Disclosing Visions of Technology

Peter-Paul Verbeek
University of Twente

Review of *In Search of an Integrative Vision for Technology*, Sytse Strijbos and Andrew Basden (eds.), Dordrecht: Springer Publishers, 2006, 310 p. Hardcover, ISBN: 0-387-32150-0 (series: Contemporary Systems Thinking), $109.00.

Since 1995, a group of scholars from different nationalities and disciplines has come together every year to discuss normative and interdisciplinary issues regarding science, technology, and their social roles and impact. Members of the group share an interest in systems theory and normative reflection, and are inspired by the work of Herman Dooyeweerd, a Dutch philosopher in the Calvinist tradition. The group founded the *Centre for Philosophy, Technology, and Social Systems* (CPTS). Recently, several members of this center published the book *In Search of an Integrative Vision for Technology: Interdisciplinary Studies in Information Systems*, edited by Sytse Strijbos and Andrew Basden.

In Search of an Integrative Vision for Technology embodies a new voice in the philosophy of technology. It contains an interesting collection of articles, which each address a specific aspect of the 'systemic' interaction between technologies and society. The ambition of the book is to develop an 'integrative vision for technology'. By this, the authors mean a vision which does analyze technology "as such", but only in "the normative context of human and societal aspects". The book employs concepts from both systems theory and the philosophy of Dooyeweerd to analyze and evaluate the relations between technologies and their social context, and at some places it argues from an explicitly (Protestant-) Christian point of view.

The book is built around a conceptual framework, elaborated by Strijbos and Basden in the introduction to the book. The framework distinguishes five key elements needed to understand the relations between technology and society. First of all, the authors discern *basic technologies* (1). With the help of these technologies, *technological artifacts* (2) can be constructed. As soon as these artifacts are used, *sociotechnical systems* (3) come into being: complex relations between artifacts and users, which act as an infrastructure that fundamentally alters our lives. These sociotechnical systems come about when technological artifacts get a place in *human practices* (4). In their elaboration of this notion of practice, Strijbos and Basden make a Dooyeweerdian distinction between the *qualifying* aspects of a practice on the one hand, relating to 'what' the practice is and what makes it different from other practices, and its *founding* aspects on the other, relating to 'how' a specific practice is done and gets shape in specific ways. These 'founding' aspects form the point of contact with technological artifacts: at this point, where sociotechnical systems arise, human practices are co-shaped by technological artifacts, while artifacts in their turn get meaning in the context of these practices. The fifth element in the framework is formed by what the authors call *directional perspectives* (5), by which they indicate "a spiritual perspective that guides the way in which people work out the 'structure' of a practice – spiritual motivation, ethical attitudes, ethos, worldviews and other things that deeply influence the more visible aspects of human practice".

The structure of the book follows this conceptual framework. The first part of the book concerns "Artifacts and their development". All chapters in this section aim to contribute to a better understanding of the process of developing artifacts for human use, with a focus on information technology. They contain reflections on aspects of knowledge representation in information technology (Basden); the concept of 'qualifying function' (Bergvall-Kåreborn); the elicitation of interdisciplinary knowledge (Winfield and Basden); and on Checkland's Soft Systems Methodology (Mirijamdotter and Bergvall-Kåreborn). Part two of the book analyses how and to what extent information technologies can be seen as socio-technical systems. It contains chapters on the systems character of modern technology (Strijbos), on the cultural desire for unlimited communication (Van der Stoep), and on the cultural influence of communication technologies (Van der Stoep). The third section of the book focuses on how technologies influence human practices. Its chapters deal with the ways in which various systems approaches can inform evaluations of human practices (Vlug and Van der Lei); with unexpected and adverse impacts of the use of information systems (Eriksson); and with developing a framework to understand practices of technology use (Basden).

The fourth section of *In Search of an Integrative Vision for Technology* concerns the 'directional perspectives' that form the fifth element in the conceptual framework. One chapter in this section elaborates a new field of 'systems ethics', expanding systems theory into the domain of ethics (Strijbos); the second chapter examines how various approaches within systems thinking ("hard", "soft", "critical", and "multimodal") rest upon different world views and religious foundations (Eriksson); and the third chapter in this section develops the idea of "disclosive systems thinking" and the normative principles behind it (Strijbos). After these four sections, the book contains a fifth section with two critical reflections (by Midgley and Mitcham) on the perspectives developed in the book, mainly focusing on the strengths and weaknesses of the conceptual framework organizing the book.

Also for readers who, like me, do not have their home base in systems theory and neither in neo-Kantian systems like Dooyeweerd's, *In Search of an Integrative Vision for Technology* is an intriguing book, since it develops an original elaboration of intuitions were also elaborated in a radically different form in Science and Technology Studies and in the Philosophy of Technology. The idea that technology and society are inextricably connected, e.g., is widespread in the field, but Strijbos's and Basden's book conceptualizes this relation in a new way, which deserves critical attention. Moreover, ethical reflection is an integral constituent of the 'CPTS model' – as the authors call the conceptual model guiding the book – and this makes the model very timely in light of current discussions about ways to fill the normative gap in STS and the philosophy of technology, which has been criticized by many scholars already.

In order to explore what exactly can be the potential contribution of the book to current discussions in the philosophy of technology, I will discuss two aspects of the conceptual model, one ontological, the other ethical. First, I will discuss how *In Search of an Integrative Vision for Technology* analyzes the relationships between technology and society and how this analysis relates to other positions in the field. Second, I will discuss the ethical approach of the book and its possible contribution to the ethics of technology. For both lines of inquiry, I will use an exemplary technology to which I will apply the CPTS model in order to investigate its strengths and weaknesses. This example will be the technology of obstetrical ultrasound.

When analyzing obstetrical ultrasound with the help of the CPTS model, the five levels of the model are directly helpful to distinguish many relevant aspects of this technology. At the level of

basic technologies, there are the technologies of ultrasound radiation, detection, and translation into a visible image. The *artifact* here is the ultrasound scanner itself, and the *sociotechnical systems* are the medical systems in the hospital, which involve interactions between the building, electricity, expertise of doctors and nurses, procedures, devices, et cetera. The *human practices* around obstetrical ultrasound are the medical practices of doctors and nurses, and the practice of expecting a child and dealing with the questions and responsibilities connected to that. The level of *directional perspectives*, to conclude, concerns ethical questions about how to deal with ultrasound in medical practice and how to deal with the results of antenatal diagnostics when expecting a child.

The CPTS model, therefore, is able to conceptualize both the specificities of the technology, the social context in which it will find its place, and their points of intersection. Yet, it remains the question if this specific conceptualization of the interaction between technology and society is able to cover all relevant aspects of technology's social roles. In Philosophy of Technology and in Science and Technology Studies, many scholars have analyzed these relations between technology and society, but unfortunately *In Search of an Integrative Vision for Technology* hardly discusses these positions. Such a discussion would have been interesting, since major differences exist between the approaches.

Characteristic for the CPTS approach is that it stresses the *interaction* between technology and society, whereas many current approaches in STS and the philosophy of technology focus on their *mutual shaping* or *co-constitution*. Within the CPTS approach, technology helps to shape what is called the 'direction' of human practices (the 'how' of practices, or their 'founding function'), but not their 'structure' (the 'what' of practices, or their 'founding' function). The nature of practices is considered to have already been determined before technologies come to play a role in them; technologies can only affect how these practices get shape in specific circumstances, not what they *are*. This implies that important implications of the technology of obstetrical ultrasound might fall out of the scope of the CPTS model. For this technology actually constitutes the practice of expecting a child and dealing with pregnancy *anew*, rather than merely giving a new direction to the already existing practice.

The introduction of ultrasound has radically changed what it means to expect a child. Ultrasound fundamentally shapes our experiences and interpretations of the unborn child and of what it means to be pregnant. By isolating the fetus from the female body, for instance, it creates a new ontological status for the unborn child, as if it had an existence apart from the woman in whose body he or she is growing. Moreover, because of its ability to make diseases visible, ultrasound places the unborn child in a medical context, thus translating pregnancy into a medical process, the fetus into a possible patient, and – as a result – congenital defects into preventable forms of suffering. Ultrasound therefore plays an important mediating role in the experience of being pregnant and in moral decisions about the life of the unborn child. This role is ambivalent: on the one hand, it enhances the bond between parents and unborn child, which makes it more difficult for them to choose to have an abortion in case the child suffers from a serious disease; on the other hand, the very possibility to make predictions about the health condition of the unborn child may invite people to terminate the pregnancy if the child is likely to suffer from a serious disease. What is not ambivalent here, however, is the fact that pregnancy has changed into a process of *choice*.

Ultrasound has therefore radically changed the practice of being pregnant and dealing with the uncertainties and responsibilities connected to that. It did not simply give a new direction to what

already happened, but it reshaped the practice of being pregnant in such a way that new categories are needed to understand it. This implies that an adequate conceptualization of the relations between technology and society should take their interwoven character more into account than the CPTS model does. Rather than starting from the idea that there is a set of practices which all have a different *a priori* structure, it might be necessary to show how these practices themselves are actually *constituted* by technologies. And for this purpose, Dooyeweerds neo-Kantian framework – however relevant – might be too limited to fully grasp the social and cultural roles of technology. For this reason, the book would have benefited from more discussion with other positions in the field.

What distinguishes the CPTS model in a positive sense from many other approaches in the field, however, is its integration of ethical reflection in its conceptualization of technology. Because technology is inextricably linked to human practices, these practices and technology's role in them need 'guidance' in a moral sense, as the authors of *In Search of an Integrative Vision for Technology* explain. Especially Sytse Strijbos' article on Disclosive Systems Thinking offers a systematic elaboration of an ethical framework that is able to address the relations between technology and society as elaborated in the CPTS model. Elaborating Dooyeweerd's analysis of the various aspects of reality and their "intrisinsic normativity", Strijbos argues that technologies might form an obstacle for such norms to be realized, and that ethical reflection on technology needs to be directed at making room for their realization.

Yet, again, the example of ultrasound shows that there are limitations to this approach as well. First of all, the idea of intrinsic normativity becomes problematic when taking into account the constitutive role of technology in the relations between humans and reality. What the relevant aspects of reality are, and what their 'intrinsic' normativities are, is always co-shaped by the specific relations human beings have with reality, and by the mediating role of technologies in these relations. Moreover, by placing the 'directional perspectives' exclusively in the domain of society, guiding human practices in which technologies can play a role, the CPTS model cannot account for the moral dimension inherent in technological artifacts. As the example of ultrasound shows, not only human practices, but also technological artifacts can embody morality. This is not to say that technological artifacts are able to make moral decisions themselves, but because of the pervasive and mediating role of technology in our culture ethical reflection and moral decision-making are simply not exclusively human in nature anymore. Moral decisions about abortion get shape on the basis of specific interpretations and representations of the fetus, which are fundamentally mediated by technological devices. When locating 'directional perspectives' only in the domain of society, therefore, an important 'locus' of contemporary morality remains out of sight.

This has serious implications for the quality of moral decision-making in the practice of engineering and technology design – where the 'directional perspectives' of the CPTS model have their primary relevance. If the ethics of technology is to be more than pulling the emergency brake when a technological development is found to be morally unacceptable, we need to take the moral dimension of artifacts seriously. Only in this way we can morally evaluate not only human behavior, but also technological artifacts, and deal with this 'material morality' in a responsible way. *In Search of an Integrative Vision for Technology* is right and praiseworthy in its integration of normative reflection in its approach to technology, and it offers an interesting and rich analysis of the various aspects of the relations between technology and society. But the too radical separation between technology and society behind the CPTS model conceals aspects of both

technology and society that need to be addressed for an adequate understanding and evaluation of our technological culture.