The Product Impact Tool:
The Case of the Dutch Public Transport Chip Card

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Abstract

The Product Impact Tool aims to make a contribution to translating theories of behaviour influencing technology into design practice. It does so by providing examples of the effects of technology on people to help analyse and redesign technical products. The introduction of a public transport e-paying system (OV chip card) in the Netherlands serves as a case to illustrate how the Product Impact Tool can contribute to the development and introduction of new design products and systems. The Product Impact Tool helps to improve the usability and user acceptance of products as well as to address social and ethical questions concerning innovations.

Keywords: Product Impact Tool; Design; Behaviour Influencing Technology; Philosophy of Technology; Social Responsibility.

The Product Impact Tool: Introduction

This chapter presents the Product Impact Tool and illustrates its use with the case of the "OV chip card" (Dutch public transport e-paying system). The core of the Product Impact Tool is a model that contains examples of the different ways in which technology can impact people's lives. In addition, it includes workshop session guidelines for applying the model (Dorrestijn, 2012a, ch. 8). On the web version of the Product Impact Tool, which is under continuous development, introductory texts and movie clips are available as well as the above mentioned guidelines and materials[1].

The Product Impact Tool issues from a research project in which industrial designers, design researchers and researchers in the philosophy of technology worked together to develop methods to "design for usability" (see Kuijk, 2012). In this context, a subproject about the impact of products on users investigated the question whether knowledge about this impact could help to anticipate and avoid problems of usability and technology acceptance and to design products in a way that they deliberately guide and change user behaviour.

[1] www.stevendorrestijn.nl/tool

This focus originates from reflections on work by a number of philosophers, historians, and anthropologists. For example, philosopher Langdon Winner (1986) revealed how the overpasses to Long Island in New York were intentionally designed very low by city planner Robert Moses to prevent busses from entering this area. In this way, the overpasses acted as a vehicle for Moses' political intention to keep away poor, black people. Winner used this as an example to show that "artefacts have politics". Media philosopher Vilém Flusser expressed something similar when he said that designing is an act of throwing "obstacles in other people's way" (Flusser, 1999, 59). Anthropologist and philosopher Bruno Latour asserted that we cannot understand human action and morality if we do not acknowledge the moral significance of things and he therefore saw behaviour constraints by technical products as "delegated morality" (Latour, 1992).

While these reflections comment on the role of artefacts and products per se, in order to implement knowledge about product impact on user behaviour in design, there is a need for concepts and frameworks aimed towards application (see e.g. Verbeek 2005). On the side of the design discourse, one pioneer in this respect was Donald Norman (1988), who introduced the concept of "affordance" (from ecological psychology) to analyse what behaviours a product affords into usability studies. More recently the approaches of "persuasive technology" by BJ Fogg (2003) and of "nudge" by Thaler and Sunstein (2008) have both met much acclaim and there is further recent research in the field of design for behaviour change (as this volume testifies). The Product Impact Tool aims to combine such design oriented approaches with the philosophical perspective.

Both from the perspective of design and from a philosophical perspective, the issue of behaviour-influencing technology raises pressing questions of a broad social and ethical nature, which this chapter also seeks to address: How does technology mediate human existence? Is it the responsibility of the designer to determine how people live and use technical products? Is it morally acceptable to influence people by means of technology? The project's aim of integrating knowledge about the impact of products on users and methods to improve usability is therefore bracketed by the larger philosophical question of how the relation between humans and technology can be understood and improved.

The contribution of the Product Impact Tool to design for behaviour change is that it offers a broad interdisciplinary collection of relevant concepts and examples. An important characteristic of the tool is that it combines both reflective and applied approaches. The scope of application is equally broad, ranging from improving product usability and acceptance, to addressing ethical issues and social responsibility.

The Product Impact Tool: Model

The core of the Product Impact Tool is a model covering a repertoire of effects of technology ordered according to four different modes of interaction.

Modes of Interaction
If technical products influence users, the question can be asked "from which side" technology affects them. In this way, four modes of interaction can be distinguished, which are represented by the four quadrants of the diagram: before-the-eye, to-the-hand, behind-the-back, and above-the-head (Figure 4.1). These terms correspond to the following terms more common to the fields of design and exact sciences: cognitive, physical, background, and abstract. A theoretical grounding of why these four modes of interactions were chosen follows in a later section.

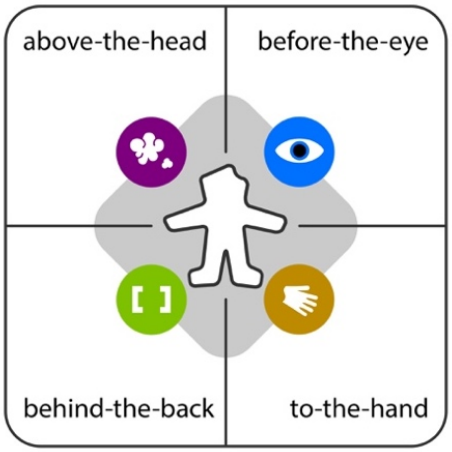

Figure 4.1: Modes of interaction in the Product Impact Model

Before-the-eye is the mode of interaction that applies when technologies address the user's *cognition*. In this case, technology functions as a carrier of meaning or information. Products offer signs that inform our decision making faculty. Think of light and sound signals, texts, shapes that are recognized as buttons and handles. In the model, the eye is the symbol for this connection, but the other senses can act as information receivers too.

To-the-hand interaction takes place through *physical* contact or affect on the senses. These most obvious influences of technology on humans are direct effects and affects on the human body and behaviour. Fences and gates may be archetypal examples. The hand symbolizes this interaction mode.

Behind-the-back designates influences yielded by technology in the wider environment or *background* which work only indirectly, without direct user-product interaction before-the-eye or to-the-hand. In this quadrant one finds in particular historical, geographical, and sociological insights about technology.

The *above-the-head* quadrant comprises a summary of generalizing views on technology, *abstracting* from concrete examples. These grand philosophical and ethical ideas do not literally make contact with the body, but are positioned above-the-head in the model.

Repertoire of effects

The modes of interaction framework serves to visually frame a repertoire of effects of technology. The categorization of three types of effect in every quadrant of the model (twelve effects in total, see Figure 4.2) is the result of an attempt to balance comprehensiveness with clarity. Most of the terms used are common in thinking about technology and design, even in everyday language. References are given only in the case of literal adoption of examples or concepts. A discussion, including further references to examples and relevant concepts in the different theoretical disciplines can be found elsewhere (see Dorrestijn, 2012a, ch. 4; 2012b).

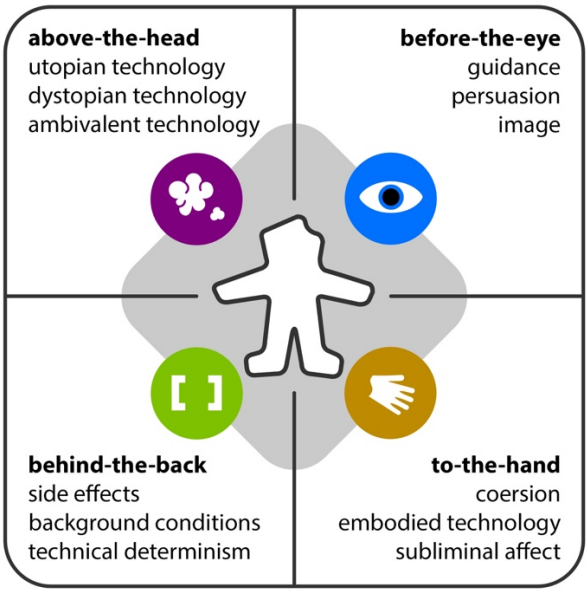

Figure 4.2: Product Impact Model with Modes of Interaction and Effects

Before-the-eye*: *guidance*, *persuasion*, and *image

The first type of influence in this quadrant is *guidance* towards intended use. In design, this effect is addressed by aiming for self-evident forms and colours through product semantics (e.g. Norman, 1988; Boess & Kanis, 2007), or by adding arrows and text, etc. The influence on human action can also be more intrusive: *persuasion* through design, termed after "persuasive technology" (Fogg, 2003). In this case technology not only guides towards proper use but is designed with the aim of interfering in people's behaviour, as in the case of pop-up banners on websites that, for example, persuade people to 'buy today' or 'click here'. In either case, technology addresses the human decision-making process. A third type of effect is the expression of people's self-*image* or lifestyle by design. For example, products like clothing or cars (Miller, 2010, 104) allow people to shape and express their identity.

The mechanisms collected in this quadrant are drawn from the intersection of behavioural sciences and design. These insights have been gaining an increasingly widespread application in current practice in design. Think of design for usability, branding, and social design.

To-the-hand*: *coercion*, *embodied technology*, and *subliminal affect

The first type of influence in this quadrant is *coercion*. This is perhaps the most obvious of all impacts of technology. Examples are a fence to control people's access or a speed bump forcing car drivers to slow down (Latour 1992). [2] A further category, *embodied technologies* (e.g. Ihde, 1990), concerns abilities such as writing with a pencil, riding a bike, or playing a musical instrument. Such activities are unthinkable without the associated artefacts, which typically must be handled with skill. Developing techniques of use (Tenner, 2003) involves much practice, but once accomplished the discipline of learning is soon forgotten. The objects involved come to be experienced as natural

2

extensions of our body and smoothly integrated in our routine behaviours. *Subliminal affect* is the type of effect of being attracted or repelled by only half-conscious sensations, for example marketers advise super markets to introduce the smell of fresh bread and coffee to enhance people's experience of hospitality and influence their buying mood.

Influences by physical interaction are widely applied in the form of technical obstructions such as fences, locks, etcetera. Compared to product impacts that address the user's cognition, such physical interference in behaviours may seem more intrusive and remind of an era of mechanical technology. Yet, the upsurge of interfaces based on touch and gestures shows that physical interaction remains fully important in the era of information and ambient intelligence.

Behind-the-back*: *side effects*, *background conditions*, and *technical determinism

Technologies or designs commonly have *side effects*. A product may perform its intended function well, but in the second instance the advantages with respect to the primary function may be undone by disadvantages on another level. Secondly, the successful functioning of a product is dependent of *background conditions*. A product may require an infrastructure for maintenance or provisioning, or the operation requires prescience and skills. *Technical determinism* means that technical developments instead of responding to existing needs may have a dynamic of their own and create or transform human values and needs.

Because this type of influence is indirect and because the environment extends endlessly it is impossible to simply apply behind-the-back effects. But at least acknowledging the context can help to control risks. System engineering and designing product service combinations are examples of actually approaching product and wider context together.

Above-the-head: utopian technology, dystopian technology,* and *ambivalent technology

What is, all these concrete impacts taken together, the meaning of technology as a whole? Does it liberate or control humanity? Is it desirable or dangerous to develop behaviour influencing propducts? Claims on the meaning of technology in general are very diverse and often contradictory. *Utopian technology* denotes the very optimistic belief in progress by means of technology (the typical view in modernity). *Dystopian technology* refers to the opposite view, the fear of domination (prevailing in the twentieth century with the nuclear bomb and ecological crisis). The view of *ambivalent technology* is the prevailing view in contemporary philosophy of technology. While a profound hybridity of humans and technology is acknowledged this is not evaluated with either euphoria or despair, but as always ambivalent.

The use of these generalizing ideas, abstracted from tangible and concrete examples, is not to materialize them in design. They do however inform thinking about technology, as in drawing future scnenarios[3]. Moreover, these general views often figure in controversies about technology. That makes this quadrant in particular helpful for ethical reflection and discussion.

[3] Combining Product Impact and scenarios in design, both for improving product use (scenario based design) and for future scenario planning is the topic of another publication (Dorrestijn et al 2014).

Theoretical backgrounds

The Product Impact model has a background in research on "technical mediation". This term is used by scholars in the philosophy of technology and associated disciplines to denote that humans do not simply use technical products, but that technology has deeply transformed and marked human existence (McLuhan, 2003; Ihde, 1990; Feenberg, 2002; Kockelkoren, 2003; Verbeek, 2005). A book title by Peter-Paul Verbeek (2005) indicates that such research is about "*what things do*". Questioning the impact of products on users and society is a good starting point for translating technical mediation research to practical application and has led to the Product Impact Tool. This section discusses the theoretical position and background of this framework. What kind of model or theory about the impact of things is necessary and achievable?

The interaction and impacts between technical objects and people are to an important degree human and social phenomena which escape a fully objective description by some mechanistic theory. For, one can never altogether see through oneself. And by knowing about ourselves and acting upon that knowledge we also change ourselves. In terms inspired by the philosopher Michel Foucault (2000) a theory about *Product Impact* has a self-reflexive character: it concerns our attempt to understand and take care of our own condition of being regarding the impacts of technology. The categories of effects in the Product Impact Tool model should therefore be seen as expressions of *what we think things do to us*. This phrasing adopts Verbeek's notion of *what things do*, but adds an explicit reminder about the reflexive and performative character of product impact knowledge. As the tool aims to offer a repertoire of recognisable effects, rather than a complete explanatory theory, an advantage is that it allows to use and compare examples and concepts from different times and across the disciplines.

The character of self-investigation is also expressed by the question from wide sides the impacts of technologies seize us in the set up of the the Product Impact Tool model. The approach and terms for discerning the four modes of interaction are inspired by phenomenological research in philosophy and media studies, in particular by Vilém Flusser and his posthumous book on "Becoming human", *Vom Subjekt zum Projekt: Menschwerdung* (1994). Flusser reconstructs through historical-anthropological findings, etymological traces, and admirable philosophical imagination how humans first became humans by learning to use their hands and feet (*Vorderhand*). In a later stage casting an eye (*Augenblick*) became more important for the human way of being in the world. This second more cognitive and analytical posture to the world eventually superseded the earlier physically immersed way of being.

The categorization also reflects different notions from Don Ihde's phenomenology of human-technology relations, and thereby the whole phenomenological history that Ihde synthesizes (Ihde, 1990, 72). To-the-hand reflects Ihde's "embodiment relation" (as well as Merleau-Ponty's "embodiment" and Heidegger's "readiness-to-hand"). The term *before-the-eye* is indebted to McLuhan's notion of "an eye for an ear" which is his abbreviation of his comparisson of tactile-acoustic space and visual space (cf. McLuhan, 2003, 115). It equally reflects Ihde's "alterity" and "hermeneutic" relations and Heidegger's analysis of "presence-at-hand". The behind-the-back category resembles Ihde's "background relation", and refers to McLuhan's notion of mediation by our technical environments. The "above-the-head" quadrant brings the non-empirical, generalizing philosophical conceptions of how technology influences us within the scope of the model of interaction modes. This reflects Hans Achterhuis' (2002) notion of a "utopia/dystopia syndrome" in philosophical debates about technology and his call for an "empirical turn" to complement abstract analysis.

The Product Impact Tool is not a theory in the sense of explaining human-technology interaction in some mechanistic way. Still it can help structure anyone's thinking about the effects of technology by summarizing a variety of conceptualizations and examples that researchers have thought of previously. That it allows comparing examples from different theoretical backgrounds and historical periods is a benefit of this model.

The case of the OV chip card

The public transport e-paying system in the Netherlands (OV chip card) serves as a good case to illustrate the use of the Product Impact Tool. The introduction saw a wide range issues, from usability problems to important ethical concern about security, privacy and freedom. I will show how the Product Impact Model helps to assess the OV chip card system as well as to imagine redesign options.

The OV chip card is a contactless card that employs RFID technology. Travelers all need to have such a card and they need to check in and out every time they get on or off a train, bus or tramway. Buses and trams are equipped with a reader at the entrance and exits. In the case of the train and metro the readers are on the stations, either on the platforms close to the trains or at the entrance of the stations (Figure 4.3). Some stations are gated at the entrance, so that people have to check in before they go to the platforms. The OV chip card has been introduced nationwide in all the public transport companies' buses, trams, the subway systems, and trains.

Figure 4.3: Changing trains different companies requires a check-out and check-in.

The introduction has seen many problems, which have made the news headlines many times. In 2007, the Dutch Data Protection Agency (CBP) investigated the handling of data by the Amsterdam public transport company and concluded that too many data were collected and stored. Data were also insufficiently protected, for example against consumer profiling for personalized publicity (CPB 2007).

In 2008, computer security experts from Nijmegen University hacked into the RFID technology of the card (Broek, van den, 2008). They were able to read and duplicate cards and to open gates. This prompted a lot of debate in society and parliament. The OV chip chard was almost abandoned (see Hof, 2011).

Around 2009, when the public at large was introduced to the system, practical user problems came to the fore and attracted a lot of public attention, too. The main issue was the problem of *forgetting to check out* (a new and extra procedure compared to the old paper ticket system). In September 2010, it appeared that the public transport companies took half a billion Euros per month in deposit money due to 'incomplete transactions' (Koot, 2010).

Meanwhile, the OV chip card has almost fully replaced the paper ticket. Moreover, the security debate has somewhat faded away. But forgetting to check out continues to be an issue. Research in 2014 showed that incomplete transactions led to 16 billion Euros cashed deposit money in a year (Schepers & Zwart, 2014).

Forgetting to check out: design for usability

OV chip card developers have greatly underestimated the practical obstacles of users having to learn the new travel procedures, and to adapt to the new behaviour required by the new system. The most critical issue appears to be that people forget to check out. The user influencing effects in the before-the-eye and to-the-hand quadrants are helpful for conceiving concrete options for design improvements. Applying (cognitive) signs or (physical) constraints is always the most obvious way of introducing behaviour guiding and changing elements. Alternating between the two options is a good strategy in brainstorming about redesign. So, how could assessing and redesigning cognitive and physical product impacts help?

To-the-hand

Smooth interaction, coming with a natural experience, is achieved when the chip card and other components of the system become embedded in routines of travellers (*embodied technology*). But even if the procedures and devices allow for a smooth interaction, especially during the initial period of habituation users need extra help and other types of product impact can be helpful.

An obvious strategy is physical *coercion*. The checkpoint gates applied in many subway stations and increasingly in train stations can be seen as belonging to this category. While the promise of coercion is that nothing can go wrong, it often happens that the problems people experience actually get worse if things still do go wrong.[4] Furthermore, coercion generally decreases user-friendliness and can be perceived as an infringement of personal freedom.

Before-the-eye

Besides physical coercion, the effects of *guidance* and *persuasion* are useful options. The advertising campaigns and intercom announcements on trains and buses that instruct travellers

[4] Take the following anecdotes. An acquaintance had to wait in que for a checkpoint so long that when she had finally checked in, the metro left. She then wanted to take a train heading in the same direction which just stopped on the adjoining platform. She had to check out of the metro and check in for the train. But checking out appeared to be impossible. The checkpoint just returned the message: you have already checked in. Frustrated she decided to jump in the train anyway. This got her trapped in the system and all the more frustrated, for at the station where she got of there were gates and not properly checked in her card did not open the gate.

Another anecdote concerns a professor of design and philosophy who hurried with a coffee in his hand to the train. Before him somebody passed a gate, the professor presented his card, heard friendly bleeps coming from everywhere in the station, and thought that the gate stayed open for him to enter. But the gate door closed, hit the coffee and spoiled the professor's shirt.

about the new procedures are examples of *guidance*. Another aid, which is better integrated in the design of the system itself is the pink colour OV chip card corporate style. This does help to *guide* OV chip card users to the check in/out points. However, the system can and should be made to guide travellers much more strongly towards the right procedures. In the first years, shortage of checkpoints and sometimes illogical placement *misled* rather than *guided* people. The system made people *forget* rather than *remember* to check in and out.

Another strategy could be to attempt to redesign elements of the OV chip card system in a way that they teach people a lesson, encourage or seduce them (beyond merely providing guiding information). In the beforementioned workshops, participants considered how the card and gates could be made *persuasive* by making the interaction more challenging. Introducing a game element, "every tenth passenger travels for free", was one of the ideas. Turning the presentation of the card to the checkpoint into a more interesting procedure, by requiring a dance-like gesture with the card, was another (somewhat frivolous) proposal.

Freedom and privacy: societal and ethical issues

Whereas the right side of the Product Impact Tool model helps to assess and improve the concrete design and interface of products, the left side rather helps to bring up acceptance and ethical issues. The most important issues here have to do with privacy and freedom. An assessment in these dimensions may not yield concrete redesign options, but it can help to understand the context which needs to be taken into account when redesigning options for usability.

Behind-the-back

The electronic and radio frequency technology of the OV chip card is largely invisible and functioning *behind-the-back*. There are vast technical and organisational infrastructures that function as a *background conditions* of the card and checkpoints. The usability issues of the card are to an important degree caused by the fact that the background infrastructure is far from perfect. The initial lack of checkpoints was already mentioned. Also website procedures of subscription – to get the card working in the first place – were very complex (quite the opposite of the usability and flexibility that the system promised). Online skills and acquaintance with the registration procedures are therefore another background condition which can hinder for example elderly people and foreign travelers.

This brings us to *side effects* of the system. That elderly people and foreign travelers experience difficulties with access are unintended consequences. Undoubtedly, it was also unforeseen that, as a result of the system, travellers can now be seen queuing not only to get in but also to get out of busses, trams and train stations. This interferes with the promise of fast and easy payment. While a chip card check-in replaces ticket stamping by the driver, travellers are focussed on the card reader, with the effect that many people pass the driver without greeting. Impairment of personal contact is a common social side effect of ICT's. *Let devices come along but not in between*, seems therefore a widely applicable design motto.

A further consideration of *behind-the-back* is whether the OV chip card responds to human needs and values, or whether this technology rather creates and changes those (*technical determinism*). Considering how the e-payment system transforms our needs and the values of privacy and freedom helps understanding acceptance issues, although it also precludes unambiguous moral evaluations. The OV chip card promises ease of use: fast and easy checking-in and checking-out, jumping on and off trains, switching between train and subway, etcetera, while payment proceeds automatically. This flexibility indeed fits a trend of our time, conditioned by all kinds of network technologies in our environment. We have permanent access to the Internet for the weather forecast, banking, e-mailing etcetera. As soon as people become used to the e-paying card, the

activity structure of pre-planning a trip for the whole day, buying a ticket accordingly, and then sticking to the plan for the day, will very soon begin to feel outdated. Freedom is increasingly being associated with flexibility.

One can forecast, that in the age of flexibility the ticket controls on the train will increasingly be experienced as outdated and paternalistic, referring to a 1950's style of discipline, a form of morality from the past. The old paper ticket was as much as the new chip card part of a regime that structure our behaviour, and that conditions particular experiences of freedom and privacy. Even the fact that the new system still requires people to go searching for a checkpoint, belongs to the old structure of moral behaviour and does not appear congruent with the new trend of flexibility and ease. People will be prepared to connect their OV chip card to their bank account for automatic payment, but will be annoyed if instead of the promised flexibility and automatic payment they still get confronted with difficult and demanding procedures for checking in and out.

Above-the-head

The issues discussed from a historical and empirical perspective under technical determism, can also be considered from a philosophical and ethical perspective. As already mentioned, there is a tension between the idea of eternal values for philosophical and ethical evaluation and determinism by concrete, temporal developments. Moreover, if some technology supports or rather threatens a certain value, is often debated. In the case of the OV chip card the ambiguity of the meaning of technology indeed comes to the fore en sometimes even divides a single person or group. Hackers of the card make allusions all the time to the fear of a "definitive demise of privacy" as well as the need for an "absolute secure chip". The latter idea, of a completely secure and controllable technology, is an example of the view of *utopian technology*. The counterpart, the view of *dystopian technology*, marks the claim that the chip card system woukd be the next step towards Big Brother.

Understanding the variety of these general ideas helps to understand debates about specific cases. Acknowledgment of how different people, for example the engineers and the users of a system have different stances, is paramount for successful adoption of a technology. Ideas about the technology at an abstract level tend to dominate the debate about the public transport card. Such debates are all important but often also without a definitive conclusion. For that reason the success or failure of the OV-chip card will probably not so much depend on this debate about absolute security, but more on the user appropriation and solving of usability issues in practice. The recognition of both pros and cons to every technology and the importance of finding balance in practice is characteristic of the view of *ambivalent technology*.

Conclusions about the OV chip card case

The OV chip card is a good showcase for many of the effects of the Product Impact Tool, from the more practical effects on the right side of the model to the general views in the upper left quadrant. The debate surrounding the OV chip card has caused privacy and security issues to dominate the news. Security and privacy obviously deserve attention, but it is typical that this debate has taken precedence over attention to practical use problems. Difficulties in concrete interactions with the system, are equally important. Although the new ticketing system promises an increase of flexibility and comfort to travellers, there have been so many practical obstacles to this potentially great advantage, that during the introduction the system was a usability nightmare. These more practical issues have been discussed have been highlighted by zooming in with *to-the-hand* and *before*-the-eye quadrants of the model. The Product Impact Tool allows to zoom in and zoom out with the different dimensions of impacts and to understand usability problems, in relation to acceptance issues and ethical debate.

At some point a spokesman for the Dutch Railways announced on TV that they wished to increase surveillance on trains, to make sure that 90 percent of people would be motivated to check in and out. This seems an impossible attempt to maintain a routine of ticket buying and showing the ticket on the train that was conditioned by the old system and transfer it to the new technical environment. If more control is needed, this shows that the system fails to live up to its promise of augmented flexibility and automatic payment. An analysis of the technical environment helps to understand this problem of usability, in the broad sense of successful adaptation in user routines. The same spokesman also said that a lot more checkpoints were to be placed and routings improved. That seems a much more obvious solution for improving the chip card system, and contrary to the first proposal, shows some acknowledgement of the impact of technology on behaviour.

The Product Impact Tool and responsible innovation

The Product Impact Tool contributes to understanding human-product interaction as well as to design for behaviour change. A distinctive characteristic of the Product Impact Tool is its broad scope, from concrete human-product interaction to social and ethical issues. It can also help to address the question of how designers can mediate how we live. The perspective of product impact gives new impetus to the responsibility of designers.

Especially in the tradition of modernistic design theory and education, social engagement used to be an important aspect of design, often with utopian traits. With the advent of postmodernism utopian grand narratives have become suspect and seemingly abandoned. But its social engagement, even utopian striving, has not disappeared or is coming back, as is shown from titles such as *Do good: How designers can change the world* (Berman, 2009), or *Expanding architecture: Design as activism* (Bell & Wakeford, 2008). However, in both of these books the perspective of the impact of products (technical mediation) does not play an important or precise role. Berman for example makes an appeal to “not just do good design, but to do good”. The focus here is on the intention of designers. How products themselves guide and change people is not explicitly addressed. These initiatives could benefit from integration with recent work on the empirically oriented philosophy of technical mediation.

In the field of design, Victor Margolin is a design critic who offers a good starting point for fruitful collaboration of design practitioners and design philosophers. He states that the focus of design should be broadened from “products” to “the way we organize possibilities for human action” (Margolin, 2002, p228). The complementary task is to show how society and designers can cope with product impact. Margolin estimates: “A greater awareness of how products contribute to personal experience will help everyone act more consciously and decisively within the product milieu as we seek to improve the quality of our lives” (p55). Instead of ignoring the impact of the product milieu or trying to overcome it, the challenge is to employ it for the purpose of improving the quality of life.

What is required is to learn more about the social effects of technology. The impact of technology should not be ignored or rejected, but acknowledged as an important topic in design. However, it should be treated in a nuanced way. To avoid exaggerated and dangerous utopian programs as well as dystopian fears, it would be necessary to employ and further develop a more precise and ambivalent understanding of technical mediation, such as proposed by the Product Impact Tool. The challenge is to employ technology moderately and wisely for the purpose of improving the quality of life.

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Short-biography

Dr. Steven Dorrestijn is senior researcher in the Ethics and Technology group at Saxion University of Applied Sciences, the Netherlands. In 2012 Dorrestijn completed his PhD thesis (The design of our own lives: Technical mediation and subjectivation after Foucault) at the University of Twente, the Netherlands. Previously he studied Philosophy in Paris and Philosophy and Mechanical Engineering in Twente.

Figures

Figure 4.1: Modes of interaction in the Product Impact Model (Steven Dorrestijn)

Figure 4.2: Product Impact Model with Modes of Interaction and Effects (Steven Dorrestijn)

Figure 4.3: Changing trains different companies requires a check-out and check-in. (Steven Dorrestijn)