Chapter 6

ACTING ARTIFACTS:
The Technological Mediation of Action

Peter-Paul Verbeek

1.   INTRODUCTION

During the past decade, the role of technological objects in society and in people's everyday lives has become a central theme in the philosophy of technology. Many authors have made analyses of the ways in which technological artifacts help to shape the ways in which humans experience reality and live their lives. A central theme in these analyses is 'mediation': artifacts are conceptualized in terms of their mediating role in the relationship between human beings and their environment. In this paper, I will draw together the main lines of thought that can be found in some recent approaches. This will result in a conceptual 'vocabulary' for understanding technological mediation.

2.   TECHNOLOGY AND HUMAN-WORLD RELATIONSHIPS

The approach I will follow in developing a philosophical framework for understanding the influence of artifacts on people's actions and experiences is phenomenological in nature (cf. Verbeek, 2005). This framework needs some explanation before turning to the contribution of the philosophy of technology to the analysis of the relationship between technology and behavior. I will define phenomenology broadly as the philosophical analysis of human-world relationships. The central idea in the phenomenological approach is that subject and object — or: humans and their world — constitute

each other in the relationships that exist between them. Humans and their world are always interrelated. Human beings cannot but be directed at the world around them; they are always experiencing it, and it is the only place where they can live their lives. Conversely, the world only gets a meaning for human beings in the relationships they have with it: it needs to be perceived and interpreted in order to be meaningful. Humans and their world, therefore, determine each other in the relations and interactions that exist between them. In their interrelation, both the subjectivity of humans and the objectivity of the world are shaped.

This phenomenological perspective offers a framework for analyzing the relationship between technology and behavior, which is the central topic of this book. Technological artifacts are related to human behavior, because they can play a mediating role in the very relation between human beings and their world. A good starting point for understanding this 'technological mediation' is the analysis of the relationships between humans and artifacts, as made by the American philosopher of technology Don Ihde.

Ihde (1990) discerns several relationships human beings can have with technological artifacts. Firstly, technologies can be 'embodied' by their users, making it possible that a relationship comes about between humans and their world. This 'embodiment relation', for instance, occurs when looking through a pair of glasses; the pair of glasses is not noticed explicitly but yet it co-shapes the relationship between human beings and their environment. We do not look *at* a pair of glasses, but *through* it to the world around us. In the 'embodiment relation', technological artifacts are 'incorporated', as it were; they become extensions of the human body. Secondly, technologies can be the *terminus* of our experience. Ihde calls this relation with technologies the 'alterity relation'. It occurs when interacting with a device, as is the case, for example, when buying a train ticket at an automatic ticket dispenser. Thirdly, technologies can play a role at the *background* of our experience, creating a context for it.[12] An example of this 'background relation' is the automatic switching on and off of the refrigerator, or the temperature condition in a room as produced by a heater or air conditioner. Such devices are not experienced directly, but shape a context within which experiences can take place. This third relationship is of less importance than the other two for understanding technological mediation, and therefore I will not discuss it further.

Ihde's conceptualization of human-technology relations is based on the analysis that was made by the German philosopher Martin Heidegger of the

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[12] For the sake of clarity, I leave out a fourth human-technology relationship Don Ihde discerns: the 'hermeneutic relation'. For an analysis of this relation, see: Ihde, 1990.

role of tools in the everyday relation between humans and their world. According to Heidegger (1927), tools should not simply be understood as functional instruments, but as 'connections' or 'linkages' between humans and reality. The way tools-in-use are present Heidegger calls 'readiness-to-hand'. By this he means that tools that are used for doing something typically *withdraw* from people's attention. The attention of a person who drives a nail into a wall, is not primarily directed at the hammer, but at the nail. Human involvement with reality takes place *through* the ready-to-hand artifact. Only when the artifact breaks down, it demands attention for itself again. It then becomes 'present-at-hand'; it presents itself as the terminus of our experience and cannot facilitate a relationship between user and world any more. Table 6-1 schematizes these human-technology relationships.

Table 6-1. Human-technology relationships (after Ihde, 1990)

embodiment relation ('*readiness-to-hand*')	(human – technology) → world
alterity relation ('*presence-at-hand*')	human → technology (– world)
background relation	human (– technology – world)

The Concept of readiness-to-hand is of utmost importance for understanding the relationship between technology and behavior. Artifacts that are ready-to-hand are able to bring about a relationship between human beings and their world. By withdrawing from people's attention, they create 'through themselves' a relation between user and world. Artifacts facilitate the involvement of human beings with reality, and in doing so, they help to shape how human beings can be present in their world and how their world can be present for them. Things-in-use, therefore, can be understood as *mediators* of human-world relationships; they form a 'medium' between human beings and their world. Mediation should be understood in an active sense here. Artifacts are not merely neutral 'intermediaries', but actively help to shape human-world relationships: human perceptions and actions, experiences and existence. The mediating role of artifacts, however, does not only occur from the 'embodiment' or 'ready-to-hand' relation. As will become clear below, in the domain of action artifacts can also play a mediating role from the 'alterity' or 'present at hand' position.

The work of Don Ihde and the French philosopher and anthropologist Bruno Latour offer concepts for making a closer analysis of this mediating role of technologies. In order to link their analyses to each other, I will discern two directions of phenomenology: one that focuses on perception and one on praxis. Each of these directions approaches the human-world

relationship from a different side. Existential or 'praxis-oriented' phenomenology starts from 'the human side'. Its central question is how human beings act in their world and realize their existence. The main category here is action. Hermeneutic or perception-oriented phenomenology starts from 'the side of world', and directs itself at the ways in which reality can be interpreted by and be present for people. The main category here is perception. The phenomenological point of view, therefore, makes it possible to analyze technological mediation in terms of the role technological artifacts play in the interrelation between humans and their world, by helping to shape human actions and perceptions.

3.   MEDIATION OF PERCEPTION

The central hermeneutical question for a 'philosophy from the perspective of things' is how artifacts mediate the way reality can be present for people. As Don Ihde's philosophy of technology shows, artifacts help to shape human experiences and interpretations (Ihde 1990). Ihde's work focuses on the technological mediation of perception. Artifacts are able to mediate our sensory relationship with reality, and in doing so they transform what we perceive. According to Ihde, this transformation always has a structure of amplification and reduction. Specific aspects of reality are amplified while others are reduced. When looking at a tree with an infrared camera, for instance, most aspects of the tree that are visible to the naked eye get lost, but at the same time a new aspect of the tree becomes visible: one can now see whether it is healthy or not. Ihde calls this transforming capacity of technology 'technological intentionality'. In their mediation of the relationship between humans and world, technologies have 'intentions'; they are not neutral instruments but actively help to shape the nature of the relationship that comes about.

'Technological intentionalities' are not fixed properties of artifacts, however. They get shape within the relationship humans have with artifacts. Within different relationships, technologies can be interpreted differently and therefore have a different intentionality. The telephone, for instance, was originally developed as a hearing aid, and the typewriter as a writing tool for people who are suffering from weakness of vision. In their use contexts, these technologies came to be interpreted in a different way than their designers intended. Ihde calls this phenomenon *'multistability'*. A technology can be 'stable' in different ways, in that its 'essence' is not fixed but depends on the way it is embedded in a use context. Technological

intentionalities are always dependent on the specific ways in which technologies are interpreted and used.

Ihde's analysis of the transformation of perception has important hermeneutical implications: mediating technologies not only determine human perceptions but also our interpretations of reality. This becomes most clear when investigating the role of instruments in the production of scientific knowledge. Without these, many scientific facts and theories could not exist. Instruments make it possible for scientists to perceive aspects of reality that cannot be perceived without them, like brain activity, micro-organisms, or invisible forms of radiation emitted by stars. The 'reality' studied here, has to be 'translated' by technologies into perceivable phenomena. What 'reality' is in such situations, is co-shaped by the instruments with which it is perceived. It has no equivalent in the visible world. Medical technologies form another example of the role of technologies in human interpretation. Ultrasound scans, for instance, can be used to test nuchal translucency, the thickness of the skin at the nape of a fetus' neck. This test gives an indication of the risk of Down's syndrome. If this test is done, the echoscope lets the fetus be present in a very specific way. For those who will have to make a decision about abortion on the basis of the outcomes of the test, the fetus can be present only in terms of an organism with a risk of suffering from a serious disease. And the very act of having this test done already suggests an appropriate response. Ultrasound scans fundamentally shape one's experience of an unborn child, and even of being pregnant.

On the basis of their mediating role in human *perceptions and interpretations*, therefore, technologies can indirectly influence human *actions* as well. This holds true not only for medical technologies, but also for many technological interfaces, which mediate the way in which humans perceive and interpret the functioning of a device. A washing machine that indicates that its water filter needs to be cleaned, for instance (see Heijs, chapter 15, this volume), mediates how users interact with the machine, and how much energy they use. This indirect role of technologies in human behavior is of a different nature, though, than the direct influence which will be discussed below.

4.   MEDIATION OF ACTION

Within the existential or praxis-perspective, the central question is how artifacts mediate the actions of human beings and the way they live their

lives. From a phenomenological point of view, praxis and existence are the mirror images of perception and experience. Whereas perception consists in the way the world is present for humans, praxis can be seen as the way humans are present in their world. The work of Bruno Latour (1992; 1994) offers many interesting concepts for analyzing how artifacts mediate human praxis. Latour points out that artifacts influence actions: what humans do is often co-shaped by the things they use. Actions are not only the result of individual intentions and the social structures in which these individuals find themselves (the classical sociological agency-structure dichotomy), but also of people's material environment. A speed bump, for instance, translates a driver's intention from 'driving fast, because I'm in a hurry', or 'driving slowly in order to behave responsibly', to 'driving slowly to save my shock absorbers'. And the introduction of the microwave oven has not only enabled people to heat their food in a faster way, but has also changed their eating patterns. Since a microwave oven is particularly suitable for heating one-person, deep-frozen, ready-made meals, it appears to invite people to eat individually. By doing so, it weakens the 'culture of the table'.

Latour's concept for describing the mediation of action by artifacts is 'script' (Latour 1992). Like the script of a movie or a theater play, an artifact can 'prescribe' its users how to act when they use it. A speed bump, for instance, has the script 'slow down when you approach me'; a plastic cup from a coffee machine says 'throw me away after use'. When scripts are at work, things mediate action in a material way, which should be clearly distinguished from the immaterial or informational way in which signs mediate human behavior as well. A traffic sign, for instance, makes people slow down in quite a different way than a speed bump — if it does so at all. And people do not discard a plastic coffee cup because its user's manual tells them to do so, but simply because it is physically not able to survive being cleaned several times. The influence of technology on human actions is of a non-linguistic kind. Things are able to exert influence *as material things*, not only as *carriers of meaning*.

According to Latour, scripts are often, though not always, the products of 'inscriptions' by designers. Designers anticipate how users will interact with the product they are designing and, implicitly or explicitly, build prescriptions for use into the materiality of the product. Latour describes this inscription process in terms of 'delegation': designers delegate specific responsibilities to artifacts. To a speed bump, for instance, the responsibility was delegated to make sure nobody drives too fast. Not all scripts are the result of deliberate inscription, though. Artifacts can have scripts without these having been explicitly intended, whereas explicitly-intended scripts

can work out in a different way than expected. Wheelchair users know all about this: to artifacts like revolving doors and thresholds the responsibility is delegated to keep out the draft, not to keep out people in a wheelchair as well. Their discriminating scripts were not deliberately inscribed into them by their designers — but nevertheless they exert their influence in many buildings.

As with perception, in the mediation of action *transformations* occur. Within the domain of action, these transformations can be indicated as 'translations'. For Latour, all entities — human and nonhuman — possess programs of action. And according to him, artifacts bring about 'translations' of these programs. By entering a relationship with another entity, the program of action of the original actor is translated into a new one. When somebody's action program is to 'prepare meals quickly', for instance, and this program is added to that of a microwave oven, the action program of the resulting, 'composite actor' might be 'regularly eating instant meals individually'.

In the translation of action, a similar structure can be discerned as in the transformation of perception. Just as in the mediation of perception some aspects of reality are amplified and others are reduced, in the mediation of action specific actions are 'invited', while others are 'inhibited'. The scripts of artifacts suggest specific actions and discourage others. The nature of this invitation-inhibition structure is context-dependent, as is the amplification-reduction structure of perception. Ihde's concept of multistability also applies within the context of the mediation of action. The telephone, for instance, has had a major influence on the separation of people's geographical and social context, by making it possible to maintain social relationships outside their immediate living environment. But it could only have this influence because it is used as a communication technology, not as the hearing aid it was originally supposed to be.

An important difference with respect to the mediation of perception, however, is the way in which the mediating artifact is present. Contrary to perception, artifacts not only mediate action from a ready-to-hand position (Ihde's 'embodiment relation'), but also from a present-at-hand position (Ihde's 'alterity relation'). A gun, to mention an unpleasant example, mediates action from a ready-to-hand position, translating 'express my anger' or 'take revenge' into 'kill that person'. A speed bump, however, cannot be embodied or ready-to-hand; it exerts influence on human actions from a present-at-hand position.

5.   CONCLUSION: A VOCABULARY
FOR TECHNOLOGICAL MEDIATION

Within phenomenological philosophy of technology, several concepts have been developed for analyzing the influence of technologies on people's actions and perceptions. This influence can be described in terms of mediation. Artifacts mediate action by means of 'scripts', which prescribe how to act when using the artifact. They mediate perception by means of technological intentionalities: the active and intentional influence of technologies. Technological mediation appears to be context-dependent, and always entails a translation of action and a transformation of perception. The translation of action has a structure of invitation and inhibition, and the transformation of actions a structure of amplification and reduction. Table 6-2 below draws together all relevant concepts.

Table 6-2. A Vocabulary for Technological Mediation

hermeneutical perspective	praxis perspective
mediation of perception	mediation of action
technological intentionality	script
transformation of perception	translation of action
amplification and reduction	invitation and inhibition
delegation:	
deliberate inscription of scripts and intentionalities	
multistability:	
context-dependency of scripts and intentionalities	

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