, Real Foundations, Cambridge: The MIT Press.

Keen, Peter S. W. (1980), "MIS Research: Reference Disciplines and a Cumulative Tradition," Proceedings of the 1st International Conference on Information Systems, Philadelphia, December, pp. 220-232.

Mitcham, Carl and Robert Mackey, eds. (1972/1983), Philosophy and Technology: Readings in the Philosophical Problems of Technology, New York: The Free Press.

Seni, D.A. (1990), "The sociotechnology of sociotechnical systems: Elements of a theory of plans," in Weingartner, P., and J. Dorn (eds.), Studies on Mario Bunge's Treatise, Amsterdam-Atlanta, Ga., Rodopi Press, pp. 431-454.

Seni, D.A. (1996), "Planning as sociotechnology, in Kuklinski, A., (ed.), Production of Knowledge and the Dignity of Science, Euroreg, Warsaw, Rewasz, pp. 131-146.