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Going Native with the Digital

Practices, Values, and Innovation in the Information Age

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Abstract

Digital technologies have become a part of everyday life, and are now taken for granted, especially by younger generations – the *Digital Natives*. This new generation of users has grown up surrounded by information technology and therefore embedded the digital into their habitus. They have mastered to combine digital and non-digital artifacts in order to adopt their everyday networks to their individual needs.

This thesis seeks to understand the everyday practices and materiality in in the information age from the perspective of the *Digital Natives*.

Therefore, a combination of observation and interviews with university and high school students was conducted in order to gain insights into the experiences of digital everyday life. Hereby, he focus lies in the particular understanding of how *Digital Natives* are constructing and stabilizing networks that are evolving around their practices with digital technologies. By building upon a theoretical foundation of Actor-Network-Theory and Phenomenology, the analysis aims toward an in-depth understanding of the diversity among users of new technologies.

In the latest years there has been an increasing importance of cultural analysis in user-centered design and innovation. Designers strive to develop products that contain a certain value for the user – functional but also social and emotional. The thesis therefore reflects upon the potential of cultural analysis in innovation research and how its application can help to develop an image of the user of tomorrow.

Keywords: Digital Age; Technology; Everyday Life; Material Culture; Phenomenology; Actor-Network-Theory; Innovation; Design; Qualitative Methods;

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Introduction

> ***"Digital –*** *(late 15th century: from Latin* digitalis*, from* digitus *'finger, toe) [...] expressed as series of the digits 0 and 1, typically represented by values of a physical quantity such as voltage or magnetic polarization. Often contrasted with analogue"* (Oxford University Press, 2011)

It is very small, blue, and has a fashionable look to it. A thin string connects it to my keychain, so that it is with me every time I leave the house. The 4 Gb of data that fits on it is more space than I need. My USB-Stick is a digital artifact: The data on it are expressed with the numbers 0 and 1, and are forming important parts of my life, such as the newest episode of my favorite TV-show, and the pictures from my last vacation. Most importantly, I can use it to backup and save a copy of my thesis instantly when I plug it into my laptop.

I was born in 1983, and I got my first Computer when I was 12 years old. This makes me a so-called *Digital Native* or a member of the "net generation," which means that the digital has become part of my life history. Thus, the USB-stick represents the digital in my current everyday life. This thesis wants to look into the everyday life of the *Digital Natives* and in particular its materiality - which role digital artifacts play. The most important digital artifacts are often considered computers and mobile phones but it can be all kind of artifacts that are building the infrastructure of the information age – like my USB-Stick. The thesis will reflect upon the question of how far the digital is embedded in the habitus of *Digital Natives*, and in how far it is structuring their everyday life and becomes part of their practices.

The stick is not the only element on my keychain. Of course, the keys are essential for me to open and close my bike-lock and enter my home. The bottle-opener does not only have a practical use, but, at the same time, it reminds me of a positive experience I had back home in Germany. The little figure of a sheep – a character of a TV-show – was a birthday gift from my sister. My key-chain is therefore a collection of different artifacts – digital and non-digital.

Practices – like the regular safety-copy - are emerging around digital artifacts and at the same time networks of digital and non-digital actants are evolving around these practices. This thesis shall therefore look at exactly these networks that involve digital artifacts, how they are formed and which functions they fulfill in everyday life.

Recently I got a new key ring that is supposed to hold my keys together. Very soon I realized that the new ring changes the whole keychain. Since the bottle opener could not be put directly on the ring I had to attach a little additional chain. Now the little network of my keychain has been transformed and reshaped. The single elements – keys, USB-stick, key fob, bottle-opener – work in a different way together and at the same time each of these elements is carrying a certain value for me. The interruption has brought these values to my attention.

On the one hand these interruptions make the actual experience of the user visible to me because in the moment of interruption, an artifact is perceived *in itself* and not just as a tool that is there *in order to* do something. On the other hand, these interruptions also mean that a connection inside the network is broken. I aim to examine what happens to the networks of everyday life of natives and immigrants if these disruptions occur.

By using a combination of observation and interviews, I want to analyze the meanings and practices that are evolving around digital artifacts and how they are affecting and are itself affected by the people who use them. The young designer who does everything with her brand new Macbook Pro[1], except her extensive hand-written TO-DO-lists that cover the walls of her bedroom; the young researcher who works with technology all day but is proud of his 10-year old analog phone, which he uses to call his friends after work; the student who refuses to use her cell phones MP3-function and instead worships her old CD-Player; the way that *Digital Natives* are combining artifacts, how they interact with them and which artifacts are important to them, plays a role for designers. According to Shove (2007), practices around artifacts are underlying constant changes of routinization, and normalization without closure or stabilization. Practices - formed as entities consisting of instances of performances, are ”inherently unstable”(p.146). Therefore it is hard for product innovations to address certain practices, since they are only hard to control.

[1] I decided to use the actual product names for all products from the company

In order to be able to develop new products and solutions for digital everyday life, they have to gain an understanding of these practices. Design- and market researchers – especially in the area of consumer technology - often use qualitative methods to gain insights into material culture and how future technology could possibly look like, but struggle to implement cultural analysis with its theoretical implications (Sunderland & Denny, 2007). By building my analysis and methodology on a strong theoretical foundation, I want to advance the insights in user research and help designers to understand the variety of practices around materiality in digital everyday life.

Natives in a Digital World

Digital originally means that data is consisting of discrete or absolute numbers –like computers communicate via 1 and 0. Even though originally used in a technical context, the term now has become a synonym for all kinds of media that are working with information, that are transformed and transmitted through computers and particularly via Internet (Gere, 2008, p. 15). While the term *technology* can describe everything - a light bulb, a pen, a toaster – the term "digital artifact" in this thesis is referring to an artifact that is based on the use of digital data.

In popular media as well as in the academic discourse, the term *digital* is now associated with all kinds of social phenomena that were made possible through the use of digital technologies (Gere, 2008, p. 15). During the 1990's it found widespread use in relation to the Internet and was connected to utopic and dystopic ideas about the virtualization of social interactions and the disembodiment of identities (e.g. Turkle, 1995). The rise of the information age was announced and in the enthusiasm, dreams (and nightmares) about the virtual self evolved (Willim, 1999). The information age is often seen as the successor of the industrial age. It implies that we are living in a society that is constituted and shaped by information and the connection of information. The information age is also often seen as the replacement of a modern order through a postmodern notion of "disorganization and fragmentation" (p. 23). Research around the information age has therefore, particularly in the beginning, been rather concerned with what happens online – inside the information – instead of looking at its offline-practices.

The idea that the manner through which humans interact with the digital is affected by the role that information technology plays during their socialization, was

first introduced by Tapscott (1998) announcing that "the net generation has arrived" (p. 1). The term that I chose to use in this thesis – *Digital Native* – was coined by Prenskey (2001) and implies that information technology is shaping a new world. The generation of the Natives grew up with digital technologies and are therefore "native speakers of the digital language" (p. 1). On the other side are the *Digital Immigrants*, who became acquainted with the digital world much later. Many of the *Digital Immigrants* learned the new technologies but they will always have an "accent"; they will never perfectly "speak" digital (Palfrey & Gasser, 2008).

Research Questions and Structure of this Thesis

My research aims to understand the digital world from the perspective of the *Digital Natives*. I want to examine their use of the artifacts which form the infrastructure of the information age. Instead of elements that build the information age online – *Facebook, Twitter, Youtube, Spotify* – I am moreover interested in the individual's everyday experience and how concrete practices are evolving around these digital artifacts. Furthermore, I am focusing on the generational differences between *Digital Natives,* who grew up with technology, and *Digital Immigrants* who did not. My aim is to create a strong theoretical foundation and approach to digital material culture. In building on this approach, it is then possible to build a methodological framework to examine the digital in the experience of the user. This theoretical framework is therefore built on three basic premises:

1. Artifacts are not standing by themselves. They are embedded in networks that evolve around practices. Therefore, I am interested in the dynamic and processes that evolve around networks that involve digital artifacts and in particular, the interaction between digital and non-digital artifacts. How are these networks constructed and what happens if the networks are disrupted?
2. Artifacts – digital and non-digital – are changing in their perception to the user. The thesis shall – based on a phenomenological approach - examine these changes, in particular the difference between digital and non-digital actants. How do individuals perceive digital artifacts compared to non-digital artifacts? And how are they perceiving the networks that are evolving around them?
3. Practices that are evolving around digital artifacts are influenced by the individual's habitus. In how far does the information age – meaning that the user

grew up with digital information technologies – shape the habitus? Which effects does it have on the everyday networks around practices?

Digital Natives are the user's of the future. I want to demonstrate how a methodological and analytical approach, that is based on these three premises, can be made useful for innovation research and allow a view into the future use of digital technologies.

I want to start by introducing the theoretical foundation that I am using. Therefore, the next chapter shall give an overview of a few approaches to material culture and human's interaction and elaborate on the concept of *Digital Natives* and similar concepts that try to grasp the generational differences in the use of digital media. Afterwards, I want to give a first insight into my informants everyday life, the role that digital technology plays in it and in how far it is embedded into their habitus. Building on this I will then show how networks of everyday practices are evolving around digital artifacts. The next chapter shall then elaborate on this concept by showing *how* the habitus of my informants is "digitalized" and which role the digitalized habitus plays in my informants dispositions and practices around technology and how it creates emotional, social and cultural values. The value of digital artifacts is particularly relevant for the implications of my approach for user-centered innovation. The last chapter discusses how this kind of analysis can help to get an image of the user and how gathering these types of insights can be made usable for the work of designers.

Theoretical Foundation

Material Culture in the Information Age

Since my research focuses on the materiality in the information age I want to start my theoretical considerations with the relationship between humans and artifacts and the relationship between digital and non-digital artifacts; as these relationships will set the first foundation for my ethnographic analysis.

Miller (2010) points out that in anthropological research traditions there is often a dichotomy built up between humans and artifacts. Scholars following this tradition describe material culture as matters of *representation*. Therefore the relationship between artifacts and humans is rather unidirectional. Miller (2010) argues that this approach implies that there is a sort of inner self to the human, a

mystical core that needs to be explored through material culture. That means that this perspective – even though it is set around material culture – puts the human alone into the focus (p. 13). He rejects this approach and instead he develops the concept of "objectification", based on Hegel's dialectic, implying that the artifact gains meaning through the individual but on the other hand also affects the individual himself. Objectification therefore argues for a mutual relationship between individual and object (p. 54).

Actor-Network-Theory (ANT) also seeks to dissolve this dichotomy between different actants, analyzing the networks that are formed between different agents and their agencies – these agents can be human or non-human (Latour, 2009). As Shove et. al. (2007) point out, ANT provides an approach to analyze the relationship between humans and artifacts by looking into its outcome or effect – that is called agency. Agency is not necessarily human. Instead agency can be an outcome between a human and a non-human actant (Shove, Watson, Hand, & Ingram, 2007) A person calling someone on their mobile phone becomes thus a new entity that affects other networks – like another person and their mobile phone or just the annoyed people in the library who want to read their books in silence. From the perspective of Actor-Network-Theory, all practices consist of networks of actants. This can be artifacts as well as human actants and but also ideals or values. Kien (2009) underlines that in an ideal ANT-research setting the researcher has to be agnostic, he must not have any concepts about what he is looking at in order to allow free associations about all actants and agencies (Kien, 2009, p. 29). Czarniawska (2007) discusses whether an approach like ANT that insists on the symmetry between human and non-human actants can be combined with an anthropological perspective on practices that sees practices as an outcome of human activities. She argues that it is possible to see practices as an outcome of the cooperation between humans, things and machines and therefore to maintain symmetry "without symmetrical parts being identical" (p. 8).

But what happens to materiality in everyday life, when digital artifacts are getting involved into everyday practices? For many people, mobile phones and computers have particularly become an indispensable component of everyday life. At the same time they receive an attention that differs from the perception of other everyday artifacts: Hassan (2008) writes that the information society is "a society where digital information is – at its root – ideological" (p. 1) This also means that the

artifacts that are building the technical infrastructure for this society are in some way idealized. When Tapscott (1998) tries to describe the net generation he says: "Today's kids are so bathed in bits that they all think it's part of the natural environment. To them, the digital technology is no more intimidating than a VCR or a toaster" (p. 1) This implies that the digital technologies get assigned a different type of meaning than "normal" artifacts like a toaster. Much of the research about all kind of digital artifacts seems to take for granted that the use of a computer does not happen in the same implicitness as the use of, let's say a bottle-opener. And while the bottle opener is embedded in the use of the whole kitchen – e.g. as one agent in the process of enjoying a good glass of red wine after a long day at work – the use of the computer is still isolated and mystic as if it happens in a special (virtual) world that many people (like the *Digital Immigrants*) do not understand yet.

The dichotomy that has been built up between digital and non-digital artifacts is reflected by the approaches of numerous scholars, in which the focus lies often on cultural aspects of a *single* technological or digital artifact. One of the earliest examples is the analysis of the culture of the Sony Walkman (du Gay, 1997)**.** Recent studies about the cultural implications of artifacts have dealt with the issues of mobile communication (Richardson & Third, 2009) and the mobile phone (Goggin, 2006; Horst & Miller, 2006) as well as the iPod (Bull, 2007; Julier, 2009).

Löfgren & Wikdahl (1999) criticize the rather narrow focus of media studies that tend to concentrate on the more "eye-catching" forms of media, such as IT. Instead they argue that it is necessary to pay attention to the more "down-to-earth" (p. 41) forms of communication because media use has to be set into a context: "Despite all the talk about the computer's superior ability to organize information, there are still rows of little yellow stickers framing our computer screens" (p. 42). Shove et. al. (2007) make a similar argument: In their study of different practices in the kitchen and in digital photography they argue that the practices in everyday life consist rather of complex assemblies of artifacts than of single isolated artifacts. By putting the focus on the digital artifacts alone a research can fail to understand these artifacts in context of the networks of practices around them. Therefore, as I would like to argue, is it important to dissolve this dichotomy and look at the practices around digital artifacts in the same way as we look into other practices.

This research seeks to understand the relationship between humans and artifacts *as well as* the relationship between digital and non-digital artifacts as mutual. Humans and artifacts are affecting each other; therefore the focus has to lay on the outcome of their relationship to each other, the practices, instead of just putting the focus on the human alone. The same symmetry must be obtained for the relationship between digital artifacts and non-digital artifacts. In the network of a certain practice their agency is an outcome of their relationship together and they cannot be examined isolated from each other.

Experiences of Materiality – Phenomenology and Material Culture

After reflecting on practices as the outcome of humans and artifacts interaction, I want to focus now on the perspective of the humans and how they are experiencing the networks of practices around them. When researching about the actual experience of individuals, phenomenology has become more and more popular in ethnological methodology. "Being there" (*Dasein)* in ethnological research is connected to the idea that the ethnographic researcher – the participant observer or the interviewer – must strive to put himself in the perspective of the informant, must put himself into his being-there in order to understand his informant's experience.

One of the main thinkers of phenomenology – Heidegger – has written about the relationship between the human being and technology. In *The Question Concerning Technology* (1962), Heidegger says that the essence of technological thinking is to bring the world forward, to "enframe" (*bestellen*) it. Technology, or more the sum of all technology, enframes experienced reality as *Bestand*. This *enframing* turns things and tools into a mere resource. But by taking this rather holistic point of view there is the risk – as Frykman and Gilje (2003) point out – "to reduce a complex reasoning into a simplistic critique of technology" (p. 12). Therefore I shall go back to the actual practice of using technology in everyday life, the everyday *enframing*. In *Being and Time*, Heidegger (1976) uses the example of a hammer. In the process of hammering it is not the hammer itself in its being that is grasped, but instead the hammer has been enframed/*bestellt*. Therefore the hammer becomes *zuhanden* (ready-to-hand) for the individual. That means it is not seen for in its being itself but instead only in its purpose – in this case for hammering nails. It is seen as being there *in order to* do something (German: um etwas *zu* tun). The actual being of the hammer becomes in this moment invisible, the hammer is not

experienced consciously. It happens in the moment of interruption that a *zuhandenes* tool turns into *vorhandenes* (ready-at-hand). The non-useful (*unbrauchbare*) hammer just lies there. And in this moment the thing stands out and becomes visible, before it will – eventually – turn *zuhanden* again (p.98). The hammer will stand out in the moment that for instance its handle breaks. Accordingly, the Internet that for most of my informants is usually just there without them paying attention to it, will be perceived consciously in the moment that the connection to it is interrupted. In this moment it will move outside the *bestand* because it does not fulfill its purpose anymore. Setting these ideas in relationship to my research about digital technologies I must look for these interruptions. How do we *enframe* digital technologies into our *bestand*, when do they become *zuhanden* and when do they stand out and become *vorhanden*?

The question of how digital technologies are shaping human experience has been discussed in several studies of media and online practices, which also address the question of digital technologies being *zuhanden* or *vorhanden*. Thereby these studies are often more concerned with the question what is happening *behind* the screen or in the mediation of the experience through the screen. In her study of the online-community *Second Life* Koch (2009) describes the perception of the technological tools as *vorhanden*. Because they are consciously perceived by the user and they prevent the digital experience behind the screen from being flawless, it is always experienced as mediated (p. 222). Richardson and Third (2009) are using a similar phenomenological approach in order to analyze the concrete materiality of mobile media. They underline that the mobile device (mobile phone) is not detached from the body but instead incorporated into the bodily experience. Their analysis is mainly based on Merleau-Ponty's idea that the body "is not determined by the boundaries of material". Instead technologies become an extension of the bodily experience. They argue that media interfaces are "deeply integral to our individual and collectively realized corporal schemas" (p. 146) As Richardson and Thirst point out, the study of media devices cannot only be a study of the "perceptual and sensory dimensions", on the contrary it must also focus on "the haptic, gestural and embodied appropriation of the device" (p. 148). Contrary to Koch they identify the mobile phone itself as *zuhanden* in the Heideggerian sense, which means that it moves

outside of the conscious perception. At this point the artifact becomes preconscious in its perception by the user.

It has to be mentioned that the way in which a phenomenological approach treats artifacts as mere tools is criticized: Post-phenomenologist such as Ihde (2003) as well as Verbeek (2005) argue that artifacts have a mediating role: An artifact mediates between the individual and the world and can therefore not be reduced to its functionality but rather to its "technological mediated intentionality" (Verbeek, 2005, p. 116). This becomes particularly relevant in a situation where an experience is mediated through a screen, as Koch (2009) shows, because the screens mediating power has to be considered in the analysis. As shown in these studies phenomenology must not be seen as a mere methodological tool. Instead, its approaches towards an individual's experience – particularly in relationship to material culture can be a useful analytical tool as well. This is especially the case when reflecting about the experience in relationship to digital technologies. Combining the phenomenological and the ANT perspective the being-there can be understood as a network of *vorhanden* and *zuhanden* actants that can be material, non-material and human or non-human. These networks are different for each individual and depend on the individual's dispositions and structures.

Growing up in a Digital World

The two approaches that I have discussed so far are mainly dealing with practices and experiences as they happen *now* in the present. But they are not taking place in a vacuum. Each individual in his everyday being-there is equipped with his own set of dispositions and structures that Bourdieu (1990) defines as an individual's habitus. In the following, I want to discuss how the digital of the *Digital Natives* can be accounted for in Bourdieu's theory of the habitus.

The idea of the rise of a new generation that is more fluent with technology and new media came up in the mid-90's (Tapscott, 1998), and was mainly discussed in education and psychology and in this context became almost "commonplace" (Jones & Czerniewicz, 2010, p. 317). At the same time the generational difference remained rather not reflected upon anthropological or ethnological discussions about media and technology use – remaining mainly an educational concern. Löfgren and Wikdahl (1999) saw practices around technology in everyday life as a matter of power and competence, asking: "Who gets hold of the remote control?" (p. 54). Later

on Löfgren (2007) claimed that different generations are creating their own medial landscapes, without further elaborating on this concept.

Especially in the latter years Prensky's (2001) terms *Digital Natives* and *Digital Immigrants* drew attention, particularly in popular media – not without being criticized by different scholars. One of the weaknesses of Prensky's concept is a missing clear definition of what a digital native actually is. While Tapscott (1998) is very precise in his definition of the net generation being born after 1977 and foreseeing the next generation shift in 1997, Prensky (2001) does not specify at all. Urs and Gasser (2008) set 1980 as the beginning year without clarifying the foundation of this claim. However Oblinger & Oblinger (2005) and also McMahon and Pospisil (2005) raised the question of whether or not the birth year as definition is sufficient or if it is not rather necessary to pay attention to the actual exposure to information technologies in early ages. Another point of critique is the methodological weakness of Prensky's and other scholars' claims. Bennett et. al. (2008) argue that Prensky's arguments, in particular, are rather built upon a "common-sense-belief".

I want to argue that it is not necessarily the methodology that weakens Prensky's as well as Tapscott's argumentation but instead they fail to connect the socialization with digital technologies and the actual practices of everyday life in present. Instead, they are both arguing rather that a certain set of skills distinguishes *Digital Natives* from the *Immigrants*. Bennett and Maton (2010) suggest that the debate should be more advanced by combining it with Bourdieu's theory of practice in order to find a theoretical approach towards practices around digital technologies. Bourdieu's concept of the habitus allows combining the identity – that which has defined the individual through his socialization – with the practices of everyday life. It helps "to grasp the wider context around the individual" (Frykman & Gilje, 2003, p. 38). Bourdieu himself was strongly influenced by phenomenologists such as Merleau-Ponty, Sartre and Heidegger, even though he would reject the latter one strongly. In *The Logic of Practice* Bourdieu (1990) criticized phenomenology for not being able "to go beyond a description of what specifically characterizes lived experience of the social world" (p. 26). Instead, Bourdieu asks for how the individual's internal structures, that are effected by the external structures (during his socialization) are effecting the present experience (p. 27). Bourdieu says that these "structuring

structures" are generating and organizing everyday practices and in this organizing the habitus is preconscious. The outcomes that it produces are not result of a "conscious aiming" (Bourdieu, 1980, p. 53). There is a certain risk that Bourdieu is well aware of, that the habitus is misunderstood as determining the individual:

> *"As an acquired system of generative schemes the habitus makes possible the free production of all the thoughts, perceptions and actions inherent in the particular conditions of its productions – and only those. Through the habitus, the structure of which it is the product governs practice, not along the path of a mechanical determinism, but within the constrains and limits initially set on its inventions." (Bourdieu, 1980, p. 55)*

In order to avoid this deterministic view the research has to be set into the context of the actual practice and perceptions in daily life. The task of the Ethnologist – and it is not an easy one – is now to locate these "structuring structures" since they are the ones that are in direct connection to the everyday practices. Therefore the ethnologist must obtain some sort of "double hermeneutic" as Frykman and Gilje suggest, that is they have to interpret the meaning that is created by the individual but then accordingly put it in the context of the individual's life history and social environment (p. 39). Understanding *Digital Natives* as individuals whose habitus has digital elements – is *digitalized* – allows this kind of double-hermeneutic perspective. On the one hand research has to be designed to look into the individuals' social environment and life history - but on the other hand, I also seek to understand my informants' personal dispositions that they have in everyday life. With this argumentation I want to show that *Digital Natives* have to be understood as social actants who have always had access to digital technologies and in whose socialization they played a certain role. It is therefore not sufficient to just define *Digital Natives* by their birth year but rather by their exposure to digital technologies during their childhood. That does not mean that they have to be dealing with digital technologies themselves – and therefore became computer experts in early age – but instead had been constantly in touch with digital technologies. For *Digital Natives* digital technologies are nothing new and exciting but instead something that had been there all or at least most of their life; because thereby the digital becomes part of their structuring structures.

Digital Natives On Site

Research design

The in-depth theoretical considerations I have made in the previous chapter had to be transformed into a research design that allowed me to apply these theories. That made it necessary to conduct fieldwork that would give me an in-depth view into the life of my informants – where the focus was not only on their actual everyday practices but also on their individual life history. Therefore, I chose a set of six main informants, four of them born after 1980 and two of them born before 1960, whose everyday lives I could examine intensely through a combination of observation and interviews. Therefor the theoretical considerations about approaches to digital culture that I have made in the previous chapter had to be - to the same extent - reflected by the methodology of this research.

Observation and Interviews

The phenomenological perspective made it necessary to get as close to the experience of the user as possible. How does he actually experience the use of digital artifacts, how does he perceive the digital artifacts and the practices that are evolving around it in his everyday life? And more important for choosing the right method: How can this perception be made visible to the researcher? While the *vorhandenheit* of artifacts can be made visible through interviews – since these artifacts are perceived consciously – the *zuhandenheit* of artifacts makes them almost invisible for the ethnographer. As Davies (2008) points out social actants are not aware of the processes in everyday life; instead they take them for granted. Some reactions of my subjects during the interviews when I asked them to use their technological artifacts, bringing them into their consciousness underline this hypothesis. Usually the subjects were confused or could not answer questions, when asked, for example, to describe their actions when writing a text message on their cell phone. The examination of these preconscious actions is a challenge, especially when the practices that I am interested in are part of an everyday routine. Czarniawska points out that an "observer or stranger can see *different* things than actors" (Czarniawska, 2007, p. 21). The method she describes, "shadowing", is therefore a useful tool in order to make the things visible that are outside the informant's consciousness. Variations of this method are also described by Pink (2009) and Kusenbach (2003), both rather focusing on the aspect of place. By "walking with others" (Pink, 2009, p. 76) the observer can

participate in the same place-making practice as the informant and at the same time share their multisensorial experiences of the places they are walking through. Pink (2009) underlines the role of walking as a place-making activity, because those "places are made through peoples embodied and multisensorial participation" (p. 77). Interestingly, the experience of walking was during my research usually replaced by the practice of biking – which is the way in which Lund's students prefer to create the place they are moving in.

Kusenbach (2003) argues for a "go-along" - a combination of observation and interview, similar to Pink, underlining the "constitutive role" (p. 458) of places. The *go-along* allows the observer to move with the informant in his natural environment and to observe his practices but at the same time it makes the observer able to interview, let the informant explain what she or he is doing. This form of shadowing was an essential part of my research. I followed my main informants through their everyday life, beginning in the morning and ending often late in the evening when going to a party together. Often I would just spend the day at the library with them, reading my own books and then talk about my observations during a coffee break. Despite its advantages shadowing comes along with difficulties. Czarniawska describes a certain sense of awkwardness when following her informants (p. 33). I could make a similar experience – in particular when following Greger, a male informant, who obviously was not feeling comfortable with a woman following every one of his steps. Particularly in combination with digital artifacts the method often reached a certain limit since it can be hard to examine the things that the user experiences through the screen. Especially artifacts, which provide some kind of virtual environment – cell-phones, game consoles, computers – can be an invisible barrier for the researcher when trying to observe the users experience. In this case – from the post-phenomenological point of view described by Ihde (1993, p. 114; Koch, 2009) and also Verbeek (2005) – technology is stepping between the researcher and the experience. The experience is not only transmitted through the subject but instead technology adds a third instance, the researcher is farer away, the experience is mediated and filtered through the technology.

In the concrete situation it was impossible to ask my informants in the middle of a lecture what they were doing with their mobile phone right now or talk about every single click that they were doing during an intense study period in the library. It

also felt rather uncomfortable to watch over my informant's shoulders constantly. The only possible solution was to try to cover as many of these situations during the interviews. But since the research focus was lying on the actual materiality – the things that happened in context of the actually artifacts instead of the practices online – I rather tried to examine the activities that stood in the direct relationship to an artifact. From an Actor-Network-Theory point-of-view it was at the same time necessary to concentrate on the different actants that play a role in my informants everyday life – in particular digital artifacts – the mobile phone, the computer but also artifacts that are in close connection to those – like the table a laptop is standing on, or a cable that connects a mobile phone to electricity. In order to examine these networks Czarniawska ((2007) suggests that the researcher shadows the objects instead of the people. This allows the researcher to understand how non-material actants are transforming and forming other networks. This way can also make actants visible that are otherwise often invisible in the context of their network. (Czarniawska, 2007, p. 106). By shadowing how for instance a more visible digital actant like a laptop is used and connected through the day may uncover the power cable that enables it to work. Thereby it is important to orientate along the basic ANT research principles as Callon formulated them. This includes that the researcher needs to be as neutral as possible towards the role of different actants (Kien, 2009, p. 29).

As a third focus, the user's habitus had to be taken into consideration when developing the methodology. This implied that I had to examine the individual's disposition towards technology and factors that played a role in his socialization – regarding the use of technological artifacts. How does the individual life story influences their practices in everyday life? The concept of the habitus brings all the aspects together, the individuals personal history as well as current influences from outside - the "structuring structures" that are part of the habitus. In unstructured interviews I aimed to grasp these structures and how they are influencing everyday life. Pink (2009) understands interviewing as the creation of some sort of place – an interview-place, in which all the different experiences, emotions, dispositions come together and can thereby be observed by the interviewer and who can then grasp "how the interviewee experiences her or his world" (p. 95). By approaching the interview technique in this way it also allows to understand the interview as a place where all the different actants of an informant can come together. Therefore I held the

interviews at the end of my observation. By trying to gather all the different actants I could observe during my previous time with the informant I was able to get a deeper insight into how these actants are related to the individuals habitus.

The research objections required informants that were socialized with digital technologies and at the same time be willing to participate in the extended form of research that I was planning on doing. I decided to set my research in a field where the use of digital artifact plays a major role in everyday life. The four students that I chose were all studying in different undergraduate programs at Lund University. Their everyday life consisted mainly of attending classes and learning for these classes – both activities that required the constant use of digital technologies – mainly the computer and the mobile phone. At the same time my informants were all born between 1980 and 1987 and comfortable with the use of digital technology – in how far I am going to show in the next chapters.

Another aspect to consider when choosing my first set of informants was the similarities between their and my lifestyle. Czarniawska (2007) discusses this problematic and concludes that a certain similarity can be an advantage as well as a disadvantage for the access to informant as I could see during my research. While the similarity to my female informants promoted our cooperation and let me grant higher access to their personal life, the closeness to my male informant was rather corrupting this access and creating a certain discomfort – even though the reason for this notion remained unclear. However, in order to keep the advantage of "introspection" (Czarniawska, 2007, p. 51) I chose informants that I was not acquainted with before. Thereby the fact that my informants had a rather similar lifestyle to my own enabled me to gain insights by constantly comparing and reflecting my own behavior in relation to my informants (Czarniawska, 2007, p. 56).

Even though my main focus was on everyday practices of *Digital Natives* it was necessary to set my results into a context and set my observations in contrast to the *Digital Immigrants* practices and experiences. I was able to conduct in-depth interviews as well as two days of observation with a man, Erik, born in 1944, and a woman, Maria, born in 1958. Both were chosen because they use digital technologies on a regular basis and agreed on my extended form of research. Together these six informants provided the core set of data that I used. In particular the field notes that

were generated during my, in total, over twenty days of observation, built the foundation of my analysis.

Focus Group Interviews in Germany

In order to complete my data I decided to add a third component to my study by examining how digital technologies are experienced in a slightly different context: I was able to conduct fieldwork in a German high school in the form of several focus-group interview with students of two different computer science courses. They differed from my main informants through their nationality as well as through the intensity of their use of digital technologies.

Palfrey and Gasser (2008) argue that differences in socialization are shrinking through digital technologies (p. 13). They argue that the behavior of teenagers worldwide is conformed through their use of digital media. A look into the statistics about media access shows that the numbers of media use in the EU are conforming, even though Germany and Sweden are differing in the overall access. In Germany only 77% of the overall population have access to Internet, while this access rate in Sweden is larger with 90%. However, a look into the access of a younger age group adjusts this difference, showing that the large part (95%) of the German population group between 14 and 29 has access to the Internet (Initiative D21, 2010). Counting the numbers of mobile phone contracts per 100 inhabitants, Sweden (122,8) and Germany (128,2) show a similar high diffusion rate (Statistisches Bundesamt Deutschland, 2011). My studies in Germany where therefore expected to show no differences between digital practices in both countries.

Another point in which the students of the German high school differed from my informants in Lund is the fact that they are not using digital technologies to the same extent for work-related tasks as students in Lund do. As I will show later, computer and mobile phone were mainly used for spare-time activities instead for study-related tasks. In addition to that, the use of mobile phones was officially forbidden at the school, a fact that – even though widely ignored by many of the older students – constrained the use of digital technology.

The students of the German high school mainly had a middle-class background and therefore relatively low financial, for instance indicated by the fact that the biggest part of my informants possessed a mobile phone, a computer as well as different other digital artifacts such as MP3-players, Smartphones and game

consoles. Working with high school students narrowed the fieldwork because I was not able to conduct observation with them, due to restrictions by the school board. Therefore I was confronted with the problem that "what people say is often very different from what people do" (O'Toole & Were, 2008, p. 626). An interview situation is therefore not as optimal in order to gain insights in actual routines and processes, as observation is able to produce. Instead I had to find a way to gain insights into the student's everyday practices by bringing them as close to these practices as possible. Therefore I chose to conduct focus group interviews. As defined by Fallon and Brown focus groups are "simply a discussion, in which a small group of people […] talks about a topic selected for investigation". (Fallon & Brown, 2002, p. 196). As Davies (2008) points out, the advantages of focus groups is their "explicit use of group interaction to produce data" (p. 117). I decided on taking this advantage and conducted several focus group interviews instead of normal one-to-one interviews. By letting the informants talk to each other the conversation gained a certain flow and made my informants reflect about situations that were usually experienced rather preconsciously. This effect was for instance shown in situations in which two informants perceived the same situation differently or in which one informant could add own observations to the description of another informant.

In this context it is also important to take into account that not only the spoken word is relevant for the analysis but also the way in which things are communicated. Sunderland and Denny (2007) underline therefore that words have to be "contextualized" (p. 177). In the particular situation it was often rather important what my informants did *not* say instead of what they actually said. Especially in the context of a phenomenological based analysis, it is hard for the researcher to determine how a particular artifact is experienced in the moment of its actual use, since this happens often rather pre-consciously for the individual, it was important to involve the whole group and their impressions about the use of artifacts into the analysis. The setting that the students knew each other before was intended and necessary in order to create this kind of dynamic, but it also makes the role of the moderator sensible: I had to balance out the effects of a pre-existing group structure such as group pressure (Fallon & Brown, 2002, p. 199). Even though a focus group still takes place in a rather "unnatural setting" (Fallon & Brown, 2002, p. 196) and must therefore not to be mistaken as bringing the same kind of data as participant observation, it proved to be

a good way to gain insights into the students dispositions and experiences with digital technology.

The focus groups were staged in the high school itself. In total I conducted six focus groups with students from the computer science class and one focus group with students who volunteered as network administrators at the high school. The size of the group ranged between four and six. Even though Davies (2008) as well as Fallon and Brown (2002) recommend a larger amount of people the size of my focus group allowed me to keep a double-focus on the group as well as the individuals. This helped me to not only examine the actual practices with digital technology as the group experienced it but also consider the individual dispositions about digital technologies.

Living Digital

Introducing my informants

Anna has a state-of-the-art Macbook and a passion for handwritten TO-DO-lists. Greger studies information technology but the computer is, for him, rather a tool than a lifestyle artifact. Karolin claims to not be at all a "technical person", but does not even go into another room without her iPhone. Charlotte studies biology and her love of music is expressed by the many digital and also analog ways of listening to music. At first sight, there were only a few things these informants had in common. They were all students in Lund, they were all born after 1980 and therefore clearly part of the *Digital Natives* Generation. And their everyday lives were full with digital artifacts – often without them even realized it. The second group of informants – the *Digital Immigrants* – did not have much in common either, except for the fact that digital technologies entered their life at a much later period of life.

In this chapter I would like to have a closer look into my informants and their life history in order to find out what exactly makes them *Digital Natives* or *Digital Immigrants*. My focus in this chapter lies on two elements: On the one hand, I am interested in my informant's life history and in how far the digital is embedded in their habitus. Therefore I am asking, not only for their knowledge and skills with digital technologies, but also for their affinity towards technology and what their actual disposition towards technology is. The second element that I am looking into is the everyday life with digital technologies and to what extent digital artifacts are a

part of my informant's life. Hereby I am not only interested in digital artifacts by themselves but also how they are connected to certain practices. This chapter is not so much intended to focus on detailed practices but instead strives to give an overview image of the *being there* (*Dasein)* of my informants, to work out what distinguishes them from each other and what they have in common.

Digital Natives

Anna just turned 30 years old and is therefore on the margins of being a *Digital Native*. But her socio-economic background caused a relatively early encounter with digital technologies, amongst other things in form of her brother's videogames that she was allowed to use when she was around 8 years old.

Anna studies Industrial Design and has previously finished an apprenticeship as a gold smith. Creativity and design is a constant part in Anna's life, but the designing and creating of things is also connected to a lot of crafting work. The computer for Anna is therefore a tool which she needs for her work. The fact that it is an ultramodern and very expensive Macbook Pro is therefore rather a necessity for her since she needs its technical capacity in order to run the extensive program that are required for her studies. Whereas the mobile phone rather covers the social and private interactions in her everyday life, she is keeping constant contact with her friends. But her computer also plays a role in this. The chat program *Skype*, as well as *Facebook*, are constantly used in order to reach friends, make dates with others or just distract her from work. There is a constant area of tension between Anna's ambition to study hard and to distract herself from work – in particular also because her social circle influences her everyday practices to a large extent. She tries to resolve this tension by writing an extensive amount of TO-

Figure 1: Anna's TO-DO-list above her desk.

DO-lists that are covering her wall (Fig. 1[2]) and that she takes with her wherever she goes. Anna describes herself as a "medium-skilled" technology user, meaning that she still tries to fix problems herself first but sometimes her skills reach a limit and she has to ask someone for help. (Field diary, Anna, May 2010)

Kirstin does not consider herself as tech-savvy at all. She underlines that – compared to her brothers – she does not do so much with computers, whereas her younger brothers basically grew up with technology. She explains to me that she does a lot of things still *offline*, even though she use her IPhone or her laptop instead. Maybe she does not realize herself how much technology is around her during the day – more than with all my other informants. Her mobile phone is the one artifact she always carries with her – being afraid to miss a call from her boyfriend who is studying in a town far away. The first impression Kirstin gives me is as a warm and welcoming person and at the same time being very straightforward and organized. Her commitment to social and political issues plays a big role in her life. At the same time she is an extremely organized character, everything in her life is in order and systemitized, for example her books that she marks with little post-its (Fig. 2). This notion of being organized is even extended to her interactions with classmates, as Kirstin typically takes the lead when it comes to a finding out about regulations and assignments for her studies (Field diary, Kirstin, March 2011).

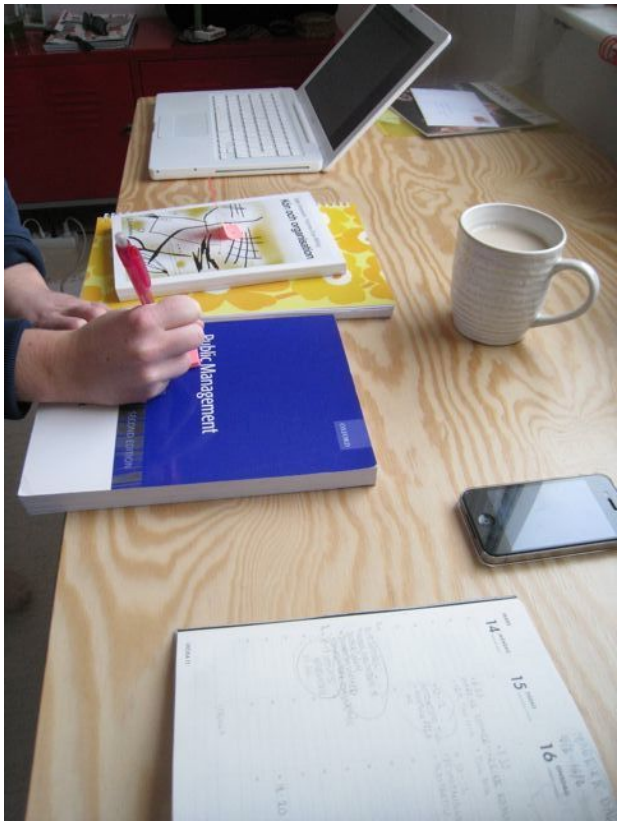

Figure 2: Kirstin writes a post-it note to mark a book that she has to read.

[2] All photos and images by Mareike Glöss

Similar to Kirstin, *Charlotte* does not think technology plays a big role in her life either. It is rather music that is a central part in her life: She plays the piano and sometimes the – very expensive - guitar that is standing in one corner of her room. But she does not only play music, she also listens to it – in an astonishing variety of ways. First of all she has an old-fashioned CD-Player – reminiscence from her childhood. But she also uses an MP3-Player to listen to music and if it runs out of battery, her mobile phone steps in. Charlotte's boyfriend is very tech-savvy. He connected her computer to her old-fashioned stereo-system (Fig. 3) with the higher quality music boxes. Now she can even listen to Spotify with better quality than before just through her computer's loudspeakers. Charlotte does not remember when she first got in touch with a computer but she thinks it must have been early since she remembers a certain game that she used to play. Since she does not regard digital technologies to be an important part of her life, she does not really pay much attention to the fact that her laptop is broken and immobile. Instead it is standing on her desk all day and only sometimes does she dare to carry it cautious to her bed so she can study while lying there. Charlotte knows that she will eventually need a new one but a new camera is a higher priority. She would love to have a camera again to take pictures of her friends – not artistic ones – just as a hobby (Field diary, Charlotte, April 2011).

Figure 3: Charlotte's old stereo in her bookshelf.

Greger is the only one of my informants who could be called tech-savvy even though he does not fit into the image that I have of someone who studies computer science. He has nothing to do with the stereotype of the unsocial nerd, who is sitting in front of his computer all day. Instead Greger presents himself as an extraordinary social person, whose commitment to his social circle and the identification as a

student plays a much bigger role in his life, than the actual activities with computers, even though it is that which constitutes his social circle. I follow him to the basement of the engineer building where he is meeting his fellow students to discuss organizational matters in the student council of his department. Greger got his first computer at a very young age and they played a big role in his life. He has a strong identification with the use of the computer. Many of his dispositions and also everyday activities are related to computers. For example, he does not like products from the brand *Apple* or the fact that he actually owns three computers. But the practices that are evolving around his computers are strongly connected to his offline social circle: The one laptop is situated at his girlfriend's place, the other one he uses, amongst other things, to play computer games and when he programs a piece of software as part of his homework he does it together with his classmates (Field diary, Greger, April 2011).

The first impression the students of the German high school gave to me was that they were using a massive variety of digital artifacts: IPhone, IPod, IPad, laptop, stereo, game consoles, TV and a variety of other hardware was widely discussed among the students. They could barely remember when they actually got their first mobile phone or started using the computer, showing how deeply digital technologies had been integrated into their lives. But in comparison to students in Lund, these artifacts were barely related to their studies. And even though there were attempts to integrate digital technology into their school life (which were usually prohibited by school regularities), those attempts seemed to be barely taken seriously. Instead, digital technologies were much more related to the student's private environment than to the school. This was even more surprising considering the fact that all the students I interviewed were recruited from the computer science class. This did not lead to an increased interest for computers among my informants. Quite the opposite: The dominant artifact was the mobile phone as the major actant of connectivity in their private life. Digital technologies were widely used to constitute private life. The social network *Facebook* was a dominant topic in the discussions, even for those who underlined that they were not participating in these activities.

Interestingly, the one group of students that were focusing on the technical aspect of digital technologies was on the other hand much less interested in the private sphere of digital artifacts. The *network administrators* – assigned by the schools computer science teacher – were a group of four students that had developed a group coherence through their distinction to the less computer-knowledgeable students. They underlined their disposition through certain cultural codes – as their preference for a certain operating system or their rejection of common social online activities. Those experts were rather focusing of the experimental potential of digital artifacts. Even though some of them were completely integrated into their everyday lives – like the mobile phone – others were used for trying out their own skills – like programing a little game on a standard calculator (Focus group interviews, German high school, April 2011).

Digital Immigrants

Erik is born in 1944 and a Digital Immigrant. But at the same time, Erik shows an extensive interest for technology and in new technological developments. Therefore he is very excited about the IPhone that he has owned for a few months. From all the technological artifacts in his household, it is probably the phone that is most important to him. Erik is using it all the time. The same counts for the TV that is usually running when he is at home. He even takes the TV-receiver with him to his summerhouse where he spends the weekends from time to time. Even though the computer plays an important role for his work, he is very insecure in how to use it sometimes. And usually he cannot fix problems occurring with the computer himself and relies on help from others, which does not really seem to bother him. He takes it for granted that some people know things better than him. Erik can recall very precisely when he got his first computer, especially because it was quite early, in the late 1970's. He is proud of being an early adopter and on top of the technological development (Personal Interview, Erik, April 2011).

In contrast, *Maria* – born in 1958 - is skeptical towards digital technologies. She thinks that it changed her and other people's lives not only in a good way. She does see the advantages of technological development, the things she can do online; but she also thinks that computers and mobile phone keep people away from having real social relationships. Maria is – similar to Erik – a vey social person and seems to

have a very big social circle. Her fridge is covered with all the different invitations to party's and other events that she receives from her friends. In order to keep up with her social life Maria has even set up an account in the social network *Facebook* that she barely uses and does not really know what functions it has. Despite her reluctance towards technology, there is a surprising amount of digital artifacts in Maria's life. She owns a computer that she was forced to use because she needed it for her job. She also owns a mobile phone that she does not seem to use very often. Instead it lies somewhere in her house and she does not hear it if it rings. She likes to use the landline phone in order to call friends. Therefore, she uses a little address book in which she writes all her friends' phone numbers. One of the most interesting digital artifacts Maria has is her *IPad* that she got for Christmas from her partner. It is a very expensive type of mini-computer that can be mainly used to watch movies or read virtual books. After Maria got the *IPad,* it remained unused for several months because she could not figure out how to activate the necessary software. But after someone had set up the device for her, she took it with her on a vacation and now uses it quite regularly in order to surf the web or chack mails (Personal Interview, Maria, April 2011).

Differences and Similarities

The first impression I got from the *Digital Natives* was the big difference that they showed in their own affinity and disposition towards digital technologies. But it is also conspicuous that the own affinity towards technology does not have a direct impact on the way the *Natives* are actually interacting with technology. Greger, who has a high grade of knowledge and a strong affinity to technology, does not spend more or less time with digital technologies than the informants that rated their own knowledge and affinity rather low. Quite the opposite: There is a certain set of practices that connects all my informants: All of them own a laptop and a mobile phone, all of them use the laptop in order to study and the mobile phone rather to maintain their social circle. Comparing these observations to my results from the focus group interviews with German high school students, it seems that the use of a laptop seems to gain importance for students, while in high school, the mobile phone plays a much bigger role. But neither of these groups attributes the mobile phone or the computer a special value. During the interviews and observations, it became clear that the mobile phone as well as the laptop are mainly perceived *zuhanden*. Erik and

Maria both own an extensive amount of digital artifacts but they both differ from each other in the extent of the use of it and in their affinity towards new technologies. What they both have in common is the fact that they have a strong opinion about digital technology, something that the *Digital Natives* are lacking. While Erik is very enthusiastic about it and showing some sort of pride about being "up-to-date", Maria shows a strong reluctance. This shows that for Erik and Maria, digital technology is – *as opposed to the Digital Natives* – rather *vorhanden*. This difference in the general disposition towards digital technology raises the question how these differences are reflected in the everyday life handling of digital artifacts.

Digitalized Practices

Networks in everyday life

After introducing my informants in the previous chapter, I would like to show the practices around digital technology in everyday life and how my informants managed to integrate them. From an ANT-perspective, I am striving to identify the different actants in my informants practices and what role they play together with other artifacts. Hence, I am showing, along concrete practices, how networks are constructed around practices and which effects disruptions have on these networks. Combining this approach with a phenomenological point of view allows me to concentrate on the actual perception of my informants: Where are the differences in experiencing digital and non-digital actants and what effect does that have on the evolving networks? When do my informants experience artifacts as *vorhanden*, when do artifacts become *zuhanden* and what processes lie in-between? According to Heidegger, it is the interruption that makes an artifact *vorhanden* and therefore visible. After analyzing the construction of these networks, I want to examine these interruptions. How far do they affect the experience of digital technologies and how stable are the networks of practices that are built around them?

Constructing

Kirstin carries around with her four things: Her iPhone, her calendar, her pencil and a rubber. These things were always around her. If she was working she would lay them down on a table in front of her, they were there during the lectures and when she had lunch (Fig. 4). The way she would arrange these artifacts always followed the same patterns and very often, they were laying on the table next to her completely untouched the whole time (Field diary, Kirstin, March 2011).

Figure 4 Kirstin is taking notes during a lecture. Iphone, pencil and rubber in the background.

All these artifacts are actants in a network that evolves around Kirstin's practice as a student. Each of it has a certain role in the network. The calendar represents her aim to structure and organize her day, the iPhone is used to connect her to friends and family, the pencil and the rubber are necessary tools in order to make notes and erase them. All the actants by themselves in the network follow a direct purpose – like the pen that she needs in order to take notes in her calendar. But that alone does not explain why is she putting all these things out of her pocket when she is not even using them. Why does she arrange these things on her desk – even when she leaves the room straight afterwards to have dinner? The construction of these networks does not necessary follow a rational scheme, it is through the combination of actants that the network gains a different meaning. In this case the network consists of material actants – the table, the pen, the rubber, the phone, the calendar – but also of non-material actants – that is Kirstin's self-concept of being an orderly person, Kirstin's need to study in different locations – and all these actants together explain Kirstin's practice: She is using this network in order to connect the different spheres in her everyday life. By arranging the artifacts on each table she is working at – home, in the lecture hall or in the library – she puts herself in a familiar setting – she creates a place that she is familiar with.

Anna is using her state-of-the-art *Macbook* for almost everything. And still, when asking her in the interview for her most important artifacts, Anna tells me that

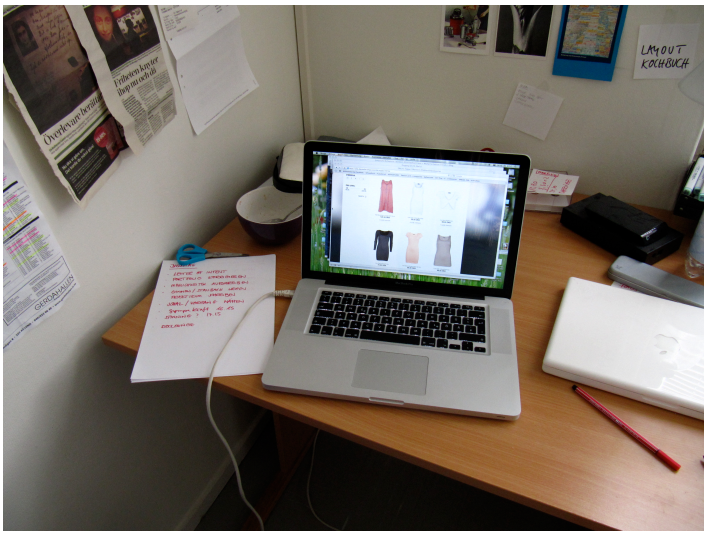

Figure 5: Anna writes her TO-DO-list next to her computer.

she would definitely always need a pen and paper in order to write her TO-DO-lists. Her TO-DO-lists are a constant part of Anna's life – without them she tells me she would be not able to accomplish anything. They give her a feeling of control. Interestingly enough, Annas TO-DO-lists are not virtual but almost old-fashioned hand-written notes hanging on her office and student room wall. But they would be useless without the help of her laptop. Most of the things on her TO-DO-list are accomplished through the use of digital artifacts. But why does she write her lists on normal paper instead of making a virtual list – with the help of one of the countless programs that are available for free for this purpose? Anna tells me that she likes to sit at her desk and watch the lists while working. She also likes the process of crossing the different points on the list – a ritual that gives her the good feeling of accomplishing something (Field diary, Anna, May 2010).

Charlotte has found another way to create a familiar environment everywhere she goes: She surrounds herself with music in different ways. On the one hand she likes to make music herself, she underlines the importance of the guitar that stands in her room even though she has to admit that she barely plays it. On the other hand listening to music plays an extraordinary role for her, as I have described earlier. In the practice of listening to music that I have introduced earlier, an astonishing broad range of actants play a role: Not only does she use her MP-3-Player and her laptop; when her MP3-Player runs out of battery she would use her mobile phone; she also has a broad range of CDs that she listens to through her old stereo that she owns since childhood days. The stereo is connected to the boxes of the stereo so she can listen to music via an online music service – with the help of yet two other actants: her boyfriend and a cable (Field diary, Charlotte, April 2011).

My informants are constantly combining digital and non-digital actants. In these evolving networks they do not make any difference between them. Instead, the

non-material actants play a much bigger role. By combining the different artifacts, my informants build a familiar environment everywhere they go. Digital artifacts turn into a *bestand* in the Heideggerian sense: They step into the background, are perceived as *zuhanden* instead of *vorhanden*. There is a high proportion of digital artifacts that play a role in the *Digital Natives* everyday networks of practices, but a closer look to the networks of the *Digital Immigrants* shows no significant difference in the way these networks are constructed, at least not in the intensity of use. Erik has a favorite spot in the house: He spends a big amount of time in front of the TV, his laptop is standing in front of him on the coffee table together with the cordless landline phone, his *IPhone*, and a certain amount of papers and letters. IPhone, phone, TV and laptop have a very high functionality in his life and except for the *IPhone,* they are all *zuhanden*, Erik does not perceive them consciously but instead they are tools in his daily life. But there is a significant difference between Erik and for instance, Kirstin's way of perceiving their individual work situation: While Kirstin is fluently rearranging her network, constantly adapting it to her needs, Erik's network is fixed and much less flexible. This gets clearer when looking into the different processes of how digital artifacts become integrated in these networks.

From *Vorhanden* to *Zuhanden* – Domesticating the Digital

Charlotte's smartphone is fairly new. She has it a few months but it is already completely integrated into her everyday life. She has loaded her favorite music to it, set her personal ringtone and when I ask her about it, she could barely recall what she was doing with it during the day. Charlotte's smartphone had already reached the state of being *zuhanden*, it had become a tool that she takes for granted; it has been domesticated. Berker et al. (2006) say that domesticated artifacts "have lost all their magic and have become part of the routine" (p. 3). This process of domestication is building the *bestand* of artifacts; a network of things that surrounds the individual in his everyday life. Charlotte's integration of the smartphone shows that this process of domestication is "adapting and morphing" (Berker, Hartmann, Punie, & Ward, 2006, p. 3), which means that the process is not linear but instead constantly adapting to the user's needs and the spatial and social environment that it takes place in. While Charlotte's smartphone has already gone through a domesticaton process, Kirstin's IPhone is just standing at the beginning: Her IPhone is still new and exciting and everyday she learns something new about it. When I asked Kirstin later during the

interviews about the things she carries around with her, the only thing she could recall was the iPhone. It was constantly *vorhanden* in her perception whereas the pencil and the rubber disappeared and became a part of the *bestand*.

It is not the fact that the IPhone is digital which makes it stand out in her experience. While digital artifacts eventually became *zuhanden,* part of the *bestand*, it was striking how most of my informants underlined the importance of certain non-digital artifacts: A calendar that is used to plan private activities, a framed photograph of a circle of friends, a pink overall that works as some kind of uniform for computer science students. Whereas other digital artifacts that had a very high functionality and actual value for the user – a state-of-the-art computer, an MP3-Player that is constantly in use – are disappearing completely in the user's perception. How different *Natives* and *Immigrants* perceive digital technologies becomes apparent when comparing the different processes of domestication: Erik has integrated the laptop into his everyday life as well as other artifacts in his everyday life, but it took him much longer and once they reached the status of domestication, they remained there stable. For instance, he is still using an Internet connection that is extremely slow and on the same technological level as it used to be years ago when it was installed. Nevertheless, Erik tells me enthusiastically about his home network, even though for me – a *Digital Native* - it must appear rather old-fashioned. Erik is not able to adapt and "morph" digital technologies to the same extent as Charlotte or Kirstin are. Once constructed, his networks remain inflexible and sensitive to disruptions.

Disruption and Stabilizing

I have described how artifacts become *zuhanden* in the perception of the user. In the next step, I want look into the situations in which artifacts become *vorhanden* – in the moment of interruption. From a phenomenological point of view, interruptions make a tool visible in the perception of its user, because then the tool is not working anymore and looses that trait that makes it *zuhanden* – ready to hand. At this point, the tool becomes a thing in itself and therefore *vorhanden*. The cultural analyst has to look for these interruptions because it tells him something about the disposition of the individual to the thing in itself. But these interruptions can at the same time be seen from an ANT perspective. Because in the moment of interruption that a link or connection in a network of practices is broken, it disrupts the network. By bringing the interruptions in context of the whole network, it is possible to observe if and how

non functioning actants are then built into the network again. In order to avoid mistakes, I will, when referring to these interruptions of networks, talk about *disruptions*.

Anna has a problem with the software for her *Macbook*. She recently bought a new computer that is more powerful than her old one but the software that she actually needs in order to work, does not work on the new device. Therefore she still has to use the old one – at least for using the software. At the same time, Anna does not want to relinquish her brand-new device. Therefore she uses the new computer for the set of tasks, for that she needs to be connected to the Internet via cable. For every task, she needs the special programs for which she uses the old computer instead. Every time Anna is now working, she arranges both computers around her (as it can be seen in Fig. 5) (Field diary, Anna, May 2010). It was this moment of interruptions that I was looking for. From a phenomenological perspective, this moment in Anna's life made her perception of how she works with her two computers visible to me. But this moment was very short, since Anna found a solution very quickly.

In my first impression, *Digital Natives* did not seem to have many interruptions in their everyday life. Neither was I able to observe them in their everyday practice nor could they be recalled later during the interviews. It was quite the contrary with the *Digital Immigrants*: When asking Erik and Maria about any interruptions in the use of digital technologies, I got to know that both of them perceive digital technologies as constantly disrupted. Maria told me that her Internet does not work properly; therefore she has to rely on other peoples help since she cannot fix it by herself. Erik made a similar experience but underlines that he is able to fix most of the problems quickly. Both of the *Immigrants* had a very strong disposition towards disruptions in their everyday life. For them, digital technologies were working differently than other tools that they were using in everyday life and were still connected to a high grade of uncertainty. To understand in how far the perception of the *Digital Natives* differs from the perception of the *Immigrants* it is necessary to look into the *disruptions* and much more importantly, the processes of *fixing* the networks again.

The life of the *Digital Natives* was actually full of disruptions related to their digital artifacts. Most of their networks contained one or several devices or other actants that would not work properly: Charlotte's laptop was broken and she could not

carry it around anymore, Greger's wireless router was not functioning correctly, Kirstin is still struggling to get acquainted to all the functions of her new IPhone; these are just a few examples, but what was really interesting, was that neither of my informants could recall these things in an interview setting – even though I had observed these interruptions just a few days earlier. But when asking them about things that would not work properly, things that were disrupting their life, the *Digital Natives* did not find an answer. The reason is that *Digital Natives* have found ways to adapt and construct the networks *around* and even *with* these disruptions: Anna's network around the practice of working and designing is complex and at the same time remarkably stable. In the moment a problem occurs – as with the new software not running on her new laptop – she rearranges the network. And even though there is a short moment of *vorhandenheit* in the perception of the laptop – in form of strong irritation – she is able to integrate it again quickly. She is even able to turn the disruption into a positive outcome: Since she cannot access the Internet now with her "work-computer", she tells me she would be less distracted and more focused on her work (Field diary, Anna, May 2010).

Digital Immigrants are not able to integrate the disruptions into their networks to the same extent. In the moment a digital artifact looses its connection to the network of practice, it remains outside the *bestand*. It is not part of the network anymore and gets barely reintegrated. For instance when Maria's or Erik's Internet does not work anymore, they will completely interrupt the practices that the Internet was needed for – e.g. checking their emails. A *Digital Native* would at this point develop strategies in order to make the practice function without the missing actant: Maybe they already know that they will have to restart the router, maybe they will ask a roommate who knows more about the problem or they will just move their laptop to the library and use the Internet there. They have developed strategies in order to deal with the interruption in their networks. That makes their digital practices much more stable because in the moment of interruption, they restructure the networks fluently. I would like to emphasize that it is not a matter of knowledge that enables the *Natives* to act in this way. The restructuring of the networks does not necessarily happen by fixing the problem; instead the natives find ways around it: Charlotte uses the laptop available at her institute every time she has to work in the library; she transfers the texts that she writes there by sending emails with the texts as attachments to herself.

Greger and his roommate are accessing the Internet now via cable since they both own a stationary computer and do not necessarily need wireless Internet anyway. Kirstin explains to me that she is self-confident that she will eventually find out about all the functions of her IPhone. These examples show that the *Natives* do not have special skills that allow them to remove the cause of the interruption. As I have shown earlier, most of my *Digital Immigrants* do not see themselves as very tech-savvy. For Erik and Maria, the practices around digital artifacts are standing outside their usual networks. In the moment one of the artifacts does not work anymore, the whole network fails to work.

In this chapter I have shown how my informants combine digital and non-digital artifacts in their everyday life and connect them – together with non-material actants as values and dispositions - to networks that are evolving around practices. These networks are maintained by social actors in order to gain a notion of familiarity. I have shown how, in the process of domestication, digital artifacts are integrated into these networks and how *Digital Natives* succeed in stabilizing these networks – as opposed to *Digital Immigrants,* for whom digital artifacts in the moment of disruption are standing outside their networks. But understanding the construction of these networks is only a sub-step in the analytical process. Looking into the interruption of practices, the moment in which digital artifacts become *vorhanden* can now give insights into the role of the habitus in the everyday practices around digital artifacts.

Digitalized Values

The relationship between individual and artifacts

While the last chapter was focused upon an overall view of practices around digital artifacts this chapter shall have a closer look into the actual relationship between digital artifacts and their user. Therefor I want to focus on the different types of values that individuals are assigning certain artifacts and how those are connected to the dispositions and structures of the habitus – in particular in relation to the differences between *Digital Natives* and *Digital Immigrants*. Following my informants dispositions and values I want to work out what distinguishes the *Digital Natives* practices and examine along my fieldwork material, how and why digital artifacts gain meaning and value for them.

Valued Artifacts

Anna and Charlotte both tell me that their life would not work without a computer. That does not make the computer necessary special, as Anna explains to me, but there is just no question about it. "There has to be a computer otherwise I could not work" (Personal Interview, Anna, May 2010). During my observation it became apparent that artifacts have different grades of importance: The mobile phone, the computer and other high technology artifacts were usually very relevant to my informants because they connected them to a whole range of interactions in their everyday life: With a mobile phone they would take pictures, call their friends and families, check their emails or their schedule for the day. For all my informants the computer was used to surf on the web, watch movies or chat with friends. For the students in Lund it was in particular highly work-related. Most of the activities related to their studies were taking part with the help of their computer. Maria as a digital immigrant made a similar experience. She had to overcome her reluctance towards digital technologies in order complete everyday work-related tasks: "Today you can't do anything without a computer. If you want to transfer money for example, it is all online." (Personal Interview, Maria, April 2011)

In order to gain a deeper understanding of human relationship to artifacts it is important to reflect on what *value* actually consists of. Therefore it is necessary to develop an understanding of value that exceeds the mere notion of economic value. Verbeek (2005) says that designers are looking at an artifact from two perspectives: From its functionality and from its "sign-value" (p. 204). He defines this sign-value as what the product stands for in a certain cultural context. Here the value of the product is seen rather one-dimensional, with a strong focus on its role as representation of the individual. Boradkar (2010) sketches a more complex image of value by defining it as an "aggregate" (p. 49) of value of a certain artifact. Such an aggregate contains the different forms of value that are attributed to an artifact and represents therefore its overall value for the user. Besides the economic component value can also be aesthetic, functional, emotional, historical, environmental, social, cultural or symbolic, just to name a few. He underlines that a list of types cannot be complete, since that would mean "reducing the complexity of value" (p. 50). But in order to gain insights into the actual meaning of an artifact in a users life, such an aggregate can be

helpful. The different forms of value become apparent when looking at the practices around digital artifacts from an ANT perspective.

Two Types of Value

Mobile phone and computer have a high *functional value*. Understanding these digital artifacts as part of a network shows that they have many connections to actual practices in everyday life; that is what distinguishes them from many non-digital artifacts. However, it is not only the intensity of use that would give a digital artifact a particular high value aggregate. Instead the value of artifacts is affected by the dispositions and structures of the individual's habitus as I am going to show in the following example: Kirstin's IPhone is special to her. It is constantly in use and at the same time she is very conscious about it. It is not only its state of being new and exiting that made it valuable in her perception. In the value aggregate Kirstin's IPhone has a high social value, through the connection to her boyfriend, friends and her family, as well as a high emotional value, since her family and her boyfriend are connected to strong emotions. In addition to that the IPhone helps Kirstin to gather and organize information, which has a high value for her, since she likes to be ahead of things. From an ethnological perspective Kirstin's IPhone, with all its values, shows the influence of her habitus in her interaction with digital technology. This becomes clear by understanding the habitus in itself as a network of dispositions and structures. Fig. 6 shows Kirstin's habitus together with her network of everyday life (or at least a part of it). Kirstin and the other informants surrounded themselves with artifacts that had a certain meaning for them – in form of a connection to the dispositions of the habitus. In a value aggregate these artifacts would get assigned a high emotional, social or cultural value. Such a value – that is given to an artifact through its connection to the individual's habitus I am going to call *disposition-value*.

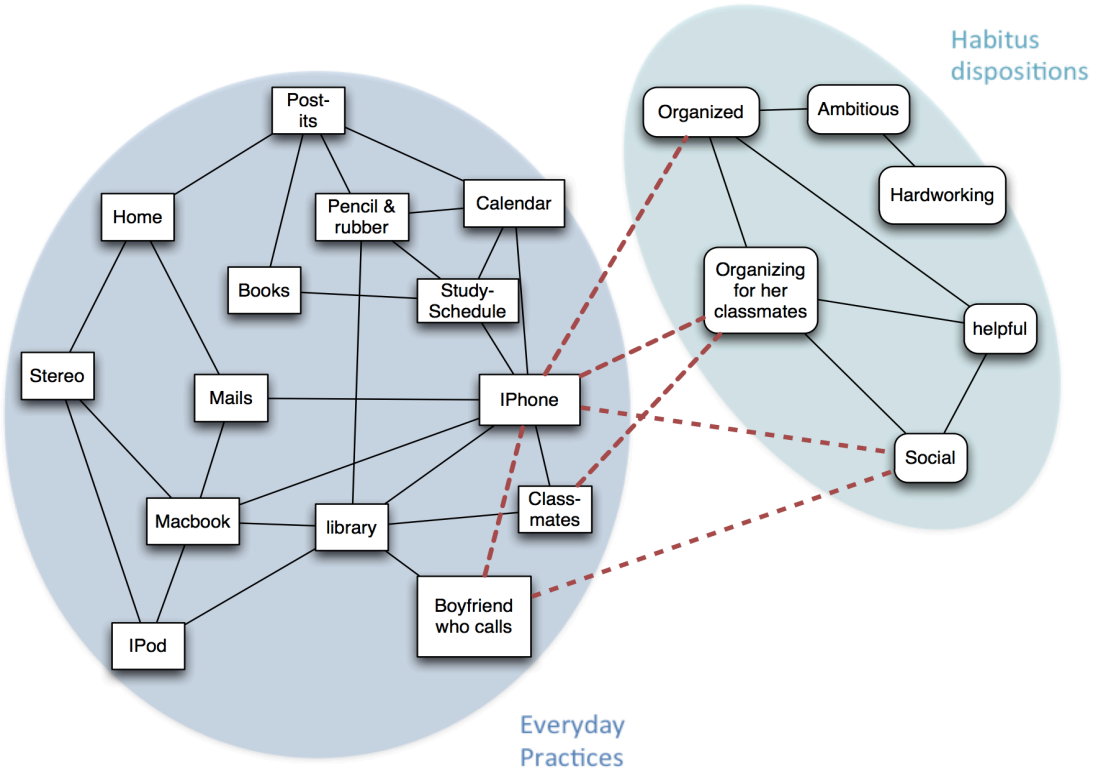

Figure 6: Kirstin's network of studying

Disposition-values must not be understood as stable and fixed but instead they can have many different specifications: For the students of the German high school the value of the mobile phone and the computer (in form of the social network *Facebook*) consisted mainly of its social component. Other artifacts did not gain their value by connecting my informants to important people, like their parents or partner, but instead artifacts that had a cultural and symbolic value to them and represented who they are in a certain cultural context: Anna's decision to buy a Macbook was not only based on rational considerations – as she admits during the interviews – but also "because as a Designer you just have a Mac, that's how it is" (Personal Interview, Anna, May 2010).

Values of *Natives* and *Immigrants*

The fact that *Digital Natives* grew up with digital artifacts makes them able to integrate the network of everyday practices into the dispositions and structures of the habitus and vice versa, which means that the habitus of a Digital Native is deeply embedded into the networks of digital everyday life. Therefore a digital artifact – like isten's IPhone - can have a high disposition value, something that the digital artifacts in the *Immigrant's* life are lacking: Maria – as a digital immigrant – is struggling to

understand the *Digital Natives* around her. She tells me that she finds it peculiar that so many young people are sustaining their social contacts via digital media: "On the airport we saw these young girls sitting next to each other and they all had their phones or a laptop and they were just typing something instead of talking to each other". For Maria digital artifacts – like her mobile phone that is often lying unused somewhere, likewise the computer that she only uses if she has to – remain impersonal. But nevertheless *Digital Immigrants* are participating in digital everyday life – and not always because they are forced to. Similar to Kirstin, Erik just got a brand-new IPhone that he is using with big excitement. But for Erik the value of the IPhone does not lay in its connection to other – for example social dispositions in his habitus. Instead the *digital* is one of the dispositions in his habitus: He understands himself as an early adopter and is proud of being on top of the newest technological innovations.

Erik's example shows that this certain digital disposition is not a specific characteristic of *Digital Natives*. They do not have to have the digital per se as a disposition in their habitus in order to assign a digital artifact a high value. *Digital Natives* that would not call themselves experts – like Charlotte or Kirstin - learned to integrate digital artifacts into their life to a degree that they got fluent in handling possible disruptions. But they do not have a higher grade of technological skills than *Digital Immigrants* nor do they have a particular high interest in digital technologies. This becomes apparent when looking into all the non-digital artifacts that gain a high disposition-value: Anna, who stores all her pictures online and is proud of avoiding having too much stuff in her room, shows me proud the big box of photos, invitations and other memorabilia that connect her to her family at home. Greger's most valuable artifacts were his student hat and a special overall that all the data engineers in Lund wear on special occasions.

Digital Experts

Nevertheless the digital *can* be part of the habitus and it is interesting to see how this disposition structures digital practices: As I have shown earlier computer are one of Greger's main hobbies. He surrounds himself with a large amount of technology. The digital is not only a tool but also a passion. Nevertheless the fact that Greger is such a computer expert did not change the general way he was dealing with digital technologies. I could examine something similar when I was talking to the

group of network administrators at the German high school. Here I could make an interesting observation: Even though the interaction with computers was a central part of their life, they would use digital technologies much less in everyday practice than their less tech-savvy classmates. For them computers, mobile phones or even a calculator were tools on which they could experiment. Even though for Greger and the web administrators the digital becomes a disposition in itself it barely affects their daily practices with digital technologies. The digital experts everyday networks of digital practices do not differ in *extent* of use or functionality from *normal* users. Instead the digital has two different agencies in their life: On the one hand it is a value that they have – an interest or hobby. On the other hand, everyday digital artifacts – like their computers or mobile phone are integrated in the infrastructure of their everyday lives in the same way as the non-experts.

Mapping Values

I have shown how the habitus is influencing the way we assign value to different artifacts and in particular digital artifacts. The way *Digital Natives* are attributing value to digital artifacts differs from the way *Digital Immigrants* do. To recognize the value of an artifact is an important part of the design process because designers aim to develop artifacts that become more valuable to the user. (Boradkar, 2010, p. 64f.) Therefore I want to demonstrate a way to structure and *map* the values that artifacts get assigned. As I have shown, the value aggregate of a digital artifact contains the functional value as well as the disposition value. Fig. 6 shows that Kirstin's IPhone has many connections in her everyday practices but at the same time connects these practices also to the dispositions of her habitus. Some of the artifacts in my informant's life had these special role. Anna's Macbook, Greger's smartphone, Charlotte's laptop – they were all combining a high functional with a high disposition value. I am calling these digital artifacts *central hubs* because they mediate between the structures of the habitus and the digital practices in everyday life.

Invisible Artifacts

But what happens to artifacts that are having a high functional value but are lacking the disposition-value? There are many digital artifacts in my informant's life that remained – even though they were intensively used – invisible in their perception: Anna's practices in her room are centered around a power strip next to her desk: Since

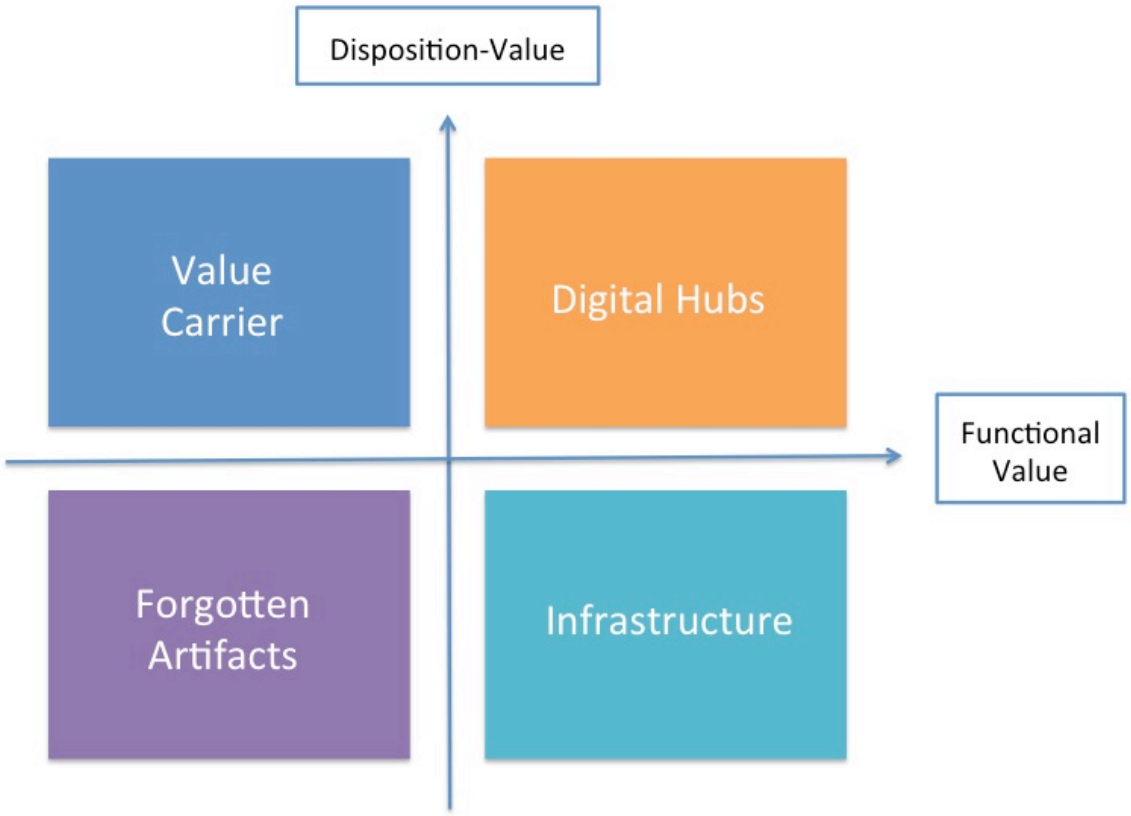

Figure 7: Value Map

many of her daily activities require electricity they have to happen in the radius of this power plugs because it is the only one in her room. I am surprised to hear that she had not even thought about it but agrees with me that this arrangement is rather inconvenient (Field diary, Anna, May 2010). Cables, the router that connects to the Internet, the external hard drive that stores masses of data: These artifacts are what I would like to call the *infrastructure* of the networks of everyday practices. Without them the practices could not work in the same way but they lack the value that is attributed to some other artifacts. That makes them constantly *zuhanden* in the *Digital Natives* perception. These artifacts stand out due to their stability inside the networks. Like Anna's inconvenient power plug are they in their perception (not in their functionality) rather immune to interruptions. When a cable is broken, a new one is bought; when Greger's stationary computer has a problem he fixes it. I have already shown in the previous chapter that the *Natives* networks containing digital artifacts are more stable than the digital networks of the *Immigrants*. The infrastructure is the basis for this stability. It surrounds the *digital hubs* and builds the foundation for their function.

Neither Erik nor Maria perceive any of the digital artifacts they are surrounded with as a mere infrastructure. For Erik, digital artifacts have a particular high value,

for Maria they are peculiar and are standing out. But for both of them the particular positive or negative value lies in the digital of the artifacts and not in its connection to other values. As I have pointed out in the previous chapter, neither Erik nor Maria succeed in integrating the artifacts into the networks of their everyday life, nor are they integrated into the structures of their habitus

Forgotten Artifacts

It is part of the process of domestication that artifacts fall out of fashion and are replaced by new technologies. Löfgren (2009) describes how these artifacts then often disappear into boxes down in the basement. There are many artifacts that show this process of forgetting among my informant's artifacts. Greger's old notebook that he stores now at his girlfriends place and obviously barely uses is for him invisible. Kirstin's iPod – even though once used extensively was quickly forgotten after she started listening to music with her iPhone. Forgotten artifacts did not only use their function but also their value, their connection to the structures of the habitus. This can happen out of different reasons: Anna's old Macbook was replaced by a newer and better model – the same one that many of her designer colleagues have. The same happened to Kirstin's IPod, who merged different functions in one device. And Greger is much more interested in his stationary computer – because it is more powerful and allows him to play advanced computer games but also it offers him more opportunities to modify it – which is an expression of his identity as a computer expert.

Value Carriers

Not all old artifacts loose their meaning. There are many artifacts in my informants' life that keep their value or even win their value through being old and therefore gaining a certain symbolic, emotional or social value. Anna has an old radio (Fig. 8) that is very important to her since it connects her to positive

Figure 8 : Anna's old radio

memories from her old student dorm. In the moment the artifact stands in connection to the habitus of its owner and gains therefore disposition-value, it turns into an actant that has a value in itself and it then also reintegrated into certain practices of everyday life, as Anna who listens to the old radio from time to time. For the digital experts this kind of value can be even related to digital technologies. The network administrators of the German high school discussed excessively an old *Gameboy* that one of them keeps as a high-valued memory. *Value Carriers* can bring with them even a notion of notion of anachronism to an observer (maybe a *Digital Immigrant*). But at the same time they are crucial elements in understanding how *Digital Natives* assign values, because *Value Carriers* diffuse the notion of that digital technologies do have a disposition-value through their technological sophistication. Designers and engineers who are seeking to develop products with a certain value cannot just rely on a certain technological advancement but have to find ways to advance the disposition-value that is embedded in a product.

Digital Innovation

Cultural Analysis and User-Centered Design

Understanding the practices and values around digital technologies as I have strived for in the previous chapters is not only relevant in an academic discourse but also part of the designing process. User-Centered-Design seeks to set the user as the driving force in the innovation process – a deeper level of understanding of what drives people in their digital everyday life is therefore a necessary element of developing new technologies. The implementation of user research in the design process has during the past years become widespread amongst designers (Shove et. al., 2007, p. 130) and finds its reflection in a number of design compendiums, in particular in the field of computer- and interaction design (e.g. Kuniavsky, 2003 or Goodwin, 2009). Classical methods include for example focus groups (in which ideas for a new product can be developed) and usability testing (in which the already existing product is tested) (Goodwin, 2009, p. 56). However, despite this aim towards achieving a user-centered design, it often lacks in implementation. And even though anthropologic approaches in consumer research become more and more popular it is often just reduced to "observation" (Sunderland & Denny, 2007, p. 26). In my last chapter I want to show how a cultural analytic approach can enhance the developments of

innovation and lead to a process of practice-centered design. Along the results of my research I want to demonstrate then how the design process can be improved by focusing on different forms of values and practices.

How to Innovate with Cultural Analysis

I would like to begin with reflecting upon the question what kind of innovation my analysis of the *Digital Natives* actually strives for or rather, what kind of innovation this kind of in-depth analysis can actually contribute to: "Innovation is an invention that has a socioeconomic effect; innovation changes the way people live" (Chayutsahakij & Poggenpohl, 2002, p. 1). This definition of innovation set into contrast to the actual everyday work, as I could observe during my time in the design center of a global electronic company, reveals a gap between blending theory and actual practice. My work there showed that – even though user research was supposed to lead to ideas for new products – it often was rather used for improving already existing concepts and product models, while the actual responsibility for user research for innovation was rather in the marketing department. This leads to the situation where the actual in-depth consumer research is detached from the technological innovation process. Chayutsahakaij and Poggenpohl (2002) discuss the problematic that come with this kind of approach. Because marketing research builds upon already existing technologies they will not be able to create innovations that "*change* the way people live" [emphasis added] (p. 2). Accordingly designers in this kind of cooperate context are limited to a product-centered approach that does not take user needs into account. Both approaches – limited to themselves - suffer therefore from their one-dimensional perspective. Chayutsahakaij and Poggenpohl suggest a model in which design research accounts on the one hand for future technological developments but on the other hand also for changing markets, that means changing consumer needs. Based on these two dimensions they develop four types of "innovation situations" (p. 3f): "New technology for new markets", "New technology for known markets", "known technology for new markets" and "known technology for known markets". The first innovation situation in which new technologies are developed for unknown markets is then described as a situation in which user research has to "match the unarticulated needs of users with technology possibilities. It is essential to understand the users experience holistically" (p. 3). It is the situation with the highest grade of uncertainty. It is this uncertainty that is at the same time coming along with a high

financial risk that often constrains this kind of innovation in a corporate context because the designer has to design products for a user that he is yet unfamiliar with. (Chayutsahakij & Poggenpohl, 2002, p. 4). Understanding *Digital Natives* as a sort of "new market" helps the designer to have a look into the future of digital technology use in order to release some of this uncertainty. The analysis that I developed in the last chapters can give this kind of "holistic" insight that Chayutsahakij & Poggenpohl ask for. It is focused on the practices that evolve *between* users and artifacts instead of focusing on either one of them by itself. The potential for an innovation process that involves cultural analysis lies in the theoretical approaches to actual everyday practices, which can be then connected to the *Digital Natives* habitus – that is what actually drives him and creates value for him.

From User- to Practice-Centered Design

There are different approaches in the design process that have been developed historically. Shove et. al. (2007) show that originally design was based around the idea that a value is given to the object by the designer. As they point out, this approach presumes that consumer needs are stable and the designer can give then – since he has insights into the consumers needs – products a certain value so that they enrich the consumers life. Whereas the value of user-centered design lies in the users needs and the value that he assigns a certain product. (p. 119) This approach can be enhanced by understanding the relationship between different artifacts and users as a network and focusing on the outcome between user and artifact – the actual practice.

Shove et. al. call this a "practice-oriented design": While the product-centered approach assigns the product a certain value that affects the user and the user-centered approach focuses on the meaning that the user assigns to the product, the practice-oriented design seeks to put the perspective on the *agency* between user and artifact. This approach implies that is not only the user who creates a practice around the artifact but instead the "material artifacts themselves configure the needs and practices of those who use them" (Shove et. al., 2007, p. 136). This approach calls for an understanding of the relationship between object and user that is mutual as it is suggested by Miller (Miller, 2010): By understanding the connection between user and artifact as "objectification" the design researcher can examine not only the value the user puts into the artifact but also how the artifact affects the individual.

Value Maps

A designer strives to develop a "valuable experience" (Boradkar, 2010, p. 64), meaning that a product has to be experienced as having a high value. Therefore a product has to "satisfy the physiological, cognitive and emotional expectations (or needs) of people" (Boradkar, 2010, p. 64). However, user research is often more focused on the physiological and cognitive aspects of a product – its usability and therefore functional value - instead of its emotional aspects. A quote from a comprehensive design handbook makes that clear: "If you are designing a mobile phone, you're addressing the communication and information needs people have when they're not sitting at a desk" (Goodwin, 2009, p. 122) By focusing on the users actual experience I was able show that the individual experience of digital in everyday life is connected to socialization with digital technologies. The fact that *Digital Natives* grew up with digital technologies does not necessarily change their knowledge but instead lets them move more *fluent* in interaction with them. This is in particular relevant for the designer in order to understand what happens when the networks – and with it the use of certain artifacts – are subject to disruption. Because the *Natives* networks of practice are much more stable than the Networks of *Immigrants*, it is the disposition-value that plays a much bigger role in the overall perception and importance of a particular product. Related to the above-mentioned example of the mobile phone the disposition-value of the device plays an at least as big role for the user's experience than the actual communication needs it fulfills. And even though the actual usability of a product is important, the functional value is rather secondary in comparison to the personal and cultural value. As I have shown in the last chapter artifacts gain their overall value for the user by the combination of functional and emotional, social or cultural value. The relevance of these disposition-values becomes clear by looking at an example of an artifact that succeeded in producing this value. Apples' IPod has been subject to research because of its unique role as a "cultural icon" (Bull, 2007, p. 1). The designers of the iPod succeeded in moving the value from the functional level – being an MP3-Player – towards the disposition-value. As Bull (2007) points out, the IPod is for instance able to connect to the social dispositions of the habitus since it focuses on the "we-ness" aspect of music (p. 6). This re-focusing away from the functional value towards the individuals perspective can be found in many products that are designed by the company *Apple*

and is reflected by the broad range of dispositions that my informants had towards the brand name. For Anna it belonged to her designer-being, for Kirstin it was a sign for connectivity and multi-tasking; and the reluctance towards it was embedded into Greger's disposition as a digital expert. But they all had in common that they *had* a certain disposition about *Apple*.

The example of the iPod shows that it is important to identify the different values that an artifact can get assigned from different users. Fig 9 displays a *value map* of the digital artifacts in Anna's everyday life.[3] It shows that her mobile phone, as well as her old computer have a high functional value but are lacking the connection to her habitus and therefore the "soft" value. Thus they become part of the infrastructure. Her old Macbook will probably soon – once she does not need it anymore – become a forgotten artifact. Whereas her new Macbook still has a very high value for her, even though this effect could wear of over time, due to the process of domestication. Anna's camera is also a central hub, because it has a high functional value – she barely leaves the house without it – that is combined with a high social

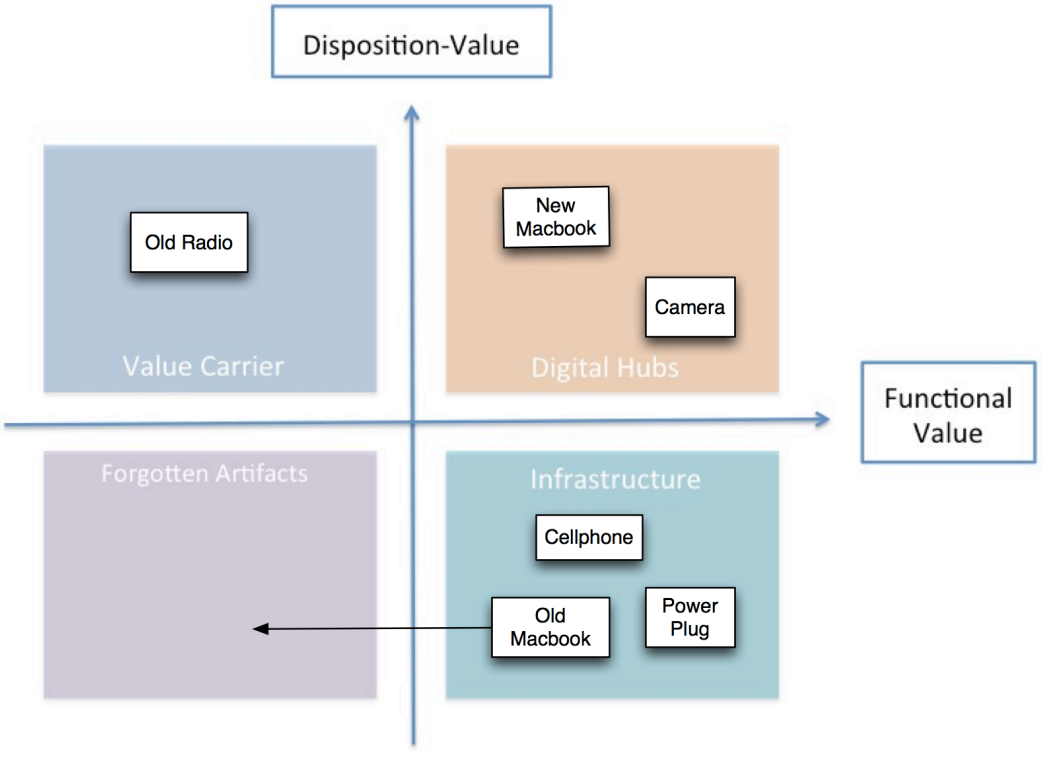

Figure 9: Anna's value map

[3] Value maps from my other informants can be found in the appendix.

value – by taking pictures of social activities with a certain group of friends she gains a notion of integration with this group. This kind of "mapping" is for instance relevant for a designer who strives to design a product that is very likely to be just a part of the infrastructure – for example a router: During my observation routers where the artifacts whose high functional value – connecting all the digital artifacts to the Internet – stood in a sharp contrast to its lack of emotional or cultural values. Therefore the router never moves away from its *zuhandenheit* and becomes a mere commodity. In order to bring the router out of its invisibility the designer has to find ways to connect its functionality with a certain disposition-value. Value maps can visualize the relationship between disposition-value and function and therefore be a good foundation for the designer to work on.

Personas

Disposition-values differ from individual to individual because each human being has its own life history and therefore a different set of disposition and structures. But products cannot be designed for each individual (even though there are attempts to make products more customizable). Designer and cultural analysts have to find ways to make the gained knowledge usable in the design process. One of the tools that designers use during the design process in order to get an overall image of the user they are designing for are *Personas*. *Personas* are specified user models that are developed from general characteristics that potential users can have thereby they are supposed to represent the customer. Kuniavsky (2003) explains that they "allow you to focus on specific images of users that everyone o the team can reference and use as sounding boards for development ideas." (p. 130) Even though these persona have the potential to actual fulfill this purpose by helping structuring qualitative data, they are unfortunately often created like Kuniavsky describes it: "Based on your intuition, your judgment and information you have at hand" (p. 130). This means that designer often rather "assume" what the user wants based on experiences in the past (Travis, 2009). By putting user research in the beginning of the research process before creating the personas, user profiles can be developed based on user-specific value-structures. Both, designer and cultural analyst have to work together on deciding, which key factors shall be integrated into the development of a user profile. Possible factors could be classical demographic data, as age, profession or education, but they also have to incorporate the results of the qualitative user research that can

display the habitus of users. This kind of user analysis enables designer and cultural analysts to improve concrete products – like a router or an MP3-Player. Hereby the potential of cultural analysis exceeds classical user research approaches and usual design research structures, but makes it also necessary to overthink design processes in a corporate context.

Conclusion:

This research originally evolved out of my interest in users of digital technology and how the integration of digital technologies in everyday life can be better understood. Digital technologies have become a part of everyday life that became, especially for younger generations – the *Digital Natives* – taken for granted and part of their everyday practices. I was particularly interested in building a strong theoretical foundation in order to reach a more abstract level in the analysis. User-centered innovation can then build on this deeper understanding of *Digital Natives'* practices and values.

Practices and Values in the Information Age

Digital Natives are permanently acting in networks that evolve around their everyday practices with digital technologies. Therefore they are combining digital and non-digital artifacts and in their perception, digital and non-digital are symmetrical. These networks are stable. If an interruption occurs – the mobile phone battery that does not charge anymore, the laptop that cannot be closed, the cable that is constantly too short – they find strategies to solve these problems without the networks being affected. It is rather the excitement of the new that makes an artifact stand out and visible in the user's perception. A new mobile phone, a new camera or just the wish to own something: Digital artifacts have to be domesticated – they have to find a place in the network before they can become part of the users networks of practice. Different digital artifacts have a certain grade of value that affects how they are perceived. Because the *Natives'* digital networks of practices are stabilized, the functional value of a digital artifact does not play an exclusive role in its overall value *aggregate*. Instead an artifact gains value through its connection to value-loaded actants – this can be friends and family but also work- or study-related. Such an artifact gets assigned a certain *disposition-value*. While other artifacts – which are lacking this habitus-related value – are building the *infrastructure* of digital everyday

life. *Central hubs* – artifacts that combine a high functional with a high disposition-value – remain more often *vorhanden* in the perception of the user because they connect the user to certain emotional values and dispositions. In direct comparison to the *infrastructure*, it is not the digital in itself that gives the *digital hubs* their importance, but instead their role in the network of the "structuring structures" of the habitus in combination with their practical function in everyday life. Computers or other digital technologies *can* be embedded into the habitus as a value, but the *Digital Natives* are not defined by the fact that the digital is their core value. Looking at the *Digital Experts*, it becomes clear that the *Digital Natives* cannot be seen one-dimensional as a generation of digital experts, but instead they differ to high degrees in the way they attribute values and experience digital artifacts. The digital function for the *Digital Natives* is not, per se, a value in itself.

Towards a Cultural Analysis of *Digital Natives*

There can be no doubt that there is a need to research about the changes in technology and how it influences human's relationship to technology. The concept of *Digital Natives* - the idea that the way we interact with digital technology is connected to our socialization in the information age – has proven to be an important approach to research about social change. My aim in this thesis was to show a possible direction for such an approach. Due to the rather small scale of my research project, I was able to scratch on the surface of this issue but it is now necessary to follow this path further and focus on all the new questions that my research has opened up: The gender aspect, for example, is one of the aspects that still requires further examination. Some of my observations point towards a shrinking of the gap between female and male use of technology. Also relevant are issues of home and place making. There is a notion of dislocation and globalization that is coming with the digital age (Morley, 2006). However, some of my observations show that *Digital Natives* show the tendency to take their home with them by connecting the different places of their life with some sort of digital toolkit. This would fit to the concept of *Digital Nomads* – the idea that digital technologies facilitate a nomadic lifestyle. (Makimoto & Manners, 1997) All of these issues have in common that they strive to see *Digital Natives* in their diversity. Previous analyses about the *Digital Natives* have often remained on a rather superficial level. Quantitative as well as qualitative studies

were rather concerned with questions about the level of knowledge or about the quantity of media consumption. They failed to ask for the *how*.

In my study, each theoretical tool brought a deeper level into the understanding of processes: Actor-Network-Theory was the foundation that allowed me to see digital artifacts in everyday life in connection to each other and in their connection to the user. Phenomenology made it possible to take the perspective of the user focus on the individual's experiences. By looking into the being-there of the individual, focusing on how he experiences artifacts helped in understanding at which point different artifacts are perceived differently and which values they are attributed with. By focusing on the habitus of my informants, I could take the individuals socialization into account. This in-depth cultural analysis is not a "nice-to-have" but can instead be a valuable contribution, to both, the academic discourse and in an applied context. Understanding the practices of *Digital Natives* means understanding the consumer of the future.

Designing for the Future

My USB-Stick is special because it has a personal value to me. It has turned into a *digital hub* - it is through my habitus that the USB-Stick gains its high value. Thereby it differs from many other USB-sticks that are constantly part of the *infrastructure* and therefore always remain rather a commodity. I want to argue that a design that meets the needs of *Digital Natives* must strive to understand the role of disposition-value, because the mere functionality of a device is not enough anymore. Therefore the designer has to concentrate on the relationship between *Native* and digital artifact and thus understand how practices around an artifact are formed through its cultural value. But I would even like to go a step further: The understanding of the practices of *Digital Natives* are valuable to develop products for the present but there will be new developments in technology that we cannot yet foresee. I want to argue that it is therefore important to understand the cultural *processes* that are coming with technological innovation instead of just making the status quo visible. By opening the contrast between *Natives* and *Immigrants* and lining out how the value of certain artifacts develops over time, my research shows in which way practices are *changing*. This does not only help to understand the current practices of *Digital Natives* but provides the tools for a deeper understanding of generations and practices that are yet to come.

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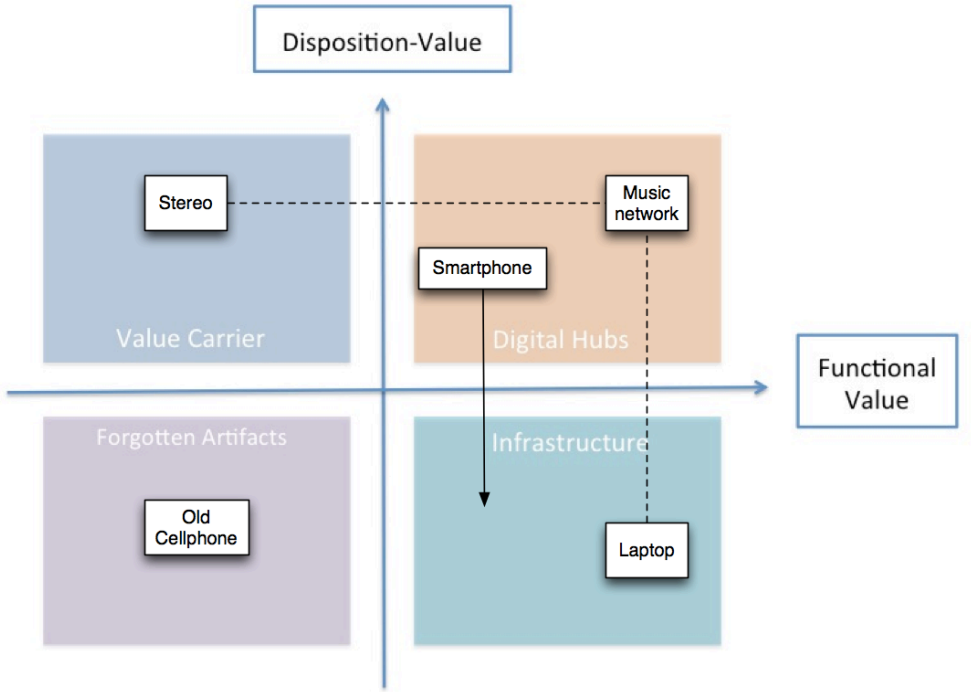
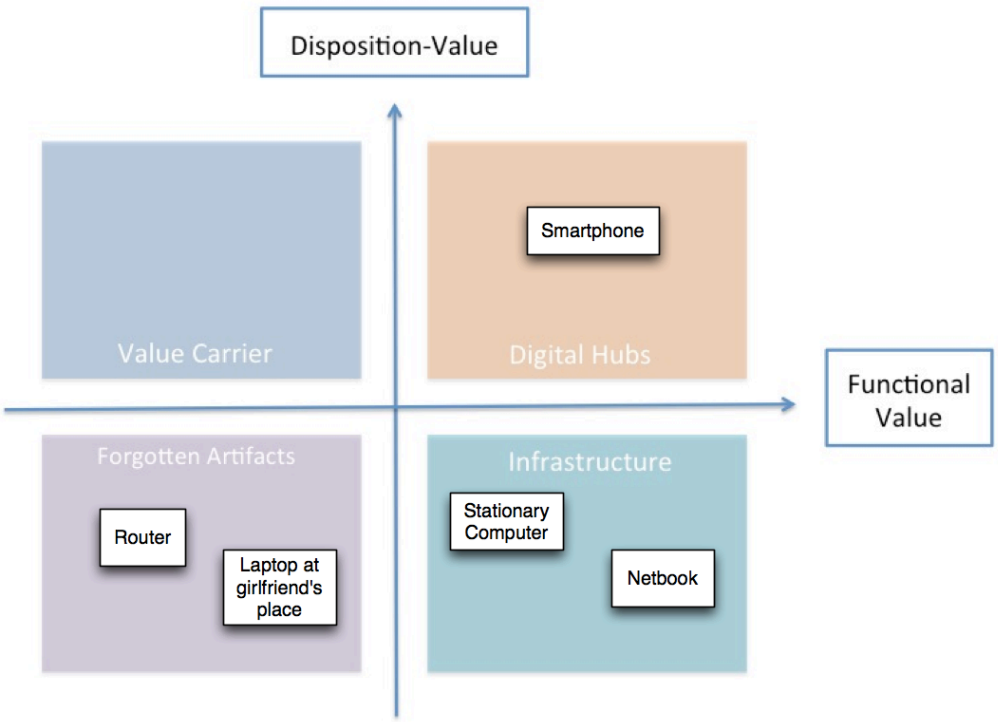
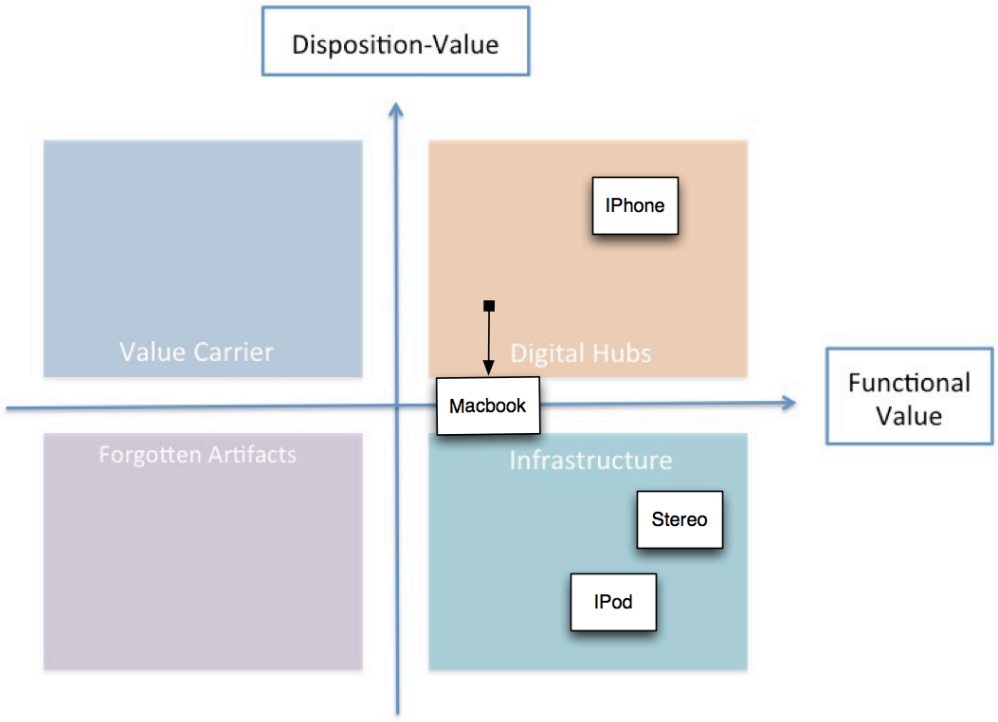
Appendix: Value Maps



Charlotte's Value Map: One of her most important *digital hubs* is her music *network* that consists of several artifacts, which have themselves different meanings. Her mobile phone is at the moment rather high-valued because it is new and exciting, but is very likely to become infrastructure after being domesticated.



Greger's value map: His computer's both have a relatively low disposition-value. Many artifacts in Greger's life are *forgotten*.



Kirstin's value map: Her Macbook – even though constantly used – has moved from being a *digital hub* towards the infrastructure. It has been replaced by the new IPhone.