RELATIONSHIPS OTHER THAN USE

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ABSTRACT

The people who use a designed artefact are not the only ones who will experience or be affected by it. This paper introduces the notion of relationships other than use as an important consideration for design, in addition to relationships between users and artefacts. It identifies some related issues in design discourse with regard to the concept of use and discusses how the concept has emerged in design practice and discourse, with particular regard to participatory design. Different kinds of design relevant relationships other than use are presented and described through a case study involving designing with the pre-users of medical devices. The relevance for design is discussed and design examples are put forward to that show the importance of the consideration of these alternative relationships, along with suggestions of methods for working with them.

INTRODUCTION

In the field of participatory design (PD), and design in general, huge advancements have been made in attempts to make the outcomes of design process meet the needs of users over the last 30 years. We are now in a position where it is generally understood that user knowledge and participation, are critical to project success, companies pride themselves on their user driven approaches and resources are allocated to understanding and involving users in the design process. The concepts of 'use' and 'the user' have become an intrinsic part of most current design discourse and research, indicative of the general shift it design practice towards human-centeredness. Yet the idea of the user carries a slight risk of foregrounding the use of the artefact, and leaving other legitimate and design relevant aspects of human-artefact relationships to be overlooked. While acknowledging the concept of the user is a vital one to design, the object of this paper is to draw attention to some of its limitations and to introduce a broader view of the kinds of relationships that may be relevant to consider when developing design. Here I am referring to design objects as not only products and physical things, but any potential outcome of design processes, including computer systems, interfaces and services.

In this paper I will present evidence from a case involving two industrial partners who manufacture medical devices, where as a result of this, we have taken our starting point from the technology relationships, looking exploring opportunities for participatory design and innovation with people, who due to a progressive medical condition, may one day become users of these technologies. In these cases we believe the relationships that these people have to the devices, although they are not users, are important, because a delay in adopting the treatments technologies beyond a certain point in their future could potentially have a significant effect on their health and well-being. We are currently using the term 'pre-users' as a working title to refer to this group.

Other scholars have identified issues related to the concept of the user in design, in particular with regards to how 'use' and the 'user' are represented in design processes. One important point that is often raised is that, in design processes which aim to produce innovative offerings, how is it possible to design for and with the users of something that does not yet exist (Redstrom 2006, 2009, Ehn 2008). Another issue that is also brought it is with regard to the object-user relationship, is that differences that emerge between the designers intent and actual use. As Akrich (1992) points out, designer pre-scribe roles for an objects users, but it may be that no one will come forward to fulfil those roles, or that users may define quite different roles of their own. Some scholars and practitioners have also challenged the assumption that successful design is defined by its effectiveness for its intended purpose and also its ability to persuade people to use it for this purpose, as Redstrom (2006) states " there are fundamental problems associated with the idea that design is about determining the use of objects in detail", arguing that people should be able to people customise and adapt design to their own purpose, essentially being able to make the object more valuable to themselves by doing so. These arguments all arise from the problem of reconciling intended use, which is what creates a reason to call the artefact into being, with actual use, that can only be defined when it comes into play in context. However these arguments also focus only on the use role of the artefact, but in this paper I would like to draw attention to some of the other roles that artefacts can play and relationships that can be had with them.

In participatory design, a central tenet has actually always been to include all of those who will be most affected by the design, into the design process (Segalowitz & Brereton, 2009) Nevertheless most of the discussion in PD revolves around some kind of user participation, with those relevant stakeholders who may not actually use the product, still being categorised as some kind of user (Bergvall-Kåreborn & Ståhlbrost 2008), but there have been attempts to acknowledge more distinctly, that other people may be relevant to and affected by design and design processes, who are not characterised by the user role. One such example being 'non-users' (Herstad, Stuedahl & Thanh 2002); people who may be affected by an object without actually using it. In order for PD practice to maintain its democratic principles it is important to also allow these people who may be affected by a design, who are not covered by the concept of the user, to participate in design processes.

PD began in Scandinavia with an original focus on empowering workers and unions in the processes of implementing new technologies in the workplace and not necessarily on the use of those technologies. This was in the 1970's as a reaction to negative affects that the introduction of computer technologies into the workplace seemed to be having on the workforce. Workers and unions were concerned that the introduction of such technologies was leading to a reduction of the control they had over their working environment, resulting in deskilling and eventually would lead to workforce reductions. The ambition, therefore, was based on ensuring democracy within the workplace by building up technical and organizational competences among workers and shop stewards in order to strengthen their bargaining position with management (Kensing & Blomberg, 1998). Early projects such as NJMF in Norway, DEMOS in Sweden and DUE in Denmark, took a strategy that included exploring the potential and actual consequences introducing specific systems, developing goals and strategies for the Unions, and formulating and advocating the adoption of laws and policies at a national level, but despite successes in these areas workers and Unions still struggled to be able to influence the implementation of new technologies.

One of the ways that researches and workers tried to address their continuing problems in influencing the adoption of technologies in the workplace was to look towards the technologies themselves, considering the possibilities of designing, developing and implementing technologies that took there starting point from the needs of workers (Kensing & Blomberg, 1998). *"The main ideas of the first projects, to support democratization of the design process, was complemented by the idea of designing tools and environments for skilled work and good-quality products and service,"* (Ehn, 1993). One of the first attempts to do this was the UTOPIA project (1981), which had the overall objective to explore the prospects for interdisciplinary cooperation on work and technology design for computer applications. The requirements for the design were that it should improve the quality of work and products, realise democracy at work and *enhance user skills* (Floyd et al, 1989) Part of the attention was therefore focused on the relationship of workers as *users* of the technologies, and empowering them through participation in the design of use. When, later, the loss of Union Power in Scandinavia lead to a refocus of the objectives of participation, PD shifted much of its focus from looking at how technologies would influence workers, to looking at use relationship between technology and worker, further promoting the significance of the role of *user (*Bergvall-Kåreborn & Ståhlbrost, 2008).

Similar to PD, 'User Centred Design' (UCD) is a term that emerged in the 1980's, indicating an up-front commitment to putting the needs of the user at the centre of the design process, though both encompassing and differing from PD, in that it did not denote the direct participant of users in designing, but rather involved a broader view of being user focused, which also could include approaches limited to studying and observing users as subjects (Marti and Bannon 2009). One argument as to why these terms have achieved such a high level of influence, to the extent that the focus on 'the user' has pervaded all areas in the field of design, is that what they did was to put an actual person into the picture. Marti and Bannon (2009) argue that these terms, "serve as an important correction to other design approaches which tend to ignore the human side of things". They draw attention to the importance to the human relationship with the designed artefact, acknowledging that how people relate to the design is what define the value it will provide, but the term 'user' puts the focus on specific kinds of relationship that can exists between human and design thing, and also significantly it prescribes, who is to be considered important.

It is also significant to draw attention here to the significance of the contexts in which the term ‘user’ began to gain significance in the field of design. Both PD and UCD emerged at the same time as the early development of computer technologies for the workplace. Here work practices that had previously been defined in the minds of workers were being controlled by machines and therefore defined by programmers (Emspak 1993). In many cases the result was in a multitude of serious usability issues which impacted on worker health and also company profits (Bravo 1993). With these specific issues it is evident that use and usability would be considered a priority consideration, and the most important kind of relationship to consider.

In the intervening years though, there has been an increasing acknowledgement that there was more to creating a successful product than ease of use, and other aspects of the users experience are considered more and more. One indication of the magnitude of this shift in thinking can be seen in the work of UCD pioneer, Donald Norman, who in 1988 had published a highly influential book, the Design of Every Day Things (Mitchell, 1992), in which he sought to draw attention to the needs and interests of the user, arguing that usability was more essential to good design than desirability. 16 years later he published ‘Emotional Design’ (2004) in which he promoted consideration of the emotional experiences that objects create and stated that ‘the emotional side of design may be more critical to it’s success than its practical elements.’ This shift in thinking has led to the emergence of the area of Experience Design where the focus is on the designing the experiences around use. In his book Designing Pleasurable Products (2002), Patrick Jordan promotes the idea that products should not just be easy to use but actually create pleasurable experiences, providing value to the user on multiple level he considers that pleasurable product experiences encompass usability, but are by no means limited to it. The shift to looking at the user experience has been a way to extend the range of product/ person relationships that are considered in design, but these can be expanded upon even further to include relationships other than those related to use.

WHERE THE INTREST IN PRE-USERS COMES FROM

The two companies that are involved in this project are Novo Nordisk who produce insulin injection systems, and Oticon who produce Hearing Aids. Both these companies are in a situation where they have a large untapped customer base, people who could medically benefit from being treated with their technologies, but who delay starting those treatments for significantly long time period past the time it would benefit their health and well being. The idea behind this research was to adapt User Driven and Participatory Design methods and extent innovation processes to involve these two groups. As these people are in a situation where there is a possibility of becoming users in their future so the working title ‘pre-users’ was chosen for them. Specifically we refer to the pre users of hearing aids as those people who have an early stage hearing loss but do not yet own a pair of hearing aids. The pre-users of injection devices/ insulin are people with type 2 diabetes who have not yet started to use injection treatment/ insulin.

Age-related hearing loss is a gradual condition that progresses over a long period of time. People may have this type of hearing loss for several years before they begin to experience any problems related to it. It is often the case that they themselves will not be the first to notice their hearing difficulties; rather it is frequently their partner, friends or colleagues (Engelund 2006). Age-related hearing loss is caused by the degradation of some of the receptors in the inner ear that detect different frequencies of sound, and often those in the range of human speech. This kind of hearing loss is incurable, but many of the effects can be ameliorated with the use of hearing aids (HA’s) which can amplify the relevant frequencies of sound in the environment into the hearer’s reduced hear-able range. Modern HA’s are usually small, inconspicuous devices that sit behind the wearers ear. In many places they can be paid for by health services or insurance.

Diabetes type 2 to is a similarly progressive condition. In this case, it develops when the body is unable to produce enough insulin or is unable to respond properly to it to be able to convert glucose (sugar) in the blood into energy that cells can use. The prolonged demand for more insulin produces strain on the pancreas (the organ that produces insulin) which can eventually cause it to cease insulin production. Type 2 diabetes can lead to the damage and functional impairment of a number of organs, most significantly the cardio-vascular system. It is potentially fatal, and can cause many other serious complications. In its early stages the condition can be treated in several effective ways, also including insulin, but if it progresses eventually insulin injections become a necessary treatment. Many people who take insulin now are using devices often referred to as ‘pens’ as they resemble a writing pen, to inject with.

As has been stated previously, it is relevant to include both these groups when considering the design of the respective technology for reasons which extend beyond just the commercial benefits for the companies. In the case of hearing. In a US study, nine out of ten users of hearing aids said their hearing aids improve their quality of life (Kochkin 2005). Despite this, in the US only one in four people for whom hearing aids could be beneficial actually use them. Despite such high user satisfaction, there are still very few people who could be benefiting from them that actually are (Kochkin 2005).

For type 2 diabetics the consequences of unnecessarily delaying insulin therapy can be extremely serious, as it has been linked to an increased risk of a large number of related complications such as blindness, organ damage and loss of circulation to the limbs resulting in amputation; studies show that failure to promptly begin insulin therapy is likely to result in needlessly reduced life expectancy and compromised quality of life (Goodall, Sarpong Hayes & Valentine 2009), but here also most patients wish to delay the treatment for as long as possible.

DIFFERENT PERSON OBJECT RELATIONSHIPS

Our research so far has involved an exploratory study, which included interviews with people in their homes and a small co-design workshop. We also interviewed healthcare professionals, and observe clinical meetings with people who fall into these groups. Almost all of these activities were video recorded. When initiating this work we chose the label of pre-users for these groups. This name referred to the temporal situation that these people were in, being on a trajectory to becoming users, because of their medical condition, and not because of a consumption choice, as in the case of potential and non-users. As we began the project we have found this term to be increasingly problematic, one important issue is that these groups find it difficult to define themselves through the concept of being a user, for example one woman with type diabetes we spoke to, was determined to reverse the progression of the condition felt that the label was offensive to her. Although the term pre-user indicates that these people are not users, it can still imply that they will become users and that is what that connects them to the technologies.

We are using ‘pre-use’ to refer to a situation a person may be in but it does not define the kind of relationship between person and object. In fact our research so far has shown that while it may be important how people in this situation relate to the designed object, there is no single relationship that defines or dominates this; but rather there were a multitude of different ways in which people are connected, directly and indirectly to the designed objects. Instead of having a simple one to one relationship such as implied by the concept of use, person and object are linked through a network of interconnecting relationships, some of which I go on to will present here.

RELATIONSHIPS THROUGH INTERMEDIARIES EXPERIENCES

One way that people may have a relationship to a designed artefact is through an interaction with another person that is influenced in turn by that person’s experience of the artefact. In our case most of the study participants we spoke to referred to another person they knew who had been using the technologies, when describing what they knew about them. For example one of our participants with type 2 diabetes, Marie, had a young colleague who had type 1 diabetes, and was aware that she injected three times daily and had tried several kinds of insulin before finding a regime that suited her. Marie’s father also had type 2 diabetes and like herself he had began on tablet treatment for many years before starting insulin in order to keep his sugar levels down. Interestingly Marie thought that insulin was okay for him but not for herself, although she had no problem injecting or using the devices, this was because she was under the misimpression that if she began taking insulin she would no longer be able to reverse her condition.

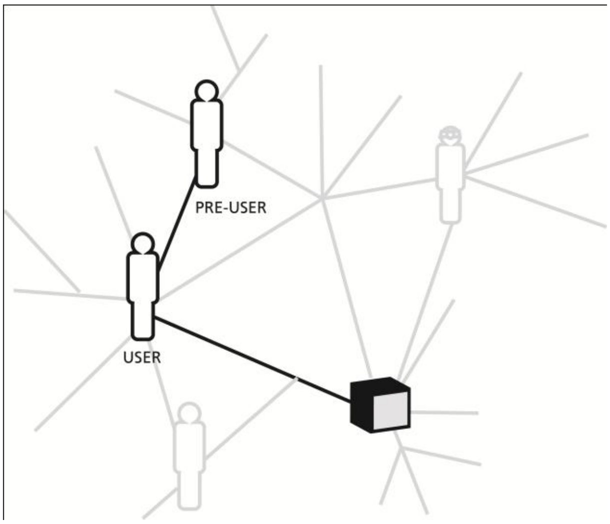

Figure 1: Relationships through intermediaries’ experiences

We also spoke to one HA pre-user, Karsten, who was considering getting a hearing aid. He was going to fitness with a group of men the same age weekly and said that amongst this group they discussed regularly the possibility of needing hearing aids. One have them, who Karsten had noticed was having hearing problems, had recently got HA’s and Karsten was aware that he was having a positive experience, which he attributed to its adjustment, *“ it is adjusted in such a way that he is very comfortable with it,”* and expressed later on in the interview that he would like to have a kind he could adjust himself, in order to make sure it worked for him. Karsten was also aware and positive towards the appearance of his friends hearing aid .*“it looked nice, not dominant in any way, and it didn’t have this ugly skin colour; it’s a sexy grey colour very nice.”* Another participating HA pre-user, who was also considering getting some, but had delayed it for many years discussed that unlike glasses which are for all ages, HA’s are something that he thought people associated with old age. He then brought up that he had recently discovered a woman he knew that he considered young, around 50 years old, had actually been using hearing aids for 15 years and he had never noticed because of their discreet appearance. *“ she had been using it for 15 years a… I had never noticed…so it just proves that they don’t dominate your appearance…people won’t* *look and say ah you are wearing a hearing aid, because people won't notice."*

What is interesting is the way these designed objects allow themselves to be talked about and demonstrated. With the diabetes technology for example, the discussion can be dominated by the effect of the drug, so experience of the device is over looked. While hearing aids have their own particular issue when it come to conveying the positive aspect people experience from them through these secondary experiences, as they have become smaller to better suit the needs of use, it becomes less obvious if people are wearing them and they provoke less discussion. The way other people have describe their experiences with the designed thing affects directly both positively or negatively, the willingness to adopt the technologies.

RELATIONSHIPS THROUGH PASSIVE EXPERIENCES OF THE INTERACTION

Herstad & Ericsson (2000) introduced the idea of the non-user of mobile communication technologies, as people who are not using but influenced by the interaction without the technologies. One their examples being the experience of a person attempting to greet another, who is simultaneously using a ear-piece connected mobile phone to have another conversation with somebody not present in the room. This kind of relationship I argue is defined by a passive experience of the interaction, where although the person is not interaction directly, the interaction has an effect on them. A person suffering from the condition interacting with both the hearing and diabetes technologies will influence other people as both the conditions, and therefore the treatment technologies play a role in social activities.

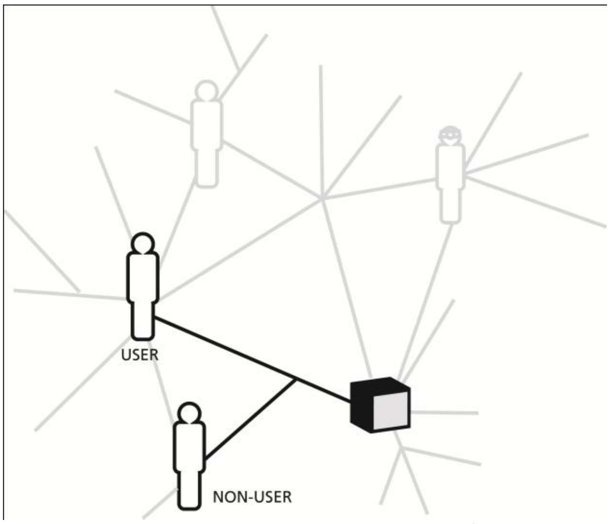

Figure 2: Relationships through passive experiences of the interaction

In the case of diabetes, the condition can have great influence on the social event of eating; people must take care of what they are eating in order to control their blood sugar levels on any kind of treatment. This can be problematic when eating at a friend's house or at a restaurant when they can not be sure what is in the food. All the people we spoke to with type 2 were conscious of this and had different strategies for dealing with it. One participant, for example had told all of her friends so that they were aware what to cook when they invited her over for dinner. Insulin injection treatment can be even more disruptive, as it is necessary to inject at meal times and calculate the amount to be injected based on what is being eaten, which could make it necessary to both check blood sugar and inject in a public place or in front of other people. During a co-design workshop we introduced the concept of technologies that would make nutritional values of foods visible during meals. The participants felt that although it could be useful for them in situations like eating out where they did not know what was in the food, but it was not something they felt was socially desirable, that amongst other things they did not want to in a sense boast about the healthiness of their diet, *"you don't need to make PR about how you are eating."* They were concerned about the affect that their interaction with the concepts would have on the people around them.

With hearing loss, the condition diminishes people's ability to communicate which is an interactive experience and can cause problems for the people around them also. One of the pre-users of HA's we spoke to explained that both he and his wife had to get used to staying facing each other while having conversations to ensure he could understand, and also that when his adult children came to visit they would complain about him having the TV too loud. Another we spoke to explain that he got embarrassed having to ask people to speak louder, so would sometimes pretend to be understanding. He also explained that the people he knew well and who knew he had a hearing loss could take actions to compensate, *" they can talk a little louder or talk into my ear if its possible."* Hearing loss effects the people who interact with its suffered and therefore their experiences can be altered if that person adopts the technology, which can also be a potentially motivating factor to do so. The passive experiences of those around the people interacting with the design artefact can be important and also may have bearing on attitudes to the artefacts.

RELATIONSHIPS WITH AND THROUGH OTHER ARTEFACTS

Artefacts do not exist in isolation of other design objects, and relationships to one can be created through another. In health care, companies do not sell products directly to consumers, instead health systems are positioned between the devices and the end users, as these technologies almost always need to be prescribed to be obtained. These systems can also be perceived as a type of artefact that creates additional kinds of relationships that will affect how people are able to access and how they relate to the devices.

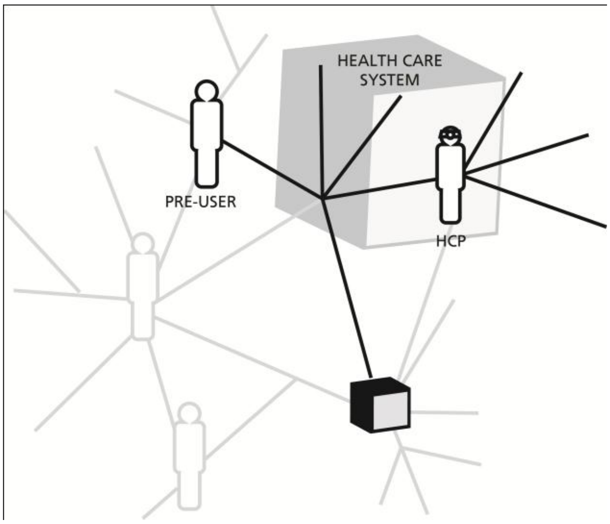

Figure 3: Relationships with and through other objects

We found during our initial interviews that many of the participants decision not yet to adopt the devices, was significantly affected by their interaction with the health care system. One hearing loss sufferer for example had had to go through several consultations in different places, and wait for several months before he was prescribed a HA because he first had to get checked for an ear tumour, in the end he was so tired of having to wait for the different appointments, and to wait at the office for the appointments that he decided to go to a private vendor to actually get the hearing aid. *".... and when they told me that they could help me to a hearing aid, I said well I don't think I have the time to wait for your help, I'll go somewhere else."* The time it took to get through the system proved a significant barrier between the person and the technology.

The health system are them selves represented by health care professionals (HCP's), and interactions with them also are interactions with the system, that are also influencing treatment decisions. In Denmark, most HCP's have a limited amount of time to spend with their patients and we observed also that much of the limited time available to ENT's in consultations where HA's were prescribed, was spent explaining where HA's could be acquired and how they would be paid for by the Danish Healthcare system, because of its complexity, giving them less time to discuss the actual treatment itself. The way the interaction with the healthcare system is also represented in the interaction with the health care professional can be additionally problematic. In the case of one person with type 2 diabetes we spoke to, the way she felt about this interaction had stopped her from taking the medication she was being prescribed and going to see her doctor. She did not trust him, as he did not take the time to explain why she should take particular medications, "*I felt like he just wanted me to take the pills – he never gave me the information that convinced me that he was right*." The relationship she had with her doctor affected her relationships both with the system and with the proposed treatment.

RELATIONSHIPS THROUGH SECONDARY USE

There are also ways in which a person may actually make use of an object in a certain way, without being considered a user of the object. This could mean that they have in some way deployed the object for an intended purpose, but is not directly using the object and would not identify themselves as being a user. In our case, as HCPs are basically the gatekeeper between the end users and companies must look also to them and their needs. While the person suffering from the condition may be the direct end user of the device, the healthcare professional (HCP) is also essentially using the technologies at the same time, as a way to treat them.

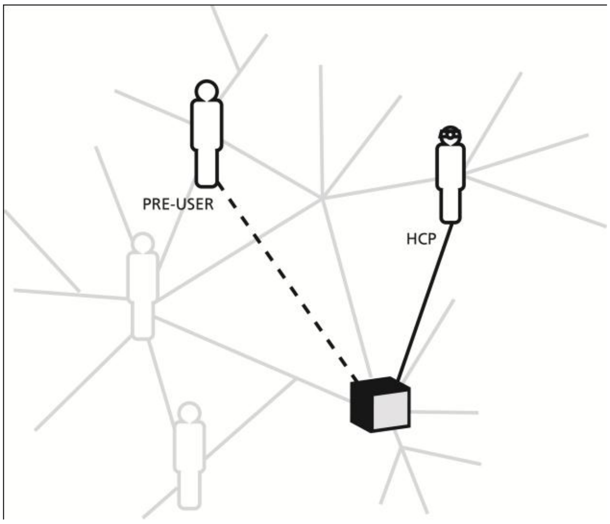

Figure 4: Relationships through secondary use.

We found that it was often the HCP who was introducing people to the idea of adopting the technologies, and the way that they present them and their own apparent attitude towards them can be highly influential and varied greatly. One GP for example, sent all of his patients who needed to start the treatment to a specialist for initiation as he considering it too complicated for him to teach by himself, while another we spoke to was comfortable enough with the technologies to bring out a device in consultations and stick himself with it, in order to demonstrate how little it hurt. The HCP's use of the objects takes a different form than that the people who are using it through a direct interaction, and therefore they have different demands of it. While the patient may need to know who use the technology, the HCP simultaneously needs feel confident the patient will be able to administer the treatment correctly, and the for the second GP for example, the device itself was also tool which he employed as a means to convince his patients to start the treatment.

Secondary users can also include people who have directly interacted with the product, but have not had a complete experience of use. We talked to one person with a hearing loss who had in fact tried out hearing aids, but had found the experience unrewarding, mainly because he had not had a chance to use them in any of the situations where he usually had problems with his hearing. He had therefore ceased to use them as he in this early stage when he was not yet committed to using the technologies had a different requirement of them than someone who had made the commitment to use them. He needed them to prove they were helping him, while someone who had just adopted them may need them to be easy to learn and more experienced users may again have different requirements. Even relationships that involve direct interactions and can take many different forms, sometimes involving simultaneous relations, and changes in need with the progression of use.

WHAT THIS MEANS FOR DESIGN

The types of relationships I have mentioned here are just some of those that have begun emerging in our study. What becomes interesting is when we start considering the different kinds of relationships in the context of design. If the focus of our interest as designers is solely on the user then the opportunities that we have to innovate will be only in the area of use. Even by broadening our focus to consider a more general user experience, we still confine ourselves to looking only at relationships that are closely related to use. By instead considering the designed artefact as part of a network of relationships new opportunities are opened up, both for the improvement of existing relationships with objects, and for the radical innovation of new relationships and interaction spaces.

In the cases presented here the designed objects have the potential to play many different roles in a network of different kinds of relationships. In our case for example we have identified that by designing the artefact with characteristics that make it easy to start conversations around, there may be a way of influencing the relationships created through intermediaries experiences. and this could potentially help change pre-users attitudes towards the devices. This could also be a way to change the passive experience relationships, ‘normalising’ the devices in social situations so people around the user feel at ease. We also have identified with regard to the health care system, that providing tools and materials to guide people through the system could change the nature of this relationship, making it easier to gain access to the technologies. Finally there are also opportunities to reinvent the secondary relationships with the devices, by considering designing devices that take into account the specific needs of the trial experience for example.

As there are opportunities for design in considering relationships other than use, we need methods and practices for exploring these. We found that methods such based on ethnography, like the ones we used in the case studies proved to be useful in helping actually identify what were the different existing and potential relationships at play in the design space, with which we were able to being to elicit the range of types of connections, and establish how these were made and what was affecting them. It becomes more challenging considering then how to go about developing concepts to reinvent this network of relationships though. Here we need tools for working with the complexities of multiple relationships and I therefore suggest adapting traditional scenario methods could be a powerful tool. One approach would be to develop and map network, as opposed to linear, scenarios that follow different actors and their interaction intersections with the designed artefact. This allows for the accommodation of several kinds of relationships and can reveal the nature of the interactions. By developing scenarios for each relationship identified, and mapping them along a diagram of the network, it should become easier to understand how a design decisions may influence the entire range of relationships.

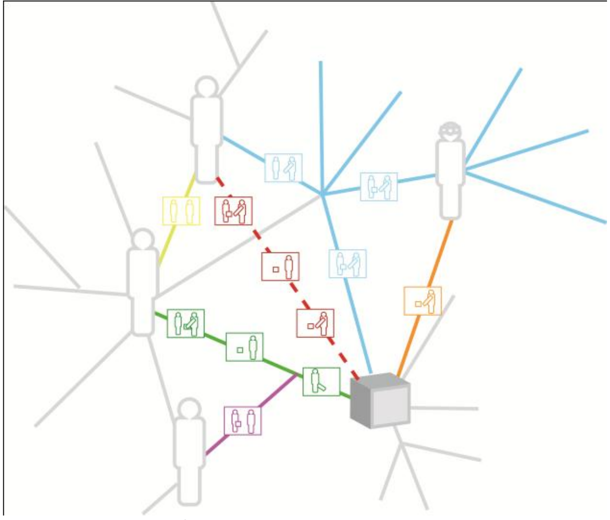

Figure 5: Example of what a network scenario using story-boards may look like.

I envision that this mapping of a network of scenarios could work well in participatory sessions, together stakeholders representative of the different relationships, but here I must highlight that designing for relationships other than use poses additional challenges for participation. When a user enters a design project they are able to adopt a role such as expert in use, but when exploring these other relationships, expert is not necessarily a role the representative participants will be able to assume. We addressed this in our case by focusing on areas that are of current salience to them, for example the experience of the health care system, which is one way of enabling people with a relationship other than use to participate (Kelly, Matthews 2010).
It is also not possible to apply the existing tools of participatory design in the same way for working with participants with a relationship other than use when they rely on drawing on a familiarity with existing use situations to allow users to participate in design, *“user can participate in the language game of design because the application of design artefacts gives their design activities a family resemblance with the language games they play in ordinary use situations”,* (Pehn 1993) As

with no context of use, it is difficult to create then a familiarity; but our experience so far indicates that more exploratory tools such as critical artefacts (Bowen 2009, Kelly, Matthews 2010) may prove successful in these contexts.

CONCLUSION

The concept of 'the user' is embedded so deeply in design discourse that it is rarely questioned, having emerged from a need to solve urgent usability issues in the adoption of new technologies, particularly in the workplace. Although its meaning has been broadened to encompass a wider range of relationships that the person who uses the designed artefact may have with it, I argue that it still limits the consideration of other important relationships that may exists between person and artefact. There is, for example, much existing literature attempting to address the issue of how we can reconcile the defining of the use role of an artefact which occurs in the design process with the actually use relationship, defined when it comes into play in context. However these do not go as far as to consider that artefacts will also be part of defining other kinds of relationships than use too. In our own case we find several groups of people who have important relationships with the designed object that are not directly users or encompassed by the concept of use.

As designers, we have the responsibility to acknowledge the potential effects of designs on these relationships other than use; but also by doing so, new opportunities are opened up for design. I suggest that when embarking on, and carrying out design process we consider more deeply who and how people may relate to the designed artefact, identifying whose needs are relevant to consider based not on the confining concept of use, but rather on the extent and impact of the relationship. This will provide additional challenge with regard to working with complexity, and also for participation, but it should be possible to address these by using methods such as network scenarios, and taking an exploratory approach to participation. By looking to relationships other than use not only should designers be able to meet the needs of the wider range of people who will be influence by designed artefacts, but also by doing so, greater opportunities for design and innovations become identifiable as a broader design space is opened up.

Of course in the end, I can not realistically discuss the possibility of looking at relationships other than use, without actually also looking to use itself- as an intention for use is essentially the justification needed for calling an artefact into being. As I have shown, the design of an artefact does not just influence use and user, but will also potentially reinvent the network of relationships in which the artefact is to be embedded. People can also be influenced by the designed artefact through intermediaries, passive experiences of the interaction with it, through other artefacts and by interacting with it as a secondary user. However, what is perhaps most important about considering these relationships, is that they will in turn influence back on the use relationship in some way; as in the example of the case presented here, by having an effect the pre-users transition to use.

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