Intentionality of Persuasive Technologies

Program:

Philosophy of Science, Technology and Society (PSTS)

Track:

Philosophy of Technology (PoT)

Student:

Sadjad Soltanzadeh

Supervisors:

Prof. Dr. Peter-Paul Verbeek

Dr. Elsbeth Brouwer

Master thesis, University of Twente, July 2009

Acknowledgment:

There are some people that helped me throughout the whole PSTS program in general, and during writing this thesis in particular, and I feel it is up to me to thank them.

I should thank my first supervisor Peter-Paul Verbeek who gave me some directions for all chapters by the comments they made. Discussions with Peter-Paul on philosophy of technology were interesting also because I felt we had the same fields of interest but we were approaching problems from different perspectives. Any time that I came back from meeting with Peter-Paul, I was refilled with energy and motivated to work on my thesis. Thank you Peter-Paul! I also should thank Elsbeth Brouwer, my second supervisor, who helped me a lot in the structure of the first chapter. Besides philosophically relevant ones, one of the points about Elsbeth's character that I really appreciate is her concern about everyday life, as distinct from academic life. She asked me to eat well, to sleep well, and not to forget about myself as a human being. Thank you Elsbeth for all advices you gave, whether philosophical or non-philosophical!

I should also thank W.T.S. Ideefiks, our study association and its members who kept me motivated and brought me so many fun moments. I feel like thanking them one by one, but it is a long list of most Ideefiks members that I know, so I just thank them all at once! I think I should specifically thank Ralf and Jasper my fellow-Ideefiks board members because they taught me being a board member is more about having fun than doing some tasks! :) Thank you guys!

The International Office in Cubicus, especially Dio and Frances who are not working there anymore, also helped me a lot to settle down especially in the first few weeks of joining PSTS. Thank you both.

Table of Content

Introduction

If you are a student and you need to borrow a book from the library of the University of Twente, you first have to register your library number together with the ID code of the book by placing the book you want to barrow and your student card under a laser-like beam coming out of a machine to let it know who has borrow which book. This machine gives a small printed receipt that shows you have officially borrowed the book(s) in question and also sends the information to the library's data list which is connected also to another machine standing in front of the library's exit point. This second machine works like an anti-shoplifting gate, except that it is used in a library not at the exit point of a store. If you leave the library with a book that is electronically tagged by the library's data list as not-borrowed-yet, the machine starts beeping. Normally, what happens next is that the librarians call you to their desk to check if you are allowed to leave the library with the books you hold. Probably some other UT students also know that those machines do not always work properly. It happens once in a while that the first machine does not transform the information to the library's data list, or that the anti-library-lifting gate confuses a bank card or a different electronic chip with the electronic tags exclusively meant to be for the UT library's books, and so it starts beeping when it is not supposed to beep. I can also easily think of some Electrical Engineering students who know how to isolate a book's chip from electromagnetic radiation and practically shot the anti-library-lifting gate while they leave the library with a book they are not officially borrowed.

I had an experience in a November Friday evening in 2007 that I can still vividly remember. I was working in the UT library on an essay on Kant's philosophy for the course Introduction to Philosophy. After studying for an hour I got bored and decided to leave the library to Theatercafe, get a beer, and simply call it a day. Seeing the fact that I had not completely finished the assignment, I had to borrow a book which was quite useful to copy and paste some of its paragraphs to hand in my assignment in an efficient and effective way. So I registered the book together with my library number and walked out of the library. Not surprisingly, the gate started beeping. To me this beep did not mean that I lacked enough EE knowledge to know how to isolate the book, instead it meant that the technology was idiot enough to beep when it should not. Probably some students who were present in the library at that time ascribed the same meaning to the technology and its beep, and probably some of them thought I had forgotten to register the book. Unfortunately, to the librarian the beep meant that I was trying to steal a book. 'Blab lablab', the librarian said to me with a smile that did not mean he was glad about what was going on but had been told to be always polite and never forget to smile. I did not understand what he said, but I knew I had to go to his desk and show

him the books I had. 'Can I see your bag?', he asked me, wearing the same meaningless smile. I showed him the book and told him that I had just borrowed the book and could even show him the receipt as well. The guy was looking at me as if he was sure that I was trying to steal the book, but he accepted my suggestion of showing him the receipt to make sure. I searched for a while to find the receipt, but I could not find it. 'And of course you have borrowed the book!', he told me. Without further negotiations he called Charlie, the UT's security center, probably asking them to arrest me or something. I could not figure out what he exactly said on the phone because he was speaking in Dutch and back then my Dutch was even worse than what it is now. What I could figure out, though, was remembering the pocket I had put the receipt in. So I showed the receipt to him, but he decided to check it also in the library's data list. Just to make sure!

There are some points about this anecdote which deserve some special attention. One point is the meanings that different people with different cultural and historical background could ascribe to the beep of an anti-library-lifting gate. These meanings are conflicting and cannot be fully explained by the physical properties of the technology. Another point is that such a technology works like a human agent standing in front of the library and controlling if everything goes right. Moreover, the meaning ascribed to the beep and the act of the anti-library-lifting gate have a social character. The beep is meaningful only as long as there are some individuals who interpret it in specific ways. The technology performs some acts only as long as there are individuals who contribute or react to its acts. If the librarian and others do not pay any attention to the beep of an anti-library-lifting gate, the sounds it produces would serve at best as a background melody and at worst as an annoying noise which distracts students' attention. The third point is the ostensible difference between such kinds of technologies and technologies like a hammer. A hammer looks like an innocent tool which is always neglected, whether when it lies inside a tool box or whether it is used to hammer a nail. In the former case, the hammer is kept in the basement, and in the latter case, people's attention is completely focused on the nail and their fingers. But an anti-library-lifting gate is never neglected. It cannot be put in the basement because it is too big to be kept in a tool box, and it is cannot be neglected in use because its beep draws attention. It looks like a naughty boy that cannot get rest and always wants to influence others. Technologies like an anti-library-lifting gate are referred to as persuasive technologies. As I said, these technologies act in a way to influence people. It seems they quite often *intend to persuade users*.

The topic of this thesis is intentionality of persuasive technologies. In this thesis I want to explore the persuasive effect of technologies like an anti-shoplifting gate and examine where their meaning

and act of persuasion originates from. So I will deal with questions such as 'Is the persuasive effect of such technologies inherent in their physical properties?', 'Can such technologies literally intend to act in a specific way?', and 'How can one formulate their apparent intentionality?' Before explicating my aims and plans in this thesis, it is better to clarify the concepts of persuasive technology and intentionality a bit more.

1- Persuasive technologies

Persuasive technology is defined as 'any interactive computing system designed to change people's attitudes or behaviors' (Fogg, 2003, p. 1). B.J. Fogg also coins the term 'captology' to refer to the study of computers as persuasive technologies (ibid., p. 5). There are some points about Fogg's definition that deserve closer attention and pave the road to the central question of this thesis. First, computers can generally be used to interact *with* or *through*. Captology focuses only on interaction of people *with* computing systems (ibid. p. 16). So, applications like using chat rooms to persuade people are not of any interest to our present topic. Second, each technology could have intended and unintended aspects. Intended aspects are those that designers had in mind before anyone starts using the technology. For instance, using a lighter to set up a bon-fire in my back yard is intended, and using it to open a beer bottle is not intended by the designers. When it comes to persuasion, users may apply some features of computers to persuade themselves or others. Captology deals only with the intended kinds of persuasion, i.e. those which have been in the mind of the designers. So captology has nothing to do with side-effects and unintended persuasions. Third, persuasive technologies are directed at users and aim at influencing their behavior and decision-making. This way, one can identify both dimensions of intentionality here. On the one hand, these technologies could provide information about and be directed at a specific event, hence the first broad dimension of intentionality; and on the other hand, they tend to influence users' behaviors and attitudes, hence the second dimension.

During the thesis, I will stick mostly to what Fogg has introduced as persuasive technologies. So I refer to persuasive technologies as those which satisfy three conditions: 1) the interaction is *with*, not *through* technologies. 2) They are specifically designed to have such a persuasive effect by designers. 3) They influence people's behavior and decision makings. Therefore, I will not confine myself to computing systems and any kind of technology satisfying those conditions is persuasive.

Before discussing the thesis' plans, a quick note on the concept of persuasion would be helpful. Persuasion stands some where between coercion and suggestion. I agree that it is a rather vague

term, but it still makes sense. For instance, anti-shoplifting gate and a GPS device are persuasive technologies. Both change users' beliefs or behavior. In both cases the interaction is with, not through technologies. And both are designed specifically to have those effects on users. I will keep referring to these technologies during the thesis.

2- Intentionality

Intentionality has long been a core concept in variegated fields of philosophy such as phenomenology, philosophy of mind, philosophy of language, and philosophical anthropology. Normally, ordinary people do not differentiate between the terms 'intentionality' and 'intention' and see intentionality as the act or fact of intending. Philosophers, however, are more meticulous about the usage of these two words and hold a rather broader notion of intentionality. Although different scholars propose different definitions of this term, one can roughly define intentionality as 'that aspect of mental states or events that consists in their being *of* or *about* things' (Siewert, 2006). For instance, my belief that it is raining now does not get stuck in my head, but it goes beyond this body and reaches something in the world. It is about the weather. Or when I hope I was not in rush to go home, the hope is in fact inside my head, but at the same time it is about the fact that I am in rush now.

There are at least two advantages about such a definition of intentionality. On the one hand, it shows that intentionality does not necessarily belong to the so-called realm of 'mental', as opposed to 'physical', but could possibly be ascribed to the latter realm as well. On the other hand, this definition also includes the ordinary people's definition of the term, namely intention to act. So intentionality and intention are not two different concepts but one includes the other (Haugeland, 1997, p.4; Searle, 1983, p. 3). 'The ability to form intentions to act in a specific way, after all, cannot exist without being directed at reality' (Verbeek, 2009, p. 69).

The general topic of this thesis is formulating intentionality of technological artifacts. More specifically, I will focus on a certain type of artifacts that are called persuasive technologies. In the next section, I will explain what is meant by persuasive technologies.

3- Thesis' research question

The question I will try to answer in this thesis is '*how can one formulate intentionality of persuasive technologies*?' I want to analyze how we can meaningfully attribute intentionality to persuasive technologies. As we will see, some scholars, like John Searle, reject the idea that technologies could

be intentional in the same manner that human beings are. On the other hand, phenomenologists have problems with the phrase "in themselves" because they start their studies from relations and believes there is no way to study one pole of a relation "in itself." Some others, like Latour, technologies have an inherent social nature, and therefore their meaning and existence depends on the social network to which they belong.

To answer this question I will start with theories of intentionality, and try to analyze whether this concept can be generalized to the technological realm or not. I should make it clear that I will not get into the whole topic of intentionality and its related subjects. Nor will I examine ideas of all philosophers whose theories have things to do with intentionality. What I will do, however, is adhering to a couple of contemporary philosophers and trying to show how their theoretical frameworks can be applied to persuasive technologies. Don Ihde, Bruno Latour, John Searle, and Peter-Paul Verbeek are philosophers that I mostly focus on in this thesis. Not surprisingly, the way these scholars would see intentionality of technologies in general, and that of persuasive technologies in particular, is not the same. Consequently, they give different and somehow incompatible answers to the question I posed above. Roughly speaking, Searle makes a distinction between what he calls individual intentionality and collective intentionality and he believes the products of the present generation of AI do not have the individual form of intentionality. Although, according to Searle, it is not impossible to design and produce technologies that do possess intentional states, since we still do not know how our intentional mental states are causally related to our brain and neuro-physiological processes, we cannot produce any piece of machinery that is intrinsically intentional. When it comes to collective intentionality, however, Searle believes technologies are necessarily intentional. In fact, Searle believes what makes a difference between a technology and an ordinary object is the collective form of intentionality that it possesses. Latour partly agrees to Searle's analysis of the social character of technologies, but he totally rejects the idea of individual action and intention. Ihde and Verbeek with their postphenomenological studies keep Latour's emphasis on the importance of networks, and at the same time, they try to open each network and analyze human-technology relations inside the network.

The reason that I chose these authors is that first, these authors, esp. Verbeek and Searle, explicitly tackle the question of intentionality of technologies, and second, at first glance their positions conflict each other. Ihde, Latour, and Verbeek criticize the universal, modernist view, and replace it with their contextualized, network-related one. Searle's project opposes on the one hand, the

phenomenological view, and on the other hand, AI theorists that claim they can design Intentional technologies.

4- Thesis outline

The first chapter will be on John Searle, his conception of intentionality, and the ways his ideas could be applied to the intentionality of artifacts in general and that of persuasive technologies in particular. I explain that Searle identifies two types of intentionality, namely, individual (or intrinsic) and collective (or derived). In a nutshell, he believes the present technologies do not have individual intentionality, but any kind of technology is necessarily intentional in its collective sense. He believes the meaning people ascribe to a technological artifacts is a derived form of intentionality which one the one hand, distinguishes them from normal objects, and on the other hand, has a social character and comes from more fundamental forms of intentionality (Searle, 1983, 1997).

The second chapter is on Bruno Latour's philosophy. In that chapter I develop his network metaphysics and show that according to him any act has a social nature and there cannot be any individual act. Thus, when it comes to intention to persuade people, that persuasion is an act of the whole network with human and nonhuman actors, and consequently, if there is any intentionality it is a property of the whole network. Besides, Latour shows technologies normally turn out to act differently from what designers have expected. Therefore, the so-called persuasive technologies, which are apparently designed to have the influence they have, could be used to serve other purposes. So one should wait and see how a technology is actually used in a network and then call it persuasive.

While Searle makes a distinction between things which are intrinsically intentional and those that are not, rendering present technologies as members of the second group, and while Latour emphasizes the social character of technologies, Don Ihde and Peter-Paul Verbeek stand close to either of them in different manners. Ihde's and Verbeek's postphenomenology sticks to the socio-cultural aspect of each experience and on the hand disclose the hermeneutic context where any technologically mediated experience takes place, and investigate different human technology relations. My central concern in the third chapter is the way postphenomenological analyses help us get a deeper understanding of persuasive technologies and the structure of those human-technology relations that obtain in the case of persuasive technologies.

In the last chapter, I try to recapitulate ideas that I put forward in the first three chapters. I will show how the concept of intentionality helps us differentiate between technologies, ordinary objects, and human beings. Then I present my final analysis of the concept of persuasive technology and the intentionality one can ascribe to such kinds of technologies. Thus, on the one hand, I modify Fogg's definition of persuasive technology that I brought about in this introduction, and on the other hand, I put together ideas of Searle, Latour, and postphenomenologists to give a formulation of the intentionality of persuasive technologies. So, in concluding chapter, I come back to the three points about anti-library-lifting gates that I explained earlier in this introduction, yet in a more profound way this time.

Chapter 1

A Searlian Formulation of Intentionality of Persuasive Technologies

Introduction

In this chapter, I will try to formulate intentionality of persuasive technologies based on John Searle's philosophy. I shall start with the theory of intentionality he develops in his book *Intentionality* (Searle, 1983). I shall present his ideas on the logical features of intentional states and the standpoint from which he approaches the subject of intentionality in general. Then I will show that according to Searle, even the most sophisticated technologies which are designed by AI techniques cannot bear any intentional state. Finally, I shall develop a formulation of the intentionality of persuasive technologies based on Searle's notion of collective intentionality that he develops in his book *The Construction of Social Reality* (Searle, 1995).

I should mention here that the first two sections are mostly theoretical discussion on Searle's conception of intentionality and its characteristics. The readers might miss the central topic of this thesis in these sections and start wondering if these arguments are necessary for our main goal to formulate intentionality of persuasive technologies. However as we proceed and in the last two sections of this chapter when I focus on the goal of the thesis, I will keep referring to the theoretical discussions of the first two sections, to give a deeper account of the intentionality of persuasive technologies.

1- Searle's notion of intentionality

John Searle defines intentionality as 'that property of many mental states and events by which they are directed at or about objects and states of affairs in the world' (Searle, 1983, p.1). Desires, beliefs, intentions, hopes, etc. are instances of intentional mental states. If I desire to go climbing tonight, my desire is *about* going climbing tonight; if I believe my housemate is lazy, then my belief is *about* my housemate's being lazy; etc.

To understand Searle's view on intentionality, it is better to see where his analyses stand. I will first clarify the logical and ontological standpoints of his ideas, and then I shall move into details of his account of intentionality by explaining some central concepts in his work.

1-1- Searle's logical, but not linguistic approach

It is important to see Searle's approach to intentionality as a logical, but not a linguistic one. Searle claims small infants and animals also possess intentional states, but they do not have language. Crying babies need milk; they perform the intentional act of expressing their desire for milk with their cry, but still we do not attribute language to infants in any ordinary sense. So having linguistic abilities is not a necessary condition for an entity to have intentionality (Searle, 1983, p. 5). On the contrary, Searle believes it is the intentionality of language which has to be explained by the intentionality of mind. Language is not something that renders our acts and perceptions intentional by its syntactic or semantic tools, rather it derives its intentional character from more primitive forms of intentionality, i.e., those of intentional mental states. That is why, Searle believes, the representative role of language has logical priority over its communicative role. One cannot intend to communicate with the noises coming out of one's mouth, without the intention of expressing one's beliefs, desires, etc. (ibid., pp. 165-166). In his view, 'the fundamental linguistic notions such as reference, meaning, statement, etc., can be analyzed in terms of even more fundamental psychological notions such as belief, intention, and desire' (Searle, 1981, p. 720).

1-2- 'Biological naturalism' as Searle's answer to the traditional mind-body problem

Metaphysically speaking, according to Searle, intentionality belongs to 'a certain set of biological capacities of the mind' like hunger and thirst (Searle, 2004, pp. 163-4). This way, our mental ability to have intentional states is nothing mysterious or spiritual, but is a product of our nervous system. Searle calls his position *biological naturalism* which treats the existence of intentional states as an intrinsic biological ability of some organism shaped through the process of evolution like digestion and blood circulation (Searle, 1984, pp. 5-7). He posits this theory as the satisfactory answer to the traditional "mind-body" problem[1], rejecting both traditional answers given to this problem, namely

---

[1] Mind-Body problem was introduced as a philosophical challenge mainly through works of Rene Descartes. The problem in simple terms is based on two premises. First, apparently mental states (events, attitudes, etc.) are categorically different from the physical ones. It seems that pain and belief are not made of the same kind of stuff as tables and screwdrivers. Secondly, human beings experience mutual causal interaction between their mind and their body: On the one hand, if I intend to kick a ball, then my leg moves according to my intention and kicks the ball (mental to physical direction of causation); and on the other hand, if someone slaps me in the face, I feel pain (physical to mental direction of causation). The so-called mind-body problem comes out of these two rather obvious premises. If mental and physical are two different realms, then how can they interact with and leave any influence on each other?

dualism[2] and materialism[3], and shows they are both right in one point and wrong in another one. In his article *Why I am not a property dualist* (Searle, 2002), Searle argues that materialists are right that the world is only made of physical particles and phenomena, but they are wrong in their claim that the realm of the mental does not exist. Dualists, on the contrary, are right that ontologically irreducible mental states and phenomena exist, but thesys are wrong in their claim that the mental belongs to a substantially different realm from the physical (ibid. pp. 62-63). So intentionality, in Searle's biological naturalist view, is 'as much part of our biological natural history as digestion, mitosis, meiosis, or enzyme secretion' (Searle, 1992, p.1). To make his view clearer, Searle appeals to the difference between ontological and epistemic notions of subjectivity and objectivity. In his *The Construction of Social Reality* (Searle, 1995, p. 8), he writes

Epistemically speaking, "objective" and "subjective" are primarily predicates of judgments. We often speak of judgments as being "subjective" when we mean that their truth and falsity cannot be settled "objectively,"… As an example of such a [subjective] judgment might be, "Rembrandt is a better artist than Rubens." … For … objective judgments, the facts in the world that make them true or false are independent of anybody's attitudes or feelings about them…

In addition to *epistemic* sense of the objective-subjective distinction, there is also a related *ontological* sense. In the ontological sense, "objective" and "subjective" are predicates of entities and types of entities, and they ascribe modes of existence. In the ontological sense, pains are subjective entities, because their modes of existence depends on being felt by subjects. But mountains … are ontologically objective because their mode of existence is independent of any perceiver or any mental state.

When it comes to intentionality and consciousness, like the dualists, Searle asserts that these mental phenomena are all ontologically subjective and irreducible to physical facts; but epistemically speaking, like the materialists, he believes the world is causally closed and we can have an objective account of intentionality.

At first glance, there seems to be a contradiction in Searle's claims. He believes although intentionality is subjective and ontologically irreducible, the world is only made of physical stuff and intentionality is realized in the brain. How can intentionality be ontologically irreducible to the

---

[2] There are many theories that bear the title of dualism. Historically, two most famous dualist theories are substance dualism and property dualism. The former claims mind and body are composed of different substances; the latter claims they are two different features or properties of one and the same substance. The problem that any dualist theorist faces is explaining the causal interaction of mind and body.

[3] Materialism, like dualism, is a title given to different theories. Roughly, materialism is a doctrine claiming that the world is made of only physical objects and facts and the so-called realm of mental doesn't exist.

brain states and at the same time be caused by our brain systems? Searle solves this problem by appealing to an analogy. Think about a glass of water. Although water is nothing but a collection of numerous H2O molecules, liquidity, as one of water's features, cannot be ascribed to single molecules; it is a property of the glass of water as a whole: a glass of water is liquid, but it is meaningless to call an H2O molecule liquid. On the other hand, liquidity can be causally reduced to the behavior of molecules, and that is what physicists show. Causally speaking, the same applies to the relation between intentionality and our brain. Searle believes intentionality is a higher level feature of the brain system, caused by the lower level features of the brain, in the same sense that liquidity is a higher level feature of water, but can be explained by the lower level features. Note that the analogy between the relation of water and liquidity and the relation of the brain and intentionality is not complete. The difference between the case of liquidity and intentionality is that, in the former case, the causal reduction leads also to ontological reduction, while in the case of intentionality it remains subjective and irreducible (Searle & Putnam, 2001, p. 5).

So far, I have introduced the logical and ontological standpoints of Searle's notion of intentionality. I showed first that his analysis is not a linguistic one. He is not concerned about how we ascribe intentionality to others, but about the metaphysics of intentionality. Secondly, the answer he suggests to the mind-body problem is biological naturalism. In this view our brain is nothing but a physical machine, and intentionality is a neuro-physiological product of our brain belonging to our natural biological life history. Although intentional states function causally with our body and there could be an objective science of them, the existence of intentional states is not reducible to the brain and remains ontologically subjective (Searle, 2002). Later on in this chapter, I will argue how these ideas of Searle's imply that the present technologies do not bear the same kind of intentionality as our mental states do. In the next section I briefly introduce a few key concepts that reveal the structure of intentionality in Searle's works. Then I will show how Searle's ideas could help us formulate an account of intentionality of persuasive technologies.

2- Logical features of our intentional states

In his book *Intentionality*, Searle establishes a conceptual apparatus to elaborate his theory of intentionality. This apparatus mainly stands on a few key concepts that I will introduce in this section.

 2-1- Direction of fit, direction of causation, intentional object, intentional content, conditions of satisfaction, and psychological mode

The *content* of an intentional state is what the intentional state says about the *intentional object* in a given *psychological mode*. Beliefs, hopes, perceptions, intentions, memories, etc. are different psychological modes. But since these psychological modes are intentional states of mind, they are about or directed at something else. What the psychological mode is about is intentional object, and what is said about the intentional object is the intentional content. *Conditions of satisfaction* of an intentional state are essentially metaphysical. They refer to the existence of circumstances that if occur, fulfill the intentional state in question. For instance, in my belief that snow is white, the psychological mode is belief, 'snow is white' is the content of my intentional state, and the object of that belief is snow. The belief's condition of satisfaction is snow's being white. So the content of an intentional state is always propositional, its object is something about which that proposition is uttered, and its conditions of satisfaction are the circumstances that satisfy the intentional state (Searle, 1983).

If intentionality is defined as aboutness or being directed at something, then we can show it as a relationships between an X and a Y, in which X is directed at or is about Y.[4] But aboutness is one thing, matching is another. The sentence 'my laptop is plugged in and its battery is charging' is about my laptop's being plugged in and its battery; but unfortunately it does not fit what is actually happening, and the sign in the right corner of the monitor tells me the battery is gradually discharging. Or as another example, my intention to fix the laptop is about my laptop again, but we should wait and see if I actually do something and then say whether or not the intention matched the worldly act. So if X is about Y, it does not mean X also fits Y. Searle defines the concept of *direction of fit* to imply 'the intuitive responsibility for fitting'. Direction of fit shows the asymmetrical relationship that either of X and Y is responsible to match the other. In the case of my belief, again, it is responsibility of my belief to fit what is happening in the world. If I think the laptop is charging but in practice the battery keeps discharging, then it is my belief which is at fault, but not my laptop's battery. So in this case the direction of fit is mind-to-world. But when it comes to my intention to fix the laptop, it is responsibility of my action in the world to fit the intention. If I do not

---

[4] Of course, we should be careful about using the word "relation" here. Searle believes, for example, belief is not a relation between the believer and a proposition as its content, because beliefs have propositional content and a proposition cannot be an object of a relation. Linguistically, relations are between two or more names, not propositions; and metaphysically relations are between two or more objects, not facts. The content of an intentional state should not be confused with its object. Intentionality is not a relation between a believer and a proposition, rather it is a relation between a believer and things represented by that belief's content, namely, the intentional objects. For a more detailed explanation refer to Searle's *Intentionality* (Searle, 1983, pp. 18-19).

fix my laptop, then my worldly action is at fault, but not my intention. So in this case the direction of fit is world-to-mind.[5] (Searle 1983, pp. 7-9)

Direction of causation, according to Searle, shows the asymmetrical relationship that either of X and Y causes the other. Direction of causation is always the opposite of direction of fit, 'for fit is achieved only if the fit is caused by the other term of the relation of fitting' (Seale, 1983, p. 49). So in the case of my intention to fix the laptop, my mental state is supposed to cause the worldly action, so the direction of causation is mind-to-world.

Note that direction of fit and direction of causation are linked to the psychological mode involved. If the psychological mode is, for example, belief or perception, the direction of causation is world-to-mind, and the direction of fit is mind-to-world. If the psychological mode is intention, the direction of causation is world-to-mind, and the direction of fit is mind-to-world. Besides direction of causation and direction of fit which depend on the psychological mode, the role of conditions of satisfaction is also defined by the psychological mode involved. If the psychological mode is belief, conditions of satisfaction are meant to show whether the belief is true or false. If the psychological mode is intention, conditions of satisfaction are meant to show whether the intention has satisfactorily caused the action[6], etc.

2-2- Network of intentional states and the Background of non-intentional capacities

So far I have presented Searle's ideas that we have some intentional states like beliefs and desires and these intentional states have properties like direction of fit, direction of causation, or conditions of satisfaction. But let us go one step back and ask how can something be directed at or be about another thing after all? Is it not a bit strange that an entity's characteristics go beyond itself and reach some other entity? Searle in his book *Mind* poses these questions, next to some others, as what he calls the problems of intentionality. Granted that our mental states are caused by our brain, as I clarified in discussions on Searle's biological naturalism earlier, then how is the content of intentional states determined, and how does the whole system of intentionality work? (Searle, 2004, pp. 160-161) The question can be posed also from another perspective. If intentionality is aboutness and directedness, then how can we differentiate between aboutness or directedness of some mental

---

[5] Note that not all mental states have a direction of fit. Sometimes, for instance, one feels happy or sorry, but that happiness or sorrow does not have any direction of fit. (Searle 1983, pp. 8-9)

[6] I will separately analyze Searle's views on intentions as one kind of intentionality later in this chapter.

states which makes them intentional and the ostensible aboutness or directedness of some other entities which we do not regard them as intentional? As Charles Siewert (Siewert 2008) put it,

But what kind of 'aboutness' or 'of-ness' or 'directedness' is this, and to what sorts of things does it apply? How do the relevant 'intentionality-marking' senses of these words ('about,' 'of,' 'directed') differ from: the sense in which the cat is wandering 'about' the room; the sense in which someone is a person 'of' high integrity; the sense in which the river's course is 'directed' towards the fields?

In Searle's view, a mental state cannot be intentional without being a part of a Network of intentionality. A belief's conditions of satisfaction cannot be determined on its own, but in connection with other intentional states. For instance, if I intend to take an umbrella with me when I am walking out of the building, then I also believe that it is probably going to be a rainy day, and that rain is something that can make me wet, and I desire not to get soaked in the rain, and I believe that an umbrella is something that can prevent me from getting soaked in rain, and so on. So although the first belief is put in one thought, which is the intention to take the umbrella, its conditions of satisfaction are interwoven with other parts of the Network of intentionality. If I take the umbrella and all of a sudden throw it at the first car I see in the street, my first intention to get the umbrella to prevent myself from getting soaked is not satisfied. Although taking an umbrella not to get soaked and taking an umbrella to throw at a car share the first intentional state of taking the umbrella, their conditions of satisfaction are different from each other, and these conditions of satisfaction are partly determined by the rest of the Network of intentionality. So an intentional state cannot be seen separately, but as a part of a Network of intentionality. (Searle, 1983, pp. 141-142)

There are definitely many intentional states that contribute to the conditions of satisfaction of a given intentional state. If we start the task of spelling out each of the intentional states in the Network to determine the conditions of satisfaction of a given intentional state, 'soon we find ourselves formulating a set of propositions which would look fishy if we added them to our list of beliefs in the Network; "fishy" because they are in a sense too fundamental to qualify as *beliefs*, even as unconscious beliefs' (Searle, 1983, p. 142). Searle calls this bedrock of mental capacities, which is lying at the bottom of the Network, the Background. In our previous umbrella example, the facts that there exists an umbrella and that my house has a door and that I should first open the door before going out, etc., can be seen as parts of the Background. So, the Background is defined as 'a set of all nonrepresentational mental capacities that enable all representing to take place' (ibid., p. 143). According to Searle, the Background is more of *know how* than *know that*. It is not representational,

non-intentional, but any representation, any form of intentionality, is possible only thanks to the existence of the Background.

Now we can answer the questions I posed at the beginning of this section. The difference between the cases of a river's being directed toward the field and my visual perception's being directed toward an object is that the latter, but not the former, belongs to a Network of representation that works against the Background of non-representational capacities. When I perceive a black umbrella in front of me, I also perceive its shape, its function, the desk it is standing on, and beside all these, I take it for granted that the umbrella does exist, and that the color of the umbrella does not affect its function, and so on. Any single intentional state works as a part of the whole Network of intentionality. But in order for this Network to be intentional, it should lie on the bedrock of the Background, which is not intentional itself. So, it is the Background, as 'the conditions of the possibility of the functioning of the mind', that enables the whole system of intentionality to work (Searle, 1983, p. 157).

2-3- Prior intention and intention in action

Before going further, it is convenient to focus on Searle's ideas on the intentionality involved in intentions to act, both for the sake of clarification, and for the sake of analysis of intentionality of persuasive technologies that I will provide later in this chapter.

Searle discerns with two different kinds of intention; i.e., prior intention and intention in action. Prior intention comes before the action, but intention in action comes along with the action. For instance, in the umbrella case, my early intention to protect myself from the rain with my umbrella makes the prior intention, and my act of doing so when I grab the umbrella makes the intention in action. Intention in action and prior intention both have the same direction of fit and direction of causation, mind-to-world direction of causation and world-to-mind direction of fit.

The conditions of satisfaction of prior intention and intention in action are different. The intention in action is satisfied when the action that the content of intentional state displays occurs in the world as a causal result of that intention. For example, imagine a case in which some guy decides to break up with his girlfriend through sending an email. After typing the email and while sending it, he starts fearing the consequences of his act, and out of such a fear, his fingers start shaking and *unintentionally* press the click button on the mouse and consequently the send button on the screen. In such a case, the act of sending that email is what he actually had intended, but it was not his

intention which led to the act of sending, rather the unintentional movements of his fingers, so the intention is not satisfied. But the condition of satisfaction of prior intention is that it cause the intention in action which itself should cause the action.[7]

3- Can persuasive technologies bear the same kind of intentionality as humans' intentional states?

Up to this point I have elaborated Searle's notion of intentionality, its logical structure, its ontological status, and the way it functions, mostly based on ideas in his book *Intentionality*. The rest of this chapter will be dedicated to formulating and analyzing intentionality of technologies in general and that of persuasive technologies in particular. I will first argue that based on what I have presented so far, (at least the present generation of) technologies cannot be called intentional, due to the fact that they cannot totally fit the structure of intentionality I have sketched.

In the next section, I will deal with the question that if technologies are not intentional in the same way that our beliefs are intentional, then how can one explain their ostensible aboutness? How can one explain the fact that an internet message could be directed at another website or that the beep of an anti-shoplifting gate intends to persuade the shopkeeper of a case of shoplifting? To answer such questions, I will refer to another work of Searle's, *The Construction of Social Reality*. In that book, as we will see, Searle formulates two different kinds of intentionality, individual and collective. All our discussions up to now on the intentionality of mental states fall into the category of individual intentionality, which is an intrinsic form of intentionality. However, there is another form of intentionality, collective or we-intentionality, which can explain the intentionality of social facts like computers, anti-shoplifting gates, or even the intentionality of money. Any case of collective intentionality, as we will see, derives its intentionality from the intentionality of the social agents. After elaborating his conception of collective intentionality, I apply his ideas to the case of persuasive technologies. We will see, then, that the intentionality of technologies could be seen as a derived form of intentionality, which comes from human intentionality, but is a property of the whole context that comprises humans and non-humans. Finally, I give an account of the intentionality lying in the act of persuasive technologies as distinguished from the intentionality lying in the social meaning of persuasive technologies.

---

[7] There are some technical details on the way this causation should be seen, but since they are not directly relevant to our present topic I prefer not to confuse the readers. One can refer to the third chapter of Searle's *Intentionality* in which he elaborates the conditions of satisfaction of intention in action and prior intention in more detail.

3-1- Intentional features of persuasive technologies in detection and action

In the previous section I presented Searle's terminology to analyze intentionality of mental states. In this section I want to go through these features and explore how the study of intentionality of persuasive technologies can benefit from this diction. I will mostly refer to the examples of anti-shoplifting gates and an internet message popping up on the computer's screen, trying to persuade users to click on a specific link.

One can classify the function of persuasive technologies into two phases, *detection* and *action*. The *detection* phase is when the technology recognizes the object of persuasion, through its sensors, cookies, etc. For example, for an anti-shoplifting gate to work, it should first detect that there is a suspicious case of robbery. Before starting to beep, its sensors detect the RFID chips inside the goods. It does not beep all the time, because not at every moment its sensors send a signal to the microprocessors. I call this function of persuasive technologies "detection." In the case of the internet message, also, users do not face the same message all the time, but only when they click on specific links where the computing system recognizes that the user has opened those specific websites. The *action* phase of persuasive technologies is when the technology actually starts persuading users, for instance, when the gate starts beeping, or when the internet message pops up on the computer's monitor. Some analogies could help to clarify the action-detection distinction. Those who are more familiar with control engineering recognize that the functional distinction between detection and action is not actually confined to persuasive technologies but applies to pretty much any engineering product that gets a set of inputs from its surrounding and transforms them into a set of outputs. Moreover, this functional distinction is also in line with rather the same distinction held in two other fields, namely, neuro-physiology and philosophy. Roughly, neuro-physiologists make a distinction between sensory neurons and motor neurons. Sensory neurons convey signals to our brains from the five sensory organs, and motor neurons carry signals from the brain to the muscles for action.[8] Philosophers also make a distinction between intentionality of action and intentionality of perception. In the introduction, I mentioned the difference between the praxical and the hermeneutic definition of intentionality (Verbeek, 2009, p. 69). Searle also makes a distinction between the intentionality of perception and the intentionality of action. Based on his

---

[8] Note that what I presented as the way our neuron system functions is a very simplified picture meant only for the sake of analogy and clarification of action/detection distinction. So the accuracy of this account is contested yet irrelevant to the present topic.

conceptual framework, he argues that perception has a world-to-mind direction of causation, and mind-to-world direction of fit; however, action has a mind-to-world direction of causation and world-to-mind direction of fit (Searle, 1983).

Keeping the distinction between detection and action, let us now go back to the intentionality of persuasive technologies. For the sake of the present discussion, I take it for granted that persuasive technologies bear some kinds of intentionality. I will soon question whether it is possible to ascribe intentional states with the features that I introduced in the previous sections to persuasive technologies or not. In the phase of detection, as in the case of human perception, the direction of causation seems to be world-to-technology and the direction of fit is technology-to-world: it is the worldly circumstances that the sensors of an anti-shoplifting gate detect, and it is up to the technology to detect it correctly. If the sensors detect a case of robbery when only a fly crosses the gate, it is the fault of the technology not the world, but in any case it is the world that stimulates the sensors. In the action phase also, as in the case of human intention to act in a particular way, it seems the direction of causation is technology-to-world, and the direction of fit is world-to-technology. It is the central processor that causes the beep, and it is up to the beep to fit what the central processor orders.

But what about the Network and the Background? Can we find any Network of intentionality or a Background of non-representational capacities in an anti-shoplifting gate? Clearly not! It sounds weird to think that such a technology has a Network of intentional states where it *intends* to persuade the shopkeepers that there is a suspicious person leaving the store or *believes* that some people in the world are shoplifters and some people are not or *believes* that there is really a world outside its physical boundaries and its sensors are not just sensors-in-a-vat. There simply is not any Network of intentionality, and since, as I explained earlier, an intentional state functions necessarily as a part of a Network of intentionality, one cannot identify their action or detection phase as intentional states. The point is that an anti-shoplifting gate is actually just a piece of machinery which obeys the laws of physics like any other physical object, and it is totally possible to predict and explain the behavior of such a technology only by natural laws. So the causality involved, whether in the detection phase or in the action phase, does not include any intentional state. Even the direction of causation in the phase of action of the gate can be seen as world-to-technology as well as technology-to-world because the beep of the gate is nothing but a causal response to the worldly circumstances in which the sensors of the gate detect the related RFID chips. More precisely, the distinction between the world and technology cannot be sharply and meaningfully

made as in the case of the world and mind. There is no difference between properties of an anti-shoplifting gate and any other physical object in the world. They are all made of the same stuff and all behave according to the same causal laws. These observations show that, unlike our mind, an anti-shoplifting gate and such technologies do not possess any intentional state. They simply are not intentional, at least in the same sense that our mental states are, whether in the detection or action phase.

Before jumping to the conclusion that this lack of intentional states applies to all kinds of technologies, let us examine more sophisticated forms of technologies to which one can ascribe some forms of agency and autonomy.

3-2- Can AI products bear any form of intentionality?

In their article *On the morality of artificial agents*, Luciano Floridi and J. W. Sanders (Floridi & Sanders, 2004) argue that one can adopt a given Level of Abstraction at which some products of Artificial Intelligence could be seen as autonomous agents. A Level of Abstraction 'consists of a collection of observables of given types' (ibid., p. 6), which is determined 'by the way in which one chooses to describe, analyze and discuss a system and its context' (ibid., p.1). For example, one can describe movements of a robot by attributing humanoid characteristics to it like sad, determined, adamant, etc. But it is also possible to describe its movements in terms of the electricity currents in its wires and the mechanism through which the power is transmitted from the electric motors to the gears and levels. Although both stories describe the behavior of the same robot but they belong to different Levels of Abstraction. This way, Floridi and Sanders believe that by adopting the right LoA, one can ascribe agency to some AI products. At that right LoA, agency is defined as a logical conjunction of interactivity, autonomy, and adaptability (Florid & Sanders, 2004, p. 7). Showing that some virtual products of Cyberspace can also be interactive, autonomous, and adaptable, Floridi and Sanders conclude that the class of agents can be expanded to include also some products of AI.

Although Floridi and Sanders explicitly state that having intentional states is not a condition of agenthood (Floridi & Sanders, 2004, p. 13), the question relevant to our discussion is that if some technologies are getting so sophisticated that one can ascribe agency to them, is it not possible to build robots or super-computers based on AI techniques with intentional states? The answer Searle gives to that question is negative. In his famous Chinese Room argument (Searle, 1980), Searle shows having intentional states and being intelligent are not properties that any technology based on AI techniques could ever exhibit. This way, even the most sophisticated AI products do not and

cannot have intentional states. There are two points about Searle's position that I should explicate a bit further.

First, as I mentioned earlier in this chapter, Searle's position is not linguistic or epistemological, but metaphysical. What he claims is not that there cannot be any robot that looks like humans to the extent that we cannot tell the robot and a human being apart. What he argues is that the metaphysics of having intentional states is so that we cannot ascribe intentionality to any technology that works based on AI techniques. One may ask 'is it not possible that a robot, built by AI techniques, looks so similar to human beings that one cannot distinguish between that machine and a human?' Searle's answer to such question would be 'yes it is possible', but that is not a type of question he is interested in. Such a question is an epistemological question concerning justification of our beliefs of ascribing intentional states to other entities and human beings. He agrees that, for instance, there could be a generation of robots that look so humanoid that we cannot tell them and human beings apart, and consequently describe their behavior with the vocabulary of intentionality. Nonetheless, Searle holds a metaphysical position. What Searle wants to show is that following some syntactic rules, as what AI products do, does not generate intelligence or intentionality. The metaphysics of intentionality and intelligence is not following a set of syntactic rules.

Secondly, Searle's claim is not that we can never build intentional technologies. His criticisms are directed at AI products and what is called Strong AI theory. Searle refers to Strong AI as a theory claiming that 'computer is not merely a tool in the study of the mind; rather, the appropriately programmed computer really is a mind in the sense that computers given the right programs can be literally said to *understand* and have other cognitive states' (Searle, 1980, p. 183, italic in the original text). Taking that definition of Strong AI, Searle shows any AI product cannot have intentionality. So he basically criticizes strong AI claims regarding contemporary technologies, but nevertheless he agrees that it is possible to make machines with intentional states in the future. In fact, as I showed earlier in the discussion of Searle's biological naturalism, according to him, our brain is nothing but a machine with the ability to produce intentional states. But in order, for us, to make an intentional machine, we need not to only simulate our brain; rather, we ought to duplicate it with all its causal relations; the present AI products do not possess such causal relations.

4- A Searlian account of intentionality of persuasive technologies

So far, I have shown based on Searle's ideas that persuasive technologies cannot have intentional states, due to the fact that each intentional state can work only as a part of a Network of

intentionality against the Background of non-intentional capacities which persuasive technologies lack. I argued, then, that although by choosing the right Level of Abstraction one can ascribe agency and autonomy to some technologies, according to Searle, AI products cannot literally have any cognitive state, and therefore one cannot call them intentional in the same way that our beliefs, desires, intention, etc. are. But after all, the beep of an anti-shoplifting gate is *meant* to persuade the shopkeeper of a case of robbery; the beep is not totally meaningless, but is *about* something. A GPS device does not display a random collection of signs and curves, but is *about* the users' earthly location or that of the place they want to have more information about. So how can a Searlian account of intentionality include the apparent intentionality of such technologies?

If we consider persuasive technologies more carefully, we can indentify two intentional features of them. At one level, the meaning that we ascribe to the technology is intentional. The beep of the anti-shoplifting gate has a meaning; it represents something and any representation bears a kind of intentionality. At yet another level, we can open each instance of persuasion and analyze the way in which different social agents and probably the technology itself have lead to such a persuasion at a given spatio-temporal point. Thus the first intentional feature of persuasive technologies is in their meaning, and the second one is in their contribution to the act of persuasion. The important point is that an anti-shoplifting device can contribute to an act of persuasion only as long as its beep carries some meaning. Thus, the first intentional feature of (persuasive) technologies is a necessary condition for their second feature. Searle himself does not discern with these two intentional features of technologies, but the way I formulate intentionality of persuasive technologies can be called Searlian in the sense that I use the conceptual apparatuses that he develops in his book *The Construction of Social Reality* (Searle, 1995).

The rest of this section falls into two parts. In the first part I present a Searlian account of the meaning assigned to each persuasive technology, and in the second part, I formulate the intentional features of their act of persuasion.

4-1- Intentionality in the meaning ascribed to persuasive technologies

In his book *The Construction of Social Reality* (Searle, 1995), Searle differentiates between two kinds of intentionality, individual and collective. In his view, intentionality of technologies falls into the realm of collective intentionality, but intentionality of our intentional states is individual. All our discussions up to now were about the individual kind of intentionality. The difference between collective and individual intentionality is that individual intentionality (or I-intentionality) is an

intrinsic form of intentionality, but collective intentionality (or We-intentionality) is a *derived* form of intentionality; i.e., any instance of collective intentionality derives its intentional character from other basic and intrinsic forms of intentionality.

Searle starts his analysis by differentiating between *brute facts* and *social facts.* Brute facts display the intrinsic features of reality, and social facts display the observer-relative features. Brute facts are those facts that their existence does not require any human institution, like a piece of stone at the top of mount Everest, a tree in Amazon rainforest, or the planet Mars. Social facts, on the other hand, are those that their existence depends on human institutions, like money, government, screwdriver, bank accounts, etc. (Searle, 1995, p. 2). So brute facts are ontologically objective, and social facts are ontologically subjective. Searle's project in his book *The Construction of Social Reality* is to show how there can be social facts as distinguished from brute facts. He is trying to show how those levels of reality and our social lives, like governments and bank accounts, that cannot be explained by empirical sciences are constructed. Technologies are among these facts in that their social meaning cannot be reduced to their physical properties. From an engineering point of view, an anti-shoplifting gate, is nothing but a bunch of wires, transistors, and sensors; however, we ascribe a meaning to its beep, we say its sensors are directed at some chips, we do not see it like a piece of stone at the top of mount Everest, and all these make it more than just a bunch of wires and transistors. A GPS device is not just a bunch of curves and signs, but it represents spatial, earthly positions. The representation of a GPS device and the meaning of the beep of the anti-shoplifting gate display their intentional character, and that is something that Searle wants to explain in his book. So it is not that Searle denies the apparent intentional character of technologies around us. What he denies, however, is the claim that the intentionality of technologies is an intrinsic form of intentionality such as our beliefs.

According to Searle, an anti-shoplifting gate is anti-shoplifting gate only because people use it as such. Although it is an epistemically objective feature of this object that it is an anti-shoplifting gate, that feature exists only relative to observers and users, and thus calling that device an anti-shoplifting gate is ontologically subjective; the meaning of the technology is observer-relative. 'For any observer-relative feature F, *seeming to be* F is logically prior to *being* F, because seeming to be F is a necessary condition of being F' (Searle, 1995, p. 13, italic in the original text). Searle refers to this feature of social facts as self-referentiality of social facts that in order for a social concept X (like anti-shoplifting gate) to satisfy the definition of X, it must be believed to be, or used as, or regarded as, satisfying the definition. Therefore, the way people treat with the phenomenon of a social fact is

partly constitutive of that phenomenon (Seale, 1985, pp. 31-32). It is intrinsic for an anti-shoplifting gate to beep when its sensors detect the RFID chip, but the meaning of that beep is socially constructed.

While dealing with technologies, we do not normally experience a collection of raw materials in a special order, but we experience the device as a whole, something to which we assign a certain meaning. The intentional character of technologies comes from this very assignment of meaning, a meaning which is observer relative and is assigned to the technology by users. Such intentional characters of technologies, according to Searle, do not add any intrinsic facts to causal facts of nature; they only derive their existence from social agents with intrinsic forms of intentionality (Searle, 1985, p. 14).[9]

One of the important points about collective intentionality is that it is not just summation of individual intentionalities, rather it belongs to the whole social system in which it works. Searle believes although collective intentionality is derived from the individual form of intentionality, it cannot be reduced to them (Searle, 1995 & Searle, 1990). The formula that Searle gives for the representational intentionality of an anti-shoplifting gate or any other kind of technology is 'X is Y in C,' in which X is the physical appearance of the technology (the acoustic wave of the beep), Y is the meaning assigned to it (the possible case of shoplifting), and C is the context (Searle, 1995). The beep can perfectly be assigned any other meaning to in other contexts; and the very fact that the meaning is not intrinsic to the beep's physical properties shows it is context dependent. Thus, the intentionality involved in the meaning assigned to (persuasive) technologies belongs to the context in which it is being used.

I end this section with a quotation from Searle (Searle, 1995, p. 41):

Our aim is to assimilate social reality to our basic ontology of physics, chemistry, and biology. … The central span on the bridge from physics to society is collective intentionality, and the decisive movement on that bridge in the creation of social reality is the collective intentional imposition of functions on entities that cannot perform those functions without that imposition.

4-2- Intentionality of persuasive technologies in their act of persuasion

---

[9] For more discussion on Searle's account of the functional features of technologies refer to Peter Kroes (Kroes, 2003).

Earlier in this chapter, I mentioned two levels at which one can analyze the intentionality of persuasive technologies; the meaning we ascribe to them, and the act of persuasion. In the previous section, I elaborated how collective intentionality of the social meaning of technologies in a given context works. In this section, I want to examine how Searle's account of intentionality let us go a bit into details of the context and uncover the individual intentionalities that contribute to the act of persuasion.

The act of a (persuasive) technology is a collective act, an act done in a social context comprising humans and technologies, and since it is a collective act, it takes a 'we-intention', a collective form of intentionality, as different from individuals' prior intention or intention in action. But according to Searle (Searle, 1990), any kind of collective intentionality (*or* we-intentionality) cannot exist without existence of individual intentionality (*or* I-intentionality). Therefore, a collective act can be done only as long as there are some individuals contributing to that act. For instance, if my housemate and I *intend* to make dinner as a collective act, this act bears a kind of we-intentionality, but in fact either of us also bears some individual form of intentionality; i.e., I *intend* to cut some vegetables and my housemate *intends* to mix them together. So the collective act of making dinner cannot take place unless it leads to a bunch of individual acts. And therefore, it is in the conditions of satisfaction of the collective intentionality that it causes individual intentionalities that contribute to that collective action (Searle, 1990). If in the collective act of making dinner, I do not cut the vegetables, or if I do cut the vegetables but only to give them to my pet in the backyard, the collective intentionality is not satisfied, as it has not resulted in individual intentionalities contributing to the collective act.

It is noteworthy that although for collective intentionality to lead to a collective act, it should cause some individual act with individual form of intentionality, the collective act cannot be seen as a sum total of a bunch of individual acts. In other words, though we-intentionality is logically dependent on I-intentionality, we-intentionality cannot be reduced to I-intentionality (Searle, 1990). So the direction of causation in any collective action is from the collective intentionality to individual intentionality, but metaphysically, the existence of individual intentionality is prior to the existence of collective intentionality (ibid.). In the case of making dinner together, the act of making dinner can happen only if there exist some agents with individual form of intentionality to carry out such an act, so the existence of that collective intentionality depends on existence of individual intentionalities. But at the same time, it is the collective intention which causes some individual intentions to function; i.e., *I* cut vegetables as a part of *our* making dinner.

In case of persuasive technologies, the collective act is the very persuasion. The social context of persuasion comprises designers, users, and the technology itself. This persuasion works mainly through intentionality of users plus another form of intentionality which is in the meaning of the technology. It is clear how the intentionality of users work in each instance of persuasion. In the case of anti-shoplifting gate, it is shopkeepers who after hearing the beep of the device prevent possible burglars from walking out of their store. In the case of a GPS device, it is the user who after reading the signs on the device's LCD makes a choice to take this or that direction; etc.

One may put the following argument to show that intention of designer's also plays a causal role in the act of persuasion: As I explained in the introduction of this thesis, the persuasion of persuasive technologies should be intended by its designers; otherwise the technology could not count as persuasive. Thus, by definition, in any instance of persuasion of persuasive technologies, there is a logical element of designers' intention. So, one may conclude that the act of designers is causally linked to the whole process of persuasion. This argument, however, is fallacious. Actually, although persuasive technologies are meant to have persuasive effects on users, it is odd to think designers have thought about every single act of persuasion. The point is that designers have a general idea about the way artifacts are supposed to work, but their intention is not focused at any instance of persuasion, and they remain physically and causally absent from any given instance of persuasion.

To recap, the collective action occurring in the case of anti-shoplifting gate is catching shoplifters. This collective action has a collective intentionality that works through the act of individual intentionalities. These all happens in a social context in which the beep of anti-shoplifting gate is meant to persuade shopkeepers of a possible case of robbery; a context which temporally starts from the introduction of the technology and is significant only as long as there are individuals who give some extra, social meaning to the mere physical characteristics of a given technology.

Note that the role that (persuasive) technologies play in social contexts hinges on, yet is different from, the meaning assigned to them. It is one thing, for the beep of an anti-shoplifting gate to alarm a case of burglary, something different for this device to act in the process of catching a burglar. In order for a persuasive technology to have a persuasive role, it should be first assigned some meaning apart from its physical properties. Therefore, if individuals contribute to a collective act (of persuasion) by the intrinsic form of intentionality they have, (persuasive) technologies do so by the meaning assigned to them. Then again, both the meaning (persuasive) technologies bear and their act have a collective form of intentionality. In the previous section, I explained the intentional

feature of persuasive technologies in the meaning they bear, and in this section I elaborated the intentional features of their act of persuasion.

Before concluding this chapter, it is important to note, once again, the difference between cases in which an artifact is seen individually and cases in which it is seen as a part of a social context. Earlier in this chapter, when I was analyzing the individual intentionality of persuasive technologies, I said that it is absolutely possible to predict and explain the behavior of an anti-shoplifting gate or any other kind of technology only by laws of physics. Now we realize that claim is valid only when we approach a device separately. The present generation of technologies, when seen separately, are not different from other physical objects, do not bear any individual form of intentionality, and to explain their behavior we need not know more than physical laws. However, if we see an artifact as a part of the social context to which it belongs, we recognize a form of collective intentionality which is in the meaning that it bears. Although this meaning does not add anything to the artifact's intrinsic properties, it does make a distinction between the artifact and other physical objects, such as a piece of stone on the planet Mars. The distinction between artifacts and other physical objects is that artifacts can play a social role that cannot be explained by laws of physics. An anti-shoplifting gate does not only make some noise but enters into the process of detecting burglars and works as a part of the context in which shoplifters are caught red-handed. I will elaborate more on individual and social properties of technologies and their difference with other ordinary object lying around in the last concluding chapter.

5- Conclusion

One can summarize this chapter's discussions on the intentionality of persuasive technologies in these claims:

1) Intentionality could be individual or collective.

2) The technologies which are claimed to have the individual intentionality are the products of AI. But according to Searle, although it is not impossible for a man-made machine to bear individual intentionality, the AI products and the present generation of technologies do not have an intrinsic, individual form of intentionality.

3) Almost all technologies bear the collective form of intentionality, and that is in the meaning and function assigned to the technology. The intentionality involved in any case of collective

intentionality belongs to the whole social system, and is valid as long as there are individuals who could possibly ascribe intentionality to the technology.

4) In case of persuasive technologies, the very act of persuasion is not intrinsic to their physical properties, but is a function that users and designers assign to them. This function is a social fact and social facts are those that involve collective intentionality. So on the one hand, the intentional feature of persuasive technologies has a logical priority over their existence, and on the other hand, this intentionality exists only as a part of a context made of social agents with intrinsic forms of intentionality. It is these agents that interpret the beep coming out of a bunch of wires and transistors as a message trying to persuade shopkeepers that something is going wrong in their store. Moreover, the collective intention works through causing individual intentions; intention of users to apply the artifact and practically use it for its persuasive effects. These all happen in a context in which the beep of an anti-shoplifting gate has such a meaning.

The only thing missing in this account is a more elaborated analysis of the character of persuasive technologies themselves, an account that gives more credit to the role of technologies qua active and hermeneutically influential elements in the contexts in which they are used. Although Searle concedes that the collective intentionality involved in the case of persuasive technologies cannot be reduced to the sum of individual intentionalities involved and is a property of the whole context comprising human beings and non-humans, this formulation of intentionality of persuasive technologies can be revised or complemented at least in two features. First, in this account, the individual intentionalities which are logically necessary for the existence of collective intentionality are confined to humans as the only social agents and the existence of technologies is remained passive and secondary to that of humans. Moreover, even in case of humans, we had some doubts whether or not to include act of designers as a part of the collective act of persuasion as designers only hold a general idea about artifacts and do not think about every specific act of persuasion. So the way designers' expectations play a role in the act of persuasion could be investigated further. Secondly, in this account our interpretation of what we experience in the presence of technologies is not fully developed. The point is that after accepting Searle's analysis of the logical features of intentionality of the context in which persuasive technologies function, we can go further and explore how one's interpretation of one's perceptions change in any interaction with or through technologies. These two points are at the core of my next chapters' discussions where I introduce social, hermeneutic and existential aspects of persuasive technologies, mainly through works of Bruno Latour, Peter-Paul Verbeek, and Don Ihde.

Chapter 2

Intentionality of Persuasive Technologies

or

Persuasion by Intentional Networks?

Introduction

In this chapter I will deal with the matter of intentionality of persuasive technologies from Bruno Latour's perspective in particular and the so-called Actor-Network-Theory's in general. I shall start by introducing Latour's network metaphysics and argue that in Latour's view the a priori difference between humans and technologies is insignificant, if not completely useless, and he treats humans and nonhumans symmetrically.

Then I will move on to the normative character of artifacts one of their anthropomorphic qualities. I shall argue that, according to Latour, artifacts do not act exactly in accordance to what designers expect and may end up performing completely different tasks. I elaborate more on the normative character of artifacts with his *script* analysis.

Finally, I will discuss intentionality of persuasive technologies. I will first try to argue how Latour's ideas can help us to have a clearer understanding of the notion of persuasive technology. Then I conclude that persuasion should be seen as a network act, not an act of any particular technology, and therefore intentionality should be ascribed to the entire network.

1- Network ontology and the symmetry of humans and nonhumans

Bruno Latour in his article *Where are the missing masses? The sociology of a few mundane artifacts* (Latour, 1992), advocates a kind of *network* metaphysics. He sees networks as a collection of miscellaneous *actors* contributing to the network's *program of action*. Program of action is what the network is running for. But it is not the case that Latour defines a network in terms of the actors it comprises; rather, in Latour's view, the existence of a network takes priority over the existence of its actors. In other words, the actors' existence is secondary to that of networks and consequently there cannot be any actor that does not belong to any network. So in this theory, there remains no

room for the a priori, universal actors (subject) that Descartes and his "modernist" followers defend. Latour believes, one cannot talk about actors as transcendental entities ignoring their temporal and spatial limits. Every individual, every actor's existence is network-dependent.

An example could make his view clearer. Imagine a factory that produces peanut butter. The whole factory can be seen as a network with the program of action of producing peanut butter. The factory probably has some workers, managers, salespersons, accountants, secretaries, etc. Beside all these human actors, there are lots of machines and technological devices contributing to peanut production, its packing, carrying peanut cans on conveyor belts, etc. Next to all these, there exists a generator producing electricity for all these machines, some drivers and their vans to carry peanut butters from the factory to supermarkets, some engineers who design peanut butter producing machines, and so on and so forth. So, when we open the network of a peanut butter factory and examine it more closely, we realize there are so many human and nonhuman actors contributing to the program of action of the network, each of which bears some responsibility and performs its own tasks. Since responsibility and task of each actor hinges on the program of action of the whole factory, the existence of any actor should be seen as dependent on the existence of such a network.

Moreover, in Latour's view, since what matters in a network is the way actors fulfill responsibilities, it is pointless to differentiate between human and nonhuman actors. Thus Latour refers to his theory as a symmetrical approach toward humans and technologies (Latour, 1992). His theory, called Actor-Network-Theory (ANT), suggests as far as the program of action of each network is concerned, it does not matter whether acts are done by humans or nonhumans. In the peanut butter example, it does not really matter whether the act of, say, filling the cans with peanut butter is done by a human worker or an automatic machine; what matters is that such an act is done which is in line with the program of action of the whole network.

Thus, one of the central claims of Latour's ANT is its *network ontology*. In this view, networks take ontological priority over actors. What is the case is a bunch of networks including a bunch of actors, but not actors that somehow decide to get together and shape networks. Actors derive their existence from the network to which they belong. If actors have any essence, the essence is network-dependent. Latour believes 'Nothing, not even the human, is for itself or by itself, but always *by other things* and *for other things* (Latour & Venn, 2002, p. 256, Italic in the original text). As I just mentioned, his network ontology has at least two significant ramifications. First, technologies should always be seen as parts of networks, and it is pointless to speak about an

artifact on its own. Second, one cannot draw an a priori distinction between technologies and human beings. in the rest of this chapter these two points will pop up frequently in arguments I will present.

Treating humans and technologies symmetrically can be construed as ascribing a kind of agency to technologies which could be fruitful to thesis' topic of intentionality of persuasive technologies. The point is that calling an artifact "persuasive" gives a form of agency to it; as if the artifact intends to persuade users. So I will continue this chapter first, by elaborating more on Latour's discussions on the metaphysics of technologies by his notion of *fold*. Then, I move on to the normative character of artifacts, and argue that according to Latour, one of the aspects of technological agency is having normative characters. In the end, I focus more on the act of persuasive technologies and the way ANT helps us to formulate intentionality of persuasive technologies.

2- Agency of technologies

In the article *Morality and Technology: The End of the Means*, Latour argues that the term technical should be redefined as an adjective instead of substantive (Latour & Venn, 2002, p. 248). The term substantive implies possessing a universal substance, something existing on its own, however, according to Latour, 'Technology is everywhere, since the term applies to a regime of enunciation... to a mode of existence' (Ibid.).

Latour describes the regime proper to technologies by the notion of *fold*. In his view, *time*, *space*, and *the type of actants* are folded in technical action. A technology gathers together heterogeneous components from different spatial and temporal points that nothing before the technical action could gather together. Latour argues even a simple artifact like a hammer displays the spatio-temporal folds. A hammer 'keeps folded heterogeneous temporalities, one of which has the antiquity of the planet, because of the mineral form that it has been moulded, while another has that of the age of the 10 years since it came out of the German factory which produced it for the market' (Latour & Venn, 2002, p. 249). The history of some components goes back to centuries ago and some components are collected from other continents, and these all contribute to the technical action that obtains now. Although when we use an artifact we do not normally trace all these spatio-temporal folds and most of the time we are focused on the technical action, when we actually observe the artifact more closely, we notice the heterogeneity around it. As Latour put it, 'There is nothing less local, less contemporary, less brutal than a hammer, as soon as one begins to unfold what it sets in motion; there is nothing more local, more brutal and more durable than this same

hammer as soon as one folds everything implicated in it' (Latour & Venn, 2002, p. 249). In addition to time and space, technologies are folded by diversity of actors as well. Technologies always belong to networks of heterogeneous actors. Referring to the famous swirling scene of Kubrick's film *2001*, Latour argues, 'all technologies incite around them that whirlwind of new worlds. Far from fulfilling a purpose, they start by exploring heterogeneous universes' (Latour & Venn, 2002, p. 250). Therefore, when we, so to speak, *open* technologies, we realize they are not simply instruments to facilitate or enhance our lives, but the three kinds of heterogeneity folded in them reveals the fact that they gather diverse agents around themselves.

This way, ANT theorists reject the idea that sees technologies as malleable instruments belonging to the realm of means, as opposed to our humanity belonging to the realm of ends. Since we share so many modes of existence with technologies: 'Without technologies, human beings would not be as they are' (ibid.). Technologies are 'a true from of mediation. Far from ignoring being-as-being in favor of pure domination, of pure hailing, the mediation of technology experiments with what must be called *being-as-another*' (Latour & Venn, 2002, p. 250).

Although Latour's notion of fold gives us a deeper understanding of the nature of technological devices and proves the instrumentalist view to artifacts inadequate, Latour does not stop there and by questioning the distinction which is normally made between humans and technologies, he ascribes a sort of agency to technological artifacts.

As I mentioned earlier, the network ontology Latour advocates implies a kind of symmetry between human and non-human actors. Since what matters is acts of actors in networks and their interaction with each other, in Latour's view, an a priori distinction between actors based on their biological, and physical properties is pointless: 'You discriminate between the human and the inhuman. I do not hold this bias (this one at least) and see only actors—some human, some nonhuman, some skilled, some unskilled—that exchange their properties' (Latour, 1992, p. 236). Therefore, Latour treats humans and nonhumans equally and traces anthropomorphic qualities of technologies. It is noteworthy to refer to two of such qualities. First, as a consequence of delegation of competences, technologies could substitute for the actions of people and could permanently occupy the position of a human (Latour, 1992, p. 235). For instance, before introduction of anti-shoplifting gate, shopkeepers had to always keep an eye on customers to make sure no shoplifting happens in their store. But nowadays, thanks to the invention of such a technology, the task is delegated to nonhuman actors. Secondly, technologies shape human action by prescribing back how people

should interact with or around them (ibid.). An anti-shoplifting gate is telling us not to try to steal anything, because if that happens it probably is going to start screaming loudly. The bad news for shoplifters is that this artifact, unlike its human counterparts, is not into bribery either. Shoplifters should watch their behavior while passing the gate. They should either say goodbye to their old hobby, or break the technology into pieces and run. The old tricks do not work anymore. The second anthropomorphic aspect of technologies, which I will refer to as their normative character, will be at the center of my discussions in the next section.

Up to this point, I tried to expound Latour's idea on the importance of networks and the way human and technologies should be equally seen as actors of heterogeneous networks. I argued Latour disagrees with instrumentalist view to technologies and even ascribes some sort of agency and anthropomorphic characteristics to them. This way, neither humans nor technologies takes priority over the other, because what matters is their act in networks. Actors should not be seen through their pure biological or physical properties, and neither of humans and technologies will necessarily be the mastermind of the network. Therefore, both reductionist social views, known as social constructionism and technological determinism, are incompatible with ANT. Social constructionism gives more credit to humans and technological determinism gives more credit to technologies, however, ANT refutes both views. As John Law (Law, 1992, pp. 382-3) put it:

The reductionist versions tell that either machines or human relations are determinate in the last instance: that one drives the other. However, though these reductionisms are different, they have two things in common. First, they divide the human and the technical into two separate heaps. And second, they assume that one drives the other.

Actor-network theory does not accept this reductionism. It says that there is no reason to assume, a priori, that either objects or people in general determine the character of social change or stability.

3- The normative character of artifacts; scripts, and the program of action

The way I have put Latour's ideas in particular and ANT in general so far could mislead the reader to conclude that networks are fixed institutions with a kind of transcendental existence that impose tasks on their actors and shape the actors in the way they want. So it may seem as if by showing the network-dependence of actors, Latour gives a full authority to networks to make actors behave exactly in accordance to the networks' expectations; as if the unchanging, universal essence of modernist subject has now been embedded in networks. However, it is not the case that in ANT each actor that joins the network stays tractable and acquiesces to the network's program of action.

According to Latour, the introduction of each technology *translates* the program of action of the whole network. So there remains nothing essence-like or transcendental about networks that stays immune to change. Artifacts 'take on themselves the contradictory wishes or needs of humans and non-humans' (Latour, 1992, p. 247). Artifacts have normative characters. They demand some things and refuse to behave in any arbitrary way: 'What they exactly do, what they suggest, no one knows' (Latour & Venn, 2002, p. 250). That is why they can be quite adamant not to accept what is delegated to them by the network they belong to, and consequently change the program of action of the network. Latour believes any artifact, to a certain extent, changes the program of action of the network that it enters, and by doing so, the artifact slightly changes the entire network.

Latour explains this normative character of technologies by his *script* analysis (Latour, 1992). In his view, engineers *inscribe* a program of action to artifacts, and so they delegate a task to artifacts; they expect artifacts to act in a certain way. In the case of the anti-shoplifting gate, designers expect the technology to beep when its sensors detect the RFID chips, and after the introduction of this technology in supermarkets, the task of detecting burglars would be delegated to technologies. But there are two possible hindrances that prevent a technology to perform their inscribed functions; one coming from the network it joins, one from the technology itself. On the one hand, it is quite likely that other actors of the network give a different task to the artifact from the inscribed one. For instance, anti-shoplifting gate is designed to prevent or reduce the amount of shoplifting, but there is a village in Africa where its inhabitants attach an RFID chip to a football and use anti-shoplifting gates as goals in order to make sure whether the ball has actually passed the line or not.[10] Although the positive point about this novel football game is that there is no need to rely on human referees anymore that frequently make visual mistakes, especially if one of the two teams is from their own town, in this game anti-shoplifting gate is not used in accordance to designers' inscriptions, and the actors have given a different task to it. On the other hand, the technology may be used to perform the task that designers have inscribed, but it just does not behave exactly in that way. An anti-shoplifting gate may start beeping when it detects my bank card or decline to beep when an electronic engineer knows how to shut up the device by isolating the chip from electromagnetic radiations. Therefore what actually happens is that when a technology joins a network, the task that designers inscribed to it does not always obtain; in other words, the technology translates the program of action of the network; an *anti-program* takes place, users start *re-inscribing* new tasks to

---

[10] See: www.itwasjustamadeupstory/forthesakeofmakinganexample.com

the artifacts, and tasks of the new network get delegated between humans and nonhumans in a different way.

This normative character of technologies also has spatial and temporal dimensions. Law introduces *mobility* and *durability* as two dimensions of normativity of artifacts (Law, 1992, p. 387). The more durable materials can keep their normative character for longer time. Law believes 'a good ordering strategy is to embody a set of relations in durable materials. Consequently, a relatively stable network is one embodied in and performed by a range of durable materials' (ibid.). If an anti-shoplifting gate used as goals in a football match breaks down after a couple of strikes, it will not be able to keep ordering and will lose its normative character in that network. Moreover, 'If durability is about ordering through time, then *mobility* is about ordering through space' (ibid., italic in the original text). A GPS device, working together with some satellites, as a mobile technology, keeps its persuasive nature wherever users go. It is not fixed on a particular land; rather, it is able to give orders at any location on our lively planet.

So far, I have pointed out Latour's network ontology, the fact that humans and nonhuman actors are treated equally in ANT, and that one can ascribe agency to technological devices as well. Then I focused on normative character of technologies as one of their anthropomorphic qualities and with Latour's script analysis showed technologies give orders and change the networks they join. So after introduction of technologies we realize that 'we have *changed the ends by changing the means*, and… we have begun to wish something quite else from what we at first desired' (Latour & Venn, 2002, p. 252, italic in the original text).

Now that we have gained enough conceptual apparatuses and clarifications regarding Latour's ANT, the rest of this chapter will be dedicated to the main topic of the thesis, namely, intentionality of persuasive technologies. I will discuss this matter in the next section.

4- Latour's ANT and intentionality of persuasive technologies

To provide a deeper understanding of the way ANT treats intentionality of persuasive technologies, there are at least two points that should be taken into consideration. First, we should see how the notion of persuasive technology can fit this theory, and how ANT can differentiate between persuasive technologies and non-persuasive ones. Secondly, it is debatable whether one can easily derive a theory of intentionality from Latour's ideas for in his writings he does not refer to this term at all, and it seems Latour is not favorably disposed to get into detailed analysis of actors and their

properties. These two points are my main concern in the next two sections. I will begin with a discussion on the concept of "persuasive technology" and will argue that it would be more precise to let go of the term "persuasive technology" and use the term "persuasive network" instead. Then I move on to the discussions on intentionality, and try to develop a theory of intentionality of technologies based on Latour's ideas.

4-1- Persuasive technologies and ANT

The main topic of this thesis is focused on persuasive technologies, as distinguished from non-persuasive technologies. But is the distinction between persuasive and non-persuasive technologies compatible with ANT? To answer this question we should review the idiosyncrasies of persuasive technologies that I explained in the introduction. Here I would like to especially repeat some of them which are fruitful for our present discussion. As its definition goes, persuasive technology is a type of technology which is designed to influence users' behavior and decision making. There are two important points about this definition. First, persuasive technologies are those that influence users. Secondly, these types of technologies are *designed* to be influential, so the designers' intention is inseparable from the definition of persuasive technologies. Let us examine these points respectively.

In ANT the fact that technologies leave some influence on users is obvious. In fact in Latour's view, technologies do not simply influence users, rather human and nonhuman actors mutually shape each other. This fact which applies to any artifact stems from ontological status of technologies that I explained earlier. Technologies form a mode of existence. We share so many modes of existence with technologies, and without technologies we would not be the same humans as we are now. Latour points out this co-constitution of humans and technological artifacts referring to a simple artifact like hammer: 'thanks to the hammer, I become literally another man', and therefore, 'the theme of the tool as an 'extension of the organ' makes such little sense' (Latour & Venn, 2002, p. 250). Therefore, in Latour's view, not only persuasive technologies, but all technological devices shape and influence us: 'Without technologies, human beings would not be as they are' (ibid., p. 252).

The second fact about persuasive technologies is that they are *designed* to have such a persuasion. This aspect of persuasive technologies at first glance sounds rather problematic for an ANT theorist, but as I will argue, this fact is not necessarily incompatible with ANT. The point is that by definition the persuasive character of persuasive technologies should be *inscribed* by engineers, and technologies are supposed to keep this character after joining the network of persuasion. However,

as I showed earlier, in Latour's view, it is not the case that technologies always behave in accordance to engineers' inscriptions: on the one hand, users might give a different task from what engineers expected, and on the other hand, artifacts may themselves decline to perform inscriptions. Thus, when artifacts are designed, there is an element of uncertainty and unpredictability about their future task in networks they would join. Referring to technologies, Latour believes 'What they exactly do, what they suggest, no one knows, and that is why their introduction in the countryside or in towns, initiated for the innocent sake of function, always end up inaugurating a complicated history, overflowing with disputes, to the point of ending up either at the State Council or at the hospital' (Latour & Venn, 2002, p. 250). So there seems to be a paradox here. On the one hand, the persuasive character of technologies is supposed to be inscribed by the designers, and on the other hand, all technologies, including the persuasive ones, do not behave exactly in the same way that is expected from them. In other words, the definition of persuasive technologies implies that they should behave as what designers have inscribed, but there is always an uncertainty about the extent to which technologies act based on engineers inscriptions.

What we need to do to solve this paradox is to turn our viewpoint and modify the definition of persuasive technology. Instead of seeing designers as the final authority who determine the act of persuasive technologies, we should see persuasive technologies as those that (accidentally) behave in accordance with what designers have expected. This way, designers' wishes would not have the final authority that is frequently imputed to them; rather, the persuasion of a persuasive technology would be network-dependent. In other words, the persuasive character of persuasive technologies should not be seen as universally valid; instead, one should look closely at how the artifact is actually used and how it acts in a given network, and then if this act turns out to be in line with designers' inscriptions, the technology can be called persuasive. Thus, no factory produces persuasive technologies for one cannot tell how products of a factory are going to be used. One cannot tell an anti-shoplifting gate is a persuasive technology before the device joins any network for it might be used as a football goal or as a device to warn shopkeepers about a possible case of shoplifting. So, we can solve the ostensible paradox of persuasive technologies and ANT by defining persuasive technologies not in terms of designers inscriptions, rather based on the way they actually behave in a given network. We need to *de-center* the role of engineers, and emphasize the manner in which an artifact actually behaves in a given network.

4-2- Intentionality and persuasive networks

Latour's network metaphysics and his emphasis on actual role of artifacts in networks instead of engineers' inscriptions have some other consequences which are also fruitful for our analysis of intentionality of persuasive technologies.

1) Although at first glance it seems that the persuasive character of persuasive technologies is inscribed by designers, in fact persuasion does not belong to technologies in themselves, rather to the networks where they act. An anti-shoplifting gate just beeps, but the customer, the shopkeeper, the RFID chip, etc. all contribute to the act of persuasion. Calling a technology persuasive is misleading because it overlooks the role of other actors in persuasion. So in the same way that the existence of a technology is network-dependent, so is its persuasive character. Therefore, if we want to be meticulous about the terms we use, instead of "persuasive technologies", we should use the term "persuasive networks" to emphasize the fact that persuasion is the act of the entire network.

2) When discussing the notion of intentionality from ANT's viewpoint in general and that of Latour's in particular, we should not forget the fact that his analyses are done only at the network level. Latour does not develop a theory of intentionality that, for example, amounts to Searle's theory with respect to depth and details. As I presented in the previous chapter, Searle develops a detailed conceptual apparatus by which one can get the meaning of intentionality in his theory. Latour, however, does not present such a complex theory. As a result, in ANT the term "intentionality" does not bear the complicated meaning that it does in Searle's theory, and that is what we should keep in mind while speaking about intentionality of persuasive technology from an ANT perspective. Nevertheless, there are two rather similar arguments through which one can discuss intentionality of technologies from ANT's view. I will finish this chapter's discussions with these two arguments.

First, as I previously mentioned in this thesis, intention to act in a specific manner bears a kind of intentionality. Since the program of action of a network is what the network wants to do, one can detect a sense of intentionality in the act of persuasive networks. So if the intentionality we seek in persuasive networks is in their intention to persuade users, illuminating the structure of the act of persuasion reveals the nature of the intentionality in question. To do so, we should, once again, refer to the network metaphysics that Latour advocates. Because any intention to persuade does not belong to any specific actor, but to the whole network of human and nonhuman actors, the intentionality involved belongs to the network's program of action. It is the whole network that has a persuasive effect, and therefore intentionality should be ascribed to the network as a whole.

Secondly, Latour's symmetrical treatment of human and nonhuman actors and his network ontology lead to network-dependence of technological agency and technological intentionality. The point is that the term "persuasive technology" implies there are some technologies which bear a kind of agency to influence users, as if artifacts play the role of active agents to persuade users. However, since agency is a metaphysical condition of any intention to act and since the existence and behavior of each technology depends on the network to which it belongs, one cannot give universal agency to an artifact, rather the agency belongs to the whole network which is folded in a specific artifact. Therefore, one should speak of network agency and network intentionality.

5- Conclusion

The goal of this chapter was to give a formulation of intentionality of persuasive technologies based on Latour's ideas. I mentioned a couple of important features of Latour's philosophy that help us to achieve this goal which are not completely independent of each other. Among others, one can refer to features such as, symmetrical treatment of humans and nonhumans, network ontology, the notion of technological agency, and the normative character of artifacts.

This way, Latour's ANT is fruitful for the analysis of intentionality of persuasive technologies in the following respects:

1) Any kind of technology, whether persuasive or not, influences users. In fact technologies do not just simply influence humans; rather, they constitute our humanity, for we share so many modes of existence with technologies.

2) Although the definition of persuasive technology implies that such technologies should be *designed* to influence users, one cannot call a technology persuasive, before it joins any network, and therefore, there is no factory that produces persuasive technologies. To see whether a technology is persuasive or not, we need to turn our view from designers' point to the actual manner in which technology is used.

3) Although the persuasive character of persuasive technologies is inscribed by designers, the act of persuasion is in fact done by the whole network. So we had better replace the "persuasive technology" with "persuasive network".

4) Since intention to act in a specific way bears a form of intentionality, one can ascribe intentionality to the program of action of the network in which an artifact is used.

5) One can come to the prior conclusion via Latour's notion of technological agency as well. The term persuasive technology implies a kind of agency hidden in the artifact. As if the artifact stands face-to-face to users and influence their decision-making and behavior. Although Latour develops a theory of technological agency and assigns anthropomorphic qualities to artifacts, still this agency is network-dependent and therefore the act of persuasion and the intentionality involved belongs to the whole network.

Chapter 3

Postphenomenology and Persuasive Technologies

Introduction

In the previous two chapters I approached intentionality of persuasive technologies from Searlian and Latour's ANT viewpoints. First, I argued how Searle makes a distinction between individual and collective forms of intentionality and regards intentionality of persuasive technologies as a collective one. Secondly, I showed that although the concept of intentionality is not central to Latour's theory, if not dispensable, still his ideas provide us with a sociologically more lucid understanding of the notion of persuasive technology.

In this chapter I will examine intentionality of persuasive technologies from a postphenomenological point of view that especially Don Ihde (Ihde, 1990 and 1992) and Peter-Paul Verbeek (Verbeek, 2005, 2008 and 2009) advocate. I will first briefly introduce some key elements of classical phenomenology and what postphenomenologists claim to be different in their approaches. Afterwards I introduce Ihde's philosophy and the way he discerns with different human-technology relations. Then I shall show how Verbeek and Heersmink expand Ihde's theory with a more emphasis on technological intentionality.

During all analyses I will keep an eye on persuasive technologies and the way theoretical discussions assist us to get a grip on more practical subjects.

1- Some remarks on phenomenology and postphenomenology

Historically, the philosophical movement which is now known as phenomenology dates back to works of Franz Brentano and his pupil Edmund Husserl. Brentano employed the term descriptive psychology as distinguished from genetic (or physiological) psychology to refer to the a priori science of the laws of the mental and study of the self-evident awareness accompanying each perception, which is different from the act of sensing itself (Moran, 2000). His pupil, Husserl referred to this field of philosophy only as phenomenology.

Husserl emphasized on Brentano's principles of presuppositionlessness and givenness. Presuppositionlessness implies that phenomenology should be seen as an independent field and

free from scientific achievements and rules, and givenness means that all experience is experience *to someone*; any experience belongs to an experiencer (Moran, 2000). This givenness is the very broad conception of intentionality that any phenomenologist holds in a way or another: our experiencing of the world is not something confined to what happens in our head but is about, or directed at, something else. So, one can roughly define phenomenology as 'the study of structures of consciousness as experienced from the first-person point of view' (Smith, 2008). The central point of consciousness is its intentionality, its being directed at something.

Dan Zahavi (2008) argues that although historically phenomenologists have held rather different positions, the study of human-world relation is a common line among all of them. As he points out 'Our relation to the world is so fundamental, so obvious and natural, that we normally do not reflect upon it. It is this domain of ignored obviousness that phenomenology seeks to investigate. The task of phenomenology is not to obtain new empirical knowledge about different areas in the world, but rather to comprehend the basic relation to the world that is presupposed in any such empirical investigation' (Zahavi, 2008, p. 665).

If phenomenology emphasizes the relation between humans and the world, phenomenological philosophy of technology approaches technologies as lying in this relation and influencing our original perception of reality. To analyze the human-world relation in a technologically mediated experience, one cannot disregard the role of technologies. It is pointless to practice phenomenology in any experience in presence of technologies, without paying attention to changes brought by technological mediation.

Within the field of philosophy of technology, one can discern with at least two philosophical lines that historically have kept strong connections with phenomenology, namely, existentialism and hermeneutics. Hermeneutics 'analyzes the human-world relation in terms of the way in which the world can present itself to human beings and become meaningful', and existentialism 'looks at the way in which humans are able to realize themselves in the world' (Verbeek, 2005, p. 111).

To elaborate more on phenomenology and the way postphenomenologists distinguish themselves from classical phenomenologists, I should first clarify concepts of micro- and macro-perception that Ihde introduces in his book *Technology and the Lifeworld: from garden to earth.* Put in rather simple terms, microperception is the sensory data that one experiences at a certain moment, and macroperception is the cultural background that helps one to interpret that very experience. As Ihde writes, 'What is usually taken as sensory perception (what is immediate and focused bodily in

actual seeing, hearing, etc.), I shall call microperception. But there is also what might be called a cultural, or hermeneutic, perception, which I shall call macroperception… Both dimensions of perception are closely linked and intertwined. There is no microperception (sensory-bodily) without its location within a field of macroperception and no macroperception without its microperceptual foci' (Ihde, 1990, p. 29). Therefore, Ihde believes 'there is no bare or isolated microperception except in its field of a hermeneutic or macroperceptual surrounding; nor may macroperception have any focus without its fulfillment in microperceptual (bodily-sensory) experience' (Ihde, 1993, p. 77).

It is noteworthy to mention that the relation between micro- and macro-perception in Ihde's philosophy is similar to the relation between a given intentional state and the Network and the Background in Searle's philosophy that I explained earlier in this thesis. In the same manner that Ihde believes micro-perception always takes place in a hermeneutic and macroperceptual field, Searle also believes intentional states function only as part of a Network of intentionality against the Background of non-intentional capacities. In the same manner that Searle contends that the directedness of experience, is shown by the intentional state, Ihde also asserts macroperception finds its focus, its intentionality, in microperception.

Ihde applies the micro-/macro-perception terminology to show different historical movements in classical phenomenology and to put forward his alternative postphenomenology. Ihde traces microperceptual analyses which focus on bodily-sensory dimensions of perception especially in works of Husserl and Merleau-Ponty, and macroperceptual ones which have more implicit cultural and hermeneutic emphases in works of Heidegger and Foucault (Ihde, 1993, pp. 75-76). He believes most works of Merleau-Ponty are in the Husserlian microperceptual trajectory, however, with Merleau-Ponty's concern on *multidimensional* experiences, he moves somehow beyond Husserlian context and adds some macroperceptual considerations to his philosophy (Ihde, 1993, p. 76). Probably the best way to explain multidimensional experiences is through the famous example of Necker Cube in Figure 1.
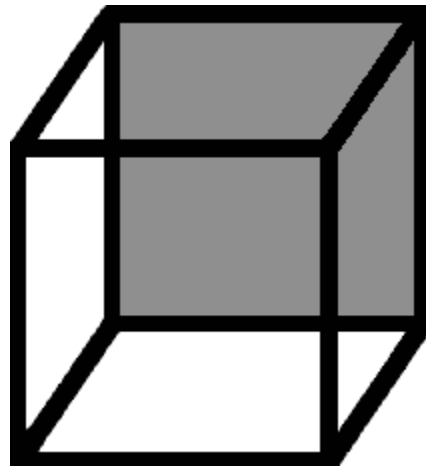
Figure 1. Necker Cube

We can see the Necker Cube in Figure 1 at least in two different ways. We can see the dark side as the front side or as the rear side. This aspect of some of our perceptions is called their multidimensional character. The point about this example is that if we consider only microperception as what shapes our understanding, we cannot justify this dual nature of Necker Cube for our sensory impression in both cases is the same. We are faced with the same combination of lines and colors, but we interpret it in two different ways. So in such cases, there should be something different from the bodily perception that shapes our understanding of the cube. As Ihde points out, 'The actual micro- or bodily-sensory fulfillment "follows" the linguistic-hermeneutic tale' (Ihde, 1993, p. 78). Therefore, multidimensional character of some of our experiences could be justified only by an appeal to cultural, hermeneutic aspects of perception.

According to Ihde (1993), Husserl's pupil, Martin Heidegger is known to be the first famous philosopher with a macroperceptual view to technology. As Verbeek (2005) has shown, Heidegger holds a transcendental view to technology. Although transcendental view is not completely equal to macroperceptual view, it is one of the characteristics of transcendental position that it does not get into microperceptual instances of technological mediation. Heidegger's philosophy does not focus on instances of human-technology relations; instead, he only refers to conditions of possibility of our experience and cognition in a technological world and sees technology as a way of revealing reality. He showed reality is revealed differently in the so-called technological age from ancient Greece era, due to Technological hermeneutic effects (ibid.). These all show Heidegger's hermeneutic, macroperceptual stand.

This way, Ihde seems to suggest that postphenomenology differs from classical phenomenology with respect to postphenomenology's special attention to both levels of perception and their relation to each other. Moreover, postphenomenology of Ihde and Verbeek seems to be strongly connected with the role of technologies in our perceptions. This fact, beside the importance of both levels of perception in postphenomenology is not so common in works of classical phenomenologists and could be another tiny difference between these two approaches.

All in all, it is not my aim here to discuss if and how postphenomenology differs from phenomenology. To go back to the topic this thesis, in the next section I will elaborate Ihde's and Verbeek's analysis of human-technology relation and the way this analysis helps us to formulate intentionality of persuasive technologies.

2- Intentionality and human-technology relations

So far I have put some introductory words about phenomenology and postphenomenology and the importance of micro- and macro- levels in postphenomenology. In will start the rest of this chapter with some consequences of Heidegger's philosophy of technology and then I shall focus on postphenomenology of human technology-relations and the way it can be related to intentionality of persuasive technologies.

2-1- From Heidegger to Ihde

Heidegger's philosophy, according to Ihde, has three main consequences for analysis of human-technology relations. First, like Searle, Heidegger believes that all technologies are relative to a context. There cannot be technologies in themselves (Ihde, 1990, p. 32). As I presented in the first chapter, Searle treats the functional character of technologies as a social fact that depends on the context in which they are defined. Notwithstanding, there is distinction between Heidegger and Searle in this respect. Heidegger's claim applies not only to technologies but to all objects, so in his view, there cannot be any object-in-itself at all, whether technological or not. Searle, however, makes a distinction between social facts and brute facts, regarding the functional characters of technologies as social facts and their physical and chemical properties as brute facts. Therefore, his claim about context-dependence of technologies cannot be generalized to all objects.

The second achievement of Heidegger is what Ihde calls *instrumental intentionality*. Each technology has a function; it is seen "in order to ---" (Ihde, 1990, p. 32). This "in order to ---" shows an assignment of a function to technology. This point is also what Searle agrees with. As I showed

earlier, Searle sees the functional character of technologies as an instance of collective form of intentionality. So both Heidegger and Searle contend that technologies are necessarily instruments in order to perform some functions, and their instrumental or functional character bears a kind of intentionality. But there remains a distinction between Searle's and Heidegger's philosophy in this respect. While Searle approaches technologies as pure instruments that act obediently according to their functions, Heidegger argues that the instrumental character of technologies leads to inescapable hermeneutic consequences through changing our macroperception (Heidegger, 1997). Thus, generally one can distinguish between two types of instrumentalist view to technologies. One is seeing technologies as mere means whose impacts are limited to their instrumental character, at the level of microperception; another is seeing technologies which go beyond being mere tools and give shape to our conceptions, at the macroperceptual and hermeneutic level. The first line, which is closer to the Searlian perspective, can be called *pure instrumentalism* and the second line, which is closer to the Heideggerian view, can be referred to as *rambling instrumentalism*.

The third achievement of Heidegger, as Ihde points out, is that when we use a technology, its existence fades away and the tool becomes a transparent means, not the object of experience (Ihde, 1990, p. 32). When some holds a hammer in one's hands, the hammer becomes the object of experience, being *present at hand*, but soon after one starts hammering a nail, the hammer becomes a transparent tool, *ready to the hand* of the user. So Heidegger believes a ready to hand technology is not focal, it does not attract any attention.

Ihde agrees with the first two achievements of Heidegger's that technologies are context dependent and that one can ascribe a kind of intentionality to them. However, he does not concede to the third claim that *any* technology in use becomes transparent and non-focal. As I shall show in the next section, Ihde believes there are some other human-technology relations which do not fit Heidegger's analysis. So Ihde thinks Heidegger's account is not incorrect, but incomplete; it does not cover all human-technology relations. In the next section, I shall present Ihde's framework to analyze human-technology relations.

2-2- Postphenomenology of human-technology relations

Ihde's project in his book *Technology And The Lifeworld* is to investigate the difference between technologically mediated and non-technologically mediated experiences. He wants to show how technology changes the immediately experienced environment. In his view, the task of a phenomenology of human-technology relations is discovering 'the various structural features of

those ambiguous relations' (Ihde, 1990, p. 72). So he starts his analysis with the so-called *direct* perceptions of the world, i.e., those body perceptions that at the microperceptual level are not technologically mediated. For example, one can refer to climbers' experience of grabbing rocks as a direct relation of body and the world. Ihde formalizes these non-mediated perceptions as *I-world* relations (ibid., p. 45).

As I explained in the Necker Cube example, *I-world* relations includes multidimensional complexity. This very feature leads us to the structure of such perceptions which always includes *seeing as ---* and *seeing from ---* (Ihde, 1990, p. 42). The *seeing as ---* and *seeing from ---* features actually disclose the way microperception relates to macroperception. The *seeing from ---* feature stresses the existential contribution of macroperception on microperception. It shows the importance of the subject's standpoint, claiming that perceptions always take place from a certain perspective; we always see objects *from* the position we find ourselves in the world. The *seeing as ---* feature emphasizes the hermeneutic contribution of macroperception on microperception. It shows the world appears to us in a certain way. We interpret a combination of lines and colors *as* a cube or a sequence of notes *as* a piece of music.

Let us move on to technologically mediated experiences and see how Ihde formulates their structures. These structures are meant to show 'the various ways in which I-as-body interact with my environment by means of technologies' (Ihde, 1990, p. 72). The first kind of technological mediation, according to Ihde, is *embodiment relations*. In embodiment relations, I perceive the world *through* technologies (ibid.). When I see the world through eyeglasses, I embody the technology as a part of my body; they work as transparent extensions of my eyes. Heidegger's *ready to hand* hammer has an embodiment relation with the user; it works as an extension of one's fist. Before forging ahead to other types of human-technology relations it is noteworthy to mention a couple of points about embodiment relations. First of all, the structure of any embodiment relation can be displayed as

$$(\text{I-technology}) \rightarrow \text{world}$$

The parentheses in this structure show that in embodiment relations technologies work as a part of one's body and the whole combination of human and technology perceives the world. The arrow in this scheme, indicates 'human intentionality.'

The second point about embodiment relation is that at first glance there seems to be a dilemma concerning what users[11] expect from the technology. On the one side, users want to have the transformation that technology makes available, and on the other side, they want technology to be as transparent as possible (Ihde, 1990, p. 75). I expect my eyeglasses to aid my vision, but at the same time, I do not want to feel the presence of the glasses themselves. The fact that users want the technological transformation is a hermeneutic expectation, but the fact that they do not want to feel the technology itself is an existential one. So the extreme embodiment relation could be one that the dash in Verbeek's scheme does not contain any intentionality; i.e., the user does not perceive the existence of technology itself. So in the extreme embodiment relation the technology becomes existentially transparent, but at the same time, it leaves some hermeneutic influences on the user's experience of the world; i.e., the world becomes present to the user differently.

Existential transparency of technologies in embodiment relations provides us with a good reason not to count such technologies as persuasive. In the first chapter of this thesis I explained that one of the conditions for a technology to be persuasive is that the user should have an interaction *with*, not *through*, the technology. In embodiment relations the interaction is always through technologies, and the technology becomes non-focal, and so their structure is not interesting for our analysis of persuasive technologies.

The third peculiarity of embodiment relation is that there is a kind of magnification/reduction in the structure of this relation; i.e., one or a few sensory organs get extended and the rest is pushed away. For example, using a telescope, one augments one's visual perception and reduces others, such as olfactory and tactile, or a telephone provides only an auditory extension and other senses are pushed aside (Ihde, 1990, p. 78).

Note that in embodiment relations, the extension of an organ does not include any transformation of the sensory data: a telephone does not turn audial inputs into, say, visual ones, or a telescope does not transform the visual data into tactile one. However, as we know there are some technologies that do transform sensory data to another sensory data. A barometer and an ECG are such technologies. So, what is the structure of human-technology-world relations in such cases? These cases clearly do not make embodiment relations for at least two reasons: first, the technology is not transparent and its presence is felt, and second, these technologies do not simply extend our organs,

---

[11] The word user as I use it in this chapter refers to human beings who have a relation with the technology.

but transform a kind of sensory experience into another one. Such technologies establish a different kind of mediation which Ihde refers to as *hermeneutic relation* (Ihde, 1990, pp. 80-97).

In hermeneutic relations the user focuses on the technology and by means of the technology makes connection to the world. In these relations, the presence of the technology is felt, but still it is construed as a source of information about the world. A barometer, when used to measure atmospheric pressure, establishes a hermeneutic relation to the world and the users. On the one hand the users' consciousness is focused at the barometer, and on the other hand the barometer says something about the world. This way, Ihde refers to hermeneutic relations with the following scheme (ibid., p. 89):

$$I \rightarrow (\text{technology-world})$$

This scheme shows in hermeneutic relations the human intentionality is focused on the technology which gives us information about the world. Comparing this scheme with the scheme of embodiment relations, we realize that in the move from embodiment relations to hermeneutic relations technologies lose their existential transparency. A technology that establishes hermeneutic relations with users becomes a focal object itself; its existence becomes more apparent and more important. On the other hand, in hermeneutic relations the world moves a bit to the background. One cannot make a transparent relation to the world as one makes in embodiment relations. Moreover, in hermeneutic relation, technologies no longer simply extend one or more sensory organs as they do in embodiment relations, rather they get input from the world and present it to us in a different manner. A barometer, for instance, the device transforms movements of air molecules into a column of mercury or a figure on a digital screen. Pressure is a tactile experience, but equipped with a barometer, we get a visual feeling of the air pressure. Such transformation does not happen in the case of embodiment relations.

This way, one can see most technologies that make hermeneutic relations as persuasive technologies, as they satisfy three main conditions for a technology to be persuasive. First, hermeneutic relations with technologies influence people's decision making and behavior. A barometer tries to tell us what the atmospheric pressure is. A GPS device is persuading us about our global location. An ECG shapes cardiologists' beliefs about direction and pace of the electric currents in the tissue of patients' hearts; and so on. Secondly, these technologies are designed to have such an influence on the users; i.e., designers had this intention to engineer a technology to be used to give that kind of information. And thirdly, the user is interacting *with*, not *through* technologies. In

hermeneutic relations, technologies become focal; their existence is felt and therefore, the user interacts with the technology.

Alterity relations are the third kind of human-technology relations that Ihde identifies (Ihde, 1990, p.97). Ihde characterizes alterity relations as those in which technologies become even more focal than hermeneutic relations and the world is pushed even more to the background. The relation we normally establish with an ATM machine or with an anti-shoplifting gate falls into this category. We do not use these technologies to get data about the world, nor do they transform any of our direct perceptions. We simply use these technologies for their own sake. While in embodiment relations we use technologies as extensions of our bodies and in hermeneutic relations technologies become a source of information about the world, in alterity relations technologies stand before us without being necessarily connected to the world. Therefore, the more we move from embodiment relations to hermeneutic ones and from hermeneutic relations to alterity ones, the more technologies move from being a constituent of the subject of experience to being a constituent of the object of experience, to the extent that in alterity relations technologies appear to us as *quasi others*. But calling a technology simply an object of experience does not do justice to the mediatory role of technologies in alterity relations. Ihde explicitly differentiates between alterity relations and an objectivist account that simply concentrates on physical properties of the technology as an object of knowledge (Ihde, 1990, p. 98). That is why Ihde refers to technologies in alterity relations as *quasi others* to stress the sense of anthropomorphism involved. In alterity relations, we are in a way communicating with technologies, but 'technological otherness is a *quasi-otherness*, stronger than mere objectness but weaker than the otherness found within the animal kingdom or the human one' (ibid., p. 100, Italic in the original text).

So, in a sense, embodiment relations and alterity relations make two extreme poles of the human-technology continuum of relations. In extreme embodiment relations the technology appears as a quasi-me, and in extreme alterity relations the technology appears as a quasi-other (Ihde, 1990, p. 107). Ihde shows alterity relations in the scheme below:

Human → technology-(-world)

The arrow in the scheme represents human intentionality, and the dashes show a very loose and somehow totally absent relation with the world. Clearly, some persuasive technologies, like an anti-shoplifting gate or computing persuasive systems, make alterity relations to their users. In such

cases, the artifact is designed to influence people's decision-making or behavior, and users' attention is directed at the artifact.

Up to this point I have introduced three kinds of technological mediation that Ihde introduces; namely, embodiment relations, hermeneutic relations, and alterity relations. The common point about all these relations is that they all have been microperceptual and focal (Ihde, 1990, p. 108). As the schemes show, one could always trace an arrow of intentionality in these relations. However, there is a forth kind of technological mediation, in Ihde's view, that is not focal and works at the level of macroperception. He calls such relations *background relations*. In background relations technology goes to the side. For example, a central heating system provides such a relation. Normally, we pay no attention to the existence of central heating system. It just works in the background and keeps the temperature of the room between our desired levels. The same applies to scarecrow. Scarecrows do their job in the absence of humans, but at the same time, it does not mean they are not influential. Their influence is non-focal, yet macroperceptual. As Ihde points out, in background relations, 'the background role is a field one, not usually occupying focal attention but nevertheless conditioning the context in which the inhabitant lives' (Ihde, 1990, p. 111). I will not elaborate more on the background relations as there is no specific intentionality involved in such relations and so this kind of technological mediation is not that fruitful for the purpose of formalizing intentionality of persuasive technologies.

3- Intentionality of persuasive technologies; Verbeek and Heersmink

In the previous section, I explained four schemes by which Ihde formulates human-technology relations. Except for the background relations that work at the macroperceptual level, the other three kinds of technological mediation hinge upon their own kind of microperceptual intentionality of human technology relations. All these schemes of human-technology experiences, as Verbeek points out, 'are not entirely "human"— human beings simply could not have such experiences without these mediating devices' (Verbeek, 2008, p. 390). Moreover, as I argued, the definition of persuasive technologies is such that excludes embodiment relations. Although embodiment relations have hermeneutic influences on users and the technologies that establish such relations with the users might be designed specifically to have such influences, there is no human-technology interaction in embodiment relations as it is the case for hermeneutic and alterity relations.

 Thus, to formulate the structure of human-technology relations in persuasive technologies, one can refer to Ihde's schemes of hermeneutic and alterity relations. However, the point about the

intentionality involved in these two schemes is that the arrows indicate human intentionality (Verbeek, 2008, p. 389). Although even in such cases, the intentionality belongs to the human-technology *relation* and not to human beings alone, still human beings remain at one pole of these relations. To give more credit to the technological constituent of intentionality, we need to revise Ihde's hermeneutic and alterity relations. In the rest of this section, I will refer to Verbeek's works as extension of Ihde's hermeneutic relations and Heersmink's work as an extension of Ihde's alterity relations in which they discern with an arrow of technological intentionality next to that of human intentionality.

Verbeek in his article *Cyborg intentionality: Rethinking the phenomenology of human-technology relations* introduces the concept of *composite intentionality* referring to 'situations in which not only human beings have intentionality, but also the technological artifacts they are using' (Verbeek, 2008, p. 390). In the barometer example, for instance, one can refer to the relation between the barometer and the world as an intentional one, standing next to the relation between the user and the barometer. So, 'When this "directedness" of technological devices is added to human intentionality, *composite intentionality* comes about: a form of intentionality which results from adding technological intentionality and human intentionality' (ibid., pp. 392-3). To show the scheme of composite intentionality, Verbeek changes the dash between the artifact and the world in Ihde's hermeneutic relations into an arrow, so the result would be:

$$I \rightarrow (\text{technology} \rightarrow \text{world})$$

Such a scheme shows that intentionalities of technological artifacts themselves play a central role in hermeneutic relations. In such cases, 'humans are directed here at the ways in which a technology is directed at the world' (Verbeek, 2008, p. 393).

The point about composite intentionality is that one can add more arrows to the scheme above by involving more technologies or human beings. In the GPS example, for instance, one could identify an intentional relation between the user and the GPS device, one from the GPS device to some satellite, and one from the satellite to the earth. Therefore, one had better refer to the scheme below to refer to intentionalities involved in technological mediation of a GPS device:

$$I \rightarrow \text{GPS device} \rightarrow (\text{satellites} \rightarrow \text{world})$$

Or:

$$I \rightarrow technology \rightarrow (technology \rightarrow world)$$

Still the relation could include more technologies and human beings. This fact shows that while Verbeek's analysis of composite intentionality gives us a better understanding of some hermeneutic relation that we make with persuasive technologies, if we want to apply postphenomenological analyses to cases in which many human and nonhuman actors contribute to an action, as Latour would put it, we would end up with an intricate scheme with lots of arrows and parentheses. Although it still does not mean that in the study of persuasive technologies we need to overcomplicate the schemes. As I showed, in the case of a barometer or a GPS device that make hermeneutic persuasive relations with the users, one can identify all intentionalities involved without getting lost in a complex scheme of human-technology-world relations.

While Verbeek elaborates more on Ihde's hermeneutic relations, Richard Heersmink with his concept of *reciprocal intentionality* generalizes Ihde's alterity relation (Heersmink, 2008, p. 78). The point is that alterity relations do not do justice to technological intentionality in interactive relations between humans and technologies. A technology that gets feedback from the user could bear such a technological intentionality parallel to human intentionality. For instance, a robot that listens to its owner's orders establishes an intentional relation to humans in the same way that humans establish intentional relations to it. So Heersmink formulates human-technology relations in reciprocal intentionality as follows:

$$(I \leftrightarrows technology) - world$$

The two-way arrow shows the intentionality involved is not just from human to technology, but also the other way around. The dash with the world shows that the world remains in the background in this relation and the interaction happens between humans and technological artifacts as in Ihde's alterity relation. Obviously lots of persuasive technologies make such relations with users. Any time that my laptop asks me to download new versions of certain Softwares, or when an internet message pops up again and again trying to persuade me to click on a specific link, I make a reciprocal relation with the technology I am using.

4- Conclusion

With Verbeek's composite and Heersmink's reciprocal human-technology relations that stand in close connection to Ihde's hermeneutic and alterity relations, we have achieved our goal of formulating intentionality of persuasive technologies from postphenomenological perspective. But

if you are reading this thesis from the beginning, you would probably notice a kind of conflict between the Searlian account and that of Verbeek or Heersmink. The point is the intentionalities that Verbeek and Heersmink ascribe to technologies in composite and reciprocal human-technology relations are similar to that kind of intentionality which Searle calls individual intentionality. As I showed earlier Searle believes at least the present generation of technologies cannot bear individual intentionality. However, Verbeek and Heersmink assign the same kind of individual intentionality also to technologies. Note that the point is not that even human intentionality is relational and cannot be all human. Verbeek and Heersmink are totally aware of this fact, and that is why they draw two arrows, one indicating technological individual intentionality and one indicating human individual intentionality. What is peculiar about these philosophers is that they believe artifacts can have the same kind of *perception* that humans have. I will deal with this apparent conflict of ideas in the addendum of this thesis. At this stage, I conclude this chapter by showing the way postphenomenological studies help us get a better understanding of the intentionality of human-technology relations and the nature of persuasion in some technologies.

In the previous chapter I suggested to replace the phrase "persuasive technology" with the phrase "persuasive networks". Having seen the importance of both micro- and macro-perception in postphenomenological philosophy of technology, we realize the whole network of persuasion has a given human-technology relation at its center. The importance of relations in phenomenological studies proves that at microperceptual level, any technology should be seen as constituting only one pole of a relation. So we had better replace the phrase "persuasive network" with "persuasive relation", as long as we do not forget the importance of macroperception in any microperceptual instance of human-technology relation. In other words, the importance of macroperception corroborates the fact that the context in which a technology works plays a significant role in the meaning ascribed to the technology and the technology's influence on the user(s); however, macroperception finds its focus at microperception. Thus, although this whole context contributes to the act of persuasion, and although the macroperceptual hermeneutic background is necessary for any microperception, still the relation between the user(s) and the technology stands at the core of the act of persuasion. So one can open the persuasive networks and find the persuasive relations that constitute the very microperceptual influence on the users' beliefs and decision makings.

After opening the network, we realize that persuasive relations would have the structure of either Ihde's hermeneutic relations or his alterity relations. In both cases, users' consciousness is focused on the artifact, and the human-technology relation lies at the center of technological mediation: in

both cases humans interact *with* the technology. The nature of technological persuasion in hermeneutic relations is that the technology gets some data from the world and presents it to the users in a different type of sensory data. An ECG provides a new perspective to study the heart; it transforms the electrical currents flowing in the heart's tissue into a graphic record. So the technology does not simply act as an extension of our organs, rather it influences our beliefs and behavior by presenting a new world to us which would not be available without technological mediation. In alterity relations, the technology establishes little or no connection to the world. It stands in front of us and becomes the very object of our experience. In such relations, the nature of persuasion is not in the technology's providing some information about the world but in the technology's acting as a *quasi-other* with its *quasi-autonomy*. An anti-shoplifting door acts as a quasi-human standing in front of each store and controlling customers for a possible case of shoplifting.

This manner of technological mediation in hermeneutic and alterity relations blurs the distinction between the intentionality in the meaning we assign to technologies and the way we interpret them and the intentionality in the act of persuasion. In the first chapter I argued one can discern with two distinct kinds of technological intentionality, i.e. one in the meaning they bear, and one in their participation in the collective act (of persuasion). However, Ihde shows that in persuasive hermeneutic relations, technologies build a new world for us that on the one hand gives new dimensions to our conception of reality, and on the other hand influences our behavior. The meaning we assign to technologies is connected to the way they represent the world from new angels, and their act of persuasion is significant provided that certain meanings have been ascribed to them. Rather the same applies to persuasive alterity relations. In the same fashion that in our communication and interaction with other human beings our actions and reactions are mixed with the way we interpret other person's words and body language, the meaning ascribed to the technology is interwoven with the way the technology and user(s) act and react to each other's signs. Verbeek also refers to the inter-dependence of the intentionality in the meaning and the intentionality in the act of technologies: 'The 'praxical dimension [of intentionality], concerning human actions and practices, cannot exist without the 'hermeneutical' dimension [of intentionality], concerning human perceptions and interpretations—and vice versa' (Verbeek, 2009, p. 69). Forming intentions to interact with a technology in persuasive relations requires a certain interpretation of the world brought about or mediated by the technology, and the way we interpret the world and the technology depends on the way we interact with the technology. People think of me as a potential shoplifter when the anti-shoplifting gate beeps because of the meaning ascribed to

its beep. But on the other hand, the meaning ascribed to the anti-shoplifting gate depends on the way people react to its beep as well. If users apply these gates as goals in a football match and some people start cheering whenever it beeps, the beep does not have anything to do with shoplifting anymore and shows the football has crossed the line and one team has scored.

Chapter 4

Conclusion

Although it will not do justice to what I explained as the goal of this thesis in the introductory section, I can put this goal in only one phrase which would be 'giving a formulation of the intentionality of persuasive technologies'. If one comes across the phrase "intentionality of persuasive technologies", probably the first questions popping up in one's head would be 'What do you mean "technology"?', 'What kind of technologies are persuasive?', and 'What is meant by the intentionality of a certain type of technologies?' I begin this chapter with the first question and will gradually shift the discussions to the so-called persuasive technologies and their intentionality.

Although the concepts of 'technology', 'human being', and 'ordinary object' are rather vague and controversial, one can roughly make a distinction between the extensions of these terms. Therefore, one can claim there are technological artifacts, there are objects lying here and there which are not considered technologies, and there are some creatures that are called human beings. However, talking about technologies, ordinary objects, and human beings as belonging to three different categories is meaningful as long as one provides a set of criteria to justify the claim that these categories should not be seen as equal. In the next two sections, I will refer to two peculiarities of technologies that indentify them from the other two groups. The first one is in technologies' possessing a derived form of intentionality, yet lacking its intrinsic form, and the second one is in the mediatory of technologies.

1- Individual and social properties of technologies

If we compare ordinary objects, technologies, and human beings with each other based on properties they possess *in themselves*, technologies share some properties with humans and some with normal objects. A hammer's properties are closer to those of ordinary objects and a humanoid robot's characteristics are closer to those of humans. This continuum of technologies from more mundane ones to more sophisticated ones is discussed, among others, in works of Arnold Gehlen, the philosophical anthropologist. Elaborating Gehlen's ideas, Peter Berger (Berger, 1980, p. 19) explains the continuum of technologies:

This process develops in three stages. In the first, that of the *tool*, the physical energy necessary for labor and the required intellectual input still depend on the subject. In the second, that of the *machine*, physical energy becomes objectified by means of technique. Finally, in the third stage, that of *automata*, technical means make dispensable also the intellectual input of the subject.

We can trace a continuum of technologies from simple tools to machines and to automata that lie somewhere between ordinary objects and human beings[12]. This ontological ambivalence of technologies makes it difficult to tell them apart from ordinary objects and humans.

Among philosophical theories I have examined in the previous chapters, Searle's ideas are the most fruitful ones to differentiate between technologies, human beings, and ordinary objects on the basis of their individual properties. The point is that Searle's approach is closer to what is known as the *modernist* view. Modernism, as I use the term, refers to any philosophical movement that first, makes a distinction between the subject and the object of knowledge, and secondly, believes in facts that are universally true and their truth is independent from human beings. Science claims to be seeking such truths that as Searle would put it, are epistemically objective. So Searle also examines properties of things in themselves. Unlike Latour who holds a network metaphysics and contends there is nothing by itself or for itself and unlike phenomenologists who start their investigations on the basis of intentional relations between subject and object which makes it problematic for them to get into properties of things in themselves, Searle asserts there are some facts in themselves. This modernist view makes Searle's philosophy fruitful to differentiate between technologies, human beings, and ordinary objects with regards to their individual properties.

Searle's notion of individual intentionality is a conceptual tool to discern with human beings and the present generation of technologies with respect to those properties that they have in themselves. He believes the metaphysics of intentionality is such that even the most sophisticated products of AI do not have individual intentionality, although it does not mean that Searle concedes to a kind of dualism or that he thinks it is impossible in principle for technologies to be intentional. So on the one hand, with his biological naturalism, Searle agrees with the materialist claim that the world is only made of material stuff, and that our brain causes our intentional states, and that the brain is nothing but a piece of machinery. And on the other hand, his criticism is directed against Strong AI theory claiming that there is no distinction between mental capacities of an appropriately programmed computer and human mind. Therefore, Searle concedes to the idea that there could

---

[12] Here I excluded the possible future post-humans, which are partly technological, who could outwit human beings.

emerge a generation of artifacts in the future that possess individual intentionality. In any case, the notion of individual intentionality gives Searle the possibility to differentiate between human beings and at least the (persuasive) technologies we cope with these days.

In his *The Construction of Social Reality*, Searle develops his notion of derived (or collective) intentionality to distinguish between technologies and ordinary objects. In his view, technological artifacts perform functions and bear some meanings that could not be explained by their physical or chemical properties alone. The function of a screwdriver and the meaning ascribed to the lines and curves on the LCD of a GPS device could not be explained by their physical properties, but are assigned to them by other social agents. That is what differentiates technologies from ordinary objects. Ordinary objects do not have any form of intentionality and their behavior could be explained solely by laws of nature, whereas, technologies have a derived form of intentionality and their function cannot wholly be explained through scientific laws. Clearly, this account applies also to persuasive technologies as well. As I showed in the first chapter, based on Searle's ideas, the beep of an anti-shoplifting gate has some meaning which displays its intentional character that cannot be explained through its physical properties alone. In the first chapter I also mentioned that one can use the notion of derived intentionality and go beyond Searle by distinguishing two levels at which an anti-shoplifting gate or a GPS device bears collective intentionality. First, there is a type of derived intentionality in the meaning assigned to the gate's beep or to the GPS's curves. Secondly, whenever such technologies join a collective act (of persuasion), they share a collective intentionality in their collective act (of persuasion) with other social agents in that context. Therefore, while ordinary objects do not have any form of intentionality and humans have individual forms of intentionality in addition to collective intentionalities they share with others in their collective acts, technologies stand somewhere in the middle and only, yet necessarily, possess a derived form of intentionality.

In addition to clarifying the border between ordinary objects and technologies, Searle's notion of collective intentionality leads us from discussions on individual properties of technologies to more social ones. The point is that collective acts are not performed by any individual or any artifact on its own but by the whole social context including humans and technologies. Therefore the intentionality involved in any collective act belongs to the whole context. In the case of persuasive technologies, the persuasive character which is normally attributed to an artifact actually belongs to the whole network. More precisely, as Latour would put it and I presented in the second chapter, although the persuasive character of persuasive technologies is inscribed by designers, since the act

of persuasion is in fact performed by the whole network, we had better replace the phrase "persuasive technology" with "persuasive network".

Latour also advocates the idea of the inherently social character of technologies. With his network ontology, Latour argues that the analysis of technologies starts from the social level, and so the existence of technologies depends on the network in which they act. Thus, both Searle and Latour contend that metaphysically speaking technologies are necessarily network-dependent. This fact is clear in Latour's network ontology and his claim that 'Nothing, not even the human, is for itself or by itself, but always *by other things* and *for other things* (Latour & Venn, 2002, p. 256, Italic in the original text). In Searle's philosophy also technologies necessarily have a social character, because the function of technologies is a social fact for any function is ascribed to technologies by people dealing with them. And since the way people deal with the phenomenon of a social fact is partly constitutive of that phenomenon (Seale, 1985, pp. 31-32), technologies are necessarily network-dependent. The difference between these two philosophers is that Searle's philosophy starts from individual properties, and even in the case of intentionality, his theory of collective intentionality is founded on his theory of individual intentionality, while Latour's philosophy starts from social networks and never gets into analysis of actors on their own.

In addition to claims that the existence of technologies is network-dependent and that persuasion is not an act of an artifact but of a network, Latour's Actor-Network-Theory and Searle's philosophy have some other implications for the subject of intentionality of persuasive technologies in a way or another that I mention them here.

1- As their definition goes (Fogg, 2003), persuasive technologies are those that influence people's decision-making or beliefs and this influence should be intended by designers. However, Latour believes having some influence is not specific about any kind of technologies; rather, all technologies influence and even co-shape our humanity. We share many modes of existence with technologies and without technologies we would have been different from what we are (Latour & Venn, 2002).

2- Latour's philosophy teaches us to turn our view from the designers' point to what technologies actually act in networks. Latour approaches technologies as actors with a normative character which means they do not always act according to designers' wishes and expectations. There are at least two reasons for technologies not to have the same role in networks that engineers have inscribed to them. First, users may give a different task to the

artifact. For instance, people may use anti-shoplifting gates as goals in a football match. Secondly, technologies may themselves decline to perform the inscribed tasks which itself could have different reasons. For example, an anti-shoplifting gate will not beep when the shoplifter knows enough about electronics to isolate the RFID chip from electromagnetic radiations and render the artifact useless. Therefore, one cannot tell whether or not an artifact that engineers design will have persuasive characters even if designers apply psychological tricks to inscribe persuasive effects on the artifact; rather, one should examine how a technology actually acts in a network, and if this act turns out to be in line with engineers inscriptions, one can call it a persuasive technology. This all, of course, does not mean that persuasion is an act of the entire network.

3- As a result of the previous note, no one fully knows how a technology is going to be used, and an artifact may end up behaving differently from designers' inscriptions. However, designers should not be totally thrown out of the network of persuasion, because as social agents, they participate in the meaning ascribed to technologies and the way artifacts are used. In the last section of the first chapter, when I was analyzing the intentional causal relations that contribute to any instance of persuasion, I reached the same conclusion from Searle's philosophy. I mentioned that although designers have a general idea on the way a technology is going to be used, since they have not thought about any given instance of persuasion, their individual intention is not causally linked to the persuasive act. Notwithstanding, they are members of a society that the meaning and intentionality of persuasive technologies is derived from.

So far, I have pointed out the differences between human beings, ordinary objects, and technologies on the basis of their individual properties. I used Searle's notion of individual intentionality as a criterion to make a distinction between human beings and the other two groups and his notion of derived intentionality to differentiate between technologies and ordinary objects. As I elaborated before, derived intentionality has a social character. In other words, derived intentionality is not a property of things *in themselves*, but is intentionality that is derived from other social agents. Therefore, technologies and ordinary objects cannot be differentiated based on their individual properties, but it is their social status that identifies technologies from ordinary objects. This fact, first, shows that the engineers' view is right that all technological and non-technological objects obey the same laws, and therefore their behavior is predictable by the same scientific laws. Secondly, it implies that one should always keep in mind the social context around a technology, to

be able to differentiate between technologies and ordinary objects. So if one of the important aspects of persuasive technologies is their social status, we had better replace the phrase "persuasive technology" with "persuasive network."

2- Postphenomenological view to technologies

If intentionality and persuasion of persuasive networks belong to the entire network, and not to any individual actor, it is still tempting to open each network and analyze the human-technology relations that contribute to the program of action of the network. Postphenomenological studies are fruitful for such discussions. One of the characteristics of postphenomenology is its emphasis on both levels of perception, namely, macro- and micro-perception. Microperception is the sensory-bodily aspect of perception. The physical experience of my fingers' touching my laptop's keyboard, as distinct from the social context in which it takes place, is a microperception. Macroperception is the cultural and hermeneutic aspect of each perception. It refers to the cultural background in which a microperception takes place. This way, postphenomenological analyses of Ihde and Verbeek on the one hand, keep an eye on the social context of each perception, and on the other, display the microperceptual structure of any instance of human-technology relations. Therefore, Ihde and Verbeek would accept the idea of replacing the phrase "persuasive technology" with "persuasive network" or "persuasive context", but that just covers the macroperceptual level. At the microperceptual level one can identify human-technology relations that stay at the center of persuasive networks. These relations, on the one hand, show another way of differentiating between technologies and ordinary objects, and on the other hand, clarify the microperceptual structure of persuasion.

Next to the individual and social characteristics of technologies, another peculiarity of technologies that differentiates them from ordinary objects lies in their microperceptual mediatory role. Technologies mediate the way humans are directed toward the world. The relations humans establish with technologies change humans' perceptions and shape their conception of the world. A piece of junk lying at a corner does not mediate my perceptions, unless I actually use it as a tool, say, to hammer a nail. This fact has two implications. First, there is no inherent difference between an artifact and ordinary objects. Second, microperceptual mediation is another peculiarity of technologies that differentiates them from ordinary objects. Soon after an object is used as an instrument, or a machine, it becomes a technology. Each technology, on the one hand, mediates any

instance of the users' bodily-sensory perceptions, and on the other hand, enters the cultural context in which the microperception has taken place.

This way, Ihde's philosophy by emphasizing the macroperceptual part of each experience, clarifies how we can move from a network perspective into human-technology relations happening between users and technologies. Since at the core of each persuasive network there lies a microperceptual human-technology relation, we can replace the phrase "persuasive network" with "persuasive relation" albeit as long as we still keep in mind the significance of the context of persuasion. Don Ihde and Peter-Paul Verbeek have identified different structures of human-technology relations. Since one of the characteristics of persuasive technologies is that users make interaction with, not through, technologies, we should look for those structures in which technologies become focal. Ihde's hermeneutic and alterity relations display such structures. In both relations the technology becomes a focal entity. In hermeneutic relations the technology gets some data from the world, transforms them, and presents them to the users in a different way. An ECG, a barometer, and a GPS device establish persuasive hermeneutic relations with users. In alterity relations the technology becomes a *quasi-other* which is *quasi-autonomous*. It stands in front of the user(s) and interacts with them. In alterity relations the technology makes little or no relation with the world. An anti-shoplifting door acts as a quasi-human standing in front of each store and controlling customers for a possible case of shoplifting. An internet message popping-up on the screen of my laptop that tries to persuade me to click on a specific link to win 1,000,000 Euros establishes a persuasive alterity relation with me. So persuasive character of persuasive technologies is either in their indirect manner of giving information they give about the world (hermeneutic relations) or in their *quasi-other* character that interacts with users (alterity relations).

The technological mediation in hermeneutic and alterity relations blurs the distinction between the two types of technological intentionality I described earlier, namely, the intentionality in the meaning we assign to technologies and the intentionality in technologies' participation in collective acts. With the aid of phenomenological analyses we realize that although such a distinction would clarify our concepts and discussions, these two types of technological intentionality are not independent from each other. In hermeneutic relations technologies act by giving new dimensions to our conceptions of the world which influences our behavior, and at the same time acts of technologies are meaningful only if they happen in a cultural hermeneutic background. In alterity relations also, the meaning we assign to the technologies' behaviors is contingent on its behavior, and at the same time, the act of technology should be seen in a context where it gets its meaning.

This interdependency of the two dimensions of technological intentionality is an implication of postphenomenology's emphasis on both levels of perception and their connection to each other. Thus, one can conclude that Ihde's notion of macroperception amounts to the context which Searle believes a technology gets its meaning from, and his notion of microperception amounts to every single act of a technology in the network it functions with its ostensible temporal and spatial limits. If we unwrap such a network, as Latour would put it, we find contribution of heterogeneous actors extended through time and space. This way, postphenomenology connects Searle's idea of derived intentionality in the meaning of each artifact with Latour's idea of non-human actors by its own notions of micro- and macro- levels of perception.

I recap the achievements of the entire thesis in general and this chapter in particular with an exclusive eye on the intentionality of the so-called persuasive technologies.

3- Conclusion

This thesis has two main achievements. On the one hand, it clarifies the definition and concept of persuasive technologies, and on the other hand, it analyzes the intentionality of such technologies. I will begin with the former, and then I will proceed to the latter.

3-1- From persuasive technologies to persuasive networks and to persuasive relations

In the introduction of this thesis I elaborated Fogg's definition of persuasive technologies. As I displayed, there are three important points in Fogg's definition. First, persuasive technologies are those that influence users' behavior and decision making. Secondly, these technologies are those which are designed by the designers to have such an influence. Third, persuasive technologies are those that users interact with them, not through them. This last part of Fogg's definition of persuasive technologies leads us to Ihde's hermeneutic and alterity relations. In these relations technologies are focal and the users' interact with the technology. However, some words could be said about other parts of Fogg's terminology:

1- Latour's ANT teaches us that technologies do not always act according to engineers' inscriptions. So we should turn our view from the designers' viewpoint and study technologies in the networks they act. If this act turns out to be in lines with the inscriptions, one can call the technology persuasive, otherwise, not. Therefore, one cannot refer to a technology which has just been produced by a factory persuasive before it joins any network of action. No factory produces persuasive technologies.

2- The inherently social character of persuasive technologies shows there cannot be any persuasive technology on its own. Persuasion is the act of an entire network, so we had better modify Fogg's terminology and replace the phrase "persuasive technologies" with "persuasive networks". A GPS device works in the context of satellites orbiting around the earth, people who ascribe a certain meaning to the combination of lines and colors it shows on its LCD, the earth itself, and so on. An anti-shoplifting gate works in context made of RFID chips, social agents who interpret its beep as a sign of a possible case of burglary, shopkeepers, customer, etc.

When we examine each network of persuasion, we can identify some given human-technology relations that lie at the heart of the network. Those relations which are in the form of Ihde's hermeneutic and alterity relations establish the microperceptual level of the technological persuasion. So, it would be insightful to replace the phrase "persuasive networks" with "persuasive relations", albeit as long as we never forget that all actors of the network of persuasion contribute to the persuasive effect in a way or another.

3- All technologies influence people's decision making and beliefs. Their influence is even further then just shaping some beliefs: technologies constitute part of our humanity; we share some modes of existence with technologies. Therefore, Fogg's claim that persuasive technologies are those which influence people's behavior or decision making is redundant.

3-2- Intentionality of persuasive technologies

Searle makes a distinction between individual and collective forms of intentionality. The current technologies do not have the individual form intentionality. However, all technologies, including the so-called persuasive ones, bear a collective form of intentionality, which shows itself at two levels, namely, the meaning ascribed to the technology, and every single act of the technology. Both of these intentionalities have a social character. The intentionality in the meaning of the technology belongs to the context where it gets its meaning from, and the intentionality in the persuasive act of the so-called persuasive technologies belongs to the network in which it acts. The context in the former kind of technological intentionality should not be confused with the network in the latter. The former is a Searlian context where its individuals with more fundamental types of intentionality assign a function and meaning to the artifact, and the latter refers to a Latourian network where the act of the artifact with its spatio-temporal limits is obtained. Postphenomenologists refer to the cultural-hermeneutic background that gives meaning to the technology as macroperception and to

the persuasive human-technology relations that lie at the center of each network of persuasion as microperception. Notwithstanding, these two levels of perception or these two levels of intentionality are not independent of each other. On the one hand, any instance of microperception gets its meaning from the macroperceptual context and at the same time slightly alters this hermeneutic background. On the other hand, the meaning we ascribe to technologies is contingent on the way they act, and at the same time, their acts could be seen as persuasive as long as they bear specific meanings.

Addendum

Verbeek and Heersmink, as I put in chapter three, go beyond Ihde's hermeneutic and alterity relation by their scheme of composite intentionality and reciprocal intentionality. Granted their supplement to Ihde's postphenomenology, the new structure of human-technology relations should be put in these schemes:

Verbeek's scheme of composite intentionality:

$$I \rightarrow (\text{technology} \rightarrow \text{world})$$

Heersmink's scheme of reciprocal intentionality:

$$(I \leftrightarrows \text{technology}) - \text{world}$$

The difference between these schemes and those of Ihde's is the arrow they draw coming from technology to human beings (in reciprocal intentionality) and to the world (in composite intentionality). Since the arrows in Ihde's schemes indicate human intentionality (Verbeek, 2008, p. 389), in Verbeek's and Heersmink's schemes also they are meant to serve technological intentionality at the same microperceptual level. So for instance, in this account, a GPS has an intentional relation with satellites rounding around the earth. I disagree with attributing such a kind of intentionality to technologies. Although I agree that there is a relation between a GPS device and the satellites, but this relation could easily be explained by natural laws. The point is that causally speaking, there is no difference between the case where a GPS is directed at a satellite and the case where I kick a football to give momentum to it. Both cases yield to the same physical laws and their case is different from intentional relations where, as Searle would put it, a whole network of intentionality contributes to a specific intentional state, or as Ihde would put it, there always is a macroperceptual and hermeneutic field behind any microperception. It sounds implausible to claim a GPS has a hermeneutic macroperceptual background in which its microperception takes place.

To conclude one can criticize technological intentionality in Verbeek's and Heersmink's, respectively, composite relations and reciprocal intentionality from three viewpoints. First, Searle's philosophy tells us any individual intentional state occurs in a network of intentionality. Since the present technologies do not have any network of intentionality, they cannot bear the individual type of intentionality that human beings could. Secondly, Ihde's postphenomenology emphasizes the

strong connection between micro- and macro- levels of perception. He believes there cannot be any microperception without macroperceptual background, and the other way around. Therefore, since technologies do not have the same kind of cultural hermeneutic field that we share, one cannot speak about intentionality of technologies at a microperceptual level. Thirdly, on the basis of the argument I made, technologies follow the same natural laws that ordinary objects do. According to Occam's razor, we should stay parsimonious in our ontology, and so, we do not need to assign intentionality to technologies to predict and explain their behavior.

Thus, to show the microperceptual structure of human-technology relations in the case of persuasive technologies, we need to go back to Ihde's hermeneutic and alterity relations as relations that on the one hand, keep the importance of the context at which an experience is taking place, and on the other hand characterizes the microperceptual structure of human-technology relations in such a context.

References

Berger, P. L. (1980). Man and Technique. In A. Gehlen (tr. Patricia Lipscomb), *Man in the Age of Technology* (pp. 1-22). Colombia University Press.

Floridi, L., & Sanders, J. W. (2004, Vol. 14), 'On the morality of artificial agents,' *Minds and Machines*, 349-379.

Heersmink, R. (2008). *Ghost in the Machine: A Philosophical Analysis of the Relationship between Brain-Computer Interface Applications and Their Users.* Final Master Thesis; University of Twente Manuscript.

Heidegger, M. (1977). "The Question Concerning Technology." In W. Lovitt, *The Question Concerning Technology and Other Essays.* Harper & Row.

Ihde, D. (1993). *Postphenomenology.* Northwestern University Press.

Ihde, D. (1990). *Technology and the Lifeworld: from garden to earth.* Indiana University Press.

Kroes, P. (2003), 'Screwdriver Philosophy; Searle's analysis of technical functions,' *Techne,* 6:3, 22-35.

Latour, B. (1992). 'Where are the missing masses? The sociology of a few mundane artifacts.' In W. E. Bijker, *Shaping Technology-Building Society: Studies in Sociotechnical Change* (pp. 225-258). Cambridge: MIT Press.

Latour, B., & Couze, V. (2002). 'Morality and Technology: the end of the means.' *Theory, Culture & Society* , 247-260.

Law, J. (1992). 'Notes on the Theory of the Actor-Network: Ordering, Strategy, and Heterogeneity.' *Systems Practice, Vol. 5, No. 4* , 379-393.

Searle, J. R. (1980), 'Minds, Brains, and Programs,' In J. Haugeland, *Minds Design II: Philosophy, psychology, artificial intelligence* (pp. 183-204), MIT Press.

Searle, J. R. (1981), 'Intentionality and Method,' *Journal of Philosophy* , 720-733.

Searle, J. R. (1983), *Intentionality: an essay in the philosophy of mind*, Cambridge Univeersity Press.

Searle, J. R. (1984), 'Intentionality and its place in nature,' *Synthese, No. 61* , 3-16.

Searle, J. R. (1990), 'Collective intentions and actions,' In P. Cohen, & e. al., *Intentions in communication* (pp. 401-416), MIT Press.

Searle, J. R. (1992), *The rediscovery of the mind*, The MIT Press.

Searle, J. R. (1995), *The Construction of Social Reality*, The Free Press.

Searle, J. R. (2002), 'Why I am not a property dualist,' *Journal of Conscious Studies, No. 12* , 57-64.

Searle, J. R. (2004), *Mind: a brief introduction*, OXFORD University Press.

Searle, J. R., & Putnam, H. (2001), 'On Hilary Putnam's Farewell Lecture,' *The Harvard Review of Philosophy* , 4-6.

Siewert, C. (Fall 2008), 'Consciousness and Intentionality,' *The Stanford Encyclopedia of Philosphy* , URL = http://plato.stanford.edu/archives/fall2008/entries/consciousness-intentionality/.

Verbeek, P.-P. (2008). Cyborg intentionality: Rethinking phenomenology of human-technology relations. *Phenomenology and Cognitive Sciences* , 387-395.

Verbeek, P.-P. (2009). *Moralizing Technology: Understanding and designing the morality of things.* Manuscript.

Verbeek, P.-P. (2005). *What Thigs Do.* The Pennsylvania State University Press.

Zahavi, D. (2008). "Phenomenology." In D. Moran, *Routledge Companion to Twentieth-Century Philosophy* (pp. 661-692). Routledge.