

PRESENTING THE OUTCOMES OF A PARTICIPATORY USER WORKSHOP:
A DESIGN RESOURCE BASED ON THE CASE OF TV REMOTE CONTROLS

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ABSTRACT

PRESENTING THE OUTCOMES OF A PARTICIPATORY USER WORKSHOP: A DESIGN RESOURCE BASED ON THE CASE OF TV REMOTE CONTROLS

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This thesis explores participatory design methods and presents the process and the outcomes of a related case study, carried out in collaboration with Vestel Electronics, a Turkish consumer electronics manufacturer, on TV remote controls. The thesis comprises a literature review on participatory design, including its historical background and evolution, the motivations behind its contemporary utilization and the methods, techniques and tools utilized within the approach. The case study comprises two phases. In the first phase, a participatory user workshop was realized with eight middle-aged Turkish housewives. In the second phase, an interactive, computer based design resource was developed by the author, which aims to present the workshop outcomes to designers. The resource was evaluated by the designers of Vestel Electronics and the outcomes are presented in the thesis. Through such a case study the approach of a Turkish in-house design team towards participatory design methods was reached. Moreover, insights about how such a design resource can be developed were gained through designers' evaluations.

Keywords: Participatory Design, Participatory User Workshops, User Empathy

ÖZ

KULLANICI KATILIMIYLA TASARIM ÇALIŞTAYLARININ SUNUMU: UZAKTAN KUMANDA TASARIMI ÜZERİNE BİR KAYNAK

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Bu tez kullanıcıları tasarım sürecine dahil eden yöntemleri incelemekte ve bu alanda yapılan bir vaka çalışmasını sunmaktadır. Çalışma, birincil olarak, bu yöntemleri inceleyen bir literatür araştırmasını içermektedir. Bu araştırmada bahsedilen yöntemlerin tarihsel geçmişi, araştırmacıların bu yöntemlerle ilgili yaklaşımları, bu yöntemlerin kullanımını tetikleyen motivasyonlar ve bu alanda geliştirilmiş, tasarım yöntemleri, teknikleri ve araçları incelenmiştir. Vaka çalışması ise iki aşamadan oluşmaktadır. İlk aşamada sekiz orta yaşlı, ev hanımıyla televizyon uzaktan kumandaları ile ilgili bir kullanıcı çalıştayını gerçekleştirilmiştir. İkinci aşamada ise çalıştayın sonuçlarını tasarımcılarla paylaşmayı amaçlayan etkileşimli bir tasarım kaynağı geliştirilmiştir. Bu kaynak Vestel Elektronik'in tasarım ekibi tarafından değerlendirilmiş ve sonuçlar çalışmaya yansıtılmıştır. Yapılan bu çalışma ile Türk endüstrisinde faaliyet gösteren bir tasarım ekibinin kullanıcıları tasarım sürecine dahil eden yöntemlere dair yaklaşımları elde edilmiştir.

Anahtar kelimeler: Kullanıcı Katılımıyla Tasarım, Kullanıcı Katımlı Çalıştaylar, Kullanıcı ile Empati Kurmak

To My Family

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CHAPTER 1

INTRODUCTION

1.1 Motivation for the Study

Within conventional design processes, there is alienation between the two stakeholders of the process, the user and the designer. Designers design for the users and users face with the designed products within the market, where they can show their approval or disapproval through their buying decisions (Reich et al., 1996). In such processes, due to the lack of interaction between the user and the designer, designer tends to design through his/her designer intuitions, his/her personal presumptions related to the expectations of users (Hasdoğan, 1996), and the design criteria defined by manufacturers or marketing people (Reich et al., 1996). In some cases in order to prevent such an introvert process, user studies are done by companies and research findings are shared with designers. However, the shared findings of these studies, most of which are carried out with a marketing perspective, subject to the criticisms of designers due to not being comprehensible, not being inspirational and not conveying user information which can contribute to the design process (Bruseberg and Mc Donagh, 2005). At that point participatory design proposes a new approach in design by defining a process which acknowledges users as active stakeholders of the design process, who contribute to the process through sharing their experiences, problems, aspirations, expectations and their design solutions which answer these aspects. To understand this new approach is important, since it adopts a different approach to the user research process, the design process and the role of the designer and the role of the user in these processes. Consequently, the present study, which mainly derives from the exploration of participatory design through theoretical and practical investigations, is shaped according to some motivations which will be discussed through the following paragraphs.

The embracement of participatory design approach brings new concerns to the design process. Including non-designers in the design process is a very challenging issue, since it necessitates new understandings and new modes of communication among designers and users, which are not very common in traditional design process. Thus, in order to facilitate the process, new methods, techniques and tools are generated, mostly by design researchers, which aim to help users to express their aspirations and expectations and designers to elicit and comprehend in-depth personal and experiential responses. An examination of these methods, techniques and tools are crucial, not only for understanding the scope of participatory design through practical applications, but also for getting knowledgeable about the new design processes, the roles of the stakeholders in the processes and materials and mediums utilized in such design processes.

If the practical utilization of the approach in contemporary design environments is explored, it can be said that, today, the approach is mainly utilized for market based motivations. Through the advances in technology, it is not so difficult for manufacturers to produce usable products in high volumes and sell them in low costs. In that sense, as Jordan (2000) states, in order to differentiate themselves from their competitors; manufacturers seek ways to propose products which have some qualities beyond the traditional advantages of a product, such as functionality, reliability and price-based advantages. From such a perspective, participatory design approach proposes solutions for designing meaningful experiences for users, since through the approach in-depth problems, concerns and desires of users can be reached which can reveal some new opportunities and stimulate innovative solutions. However, benefiting from participatory design methods necessitates a design strategy which is appropriate for the approach. The research utilizing these methods has to be done by a research team which is knowledgeable and experienced about the issue. Nevertheless, every designer is not knowledgeable about the process, thus, the research should be done not by designers but mostly for designers. Then, as stated by Sleeswijk Visser et al. (2005), the outcomes should be analyzed and communicated with the design team. However, it is a matter of question how the outcomes should be shared with designers in order to make them benefit from the efficiency and the utility of the approach. Although there are some studies in the literature which explores the answers to the question, there is not much data on the issue.

If the studies on participatory design approaches are viewed on a geographical basis, it can be seen that the studies are mostly carried out in Europe and North America. Thus, the methodologies, techniques and tools developed and utilized within the field are mostly attuned to people from Western cultures. Since participatory design studies are case specific studies, scholars are pointing out the need of exploring other cultures within this context. Within the case of other unexplored cultures, the approaches and the utilized methods, techniques and tools may require some adaptations (Van Rijn et al., 2006). If the Turkish case is considered from such a perspective, it can be said that the studies in the field are very new. However, a study on participatory design approaches through a specific case in collaboration with the in-house design team of a Turkish manufacturer, who works in a different industrial environment than its colleagues in Europe and North America, can give an idea related to its perspective towards participatory design.

1.2 Aim and Scope of the Study

The study aims to provide a design resource for designers that communicates the outcomes obtained through a participatory design methods. This resource intends to interact with designers in a way that they can both empathize with the target user group and be informed about their experiences, their tangible and intangible problems, aspirations and expectations which are defined by them through a participatory design process.

Therefore, the study requires:

- an understanding of the participatory design approaches including both its theoretical and historical background, and practical applications, and
- additional study to complement the literature which aims to obtain users' experiences and in-depth problems, aspirations and expectations, through their creative involvement in user research.

The first objective will be fulfilled through an exploration of participatory design approaches through an intense literature review. For the second objective a case study will be carried out in collaboration with the in-house design team of a Turkish consumer electronics manufacturer, Vestel Electronics. It was desired to carry out such a study in collaboration with an in-house design team of a Turkish

manufacturer in order to be able to evaluate the participatory design approach and the resource beyond hypothetical situations, within a real design environment. Moreover, since participatory approaches are mainly discussed in Europe and North America, it is intended to get the perspective of a Turkish design team performing within Turkish industrial environment. The case study includes a user workshop on a problem which is defined by the author and the collaborator design team, developing the design resource, titled *Cooperative User Insights*, which presents the outcomes of the workshop with an interface, and getting the opinions of Vestel design team about the resource.

1.3 Research Questions

- What is the state-of-the-art of participatory design approaches?
 - Why did participatory design approaches emerge and how have they been evolved?
 - What are the motivations behind the contemporary utilization of participatory design approaches?
 - What kind of methods, techniques and tools are utilized by participatory design approaches?
- Which aspects should be paid attention to while organizing a participatory user workshop for a design team?
- What kind of information do designers want to reach through participatory user workshops?
- How can the outcomes of a participatory design process be shared with designers?
 - Why is the communication of the outcomes of a participatory design process important for a design team?
 - Which medium and elements can be preferred for communicating the outcomes of a participatory design process with designers?
 - Which aspects should be paid attention to while generating a software based design resource which communicates the outcomes of a participatory design process?
 - How can the designers utilize such a resource?
- Which factors can affect the utility of a participatory design process by a design team of a Turkish manufacturer?

1.4 Structure of the thesis

This chapter discusses the relevance of pursuing such a study in the field of participatory design. The issues in the field which needs to be explored, the aim of the study which is defined according to these issues and the research questions which will guide the reach is presented.

Chapter 2 explores the state-of-the-art of participatory design approach with literature reviews. The historical background of participatory design, the varying participatory design understandings and definitions of different scholars in the field, the motivations and the ideals behind the utilization of participatory design approaches, the evaluation of participatory design through the models of user involvement within design process and the stakeholders of a participatory design process and their roles will be pointed out through the chapter.

Chapter 3 will examine the methodologies, techniques and tools utilized through a participatory design process. The aims of these methodologies, techniques and tools, their relation with participatory design and how they are applied in the process will be addressed throughout out the chapter.

Chapter 4 will firstly present brief information about the collaborator company, its business strategies and the design process pursued by its Industrial Design Department. Then, the workshop process will be shared and the outcomes of the workshop will be presented. Lastly, the limitations of the workshop will be discussed.

Chapter 5 will explore the second phase of the case study which is about communicating the outcomes of the participatory user workshop with designers of Vestel. For the aim, an interactive, software based design resource, *Cooperative User Insights*, was designed. The chapter will present the motivation behind developing such a resource, its content and the design criteria for both the visual design of the interface and its interaction with the designer. Additionally, the resource was tested by the designers of Vestel. The evaluations of the designers will be put forward through their first impressions, interface-related feedbacks, thoughts about the contribution of the resource to the design process and

comments on the utility of the resource for Vestel. Lastly, inferences from the case study, related to both the organization of the participatory design research and communicating the research outcomes with designers will be shared.

Finally, the conclusions of the study will be presented in Chapter 6, through the answers of the research questions based upon the literature review and the findings of the case study. Some recommendations for further studies will also be shared.

CHAPTER 2

THE STATE OF THE ART IN PARTICIPATORY DESIGN

2.1 The Emergence and the Evolution of Participatory Approaches within Industrial Design Domain

Although the main focus of the present research is the participatory design approaches within the industrial design domain, looking at the issue from a wider perspective, such as the evolution of participatory approaches in the design domain can contribute to have a broader comprehension of the issue. Thus beginning the exploration from the Scandinavian Movement which is known as the first attempt of user participation in design within the domain of computer supported cooperative work can be helpful for such a goal.

Participatory design approach first emerged in Scandinavia, in the mid 1970s, as part of “Scandinavian workplace democracy movement” (Muller, 2003). As Kensing and Blomberg (1998) explain in their article *Participatory Design: Issues and Concerns*, introduction of computers in workplaces provoked debates on the “industrial democracy in modern workplaces” mainly in Scandinavia and later in Germany. The main point of these debates was the ignorance of workers’ interests during the implementation of new computer based technologies. Researchers criticized these new technologies as their being only new means of managerial control over the workers. It was believed that these new technologies were not implemented due to their contribution to the improvement of working conditions. On the other hand, after the introduction of these new technologies, workers began to feel that they were losing power on their works since their authority was restricted and their work was de-skilled by the emerged systems. Furthermore, they began to be afraid of the fact that these new systems may even lead to workforce reductions. Such preoccupations led to new projects, firstly in Norway, later in other European countries, whose aim was to balance the power of managers and

workers over workplaces. In these projects workers were also taken into research groups since researchers believed that if workers were given chance to speak on technology, their work, goals and interests they would gain control over their work life. However, consequences of these projects were not as expected since workers could not be so effective in changing the managerial strategies about workplaces. What workers and researchers desired were technologies which were designed and implemented on the basis of worker's expectations and tendencies. Thus, researchers began to work on the studies aiming at raising the awareness of the consequences of technologies which were developed without considering workers' needs and expectations. Moreover, they studied some ways of direct engagement of workers in both design and implementation of new systems. Due to the acknowledgement of the fact that fitness of these systems to the skills, experiences and desires of workers is the basis of peaceful and productive workplace, both design professionals and managers realized the need of involving workers both in the design and implementation of computer based systems.

The participatory design field emerged in Scandinavia, and then broadened its borders not only geographically but also across different research and design disciplines. The geographical journey of participatory design initiated in Norway and continued with other European and North American countries. However, through this expansion process, due to the differences in socio-economic conditions of the countries, the ideals behind the utilization of user participation were subjected to some transformation. Within time, the focus of participatory design has shifted from the politics of design to the more practical concerns of design (Crabtree, 1998). To illustrate, the key drive behind the emergence of participatory design movement in Scandinavia was the enhancement of democracy in workplaces. However, in countries like United States the notion of industrial democracy was not as widespread as in Scandinavia. Thus, they acknowledged the participatory applications not for the sake of *industrial democracy* but mainly for the sake of commercial ideals (Kensing and Blomberg, 1998).

Despite the diversity of motivations behind the utilization of participatory design, the approach has gained a wide acceptance since the beginning of 1980s especially in West Europe and North America. The organization of the first *Participatory Design Conference* in 1990 in Seattle, United States, was the most

concrete evidence of the widespread recognition of participatory approaches in design (Schuller and Namioka, 1993). Since 1990 these conferences have continued to be held in every two year in different countries. However the analysis of current literature indicates that despite its wide recognition, participatory design is mostly embraced in Europe and North America. Contemporary researchers emphasize the need of conducting participatory studies also in Asia and Africa; in other words in developing countries. They believe so, because those parts of the world are promising markets for most of the European and American companies. In order to be able to sell in those regions, the companies have to understand the social and cultural values of people living there. From such a standpoint, participatory design seems to be a promising path for the desired goal (P.J. Stappers, personal communication, June 23, 2006). If the ideals of participation can be adapted to political, economical, social and cultural context of developing countries, these countries can also benefit from participatory approaches to a great deal (Korpela et al., 1998).

As mentioned above, although participation of users in the design process was first utilized in the field of computer supported cooperative work, in time; the approach was embraced by other fields, as well. Human computer interaction and information technologies are among the first followers. However the acknowledgement of this new approach in computer related fields also triggered the utilization of user participation in other research and design fields; such as, anthropology, psychology, sociology, graphic design, software engineering, architecture and product design (Muller, 2003). However such a diversification leads to big differences between how user participation is regarded by these fields and how it is applied in various projects (Westerlund et al, 2003). Although all the fields believe in the contribution of end-users to the design process, democratization of society and social inclusion (Gregory, 2002), the realization process of these ideals differs to a great deal, even within the same discipline. Thus in order to reach a deep understanding about the various aspects of user involvement, the present study will concentrate on user participation in the design process within the domain of industrial design.

2.2 Definitions of Participatory Design

Although participatory design approach emerged through the acknowledgement of the need for a deep understanding of users, which can be achieved through involving the users in the design process, the notion of user involvement varies to a great deal in applications. In some cases reaching user opinions through surveys and interviews is regarded as a way of user participation. However, in other cases it is evaluated as a very 'reductionistic' way of involving users and these cases promote participation of users not only in the research side of the design but also in the creative design act (Sanders, 2000). Moreover the embracement of participatory approaches in various fields of design; from computer related system design to architecture and product design, leads to a diversity of participatory practices in various projects, as well (Westerlund et al, 2003). Thus it seems very hard to create strict definitions and boundaries of participatory design (Langford et al., 2003). However, drawing a framework embracing varying approaches towards participatory design can help to comprehend the dimensions of the issue. In order to draw such a framework, analyzing the various definitions of participatory design from various scholars helps to a great deal.

An analysis of the definitions of participatory design stated within the literature indicates that it is possible to examine these definitions under some categories, due to the emphasis within them. In such a categorization the first one can be the definition of Muller, which tries to cover all aspects of participatory design. According to Muller;

Participatory design is a set of theories, practices and studies related to end users as full participants in activities leading to software and hardware computer products and computer based activities.

Many researchers and practitioners in PD are motivated in part by a belief in the value of democracy to civic, educational and commercial settings, a value that can be seen in the strengthening of disempowered groups, in the improvement of internal processes, and in the combination of diverse knowledges to make better services and products (Muller, 2003, p.1052).

Although Muller looks at the issue from the perspective of human computer interaction , his definition is striking, since it draws a wide perspective of participatory design by not only stating its theoretical, practical and methodological

concerns, but also emphasizing its democracy related, educational and commercial intentions, as well. Through this definition Muller clearly reveals the multi-dimensional nature of participatory approaches.

In some other definitions participatory design is revealed as a method of understanding users and reaching and thus utilizing their knowledge. From this perspective Maguire (2001, p.614) puts forward his ideal about participatory design with the following sentence "...when it is important to understand how the user is thinking a participatory approach is appropriate...". Although it is not a full definition the sentence of Maguire is important since it explicitly underlines the expected utility of participatory design as understanding the user. Besides Maguire, Ollson (2004, p.380) also regards participatory design as a method for grasping the user knowledge and states that "the design process involving users is also a way of eliciting knowledge about the domain and the work practices, and thereby provide essential requirements for the future support systems." Although the definition of Lahti and Seitama-Hakkarainen (2005, p.104) shares the same concern with the previous two authors, they make a distinction among users by stressing the adjective 'knowledgable'. They state that "participatory design based on the idea of giving knowledgable users an important role in design process...". Their definition implies that users who participate in the design process should be familiar with the theme of the study so that they can contribute.

Some other definitions approach participatory design from the perspective of the design process. Kuhn (1996, p.281) states that "advocates of participatory design emphasize the importance of meaningful end-user participation and influence in all phases of design process". The statement of Kuhn is important since he points out the place of user participation as all stages of the design process, from the beginning to the end. However the analysis of participatory applications indicates that user participation is mainly welcomed either at the very beginning of the design process; concept generation, or at the end, as a launch strategy. Like Kuhn, Sener and Van Rompuy (2005, p.14) also emphasize the design process but through another concern. They claim "it has been proposed that well-managed involvement of 'end-users' is central to an evolving, continual, comprehensive and effective design process". According to this approach user participation contributes to the efficiency of the design process.

It is widely admitted that participatory design has different ideals and methodologies than traditional design process. Thus it is not so surprising to come across the definitions of participatory design which emphasize its contradictions with traditional design. One of these definitions belong to McNeese and his colleagues (1995, p.346). They argue that,

In contrast to conventional practice, a 'participatory' approach would promote: active stakeholder participation in and throughout the design process, design practices accommodating such participation through an emphasis on collaboration; and a heightened understanding of full range of constraints governing prospective innovations.

Besides highlighting the contradiction between traditional and participatory design approaches, this definition also points out the importance of collaboration and concerns the notion of innovation. Moreover McNeese et al. do not restrict the subject of participatory design to 'user' and express it with the word 'stakeholder' implying a wider view of participants. Reich et al. (2006, p.165) also try to define participatory design through a criticism of traditional design. According to them;

Participatory design is the antithesis of traditional design in which designers are expected to exhibit their expertise. The right to participate in design is often ignored and even when it is accepted, many obstacles including perceived pragmatic/economic deficiencies and organizational concerns, impede participation.

With such a definition, Reich et al. do not only criticize the traditional design approaches but also underline the right of participation from a democratic perspective. In a parallel manner, Muller et al. (1991) are also among the authors who lay emphasis upon democracy within the design process. They state that "participatory design can lead to a sense of shared ownership and buy-in of the design among all participants" (Muller et al, 1991, p.31). Through this approach they criticize the dominancy of designer within the design process as the owner of the outcome. After a decade from Muller and his colleagues Sanders (2001) also stresses notion of democracy within participatory approaches from a different perspective. She believes that user-designer relationship has been subjected to two periods of change. Through the first period, the contribution of the biological and social sciences to the design process was acknowledged. Ergonomics,

contextual inquiry and applied ethnography are among the practices emerged within that phase. Participatory design has taken place within the second change period. With her words,

The next wave of change is shifting the focus away from domains of expertise and back toward everyday people. In the new design space we can see a participatory approach to the development of a truly human-centred technology. Participatory design makes everyday people, such as users, an integral part of the design process, especially at the early front end” (Sanders, 2001, 317).

Her definition criticizes the beliefs that regard the designers as the main actors of the design process and promotes participatory approaches as the acknowledgement of ordinary people’s contribution.

Commercial advantage has always been among the intentions of participatory approaches. Following authors define participatory design by emphasizing the commercial utility. Muller et al. (2003, p.1052) points out that “recently, PD has achieved a status as a useful commercial tool in some settings with several major and influential consultancies forming their business identities around participatory methods”. Their definition based upon the observation of contemporary business environment, since today well-known American and European design consultancy firms; such as IDEO and SonicRim, work on the generation of new tools utilized in participatory approaches. They serve their clients with these tools and are paid for their service. In other words, it is a fact that today participatory design has gained a commercial identity as a service of design consultancy and user research firms. The following definition which stresses the notion of commercial benefit behind participatory approaches belongs to Laurel (2003). However, she approaches the issue from a different perspective. She claims that “participatory methods involve consumers in the development of products, services or brands they hopefully will eventually buy” (Laurel, 2003, p.28). There are two striking points within the approach of Laurel. Firstly, she refers to the participants with the word ‘consumer’ instead of ‘user’ and secondly, she explicitly states that participatory approaches are embraced in order to be able to sell more within the market. In other words while Muller et al. mention the commercialization of tools for participatory approaches, Laurel claims that participatory design is utilized as a method which will enhance the sales of products or services. Sener and Van Rompuy (2005) also reflect a similar attitude with Laurel. They claim that

The central aim with co-design is to collaboratively gather insights into consumers' needs and desires at the earliest opportunity, thereby reducing risk and uncertainty over consumer acceptance of a new product and channeling the findings into concept design and development (Sener and Van Rompuy, 2005, p.17).

In addition to Laurel, Sener and Van Rompuy indicate how participatory approaches can contribute to the sales within the market. Sleeswijk Visser and her colleagues (2005) also support the perspective of Sener and Van Rompuy. According to them "in participatory design users and other stake holders participate in the design process to ensure that the resulting designs fit the way people will actually use the product in their own lives." (Sleeswijk Visser et al., 2005, p.1).

The aforementioned definitions coming from various authors practicing in different fields prove that it is impossible to convey a single definition of participatory design. The definitions can vary according to from which perspective the approach is viewed. The present author although acknowledging that participatory design has both theoretical and practical applications, regards it from a practical point of view. Within the scope of the present study, participatory design is defined as a methodology of research for design, which enables the involvement of users to the design process through their creative contributions, which can be facilitated by designed tools.

2.3 Motivations and Ideals Behind the Utilization of Participatory Design

Today despite the increasing studies on participatory design, still, most of the companies can not employ participatory approaches, due to the fact that participatory approaches are more time consuming and costly in comparison to traditional design methodologies. However, there are some strong motivations and ideals which encourage the utilization of participatory design approaches. These motivations and ideals can be analyzed under three categories; namely, humanistic concerns within design, designing for special user groups and market based motivations. Among these categories the first one embraces an ideological perspective whereas the following two deal with practical concerns.

2.3.1 Humanistic concerns within design

As discussed through Section 2.1, the main ideal behind the existence of participatory approaches is to realize democracy within workplaces by giving the users the right to speak upon their work related practices. Since then, although participatory methods have been utilized for more practical concerns, this ideological side of the issue has not lost its currency and has continued to be discussed. Especially the researchers, who believe that the design process should be social, humanistic and respectful, have been in favor of participatory approaches due to its promise of a democratic design process.

In their article called *Varieties and Issues of Participation and Design*, Reich et al. (1996) widely criticize the traditional design approach due its being so far from a respectful attitude. They claim that through traditional design process, a product is created and it is the market where the failure or the success of the product can be tested and the outcomes are returned to the following design process. Within this perspective, users of products are reduced to the mere consumers of them. Consequently, within such a system users are not able to communicate their needs and they can only show their attitudes towards the products with their buying decisions. In most of the industrialized countries where such an attitude is followed, the needs of users are mostly determined by designers or manufacturers. However, the authors believe that participation is the '*prima facie* right' of all people who will be affected by the outcome of a design, thus, participatory design should be promoted.

In addition to the aforementioned discussions, traditional design process is also subjected to criticisms due to how it regards the designer. According to these criticisms, within traditional design process, designer is regarded as superior to other stakeholders. On the contrary, participatory design proposes a process in which other stakeholders beyond the designer are also paid attention to, as active contributors and the designer shares his authority with other stakeholders, mainly with users. Reich et al. (1996, p.166) oppose to this tendency of traditional design process and reflect their objection with the following sentences:

Design knowledge is not possessed by one homogenous consciousness (e.g. the designers), but is essentially social and maintained through negotiation and reconciliation of many different perspectives (e.g. those of designers, customers, and manufacturers).

Although they do not state explicitly, through this statement Reich et al. imply a participatory design process. Luck (2003, p.523) shares the similar ideals with Reich et al. and explicitly expresses that “participatory design approaches are considered to reflect design as a social process, illustrating that the sphere of the design activity extends beyond the designer”. Hummels (2003) is also among the scholars who criticize the traditional position of designer as a ‘central leader’ of the design process, who has the right to determine what is good for the users. According to her in order to achieve a respectful and humanistic design process, the designer and the users should acknowledge each other’s contributions to the process, which is based upon mutual respect. By pursuing this kind of design process, the share of responsibility and the initiatives among the designer and the user can be enabled.

The acknowledgement of superiority of designer over other stakeholders of the design process is mainly based upon the creative ability of the designer. However, some studies on participatory approaches certainly oppose to the belief that creativity is only bestowed upon designers and they believe in creative ability in every human being. Thus they promote participatory approaches which utilize the creativity of non-designers besides that of designers. With this perspective Sanders (2001, p.317) claims that “participatory design demands from the designer a new respect for ordinary people and is based upon the belief that all people are creative and can express their unmet needs and dreams when given the appropriate tools”. Lahti et al. (2005) also believe that creativity is not peculiar to designers. In their article *Towards Participatory Design in Crafts and Design Education* they claim that creativity has also a social dimension. Social creativity does not rely upon the “individual human mind” but it is a matter of “groups of mind”. Thus, it is possible to utilize social creativity through a collaborative process by the help of interaction tools and artifacts. Sui (2003) supports the approaches of Sanders and Lahti et al. through his research on creative responses of users to ‘user-unfit’ designs. His research claims that when users come across with a design which is inappropriate for their intentions or desires, they can tackle with the

problem through their creative act. They tend to either modify the design or use it in their intended way.



Figure 2.1 Observations related to “user-unfit” designs (Sui, 2003)

His research, which is supported by examples from real-life cases (Figure 2.1), reveals the fact that users can be very creative even though they are not given the right of speaking about the designs proposed to them. Thus, it can be concluded that users have the potential for generating novel ideas about design of products and services. Therefore they deserve to be, and also should be, included in the design processes in order to be able benefit from their creativity.

2.3.2 Designing for special user groups

Hasdoğan (1996) claims that designers always have some presumptions about the target user group and their expectations. These presumptions of designers are mainly based upon their previous experiences; both in their jobs and in their lives, expertise of their colleagues and information coming from human sciences. Designers mainly initiate their design process with these presumptions. Moreover, in some design cases designers tend to put themselves in the shoes of users and design accordingly. However, Hasdoğan (1996) adds that the predictions of designers related to user expectations may not always correlate with the real concerns of users. Especially in cases where the designer cannot easily empathize

with the target user groups, it is very hard to make such predictions. Therefore, in such cases designers need to rely upon the information coming from the user research studies related to user experiences, instead of trusting their designer intuitions. For such contexts, methods, which have been generated in order to increase the user perspective of designers, including users' needs, aspirations and abilities, aid the design process to a great deal (Desmet and Dijkhuis, 2003). Accordingly, the analysis of the participatory design cases indicates that designers are mostly willing to collaborate with users when they are designing for special user groups such as, children, the elderly and disabled people.

Sanders (2000), who can be acknowledged as an advocate of participatory approaches in design process, shares in her paper called *Generative Tools for CoDesigning* that her first participatory design session with her colleagues, held in 1980s, was for the design process of a headset product for preschool children. The design team, who were so confident with representing adult users within a design process, experienced difficulties when designing with children. The team realized that they need to develop different design research skills since their subjects were not good at expressing themselves verbally. So they preferred to involve the children in the design process through some exercises which could be done by children through selecting, pointing, coloring and constructing. This approach inspired the author for developing generative toolkits for users. However, regarding her experience, the author admits that, in cases where designers believe that they can represent the users, they are less willing to involve the users in the design process.

Similarly Druin also discusses the necessity of involving child users to the design processes, especially while designing new technologies. Regarding her experiences with children around ten years, the author claims that children are "frequent and experienced users of technology" (Druin, 1999, 592). Therefore, they need to be taken into consideration as active partners of the design process, while developing new technologies. In her article called *The Role of Children in the Design of New Technologies*, Druin (2000) claims that while designing for children, adult designers try to consider their own children or to recall their childhood memories or even regard the children as small-scale adults. However, such very personal impressions are not sufficient in order to design for today's children. As a

solution some designers prefer to elaborate the needs of children through asking their parents or teachers. However, this does not seem to be an ideal solution, either. Children have their own likes and dislikes, curiosities and needs which can not be reflected through the observations of parents or teachers. Thus, in order to overcome the difficulties of entering the children's world, Druin suggests collaborating with children by admitting them as active design partners. She believes that children can give extremely honest feedbacks about technology. However, such kind of collaboration needs some alterations within the design process. Since children experience difficulty in communicating what they imagined and since most of their feedback can be captured not through their words but behaviors, some new tools or techniques should be utilized. Druin (1999) proposes 'low-tech prototyping or mock-ups' for such a concern. She believes that by creating mock-ups out of simple materials; such as, paper, clay, colored pens and string, children can more effectively express themselves. Moreover, working with children in the desired contexts can help to a great deal to interpret their actions. However, she also emphasizes some difficulties of working with children. Firstly, since children are so honest that they may be very harsh in their evaluations. Secondly, and perhaps more importantly, they are known to be very impatient.

Although the previous two authors approach the issue from the perspective of needs, Jones et al. (2003) approach the issue from an opportunity basis. According to them children's ability to 'think out of the box' are so promising in terms of innovative designs. Therefore, their potential of imagination should be utilized within design process. They even regard the spoilt children within the teams; who are so extrovert, denying the rules and disrupting the atmosphere, as an opportunity. They name this kind of children as 'bad boys' and believe that they are the most eager members in the teams, they make greater contributions and enrich the design.

Besides children, the elderly is also another user group which motivates designer towards collaboration within the design process, through active user involvement. The environment of the elderly are always surrounded with products which are very far from facilitating their lives and which mostly create extra burdens to their everyday life. When the future scenarios are considered, designing by considering the elderly becomes more crucial since future forecasts warn that the population;

especially the European population, is aging rapidly. Therefore, designing products which enable the elderly to live as self-sufficient individuals will become more important in the future (Lines and Hone 2004). From another perspective the ageing population will be more dominant in the market so as Wood (1993, 28) states “designing with elderly is not only good ergonomics but also sounds economics”.

Through such concerns, Demirbilek and Demirkan (1999) believe that the elderly can play a crucial role in the design process. Thus, they should be acknowledged as active design partners. Regarding the challenge of extracting information from elderly people, Demirbilek and Demirkan (2004) propose participatory design approach while working with elderly users. As Demirbilek states (1999) such collaboration serves for some main utilities. Firstly such a design process can broaden the perspective of the designer related to the concerns, needs and ideas of elderly users. Secondly, it enables eliciting the concerns, needs and ideas of elderly participants in the early stages of design. Thirdly, through pursuing such a process, the process can be concluded with universal design solutions for the majority of users. In addition to these benefits such a process can also reveal the hidden design problems (Demirbilek 2001).

Through such ideals Demirbilek and Demirkan conducted a participatory design session with elderly people over the age of 60. The theme of the session was doors and door handles. Throughout the session, the techniques; such as, brain storming, scenario building and unstructured interviews are utilized. In the first session, the designer and the users sat around a table and the designer guided the participants through questions. The participants were provided with blank papers and pens and encouraged to sketch.

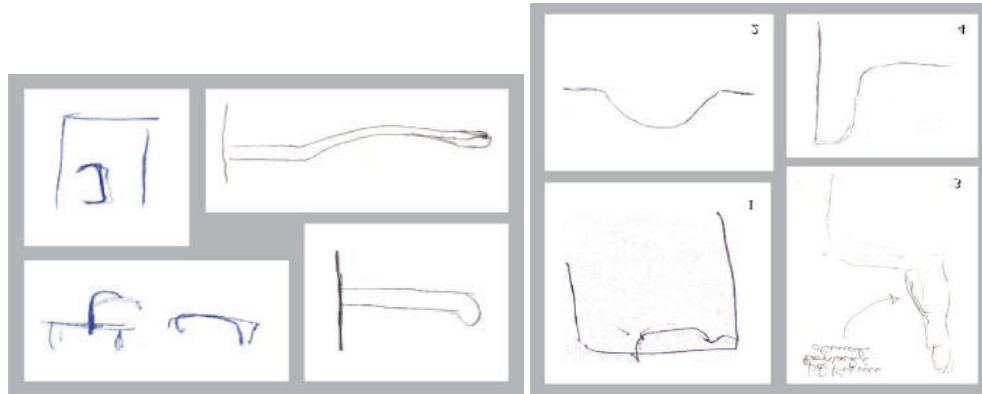


Figure 2.2 Sketches of participants (Demirbilek, Demirkan and Alyanak, 2000, p.2)

Through the second session, the participants were shown some sketches of the outcomes of the previous session and encouraged to comment on and to suggest some alterations when they need so. This study of Demirbilek and Demirkan (1999) reveal that elderly people are valuable sources for designers who deserve to be deeply explored. They can adapt to the session very quickly and show a very impressive performance. Moreover they can be very happy when involved in such a process and tend to be very interested in the outcomes.

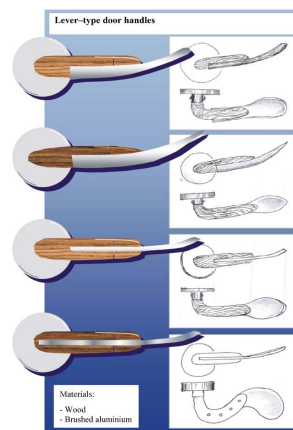


Figure 2.3 The sketches shown to the users (Demirbilek and Demirkan, 2004, p. 367)

Disabled people are the last category that designers have difficulty to get empathized with and thus need to involve them in the design process. The difficulties of designers result from two main issues. First of all, the daily life experience of designers does not correlate with that of disabled users. Secondly, since there is a dimension of health in designing for disabled people, it requires some sort of knowledge related to medical care. However although not easy, it is a very crucial task to design 'right' products with disabled people since otherwise the result may physically or emotionally hurt the users.

Participatory approaches are widely utilized while designing for users with disabilities because of two main reasons. Firstly, as in previous category it enables the designer to gather inputs related to the experience of the users which is otherwise very challenging to obtain. Secondly, since these users may lose some of their senses it is very hard to pursue a traditional design process with them, since they may need different ways of communication which needs to be configured by the designer. Participatory sessions are helpful at that point since participatory design processes are held through facilitating tools and tasks which are case-specific and specially designed for the users.

The work of Chamberlain and Roddis (2003), in which they collaborate with deaf and visually impaired children, stands as a good example of the issue. In this case, designers conduct a research in order to attain new insights about the needs of people with sensory disabilities which may help to improve new products that can help the treatment and the well-being of this group of people. Throughout the process, the designers collaborate with clinical specialists and end users. The case was very challenging for the designers since they need to understand the clinical practice and additionally the end users could not hear and see what the designers or care-takers tried to achieve. Therefore the designers had to develop some means of communication beyond visuals and words. The result was some products which can communicate with the users through vibrations.

Desmet and Dijkhuis (2003) and Zimmerman et al (2005) approach the issue with emotional concerns. They both claim that the analysis of products designed for users with disabilities indicate that they are mostly designed with ergonomic and

functional concerns. However, there is also an emotional dimension in these products, which is always ignored by designers.

Concerning the fact Desmet and Dijkhuis (2003) made a research on wheelchairs designed for children. They presumed that wheelchairs bear an unpleasant emotional impact and aimed to develop a wheelchair which has a positive emotional impact. Thus they configure a collaborative design process with child wheelchair users and their parents who were regarded as secondary users by the authors. Due to the difficulty in finding relationships between the design features and emotional responses, which are very personal, as a first step they chose the evaluation of existing wheelchair models on the basis of their emotional impacts. As an evaluation scale visual representations of emotions, PreEmo, which were developed by the first author were used.

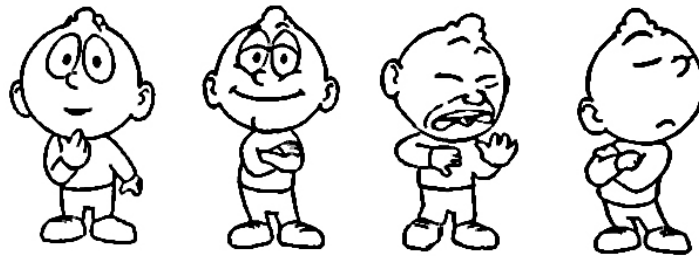


Figure 2.4 Four PreEmo animation stills (Desmet and Dijkhuis, 2003, p. 23)

In the second step, the designers tried to identify the reasons behind the emotions revealed in the first step. In the third step, the designers utilized the information coming from the users during previous two steps and tried to design a wheelchair which has positive emotional impact. The last step was the evaluation of the design by the participants.



Figure 2.5 Functional concept and final design (Desmet and Dijkhuis, 2003, p.26)

Zimmerman (2005) et al. share the same concerns with Desmet and Dijkhuis. They claim that although emotions of users are taken into consideration while designing consumer products, 'assistive technology products', such as wheelchairs, are designed very far from emotional concerns. According to the authors, such an attitude results from three main reasons. Firstly, the functional concerns of users are very critical in such kind of products. Secondly, in this sector normal user-driven market conditions are not valid. Products are mostly chosen or advised by healthcare professionals and users do not have so many choices in the market. Thirdly, the designers of these products are not their consumers. Since designers are generally not familiar with the use contexts, they are not aware of emotional needs of users. As a solution for such a limitation, the authors give the example of some wheelchair manufacturers in the Europe which tend to employ designers and engineers with disabilities. However, a reverse approach may be more promising; assigning roles to the disabled people in the design process of products for their use.



Figure 2.6 “Interceptor” wheelchair designed by disabled designers and engineers
(Zimmerman et al, 2005, p.5)

To conclude, participatory approaches are mainly utilized for informing or inspiring the design team. The examples discussed in this chapter are related to the information part of the issue since designers are more willing, or even need, to acknowledge users as active partners of the design process when they cannot easily put themselves in the place of users. Moreover, in these circumstances, as discussed through the section, users have different communicational abilities, which cannot be handled through conventional user research studies. Participatory approaches can help designers also at that point since involving the users in the design process already necessitates the generation of some mediums for communication between the designer and the user.

2.3.3 Market based motivations

Besides humanistic concerns and know-how needed in order to design for special user groups, the changing dynamics of the market conditions within the 21st century context also motivate user participation in the design process. Commercial pressure, technological developments, and the shift of market focus from products to meaningful experiences force companies who want to stay in the market to search for new ways to get in contact with their users and consumers.

Today, the qualities of products; such as functionality, reliability and price based advantages due to low manufacturing costs are not enough to gain a competitive advantage over competitors in the market. In this situation, manufacturers seek to find new ways in order to differentiate themselves from their competitors and still regard 'good design' as a promising path for differentiation (Jordan, 2000). However, expectations from a 'good design' have been subjected to some changes over decades. Jordan (2000) argues that good human factors was once the pre-requisite of a good design, however today it is not enough to conclude good design solutions. Today, consumers are already in expectation of usable and user friendly solutions, therefore these qualities in a product do not bring the user an extra value anymore; however, the absence of such concerns directly results in user dissatisfaction. Regarding the changing expectations of users overtime and inspired from Maslow's hierarchy of needs, Jordan (2000) draws a model of hierarchy of consumer needs. In that hierarchical structure, the first step belongs to *functionality*. In order to regard an artifact as a useful product it should first embrace an appropriate functionality. *Usability* is the second step that follows functionality. Once users satisfy their functional needs, and then they begin to look for products that are easy to use. Jordan puts *pleasure* as the third and last step of this structure. He argues that people always pursue products that offer additional values, thus after satisfying their concerns related to usability they tend to look for products which present emotional benefits besides the functional ones.

Morella (2000) also categorizes the utility expectations from a design function under two titles, which he names as, *objective utility* and *subjective utility*. According to him, these two types of utilities together constitute the value of products and determine the 'quality of wealth' produced through design. The objective utilities of a product are functionalism and ergonomics while the subjective utilities are meanings, symbolic and psychological values.

In parallel with previous authors Sanders (2001) examines the expectations from a design function and she summarizes the historical evolution of the concerns of design profession. According to her, through the post war years the focus of design was enabling a fit between the products and the physical dimensions and capabilities of users. In that period collaboration of design profession with fields, such as ergonomics and human factors were highly welcomed. In 1980s, with

emerging fields of information design and interaction design the focus of design profession shifted from dimensional limitations of users, to their cognitive abilities. In 1990s, with the advent of applied ethnography and contextual inquiry, designing according to the social aspects of human behavior became the main point of interest. Through the years following 1990s, designing in order to enable the emotional benefits of users has received a great attention. Fields such as affective human factors encourage the design practices aiming emotionally rich products. However, Sanders indicate that future trends will go beyond the emotional concerns, in order to compete in the market, brands should find ways to design according to the dreams and aspirations of their users.

Desmet et al (2001) also believes in the importance of designing products that promotes emotions which users would like to experience, since emotions elicited by products affect both purchasing decisions and pleasure of owning and using a product after purchase. However, they also underline the difficulty of the the designer in identifying the relationships between design features and emotional responses of users. In most cases, it is not the physical properties of products that help the user to experience a desirable emotion, but it is mostly the intangible properties of a product, the meanings that are interpreted. Designers cannot rely upon their individual concerns in that sense, since these may not correlate with those of users. Thus, they need to discuss with users. However, it is not also a solution, since users always find it difficult to identify their feelings and communicate the reasons. Moreover, in order to design pleasurable products, one cannot rely upon the results of testing and evaluation methods of existing products since the knowledge and the experience with existing products cannot guarantee a success for this kind of “new generation of products” (Lahti and Seitama-Hakkarainen, 2005). Thus, designers should pursue new ways and contexts to get in contact with their users. In that sense, participatory design may be an alternative solution which aims to reach deep insights of the users through enabling them to be involved in the design process.

Looking at the issue from the economical perspective of the 21st century indicates that the concerns of the design should even go beyond the emotions and aim at meaningful experiences. Emotions are inseparable from experiences however they are not the only concerns. As Buchenau and Suri (2000, p.424) indicate

Experience is a very dynamic, complex and subjective phenomenon...The experience of even simple artifacts does not exist in a vacuum but, rather in dynamic relationship with other people, places and objects. Additionally the quality of people's experience changes over time as it is influenced by variations in these multiple contextual factors. Experience goes beyond the concrete sensory...when we consider experience we must be aware of the important influences of contextual factors such as social circumstances, time pressures, environmental conditions, etc.

As price is not a matter of competition and technology pervades the life of people, designers should find new ways to embody new qualities of experiences beyond merely usable and pleasant ones (Forlizzi and Ford 2000). It is becoming more apparent that the preference of consumers represent a shift in behavior from product oriented solutions to experience oriented ones (Budd et al, 2003). Thus, as Wensveen and Overbeeke (2001) highlight, design solutions should initiate from and follow human experiences. Not every person experiences the same situation in a same manner, moreover, same person may experience the same situation differently in time. Thus, products should adapt to people and enrich their experiences by using the technological advances (Wensveen and Overbeeke, 2001).

In order to comprehend the importance of experience in today's economic context, looking at the economic progression model of Pine and Gilmore (1998) can make sense. They examine the economic progression under four titles; namely, *agrarian economy*, *goods based industrial economy*, *service economy* and with 1990s *experience economy*. According to Pine and Gilmore,

Commodities are fungible, goods tangible, services intangible and experiences memorable...While prior economic offerings commodities, goods and services are external to the buyer, experiences are inherently personal, existing only in the mind of an individual who has been engaged on an emotional, physical, intellectual or even spiritual level. Thus no two people can have the same experience, because each experience derives from the interaction between the staged experience and the individual's state of mind (1998, p.98-99).

The term *experience design* was first used in 1999 at the American Institute of Graphic Arts (AIGA) within Advance for Design Summit in Santa Fe. In the following year an explanation is made for the term which says "Experience design is... a community of practice not a single profession or discipline. Designing

effective experiences requires many different types of professionals with a broad range of knowledge” (Budd et al, 2003, p.5). However later this explanation was expanded by firms in the market and Philips made its own definition in order to point out a specific approach to design. According to this definition,

Experience design is a design approach which focuses on the quality of the user experience during the whole period of engagement with a product: from the first impression and the feeling of discovery, through aspects of usability, cultural relevance and durability, to the memory of the complete relationship (Budd et al, 2003, p.6).

Norton (2003) also looks at the issue from a business point of view and claims that to be involved in meaningful experiences is the biggest unmet need of today’s consumers. Following the conspicuous consumption era of 1980s, in 1990s people tend to rely upon their *cultural capital* (in tangible benefits coming from meaningful experiences; such as, relationships with family and friends and beliefs about the government and religion) and tend to spend their *economic capital* accordingly. He frames the trends in consumer demands in 1980s, 1990s and 2000s with such a table,

	Millennial	Meaningful experiences	Brand truth	Meaningful brand experiences
'90s	Experiences	Brand experience	Experiential customer encounters	
'80s	Products & services	Brand image	Products & services with personality	
	Evolution in consumer demand	Successful brand strategies	Design solutions	

Figure 2.7 The evolution of consumer demand (Norton, 2003, p.19)

According to this table people tend to look for experiential offerings in order to get more enjoyment out of their time and also in order to feel connected, important and understood.

Although it is so obvious that the design activities should follow experiential concerns in order to stay in the business, how to answer such concerns is still very burdensome for designers. Experiences are related to but also beyond the products. As Forlizzi and Ford (2000) state products represent the influence of artifacts on experiences through their formal language, features, aesthetic qualities and its accessibility. On the other hand, users represent the influence of people on experiences. Users bring their previous experiences, their emotions, feelings, values and cognitive models to the moment. An experience is beyond both entities since it takes place at the moment of user product interaction, in other words in use context, which is influenced by social, cultural and organizational patterns. Such a context points out a challenge for the design teams since being successful in such kind of designs requires a good understanding of needs, aspirations, dreams and characteristics of potential users, especially at the initial design stages. Most of the time it is very difficult not only for designers and design researchers to search for such very personal needs, dreams and aspirations but also for the users to identify and express their needs. Bruseberg and McDonagh-Phil (2001) claims that in order to overcome such barriers designers should take part in user research and widen their empathic understanding. In that sense, participatory approaches can be regarded since they enable both designers to access user information directly and also the users to become aware of their individual feeling and concerns and communicate them with the design team effectively. Moreover, as Wakeford (2004) reveals, participatory design is also utilized by big firms; such as IDEO and Adaptive Path, in order to integrate and align the brand with user experiences. IDEO has developed many methods for developing people centered solutions. Their collection of method cards pack is the most popular example of such attitudes. Additionally, they utilized participatory design in order to position the brand that they are consulting, within multi-branded experiences. On the other hand, Adaptive Path used co-creation methods in order to position the consulted brand since they believe that the fit between the brand and the features can be widely understood by people participating in user workshops, so that they can more actively contribute.

Besides emotional and experience related concerns in the market the contemporary technological developments also lead to a need for user participation. Today, thanks to technological advances, the daily life of people has

been pervaded by diversity of technologies and new ones are added everyday. They are mostly introduced to people as technical wizards whose purpose are to facilitate their lives however in most cases they result in a change in the life style, habits and routines of people. Thus, it is very hard to forecast the impact of such technologies on people and the attitude of people towards them. Through traditional design process, a product is created and then marketed. The test of the product is done in the market through the success or the failure of the product in terms of sales (Reich et al., 1996). From such a perspective the subjects of a product is named as consumers instead of users, since such a system does not let users to communicate their needs, which can be inputs for the product design process, and regards them as judges who can show their approval or disapproval of products through their buying decisions (Reich et al., 1996). However, today due to very competitive market environment there is not much space for such an evaluation strategy, anymore. Since today firms try to reach the success in one go and diminish the amount of turnovers. Moreover as Runcie (2004) highlight in terms of new technologies for future markets there are also no users at hand that can be taken as a reference, thus this technological developments are highly risky for the entrepreneurs. In order to overcome or at least diminish the risk factor, the launch of such kind of products should base upon the deep understanding of people's needs, expectations and values in future markets. Through research and development studies, people-centered design skills should be employed in order to minimize the risk. Şener and van Rompuy (2005) propose participatory design as a means of reducing the risk of being unaccepted by consumers. They claim that main aim of participatory design is to reach consumers' needs and desires as early as possible. Thus, the risk and uncertainty related to the acceptance of a new product by consumers can be reduced and findings can be utilized in concept design and development.

To conclude the perspective of today's competitive market environment prepare a ground for participatory approaches. It does not do so in order to realize participatory ideals but mainly in order to benefit from the advantages over the market gained through participatory approaches. As McClelland and Suri summarizes "as designs become more complex, technology more powerful, commercial pressure more severe and resources more expensive, there is greater need to tackle the human impact of designs" (2005, p. 322).

2.4 Models of User Involvement within the Design Process and Participatory Design

Participatory design approaches have been emerged with the desire for realization of humanistic, respectful, democratic and engaging relationships between the stakeholders; mainly between the designer and the user, throughout the design process. From a very general perspective, the realization of such ideals necessitates the involvement of users within the process. However, it is very obvious that any process in which the users are involved can not be regarded as participatory. Thus in order to understand what kind of a user involvement is proposed for participatory ideals, this section aims to discuss various models user involvement within design process and to point out the appropriate models for participatory ideals.

In the article called *Participatory Systems Design: A Structure and Method*, Mumford (1981) reflects the variations in the user involvement under three design approaches. Although he looks at the issue from the perspective of design of information systems, his categorization is worth to be represented, since his criteria for categorization are followed by other scholars, as well. According to him, user involvement within design process can be analyzed within three design models; namely, *consultive design*, *representative design* and *consensus design*. Throughout a *consultive design* process users are treated as information sources who have no influence or control over the outcome. The right of decision making is totally left to designers. *Representative design* process differs from the *consultive design* process in that user representatives are selected and involved in the process. These representatives are given the right to speak on the actual design formulation. It is the *consensus design* process that the users are continually involved in the design process. In this kind of design process, the responsibility of development process is shared with the users. Therefore, for an ideal participatory design process, the consensus model can be appropriate. Carmel et al. (1993) appreciate the categorization made by Mumford, and admit that *consensus design* is the most suitable design for participatory ideals. However, they stated that the word *compromise* can describe the notion of participatory design better than the word *consensus*.

Kaulio (1997) also categorizes the user involvement models within design process under three main titles; *design for*, *design with* and *design by*. The author borrows these terms from Eason (1992) who uses the terms for his study on the history and evolution of different user centered approaches. However, Kaulio refer to these terms as his own interpretations of the Eason's terminology, regarding the field of product design. Kaulio's categorization is highly embraced also by other authors written about participatory design approaches and applications (Şener and Van Rompuy 2005). With *design for* approach Kaulio (1997) indicates a product development process, where the outcome of the process is designed on behalf of the user. However in order to be able to design for the user, the designer needs some user related information, which can be obtained through general user theories, customer models and user research data. *Design with* approach shares the similar concerns with *design for* approach. Here, as in the previous approach, designer utilizes the data on customer requirements, needs and preferences. However, additionally different solutions and concepts are displayed to the user, thus the user gets the chance of interacting with them and reacting accordingly (Kaulio, 1997). This approach can be regarded as participatory to some extend since the users are given a so-called active role within the design process. The last category of Kaulio is *design by* approach. Through this approach, the user gains authority since he is regarded as the expert of his individual experience domain. Thus he is given the right to actively participate in the design process, through his creative contributions and acknowledged as a co-designer.

Sanders (1999) analyzes the models of user involvement with three item structure just like Mumford and Kaulio. However, she looks at the issue from a different perspective. She makes her categorization on the basis of how users are utilized within the design process. Thus she names her categorization with three verbs; through what they *say*, through what they *do* and through what they *make*. With her *say* model Sanders refers to the design processes where users are utilized through interviews and questionnaires. She claims that through such kind of a process, the designer can only rely upon what is *said* by the user. In other words what designer can reach in this case is very limited since what the user communicates with the designer is restricted with what he is aware of, what he can explain through words and what he wants the designer get knowledgeable about. Thus, Sanders concludes that this approach is very "reductionistic" and far from

participatory ideals, as it reduces the users to mere informants. With *do* category, Sanders points out the cases where users get the chance to interact with the solutions and try them. This process lets the designer to reach the knowledge of *what people do* and *how they tend to use*. Although it gives a broader idea about the user in comparison to the previous category, still the gained knowledge is not sufficient to pursue a participatory process. Moreover, the role of user in this case is still restricted. Sanders believes that in order to fulfill the ideals behind user involvement within design process, the users should be involved within the process through their creative ability. She puts such a process under the *make* title since through such an attitude, the user can communicate with the designer via what he *makes*. Thus, the designer can reach the user's tacit knowledge and latent needs. Moreover, the user can reflect his desires, feelings and dreams through his creations.

Hummels (2003) analyzes the user involvement within design process through the evolving relationship between the designer and the user. Although she constructs a model which seems very parallel to previous models, she looks at the issue from an ideological point of view. Her model has three main titles; *the rational relationship*, *the integrating relationship* and *the libertarian relationship*.

In the first case, where she thinks that the relationship is *rational*, the goals are determined in advance by the designer, design team and/or the manufacturer. Since those people are believed to have the superior knowledge, they have the right to determine what is good or bad for the user. The most popular examples of this approach can be seen in 1930s, throughout the movements such as; Bauhaus, De Stijl, Purism and Constructivism. In these social movements, the designers aimed for the improvement in the 'quality of life'. So through their designs they tried to offer people a modern society. Such an ideal underlines two important points. It acknowledges that designers/architects are superior to the ordinary people and they have the social responsibility of re-educating 'the man in the street' (Hummels, 2000). Apart from these social ideals, rationalism also eagerly embraced as a basis for the design of electronic and digital products towards the end of 20th century. The outcomes of the ideals were functional and the intelligent products; almost identical 'black boxes', which could not be easily operated by the users. Hummels (2000) argues that rationalism is very far from reaching the desired user-designer

relationship of the participatory approaches. It does not even take the issues such as respect, humanism and engagement into consideration and underestimates the power of people. She believes that the individual should have the right of choice; thus, they should be given experiential power of how they would like to interact with the products, through involving them in the design process.

The second category of Hummels (2000) underlines an *integrating* relationship. She names this relationship as a democratic one which aims a compromise between the requirements of the society and that of users. In order to achieve such a goal the designer searches the interests of both the community and the individual. In this case, the designer is not believed to have the superior knowledge of what is good and the requirements of the design process are decided by the majority of the users. The practical employment of this kind of relationship indicates the *passive* participation of the users to the process. The designer first tries to reach the explicit and observational information coming from the users and then utilizes this information in the creation of a product. However, Hummels (2000) criticizes this case since it generalizes the society into demographic stereotypes and neglects the individual differences. Thus, such an approach can not be ideal for reaching respectful and engaging contexts.

In order to reach individual needs and explore preferable experiences, the author proposes the creative participation of the individuals in the design process which indicates a *libertarian* relationship. The libertarian approach rejects the superior power of the designer who has the responsibility to determine what is right on behalf of the user. It promotes voluntary collaboration of the designer and the user basing upon mutual respect. Both the designer and the user can bring his personality, ideas, creativity and skills to the design process. The designer within such a relationship functions as a “catalyst”, who encourages the user to explore his unsatisfied needs and desires. Participatory design cases are the most related examples of such kind of relationship between the user and the designer. However, the examination of the practical participatory design applications indicates that designers are always employed as experts in such frameworks. They became the dominant member of the team which contradicts with the libertarian ideals (Hummels, 2000).

2.5 Stakeholders of a Participatory Design Process and Their Roles

Participatory design sessions aim to involve various individuals from various backgrounds, according to the requirements of the design case. However, in all these cases the two stakeholders remain the same: the user and the designer. Since participatory design cases have ideals different than traditional design processes, the roles of the participant users and the designers differ from conventional contributions of the user and the designer.

2.5.1 Users as stakeholders of a participatory design process

It has been long discussed through the chapter that participatory design is based upon the idea of giving users important roles in the design process, through their creative involvement. In such a process users are acknowledged as the collaborators of the designers (Lahti and Setama-Hakkarainen, 2005). However the implications of the term collaboration differ among cases.

According to Reich et al. (1996), the role of the user in a participatory design process is identified according to the knowledge provided for the user. In that sense, they identify two key terms which define the state of the user within the process: *dialogue* and *co-design*. They claim that when users are assigned a role based on dialogue, they are admitted to have social and informal knowledge necessary for the design process, however, they lack the technical knowledge. In that sense they are treated as not the partner but the subjects of the study. However, in the other end of the spectrum; where they are regarded as co-designers, they can access to some of the needed technical knowledge, thus they can more actively contribute. Reich et al. (1996) advocate such type of participation and claim that “ideal participation involves customers as co-designers” (p.177).

Ollson (2004) also examines the role of users in a design process and concludes three-itemed structure. According to the first item of his classification, users can contribute to a design process as *subjects*. In that case users are very passive since they are thought and represented in the design process through the presumptions of designers. According to his second category users can take the

role of *informants*. In that case they are responsible for informing the designers throughout the process. Thus in cases, where users are treated as informants, continuous contact with user is desirable. Ollson's last category assigns the users the role of *co-operation partners* of designers. In this case their equality with designers is acknowledged and they gain the status of co-designer. However, Ollson claims that none of these roles are suitable for participatory ideals since he believes that within participatory design ideals the users should be given the status in between being an informant and being a co-operation partner.

In their article called '*In-touch' with consumers: Freeform as a co-design tool for real time concept modification* Şener and Van Rompuy (2005) discusses the proposal of Lanning made in 1991, regarding the roles of consumers taken through a co-design process. Lanning claims that user can take three roles through a co-design process; namely, *subjects*, *evaluators* and *designers*. As *subjects* users are regarded as individuals who are observed and questioned about their interaction with existing products. When they are assigned the role of evaluators they are asked to measure the design proposals and outcomes. They may be asked to provide information related to the performance of the design proposal, their individual preferences and their intention towards purchase. They are assigned creative role only when they are regarded as designers. Thus in this classification of user roles only the last category correlates with participatory ideals.

Druin (2002) also makes a categorization of user roles within a participatory process regarding her experiences with children. Her categorization is very similar to the one done by Lanning. Instead of Lanning's structure composed of three titles, she examines the users' contributions under four titles. She claims that users can take four roles; namely, *user*, *tester*, *informant* and *design partner*. She states that in the role of *user*, the contribution of the children to the research and development process is enhanced through their interaction with technology, while they are observed or tested. This role is essential for understanding the impact of the existing design solutions on users, so that decisions related to future can be taken. In the role of *tester* the participants are asked to test prototypes or new technologies which are not yet released. In that case besides being observed, the participants are asked for their comments about their experiences. When they are considered as *informants*, participants contribute to the various stages of the

design process, according to the researchers' belief in participant's information. In the last category, where participant users are regarded as *design partners*, they are considered as the equal stakeholders of the process with the designers. Thus they have the right to intervene throughout the process.

2.5.2 Designers as stakeholders of a participatory design process

Examining the varying roles of users within participatory processes, the question comes to the role of the designers. In a participatory process the role of the designer moves towards somewhere in between traditional designer and design researcher, since the designers are motivated to conduct the research in which user participation is enabled. As Battarbee and Mattelmaki (2002) state, designers are in need of conducting such a research since the user data coming from market research, most of the time, are not enough to nourish a design process. Thus designers are in need of collaborating with real people in real contexts through user research. As Bruseberg and McDonagh-Phil (2001) indicate "carrying of user research enables designers to extend their empathic horizon and extend their knowledge according to specific design tasks" (p. 435).

However the responsibility of designers is burdensome in such a research. Although participatory processes based on the idea that users are the most knowledgeable people about their desires, dreams, problems and fears, They are not knowledgeable about how to contribute since they never experience such a process. McDonagh and Langford (2003) claim that it is the responsibility of designers to reveal their potential and utilize from their creativity. Thus designers should contribute to the process by creating new tools, in order to both increase the users' awareness of their desires, expectation, problems and aspirations and in order to generate a medium for communication between users, designers and design researchers. Similarly Demirbilek (2003) claims that designers play an important role in participatory design processes by providing any material which can facilitate the transfer of users' experience.

Sanders (1999) also believes in the changing role of designers within participatory processes. Prior to McDonagh and Langford she also claims that the role of designers will shift to the design of tools for end-users in order to enable them to

express their needs. In addition to the role of designer as a tool creator, Sanders also claim that designers will also function as the *translator* and the *interpreter* of the visual data expressed by users. In order to carry out such a task they will be in need of knowledge coming from psychology. This translation and interpretation is very crucial for designers since it is the knowledge that they will utilize as a source of inspiration.

The shift in the designer's role through a participatory process may be regarded as the power loss of the designers. The creative potential of designers are regarded as their most powerful sides and by the inclusion of users to this creation issue, they may be regarded as becoming more passive individuals. However, Hummels (2000) does not believe so. According to her;

This does not imply that the designer has become a passive bystander, but rather that he uses his own passion to 'resonate' with the passion of the individuals. The designer may use his strength to tempt people to explore his own. The designer has become a catalyst (p. 1.35).

According to these approaches discussed above, in a participatory design process, designer acts as a facilitator, not as a designer (Demirbilek, 1999). In other words he takes the leading role in research (Chamberlain and Roddis, 2003). However, not all participatory design processes are lead by designers. Sometimes such kinds of processes are conducted by other researchers for designers and the outcomes are shared with them. Yet sometimes although designers take role in preparation of the session, during the session, they do not intervene but only observe. In this kind of processes the session is managed by another facilitator. Actually the skill of the facilitator is important. The facilitator should prevent to loose the focus of the study. He should handle disagreements within the group in several ways. The facilitator should be good at probing, reaching the reasons behind the desires (Ciccantelli and Magidson, 1993).

2.5.3 Utilization of non-users within participatory design process

Besides these three stakeholders, there is also another group whose contributions are as valuable as the previous ones, the non-users. Non-users who participate in the design processes can be examined under two categories. The first group is the

caretakers of individuals who belong to a special user group. For example, when the subject of the study is children, their parents and teachers can contribute to a great deal. Similarly when designing for disabled people, collaboration with their caretakers, nurses, physicians and doctors can give fruitful results (Chamberlain and Roddis, 2003). Secondly, sometimes some people can give fruitful knowledge about a certain context although they are not the potential users. In this case they are regarded as domain experts. The case of Burnett and Porter (2001) can be a clear example of the issue. In their project on developing haptic control interfaces for vehicles, instead of collaborating with drivers, they choose to collaborate with people who have visual impairments. They thought that while driving a vehicle, drivers give most of their visual attention to roads, other vehicles and pedestrians. Accordingly, their visual control on in-vehicle controls is very limited. Thus, the authors thought that, designing by considering the needs of blind people can work very well here. They claim that the use of hands in order to explore objects is very much the same with “sighted” and “non-sighted” individuals. However, non-sighted people have developed some additional strategies which enhance their performance on particular tasks. Thus, in this study they are chosen by the authors for design collaboration.

The last group whose collaboration is widely desirable through a design process includes the people from the executive, marketing and sales functions of a company which the design project is done for. According to Dandavate et al. (2000) inclusion of these members, not only in research phase but also in generative sessions enhance their understanding of the project and they tend to take care of the project more eagerly, which have great contributions to the result. Moreover, through such kind of an inclusion these members develop “a new-look” to the end users and market and sell them accordingly.

CHAPTER 3

METHODS, TECHNIQUES AND TOOLS UTILIZED WITHIN PARTICIPATORY DESIGN APPROACHES

3.1 Sample Methods within Participatory Approaches: Consumer Idealized Design and Contextmapping

Although it is believed that users have the potential to actively contribute to the design process, they need some kind of guidance and facilitation in order to utilize their potential. Methodos help users to a great deal in that sense. *Consumer Idealized Design* and *Contextmapping* are two methods developed for the facilitation of user involvement. Due to their applicability for the goals of the present study, here they will be explored through their aims and methods.

3.1.1 Consumer idealized design

Consumer idealized design was developed by R.L. Ackoff due to his belief in,

Removal of deficiencies, getting rid of what one does not want, provides no assurance of getting what one does want. For example, one can easily get rid of a television program one does not want by changing the channel, but one may well get a program that one wants even less (1993, p. 405).

Thus instead of the methods which tend to involve the users within the design process, on the basis of learning what they do not want, he proposed consumer idealized design in order to reach new insights about what consumers really need or want (Cicantelli and Magidson, 1993).

As widely discussed by Cicantelli and Magidson (1993) the aim of consumer idealized design is to increase the awareness of consumers about what they need or want and also to reveal their insights as accurately as possible. The methodology is mainly based on the assumption that when provided with proper

tools and facilitation, average consumers can contribute to the design solutions for the situations that they are familiar with.

In the aforementioned article Cicantelli and Magidson (1993) describe the process in detail. The process begins with the selection of a group of actual or potential consumers. These participants are gathered in a large conference room. The whole process is either taped or observed behind one-way mirrors. The session begins with the introduction of the problem. The facilitator asks the participants to imagine that an existing product (or service) was destroyed overnight and they are given the opportunity to create something totally new, which will take the place of it. Such an introduction is extremely important for this method in order to free the participants' minds, as the aim of the methodology is not to constrain the consumers by feasibility but make them concentrate on desirability. However, the participants are not free from two constraints. Firstly, the generated product or service can be realized within the limits of current technology and secondly, it should conform to the law. Following the introduction, the participants begin to explore the problem through a brainstorming session in which they reveal the specifications of the ideal product or service. These specifications are written on a flipchart by the facilitator, since after the session the listed items are discussed by the members of the participant group. Following the brainstorming session, the whole group is divided into smaller groups who will be responsible with developing a design concept with the guidance of listed desired specifications. Then, the whole group comes together again for the presentation of ideas and discussion. This cycle can be repeated all through the day until the group decides that they reach an idealized design. In an optimum case three iterations are enough to decide on an idealized design by common consent.

Cicantelli and Magidson (1993) point out some clues which can aid the success of the session. First of all, the participants should be restrained from concentrating on deficiencies of existing products. It can be achieved by reminding that these products no longer exist, so they should only concentrate on their desired ones. Secondly, the conflicts within the group should be managed successfully, either by postponing them to the end of the session or by experimenting them within the session. The third key point is to clarify the reasons of the participants about the given decisions. These reasons can be identified through asking the 'why' question

after any decision. Finally, the participants should be motivated away from limitations and feasibility, and the concentration on their ideal designs should be facilitated.

Creative ideas which are freed from current limitations can be reached through consumer idealized design. It is considered as useful technique for situations where it is desirable to prevent the fixation on existing products and their limitations (Loufthouse and Lilley, 2006).

3.1.2 Contextmapping

The other method for user involvement within design process is called *contextmapping*. Contextmapping techniques aim at providing design teams with inspirational and informational knowledge of product use contexts, within the conceptual phase of design process (Van Rijn et al., 2006; Sleeswijk Visser and Visser 2006). In order to achieve so, the method utilizes some techniques which help participants to organize their thoughts, experiences and dreams, and then communicate them with the researcher (Van Rijn et al., 2006). After eliciting the related information from the participants, it is shared with the design team in a way that they can be both informed and inspired, and consequently innovate (Sleeswijk Visser et al., 2005). The method is regarded to be participatory since, it does not aim to ask questions in order to find answers, but create a ground upon which participants can act and create new questions and answers, and most importantly reveal blind spots in an active manner (Stappers et al., 2003).

Contextmapping process involves three main phases, namely preparation, collecting user insights and sharing these with the design team (Van Rijn et al., 2006)

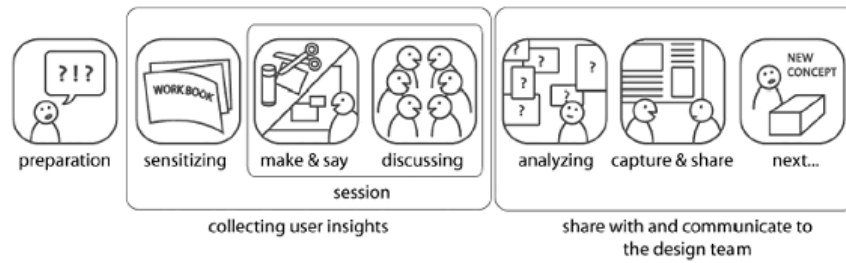


Figure 3.1 Phases of contextmapping process (Van Rijn et al., 2006, p.159).

Throughout the article called *Contextmapping: experience from practice*, Sleeswijk Visser and her colleagues (2005) discuss these phases in details. Sleeswijk Visser et al. (2005) advise to initiate the preparation stage three weeks before the intended date of the group session. First of all, the goal statement of the study should be clarified. It should not address a product but a wider context surrounding a product. For example, instead of pointing out the “insights of the use of baby buggies”, defining like “what is it like to be a parent and what concerns, feelings and attitudes do they have when being on the way?” (Sleeswijk Visser et al., 2005, p.6) is more desirable. Deciding upon the goal statement should be followed by the selection of proper methods for the aim of the study. Then a preliminary mapping should be done in order to clarify the preconceptions and assumptions of the researchers, get rid of the risk of guiding the participants through researchers’ concerns and also in order to set an initial structure for the analysis phase. The most critical issue of the preparation is to select the participants since the study is directly influenced by the background and the character of the group. Four to six participants are regarded to be optimum for such a study since it is believed to be large enough to reach the desired diversity and small enough to deal with every individual. Since the participants with associative thinking ability are desirable, one participant from a creative profession is mostly welcomed.

As stated by Sleeswijk Visser et al. (2005), the collection of user insights is initiated by sensitizing the participants. The aim of the sensitization phase is to make participants explore their experiences related to the goal of the study, and accordingly motivate and prepare the participants for the generative session.

Accordingly, throughout the session, they can put forward richer insights, experiences and concerns. Participants are tried to be sensitized with some sensitizing packages, which are sent to them from few days to two weeks before the session. These packages include various exercises prepared according to the goal of the study.

For the generative sessions of contextmapping studies, group sessions are preferred in order to enable reactions between participants. The session is guided by a moderator according to the prepared time plan, like the below sample time plan (Table 3.1).

Table 3.1 Sample time plan for generative session (Sleeswijk Visser et al., 2005, p.128)

TIME	ACTION	CHECKLIST
5 min	Introduction	Explaining set up session, goal and that they are experts on their own experiences
5 min	Warm-up	Introduction of participants by explaining their bunches of keys
	Exercise 1: collage of being admitted	Use these pictures and words to express how you feel about being admitted in the broadest sense
20 min	“make” part	
20 min	“say” part	Present collage
10 min	Discussion	Reaction on each other’ stories
5 min	Break	
	Exercise 2: draw ideal ritual	Make a drawing (or collage) to express your ideal ritual of being admitted in a building in the future (2050). Express how it feels
20 min	“ make” part	
20 min	“say” part	Present drawing
10 min	Discussion	Reaction on each other’ stories
10 min	Remain talking	

As seen in the time plan the session mostly contains three exercises. It is initiated with a warm up exercise, which is followed by other exercises that utilize generative tools. Each exercise contains two parts, namely *make* and *say*, which

indicates that after making some creative work, the participants are encouraged to present their artifacts to the group. Through these say sections, participants tend to reveal their insights. It is advised by Sleeswijk Visser et al. (2005) that the people who are responsible for the analysis should take part in the generative session. However, if possible, they should not take the role of moderator since while moderating the session; one may lose the concentration on the group.



Figure 3.2 General view of a group session and the data analysis phase (Stappers et al., 2003, p.2,7)

The generative session is followed by the analysis. The results of these sessions are not easy to analyze, since they are mostly “contextual landscapes” and “anecdotal elements” (Stappers et al., 2003, p.3). Thus a guideline can help the researchers. It is advised to begin with documenting the raw data (Sleeswijk Visser et al., 2005). Then the raw data should be searched and some patterns and relationships are tried to be caught. Working with visual representations and post-its may help the researchers. The time needed for a fruitful analysis depends on the size of the group.

As it is the aim of contextmapping to inform and inspire the design team, the communication of the session outcome with the design team is very important. The goal of the communication phase is to provide room for interpretation, to

encourage argumentation and to enhance discussions within the design team (Sleeswijk Visser et al. 2005). In order to reach such aims the outcomes of the session should be shared in an appropriate manner. However, since the data of a generative session is always multi-dimensional addressing “both, functional and affective, general and personal, subjective and objective” (Sleeswijk Visser et.al, 2005, 16), how to share such a data in a comprehensible and engaging way is an important aspect. Especially in the conceptual phase of the design process, designers are in need of immersing themselves in the situation. Hence, thorough description and visualization of the raw data is required due to their effective results in creating empathy and engagement between the design team and the users. Sleeswijk Visser et.al. (2005) proposes to communicate the outcomes through a presentation of carefully selected and compiled raw data with the hints for interpretation.

Regarding the communication phase of contexmapping studies, Sleeswijk Visser et al. (2004) developed a tool called *personal cardset*, which aims to present information about user experiences to designers and guide the designers towards exploring, interpreting and using users’ comments on their experiences. Through the *personal cardset*, each participant user is represented through a two-sided and laminated board which is called *card* by the authors. On the back side of the *card*, the comments, explanations and anecdotes communicated by the participant during the workshop are shared by designers. In these transcripts the common themes addressed by participants are highlighted by coloring, so that designers can search for common patterns among participants. On the front side of each *card*, a participant is summarized through a fictive picture, a name, a title quote and visual and verbal pieces from his contributions during the workshop. Interpretations of the researcher are also presented in this side of the *card*, through some diagrams.

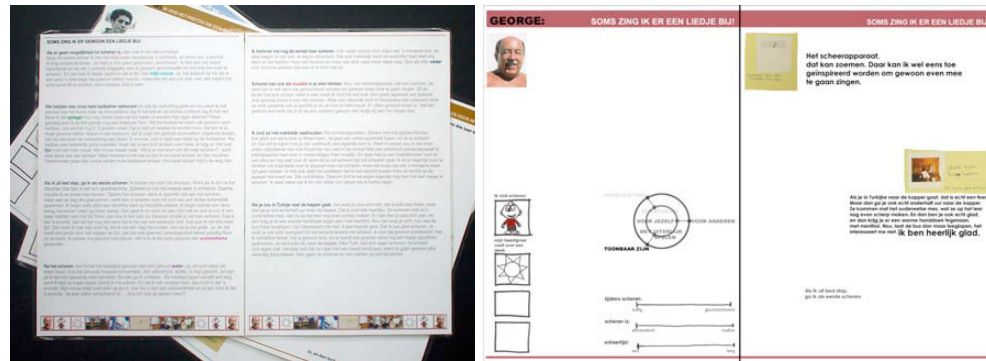


Figure 3.3 The back and the front side of the *card* (Sleeswijk Visser et al., 2004, p.1).

The graphic design of the *personal cardset* provides enough white space for the designers' personal notes. In addition to *cardsets*, markers and sponges are also provided for designers, to encourage the usage of white spaces for notes. The authors' observations of the *personal cardset* usage indicates that designers use these *cardsets* for making comparisons between the participants to find out contradictions and similarities and during the group discussions to support their arguments.

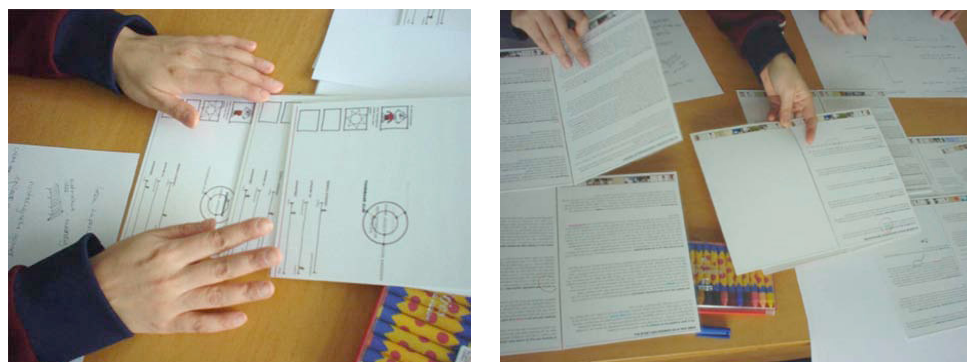


Figure 3.4 Personal Cardset in use (Sleeswijk Visser et al., 2004, p.2)

3.2 Facilitative Tools and Techniques for Creative User Involvement in Design Process

3.2.1 Probes

Probes are design oriented user research toolkits that are based upon self-documentation of users' experiences, feelings and attitudes via words or visuals. They were first introduced to the design domain by Gaver and his colleagues (1999) during a European Union funded research project. The project aimed at searching for new interaction techniques that enhance the presence of elderly people in their local environments. In order to better understand their sample group and reach inspirational data, the researchers designed some packages to be given to the subjects of the research. These packages enabled the design team to reach in-depth user tendencies and to create a communication medium between the subjects and the designers. The packages included purposefully designed postcards, with images on the front side and some questions at the back; maps, with questions inviting the subjects to reflect upon them; disposable cameras; for the purpose of self-photographing the interaction with the environment, photo albums to encourage the subjects to build up stories about their contexts and media diaries to record the television and radio use patterns of elderly people. The packages were aesthetically designed and not finished too professionally in order to encourage the subjects to interact with them. The work of Gaver and his colleagues was named as *cultural probes* and inspired further similar applications in which the context, the goal behind the application and used materials differs.

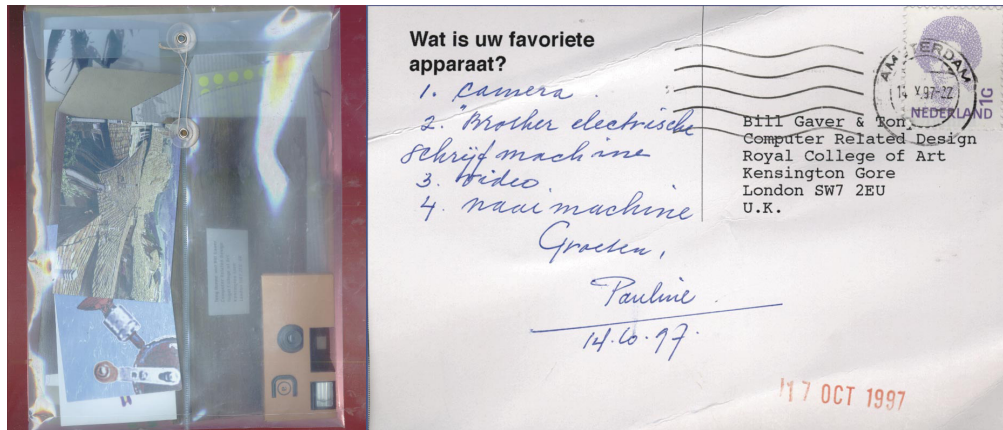


Figure 3.5 A cultural probe package and a responded postcard from the package
(Gaver et al., 1999, p.2-3)

Although inspired from cultural probes the study of Horst and his colleagues (2004) held in the Netherlands had a different attitude, since they did not use probes for design inspiration but to understand and empathize with the subjects of the research. The theme of the research was creating designs which enhance the need to keep in touch within a family, so the team distributed some tangible probe artifacts and tasks namely *empathy probes*, in order to understand the feeling of being a member of those families. Later, *empathy probes* were also utilized in several cases held in University of Art and Design in Helsinki in collaboration with companies (Mattelmaki 2005). The main aim behind those cases were creating an empathic and respectful dialogue with the participants and supporting the empathic understanding of the designers (Mattelmaki and Battarbee, 2002).

Hemmings et al. (2002) used the probe tools in Digital Care project where the subjects of the research were former psychiatric patients. According to the medical situation of the subject group, the authors called the context as “sensitive setting” in which traditional observation techniques could be both inappropriate and harmful. Although derived from cultural probes the methodology they utilized was named as *informational probes*, since the aim of the study was not to inspire designers but to elicit information about the skills and daily routines of the subject group, in order to facilitate understanding of their needs.

Hutchinson and her colleagues (2003) were inspired from informational probes and developed their own probe designs. Their probes were not kits that promote self-documentation but some devices which were utilized for designing products based on new technologies with users. The team used such probes in order to search the interaction between remote family members. The family members were given some 'seed technologies' such as; 'message probe'; digital post-it notes for sharing messages between remote members which is used through a writable LCD tablet and pen, and 'video probe'; a video camera that captures random snapshots and enables sharing impromptu images. Then, the subjects were observed in order to reach what the participants would like to develop based upon these technologies. Because of the technologies behind those simple, adaptable and flexible tools, the probes were named as *technology probes*. They were used for three goals:

- Reaching the information related to both the use and the users of new technologies in real life situations
- Field testing those technologies
- Inspiring both users and designers to think about the new uses of the technology.

The result of the application was real-life scenarios which were then used in participatory design workshops (Mattelmaki 2005).



Figure 3.6 Message probe (left) and video probe (right) (Hutchinson et al., 2003, p.4-6)

Hulkko et al. (2005) developed contextual and dynamic self-documenting tools, in order to study people's behavior in mobile context and named their tools *mobile probes*. Personal digital assistants (PDAs), emails, mobile phones, pagers and digital cameras were among the artifacts of mobile probes. The team tested those tools in a pilot study where the theme of the study was creating new kind of sales point for cloth retailers. The goal of the research group was reaching a wide range of issues related to shopping; such as, users' subjective preferences, considerations of the society and pleasure taken in shopping. Since shopping is a mobile context, instead of tangible probes, the users were given digital equipments: mobile phone with digital accessory camera and a Java applet including task and questions guiding self-documentation. Thus, the users were encouraged to document their feelings, thoughts and actions while they are moving. Mobile probes were thought to be more advantageous than tangible ones in such a context. Firstly, they enabled remote and simultaneous observation of several users. Secondly, created digital user data could be stored in one database so that researchers could reach the data appearing on the server instead of waiting for the return of tangible probes. Lastly, they enabled the users actively contribute to the project instead of regarding them as passive data sources.

All those aforementioned projects indicate that probes are used for some main purposes. Mattelmaki (2005) categorizes the main purposes of probe usage under four titles: inspiration, information, participation and dialogue.

Inspiration probes, as in the case of *cultural probes*, support designers' creative thinking by providing new insights. Those probes are designed in a way that they leave space for both the designer's and user's interpretation and inspiration. They function through sharing of the raw data, designed probe artifacts, individual tasks completed by users and new design ideas. The outcomes of the probes' usage are evaluated in a 'designerly' manner, such as exploring common patterns and exceptions, creating stories and trying to find out novel design ideas (Mattelmaki, 2005).

Reaching related *information* is another motivation of probes studies, as can be seen in Digital Care project of Hemmings et al. Information intended probes are mainly descriptive and leave less space for interpretation, since they aim at not

inspiring the designers but reaching information about users' needs and experiences. Subjectivity of the participants is very important in these kind of probes (Mattelmaki, 2005). The users involved in such probes studies are not passive respondents but active participants of the enquiry of their daily life (Crabtree et al., 2003).

Probes are regarded as effective tools for *participatory* design approaches. As mentioned before participatory design is based on the idea that users can also actively contribute to the design process when they are provided appropriate tools and sufficient encouragement. Probes studies not only stimulate users' imagination through an interaction with designed artifacts, new technologies and prototypes, but also encourage and guide them to observe, experiment and record their individual experiences (Mattelmaki, 2005).

Since the first application of probes studies, they have been regarded very successful in creating an engaging, effective and project long *dialogue* (Gaver, 1999; Hemmings et al., 2002). Mattelmaki (2005) examines this dialogue in three levels: Probes stimulate interpretive dialogue within a design team. They enhance the dialogue between the user and the designer since through the delivered artifacts and technologies not only users comprehend the theme and the goal of the projects but also their expression of individual insights both encouraged and facilitated. Lastly probes create an inner dialogue which is related to design empathy forming a link between users' experience and designers' insights.

Besides their contributions to the projects, probe studies also bare some challenges in themselves. Motivating the users to complete the given tasks and document their related experiences is the main challenge (Hulkko et al., 2004). Moreover, since probes provide open and subjective data their analysis is a big deal (Hutchinson et al. 2003). The results of the probes are mostly unforeseen due to their focus on users' subjectivity so they have the risk of failure or unexpectedness (Hutchinson et al., 2003).

In order to gain maximum efficiency from a probes study and to overcome the challenges, the probe artifacts and tasks should be designed according to some fundamental qualities. First of all, as may be seen from the aforementioned

example cases, probes are case specific tools, which should be designed according to the goal, context and the participant population of the project (Hemmings et al 2002). Secondly probes are playful tools which motivate and facilitate the participation of the users (Hulkko et al., 2002; Jaasko and Mattelmaki, 2003; Mattelmaki, 2005). They not only stimulate associations but also leave some space for individual interpretations through game like surprising tasks with visual, open ended clues and projective tasks (Jaasko and Mattelmaki, 2003, Hulkko et al., 2004). Lastly they should be easily accessible and their assignments should not be burdensome (Hulkko et al., 2004).

3.2.2 Generative tools

Generative tools or in McClelland and Suri (2005)'s expression *projective techniques* are "methods that invite people to express ideas, thoughts and feelings in forms that rely less upon verbal expressions and more upon making things, creating or reacting to imagery" (pp. 312). The development of these tools is mainly based upon the belief that "all people can project and express their needs, wants and aspirations through the use and interpretation of ambiguous visual stimuli" (Stappers and Sanders, 2005, p.4). Thus these tools are for facilitating user participation by encouraging users to express opinions, memories and explanations about the explored context (Van Rijn et al., 2006) and consequently by setting a communication medium between the stakeholders. However the pre-requisite of a successful communication through generative tool kits is the acknowledgement of users as experts in their individual experiences.

In practical applications, the generative toolkits are employed for diverse aims. First of all, generative tools set a new communication medium between users, designers and researchers. Sanders (2000) defines this new medium as a language made of visual and verbal components, out of which a wide variety of meaningful combinations can be achieved. Collages, maps, stories, plans and memories can be regarded among these combinations. Secondly, generative tools enable both the access and the expression of the emotional concerns of an experience. Through some emotional stimuli within the kit components, memories and *past* experiences are evoked while some others are used for motivating the participants towards *future* related feelings and dreams. Generative tools are also

very successful in revealing personal histories which contribute to the content and quality of experiences. Some toolkits aim at training people in observation of their individual lives so that they can be more aware of their everyday experiences which they used to take for granted (Sanders, 2001). Besides their being advantageous to reveal subjective stories, dreams and maps, they also enhance collaborative thinking and collective creativity. They can also be used in order to reach the cognitive patterns of the participants. Finally, it is also possible to utilize generative toolkits in order to elicit ideas related to novel products and services. (Sanders, 2001)

The toolkits are composed of a wide variety of components which reflect a balance of visual and verbal, abstract and concrete, positive and negative, and male and female (Sanders, 2001). The ambiguity of components is also desirable in order to stimulate the tacit knowledge of participants and making it explicit. Generally, a generative toolkit usually contains a background, which frames the working space, visual components, such as photographs and sketches, colored paper, three-dimensional forms covered with Velcro materials, stickers, pens, markers, words and phrases. These materials are introduced to the participants and they were asked to express their feelings related to the theme of the study by using those (Sanders, 2001).



Figure 3.7 Collage making tool kit (Stappers and Sanders, 2005, p.6)



Figure 3.8 Diverse components of generative toolkits (Sanders, 2001, p.320)

Creating generative toolkits can also be regarded as a design process in itself since these tools are generated according to the intended purpose, thus every case requires its own toolkit, since some toolkits are more suitable for revealing past experience, while others are good at stimulating creativity (Stappers and Sanders, 2005). Sanders (2001) indicates that development of generative toolkits is based upon certain acknowledgements. First of all, creativity is not a peculiarity bestowed on designers; all people can be creative. Moreover, the participants can supply information about the missing points, regarding their experiences and imagination. Lastly, they can put forward their needs through ambiguous stimuli since human-beings are naturally motivated towards making meaning.

As discussed above, generative tool kits contain wide variety of tools; such as collages, mood boards, mind maps, and 3-D models. However, since it was mentioned that the tools of a generative toolkit should be designed peculiar to each study, here only the tools that are chosen to be appropriate for the present study will be explored.

3.2.2.1 Sensitizing toolkits

Sensitizing toolkits are packages of exercises and assignments which are provided for the participants for a certain time; usually one or two weeks, before the participatory session. As expressed before, the aim of sensitizing packages is to

help participants observe, become aware of and reflect upon their feelings, attitudes and routines related to the subject of the study (Van der Lugt and Sleeswijk Visser, 2005). Consequently, they can make more relevant and fruitful contributions through the real session. In other words, as Sleeswijk Visser and Visser (2006) express, sensitization is the first phase of user involvement, although not as intense as the real session. However, in order to receive richer contribution from the sensitizing tools, their themes should be broader than the theme of the real study (Van der Lugt and Sleeswijk Visser, 2005; Sleeswijk Visser et al., 2005), so that participants are motivated to explore rather than concluding specific answers.

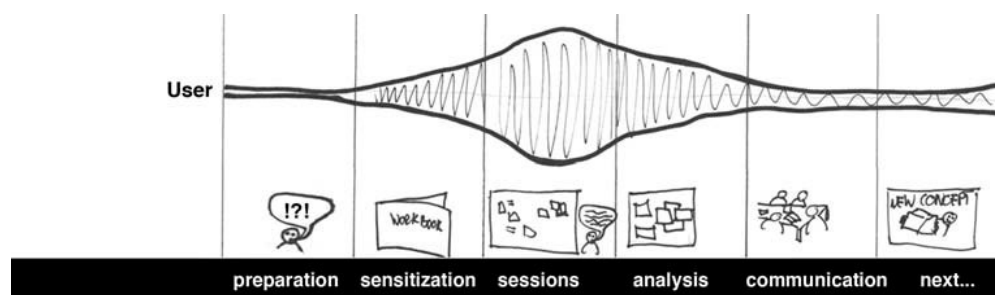


Figure 3.9 Involvement of user through the phases of participatory study.
(Sleeswijk Visser and Visser, 2006, p.149)

Workbooks and user diaries are among the mostly utilized sensitization tools, which are quite alike in terms of application. Workbooks are booklets containing little daily exercises which encourage the participants to recall memories and attitudes and reflect upon them (Van Rijn et al., 2003). Diaries are also booklets which encourage the participants to observe and express their daily routines and specific activities within their natural contexts related to the theme of the study (McClelland and Suri, 2005). While participants are working on these tools, they may ask to utilize different mediums, such as collages, drawings, visual or audio recordings and photo taking.

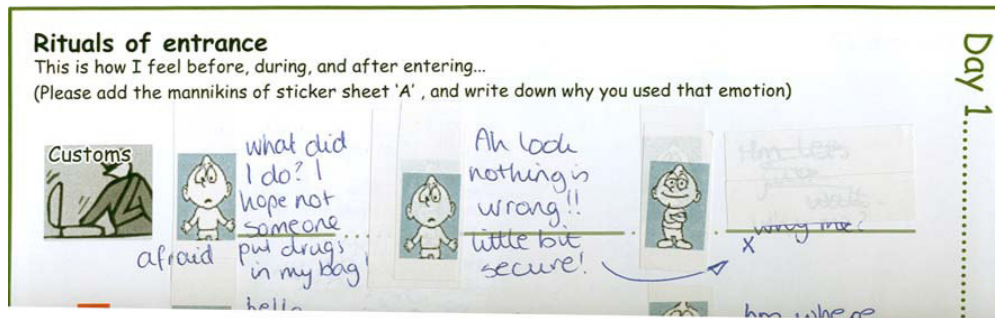


Figure 3.10 Part of a sensitizing workbook filled by a participant (Sleeswijk Visser and Visser, 2006, p.149).

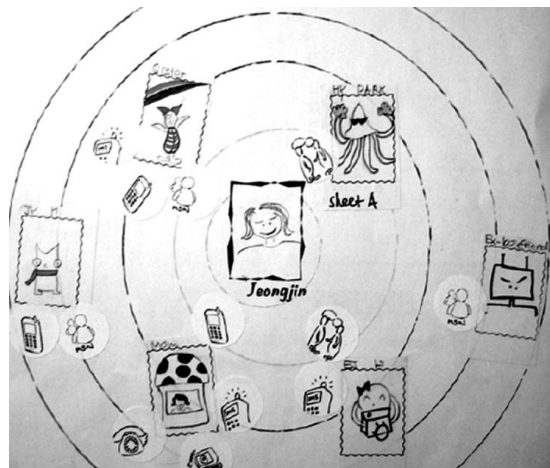


Figure 3.11 Drawings made by a participant on a sensitizing workbook page (Van Rijn et al., 2006, p.169).

Since participants work with these tools without the accompaniment of a facilitator or the researcher himself, the designs of the tools should be done accordingly. Addressing this issue, Van der Lugt and Sleeswijk Visser (2005), propose a guideline for the design of sensitizing packages. According to their recommendations;

- Sensitizing materials should have enough space for encouraging the participants to make comments and write down their ideas.

- Working with these packages should not be a burden for participants so they should not take more than five to ten minutes per day.
- They should include inspirational and provocative exercises rather than specific questions. Thus more surprising results can be observed.
- The design of these packages should be both playful and professional at the same time. They should be playful since working with them should not be boring, for enabling the motivation of the participants. They should also; look professional in order to make the participants feel that they are respected and their inputs are valuable.

McClelland and Suri (2005) add these recommendations two more. According to them, the instructions of the exercises in these packages should be clear and easy to comprehend. They recommend having a trial session while briefing these exercises to the participants. Additionally, all the mediums that participants may need should be provided within packages, with the necessary instructions and the contact information of the researcher, in case of any question.

Sensitizing tools are similar to the tools within probe packages in terms of character and application. However, sensitizing tools differ from the probes in purpose and the way they are utilized. In cases where the probes are chosen as a technique, what the designer will use as an inspiration and information source is the materials themselves, which are returned by the participants. However, in terms of sensitizing packages, although the designer may use the data coming from these tools, their main function is to prepare the participants for the real group session (Van der Lugt and Sleeswijk Visser et al., 2005).

3.2.2.2 Collages

Collages are exercises which are mostly utilized in the idea generation phase in order to explore the atmosphere of users' experiences through visual images and other helpful expressions, such as words (Hummels, 2000). The atmosphere, which is studied through collages, can be related to the user, context, and circumstances of use and emotions that are evoked by a product. Consequently, the collages can be both concrete and abstract and their creation can be based upon a wide range of representations, stimulating variety of senses (Hummels,

2000). However it is widely admitted that in creating collages visual materials are widely preferred to other materials serving for other senses. Collages are mostly two dimensional representations, however, in some cases where more spatial representations are desired, relief like and three dimensional collages are preferred. Three dimensional collages differ from three dimensional models since the emphasis in the former is mostly the atmosphere, whereas the latter deals with the user-product interaction (Hummels, 2000).

Collages are utilized for some main purposes. First of all, they are claimed to be medium for effective communication of explored aspects. Additionally, experts in the field claim that collages enhance creativity since they serve an overall picture, upon which one can build his own approach.

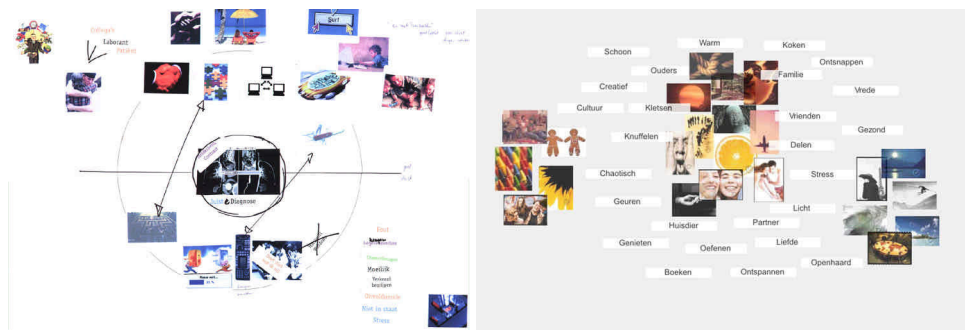


Figure 3.12 Collage samples (Stapper et al, 2003, 5)

Hummels (2000, p.2.29) believes that “making collages is a skill, but mainly a skill of looking and trusting one’s senses and intuition” so anybody can come up with striking collage representations, they do not need to be specially trained. Thus, besides facilitating the design process on behalf of designers, collages are also among useful techniques for experience exploration by users. Collages are advantageous for users in terms of their accessibility. In collage studies the user can benefit from the expressive quality of existing images, or can make his/her own photographs related to individual insights and experiences. In accordance with

Hummels, Stappers et al., (2003) indicate that collage representations work well with non-designers in comparison to designers because designers make collages for themselves but non-designers are responsible for explaining their collages to the others, thus their works are more explicit. Based upon such grounds, collages are among the preferable exercises for participative generative sessions.



Figure 3.13 Collage exercises at generative sessions (Stapper et al, 2003, p.2)

Collages are mostly employed in order to elicit memories and emotions of the participants and they are mostly regarded as suitable exercises for sensitizing packages and initial exercises of the generative sessions. The aim of the initial exercise is mostly to open the minds of the participants and stimulate them through associative thinking. Collages serve very well here, since images and words facilitate to make associations (Sleeswijk Visser, Stappers, Van der Lugt and Sanders, 2005). In order to facilitate the works of users in these sessions they are given collage kits which are composed of abstract images and words. Sleeswijk Visser and her colleagues (2005) recommend a collage kit including around a hundred images and hundred words. Besides the quantity, the quality of the images and the words should also be chosen carefully. Instead of spreading colorful magazines and brochures, intentionally chosen collage materials should be preferred, because the images in magazines and brochures cause hesitation about how to start the task due to their diversity and concentration loss because of their

location in the context of the magazine page. According to the authors, there are some issues that need to be paid attention while designing collage kits:

- The images should be diverse enough and reflect various contexts.
- There should be a balance between negative-positive and concrete-abstract images.
- Over-aesthetic images should be avoided.
- Ambiguous images are beneficial for triggering the user's association, interpretation and his/her individual story. However, the all set should not be made off ambiguous images.
- Theme-related images may help participants to start the exercises; however they should be kept minimum since the contexts created by the participants are more desirable.

3.2.2.3 Mood boards and style boards

Some collage representations are referred with specific names; such as, mood boards and style boards due to their particular purposes and distinctive characteristics.

Mood boards are visual boards built from abstract media; such as, images, textures and forms in order to communicate emotions, impressions, feelings and moods, and also in order to motivate lateral thinking (McDonagh and Storer, 2005). Mood boards offer an alternative communication beyond words, including visual and tactile senses, thus they provide a “sensory-centric” (McDonagh and Storer, 2005, 30) approach. However, due to the abstraction of mood boards, their interpretation can be very subjective, thus the message on the board may need to be supported by other forms of communication; such as, keywords. Mood boards are mainly utilized in the very initial phase of design process because of their opportunity to liberate the mind and enhance creativity. In a mood board study participants either work with a collection of pre-selected images or they may be asked to form their own image collections (Bruseberg and McDonagh-Philp, 2001)



Figure 3.14 Sample mood boards (Bruseberg and McDonagh, 2005, p.4; <http://www.theblogstudio.com/images/problogger/mood-board.jpg>, respectively)

A study conducted by McDonagh and Storer (2005) reveals utility brought to the design process through the usage of mood boards. Their study highlights three main concerns. First of all mood boards are assistive tools which enhance the communication between designers and non-designers. It is widely admitted that users may experience difficulties in expressing their needs and thought through words. In such an occasion, utilizing from various visual media is so helpful not only for users but also for designers to understand and empathize with them. Moreover mood boards are suitable tools for group studies. They can be used as warm-up exercises and facilitate the integration of group members. Also for the following studies, it facilitates to anchor some concerns and create a common ground for discussion. Secondly, mood boards stimulate the lateral thinking and accordingly help designers to get inspired. Their suitability for group works and potential of creating synergy within a group, promotes inspiration, as well. Lastly, mood boards facilitate the immersion of designers into the user profiles and use contexts.

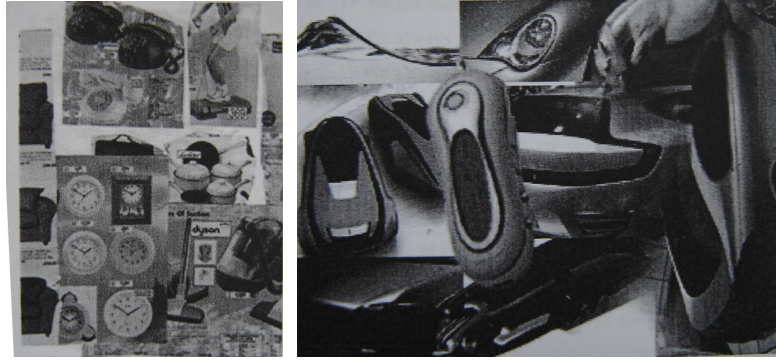


Figure 3.15 Sample style boards (McDonagh and Storer, 2005, p.19)

Style boards are also a specific kind of collage, which are generated from the images of manufactured artifacts like products, buildings and vehicles, in order to reflect the equivalent lifestyle products (McDonagh and Storer, 2005). Style boards are helpful when the outcome of the design process is intended to be presented within the certain style of products. The collection of inspirational images or desirable products chosen for a style board proposes insights related to symbolic meanings and preferred patterns within the market. As mood boards, style boards also stimulate lateral thinking through inspiring from other product styles. Additionally, style boards are helpful in creating user profiles through an association between the target user and products on the market. However, style boards can be risky sometimes due to the nature of chosen images. Since these images belong to manufactured products, if they are not used appropriately, they can prevent original thinking and cause a tendency towards imitation. To prevent such an outcome it is advisable to use mood boards in order to support style boards (McDonagh and Storer, 2005).

3.2.2.4 Visual product evaluation: Product personality profiling

Visual product evaluation techniques are based on the fact that most of the time consumers make their purchasing decision according to the visual impact of products since they have nearly no chance to try them before buying (Bruseberg and McDonagh, 2002). Especially with the availability of shopping through internet,

how consumers perceive products through their visual appearance have become much more important. In these cases purchasing decision are mainly through the result of a comparison between the visual expressions of similar products (Bruseberg and McDonagh, 2002).

Considering these facts Bruseberg and McDonagh made a study on the visual perception of users about products. They developed a technique; namely *product personality profiling* (Bruseberg and McDonagh, 2001). Due to the projective nature of the technique, it seems suitable for participatory group sessions.

As stated by Bruseberg and McDonagh (2005), product personality profiling is a projective technique which was adapted from the techniques of market research. The technique aims to reveal social value systems and emotional responses of potential users towards products. Additionally, the technique reveals the user's perception of the target consumer group of a specific product (Bruseberg and McDonagh 2001).

As explained by Bruseberg and McDonagh (2005), throughout the technique, participants are given questionnaire like sheets which have different product images that belong to the same product category. Then participants are asked to imagine each product image as a person with a distinct personality. They are asked to make comments about the life styles of these different persons; such as their age, gender and occupation.

Please imagine that these products were persons and envisage the following features for them:

	Sophie	Joan	Clive	Anita	Jeremy
					
Product	A	B	C	D	E
1 Age	30	40	45	40	25
2 Gender	Female	Female	Male	Female	Male
3 Occupation	Office worker	Retired	Stockbroker	Working mother - Sales rep.	City Banker
4 Accommodation	Flat	Bungalow	4 bed detached	3 bed semi right end of row	Backlands flat
5 Car	Small - Fiat type	None works	4 door family rep. car	4 door but good design	Fast, sporty 2 seater
6 Personality	Outward going, party animal	Staid, old fashioned	Stable, secure, focused	Efficient, hard working, hard	Arrogant
7 Holidays	Tunisia	With family members	Europe	Town & Country	Caribbean
8 Home Environment	Untidy	Spotless	Neat but not ultra tidy	Very tidy, everything in its place	Minimalist

Figure 3.16 Product personality profiling questionnaire with user responses.
(Bruseberg and McDonagh, 2001, pp.442)

It is believed that through such an abstraction, it becomes easier to reveal users' perceptions and hidden values which are hard to express or even not known. Following this exercise, a group discussion session is advisable since while discussing within a group, participants may mention about other views and feelings which they did not previously think about or mention. The data obtained from such a technique is very subjective and thus qualitative and culture dependent in nature. Thus, it is hard to obtain generalizations from such a study. However, design teams can utilize this kind of data in order to get an impression of the perceptions of potential users, related to target user group that the product is addressing.

3.2.2.5 3D modeling tools and ideal product drawing

3D modeling toolkits include some simple materials out of which participants can construct a mock-up of their ideal products. They are utilized in order to facilitate the self-expression of participants with the help of three-dimensionality. They enhance the imagination of participants, since they give the opportunity to explore both different forms and space in a *playful* environment (Bruseberg and McDonagh, 2005). With the help of 3D modeling, participants can both show and discuss the functioning of a product, expected interaction and the desired context

of use by giving reference to the created artifact (Westerlund et al., 2003). Consequently, as other generative tools, 3D modeling tools enhance the communication between the participants and the researcher. Stappers and Sanders (2005) advise that 3D modeling tools are used after participants have explored the theme of the study through some other tools, such as collages and maps. Thus, they enlarge their horizons and are motivated to think beyond stereotypes, and can put forward more creative and novel ideas.

For modeling tool kits, researchers utilize a wide variety of materials. For instance, regarding her experience with children, Druin (1999) states that it is possible to obtain valuable results by using some simple materials, such as paper, crayons, clay, string and more, during participatory user workshops. Since participants do not need to be trained in how to utilize these simple materials, it is so likely that they can easily express themselves and conclude valuable results. Moreover, they are both inexpensive and very effective in quick form giving to new ideas. She also believes that, materials for 3D modeling tools should be selected according to the theme of the study, since some materials may be found limiting and frustrating for one study, whereas it may work quite well for the other. Thus, according to her, standardized box of materials may not guarantee success for every case. However, Stappers and Sanders (2005) call their 3D modeling kit “Velcro-modeling” since their toolkit is mostly composed of prepared 3D forms in many sizes and simple forms which are made up of soft and fuzzy material. They also contain some smaller control elements which are attached with velcro fasteners. Sanders (2000) claims that with these set of materials participants work quite well, since they are both easy to use and powerful in expression. (Sanders 2000). As an evidence it is claimed that, participants can generate new concepts with these tools in a very short time, such as five to ten minutes. In some cases, some participants can even conclude three to four concepts in that amount of time (Stappers and Sanders (2005).



Figure 3.17 Father and son in a Velcro-modeling exercise. Parts of Velcro-modeling toolkit (Stappers and Sanders, 2005, p.7)

Besides 3D modeling, *drawing the ideal product* is another technique for users to generate new concepts. This technique was utilized by Bruseberg and McDonagh (2001) towards the end of one of their group sessions with users. As Bruseberg and McDonagh (2005) state, the technique enables users to express themselves visually; moreover, it provides a visual source of inspiration for designers. The advantage of the technique for users is that they can add some labels and comments on their drawings. However, the technique can be regarded as difficult by the participants due to lack of training in expressing ideas visually and consequently lack of confidence about their drawing skills. Thus, modeling tools may be regarded more suitable than drawing while working with users, since although more time consuming users are always more accustomed to benefit from provided tools and shapes (Bruseberg and McDonagh, 2001).



Figure 3.18 Example of a drawing made by a participant. (Bruseberg and McDonagh, 2005, p.7)

3.3 Tools and Techniques for Communicating User Profiles

Understanding user profiles by designers is very crucial for the success of the design process. However, most of the time such an understanding is hard to be enabled, due to the inappropriateness of the language chosen for sharing the user data with designers. Here, two techniques, *personas* and *extreme characters*, and a tool, *Real People*, will be discussed which are developed basically for addressing this problem. They all aim at facilitating designers' immersion in the life of people for whom they design and accordingly inspiring the designers. However, the methodology chosen for this aim differs in all three. While the technique *personas* aims to represent common features of target user groups within the individuality of specific persons, the technique *extreme characters* points out the extreme personalities. On the other hand the tool *Real People* represents the chosen users from the target group within their own individualities, as opposed to the unifying nature of *personas*. In the following section the specifications of these techniques and tool, and their contribution to the design process will be discussed in details.

3.3.1 Personas

Personas are the representations of user groups in the body of fictional people, who are described in detail with a name, photograph, demographic characteristics, behavioral characteristics, barriers and/or challenges and specific goals and needs (Don and Petrick, 2003). Marketing has utilized user representations for a long time; however, it was Alan Cooper who first initiated the use of personas as a design tool (Grudin and Pruitt, 2002). Cooper had two goals while generating personas: to help the product development team feel the world of users and also to make them go beyond user related personal prejudices and focus on the real characteristics of user groups while still regarding them as individuals (Olsen, 2004).

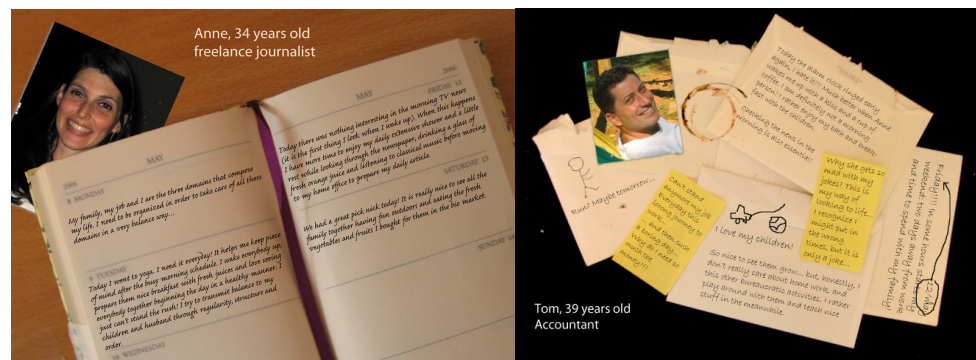


Figure 3.19 Sample persona posters, representing a tidy wives and lazy husbands, respectively (personas prepared by the students of Rich Visualization course from TU Delft, 2006).

Cooper's efforts are not only utilized but also evaluated throughout several design projects and personas gained a wide acceptance as a design tool due to their positive contributions. First of all, personas are very powerful in enhancing engagement between the product development team and the target user group. Personas enable designers to focus on different views about users who are

defined as 'one individual', and facilitate to empathize with them (Blomquist and Arvola, 2002). Pruitt and Grudin (2003) claim that fiction has great power in terms of engagement as in the example of movies. People easily admit fictional characters in movies and tend to interpret and discuss their lives. Similarly, designers also find it easy to immerse in the lives of personas and fill in the gaps. Moreover, personas make the implicit assumptions about the users more explicit, since their existence clarifies the reasons behind the taken decisions about "who will use the product and how it will be used" (Grudin and Pruitt, 2002). Another advantage of persona usage is their being an effective communication base between the members of new product development team (Grudin and Pruitt, 2002; Pruitt and Grudin, 2003). As specific individuals, personas are more recognizable and easier to refer to than mere market research reports. Thus, team members can easily use personas in their discussions such as "Would Alan use this feature" (Pruitt and Grudin, 2003, p.7). Lastly, personas are believed to function as a basis for other design tools. For example, first they are successfully created, it seems easier to construct meaningful scenarios by using them (Grudin and Pruitt, 2002).

Besides the advantages personas bring to design process, they also have some challenges. First of all, in order to benefit from all the aspects which are mentioned above, personas should be reliable. They should not be made-up characters but should rely upon real user data, which are obtained through other techniques, such as field studies, focus groups, interviews and questionnaires (Grudin and Pruitt, 2002). Even the photo chosen for the character should be reliable, thus, instead of using photos from stock galleries, ordinary photos of everyday people should be preferred. Secondly, as Godwin (2001) indicates personas should be specific to the design problem. Thus, for every design problem the target users of the design and their goals should carefully be considered and personas should be created accordingly. As mentioned above the acknowledgement of the personas by the design team members is very crucial in order to benefit from persona usage. In order to enable this, design team should be exposed to personas through a continuous campaign; such as, through a delivery of posters, flyers, hand-outs, web-pages or even toys reflecting the personas (Grudin and Pruitt, 2002). Personas are proved to be effective design tools. However, their usage should not be overextended. They should not be preferred over to other user-centered design

tools but they should accompany these tools such as field researches and scenarios (Grudin and Pruitt, 2002).

3.3.2 Extreme characters

Extreme characters is a technique, which is developed by Djajadiningrat and his colleagues. Through this technique profiles of fictional users having exaggerated emotional attitudes are shared with designers, in order to highlight cultural issues. Then designers can design by considering the socio-cultural role of products (Djajadiningrat et al., 2000).

As stated by Djajadiningrat et al. (2000) the technique was developed as opposed to techniques which are based upon the profiles of prototypical characters from the target user group. The authors believe that designing for prototypical characters focuses on only certain emotions and attitudes which are socially and culturally approved. Thus, the authors criticize these techniques as being ignorant of “full spectrum of human emotions”. However, by providing profiles of characters that are extreme, some hidden character traits due to their being antisocial and in conflict with the social status of the character can be revealed. Designers’ awareness of these character traits is also important, since, even not approved, they can also be common.

Throughout the methodology of the design process of the technique, the authors worked on the design of a PDA. Three extreme characters were defined as the user of this PDA, a drugs dealer, the Pope and a polyandrous twenty-year old woman. The characters were brought to life through role playing exercises, and visual collages; consequently the character, appearance and social role were generated coherently. As a result of such a study, the attitude of these characters towards appointments could be explored in a more relevant way. Designing for these characters revealed the importance of some issues, which are not always taken into consideration while designing PDAs, like secrecy, status and autonomy.

As a result of the study, the PDA for the drugs dealer was designed as a set of rings which differ in shape and material. Thus, the drugs dealer can choose which ring to put on according to the hierarchy of the person with whom he will meet. The

importance of the appointment can also be marked through the chosen finger for the ring. The PDA of the Pope was designed as a digital pen, inkwells and paper, which will be in harmony with the interiors of Vatican. The inkwells were decided in different types, representing different emotions. The smart pen can both recognize the handwriting of the pope and the inkwells. Thus, while writing plans about leisure activities the pen can absorb less ink. As a result, the PDA can restrict the activities related to leisure time in a manner to force the Pope to complete his formal appointments. The PDA of the polyandrous woman was designed as circular screens that can fold-up. The PDA had two modes, public and private. In public mode, the user can arrange normal appointments. While arranging the appointments with her boyfriends she can fold up the screens and control the appointment related to each boyfriend through the provided screen.



Figure 3.20 PDA for drugs dealer (Djajadiningrat et al., 2000, p.3-4)

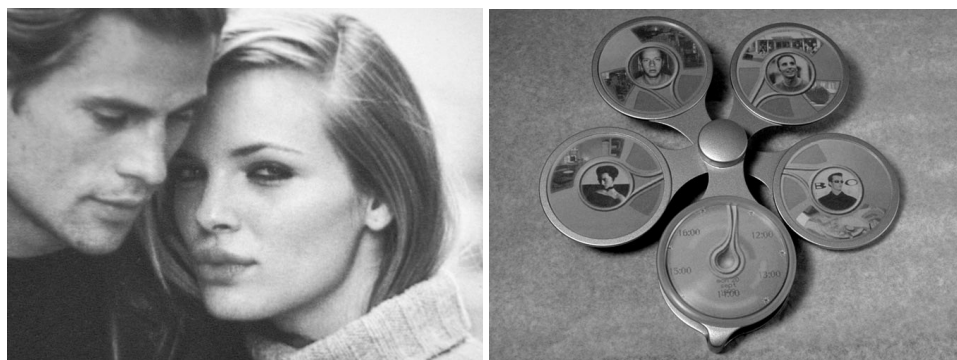


Figure 3.21 PDA for polyandrous woman (Djajadiningrat et al., 2000, p.4,6)

As a consequence of such a design process, the authors concluded some remarks for the technique. Firstly, considering the extreme characters can show the designers very diverse dimensions of design while designing a certain product. Secondly, they can facilitate the consideration of richer aspects related to aesthetics, interaction and the social roles of the products. Thirdly, the technique can attract the attention of designers on undesirable emotions which are also necessary to design 'humane' products. However, the choice of the characters is extremely important for this technique. It should not touch sensitive issues such as race and gender, it should not offend anyone and the characters should not be chosen among clichés.

3.3.3 Real People

Real People is a DVD based tool which is designed by Porter and her colleagues (2005b), in order to inform and inspire designers on the way to design pleasurable products. As widely explained in the two articles of the authors, the aim of such a tool is to inform the designers about the pleasure needs of users from the target group and facilitate the designers' inspiration and empathizing with users through immersing them in the lifestyles of people.

As Porter et al. (2005b) state the idea of such a tool stems from the observation of insufficiency of present human factors methods for designer's interpretation. Thus, most of the time, such data cannot be comprehended by designers and consequently are not taken into consideration. Thus, as a first step, the authors searched for designers' expectations from such a tool. The results indicated a tool, which is "flexible and intuitive", "logical and easy to learn", and "visually stimulating and interactive" (Porter et al., 2005a, p.5). In order to obtain the required data for such a tool, they followed two strategies. Firstly, the authors searched for approximately 700 participants from different regions of UK, in different ages and from different genders. As a consequence, they obtained data about general trends in product pleasure and product preference. Then they worked with a smaller group of people, approximately 100, on their most pleasurable products, which resulted in richer and more intimate data. For this study, some in-depth questionnaires were given to participants asking about the personalities, lifestyles, pleasure attitudes, brand choices and style choices of people. Then, some informal

videotaped interviews were held in the participants' home where they presented their most pleasurable three products with their reasons.

As a consequence of these studies, the authors developed *Real People*, through which designers can reach,

- the information of a specific user group by selecting certain variables;
- the statistical information about the generic attitudes of a particular group towards products, and
- Intimate portraits, through in-depth information of individuals and their pleasurable products (Porter et al., 2005a-b).

Porter et al. (2005a-b) explain, although the design of its outlook and overall data is still under development, the prototype version of the tool is used as follows: Firstly, the individuals or product types can be chosen on the basis of age, gender and income. Then the images of the relevant individuals or products become available. Secondly, individual home pages can be entered through the appeared images. Information related to the personality, lifestyle, style choices and brand choices and videos where participants define their pleasurable products can be reached via the links appear in the home pages. For the future, it is intended to increase the interactivity of the tool. Then, designers will be able to make and save their personal notes, save images and create slideshows of the results of their researches.

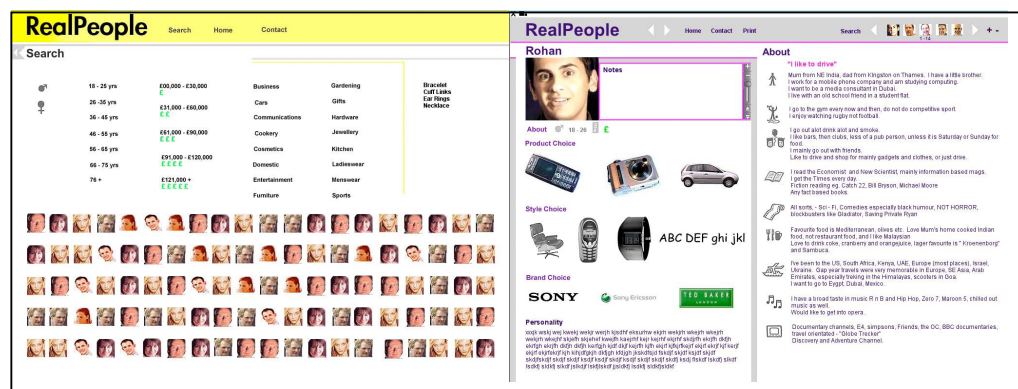


Figure 3.22 Sample pages from real people (Porter et al., 2005b, p.6-7)

3.4 Tools and Techniques for Communicating the Use Context

3.4.1 Scenarios

Scenarios are descriptions of users, their use contexts and tasks that are either performed or desired by users. Thus, scenario building is a widely accepted method used for exploring and foreseeing the dynamic interaction between the user and the product within diverse contexts in the product design process, since “it is an act of conceiving the product in a story line that involves users, activities, events and the environment” (Hasdogan et al, 2006, p.189). From such a perspective scenarios are both the reflections of the present situation, derived from a careful research, and imagination of the future for the betterment of the present situation (Nardi, 1992; Suri and Marsh, 2000). Although scenarios can be utilized for several reasons in the design process, within the context of present research, scenarios are considered important due to some main reasons. Most significantly, they enable to reach a meaningful and engaging representation of the people, whom designers are designing for, through their goals, values, environments and activities (Gruin et al., 2002). As Grudin and Pruitt (2002) mention, scenarios reveal the implicit assumptions about people’s experiences, they are good at engaging designers with future users and they can be approached from multiple perspectives, thus revealing different considerations. In addition to these, as Suri and Marsh (2000) highlight, scenarios facilitate the communication of significant points in people’s life styles. They support the communication within team members by being a shared medium which can be referred to in discussions. Moreover, they aid in keeping the focus on users and context of use while evaluating the emerging design concepts.

Scenarios are built upon some certain elements, namely, characters, a plot and some highlighted goals (Caroll, 2000). The process of scenario building is initiated by identifying the users. As Suri and Marsh (2000) state, these users are identified through “their personal characteristics, life styles, motivations and circumstances” (p.152), which are obtained through a thorough user research. This part is extremely important since a good story is based upon the characters with which audience can easily empathize (Gruin et al., 2002). After deciding upon the characters, some issues, tasks, goals, obstacles and situations are assigned to

these characters. While identifying these issues some trend analysis is essential, in order to both learn the state of the art of the situation and expectations from the future (Suri and Marsh, 2000). Finally, all these obtained elements are integrated into coherent and believable story. Grudin et al. (2002) claim that in order to make scenarios interest provoking and emotionally engaging, besides the aforementioned elements, some dramatic elements should be added. These dramatic elements can be problems to overcome, time constraints or constraints on the actions.

Created scenarios can be represented in different mediums; such as, “written stories, annotated sketches, cartoons, photographs, role-playing, video or live dramatizations” (Suri and Marsh, 2000, p.152). However, regardless of the medium, scenarios should bear some certain qualifications. Nardi (1992, p.14) says that “the properties of a good scenario include believability and simplicity”. It should be believable in order to achieve the desired engagement and it should be simple in order to be kept in mind and easily remembered. In parallel with Nardi, Gruin et al. (2002) emphasize the importance of the accuracy in a scenario. They claim that even relied upon real data, if the elements were not integrated in an accurate manner, a naïve scenario is concluded. In order to avoid this, they suggest real world observations. In the case of fictional stories, they say that informants who are knowledgeable about the issue should be invited to the process and the outcome should be validated with some subjects of the issue. According to Gruin et al. in order to conclude with successful stories, the usage of the real field study results is required. Additionally, using several stories can enhance that all the key issues are covered. Suri and Marsh (2000), highlight the engaging quality, utility and usability of successful scenarios. They claim that in order to reach such scenarios, some possible pitfalls should be avoided. Firstly, the scenarios should not be too easy and simple. The complexity of the real world, such as unexpected situations, crisis and constraints, should be reflected within the scenario. Secondly, for the sake of believability of the story, stereotypical characters should be avoided; instead characters from real observations should be utilized. Thirdly, the interest of the audience and the focus of the story should be enabled at the same time. Lastly, since scenarios are a kind of fiction, it is easy for the creator to reflect as real, however, in order to have a successful scenario; the creator should be honest to the research.

3.4.2 Storyboards

Storyboards are a special type of scenarios, which tell the story through visualization techniques instead of mere scripts. This specification of storyboards is what makes them valuable in terms of design process. Through visualization techniques designers can more easily engage with the story. As Bodker (2000, p.3) claims,

It gives a better effect to create scenarios that are caricatures... it is much easier for users and whoever else is going to relate to the scenarios to assess things when they see full-blown consequences... Not that they 'believe' in the caricatures, indeed they do not, but it is much easier to use one's common sense judgment when confronted with a number of extremes than when judging based on some kind of 'middle ground.' Caricatures are engaging.

Van der Lelie (2006) also a mention that, working with storyboards enhances visual thinking which is essential for the creative process of designers. Moreover, in storyboards the story is represented through the sequence of action scenes, thus the feeling of time and order is much stronger in storyboards in comparison to the other representation of scenarios. Thus it can be concluded that storyboards aid the designer to comprehend the product-user interaction in context and over time (Van der Lelie, 2006).



Figure 3.23 A storyboard representing the morning ritual of a mother

Baskinger and Nam (2006) state the intent behind any kind of visualization as capturing and documenting an idea. According to them, through visualization, data or an idea is turned to be information, which is accessible by a wide range of audiences. This view is also valid for storyboards since they reveal the information of the context, interactions, atmosphere and emotions related to the user and intended use case. Van der Lelie (2006) claims that storyboards are powerful mediums in achieving so, since they enable two types of interaction between the representation and the audience. Firstly, the audience can *step in* the story and empathize with the user or the context. It is the situation experienced while watching a movie or reading a comic book. Such an interaction facilitates the communication of the situation expressed within the story, since it sets a common ground. Secondly, the audience can *step out* the story and can view it from a distance. Such an objective perspective facilitates the analysis and catching some key aspects of the interaction.

Different illustration techniques can be utilized while preparing storyboards. As expressed by van der Lelie (2006), it can have a sketchy or a detailed, glossy look. She claims that the sketchy one invites audience for comments and suggestions, since it implies a representation which still needs to be considered and worked on. On the other hand, the glossy one implies a final product, thus the audience tend to admit it as it is, without any further consideration.



Figure 3.24 A sketchy storyboard (Van der Lelie, 2006, p.160)

3.4.3 The TRI set up and video collages

The TRI (Three Ranges of Interaction) set up was developed through the studies of ID Studiolab in Delft University of Technology. As Keller et al. (2000) indicate, on the way to develop such a tool, researchers were motivated by the designers' need to experience the context where their designs will be used. Observation of the designers' processes indicated that they prefer large scale mood boards, collages and narratives, such as scenarios and storyboards, in order to get the feeling about the atmosphere of the product use. However, new tools can be added in this spectrum, through the advances of computer interaction and visualization technologies. If they can be utilized properly, these computerized tools can even enable richer interactions by going beyond images and including sounds and motions within the explored environment (Stappers, 2006).

As Keller et al. (2000) describe, such observations and considerations of the researchers brought them to the *TRI*; a human body scaled interactive medium which is composed of a curved, vertical, cardboard panoramic display, a vertical overhead projection area, a Wacom tablet and an integrated screen. The acronym *TRI* stands for the *Three Ranges of Interaction*, which represents the ways people interact with their environment, namely, *atmosphere*, *layout* and *precision*. In order to enable these three scales of interaction, *TRI* set up is designed in three modes, *the large range*, *the medium range* and *the small range*. *The large range* aims at feeling of atmosphere within the context. Thus, in this range the use environment is projected on a curved vertical projection area. *In the medium range*, the user uses the vertical overhead projection and the tablet, through which he can interact with both real physical objects and projected virtual objects. Within the *small range* the user utilize the Wacom tablet and the integrated screen. Thus, *he* can work on details through interventions of projection by manipulating and drawing on. Besides these functions of the set up, its aesthetic look was also given attention. Instead of trying to enable a high quality virtual reality, which requires lots of work, the researchers preferred a sketchy look. With such a choice, in one hand, designers' appropriation of the set up is enabled, through using the advantage of their familiarity with sketchy tools, and on the other hand, the quick and easy creation of the environments is facilitated.



Figure 3.25 The TRI set up (Stappers and Sanders, 2005, p.9)

In order to utilize TRI set up, to convey the context of use, video collages can be used. Video collage is a “surrogate representing multiple video documents through extracted text, images, audio and video” (Christel et al., 2002, p. 1). While video collages are explored on TRI set up, sequences of still photographs and short sound samples are projected onto the curved, cardboard, panoramic display of TRI (Stappers and Sanders, 2005, p. 8). The required images for video collages are obtained through the visits to the locations of interest. In these visits still photographs of the important moments are taken. Then, not caring much about the professionalism, these photographs and recorded sounds are organized in a sequence, and then projected on the screen (Stappers and Sanders, 2005). Keller et al. (2000) advise to use different photos together in order to enable a match between the screen of TRI and taken photos. Accordingly, a distorted view of reality is achieved. The authors claim that facing such a view, the designer can fill in the gaps by using his creativity.



Figure 3.26 The video collage of a woman in a kitchen, achieved through several photos used together. (Keller et al., 2000, p.3)

Keller et al. (2000) consider the benefits of such a technique as follows. Firstly and most importantly, the technique enables the feeling of designer's presence in the explored context through the interaction of image, sound and motion. Such an interaction facilitates the engagement between the designer and the context. Secondly, through the selection of the photos, most important actions are highlighted and irrelevant parts are ignored. Lastly, by the possibility of immersing sounds, continuous attention towards the collages is provided, even when the attention is not on the projection.

CHAPTER 4

THE CASE STUDY

The present study aims to provide a design resource for designers, which presents the outcomes obtained through a participatory user workshop. In order to serve for such an aim, a case study was conducted in collaboration with the design team of a consumer electronics manufacturer in Turkey, Vestel Electronics, to be able to evaluate the participatory design approach and the resource beyond hypothetical situations, within a real-life design environment. As a participatory design method, contextmapping (Sleeswijk Visser et al., 2005), has been inspiring for organizing and performing the study.

Inspired from contextmapping the steps of the present study was organized as follows:

- choosing a collaborator company, with an in-house design team
- determining the design problem together with the design team
- forming a sample user group from the target group of the design problem
- planning the participatory user workshop (to design the related tools and tasks, and to acquire the necessary materials)
- realizing the participatory user workshop
- analyzing the outcomes of the workshop
- designing a medium that aims to share the workshop outcomes with the designers in an inspirational and informational way, so that they can comprehend the data and can empathize with the user group
- presenting the medium to the design team
- interviewing the designers in order to learn if they can utilize such a process and how the process can be developed

Although for such studies, inclusion of the designers in the whole process is advised, for the present study it did not seem appropriate. The preliminary interviews revealed that the designers were not familiar with participatory design techniques, so if they were included in the whole process, including the preparation, realization and analysis of the user workshop, they might not know how to facilitate and benefit from such a study. Thus, the study was organized and guided by the present author, who had some previous experiences in the method gained through a research project of a design course in TU Delft. Then the outcomes were presented to designers and shared with them in order to get their opinions. On the other hand, opinions of the designers were very crucial since they are the design experts who perform within real-life industrial conditions. Thus, their evaluations and suggestions about the utility of the approach and the further development of the resource are important for the study.

4.1 Selection of the Collaborator Company: Vestel Electronics

As discussed in Chapter 2, it is observed that the companies who are willing to utilize participatory design methods are said to be big companies who have already solved other problems related to manufacturing costs and market shares, and want not only to survive in the market but to be advantageous over their rivals through delivering products which affect their customers. Thus, they choose to invest on such kind of costly and time consuming methods in order to learn more about their consumers and use contexts. On the other hand, as claimed by Stappers and Sanders (2005), especially for certain product types, such as *automobile* and *consumer electronics*, technological innovations have reached a state of maturity. Thus, companies functioning in these fields need to invest on something more than just technological innovations, in order to differentiate themselves from their competitors. Realization of users' desires and proposing novel and pleasurable experiences seem to be an effective strategy in that sense. Thus, mostly the companies who are functioning in these fields are willing to utilize participatory methods in order to enable a deep understanding of their users.

Regarding these two aspects mentioned in the above paragraph, the company to collaborate with for the present study was searched for among Turkish manufacturers in the automobile and consumer electronics sectors. Four

companies from consumer electronics and five companies from automotive industry were identified as the result of the first search. Then their organizational structure was considered, since for such a study, a company which gives importance to design and research and development, and which is open to collaboration with educational institutions was desired in order to minimize the constraints of the study and enable efficiency. Regarding the previous experiences of collaborations between Middle East Technical University Department of Industrial Design and industrial design departments of the companies, Vestel Electronics seemed to be an ideal partner for such collaboration. Vestel employs nine in-house industrial designers. Moreover, Vestel Industrial Design Department has a good reputation for successful collaborations in the previous graduation projects of Department of Industrial Design. After deciding upon the company, some phone calls were made with the Design Manager of Vestel Electronics and collaboration was proposed with a very brief description of the project (Appendix A). They accepted to collaborate and a meeting day was decided in order to meet with the design team and discuss the study in detail.

4.1.1 About Vestel Electronics

Vestel is one of the brands of Zorlu Group, which has been in Turkish industry since 1984. As mentioned in their website, Vestel brand is composed of a group of companies, namely, Vestel Electronics, Vestel Digital, Vestel Communication, Vestel White Goods, Vestel Foreign Trading, Vestel Durable Consumables Marketing, Vestel USA, International Sales and Marketing and International Research and Development Companies. Vestel has two global manufacturing centers, one of which is located in Manisa, Turkey and the other is located in Alexandrov, Russia. Vestel products are sold in 110 countries in Europe, Commonwealth of Independent States, Asia, The Middle East, Africa, America and Australia. Vestel also offers a diverse range of products to the Turkish market, through more than 1200 dealers and 700 service stations. Through these sales, Vestel is known to be the third OEM (Original Equipment Manufacturer) and the largest television manufacturer both in Turkey and in Europe (Vestel Website, retrieved March 2007).

When the business strategy of Vestel is investigated, it has seen that some points are highlighted. In order to keep its leader position in the market, Vestel plans to keep on increasing its investments on research and development facilities for the following years. Additionally, it aims to increase the number of “A brand firms”, such as, Panasonic, JVC and Hitachi in its portfolio. Original Design Manufacturer (ODM) activities will be given more importance in the future. Besides its activities in abroad, Turkish domestic market will still be playing an important role in Vestel’s business activities. Consumer electronics and white goods are identified as the most important product groups which will be given more attention both for Turkish domestic market and international market (Vestel Website, retrieved March 2007).

As being one of the main companies of Vestel, Vestel Electronics joined Zorlu Group in 1994. Local TV manufacturer of those days has evolved into one of the biggest electronic household goods manufacturer of Turkey and third largest global TV manufacturer in the world (Karabati et al., 2005). Vestel electronics has a diverse range of products, including TFT-LCD TV, Plasma TV, 100 HZ TV, 16:9 wide-screen TV, TV with DVD combination, digital TV, TV with memory, mobile TV, the 37-87 cm screen standard televisions, DVD players and DVB set-top boxes (Karabati et al., 2005).

A case study done by Karabati and his colleagues in 2005 revealed that 30% of European market is invaded by well known brands, such as Sony, Loewe, Panasonic, JVC and Philips. Vestel, as an OEM, shares the 20% of this 30% share. The second segment televisions, where the competition is mainly based upon the costs and delivery time performance, share the remaining 70%. In this segment Vestel has an 80% share. Considering the domestic market, Vestel is the second company in terms of market share with 32% (Karabati et. al, 2005).

Regarding the business strategy of Vestel Electronics, Kabarati et al. (2005) state that its former strategy was to produce for B brand products, which were designed and manufactured for distributors, retailers and big malls such as Alba, Quelle and Carrefour. However, later it decided to increase the number of products designed and manufactured for well known A brands, such as, Hitachi and JVC. The strategy of shift from B brands to A brands in television business was also followed by other products, including DVD players and DVB set-top boxes. In terms of operation

strategy Vestel has embraced to produce at the lowest cost with high delivery performance for all sizes of any product type.

When the design process within Vestel Electronics is considered, the article written by their Design Manager Burak Emre Altınordu (2005) reveals important points. The design team of Vestel Electronics is composed of young designers, who are involved in the design process of more than 50 projects and 150 new models developed per year. The aim of the design team is described as to design products which facilitate the life of people and which evoke a desire to be owned. On the other hand, on the way to realize these aims the team analyzes the manufacturing facilities of Vestel, and tries to design “the right” product according to it. Around 90% percent of the projects are requested by clients from abroad. In order to enable success in the design of these products, which will be sold in a different social and cultural environment, the design team requires some time for observation and analysis. They visit international design fairs in order to follow new trends and technologies. Although they design less for Turkish market, Turkey is still an important market for the team. It is stated that Turkish market did not use to have sophisticated expectations, until one or two years ago. However, expectations have risen very rapidly, and today, desires of Turkish users go beyond the expectations of European market.

As Altınordu (2005) states within the design process of Vestel, every project is assigned to individual designers. The responsible designer begins exploring the design problem through sketching. The designs are developed regarding the manufacturing processes and the technological inner structure of the products. Alternative designs are produced through this approach. When the designs reach a state of maturity, after four or six weeks, the client of the project is invited in order to share and discuss the alternatives. According to the consequences of the meeting with clients, the 2D designs are converted into 3D products.

4.1.2 Preliminary meeting with the industrial design team of Vestel Electronics

Before the meeting, the designers who would take part in the study were selected by one of the designers in the team who is responsible for coordinating the

collaboration. Three main topics were decided upon for the preliminary meeting: description of and discussion on the study, discussion on the possible design problems that can be the subject of the study, and initial interviews with five designers from the team and also with their design manager. In order to inform the designers about the expectations from the meeting and to make them think on and accordingly enable the success of the meeting, before visiting them, a description of the project, the topics of the first meeting and the questions of the interview were sent to the designers via e-mail.

Preliminary meeting with the industrial design team was held in their offices in Manisa, Turkey. It lasted about five hours including the interviews. The first part of the meeting was done as a group, including five chosen designers and the present author. Firstly, a presentation was made by the author. The aim and methodology of the study, why Vestel Electronic was considered for the study, expectations from this collaboration and how the company can benefit from the study were explained broadly throughout the presentation. Samples from similar studies done in Europe were shared with designers in order to make the study more clear. After the designers were given an idea about the study, a discussion was initiated about the possible design problems, which the study can be constructed over. The discussion was followed by the individual interviews with participant designers.

4.1.2.1 Preliminary individual interviews with designers

For the preliminary meeting, an interview with five industrial designers and the design manager of Industrial Design Department of Vestel Electronics was organized. The aims of this preliminary interview were:

- to becoming knowledgeable about the design process pursued in Vestel Electronics before initiating the study,
- to learn about the individual design methodologies of participant designers,
- to find out if the designers need knowledge related to target users in their design process, if so,
- how they get and utilize this knowledge related to target users and what kind of knowledge do they need,
- to learn if they are knowledgeable about the methodologies, which involve users in the design process.

In order to find answers of these topics, the participant designers were asked eleven open-ended questions, which were answered in around fifteen to twenty minutes (Appendix B.1).

Although all the participant designers were young designers, they had diverse experience levels in Vestel Electronics. Regarding the gender of the designers, there was a balance.

Table 4.1 Qualifications of interviewed designers

	Position within Vestel	Experience	Graduation Year	Gender
Designer 1	Design Manager	7 years	1995	Male
Designer 2	Industrial Design Specialist	5 years 6 months	2000	Female
Designer 3	Industrial Designer	3 years	2001	Female
Designer 4	Industrial Designer	3 years 3 months	2003	Female
Designer 5	Industrial Designer	2 years	2003	Male
Designer 6	Industrial Designer	2 months	2003	Male

4.1.2.2 Analysis of the preliminary interview

Since the aim of the interviews was to obtain as much knowledge about the industrial design team of Vestel as possible, the interviews were analyzed accordingly. Since the designers pointed out similar points and gave complementary knowledge, instead of analyzing each interview relative to the others, the answers were analyzed collectively under two titles, namely, the design process within Vestel Electronics and the need and the utilization of user knowledge in the design process. Although Designer 6 was not as experienced as the other participants and resigned from his job few days following the interview, his answers were also taken into account while analyzing the interviews, since his comments were quite parallel with his colleagues.

4.1.2.2.1 The design process within Vestel Electronics

As stated in their website and also mentioned by participant designers through the interviews, Vestel Electronics sells more than 90% of its products as an OEM, and the remaining 10% are sold with Vestel Brand within domestic market. Accordingly, the design process within Vestel is very much affected by this strategy. Vestel Industrial Design has two main clients. Their initial client is Vestel Foreign Trading, which is responsible for marketing and sales activities of Vestel products in foreign countries. Vestel Durable Consumables Marketing is the other client of Vestel Industrial Design, which is responsible for domestic distribution, marketing and selling of Vestel products.

The design team receives new product request from these two companies, however, it was mentioned that they experience difficulties in terms of design briefs. These briefs are said to be not clear in terms of targets and limitations. Thus, the briefs always need to be re-defined by the design team. The points which are mentioned in the briefs are required dimensions of the product, the target market and the competitor products within the same market. However this information is not considered sufficient by the designers, thus all the remaining needed information and accordingly taken decisions are left to designer's individual experience level, research and observation. Thus, designers believe that they have to take more responsibility in comparison to the traditional responsibilities of designers. In order to solve this problem a *new product demand form* has been developed by the design department. The aim of the form is defined as to identify the needed information related to a new product development process and make the responsible parties state this information while they are requesting a new product. Although the form has been utilized in the process, it is still under development. Within the current version of the form the required information is titled as the target country or region, the target user group, the aim of the product, the definition of the product, from whom the demand is received and the confirmation of the parties.

Since Vestel Electronics is producing for a wide variety of clients, the design team has to deal with many projects at the same time. Thus, designers indicate that they experience quick and dense design processes. Designers in Vestel Electronics are

not specialized in one specific product group. Only Designer 5 mentioned that he is specifically responsible for laptop designs for a while; however, he also added that this situation does not mean he is specialized in laptops since he is currently also involved in TFT TV and DVD recorder projects. Moreover, in the future other designers in the group can also work on laptop designs, since in order to prevent repetition the projects are always shifted among designers. Accordingly, the designers get the chance to be involved in the design process of most of the products within Vestel Electronics' portfolio.

When designers were asked if they experience difficulties while developing a product for certain user needs, they all said no. However, on the other hand they all admitted that creating a different look in television designs has always been very hard due to some reasons. Firstly, their designs have to be shaped according to the manufacturing facilities of Vestel. Thus, most of the time, designers are responsible for designing some aesthetic forms for the products which will cover the inner electronic structures, which have an inflexible configuration. Moreover, the exterior dimensions of the products are also certain due to the dimensions of the containers, in which the products are transported to abroad. Secondly, since Vestel mostly pursues OEM strategy, enabling high manufacturing volumes in low costs and achieving differentiation with minimum extra components have always been the main criteria of design. Such an approach defines very strict limitations for the designer. However, regarding new designs for A Brand firms, they can design more freely, since in this case the satisfaction of the client is more important than the costs. Accordingly, they can try new forms and materials in these designs. Thirdly, most of the designers mentioned that television is a difficult product in terms of creating a different look. The product is mainly perceived as two-dimensional since, users always interact with the front panel. Thus designers try to achieve a different look through modifications in the front panel. As Designer 4 stated, they tend to use certain tricks in order to modify the outlook of a television. As a consequence, TV models, both the models designed by Vestel and models of different brands in the market, very much resemble each other.

4.1.2.2.2 The need and the utilization of user information in the design process of Vestel Electronics

The need for user information according to the marketing strategies of Vestel

Regarding information related to target user group, the designers mentioned that they do not have access to information on target users. However, they made a distinction between the importance of the information about target user group in projects done for Vestel Foreign Trading and Vestel Durable Consumables Marketing. For projects done for Vestel Foreign Trading, the target user group is defined very broadly without details, as mentioned by designers “Europe”, “mid-Europe” and “Europe and the whole world” are the sample words used in order to define the target user group. The designers think that this situation is very much related to the OEM strategy of the company, since most of the time the client of the company is not end-users but wholesalers and retailers. Thus, the products can be marketed in different countries under different brands. In such an environment it is not possible to develop the products according to a target user group, since it is not certain. However, when the product will be developed for a certain foreign brand, then its target user group can be more broadly described. For example, as the design manager of the team stated, Vestel has added a Finnish brand to its portfolio, namely Finlux. Since the company is not knowledgeable about Finnish culture and the tendencies of Finnish people, some related studies were initiated about Finnish market, including life styles of people, their domestic life, the homes they live in and their preferences about the electronic products they use at home.

On the other hand, Vestel Durable Consumables Marketing markets Vestel branded products in domestic market and brand loyalty is crucial for them. Thus, they are more sensitive about the definition of the target user group and carry out studies about users. These studies of Vestel Durable Consumables Marketing are taken into consideration if the company asks for totally a new model. However in general, since its sales percentage is very low in comparison to Vestel Foreign Trading, such kind of studies are not given much importance by the company.



Figure 4.1 Samples of A Brand, B Brand and Vestel branded TV's (from left to right) designed and manufactured by Vestel

Designers' individual efforts to obtain user information and the user studies carried out in Vestel

Designers admitted that if they were acquainted with knowledge about the target user group they could pursue more efficient processes. They stated that especially knowledge of user preferences, their domestic life styles, the products they prefer for their homes and the information about what kind of new products they may need in the future, can contribute to their design process. However, they mentioned that in Vestel, obtaining information related to target user group is mostly left to designers' questioning and individual research process. In order to get this knowledge some methods are utilized by designers. Benchmarking is one of these methods. Through benchmarking the designers try to understand the current trends in the market by analyzing and comparing the new models and products of competitor brands. Searching on the internet and visiting international fairs also help designers to a great deal in that sense. Whenever they feel a need for use or user related information they tend to observe people in their environment and themselves. They said that discussions among colleagues about their personal tendencies can also reveal some points. As Designer 2 stated sometimes they provide the product, which is under development, for their families and make them use the product for a while, then their product related opinions are asked.

Throughout the interview two focus group studies were mentioned as user studies done in Vestel. Both of the studies were carried out by Vestel Durable Consumables Marketing and designers from the Vestel design team were invited to the study as observers. The theme of one of these studies was televisions. For this study some user groups were formed according to their age and gender and these groups were asked to evaluate a series of televisions whose brands were hidden. Although the result of the study was shared with the design team in the form of a report, designers stated that they did not benefit from the study, since they received the report when the project reached a state of maturity. The other focus group was held for laptops. Some laptop users among Vestel employees were invited to the study. In the first phase, they were shown some laptop designs, including both mock ups and products, and asked about their purchase preferences and reasons, regarding these models. In the second phase they were also asked about the well-known laptop brands in order to position the Vestel brand among these brands. However, designers were not content with the results of this study, either. Especially Designer 5 stated that the people who were chosen for the session were not suitable. Thus, he would rather have collaboration between industrial design and marketing departments in the focus group preparation process. Besides these two focus group studies, Designer 4 mentioned that Vestel Durable Consumables Marketing has some user profiles of Turkish consumers which are defined according to specific demographic information and lifestyles. These user profiles are named as special codes such as B1, B2, etc. However, the designer added that the design team is not so knowledgeable about these profiles since they are only taken into consideration when a totally new project is requested for domestic market and products are designed accordingly. In addition to the aforementioned studies, Designer 2 mentioned a kind of user trial study about remote controls. For this study remote controls were sent to fifty different users and they were asked to use them along three months. Later the products were returned and the participants were asked about their experiences with the products.

Designers' knowledge about the methods involving users in the design process

Apart from the user studies done in Vestel, designers' general knowledge about the methods which involve the users in the design process was also inquired. Focus group studies were mentioned by most of them as a first reply. Field tests were mentioned by two of the designers and one of the designers mentioned about specially designed environments and user trials done in these environments. In terms of comparison of these methods through their advantages and disadvantages, two of the designers stated that long term involvement of users is more promising than focus group sessions in terms of the reliability of the results. Similarly, one of the designers stated that observing users can reveal more reliable results instead of asking direct questions, since while asking questions the user may think that the researcher is expecting for a certain answer and may respond accordingly.

The need of user information in the design process of different products

Regarding the product range of Vestel, designers think that through the design process of small products; which require the physical interaction of the user, knowledge about the target user group can be more crucial. Remote controls were mentioned by four of the designers in that sense. Laptops, DVD players and portable media players are other products for which user knowledge was regarded essential by the designers. Regarding these kinds of products, the perception of the interface by the user, the dimensions, weights, ergonomics (especially for the remote control) and the rituals of the people were mentioned as the important design criteria and designers stated that they would rather reach knowledge related to these aspects. Moreover, designers mentioned that they feel the lack of clear knowledge related to users and use context when they had to support their design decisions. They complained that most of the time, their designs were criticized about very minor details based on personal opinion. Since they lacked the objective knowledge they could not produce counter arguments or their arguments were regarded as weak personal opinions. However, they stated that if they had some proofs such as the result of user studies, they could more efficiently support their decisions.

4.1.3 Identification of the design problem

Identification of the design problem was very critical for the study. Firstly, the problem should be suitable for elaboration of users' experiences. Secondly, it should be inviting for users to work. Lastly, it should be promising for designers in terms of outcomes from which they can benefit in their future designs. Since the designers are not knowledgeable about the criteria for choosing suitable problems for participatory studies, first these criteria were shared with them during the preliminary meeting:

- the design problem should not point to a specific product but should focus on the desired context.
- while considering the design problem the target group should also be considered. It should be selected from a group of people, with whom designers cannot easily empathize. Thus, the utility of the method can be more objectively analyzed.
- working with problems about future scenarios and new technologies are recommended since they can put forward more fruitful outcomes (Van der Lugt and Sleeswijk Visser, 2005).

After sharing the criteria, some sample problems, which were explored by other research teams through similar methods, were shared with the designers; such as smart homes for families, home entertainment, sharing personal media and communication tools for families (Sleeswijk Visser et al., 2005). Analyzing these sample design problems, the design team decided upon *media products for elderly people*, as the design problem of the study. However, the present author had some worries about working with people from such a special user group. First of all, working with elderly people requires some experience, which the present author lacks. Secondly, while working with elderly, there is always the risk of losing the focus of the study, since other aspects also require attention beyond the aim of the study. Thus, elderly people did not seem to be appropriate for experimenting with such a new approach.

The author shared these concerns in the last meeting of the day, which was with the design manager of the Vestel Industrial Design and Designer 3, who is responsible with coordinating the collaborations between Vestel and the

universities. These worries were regarded as legitimate also by them. However, Designer 3 explained that the word “elderly” was not used in order to define old people who experience some sort of difficulties in their daily life due to their age. What they meant was, an older generation who has a different perception of and cognition related to technology and continued that perhaps “the elderly” was not the right term to define this group, “people older than 45” could more successfully define the group they wanted to work with. Her proposal was agreed upon both by the author and the design manager. The design manager added that the expectations of people in their late forties or older were quite different from those of young people and sometimes, within Vestel, some decisions could be taken without considering these differences. However, people older than 45 define a significant portion of Vestel users. As a result of the discussion, the target user group was defined as middle aged housewives aging between 45 and 70, regarding how they perceive and use technological products since they are not always taken into consideration as the user group of technological products. However the product group was still a question mark since “media products” were broad category for such a study.

Analysis of interviews revealed that designers specifically mentioned small products when they were asked about products, in the design process where they need user related knowledge. Remote controls were specifically highlighted almost by every designer. Moreover, the design manager stressed that they have experienced problems within their remote control designs in that sense. As he explained widely, the remote controls had been regarded as an accessory which was given besides a television set and they had been exported from China. However, recently the importance of remote control designs had been acknowledged, and the design team began to work on their designs. He mentioned that their remote controls have around forty buttons and marketing people have requested to diminish this number to six. However, he had doubts about it regarding the old people; whether they will prefer such a remote control and can use it. Designer 2 also stated that it is not very easy for a designer to design a remote control, since he knows every detail related to it, especially in terms of its interface, he cannot objectively consider its usability. In addition to its interface, Designer 4 stated the importance of physical properties of a remote control regarding its ergonomics and weight.

Regarding these points mentioned through the interviews, it seems that remote controls are the most appropriate product group for such a study as designers really need user related knowledge in that area. Moreover, since it is an object with which people very frequently interact, it can be easier for the users to talk about their related concerns. Thus the study was decided to work with middle aged housewives in order to explore their problems, desires and dreams related to remote controls.

4.2 Preliminary Studies of Participatory User Workshop

4.2.1 Designers' experience, expectations and preconceptions about remote control design

As the first step of the preparation process of the user workshop, a survey was conducted with designers, through a questionnaire sent via emails. The aim of the survey was to explore the experience of designers about the design process of remote controls, their preconceptions related to remote control usage and what kind of user related knowledge do they need while designing a remote control. Accordingly, designers were asked seven open-ended (Appendix B.2) questions addressing,

- the preconceptions of the designers about the usability problems related to remote controls
- the customers' constraints about Vestel remote controls
- the limitations related to technology, manufacturing, the market and the standards that effect the remote control designs
- the kind of knowledge related to user-remote control interaction that the designers have utilized while designing a remote control
- the kind of user related knowledge that the designers need while designing a remote control
- self-criticism regarding the Vestel remote controls.

The questionnaire was sent to four designers (Designer 2, Designer 3, Designer 4 and Designer 5) who were also present in the preliminary meeting. Two designers replied within the same week while the other two replied after the first follow-up. Since the aim of the survey was to obtain as much knowledge as possible about

the designers' opinions related to remote control design, questionnaires were analyzed collectively.

Designers' experiences in remote control design

The responses to the questionnaire revealed Designer 2 was involved in a remote control design process before and she was currently working on a remote control design. Designer 4 was responsible for a remote control design two years before the present study. Although Designer 3 and Designer 5 had not worked on remote control design before, they responded to the questionnaire according to their observations and preconceptions.

Designers' preconceptions about usability problems in remote control usage

Designers' preconceptions about the usability problems of remote controls revealed that these problems can be grouped under three titles namely, *ergonomics*, *interface design* and *use context*.

In terms of problems about ergonomics, the following points were mentioned by the designers:

- the importance of considering the interaction of the remote control with human hand;
- the appropriateness of its form in terms of center of gravity;
- the placement of the controls according to the physiology of human hand;
- the dimensions of control buttons.

Regarding the interface design of the remote controls, it was mentioned that users may have difficulty to comprehend the interface due to:

- excessive controls;
- lack of hierarchy regarding the location of controls;
- lack of grouping and dimensioning the controls according to their functions

In terms of the problems, which users may face within the use environment the following points were highlighted:

- problems related to the toughness of the remote controls, regarding the frequent accidental drops;

- problems about the usability of remote controls in the dark; and
- the loss of remote controls in the use environment.

Customer Complaints

When the designers were asked about the customer complaints related to Vestel remote controls, they stated that most of the complaints were related to their being perceived very ordinary in terms of form, since customers are in expectation of visually attractive ones. Designer 2 highlighted that nowadays customers ask for high-end remote controls which are harmonious with TFT and plasma TV designs and appropriate for various cosmetic applications such as, chrome coating, epoxy coating, hot stamp and applications to enable a metallic look. On the other hand Designer 4 mentioned that she was also a Vestel remote control user and was not content with their form in terms of ergonomics and interface design. She added that remote controls which were exported from abroad lacked appropriate location of controls and grouping them due to their functions, however, the remote controls designed by designers at Vestel were designed more carefully in that sense. It was also mentioned that some years before, remote controls were either exported from countries such as China and India or designed by in house design team in a way that can be manufactured in low costs. However, with the increase of high end-product groups, remote controls have been given much more attention and have begun to be designed accordingly.

Limitations affecting the remote control designs

Designers remarked that there are some limitations which affect the remote control designs. The first group of limitations is related to technology. Batteries were mainly stressed as one of these limitations. The thickness of the remote controls is directly affected by the chosen battery type. However, since the choice of small batteries increases the cost, they are not preferred. The main board of remote controls also affects their form. Although silicon added or two-sided main boards can also be used in order to enable different forms, they are not always preferred due to their high costs. In terms of limitations related to the manufacturing process, it was remarked that Vestel get manufactured its remote controls in far Eastern countries. Thus, it is affected by the manufacturing limitations of these countries.

However, it was added that these countries were also developing in that sense; even if they experienced some limitations they could solve it within a short time. The third group of limitations is related to marketing. Here the OEM strategy of Vestel was remarked and it was said that the aim of Vestel, in terms of its remote controls, was to produce high-end looking remote controls in low costs. Lastly, only one aspect was mentioned related to the standards by Designer 3. She emphasized that since remote control is a product which is always in hand, its material and the paint on it should be resistant to friction and corrosion.

Knowledge required to design remote controls

While designing remote controls designers said that they firstly benefit from knowledge related to technology, since it is the first limitation which they should follow. The type of the main board and the batteries, the placement of batteries, the number of control buttons and their functions were listed as the technology related knowledge they need. In terms of knowledge related to ergonomics, designers examine dimensions of the existing models and try to test the usability of the design through mock ups. In order to learn about user group they use the knowledge coming from marketing people since the user group and the product group that the remote control is designed for are important as design criteria. The designers have some preconceptions related to user expectations. Mainly Designer 2 stated that users desire to have the center of gravity of the remote control closer to their hand. They tend to grasp the thick end of the product. They want to control volume and program buttons with their thumbs and they want to perceive the functions of buttons very easily. Although they have some preconceptions designers still desire to have the chance of observing users while they are using their designs when they are in the mock up or prototype stage. User expectations related to the ergonomics of the remote control, frequently used control buttons, never used control buttons, the desired control button placement are among the aspects which designers would want to know while designing a remote control.

4.2.2 Workshop participants

After the identification of the design problem and the target user group, a search began for the possible participants in Ankara. First an acquaintance of the author, who is both academician in METU and the mother of an industrial designer, was told about the research. Since she has always been very enthusiastic about creative studies, although not a housewife she wanted to be involved in the study. Moreover, she mentioned that she could also help to find other participants, since most of the inhabitants of the building complex where she lives were retired women or housewives who were in their late forties. Accordingly, the author agreed upon her proposal about organizing the other participants approved by the author, since working with participants who are living in the same district and who already know each other could ease the process, in terms of their accessibility and gathering them together for the meetings and the workshop. Moreover, it was thought that participants could more easily express themselves within a group of acquaintances. Discussion is always promoted in participatory studies since while discussing, participants can realize more points that they previously not considered. However, they can also be affected by the opinions of the others.

Regarding all these aspects, it was decided to choose the participants among the inhabitants of this building complex. Six participants were decided for the study which is advised as the appropriate number for group studies. Accordingly some telephone calls were made to the women who might be interested in the study and they were invited to a meeting through which the details of the study would be discussed. The women were asked to bring their remote controls with them since the photograph of the remote controls were needed for the preparation of sensitizing materials.

The meeting was done in the house of User A, who was also the coordinator of the study. In the meeting, the aim of the project and the expectations from the participants were shared. Their questions were answered. At the end of the meeting although six participants were decided upon, eight were chosen due to the enthusiasm of the women.

After deciding upon the participants, they were asked six questions in order to learn more about them, their homes and the aspects which may affect their experience with television and remote control. Their age, education, profession, with whom they are living, their health problems and their experience with computers were among these questions (Table 4.2). Following this little interview a second meeting day was arranged with the participants in order to assign sensitizing materials.

Table 4.2 Participants of the user workshop

	Age	Education	Profession	Household	Health	Computer usage
User A	51	University	Academician	Herself, her husband and three daughters	far-sighted	Moderate
User B	69	Fashion Institute	Retired Technical Artist	Herself and her mother	far-sighted	No
User C	66	Higher Education	Retired Civil Servant	Herself, her husband, son, daughter in law, grandson	far-sighted problem with knee joint	No
User D	51	High School	Retired Civil Servant	Herself, her husband, and two children	No health problem	No
User E	54	High School	Housewife	Herself and her husband	No health problem	No
User F	53	Academy	Retired Teacher	Herself, her husband and two children	No health problem	Basic
User G	53	University	Retired Teacher	Herself, her mother and son	far-sighted	Moderate
User H	45	University	Retired Journalist	Herself, her husband and two children	No health problem	Moderate

4.2.3 Design of Sensitizing Materials

The aim of designing and distributing sensitizing materials among participants was to prepare them for the participatory workshop by helping them to observe and reflect upon their routines, feelings, attitudes, problems and desires through the assigned exercises. In order to achieve this aim, a sensitizing package was designed which was made of seven paged workbook (Appendix C), various pictures placed in three envelopes, glue and a pen.



Figure 4.2 The sensitizing package

The sensitizing package was assigned to the participants in the second meeting, which was held a week following the first one and a week before the workshop, in the house of User A. It was thought that by dealing with each page per day, participants could conclude the exercises within the whole workbook within a week. Through this meeting each exercise within the workbook was overviewed with the participants and their questions were answered. Since the author would not be with them through sensitizing, a telephone number was given in case of any further question.



Figure 4.3 Sensitizing workbook assignments

The first three pages of the workbook asked about the TV watching routines and habits of the participants. In the first page they were asked to indicate the rooms in their home where there is a TV. For this exercise they were provided pictures of the different rooms in a house, which were obtained through internet. The pictures were placed in an envelope labeled with the word *where* and the participants were asked to answer the question by pasting the appropriate picture(s) in the provided place. Although participants might answer the question by simply writing the names of the rooms, the pictures were intentionally provided in order to prepare the participants to express themselves through collages which they would benefit through the workshop. Within the same page, just below the previous exercise, a timeline of a day, which was defined by intervals like morning, noon, afternoon, evening and night, was placed. Participants were asked to match the places they indicated for the first exercise with the intervals of the day, according to which television is watched in what time of the day. Through these intervals, with whom they tend to watch TV were also asked and participants mentioned it by writing on the provided place underneath the time line.

The exercise in the second page asked the activities that participants tend to do while watching TV. For this exercise pictures belonging to some activities were provided within an envelope named as *while doing what?*, and participants were asked to paste the appropriate picture on the provided place. Regarding the activities that were not in the pictures, participants were encouraged to write them

down. Through the exercise in the third page, the participants were asked about their TV watching postures and where they tend to keep their remote controls while watching TV. For the postures, they were provided diverse sitting and laying postures in an envelope labeled *how?*. Contrary to the pictures provided for the previous two pages, these pictures mainly utilized not for familiarizing the participants about collage making, but in order to facilitate their expression. For the postures which were not represented in the pictures, participants were asked to draw.

The fourth and fifth pages of the workbook were including exercises about the remote control related wishes of the participants. In the fourth page they were asked about which functions of TV they want to control through remote controls. These functions could already be in their TV or they could be related to their wishes. One example which was mentioned by one of the participants in the first meeting, magnifying the subtitles, was given as an example in order to trigger their creativity. In the fifth page there was an exercise asking how the participants would like to benefit from their TV, besides watching it. Five examples were listed below the question both in order to make the question clearer and also trigger the creativity of participants. The given examples were, information gathering, visualizing digital photographs, listening to saved music, writing messages on the screen through remote control and setting as an alarm. Participants could choose among these examples if they wanted such a function. They could also add more functions within the space provided below the sample list.

The last two pages were about the participants' experiences with their own remote controls. For the sixth page, the photograph of their remote controls were taken by the author in the first meeting and they were pasted on the related page of the workbook of each participant. Participants were asked to indicate their remote control related likes and dislikes by referring to the remote control picture. However, two participants forgot their remote controls for the first meeting and one participant could not bring since the remote control was broken. So one of them did the exercise by drawing the picture by herself and the remaining two preferred to explain their likes and dislikes only through words. Through the last pages participants' positive and negative memories related to their remote controls were

questioned. This exercise tried to reach their problems and contentment through real stories.

After distributing the sensitizing workbooks, a meeting day for the workshop was arranged. Sunday afternoon, one week following this second meeting, was decided for the next appointment.

4.2.4 Preparation of workshop exercises and materials

4.2.4.1 The first exercise: If remote controls were people

As the warm-up exercise of the workshop, *product personality profiling* technique, developed by Bruseberg and McDonagh (2001), was chosen. It was decided to use within the study as a result of survey done with industrial designers from Vestel. Through the survey the designers pointed out that recent remote control-related expectations of the clients were mostly related to their visual appearance and their visual harmony with new television models. Accordingly the aim of the exercise was, firstly, to learn how the visual appearances of remote controls were perceived by the users and, secondly, to make the participants think out of the box. Through the *product personality profiling* techniques, participants are given the visual images of products and are asked to imagine the products as human beings with distinct personalities and try to identify these personalities through some specified factors.

Deciding upon the exercise, the image selection process was left to Vestel design team, in order to enable them to test and compare the remote controls which they were curious about. Accordingly, five images belonging to different Vestel remote controls were requested from them. The aim and the application of the exercise were also shared with the designers in order to make them choose the photographs accordingly. After the choice of remote controls by Vestel, five specifications were determined through which the remote controls would be inquired. The age of the remote controls, their gender, profession, personality traits, and the brand of the car they own were among these specifications. Through these specifications it was intended to learn about if the remote control is perceived out of fashion or not, if it is regarded feminine or masculine, which kinds of

emotions its form evokes and lastly which user and income group it is perceived to address.

As a second step of this exercise, it was decided to provide participants with several images related to different Vestel TVs and ask them to match the TVs with the remote controls regarding their visual harmony. For this part of the exercise, the images were also requested from Vestel, without any number limitations. Designers chose twenty six TV images and sent them to the author via the email.

The exercise was designed in an A3 sheet. In the upper half of the paper remote control images were put and underneath some space was provided for the participant to write the remote control-related specifications. In the lower half, some blank space was provided for the TV collages. The TV images were printed in 5X5cm dimensions and placed in an envelope which was attached to the left corner of the exercise sheet.

Aşağıdaki televizyon kumandası resimlerini birer insan gibi düşünerek onlara dair sorulan özellikleri cevaplayınız. Dilerseniz onlara isim verebilirsiniz. Zarf içerisindeki televizyonlardan, bu kişilikte bir kumanda ile eşleştirdiklerinizi ilgili kumanda resimlerinin altında kalan boşluğa yapıştırınız.

				
YAŞI / CİNSİYETİ:				
MESLEĞİ:				
KİŞİLİĞİ:				
NASIL BİR ARABASI VAR?				

Figure 4.4 First exercise of the workshop

4.2.4.2 The second exercise: Draw your ideal remote control interface

The second exercise of the workshop explored the remote control interfaces, which are desired by the participants; which functions would they like to include, which functions they would like to omit, which forms they would choose for the controls and how they would like to place the controls. For this aim, a two step exercise was designed. In the first step, the usage frequency of the controls of a remote control was asked. Thus, the picture of a sample remote control layout was chosen by the author, among four remote control models obtained from a Vestel maintenance service. This layout with the numbered definitions of the functional buttons was given to the participants, in order to facilitate the recognition of the functions. Five columns were provided on an A4 paper which were labeled as *frequently used*, *occasionally used*, *never used* and *would like to be used*, in order to make the participants rate the functions shown in the layout, and place the related numbers in the appropriate column. This first step was designed as a preparation for the next one, as through the second step participants were asked to draw their ideal remote control layout according to their usage rituals which were identified through the first step. An A3 sheet, colored markers, colored paper in different forms and glue were the materials that were provided for this step.

1. Hazır bekleme
2. TV modu
3. Harici kaynak (video gibi...)
4. Bekleme tuşları
5. Çift kanal
6. Bir önceki programa dönüp (son izdiğiniz ki kanal arasında gitti geri gelir)
7. Kopyeleme (teletext/programlar üzerindeki bilgiyi ayarların kaydedebilirsiniz)
8. Tekli/Çiftli ses modu (ayrışık dilde seslendirme dili)
9. Menü
10. Ses kesme
11. Ses azaltma
12. Ses artırma
13. Program atırma/yukarı tuş
14. Hafıza/resim dondurma
15. Sol tuş
16. Sağ tuş
17. Program azaltma/aşağı tuş
18. Özelik menüsü
19. Programlama menüsü
20. Bilgi alımı (hangi kanalı izlediğinizi gösterir)
21. Sayfa tutma (teletexte otomatik sayfa değişimi devre dışı bırakır)
22. Sayfa sıçrama
23. TV ve teletext görüntüsünü üst üste bindirir
24. Teletext (çerçeve sayfası)
25. Sahil bilgi
26. Sayfa genişletme
27. Teletext
28. Zaman
29. Ses ayar menüsü
30. Görüntü ayar menüsü

PIP: Aynı ekranda farklı kanalları izleyebilme özelliği. Bu özellik kullanıldığında:

23. PIP değiştirme
24. PIP program yukarı
25. PIP program aşağı
26. PIP Menü

Verilen kumanda örneğinden yararlanarak, kumandanızdaki fonksiyonları kullanım sıklığınızı aşağıdaki kutulara sınıflayınız. (Kumanda fonksiyonları için belirtilen numarayı ilgili kutucuğa yazabilirsiniz.)
Eğer sizin kumandanızda örnekte belirtilen haricinde fonksiyonlar varsa lütfen ekleyiniz.
Kumandanızda olmasa bile olsaydı kullanmayı tercih ederdim dediğiniz fonksiyonlar varsa lütfen belirtiniz.

Sık kullandıklarım	Ara sıra kullandıklarım	Hiç kullanmadıklarım	Olsaydı kullanmak isterdim

Figure 4.5 Materials for the first step of the second exercise of the workshop



Figure 4.6 Materials for the second step of the second exercise of the workshop

4.2.4.3 The third exercise: Model your desired remote control

3D modeling exercise was chosen as the last exercise of the workshop since it was thought that having concluded the previous exercises, participants would be ready to model their ideal remote control. For this exercise, play-dough was chosen as the main design material. Scissors, knives and toothpicks were provided as shaping tools and colored markers, colored boards, colored paper in different shapes were also given as complementary materials.

4.2.5 The plan of the workshop

The workshop was conducted at the house of User A, where previous meetings were also held. The workshop was planned to be concluded around three hours, in order not to bore participants and reach the desired efficiency. Accordingly, the time plan of the workshop was as follows:

Table 4.3 Time plan of the workshop

Activity	Time	Task
Introduction	5 min	Explaining the goal and the time plan of the session with the participants
Exercise 1: “if remote controls were human”		
	10 min	Step1: Identification of the remote control characteristics by the participants
	10 min	Step 2: Matching the remote controls with the given TV models
	20 min	Explanations of their comments on the remote control images
Break	5 min	Break for participants and time for preparing the next exercise
Exercise 2: “draw your ideal interface design”		
	15 min	Step 1: Classification of remote control functions according to usage frequency
	15 min	Step 2: Drawing the ideal remote control by benefiting from the previous stage
	20 min	Explanation of what they drew as their ideal design
Break	5 min	Break for participants and time for preparing the next exercise
Exercise 3: “model your ideal remote control”		
	25 min.	Modeling the ideal remote control design out of play dough
	20 min.	Explanation of the participants' designs
Individual Interviews	35 min.	Interviews with users in order to get feed back from them about the workshop

4.3 The Participatory User Workshop

4.3.1 The workshop performance

As decided, the workshop was held on a Sunday afternoon in the house of User A. Although 2:00 pm was told as the start time of the workshop, it was initiated at 2:30 pm due to some late participants. Before the participants' arrival the house was organized for the workshop. The dinning table in the living room was prepared for the workshop. Its surface was covered with a plastic sheet and all the workshop materials (glues, scissors, papers, pens, etc.) were organized on it. The camera was prepared and the person who was responsible with recording was informed about the scenario of the workshop and its critical points, in order not to miss any point.

After all the participants arrived, following a short greeting, the participants were invited to the table. First, the sensitizing workbooks; which they had been working on for a week, were collected, and then, the goal of the workshop was reminded to them. It was stressed that they were invited to the workshop since they were regarded as experts in remote control usage and their related experiences, problems and wishes were wanted to be learned. Thus, opinions were not judged as right or wrong, and every opinion and contribution was valuable for the study. Since the participants had been knowledgeable about the workshop for two weeks and they had been dealing with the sensitizing workbooks for a week, they had no questions in that part.

Following such a short introduction, the workshop was initiated with the first exercise. The exercise layouts were distributed to the participants. After each participant received her layouts, the brief of the exercise was read aloud by the author:

Imagine the pasted remote control images as human beings and try to identify what kind of person they are, through guessing the written specifications, namely, their age, gender, profession, personality traits, and automobile. If you want you can even name them. Then match the television images in the envelope with these remote controls by thinking about which television(s) these remote controls belong to. Paste the picture of television(s) below the related remote control image.

At first the users were confused with the exercise and asked questions. They could not understand how they perceived the remote controls as human beings. Some of them asked if they would age the remote controls by thinking for how many years they had been used and some asked if they would answer these specifications by regarding the possible user of the remote control. Then they were advised to first concentrate on the first step of the exercise by forgetting about the television images. This step was re-explained, saying that they were asked to imagine the remote controls themselves were people and to specify their characteristics according to evoked their image. A sample was given in order to make the participants understand better. After the example the exercise was understood and participants began to fill in the sheets. Some participants tended to think aloud, and the atmosphere was rather noisy. Such an atmosphere bothered some users and User G proposed everybody did the exercise by herself and silently. Concluding

the first part, participants were invited to open the envelopes of TV images, and to guess which remote control may belong to which television and paste the TV images accordingly. They were reminded that one remote control could belong to more than one TV. In that part of the exercise the participants' questions were not related to the exercise itself, but mainly related to the TV images. Since the TVs looked similar, participants complained that they had difficulty in differentiating them. As a result, all the participants pasted only one TV for each remote control.

Although it was planned that the discussion part would be held as a group, the participants explained their conclusions related to the exercise individually, without waiting for the others, since some participants concluded very early in comparison to others and while waiting for the others to complete, they either got bored or began to interfere with the others' exercises.

Between the first and second exercise a five minutes break was given. In that break while participants were resting and having their teas, the outcomes of the first exercise were gathered and the table was prepared for the second exercise. Then participants were re-invited to the table and they were introduced the second exercise. As told before, the second exercise was made of two steps. In order not to confuse the users, step one was introduced first. Two sheets were distributed to the participants, one of which contained the exercise brief and the rating columns and the other represented the layout and descriptions of the functions of a sample remote control. The brief was again read loudly, in order to trigger the questions.

Identify your usage frequency of remote control functions and list them under the columns, frequently used, occasionally used, never used and would like to use. You can benefit from the given sample remote control layout in order to remember the functions. Please do not hesitate to add functions which your remote control has but are not represented in the sample remote control. If there are any functions which you do not have in your remote control but would like to use if it existed, you can also add them in the related column.

The introduction of the brief was followed by any questions. Participants did exercise in a more concentrated manner in comparison to the previous exercise. Almost no conversation was done during that part of the exercise and it was concluded within five minutes. Then without gathering the outcomes of this step,

the next step was introduced. A3 sheets were distributed to participants, on the top of which the brief of the exercise took place.

Please draw the top view of your ideal remote control which you would like to use on the given sheet. Place any function that you would like your ideal remote control to have on this top view. You can utilize the stickers which are provided for you in order to represent the desired form and the color of the functional buttons. If you want to use any shape that is not among the stickers you can either cut them from the given colored papers or draw by hand. In order to identify the functions of the buttons you can use the numbers used in the sample remote control representation that you used in the previous step.



Figure 4.7 Participants working on their ideal interfaces.

Any further questions were raised related to this part of the exercise since participants knew that they would design their ideal remote control for a week. Thus, they were ready for the exercise, for example User C prepared a template at home for the exercise and utilized it during the workshop. Although small stickers cut in different dimensions, shapes and colors were provided for the participants, User E did not prefer to use these stickers and drew the whole remote control by herself and she colored the necessary parts with markers. However, all the other participants benefit from the stickers. The pace of the participants was also different from each other. Some of the participants did the exercise in an automatic manner, however some other preferred to think for a while. User B was the slowest

participant, since she was the oldest among the participants. Thus, in terms of pasting the stickers, the author helped her. Some participants finished the exercise much earlier than the others and as done in the previous exercise, the participants who finished the exercise began to tell her design to the author without disturbing the others. With such a strategy, the slower participants gained more time to conclude their exercises. After talking with and recording all the participants, another five minutes break was given.

After five minutes all the participants were re-invited to the table for the last exercise. Participants were given play dough and they were asked to,

Model your ideal remote control out of given play dough. You can utilize the interfaces that you designed in the previous exercise or you can highlight different aspects of your desired remote control that you could not express through the previous exercise. You can utilize any material on the table in order to shape your design.



Figure 4.8 Participants modeling their ideal remote controls.

Participants were given A4 cardboards that they could work on. Although it was considered that the last exercise would be the most fruitful part of the workshop, it did not happen as it was thought. Participants were rather tired and bored, thus they did not enjoy the exercise as much as they enjoyed the previous one. One of the participants, User H, had to leave due to an urgent telephone call, thus, she could not join this exercise. The six of the participants tended to repeat the interface designs that they did in the previous exercise. Only one of the

participants, User B, designed a totally different remote control, regardless of her previous design. As in the previous exercises, whoever finished her design told the author about it, without waiting for the others. However, this time, the after design talks were done in another room, due to the noisiness of the atmosphere. It was regarded that, participants could more comfortably express themselves and tended to talk more when they were representing their designs in isolation with the rest of the group. All the participants having talked about their designs, the whole group was thanked for their contributions.

4.3.2 The participants' evaluation of the workshop

Following the workshop, after participants had a rest for a while, they were asked to be interviewed in order to learn their evaluations and the feedbacks related to the workshop, including their feelings, observations, comments and proposals for the future similar workshops. They voluntarily agreed to talk on these aspects. They were asked six questions and the interviews lasted around two to three minutes for each participant. In case of User H, who had to leave the workshop early, the same questions were asked in the form of a questionnaire and sent to her via email. She responded to the questionnaire within two weeks following the workshop.

First of all, participants were asked if working on the sensitizing workbook contributed to the workshop exercises and they were asked to explain it. All of the participants mentioned that they regarded the sensitizing workbooks as the preliminary study of the workshop. They stated that the workbook made them concentrate on the workshop, think about their remote control related desires and observe themselves for a week. It was also mentioned that the exercises in the sensitizing workbook formed an infrastructure for the workshop exercises; accordingly, they could complete the exercises in the workshop without any difficulty.

As a second question, participants were asked to evaluate the exercises in the workshop in terms of their clarity and difficulty. Five of the participants evaluated the exercises as clear enough and mentioned that they had not experience any difficulty in understanding and doing them. However, User C stated that she felt

that the exercises came so suddenly and at the beginning she did not feel herself ready for the exercises. After the explanations she felt more comfortable and did not experience difficulty in performing the exercises. User B also mentioned that although the exercises were clear, she had difficulties due to her age. It was stated by User A that the first exercise was rather extraordinary for her, thus she had difficulty in understanding it at the beginning.

Through the third question, participants were asked to evaluate the sufficiency of the provided materials to express themselves. Moreover, they were asked if they needed any other material through the exercise. The materials were regarded as sufficient by the participants. They stated that they worked quite well with the provided materials and they did not feel the need of anything else. User C was also among these participants and congratulated the author on neat preparation of the materials. However, while she was talking on her remote control design, modeled out of play-dough, she mentioned that, she had some difficulty with the play-dough and due to the softness of the material she could not show the details. She also added that she would rather had taken the exercise as a homework in order to be able to work on it for a longer time.

As a fourth question participants were asked about the time plan of the workshop, if they could work properly with this time plan or they lost concentration or they needed more time. All of the participants were mentioned that they were content with the time plan. Some of them also added that they worked quite well, by following such an organized plan.

When participants were asked if they would also like to be involved in similar projects in the future, all of them mentioned their willingness. When they were asked about how they felt about being involved in such a study, they mentioned that they followed the process with pleasure. User B, User C and User D indicated that to be involved in such a creative process and to see that they could design something, contributed to their self-confidence. User D and User E and User F stated that they had begun to analyze their environment more carefully since they were involved in the study and began to catch some points that they were not aware of. User B and User C even stated that they began to feel younger since

they saw that they were still productive and they were taken into consideration in technological improvements.

4.4 The Analysis of the Workshop Outcomes

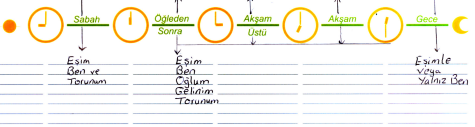
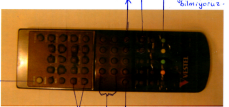
Since the main aim of the workshop was to gather data which would be reflected through the resource, designed for the designers in Vestel, the outcomes of the workshop were analyzed accordingly. All the exercises within the workshop and the sensitizing workbooks were analyzed independent of other exercises, since the exercises were very different in nature. The outcomes of the workshop and the exercises “drawing the ideal remote control interface” and “modeling desired remote control” were analyzed as personal contributions of the participants, while the exercise “if remote controls were people” and the “rating the usage frequency of remote control functions” were evaluated collectively. Since the exercises of the workshop and also the sensitizing workbook were based upon open-ended questions and participants’ designs, the data obtained as a consequence of the workshop were mostly qualitative. Only the outcomes of “rating the usage frequency of remote control functions” delivered quantitative data.

4.4.1 The analysis and the outcomes of the sensitizing workbook

Although the main aim of the workbook was to sensitize the participants for the workshop, the information indicated by the participants through the exercises in the workbook was also used as an input for the resource. Thus, the comments of all participants related to each exercise of the workbook were re-organized in a big table, through which columns represented the participants and the lines represented the exercises of the workbook. Through such a table a thorough analysis of the workbook was enabled. By reading the table through columns, individual comments of participants about the whole workbook exercises were identified. By following the rows, diverse answers of the participants related to the same exercise were reached and the differences and common tendencies were identified. After such an analysis, it was realized that each workbook reveals a unique case related to the life styles, rituals, dreams, problems and expectations of each participant. Thus, it was decided to benefit from the workbook outcomes accordingly.

Through the analysis of workbooks on this basis, the information related to the family structures of participants, the rooms where TVs are preferred to be located, parallel activities done while watching TV, expected or dreamed functions of both TV and the remote control and remote control related problems and contentment were identified, as expected. This information, which were mentioned as bits and pieces in each page of the workbook, was structured in narratives for each participant, in order to be able to reflect the outcomes in the resource in a comprehensive and empathic way. In Table 4.4 an example of workbook pages filled by User C, and the story dedicated from the workbook is illustrated.

Table 4.4 Sample workbook pages filled by Participant C and the story dedicated from her comments

Evinizde nerelerde televizyonunuz var? Zarf içindeki imajlardan size uyanlarını seçerek aşağıya yapıştırınız. Ekleme istediğiniz mekânlara varsa lütfen yazarak belirtiniz.  Günün hangi diliminde neredeki televizyonunuzu izliyorsunuz? (Yukarıda yapıştırdığınız resimleri aşağıdaki zaman dilimleriyle oklar çizerek eşleştiriniz.) Yanınızda kimler oluyor (yanınızda, komşunuz, eşiniz, çocuklarınız v.s...) Zaman dilimlerinin altına yazarak belirtiniz?  <table border="1"> <thead> <tr> <th>Sabah</th> <th>Öğleden Sonra</th> <th>Akşam</th> <th>Gece</th> </tr> </thead> <tbody> <tr> <td>Eşim, Ben ve Torunum</td> <td>Eşim, Ben, Çaylak, Çiğdem, Torunum</td> <td></td> <td>Eşim ile, Çaylak, Yalınız Dön</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Sabah	Öğleden Sonra	Akşam	Gece	Eşim, Ben ve Torunum	Eşim, Ben, Çaylak, Çiğdem, Torunum		Eşim ile, Çaylak, Yalınız Dön													Televizyon izlerken hangi aktiviteleri de beraberinde yapıyorsunuz? Zarf içerisinde kendiniz için uygun bulduğunuz imajları seçerek aşağıdaki boşluğa yapıştırınız. İmajlarda bulunan aktiviteler dışında televizyon izlerken yaptığınız aktiviteler varsa lütfen yazarak belirtiniz.  - Yemek servisi, kahve servisi, diğerdeğişim yemekleri, - Küçük keşif yemekleri (Çay, tefrici), ailem, aile masası başında uzun zaman atarak yemekleri yaparken, - Spor yaparken (Fizik tedaviden verilen hareketler gibi)
Sabah	Öğleden Sonra	Akşam	Gece																		
Eşim, Ben ve Torunum	Eşim, Ben, Çaylak, Çiğdem, Torunum		Eşim ile, Çaylak, Yalınız Dön																		
Ne şekilde televizyon izlemekten hoşlanıyorsunuz? Zarf içerisinde kendiniz için uygun bulduğunuz imajları seçerek aşağıdaki boşluğa yapıştırınız. Bu pozisyonlar dışında televizyon izlediğiniz pozisyonlar varsa lütfen çiziniz. Bu durumlarda televizyon kumandanızı nerelerde bulundurmaktan hoşlanıyorsunuz (elinizde, kucagınızda, koltukta, sehpa, yatağınızda v.s...) Neden?  En yakın mekân ve/veya şeyinizde - Spor yaptığınız mekânların dışında Koltukta oturarak, Masada, Koltukta oturarak, Yatağınızda yatarak, duvarın altına	Kumandanızda beğendiğiniz ve beğenmediğiniz özellikleri kumanda üzerinde işaretleyerek açıklayabilir misiniz?  700'ten fazla TV izlemeye izin veriyor, ama çok fazla izlemeye izin vermiyor, bu yüzden izlemeye izin vermiyor. Kısa değişim, ama çok fazla izlemeye izin veriyor, ama çok fazla izlemeye izin vermiyor. En yakın mekân ve/veya şeyinizde - Spor yaptığınız mekânların dışında Koltukta oturarak, Masada, Koltukta oturarak, Yatağınızda yatarak, duvarın altına																				

"In my house there is a TV in the kitchen, living room and bedroom. While we are having breakfast with my husband and grandson we watch the TV in the kitchen. In the afternoons we watch the TV in the living room with all family members. At night I like to watch the TV in my bedroom alone. In my daily routine TV is always open, when I am having breakfast, cleaning the dishes, preparing the meals, having the meals, ironing , knitting, reading a newspaper, sewing, doing daily fitness exercises and having rest lying in the bed. I prefer the remote control to be near me, such as on the coffee table, on the armchair, on the table, near my pillow and near sports mattress.

Besides following the programs, I also would like to benefit from TV as an alarm set to determine the closing time of the TV. I'd like to be able to carry the TV wherever I want. It would be also nice to visualize the digital photographs and listen to music via the TV. Moreover playing the DVD's via TV without need of any other devices can be very practical. I wish remote controls also had letters on it, which could be used in order to write messages on TV screens and send them to friends and relatives who live in distant cities.

When I regard my remote control we have been using this remote control for a very long time. Thus, the numbers and the icons on the controls have already faded and now all the colors are identical. We can use the remote control since we have memorized the places of the buttons within years. Secondly, TV and Teletext buttons are the buttons that I use most frequently, however, they are rather small for me. Thirdly, I have never used the colored buttons placed on the remote control and do not know what they are for. Lastly, I think that if the stand-by button were bigger than the other buttons, it would facilitate the usability.

Unfortunately, I have a bad memory of my remote control. I tend to hold it upside down, (since there is no reference to indicate the other), and push the wrong control. I'd rather the remote controls are designed in a way that refers to the correct directions."

4.4.2 The analysis and the outcomes of the first exercise of the workshop: If remote controls were people

Since the aim of the exercise was to explore how the remote controls were perceived by the participants, the exercise was analyzed on the basis of sample remote controls given as the object of the study. A table was formed for the analysis. The columns of the table were assigned to participants and the rows were for the remote controls. In each cell, the opinions of the participants related to each remote control were written, thus by following the lines, all the comments related to each remote control could be viewed as a whole. Accordingly, the similar and varying comments could be detached easily.

Participants had some difficulty in concluding this exercise, since it was unconventional for them. The questions asked in order to determine the character of the remote controls were open-ended rather than multiple choice questions. Thus, for most of the remote controls, a consensus among the participants lacked. Only for the second and the third remote control participants indicated very similar opinions. For the first and the fourth remote controls, the mostly repeated qualifications were evaluated as the characteristics of these remote controls. However, for the fifth remote control, the comments were so diverse that, from the outcomes only its masculine character was concluded.

Regarding the second step of the same exercise, in which the participants were given some pictures of Vestel TVs and asked to match the TVs with the remote controls, it can be said that a consistent matching could not be obtained. Participants had difficulty in examining the TV pictures, since they found them very similar to each other. Very different TV pictures were chosen for the remote controls and a similar pattern could not be caught. Thus, in terms of the resource, this part of the exercise was not taken into consideration. However, since this information can also be important for the design team, it was shared with them orally through the last meeting.

Table 4.5 Outcomes of the Exercise 1: If Remote Control were People

The remote controls	Specified Characteristics
	Female, 25-45 years old Civil servant, teacher or business administrator Calm, tidy, neat, arrogant and noble Drives a middle class automobile (such as Renault or Palio)
	Female, 35-50 years old House wife or retired civil servant Tolerant, daydreamer, calm and passive Drives a small and an old automobile
	Male, 50 years old Businessman or bureaucrat Idealist, inflexible and furious Drives BMW or Toyota
	Male, 35-45 years old Bank employer or manager Hardworking, prescriptive, impatient and responsible Drives an upper-middle class car automobile
	Male Could not achieve a consensus in terms of other characteristics

4.4.3 The analysis and the outcomes of the second exercise of the workshop: Design your ideal remote control interface

The second exercise of the workshop had two steps. In the first step, participants were asked to rate the functions of a remote control with regard to their usage frequency. In the second step, they were asked to design their ideal remote control interface and represent it on a paper. Although the first step was carried out in order to facilitate the second step, the outcomes were utilized, since it delivered quantitative data related to remote control functions. In order to analyze this part, a table was prepared where the columns were assigned to participants and the rows represented the parameters related to usage frequencies, namely *frequently used*, *occasionally used*, *never used* and *would like to be use*. However, although the

information could be organized through such a table, the results could not be perceived easily since there were too many functions. Then, Table 4.6 was prepared with the help of the first one. In this table each frequency rating parameter was evaluated in separate columns. The related functions were placed in lines. Then, the functions were rated with X's, since each X represented a participant who rated the function with the title parameter. Via such a table, the information of which functions were rated as which parameter by how many participants was identified very clearly. The detailed results can be found in Table 4.6.

Through the second step of the same exercise, participants visualized their designs on paper and then, told the author about their decisions and intentions. This part was evaluated on individual basis, since participants designed for themselves, according to their personal experiences. After the workshop, a page was prepared for each participant including an image of their designs and the transcriptions of what they said related to their designs. Accordingly, their remarks could more easily be identified. Below, the designs and the explanations of two participants, Participant A and Participant H are shown, as an example.

Table 4.6 Outcomes of the first part of the second exercise: Rate the functions within remote control according to your usage frequency

	Frequently Used	Rarely Used	Never Used	Would like to be used
1. Stand by	XXXX		X	
2. TV Mode	XXXXXX			
3. External Source	X	XX	XXX	
4. Numerical buttons	XXXXX			
5. Double Digit	XXXX			
6. Previous Program	XXXXX	X	X	
7. Personal Preference	XXX		XXXXX	
8. Mono/Stereo		X	XXXX	
9. Menu	XXX			
10. Mute	XXXXX	X		
11. Volume (-)	XXXXXXXXX			
12. Volume (+)	XXXXXXXXX			
13. Program (+)	XXX		XX	
14. Memory		X	XXX	
15. Left Button	XXX		XX	
16. Right Button	XXX		XX	
17. Program (-)	XXXX		XXXX	
18. Features Menu		X	XXXX	
19. Programming Menu		XXX	XXXX	
20. Information	XXXX	X	X	
21. Saved page		X	XXXXX	
22. Page Update	XX		XXXXX	
23. TV/Teletext Mix	X	XXXX	XXX	X
24. Teletext Content Page	XXX	XXXX	XX	X
25. Saved Information		X	XXXXXX	X
26. Page Enlarge		XX	XXXXX	X
27. Teletext	X	XXXXX		
28. Time	XX	XX	XX	
29. Volume Tuning Menu	XXX	XXX		
30. Image Tuning Menu	XX	XXXX		

Table 4.7 The remote control interface designed by User A and User H.

The Remote Control Interface designed by User A	"In regard to remote control, the most important thing for me is that frequently used buttons should be bigger than the others. Thus, I design the buttons that I frequently use; such as volume, program, mute, double digit and teletext, bigger than the others. Besides these functions, I also put the menu button for tuning. I did not put the other functions that I do not use on the remote control, since I do not want to see the buttons of these functions in my remote control. In terms of its form, I preferred such a shape which is thinner at the bottom, in order to be hold more comfortable, and wider at the top, in order to be able to put more buttons. Moreover, such a shape can indicate the direction of the remote control. Lastly, I want such a stand by button which catches attention easily."
The Remote Control Interface designed by User H	"I designed such a remote control, which is very simple. Whole function of the remote control can be enabled through the menu button. By moving this circular button forward-backward and up-down different functions can be reached and by pushing the button the related function can be selected. The arrows are for increasing or decreasing the value of the chosen function. Besides these, I put controls for volume up and down, external sources; such as VCD and DVD and program up-down, which I frequently used. This is a rechargeable remote control, since my biggest problem related to remote controls is the loss of batteries. The cases of batteries are very weak and easily broken into pieces after an accidental drop. My other problem is the loss of remote control in the house. Thus, I think that an alarm system can be provided within the rechargeable system. A button can be designed, pushing of which activates the alarm of the remote control and remote control can give a signal, such as a sound of bell. Accordingly, the remote control can easily be found."

4.4.4 The analysis and the outcomes of the third exercise of the workshop: Model your ideal remote control

Although the exercise was chosen in order to help the participants represent some thoughts that they cannot express in two dimensional representations, the participants still tended to model their ideal remote controls again in a planar way. Moreover, the models made out of play-dough were more or less the same with their interface representations. Only one participant, User B, concluded with a different design than her previous one. As stated before, User H could not join this part of the workshop due to an urgent phone call.

This part was evaluated on individual basis, as done for the previous exercise, since the designs of participants were the conclusions of their personal experiences. In terms of analysis of these models, individual pages were prepared as done for the analysis of the exercise related to interface design. The images of the 3D models and the transcriptions of the participants' design related explanations were placed in these pages. An example can be seen in Table 4.8.

Table 4.8 The play dough remote control model designed by User B and User D

The Remote control model designed by User B	
	"In my design I put the stand-by button on the top edge of the remote control. I provided one button for all the numbers, since by pushing the button the numbers can be enumerated one after another. I placed the volume up and volume down buttons on the upper part of the remote control, and I placed the program up and program down buttons in a place which is very close to hand. Time is important for me. Sometimes I use the teletext, for example to control the arrival and departure time of the airplanes or to learn the weather forecast. I placed all the functions related to menu in such a box at the lower part of the remote control. The functions can be seen, by turning this round part, just like in old telephones, and the tuning can be done via the button in the very middle. I preferred such a form, which is thin in the middle, to support a comfortable holding and which enlarges in the front where most buttons are placed. The front part can also be more circular."
The Remote control model designed by User D	
	"The front end of the remote control is round and there is a light to indicate the usage direction. This light can also facilitate to find the remote control in the dark. The form gets thinner in the middle, in order to support a comfortable hold. I placed the stand-by button at the upper right corner of the remote control. The big circle underneath it represents a clock placed in the remote control. The white button on the left of the clock is for teletext. The group of four buttons underneath the clock is provided for volume up/down and program up/down. The button in the middle of this group is for mute. Lastly, the buttons at the bottom are for numbers. These are the functions that I use. However, I have some comments. The letter on the buttons can be designed in an extruded form so that people with visual impairments can easily use. The remote control can work with solar energy. I prefer colored remote controls, instead of black ones, since our telephone is also black and it is usually confused with the remote control. If they are in different colors, such things will not happen."

4.5 Evaluation of the Workshop

The evaluation of the workshop can be made on the basis of two concerns. Firstly, the workshop exercises can be discussed in terms of their contributions to the study and the problems related to their comprehension by the users. Secondly, the outcomes of the study can be discussed in order to present the general tendencies of women in this age group, regarding remote control usage.

4.5.1 Evaluation of the workshop exercises

If remote controls were people

The exercise was the first exercise of the workshop. It was given as a mind-opening exercise for the users. In the exercise users are asked to specify some characteristics of remote control images by imagining them as people. After exploring the remote controls, as a second step, they were asked to match the remote controls with given TV images. The main utility of the exercise for the Vestel design team was thought to be the outcomes of the second step, since designers indicated problems about the harmony between TV models and remote controls. The first step was performed in order to make the participants concentrate on remote controls and explore them.

However, the exercise did not work as it was intended. Participants had difficulties in understanding the exercise. They had difficulties in imagining the remote controls as if they were people, thus additional explanations were made and examples were given on the basis of other products in order to facilitate their comprehension. After they comprehend the task, they completed the first section successfully. Then, they were asked to match the given TV images with the remote controls. Although no comprehension problems were experienced in this step, it could not reach the aim. Participants mentioned that printed TV images resembled each other to a great extent and it was difficult to distinguish them. Thus, they could only match one TV image with one remote control in order to complete the exercise. The analysis of this section revealed that among the participants there was no consensus on the matching. Perhaps, the print quality and the dimensions of the images might have affected the perception of the participants. Printing the

TV images in bigger dimensions or showing the TV models by projecting them on a big screen might have contributed better to the success of the exercise.

Draw your ideal remote control interface

It was the most successful exercise of the workshop. Participants understood what they should do easily. They completed the first section within five minutes and began to draw their ideal remote control interface in a concentrated manner. It was observed that the provided colored paper cut in different forms, eased the participants' expressions in reflecting their ideas.

Model your desired remote control

It was decided to be the last exercise of the workshop and through the exercise the participants were expected to communicate their remote control related desires through their models. Play-dough modeling was chosen as a medium since it was thought that with play-dough, participants can express the desires which they could not express by drawing. However, the outcomes of the exercise reveal that all of the participants, except User B, tended to repeat their 2D designs in play-dough models. There might be some reasons affecting the tendency. Firstly, participants might have needed more encouragement about expressing more aspects related to their desires within their 3D design. Secondly, as mentioned by User C, participants might have difficulty in working with play-dough. Thus, providing some other materials, such as foams, might have also helped the participants. Lastly, since it was the last exercise of the workshop, participants might have got tired and lost their concentration for the exercise. The choice of less tiring exercises for the previous parts, generous breaks between the exercises and enough facilitation through the modeling session might have helped the participants.

4.5.2 Evaluation of workshop outcomes

The analysis of the outcomes revealed that there are some tendencies, problems and expectations which are repeated by the participants, such as:

- controls related to volume up/down, program up/down, teletext, menu, time and standby are the most frequently used controls by this user group,

- they expect the frequently used controls to be bigger than the other controls (User A, User B, User C, User G),
- they prefer few controls for their remote controls since they expect to use a simple remote control (User A, User B, User C, User E, User G, User H),
- the small controls placed at the bottom side of the remote controls were regarded useless by them (User C, User G),
- In terms of the dimension of the remote control, most of them suggested a small remote control, like a mobile phone (User B, User C, User E, User F, User G),
- the indication of the usage direction of the remote control is important for some of them (User A, User B, User C, User D). To indicate the direction, these users tended to design a form which is thinner at the bottom to support a comfortable hold and larger at the top to put more controls. Moreover, a light in the front of remote control was suggested by User B and User D,
- in terms of the controls, the forms which are easy to push such as buckled forms or touch pads were mentioned as preference (User B, User C, User E, User F),
- some of them prefer different colors for different controls due to ease of distinguishing (User A, User B, User C),
- though remote controls were indicated as an expectation due to the problems experienced through accidental drops (User B, User D, User G).
- the number and symbols on the controls fading by time is a problem for them (User C, User F),
- ease of finding the remote control in the dark was expressed by User A and User D as an expectation.
- the use of foreign abbreviations within remote controls was indicated as a problem by User B.

Besides these common remarks, through the workshop some participants had distinct suggestions inspiring from their experience with TV and remote control, accordingly:

- User A suggested that remote controls can be illuminated like mobile phones for the sight problems in the dark.

- User C suggested two remote controls for a TV. One of these was a quite simple one having only frequently used controls for daily usage. The other one was a more detailed remote control which would be used occasionally in order to make detailed tunings.
- User D suggested solar energy as the power of the remote control since her biggest problem was with the batteries of it. Moreover, she suggested different colors for remote controls, since she experienced problems with black remote controls, since she confuses them with the telephone.
- User E suggested a TV whose screen can be divided into two and can be controlled by separate remote controls. She suggested such a solution since her biggest problem was that her husband and she wanted to watch different programs but also did not want to sit in separate rooms.
- User G suggested a rechargeable remote control for the problem of weak battery cases and not long lasting batteries. Moreover for her problem of loosing the remote control at home, she suggested a remote control with an alarm system.

4.6 The Comparison of Designers' Preconceptions and Workshop Outcomes

If a comparison is made between the preconceptions of designers in Vestel and the remarks of the users participated in the workshop, it can be concluded that a match could be obtained. The points which were mentioned by designers, as possible problems related to remote controls, were also remarked by the participants through their designs and explanations. In addition to the problems mentioned by designers, users also indicated problems related to the batteries of remote controls, the implication of the usage direction, the usage of foreign languages for abbreviations and the selection of their main color since they are always black.

Table 4.9 A comparison between the designers' preconceptions and users' remarks

Designers' Preconceptions	User Remarks
The possible problems regarding a remote control can be related to, • The interaction of the remote control with human hand • The form, in terms of weight and center of gravity • The placement of the control buttons according to the physiology of human hand • The dimensions of control buttons • The interface which contain excessive buttons • The location of control buttons • The grouping and dimensioning of the control buttons according to their functions • The toughness of the remote controls, regarding the frequent accidental drops • The usability of remote controls in the dark • The loss of remote controls in the use environment	A remote control should, • Be simple and easy to use • Not contain unused buttons • Have big buttons for frequently used functions • Have a form indicating the usage direction • Have a form which is ergonomic to handle • Have buttons which are both easy to operate and to clean • Have different colors for different buttons • Have Turkish abbreviations • Be rechargeable or utilize solar energy, due to problems with batteries and battery cases • Be though in regard to accidental drops • Be easy to find and use in the dark • Be in different colors rather than all black

4.7 Discussions and the Limitations of the Study

As stated before, the case study was mainly conducted in order to provide data for the resource which would be designed for the Vestel design team. The aim of the resource is to share the outcomes of a participatory study with designers in an empathic and informational way and it would be evaluated by the designers working in a real-life industrial environment. Thus, the data utilized for the resource was desired to be based on a sample participatory user workshop done with real people on a real problem. However, the users participated to the workshop was only a sample group from the target user group, which belonged to a certain social class. Thus, their conclusions cannot be generalized as the opinions of all Turkish housewives. If the study had been conducted with another sample group, different results might have obtained. Accordingly the case study should be evaluated as a

sample case, providing data for the resource and in the future some other case studies can be conducted for the development of similar resources.

Throughout the study, beginning from the sensitizing phase, participants had different levels of motivations. For example, User C was the most motivated participant, who made some preliminary works during the sensitizing phase (notes and a sketch) at home related to her ideal remote control design. However, User G, as she said, is impatient and loses concentration very easily. At the end of the workshop, while User C mentioned that she could design more in detail if the exercise were given as homework, User G mentioned that she does not like to dedicate much time to such a work. Thus while preparing such a workshop; knowing about the personalities of the participants can positively contribute.

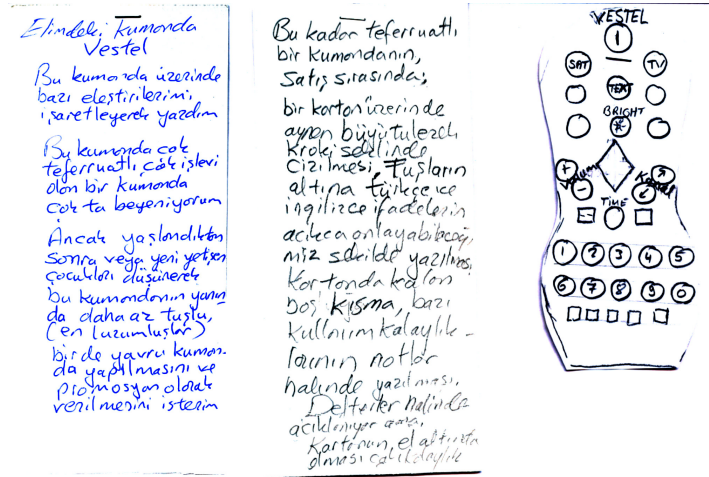


Figure 4.9 The notes and sketch of User C, which was prepared by her through sensitizing phase

Throughout the workshop some participants were better at representing and communicating their thoughts when compared to the others. Thus, the organizer or the facilitator of such a workshop should know that he will work with people who

have different abilities and should be ready to facilitate whenever a participant need it.

In terms of the atmosphere of the workshop, through the first exercise some participants tended to chat with each other and some others had complaints about it. Then silence was enabled. Through the second exercise they were very concentrated. However, at the beginning of the third exercise, some unexpected guests came to the house, thus, the participants lost their concentration.

CHAPTER 5

AN APPROACH FOR A DESIGN RESOURCE PRESENTING THE OUTCOMES OF A PARTICIPATORY USER WORKSHOP TO DESIGNERS

5.1 The Motivation for Developing Resource for Presenting Participatory User Workshop Outcomes to Designers

Bruseberg and McDonagh (2005) discuss the difficulty of making user research data comprehensible for designers. In that sense, the authors observe that designers are mostly provided with quantitative data in the form of reports and these kind of presentations are subject to criticisms due to not being sufficiently inspirational, not stimulating the creativity of the designer and also due to not conveying the user information at an emotional level. Additionally, while discussing the richness of the data obtained through generative techniques, Sanders and Stappers (2005) also highlight the difficulty of the analysis of the outcomes obtained through such techniques, involving creative contributions of the users. Inspired from such observations of the scholars in the field, it was decided that in order to make an in-house design team benefit from the involvement of the users in the concept generation phase of design process through participatory user workshops, the outcomes of the process should be reflected in an appropriate manner. Especially, in the case of Vestel, such a presentation can be regarded essential, since these designers are not much accustomed to work with such techniques. Thus, the outcomes of the process should be transformed in a pattern that the designers can comprehend and utilize the outcomes in their design processes.

Based upon above discussions, a design resource was developed the aim of which is to present the outcomes of a participatory user workshop to designers in a comprehensible and inspiring way. Moreover, such a resource aims to increase the

empathy between the designers and the users, thus, facilitate the designers' understanding of the users and take design related decisions accordingly.

5.2 Cooperative User Insights as a Design Resource

Cooperative User Insights is an interactive design resource which is developed on the basis of aforementioned concerns and aims. Accordingly, it is named as *Cooperative User Insights*, since the resource is based upon the cooperation of users achieved through participatory user workshops and it reveals user insights, problems, expectations, desires and aspirations, for designers. The data which is presented via the resource is based upon the participatory user workshop; which was carried out in collaboration with Industrial Design Department of Vestel Electronics and was discussed in the previous chapter. Thus, it should be mentioned that *Cooperative User Insights* is not a finished design resource in that sense, but a sample approach for such a resource which is developed in order to be evaluated within an in-house design environment and to draw some inferences for future studies.

The design resource was developed in Macromedia Flash, in order to benefit from some features of the computer, such as ease of communication, publishing and distribution of the data, enhancing user interaction via both visual and auditory presentations and regarding the user not as a passive receiver but as an active audience. As the language of the interface, Turkish was chosen, due to its being the native language of the designers who would use and evaluate the resource.

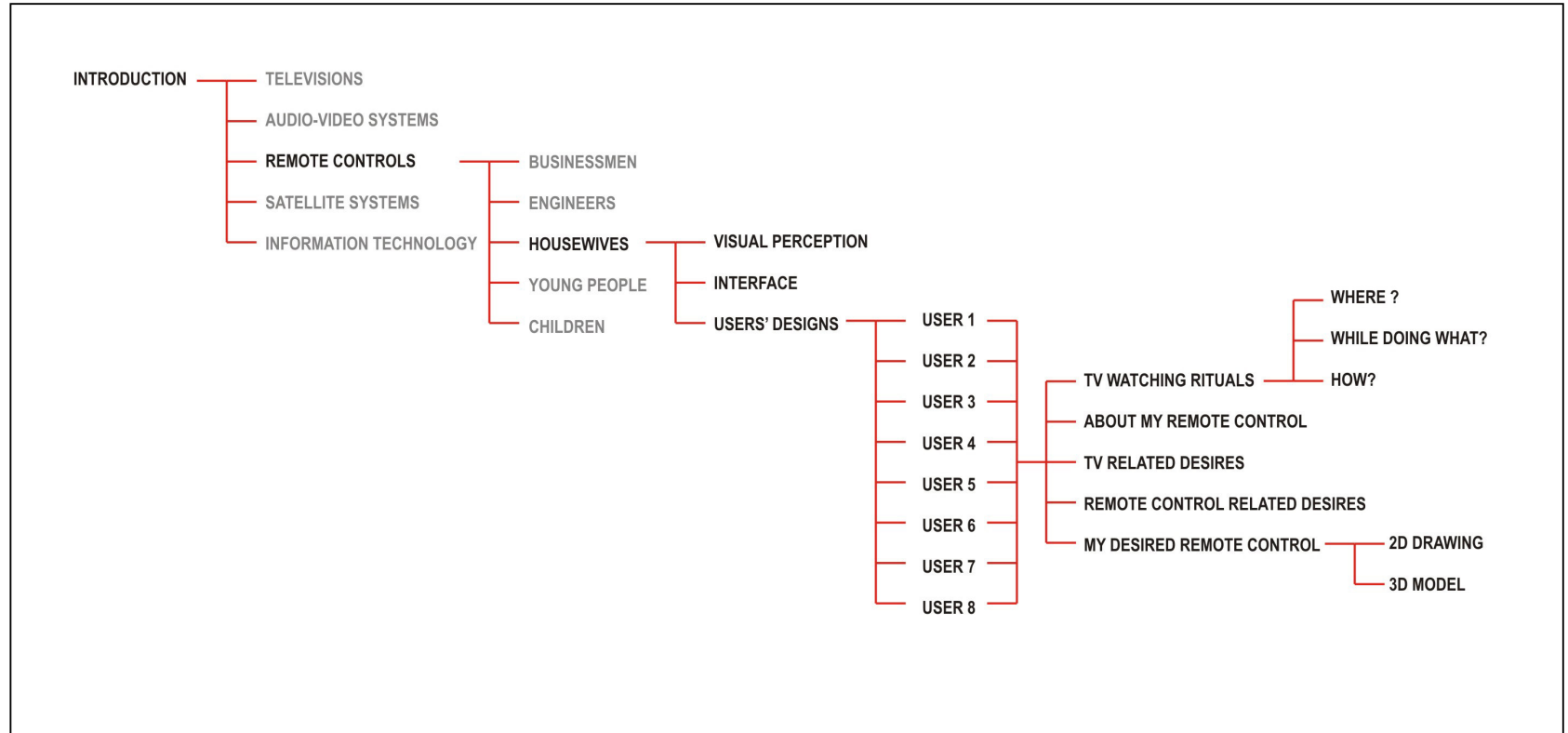


Figure 5.1 The architecture of the interface

5.2.1 The content of the resource

As mentioned before, *Cooperative User Insights* is based on the workshop which was carried out in collaboration with Vestel Industrial Design Department. Since it intends to communicate the outcomes of the workshop with designers in Vestel, its content was organized accordingly.

When a designer activates the interface, he is first welcomed with an introduction page, which gives brief information about the theme of the study, content of the resource, and the participant user group.

This interface reflects the outcomes of a design research project which was carried out with creative user involvement. The theme of the study was decided as remote control design and the research involved eight housewives between the ages of 45-70 as participants.

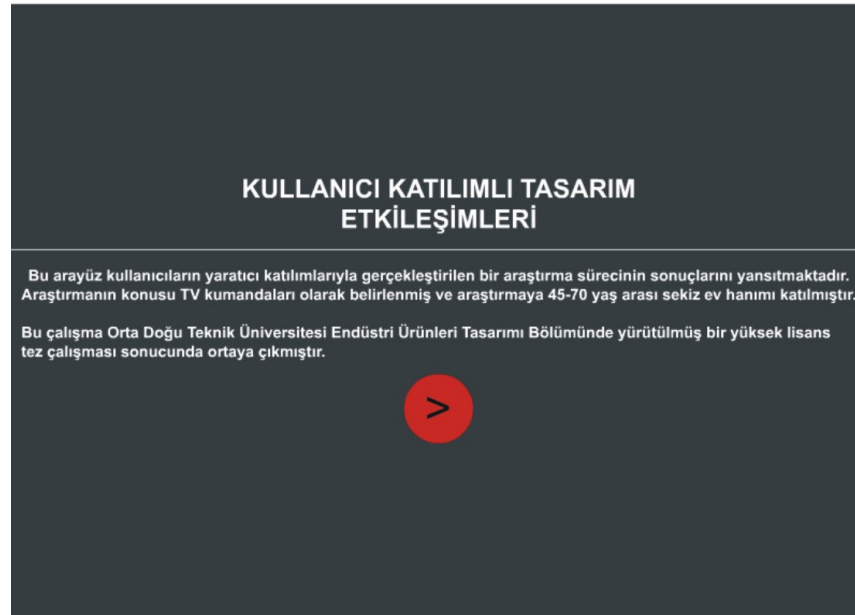


Figure 5.2 Introduction page of *Cooperative User Insights*

Through the *next* button in the page the designer can begin to navigate in the interface. Although the related study was on the remote control related experiences of a group of middle-aged Turkish housewives, it was thought that these studies can be widened in the future and the results can be shared within the same resource. Thus, in the second page of the resource other product categories of Vestel Electronics were listed. Such a list implies that such kind of studies could also be done in the listed product categories and such a resource can be function as a wide database. From that page the designer can only enter the pages which are related to the study on remote controls, since the present study was carried out on the basis of remote controls. Via the button named remote controls, the designer can reach a page including some possible user groups like children, young people, housewives, engineers and businessmen. Like the previous page, in this page also such a list was done in order to imply that a study on remote controls could also be done with other user groups and the outcomes could be shared within the resource. However, since the focus of the present study was housewives, in this page the designer can only click on the housewives button, which is the only active button.

Following such introductory pages, the designer can reach the pages which reflect the outcomes of the workshop. The workshop outcomes were represented in the interface under three themes: *visual perception*, *interface* and *user designs*. Such a categorization was mainly derived from the themes which were inquired through the exercises performed during the workshop.

Through the page titled *visual perception*, the outcomes of the first exercise of the workshop, *if remote controls were people*, was shared. At the bottom of the page a brief explanation is provided about the content of the page such as;

For analyzing how remote controls were perceived by users, the participant users were asked to imagine the remote controls as people and define some specifications for them. The comments were analyzed and common comments were presented in the page.

The page contains the visual images of the remote controls which were inquired during the workshop. Via the page, the designer can reach the collective thought of participant users regarding the personalization of each remote control; such as

their age, gender, profession, personality traits and automobiles, by clicking on each remote control image.

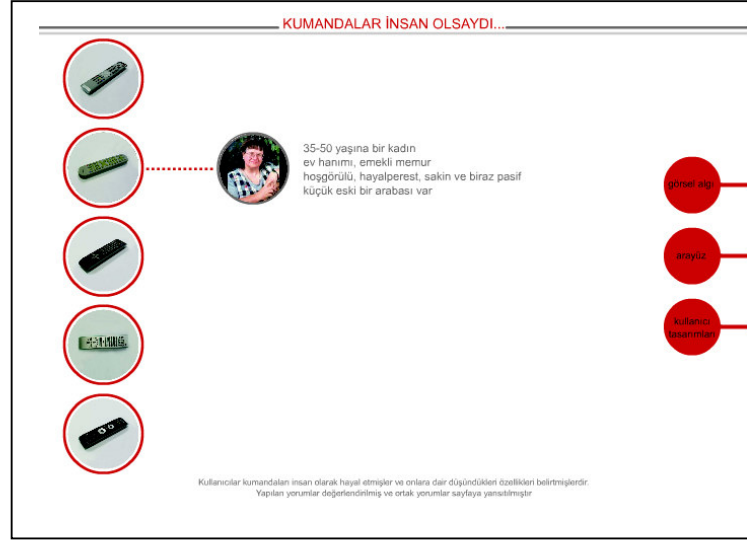


Figure 5.3 A page from the theme *visual perception*.

The page titled *interface* includes the information of the usage frequency of remote control functions represented with the buttons on it. The page provides an introductory message for the designer, such as “for the research eight participant users were asked to rate the usage frequency of functional buttons on the remote control. Their comments were analyzed and the results were presented in the page”. The designer can learn the information of which button is used by how many people at which frequency, by clicking on the numbers indicating the functional buttons in the provided remote control representation.

HANGİ FONKSİYON NE KADAR SIK KULLANILIYOR...

1. Hazır Bekleme

Sık Kullanırım

Ara sıra kullanırım

Hiç kullanmam

Olsaydı kullanmak isterdim

Yorumsuz

darı

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The button *users' designs* guide the designer through a series of pages which present the remote control related experiences and expectations of the users and their desired remote control designs. In the first page, the designer reaches the pictures of the participant users and a brief explanation about the aim of following pages.

For the study users specified their rituals, problems and expectations related to remote controls regarding their individual experiences with them. Each participant designed a remote control regarding their individual desires. The remote control related experiences and expectations, the designs and the design explanations of each participant are presented via the related pages.

The designer can enter the pages of each participant by clicking on her representational image. By doing so, the designer can reach an interim page which provides some information about the participant user, such as her age, education level, experience with computer, family structure, health problems and house. Moreover, he is provided with some buttons which will lead him to pages presenting the

- TV watching routines of the participant,

- experience with the remote control,
- expectations from a TV,
- expectations from a remote control and
- design of the desired remote control

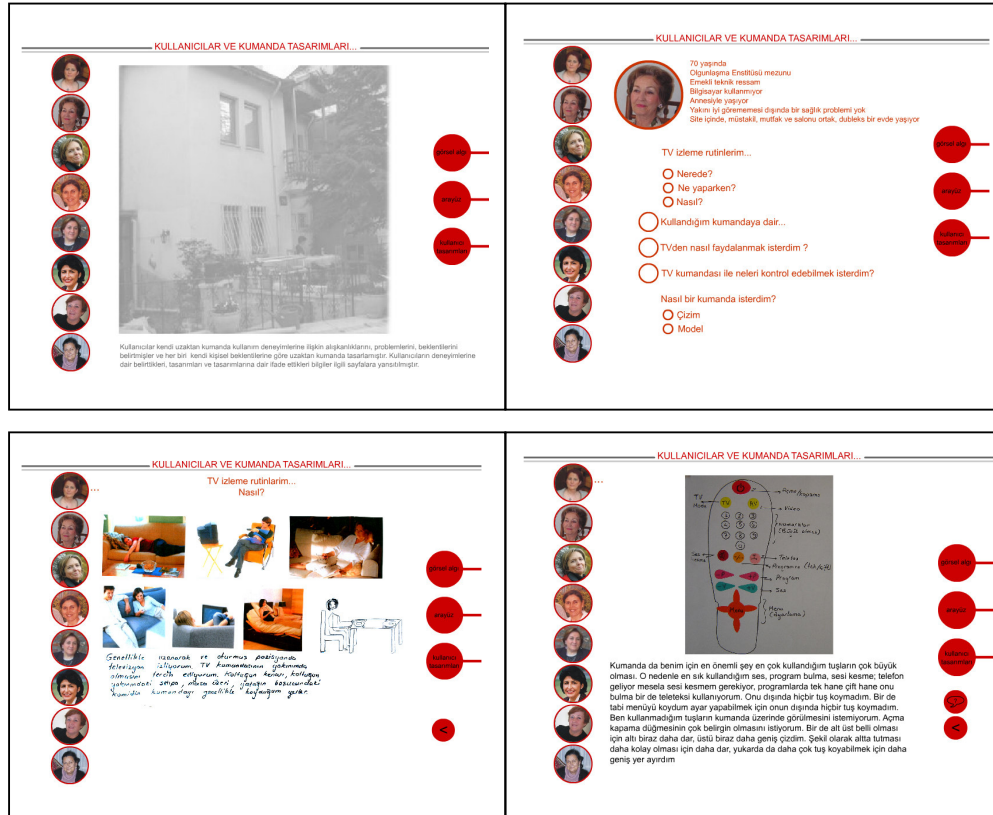


Figure 5.5 Pages from *user designs* theme

The pages about the TV watching routines of the participant present the information about where she watches TV, with whom, when, while doing what and in which postures. The page about the remote control related experiences of the participant provides the problems that she faces while using the remote control, the good and the bad features of her remote control and her good and bad memories related to her experience with the remote control. The pages related to the

expectations of the participant from a TV and a remote control include some TV and remote control related features which are desired by the participant. Through the pages related to the participant's remote control design, the visual image of her sketch and play-dough model can be reached with the explanation of her design in her words and also from her voice.

5.2.2 The design and the interaction of the interface

The resource intends to inform the designers about the target user group of their design problems and to achieve it in a way that can contribute to the creativity of the designer, through comprehensible and inspirational presentations. Thus, simplicity and clarity were the main criteria followed for the overall graphic design of the interface.

5.2.2.1 The general interaction pattern of the interface

The resource was initiated with some introductory pages which briefly tell about the content of it. In order to arouse the curiosity of the designer simple animations are utilized for these introductory pages. However, since the comprehensibility of the main data, which reflect the outcome of the participatory user workshop, was important for the success of the resource, the pages reflecting the main data were designed with a simple and clear manner. The interaction was designed in a way that designer can easily reach the information he needs, without being obliged to browse all the pages, which may lead a loss in the information. For this aim, as mentioned before, the workshop outcomes were categorized under three themes, *visual perception*, *interface* and *user designs*, and these title themes were defined as buttons which guide the designer for the related pages.

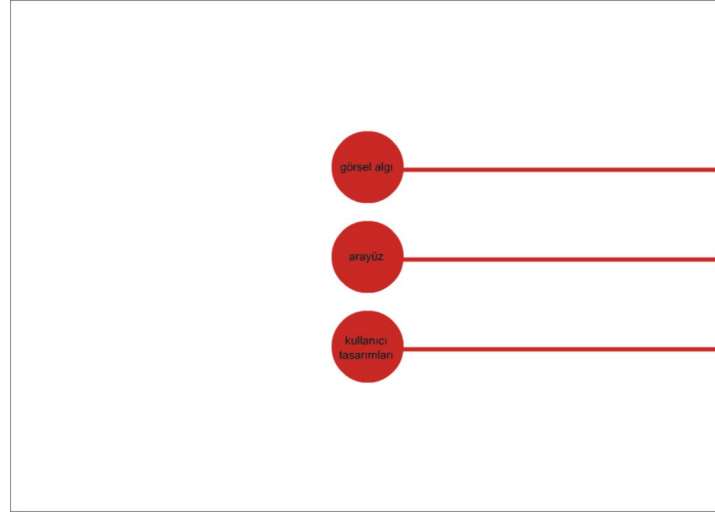


Figure 5.6 The main page guiding towards the main themes of the study

The button of the theme *visual perception* leads to the page representing the outcomes of the exercise *if remote controls were people*. In this page the inquired remote control images also function as a button, a click on which leads the designer to the information related to each remote control.

KUMANDALAR İNSAN OLSAYDI...

25-45 yaşında bir kadın
memur, öğretmen veya işletmede
sakın, düzenli, zayıf, gürültü ve sessiz
Orta sınıf bir araç var (Renault veya Fiat olabilir)

Kullanıcılar kumandadan insan olarak hayal etmişler ve onlara özel değiştirilebilir özellikler belirlemişlerdir.
Yapılan yorumlar değerlendirilmiştir ve ortak yorumlar sayfaya yansıtılmıştır.

HANGİ FONKSİYON NE KADAR SIK KULLANILIYOR...

14. Hafıza/Risim Dondurma

Sık Kullanırım	☐	☐	☐	☐	☐	☐	☐	☐	☐
Ara sıra kullanırım	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hıç kullanmam	☐	☐	☐	☐	☐	☐	☐	☐	☐
Olsaydı kullanmak isterdim	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yorumla	☐	☐	☐	☐	☐	☐	☐	☐	☐

Bu anketimize için anketimize katılan 8 kullanıcıdan kumanda fonksiyonlarını kullanma sıklıklarına göre değerlendirilmiştir. İhtiyaçlar.
Yapılan yorumlar değerlendirilmiştir ve sonuçlar sayfaya yansıtılmıştır.

Figure 5.7 Pages reflecting participants' personalization of remote controls and their usage frequency of remote control functions

Similarly, the button for the theme *interface* guides the designer through the pages which reflect the participants' usage frequency of the remote control functions. In these pages, a representational drawing of a sample remote control is provided, whose functional buttons are indicated with separate numbers. These numbers also function as buttons on which the designer can click and reach the rating schema of each functional button. Thus, the designer is given the freedom of choice. For example, if he is working on a specific project in which the usage frequency profile of some functions are crucial, then, he can only check them, without losing much time and concentration. However, if he would like to browse the ratings related to all functional buttons, he can also do so by clicking on each number.

When the designer enters the initial page of the participant users' remote control related experiences and expectations, through *the user designs* button, he reaches the representative pictures of the eight participant users. These pictures are also defined as buttons which guide the designer towards the individual introduction pages of each participant. In these introduction pages, besides the brief information about the participant, some buttons are provided which lead to the other pages related to the participants' experiences and expectations from a TV and a remote control and also related to their remote control designs.

5.2.2.2 Some design and interaction criteria for developing such a resource

Besides the intention to design a simple, clear and comprehensible design resource, there were also some criteria which need to be given attention in order to reach the intended aim. These followed criteria can be named as,

- Ease of navigation,
- Use of visual images, and
- Use of items which facilitate the empathy between the designer and the user

While designing the pages, ease of navigation of the designer was taken into consideration, since the aim of the resource is not to bombard the designer with information, but enable him to reach the desired information whenever he wants. Thus, in each page, some buttons were provided which enable the designer to shift

the theme that he is dealing with, whenever he needs. For example, in the pages of the each theme, *visual perception*, *interface* and *the user designs*, the buttons leading to the other themes were also placed on the right side of the page. Thus, the designer can move to another theme without returning to the main page. Similarly, through the pages reflecting the theme of *user designs*, the buttons that lead to the individual pages of each participant user were always kept on the left side. Thus, while the designer is navigating through the pages of a participant user, he can move to another participant, without losing time. Thus, he can easily compare the approaches of the participants.

While designing the interface, it was given special attention to utilize visuals, since designers are accustomed to work with visuals due to their own design processes. Thus, the written information in the interface was tried to be supported with visual images and representations, in order to facilitate the designers' concentration on the information and accordingly, in order to enable the comprehensibility of the data. For example, in the page reflecting the personalization of the remote controls, besides users' collective opinions, which define the specifications of each remote control, an image of a person, which evoke the specifications mentioned by the users, were also provided. It was thought that by doing so, designers can more easily comprehend the perceived image of the remote control. Through the pages which reflect the ratings related to the usage frequency of remote control functions, a sample remote control representation was provided, since, it was thought that designers can more easily remember the functions by looking such a representation. Again for the same concern, the ratings were defined as schemas, rather than a written definition. Through the pages which reflect the TV watching rituals of the users, images of the rooms where they like to watch TV, the images of activities which they tend to carry out while watching a TV and the images of their TV watching postures were provided for designers, besides the written information. Thus, the designers can easily comprehend the given information with a simple look and remember it more easily. The images of the participants' remote control designs, both sketches and 3D models, were also provided besides the written design explanations, again for the same purpose.

The resource was also developed in a manner that facilitates the designer to empathize with the participant users. In order to achieve so, the pages about the

participant users were given special attention. First of all, within the interface participant users were presented through representative photographs in order to give the designer the feeling that the study was done with real people and the presented thoughts belong to them. In the introduction page of the *user designs* theme, an image of a house from the building complex, where all the participants live, was placed; since it was believed that such a photograph can give an idea about the social status of the participants and designers can judge that the presented opinions belong to which group of people. In the pages about the TV watching routines of participants, the drawings that they did in order to explain their rituals were shared within the interface, again in order to increase the designer's empathy with the users. Moreover, besides the images of the participant's designs and their written design explanations, the recordings of the participants' design explanations were also provided in order to enable the designer to listen to the explanations from the participants' voice. It was thought that such an opportunity can help to strengthen the empathy between the designer and the user.

5.3 The Evaluation of *Cooperative User Insights* with Designers of Vestel Electronics

In order to understand the utility of the design resource for in-house design team of a Turkish consumer electronics manufacturer, it was essential to get the opinions of the designers of such a team. Since the participatory workshop was planned in collaboration with designers from Vestel Electronics, the obtained data addressed them. Thus, it was reasonable to present the resource to them and ask for their feedbacks. In order to share the resource with Vestel design team and ask them to evaluate it in the guidance of prepared questions, a meeting day was requested from the team. Accordingly, the meeting was held in their office in Manisa, like the first meeting which was done for discussing the theme of the workshop. The aim of the meeting was identified as:

- reaching the designers' initial impressions of such a resource
- reaching the designers' evaluation of the resource on the basis of interview questions
- obtaining feedback for further developments of the resource

The meeting took around five hours. It was decided that for such an evaluation the opinions of the individual designers are essential, thus, the meeting was organized accordingly. The author met with the designers individually in the meeting room. The participant designers were same with the previous meeting about the workshop. Only Designer 6 was not within the group as he had resigned from the job after the first meeting.

Through the meetings, firstly, the resource was proposed to the designers, and then they were asked to navigate through the pages. After they explored it and made initial comments, some questions were asked to them in order to make them evaluate the resource.

5.3.1 Designers' first experience with *Cooperative User Insights*

The meetings were initiated with the invitation of each designer to the seat which is placed in front of a laptop, which played the interface. When the designers entered, the author had already opened the file of the resource, thus the designers faced the introduction page.

First, a brief description was made by the author, which clarified the aim and the processes of the study.

This resource reflects the outcomes of a user research study, which involves the users in the process with their creative contributions. As can be remembered, the object and the subject of the study were decided in the previous meeting. Accordingly, the object of the study was remote controls and the subject of study was middle-aged Turkish housewives. A workshop was prepared in the guidance of points mentioned by you in the questionnaires, in order to learn the remote control related experiences and expectations of participant users. After the workshop, such an interactive resource was designed in order to present the outcomes of the workshops.

Following such an explanation, designers were asked to navigate through the pages of the interface. They were observed while using the resource, in order to reach their first attitudes towards it and the comments they made while navigating through it. Any comments they made were written down by the author, for further analysis.

It was observed that designers tended to follow the placement sequence of the themes since they all first browsed the theme *visual perception*, which was the top button of the sequence. They browsed the theme *interface*, the button of which was placed just under that of *visual perception*, as a second attempt. Pages related to the theme *user designs* were browsed after the previous two themes.

While navigating through the pages, designers tended to make some comments related to the data in the page they were browsing. These comments were important since they indicated that designers comprehended the data and could draw inferences from them. For example, Designer 1 and Designer 4 mentioned that they were so surprised with the perceived image of the second remote control in the *visual perception* theme. Designer 4 said that she had been to the design process of the remote control, thus how she perceives it was totally different from what the users said about it. She said that the bright green color of the remote control reminded her of, the furnishings of the bedrooms of young people, thus, while deciding on the age of the remote control she could say maximum of 35. However users said that the remote control could be between 35-50 years old. She added that through the manufacturing phase of the remote control, some design decisions had changed, such as the material, and these changes might affect the image of the remote control. Similarly, Designer 1 also mentioned that regarding that remote control as a person in her 50s was very interesting.



Figure 5.8 Image of the second remote control in the visual perception theme

Designer 2 remarked a different point regarding the visual perception of the remote controls. She mentioned that first two remote controls the style of which were

regarded as feminine were designed by the same designer and the designer of the following three remote controls which were perceived as masculine was by another designer. Thus, Designer 2 told that perhaps every designer had a style, and even if he designed different forms, his style did not change.

While navigating through the pages of theme *interface*, Designer 3 asked if the users had been informed about the descriptions of the remote control buttons during the research. She commented that perhaps more reliable results could be obtained without giving the descriptions, since some users might behave as if they knew the function in order not to be regarded as bad remote control users.

Designer 5 was the keenest designer for the interface. He checked ratings related to all buttons, and made some comparisons between buttons. While doing so, he was also asking questions and trying to find their answers, such as, "One person said that she never uses stand-by button, then how she shut down her TV? Perhaps she directly shut down it from the button on TV." It was observed that while navigating through the interface Designer 4 made comparisons between herself and the users, and tended to talk with the users; such as, "You are right. I have also never used this function."

Although the designers viewed the *user designs* theme after they browsed the other themes, they were more interested in this theme. Designer 1 and Designer 3 tended to examine all the pages of one user to every detail, However, Designer 2, Designer 4 and Designer 5 first had a glance to the pages of the first user, then, they browsed only the pages of the remote control designs of the remaining users. While viewing the users' remote control designs Designer 2 and Designer 5 mentioned that they could not understand the scale of the pictures and they wished the photos had been taken near a well-known object such as a pencil or a ruler, in order to indicate the scale.

After they finished the exploration phase only Designer 1 made some comments regarding the study. He said

Useful data for us. When we work on remote control design we take decisions according to the information that we regard as true since we cannot reach the data based on a research. Remote controls were never regarded as products in Vestel, they were always perceived as accessories,

and thus we cannot focus on a remote control design. On that sense, you gather a very useful data.

5.3.2 Interviews with the designers for the evaluation of the resource

In order to reach the designers' evaluation of the resource an interview was conducted through the meeting. Designers were asked nine open-ended questions (Appendix B.3) which aim to reach,

- first impressions of the designers,
- feed backs related to the resource itself,
- the possible contributions of such a resource to the design process, and
- the utility of the resource for Vestel.

5.3.2.1 First impressions of the designers

In order to learn the first impressions of the designers regarding the resource, their attitude was asked towards reaching the user research data via such a resource through the following question.

As a designer, what is your attitude towards reaching the outcomes of such a research; which explores users' remote control related experience, problems and expectations, through such an interactive interface?

Designer 1 said that he was positive about the approach since such an approach provided some objective information for the designer and avoided designing on the basis of the information which was intuitionally acknowledged as true. Moreover, he added that such a resource could also be shared with people from other departments, such as marketing, sales and technical departments, since product decisions were taken in collaboration with these departments. The other four designers considered the utility of the resource for their design processes.

Designer 2 said that it was a beneficial resource for a designer and she would like to use it. Mostly the users' designs and their problems related to remote controls were attracted her attention. Additionally, she mentioned that getting knowledgeable about the user through its gender, age, profession and familiarity

with electronic products were crucial for a designer dealing with consumer electronics.

Designer 3 regarded the resource advantageous for the designers since it provides very organized information. She criticized the marketing people who try to share the user information with designers through excel sheets and said that tables and numbers were not comprehensible for designers.

Designer 4 also found the approach beneficial for a designer. She said that such a resource could stimulate the creativity of the designer, since, even after the first scan; she began to think of some new features which could be added to a remote control.

Like previous designers, Designer 5 also found the resource effective in terms of getting knowledgeable about the expectations of target user group. However, he had some hesitations about how to utilize it. He said that the resource reflected varying attitudes of participant users, then, it could be a question mark for the designer that he would take into consideration which opinions while taking his design decisions.

5.3.2.2 Feedbacks related to the resource itself

In order to obtain feedbacks related to the resource, designers were asked four open ended questions. Firstly, they were asked to compare the approach with other approaches through the following question.

Comparison of the interface with other presentation techniques

Could you compare the interface with other techniques used for sharing user information with designers, such as reports and presentations? Here are some criteria for your comparison but you can add more if you think it is necessary.

- *Ease of use*
- *Supporting the empathy between the designer and the user*
- *Contribution to the design process by supporting the creativity of the designer*

- *Comprehensibility and ease of its being recalled*

Designers mentioned that they found the resource advantageous for some points. Firstly, the shared information was regarded as easy to be recalled due to the use of visual images. Secondly, the opportunity to reach the desired information without browsing the whole document was appreciated by the designers in terms of saving time and energy. Thirdly, the designers mentioned that the resource contribute to the empathy between designer and the user. Since the users' photographs, personal information and even voices are available for the designer, he could imagine her personality, lifestyle and even her home. Fourthly, it was mentioned that the resource contributes to the creativity of the designer, through providing such a broad data and also reflecting the desires of users. Lastly, it was mentioned by Designer 1 that such a resource can be used as a communication medium between the departments who take the product decisions, since; through such an approach the decisions can be taken more collaboratively and within a shorter time.

In terms of the advantages of the other approaches over the resource, it was mentioned that reports can be more beneficial in order to have an overview of all the data and get the data as a printed document, since it was mentioned by Designer 4 that companies might want to keep the hard copy of research data. Thus, such an interactive interface should also have a printable version. Presentations were also regarded advantageous since they are made by a person, to whom some questions can be asked and discussions can be made.

Evaluation of the content of the resource

Could you comment on the information presented through the interface? Do you think that there is missing information which is necessary for designing a remote control? The presentation of what kind of additional information could be advantageous for a designer who is working on a remote control design?

Although the designers stated that they were content with the provided information, they added some more. According to them, besides the information of how users perceive the remote controls, the reasons behind why users attribute such

personalities for remote controls should also be provided. Moreover, the preferences of users regarding the form, color and material of the remote controls could also be inquired and shared. Within the pages presenting the usage frequency of the remote control functions, the choice of functional buttons for different TV models could also be inquired in order to catch the diversity in the expectations from the remote controls of different TV models. Through the pages which reflect the desires of the users, besides viewing individual opinions, an option for a comparison between the participants can be provided for designers. Besides presenting the desires of the users, the reasons behind these desires could be asked and provided for designers. Moreover, Designer 5 realized that users did not create any solutions related to their desired remote control features in their designs. Thus, Designer 5 proposed that in the designing phase the users might be asked to create solutions for the aspects that they stated as their expectations from a remote control. Similarly, Designer 4 realized that the features which were proposed by the users have already existed on new TVs. Thus, it might be wise to ask the users if they knew that new TVs have these features. If so, have they ever thought to change their TV and why? Besides these aspects related to users and usage, Designer 1 proposed such kind of a source can also provide the technical limitations of a remote control design and previous experiences of designers and technical people related to remote control designs.

Evaluation of the interface of the resource

*Could you comment on the interaction of the interface of the resource with its user?
Could you state the points that you regarded positive or negative in that sense? Do
you have some suggestions for the further improvement of the resource?*

All of the designers regarded the interaction of the interface with its user very successful. They said that it guides its user, gives necessary feedbacks and thus, is easy to use due to its simplicity and clarity. However, they made some suggestions for the betterment of it. Designer 5 indicated that users' sketches and models of their desired remote controls is the part that any designer would be very interested in. Thus, he proposed highlighting the button which guides the designer to these pages. In terms of the graphic design of the interface, Designer 1, Designer 3, Designer 4 and Designer 5 mentioned that the comprehensibility of the

information is the most important aspect of the resource. Thus, the graphic design of its interface should be done in a way which supports the comprehensibility. Otherwise, a simple and clear graphic design is enough for the interface of such a resource. On the other hand, Designer 2 mentioned that if the user of the resource is the designer, then its graphic design should be done more professionally.

Although none of the designers mentioned about the button, which is for activating the speeches of users on the explanations of their designs, the author realized that they did not use the button until she encourages them to do so. When they were asked why they did not use it, they said that the question mark in the balloon reminded them help page or frequently asked questions, thus they hesitated to use it. None of the designers guessed that it is related to a speech.

5.3.2.3 The possible contributions of the resource to the design process

In order to reach the possible contributions of the resource to the design process, designers were asked the question below.

How do you think such a resource can contribute to the design process of a designer? Could you explain?

Designers mainly mentioned similar aspects. Firstly, it was mentioned that such a resource, which reflects the research outcomes, can be a document which the designer browses through the research and concept generation phase. Moreover, he can return to the document, whenever he needs throughout the further phases of the design process. Secondly, designers regarded the resource as a solution for the designers' tendency towards designing for themselves or according to their own truths, since it reflects the perspectives of different people. Accordingly, it helps designers to look from different perspectives towards the same issue. Lastly, it was said that such a resource could help designers predicate their design decisions upon real user scenarios, instead of made up ones.

5.3.2.4 The utility of the resource for Vestel

In order to learn about the usability of the resource for Vestel, three questions were asked to the designers, first of which was,

Do you think you can utilize such a resource through your individual design process in Vestel?

All of the designers said that they would like to have such an opportunity. Designer 2 stated that if there were such resources in Vestel at the beginning of each project she would like to explore them. Moreover, she said that she is curious about consumer expectations, thus, even if not related to her individual project, whenever she has spare time, she would like to browse all the data. Designer 3 also mentioned that such a resource can be very mind-opening at the beginning of the project. She said that a designer might get inspired from the desires of users and accordingly can propose a new solution. Designer 4 also stated that she would definitely like to utilize such a resource. She added that such a resource could also be used in order to persuade their customers, since for any new idea they might back up their decisions by such a research. She said that “We can even tell our customers that this research says that your consumers want such a feature, thus I design like that. Perhaps, you can launch your product by emphasizing this feature”. Similarly Designer 5 stated that by utilizing such a resource he could more consciously take his design decisions. Consequently, he could trust more to his design, since he could back up it through the search results.

Secondly, designers were presented two scenarios through the following questions.

If it is assumed that such an approach is adopted by Vestel as a methodology, why do you think Vestel may adopt such an approach? How do you think Vestel design team can utilize such a resource?

If it is assumed that such an approach is presented to Vestel and rejected by it, what can be the reasons of Vestel?

Designer 1 told that the approach could be accepted by Vestel since it would lead improvements in the designs of Vestel. Moreover, the resource could also be accepted as a communication medium between the departments who are responsible from a product, such as R&D, marketing, sales and the technical side. He added that in multidisciplinary product development environments, the communication between the parties is essential in order to enhance that everybody talks about the same issue. Thus, the decisions could be taken collaboratively. The communication issue was also mentioned by Designer 3, in a parallel manner with Designer 1. Designer 2, 4 and 5 approached the issue from a strategic perspective. Designer 5 said that Vestel might utilize such an approach for projects which aim to strengthen the image of Vestel. Thus, such an approach could be used for innovative projects that aim differentiation. Designer 4 also thought that Vestel would like to utilize the approach for differentiation. Likewise, Designer 2 stated that Vestel would like to utilize the approach for strategy determination. Vestel could reach the opinions of the users, and then revise its market strategies accordingly.

For the negative scenario, all of the designers mentioned that 90% of Vestel products is sold with OEM strategy. They said that the consumers of Vestel are not end-users but whole-salers. Thus such a resource might not be so meaningful for Vestel in that sense. However, they added that perhaps for Vestel such a resource could also be based upon the research done among wholesalers or the directors of the A Brand firms. In addition to this concern, Designer 1 indicated that Vestel is a product focused company, which is not very much interested in the process. Thus it might not want to invest on such an approach which does not directly point out a product. Likewise, Designer 4 also mentioned about the expenses of such a study and added that Vestel might not want to spend much money on such a study.

5.4 Inferences from the Study

5.4.1 Inferences related to the organization of the participatory user workshop

The case study indicated that designers appreciate such studies which provide them a broad data about their target user groups. Initiating a design by exploring

such a research broadens their minds, makes them take the design decisions more consciously, and accordingly increases their trust in their designs since they can back up their decisions. Moreover, the involvement of the users to the research process through their creative contributions also stimulates the creativity of the designers. New proposals coming from users regarding their desires make the designers approach the design problem from varying perspectives. The proposals of users, although may be not feasible, make the designers think other solutions which are feasible and applicable, or at least make them search for the alternative ways in order to realize the proposal.

However, despite such benefits of the approach for the design processes of designers, some points should be clarified before initiating the study. For example, the marketing strategy of the company should be explored. The Vestel case revealed that if the approach does not correlate with the marketing strategy of the company, such a study may not bring much benefit. The clients of the companies may not be end-users, but whole-salers, as in the case of Vestel. In these cases, the information revealed through a participatory design research carried out with clients, may also be beneficial for them, besides the information coming from end-users. Thus, while organizing such participatory user workshops the definition of the *participants* should be made carefully.

Prior to the workshop, inquiring about the information that designers want to obtain as the outcomes of a participatory user workshop and organizing the workshop accordingly is also essential for enabling that designers will benefit from the outcomes. Although such an inquiry was held with designers in Vestel, prior to the workshop, through a survey, while evaluating the resource they mentioned that they are curious about some more aspects, in addition to the ones mentioned through the survey and inquired through the workshop. Accordingly,

- Besides the experience focused desires of users, their desires related to the physical qualities of a product, such as material, color and form were also mentioned as the information that designers would want to be informed about.
- Additionally, the Vestel case indicated that besides the desires and expectations of users, designers may also want to be informed about the

reasons behind them. Thus, workshop exercises should be prepared accordingly and not only problems, desires, expectations and aspirations of users should be inquired, but also the reasons motivating them.

- Through the evaluation phase of the resource, Designer 5 noticed that although participants stated several desires related to remote controls, in their remote control designs they did not produce solutions for realizing these desires. Thus through the participatory user workshop, within the exercise of 2D drawing and 3D modeling, the users may be asked to design their desired products through generating solutions for their problems, expectations and desires that were revealed through previous exercises.
- Lastly, as Designer 4 pointed out, if a user mentioned about a desired feature related to a product which is existing on the new models of the product sold in the market, it may be wise to inquire if he is knowledgeable about the existence of such a product and has he ever considered to buy this new model and why? The answers of these questions may point out different problems for the design team. If he is not knowledgeable about such a product then there may be a problem about the advertising strategies of the company. If he is knowledgeable about the product but does not want to buy it although he desires it, then the user group may be defined as resistant to purchase and in order to make them buy new strategies may be needed.

On the other hand, while organizing such studies, it can be also beneficial to search for how the company can benefit from the results of the study. Although such studies are done in order to reach novel design solutions which are addressing the problems, expectations, desires and aspiration of users, in Vestel case, designers proposed some alternative usages. According to them, such a study can also be a communication medium between the departments who are responsible for new product development. Since design departments always complain about not being understood by other departments, such a research can reflect the design perspective, since participatory design workshops are carried out for design. It was also proposed by Designer 4 that, such a research approach can also be used beyond designing products. Advertisements can be the subject of such studies. Thus, while organizing such studies how they will be utilized should

be clear, since different aims require different approaches in terms of organization of the study.

5.4.2 Inferences related to the communication of the research outcomes with designers

Cooperative User Insights was an approach for communicating the research outcomes with designers. Its evaluation by Vestel design team revealed some points in terms of the expectations of designers from such a communicative resource. Accordingly,

- The choice of a computer based interactive interface was highly appreciated by designers. Designers do not want to be bombarded with all the research outcomes but want to be able to select the information which they need. For such a concern interaction is important since it gives the designer chance to stroll in the data freely. However, while designing such interactive interfaces, their printable versions should also be considered since sometimes a written document may be needed.
- The evaluation phase indicated that such communicative presentations which are specifically developed for designers should speak a language which is comprehensible for designers. In that sense the use of visuals is effective, since visual data easily attracts the attention of designers. It is easily comprehended and recalled afterwards, in comparison to written data.
- The presentation of participant users through the resource is important for enabling empathy between the designer and the user. To see real faces in the data, to be informed about their personal details and to hear their voices worked very well in Vestel case. However, new ways of presenting users to designers can also be tried in future studies, such as videos and photographs presenting the user in the real context.
- In the Vestel case, through the resource, designers were provided brief information about the research which delivered the presented outcomes. However, while navigating through the interface they asked more information about the research phase. Thus, while presenting research outcomes, detailed information about the research was carried out may also

be provided for designers besides the brief explanations. Sometimes they may experience difficulty in interpreting and evaluating the presented data. In these cases some information about the research itself may guide them.

- Presenting the contributions of the participants on an individual basis provides a very rich data for designers, which reflect different perspectives. However, an option for comparing the participants' comments or getting an overall view of the research can also be provided for designers since sometimes designers may want to see the whole picture.
- In terms of the graphic design of such an interface, it can be said that the priority is its clarity and comprehensibility. Thus the design of the whole architecture and the interaction should be done accordingly and the graphic design should contribute to it. However, since the users of the interface are designers, they may have expectations toward more designed interfaces in terms of graphic design.

CHAPTER 6

CONCLUSIONS

Throughout this chapter, the main research findings will be summarized, which were derived from literature review and the case study. The conclusions will be based upon research questions stated in Chapter 1. Additionally, recommendations for further studies will be offered at the end of the chapter.

6.1 Research Questions Revisited

What is the state of the art of participatory design approaches?

Why did participatory design approaches emerge and how have they been evolved?

As widely discussed in Section 2.1, participatory design approach first emerged in the field of computer supported cooperative work in Scandinavia in 1970s. The implementation of computer based technologies in workplaces was regarded as managerial control over the workers, through deskilling the workers' works, and consequently subjected to workers' reactions. Reactions towards the implementations required new projects which aim to balance the powers of workers and managers over workplaces. In these projects workers were involved in research groups for reaching workers' opinions on technology, their works, interests and goals. It was thought that such an approach would enable the new technologies to be implemented according to workers' expectations and tendencies (Kensing and Blomberg, 1998). Later, the approach has also been acknowledged by different countries. However, such a wide embracement has led to the evolution of the approach. Within countries that do not have the same socio-economic conditions with Scandinavia, the approach has been utilized for different aims. Within North America and Europe the approach has been carried out as the

involvement of users in the design processes. Such an involvement is appreciated on the basis of new product development since it enables a deep understanding of users and use contexts, which may reveal new opportunities for companies. If the spread of participatory design is examined on the basis of design fields it can be said that it has also been adopted by variety of design fields among which industrial design also takes place. In terms of industrial design, the active user involvement is mostly embraced in the research and concept generation phases of the design process through participatory user workshops. These workshops prepare the necessary grounds for the creative contributions of the users through designed exercises and materials. Later the in-depth responses of users, revealed through workshops, are tried to be reflected to the designs of new products.

What are the motivations behind the contemporary utilization of participatory design approaches?

The motivations behind the contemporary utilization of participatory design processes were widely discussed through Section 2.3. Accordingly, literature review indicates that there are three main motivations behind the utilization of participatory design processes, namely humanistic concerns, designing for special user groups and market based motivations. The main idea behind the humanistic concerns in design is realizing a democratic and respectful design process. For enabling such a process, the traditional role of the designer within the process, as the leader of the process who is superior to the other stakeholders, should be changed and users who are affected by the outcomes of the design processes should be given the right to be involved in the processes and speak out their expectations.

Designing for special user groups is the second group of the motivations. Designing for special user groups challenges the designers' tendencies towards designing through their designer intuitions and their assumptions about the user expectations, since designers are not familiar with the daily lives of these people. Thus, in order to understand their abilities, lifestyles, problems, expectations and aspirations, designers need the contributions of these people and their caretakers within the design process.

Lastly, market based motivations also call for participatory design process. Within contemporary market conditions companies are in need of differentiating themselves from their competitors. As today proposing durable, usable and cheap products is not enough for differentiation, in their new product development processes the companies aim at creating additional values to products and services. In order to enable this, they search for affective solutions and novel and desired experiences. However, the generation of these solutions requires a deep understanding of the user expectations and the use context, which is hard to achieve through traditional user research methods. Thus companies tend to pursue participatory design processes providing in-depth user responses which may reveal new opportunities for them.

What kind of methods, techniques and tools are utilized by participatory design approaches?

The inclusion of non-designers in the design process is a difficult issue, since it requires new understandings and new modes of communication among designers and users, which are not common to traditional design process. Thus, new methods, techniques and tools are generated in order to facilitate the process. The methods utilized within participatory design processes are based upon the belief that if users are provided with appropriate tools and facilitation they can contribute to the design solutions. From that perspective, the literature review revealed two methods, *consumer idealized design* and *contextmapping*. The analysis revealed that the techniques and tools utilized within participatory design processes can be discussed under two groups on the basis of their aims. The subject of the first group of techniques and tools are users, and they are utilized in order to facilitate the creative user involvement within the design process. *Probes* and *Generative Techniques* belong to this group. The second group of techniques and tools are for communicating the outcomes of user studies with the designer. This group can also be examined under two subgroups. The first subgroup is made up of the techniques and tools; such as, *Personas*, *Extreme Characters* and *Real People*, which aim to communicate the user profiles with designers. The second subgroup includes the techniques and tools which aim to communicate the use context with designers. Scenarios, storyboards and TRI Set Up and Video Collages can be

regarded within this group. These methods, techniques and tools were widely discussed through Chapter 3, through their aims and practical applications.

Which aspects should be paid attention to while organizing a participatory user workshop for a design team?

Inquiring designer expectation

Before initiating a participatory user workshop, the aim of the design team behind utilizing such a workshop should be learned. Then, the theme of the workshop and the participants should be determined in collaboration with the design team. Moreover, the information that designers want to get from users should also be inquired. Thus, the workshop exercises can be prepared accordingly and more relevant results can be obtained through the workshop.

Sensitizing participants

In order to make the participants think about the theme before the workshop, and also to make them observe themselves and their environments on the basis of the theme, participants should be sensitized before the workshop. The sensitizing materials should be clear for the participants and they should be delivered to them by the researcher himself, in order to explain the exercises within sensitizing materials. However, since the researcher will not be with them while they are dealing with sensitizing materials, it is beneficial for the researcher to leave his telephone number, for further questions.

Getting to know the participants

- In user workshops since participants may come from different backgrounds they may have different levels of motivations for the involvement (e.g. Some participants may be eager to contribute, while some others may lose interest and motivation easily) .Thus, before initiating the study, trying to understand the motivations of participants can positively contribute to the study.

- The participants' abilities may vary in terms of representing and communicating their thoughts. Thus, the moderator should be ready for working with people having different abilities and should be ready to help them whenever needed.

The workshop exercises

- It is important to choose exercises comprehensible for all participants. Thus, before the actual workshop, pilot run can be useful for testing the comprehensibility of the exercises.
- The exercises, in which participants are asked to design their desired product through modeling, require energy and concentration. They are mostly performed as the last exercise of the workshop after the participants did some mind opening exercises and explored some points through these exercises. However, in order to enable the success of these modeling exercises, the previous exercises should not be tiring and confusing.

Atmosphere of the workshop

The atmosphere of the workshop is important for its success. A friendly atmosphere is desirable in which participants feel comfortable. However, since some participants may have problems of concentration, silence should be enabled especially while they are dealing with exercises. Moreover, the venue of the workshop should be chosen carefully and unexpected interruptions; such as visitors, should be avoided where possible.

Observation of the workshop

- Through such kind of workshops careful observation of the participants can also provide valuable data for designers. However, it is a hard issue both to facilitate the workshop and to try to observe the participants. Thus, the researcher (or the research team) should not deal with facilitation which can be assigned to another experienced person.

- It may be hard to catch some points during the workshop, thus, the video recording of the workshop or at least taking photos from the session can be helpful for further analysis.

What kind of information do designers want to reach through participatory user workshops?

Participatory user workshops are case specific studies. Thus the kind of information that designers want to reach can vary according to the cases. As the present case study was carried out in collaboration with Vestel, the question can be answered on the basis of the approaches of designers in Vestel. However, although the designers in Vestel evaluated the information shared via the resource, their comments can be beneficial for further similar cases. According to their opinions,

- Besides the exercises inquiring desires towards the intangible qualities of a product, the exercises inquiring the desires of users related to the formal qualities of products, such as form, color and material, should also be utilized within a participatory user workshop.
- Not only the desires and expectations of users but also the reasons motivating them should be inquired during such workshops. Knowing the reasons designers can more objectively evaluate the outcomes.
- If participants state distinct desires through the sensitizing phase or through the warm up exercises of the workshop, for the phase in which they are supposed to design the product they would like have, they can be asked to create solutions for their previously stated desires within their designs. Through their designs the in-depth motivations towards such desires can be reached.
- If participants are pointing out some desired features which already exist in the market, designers may want to know if they are knowledgeable about. If so, have they ever thought about quitting their old products and buying a new one and why? The answers of these questions may reveal different aspects about the advertisement strategy of the company and the tendencies of the user group.

How can the outcomes of a participatory design process be shared with designers?

Why is the communication of the outcomes of a participatory design process important for a design team?

As stated before the aim of the participatory design process is to inform the members of the design teams about the problems, needs, expectations and aspirations of potential users and accordingly to inspire the designers to come up with novel design solutions addressing the users' expectations. Thus, the results of a participatory design process should be accessible and comprehensible for the designers. However, through participatory design processes a wide range of techniques and tools are utilized which reveal wide and complex set of data such as, ethnographic data, data about personal anecdotes, emotional responses and experiential contexts. The analysis of such data requires a degree of experience in the field. As concluded from the case study carried out in collaboration with Vestel design team, not every design team is experienced with such kind of approaches. Thus, in order to enable the process to reach its goals stated above, these kind of complex data cannot be left to the interpretation of designers, but need to be analyzed by experienced researchers and then be shared with designers. As mentioned by the designers in Vestel, the presentation of the outcomes can be utilized for different aims within the design process besides providing comprehensible information about users' in-depth responses and accordingly inspiring the designers for novel design solutions. Such kind of a presentation can be utilized as a medium which facilitates the communication within the design team and also among the design team and other departments which are responsible from new product development. Designers can also utilize such a source in order to support their design decisions through referring the information presented to them.

Which medium and elements can be preferred for communicating the outcomes of a participatory design process with designers?

Written reports and presentations are the most common ways of presenting the findings of user studies. These presentations are mostly prepared by marketing

people through a marketing perspective and are subjected to designers' criticisms. Designers regard these forms of presentations inadequate for supporting their design process since they have difficulties to concentrate on and comprehend the presented data. Moreover, such presentations are criticized due to their insufficiency in supporting the empathy between the designer and the user and stimulating the creativity of the designer. Thus, regarding the goals of a participatory design process, some elements are specifically proposed for communicating its outcomes with designers. Firstly, narrative structures are highly preferred while preparing such kind of communicative resources. The experiences of the users within the explored context, their context related good and bad memories and their desires can be shared in the form of narratives. These narratives can increase the comprehensibility of the data and they can be easily recalled afterwards.

Besides the usage of narratives, the usage of visuals is also highly prompted for presenting the outcomes of a participatory design process. The interviews conducted with designers in Vestel indicated that visuals are good at attracting the attention of the designers and the information given through visuals can be more easily recalled by them, in comparison to the written information. Thus, visual representations are regarded more engaging. Additionally, it is believed that visual representations enhance the visual thinking of the designers, which is regarded essential for the creative process. Within these visual representations, the representational or real photos of the participants and the snapshots from the daily life of participants can serve for the empathy between the participant and the designer. Diagrams can be utilized in order to visualize the quantitative data for the sake of comprehensibility and ease of be recalled.

In addition to the visuals, scenes from video recordings and audio samples are also utilized while generating such communicative mediums. These kinds of elements mainly serve for engaging the designer with the context of use and easing the empathy between the designer and the user.

The various combinations of above discussed elements are used for generating different design tools which aim to communicate with designers. These tools can be presented to the designers via a wide range of medium, ranging from poster

presentations to software applications. However, software applications are regarded more advantageous due to ease of share, ease of storage, availability of navigation within the data, and availability for interaction.

Which aspects should be paid attention to while generating software based design resource, which communicates the outcomes of a participatory design process?

For the utility of the participatory design process for the design team, the design resource presenting its outcomes should be developed by paying attention to some aspects. These aspects were widely discussed through Section 5.3. Accordingly,

- The comprehensibility of the data is crucial for such presentations, thus the development should be done on the basis of simplicity of the navigation and the clarity of the information.
- The language, the elements and the layout chosen for the interface of the resource should also be appropriate for designers. Thus a pilot study is advisable in order to test if the interface works well with designers.
- The titles of the resource should be arranged according to the interests of the designers. The titles which are thought to be more interesting for designers should be highlighted or at least should not be shadowed by other less interesting titles.
- As the users of these kind of media will be designers, their graphic designs should reflect a sense of professionalism.
- The meanings of the representations chosen for some titles or buttons should be familiar to designers. If there is a doubt about this familiarity, some explanations should be given in order to prevent misinterpretations.
- The design of the whole resource should be done in a way that it both lets the designer comprehend the whole picture of the research and also search for a specific piece of data and concentrate on it. Thus, interactivity is highly appreciated for such kind of communicative grounds, since it promotes a free navigation among the information and facilitates to conclude personal inferences.
- The presentation of the data should include explanations about the research phase since designers may have difficulty in interpreting or evaluating the data. The information of “these data are outcomes of such kind of a research” can help designers to convey more relevant results.

- The participants should be presented individually, on the basis of their individual contributions, in order to enable designers to view different perspectives and to evaluate the personal responses of the participants. However, designers may also need to make some comparisons between the responses of participants. Thus, the resource should be designed in a format which allows such kind of comparisons.
- Resources based on software are preferred in terms of ease of share and storage. However, sometimes designers may need hardcopy documents related to the outcomes of the user research. Thus, the printable versions of such kind of presentations should also be considered.

How can designers utilize such design source?

Although the resource aims to inform the design team about the outcomes of the participatory user workshop through a comprehensible interface and accordingly to help them to get inspired from the contributions made by users, the interview with designers in Vestel revealed that the designers can utilize the resource also for alternative purposes:

- Designers can go through the resource in the concept generation phase, in order to understand the target user group and generate ideas accordingly, since the resource regarded very mind opening for them.
- In the further phases of design process, whenever the designers come up with a problem, they can return to the data and may find solutions.
- Such a resource can be developed into a database and can be uploaded to the intranet of the design team. The database can be a ground for communication between the team members.
- The database can be shared with other departments, which are responsible from new product development. Accordingly, the database can also function as a communicative ground among departments. Since the other departments get also knowledgeable about users' expectations and concern, the new product decisions can be taken more easily on the basis of consensus.
- The resource can also be utilized by the design team in order to support their design decisions within the presentations to clients.

Which factors can affect the utility of participatory design process by a design team of a Turkish manufacturer?

The first and the most important factor which affects the utility of participatory design process by a design team of a Turkish manufacturer is its business and marketing strategy. As also the Vestel case revealed, not all big manufacturers in Turkey pursue a brand strategy which is based upon differentiation. As discussed in Section 4.1, Vestel follows an OEM strategy and 90% of its sales are done accordingly. Only remaining 10% are marketed with Vestel brand within the domestic market. Thus, for the most of the projects designers in Vestel do not design according to the expectations of end-users, since they do not address to end-users but mainly to whole-salers from all over the world. Within such an environment investing on participatory design methods is not so feasible, since the aim of the participatory design approach does not correlate with the business goals of Vestel. In addition to the strategic issues, the budget of a Turkish manufacturer can also affect the utility of participatory design approach for it. Participatory design processes are very expensive processes, the performance of which requires much time. Thus, a company may not want to take risk by investing on such an approach if it does not have a big expectation from the process. Lastly, the approach of the upper management towards the design department may also affect the utility of participatory design approaches.

6.2 Recommendations for Further Studies

The case study, which was carried out for the present study, is a specific case which is done with a group of middle-aged Turkish housewives on the basis of TV remote controls. Accordingly, the designed resource cannot be regarded as a finished medium but a draft reflecting an approach. Thus, throughout the evaluation phase of the case study, the designers expressed their curiosity about how the comprehensibility of the data will be enabled if the scope of the study is enlarged and similar studies will be carried out with other user groups on the basis of other product groups. Thus, for the further development of the resource participatory user workshops should be carried out with more people belonging to different user groups on the basis of more product groups. Then the resource should be developed into a database which is reflecting all the outcomes of the

participatory user workshops. Such kind of a database should be interactive which presents different classifications of the data. For the development of such a database collaboration with professional interactive designers and graphic designers is needed and it should be tested in terms of usability after the development.

The participatory user workshop carried out for the present study was initiated in order to learn the needs, problems, expectations and desires of users and use this information as an input for the design resource. However, the evaluation of the resource by the designers indicated that designers expect more in-depth responses as the outcome of such studies. Thus, for further studies participatory user workshops can be organized in order to get more in-depth responses from users by inquiring the reasons for their comments. Moreover, since in-depth responses reveal rich data for the designers, they may have difficulty in interpreting and utilizing it. Thus, for the further development of the resource the raw data can be interpreted by the researcher and presented in a more structured manner within the resource. The aim of such a presentation should give the designer the overall view of the outcomes, allow the comparison between the remarks of different participants and let the designer get detailed information about any piece of the data.

Throughout the case the developed design resource was evaluated by the designers through interviews. However, for further studies the evaluation can be done on the basis of a workshop, in which designers are asked to design by utilizing the data given through the design resource. Through the observation of the workshop and analysis of the outcomes the utility of the resource for individual design processes of designers can be more objectively obtained.

REFERENCES

- Ackoff, R.L. (1993). Idealized design: Creative corporate visioning. *OMEGA International Journal of Management Science*, 21(4), 401-410.
- Altınordu, B.E. (2005). Tasarım fabrikası Vestel. Retrieved March 10, 2007, from <http://www.vsdergi.com/200505/02/03.asp>
- Baskinger, M. and Nam, K. (2006, February 1-3). *Visual Narratives: the essential role of imagination in the visualization process*. Paper presented at the Asia Pacific Symposium on Information Visualization, Tokyo, Japan.
- Battarbee, K. and Mattelmaki, T. (2002, July 1-3). Meaningful product relationships. Paper presented at the Design and Emotion Conference, Loughborough, England.
- Blomquist, A. and Mattias A. (2002). *Personas in action: Ethnography in an interaction design team*. Paper presented at the 2nd Nordic Conference on Human-Computer Interaction, October 19-23, in Aarhus, Denmark.
- Bodker, S. (2000). Scenarios in user centred design- Setting the stage for reflection and action. *Interacting with computers*, 13(1), 61-75.
- Bruseberg, A. And McDonagh-Philp, D. (2001). New product development by eliciting user experience and aspirations. *International Journal of Human-Computer Studies*, 55, 435-452.
- Bruseberg, A. and McDonagh, D. (2002). Product handling and visual product evaluation. In P.T. McCabe (Ed.), *Contemporary Ergonomics 2002* (pp. 303-308). London: Taylor and Francis.
- Bruseberg, A. and McDonagh, D. (2005). Developing a toolkit to support collaboration for new product development. *Unpublished reports and current submissions*. Retrieved February 5, 2007, from <http://www.cs.bath.ac.uk/~anneb/ucdwn.pdf>
- Buchenau, M. and Suri, J.F. (2000, August 17-19). *Experience Prototyping*. Paper presented at the Symposium on Designing Interactive Systems: processes, practices, methods and techniques, New York, United States.

- Budd, J., Taylor, R., Wakkary, R., and Evernden, D. (2003, September 5-7). *Industrial design to experience design: Search for new common ground*. Paper presented at the ICSID 2nd Educational Conference, Hannover, Germany.
- Burnett, G. and Porter, J. (2001). 'Ubiquitous computing within cars: Designing controls for non visual use. *International Journal of Human Computer Studies*, 55, 521-531.
- Carmel, F., Whitaker, R.D., and George J.F. (1993). PD and joint application design: A transatlantic comparison. *Communications of ACM*, 36(4), 40-48.
- Carroll, J.M. (2000). Five reasons for scenario-based design. *Interacting with Computers*, 13, 43-60.
- Chamberlain, P., and Roddis, J. (2003). Making sense: A case study of a collaborative design-led new product development for sensorily impaired. *The Design journal*, 6(1), 40-51.
- Christel, M.G., Hauptmann, A.G., Wactlar, H.D., and Ng, T.D. (2002, December, 1-6). *Collages as dynamic summaries for news video*. Paper presented at the ACM International Conference on Multimedia, Juan les Pins, France.
- Ciccantelli, S., and Magidson, J. (1993). Consumer idealized design: Involving Consumers in the product development process. *Journal of Product Innovation Management*, 10, 314-347.
- Crabtree, A. (1998, November 12-14). *Ethnography in participatory design*. Paper presented at the Fifth Biennial participatory Design Conference, Seattle, Washington, USA. Retrieved October 20, 2006, from Google Scholar database.
- Dandavate, U., Steiner, D. and William, C. (2000). Working anywhere: Co-design through participation. In S.A.R Scrivener, L.J. Ball, and A. Woodcock (Eds.) *Collaborative Design* (pp. 101-110). London: Springer-Verlag.
- Demirbilek, O. (1999). *Involving the elderly in the design process. A participatory design model for usability, safety and attractiveness*. PhD Thesis. Bilkent University. Retrieved, 21 October, 2006, from Google Scholar database.
- Demirbilek, O. (2001). *Users as designers*. Paper presented at the Include 2001, Royal College of Art, London, UK.

- Demirbilek, O., and Demirkan H. (1999, September 5-9). *Designing with elderly*. Paper presented at the Fourth Global Conference on Ageing, Palais des Congress de Montréal, Canada.
- Demirbilek, O., Demirkan, H., and Alyanak, S. (2000-June 14-18). *Designing an armchair and a door with elderly users*. Paper presented at Designing for the 21st century, an International Conference on Universal design, Rhode Island, USA.
- Demirbilek, O. and Demirkan, H. (2004). Universal product design involving elderly people: a participatory design model. *Applied Ergonomics*, 35, 361-370.
- Desmet, P., and Dijkhuis, E. (2003, June 23-26). *A wheelchair can be fun: A case of emotion-driven design*. Paper presented at the International Conference on Designing Pleasurable Products and Interfaces, Pittsburg, USA.
- Djajadiningrat, J.P., Gaver, W.W. and Frens, J.W. (2000). *Interaction relabelling and extreme characters: methods for exploring aesthetic interactions*. Proceedings of the DIS 2000, ACM Press New York, NY, USA.
- Don, A. and Petrick, J. (2003). User Requirements. In B. Laurel (Ed.), *Design Research: methods and perspectives* (pp. 70-80). Cambridge, Mass: MIT Press.
- Druin, A. (1999, May 15-20). *Cooperative Inquiry: Developing new technologies for children with children*. Paper presented at the Conference on Human Factors in Computing Systems, Pittsburg, Pennsylvania, United States.
- Druin, A. (2002). The role of children in the design of new technology. *Behaviour and Information Technology*, 21(1), 1-25.
- Forlizzi J., and Ford S. (2000). Building blocks of experience: An early framework for interaction designers. In DIS2000 Designing Interactive Systems Conference Proceedings (ACM), pp. 419-423
- Gaver, W., Dunne, T., and Pacenti, E. (1999). Cultural probes. *ACM Interact*, 6(1), 21-19.
- Hemmings T., Crabtree, A., Rodden, T., Clarke, K. and Rouncefield, M. (2003). Probing the probes. Paper presented at the Participation and Design Conference, Malmo, Sweden.

- Godwin, K. (2001). Perfecting your personas. *Cooper Interaction Design Newsletter*, Retrieved September 27, 2006, from http://www.cooper.com/newsletters/2001_07/perfecting_your_personas.htm
- Gregory, J. (2002). *Design Seminar: participation and design*. Retrieved, November 22, 2006, from <http://www.intermedia.uio.no/seminarer/InterMedia/IRS-02/ppt/gregory.ppt#5>
- Gruin, D., Rauch, T. and Redpath, S. (2002). The use of stories in user experience design. *International Journal of Human Computer Interaction*, 14 (3-4), 503-534.
- Grudin, J. And Pruitt, J. (2002, June 23-25). *Personas participatory design and product development: An infrastructure for engagement*. Paper presented at the Participatory Design Conference, Malmo, Sweden.
- Hasdoğan, G. (1996). The roles of user models in product design for assessment of user needs. *Design Studies*, 17, 19-33.
- Hasdoğan, G., Evyapan, N. and Korkut, F. (2006). Understanding user experience for scenario building: A case in public transportation design. In P.D. Bust (Ed.) *Contemporary Ergonomics* (pp. 189-193). London: Taylor and Francis.
- Horst, W., Bunt, T., Wensveen, S. and Cherian, L. (2004). *Designing probes for empathy with families*. Paper presented at the conference on Dutch Directions in HCI, Amsterdam, the Netherlands.
- Hulkko, S., Mattelmaki, T., Virtanen, K. and Keionen t.(2004, October 23-27). *Mobile probes*. Paper presented at the Nordic Conference on HCI, Tampere, Finland.
- Hummels, C.C.M. (2000). *Gestural design tools: prototypes, experiments, and scenarios*. PhD Thesis. Delft University of Technology.
- Hutchinson, H., Mackay, W., Westerlund, B., Bederson, B.B., Druin, A. Plaisant, C., et al. (2003, April 5-10) *Technology Probes: inspiring designs for and with families*. Paper presented at the Conference on Human Factors in Computing Systems, Ft. Lauderdale, Florida, USA.
- Jaasko, V. and Mattelmaki, T. (2003, June 23-26). *Observing and Probing*. Paper presented at the DPPI03 Conference, Pittsburg, USA.

- Jones, C., McIver, L., Gibson, L. and Gregor P. (2003, July 1-3). *Experiences obtained from designing with children*. Paper presented at the Conference on Interaction Design and Children, Preston, England.
- Jordan, Patrick W. 2000. *Designing Pleasurable Products: An Introduction to the New Human Factors*. London and New York. Taylor & Francis.
- Karabati, S., Tan. B., Acur, N. and Gereççi, B. (2005). *Vestel Electronics: Transition into the leading European TV manufacturer*. Retrieved March 10, 2007, from <http://www.vestel.com/NR/rdonlyres/D8B38A79-D020-4972-8D02-389F256B15D7/4798/6050151M1.PDF>
- Kaulio, M.A. (1997). Customer, consumer and user involvement in product development: A framework and a review of selected methods. *Total Quality Management*, 9(1), 141-149.
- Keller, I., Stappers, P.J. and Adriaanse, J. (2000, March 27-28). *Presence for design: creating an atmosphere with video collages*. Paper presented at the PRESENCE 2000 3rd International Workshop on Presence, Delft, The Netherlands.
- Kensing, F., Blomberg, J. (1998). Participatory design issues and concerns. *Computer Supported Cooperative Work*, 7, 167-185.
- Korpela, M., Soriyan, H.A., Olufokunbi, K.C., Onayade, A.A., Adetugbo, A.D., and Adesanmi, D. (1998). Community participation in health informatics in Africa: An experiment in tripartite partnership in Ile-Ife, Nigeria. *Computer Supported Cooperative Work*, 7, 339-358.
- Kuhn S. (1996). Design for people at work. In *Bringing Design to Software* (pp. 273-294). New York: ACM Press.
- Lahti H. and Seitama-Hakkarainen P. (2005). Towards participatory design in craft and design education. *CoDesign*, 1(2), 103-117
- Laurel,B. (Ed.). (2003). *Design research: methods and perspectives*. London: The MIT Press.
- Lines, L. and Hone K.S. (2004). Eliciting user requirements with older adults: Lessons form the design of an interactive domestic alarm system. *Universal Access in the Information Society*, 3, 141-148.

- Lofthouse, V.A., and Lilley, D. (2006, May 15-18). What they really really want: User-centred research methods for design. Paper presented at the International Design Conference-Design 2006, Dubrovnik, Croatia.
- Luck, R. (2003). Dialogue in participatory design. *Design Studies*, 24(6), 523-535.
- Maguire, M. (2001.) Methods to support human centered design. *Human Computer studies*, 55, 587-634.
- Mattelmaki, T. (2005). Applying probes: from inspirational notes to collaborative insights. *CoDesign*, 1(2), 83-102.
- Mattelmaki, T., and Battarbee, K. (2002, June 23-25). *Empathy probes*. Paper presented at the Participatory Design Conference, Malmo, Sweden.
- McClelland, I and Suri, J.F. (2005). Involving people in design. In J.R. Wilson and N. Carlott (Eds.), *Evaluation of Human Work* (pp. 281-333). Boca Raton: Taylor & Francis.
- McDonagh, D. and Langford, J. (Ed.)(2003). *Focus groups: Supporting effective production development*. London: Taylor & Francis.
- McDonagh, D. and Storer, I. (2005). Mood boards as a design catalyst and resource: Researching an under-researched area. *The Design Journal*, 7(3), 16-31
- McNeese, M.D., Zaaf, B.S., Citera, M., Brown, E.C., and Whitaker R. (1995). AKADAM: Eliciting user knowledge to support participatory ergonomics. *International Journal of Industrial Ergonomics*, 15, 345-363.
- Morello, A. (2000). Design predicts the future when it anticipates experience. *Design Issues*, 16, 3, 35-44.
- Muller, M.J. (2003). Participatory design: the third space in HCI. In J.A. Jack, and A. Sears (Eds.), *The human computer interaction hand book: Fundamentals, evolving technologies and emerging applications* (1051-1069). Mahwah: Erlbaum.

- Muller, M.J.; Blomnberg, J.L., Carter, K.A., Dykastra, E.A., Madsen, K.H., & Greenbaum, J. (1991). *Participatory Design in Britain and North America: Responses to the "Scandinavian Challenge"*. Paper presented at the ACM CHI'91 Conference on Human Factors in Computing Systems. Retrieved March 13, 2006, from HCI Bibliography.
- Mumford, E. (1981). Participatory systems design: A structure and method. *System Object, Solutions I*, 1, 5-19.
- Nardi B.A. (1992). The use of scenarios in design. *ACM SIGCHI Bulletin*, 24(4), 13-14.
- Norton, D.W. (2003). Toward meaningful brand experiences. *Design Management Journal*, 14, 1, 1-25.
- Ollson, E., (2004). What active users and designers contribute in the design process. *Interacting with Computers*, 16(2), 377-401.
- Olsen, G. (2004). Making personas more powerful: Details to drive strategic and tactical designs. *Cooper Interaction Design Newsletter*, http://www.bboxesandarrows.com/view/making_personas_more_powerful_details_to_drive_strategic_and_tactical_design (accessed September 27, 2006).
- Pine, B.J. and Gilmore, J.H. (1998). Welcome to the Experience Economy, *Harvard Business Review*, 79, 4, 97-105.
- Porter, C. S., Chhibber, S., Porter, J.M. and Healey, L. (2005a, April 5-8). *RealPeople: Encouraging Inclusive Design through Empathy*. Paper presented at the INCLUDE 2005, London, UK.
- Porter, C. S., Chhibber, S., Porter, J.M. and Healey, L. (2005b, August 23-25). *RealPeople: making users' pleasure needs accessible to designers*. Paper presented at the British Computer Society Workshops in Computing (eWIC) Series, Accessible Design in the Digital World Conference, Dundee, Scotland.
- Pruitt, J., and Grudin, J. (2003). *Personas. Practice and theory*. Paper presented at the Conference on Interactive Digital design (DUX), June 5-7, in San Francisco, USA.
- Reich, Y., Konda, S.L., Monarch, I.A., Levy, S.N., and Subrahmanian, E. (1996). Varieties and issues of participation and design. *Design Studies*, 17(2), 165-180.

- Runcie, E. (2004). Role of PCD in mitigating risk in developing new technologies. In N. Wakefors (Ed.). *Innovation through people-centred design – lessons from the USA. Report of a dti global watch mission*. London: dti / University of Surrey
- Sanders, E.B.N. (1999, September 9-11). *Post design and participatory culture*. Paper presented at the Useful and Critical: The Position of Research in Design, Tuusula, Finland.
- Sanders, E.B.N. (2000). Generative tools for codesigning. In S.A.R Scrivener, L.J. Ball, and A. Woodcock (Eds.), *Collaborative Design* (pp. 3-12). London: Springer-Verlag.
- Sanders, E.B.N. (2001). Virtuosos in the Experience Domain. Paper presented at the 2001 IDSA Education Conference, Boston, Massachusetts. Retrieved March 15, 2006, from Scopus database.
- Sanders, E.B.N. (2001, October 7-11). *A new design space*. Paper presented at the ICSID 2001 Seoul: Exploring Emerging Design paradigm, Oullim, Seoul, Korea.
- Sener, B. and Van Rompuy, T. (2005). 'In-touch' with consumers: Freeform as a co-design tool for real time concept modification. *The Design Journal*, 8(1), 14-26.
- Sleeswijk Visser, F., Van der Lugt, R., and Stappers, P.J. (2004, May 11-13). *The personal cardset- a designer-centred tool for sharing insights from user studies*. Paper presented at the Second International Conference on Appliance Design, Bristol, UK.
- Sleeswijk Visser, F., Stapper, P.J. and Van der Lugt, R. (2005). Contextmapping: experience form practice. *CoDesign*, 1(2), 119-149.
- Sleeswijk Visser, F. and Visser, V. (2006). Re-using users: co-create and co-evaluate. *Personal Ubiquitous Computing*, 10, 148-152.
- Stappers, P.J.(2006). Creative connections: user, designer, context and tools. *Personal Ubiquitous Computing*, 10, 95.100.
- Stappers, PJ, Sleeswijk Visser, F, and Keller, I (2003). Mapping the experiential context of product use: generative techniques beyond questions and observations. In Aoki, H (Ed.), *6th Asian design international conference. Journal of the Asian Design International Conference* (pp. 1-8). Tsukuba: Institute of Art and Design, Univ. of Tsukuba

- Stappers, P.J., Sanders, E. B.-N. (2005, May 14-15) *Tools for designers, products for users? the role of creative design techniques in a squeezed-in design process*. Paper presented at the International Conference on Planning and Design, NCKU, Taiwan.
- Sui, K.V.M. (2003). Users' creative responses and designers' roles. *Design Issues*, (2), 64-73.
- Suri J.F. and Marsh, M. (2000). Scenario building as an ergonomics method in consumer product design. *Applied Ergonomics*, 31, 151-157.
- Van der Lelie, C. (2006). The value of storyboards in the product design process. *Personal Ubiquitous Computing*, 10, 159-162.
- Van der Lugt, R. And Sleeswijk Visser, F. (2005, September 4-7). *Widening involvement in creative group process*. Paper presented at the 9th European Conference on Creativity and Innovation, Lodz, Poland.
- Van Rijn, H., Bahk, Y., Stappers, P.J., and Lee, K. (2006). Three factors for contextmapping in East Asia: trust, control and nunchi. *CoDesign*, 2 (3), 157-177.
- Wakeford, N (Ed.). (2004). Innovation through people-centred design – lessons from the USA. Report of a dti global watch mission. London: dti / University of Surrey
- Wensveen, S. and Overbeeke, K. (2001). Adapting through behaviour: What my alarm clock should know, do and feel. In M.G. Helander, H.M. Kalid and M.P. Tham (Eds.), *Proceedings of the International Conference on Affective Human Factors Design* (pp. 242-247). London: Acean Academic Press.
- Westerlund, B., Lindqvist, S., Wendy, M., and Yngve, S. (2003). *Co-design methods for designing with and for families*. Paper presented at the 5th European Academy of Design Conference, Barcelona, Spain.
- Woods, J. (1993). Simplifying the interface for everyone. *Applied Ergonomics*, 24(1), 28-29.
- Zimmerman, L.A., Hillman, M.R., and Clarkson, P.J. (2005). *Wheelchairs: from engineering to inclusive design*. Retrieved, December 5, from <http://www.hhrc.rca.ac.uk/programmes/include/2005/proceedings/pdf/zimmermannl.pdf>

APPENDIX A

PROJECT BRIEF PRESENTED TO VESTEL DESIGN TEAM

Aim of the Study

The aim of the study is to utilize participatory design methods in order to obtain knowledge related to users, including their expectations, desires, emotions, dreams, fears, etc. Accordingly, to develop a informational and inspirational design resource which aims to share the outcomes of such a participatory design process in a way that designers can easily empathize with the target user group and thus utilize the knowledge related to users within their design process.

The research Scenario

1. To decide design problem.
2. To form a sample group from the target user group of the problem
3. To plan the participatory user workshop which will be held with the chosen sample groups. To design related tools and tasks.
4. To realize the participatory user workshop.
5. To analyze the outcomes of the workshop.
6. To design a medium in order to share the outcomes of the workshop with the design team in a way that they can empathize with the users and utilize the obtained knowledge in their design process in terms of information and inspiration.
7. To present the medium to the design team and ask them to use it.
8. To interview with designer and ask for the practicability of such a process in their design process, regarding its advantages and disadvantages.
9. To analyze the strong and weak points of the process and make a proposal for the future studies in the field.

Importance of the Study

Participation of users in design process has long been argued, especially within themes like designing for pleasurable experiences and designing for emotions. The debates mainly point out that regarding the competition within global market, functionality and usability cannot promise much added value for users. Due to the advances in technology, products in the market tend to offer similar things to their users. Thus, in order to make a product preferable among its competitors, it should promise pleasurable experiences in addition to functionality and usability. In order to design pleasurable products, designers need more than traditional user knowledge. Regarding these facts, participatory design methods aims an active collaboration between users and designers in the design process. These methods regard users as experts in their experiences and individuals who can be very creative when the right conditions are provided for them.

Inspiring from these conditions, nowadays, many projects, both academic studies and more practical university-industry collaborations, aim to explore the issue deeply through developing new tools and techniques, especially in Europe and North America. However, such studies are so new for Turkey and very few projects are done related to the issue. Thus, I aim to utilize my experience with participatory design methods, which I gain through a project done as a Philips Design and TU Delft collaboration, in a collaborative project between METU and a Turkish company who is in a leader position in the market, in order get the perspective of an in-house design team of a Turkish consumer electronics manufacturer towards the issue.

Why Vestel?

As stated before the approach is quite new and mostly utilized by companies who can already answer the functionality and usability related expectations of their users' and desire to differentiate themselves from their competitors. Thus, such a study should be conducted in collaboration with a firm, which is leader in the market, open-minded and most importantly give importance to design in order to get reliable results. Consumer electronics are one of the sectors which has been an advantageous area for such projects. Regarding the new technologies utilized by this sector, it is possible to conclude wide range of products which aim pleasurable

experiences. Thus, within such a variety, user related knowledge can be very efficiently utilized.

How can Vestel Design Team Benefit from such a Study?

- They will have the chance to become knowledgeable about these methods by experiencing it in their practical environment. Thus, regarding their processes, they can evaluate the methods, more reliably.
- They will be the first users of the design resource which is aimed to be concluded as the outcome of the study.
- They will get the chance of promoting their brand through the thesis and following publications in Turkey and abroad.

The Design Problem for the Study?

- The design problem can be a fictional problem which is designed by the researcher.
- The design problem can be a fictional problem which is proposed by the design team.
- The design problem can be a problem which was once studied by the design team (However, in this case since designers will be very familiar with the problem, they may have some prejudices.)
- The design problem can be problem which the design team wants to study in the future (In such an approach designers can more objective evaluate the practicability of the approach regarding their processes.)

Sample Design Problems

- Communication devices for families
- Home entertainment
- Communication tools for elderly
- Kitchen of 201

APPENDIX B

QUESTIONS OF THE INTERVIEWS AND THE SURVEY CARRIED OUT WITH DESIGNERS IN VESTEL

B.1 Questions of the preliminary interview

Designer's;

Full name and profession:

1. What is your position within the company?
2. How long have you been working in this position?
3. Till now, which kind of design projects did you involve in? Mostly which kind of design projects have you been responsible for?
4. Within your new product development process, how are you informed about the user expectations and the taken decisions about how to answer these expectations?
5. Do you experience difficulties while developing a product for certain user needs? How? How do you solve this problem?
6. How do you reach which kind of user related knowledge in new product development process?
7. Do you think, can you reach sufficient knowledge related to users? How do you think this knowledge contribute to your design process? Do you feel any shortcomings regarding user knowledge in some cases? How do you solve this problem?

8. Mostly in which kind of projects do you need user related knowledge?
9. Have you ever carried out projects in which users are involved? How? Could you explain?
10. When I said participatory design methods, which kinds of methods do you think about?
11. Do you utilize these methods in your new product development processes? What are the advantages and disadvantages of these methods? Could you explain?

B.2 Questions of the Survey Carried Out Prior to the Workshop

Designer's;

Full name and Profession:

1. Did you work on the remote control design before?
2. As a designer, what are your preconceptions about the problems related to remote control usage?
3. What kind of complaints or suggestions have you received from your clients related to your remote controls?
4. What are the limitations related to technology, manufacturing, marketing and standards which may affect the remote control designs?

(Please answer the questions below, even if you haven't designed a remote control. You can use your designer foresight.)

5. What kind of information (technical information, information of ergonomics, user research outcomes, personal experiences...) related to the interaction between the remote control and the user do you utilize while designing a remote control? Could you explain?

6. Do you feel the lack of what kind of information related to the user, while designing a remote control? Do you think the access of what kind of information can contribute to your design process?

7. Could you make a self-criticism regarding the remote controls developed by Vestel?

B.3 Questions of the Interview for the Evaluation of the Resource

1. As a designer, what is your attitude towards reaching the outcomes of such a research; which explores the users' remote control related experience, problems and expectations, through such an interactive interface?

2. Could you compare the interface with other techniques used for sharing user information with designers; such as reports and presentations? Here are some criteria for your comparison but you can add more if you think it is necessary.

- Ease of use
- Supporting the empathy between the designer and the user
- Contribution to the design process by supporting the creativity of the designer
- Comprehensibility and ease of its being recalled

3. Could you comment on the information presented through the interface? Do you think that there is missing information which is necessary for designing a remote control? The presentation of what kind of additional information could be advantageous for a designer who is working on a remote control design?

4. Could you comment on the interaction of the interface with its user? Could you state the points that you regarded positive or negative in that sense? Do you have some suggestions for the further improvement of the resource?

5. According to you such a resource should have what kind of an aesthetic look in terms of graphic design? Why? Could you explain?

6. How do you think such a resource can contribute to the design process of a designer? Could you explain?
7. Do you think you can utilize such a resource through your individual design process in Vestel?
8. If it is assumed that such an approach is adopted by Vestel as a methodology, why do you think Vestel may adopt such an approach? How do you think Vestel design team can utilize such a resource?
9. If it is assumed that such an approach is presented to Vestel and rejected by it, what can be the reasons of Vestel?

APPENDIX C

PAGES OF SENSITIZING WORKBOOK

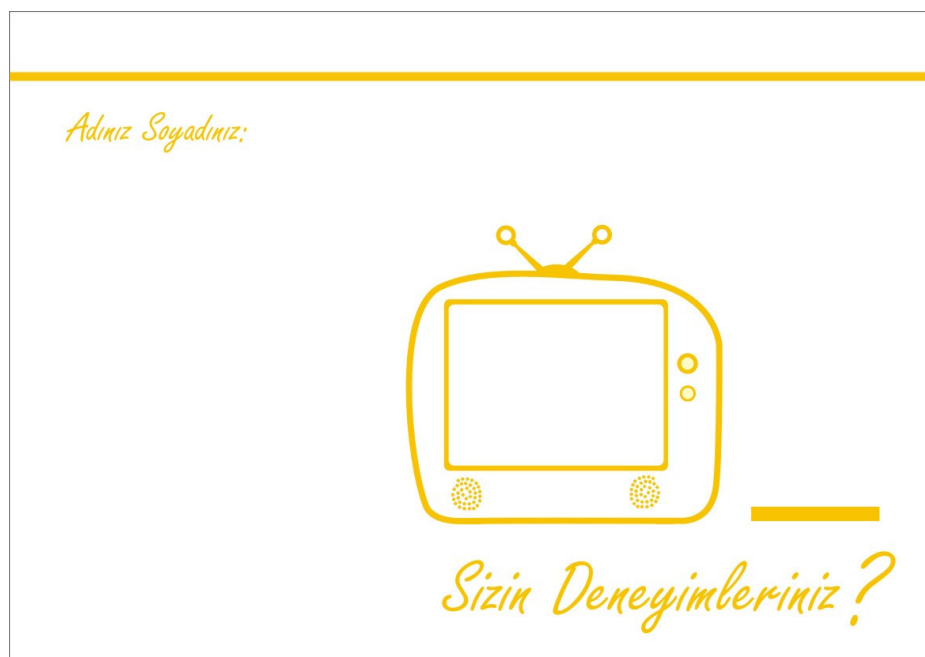


Figure C.1 Cover page of the sensitizing workbook

Evinizde nerelerde televizyonunuz var? Zarf içindeki imajlardan size uyanlarını seçerek aşağıya yapıştırdınız. Ekleme istediğiniz mekânlar varsa lütfen yazarak belirtiniz.

Günün hangi diliminde neredeki televizyonunuzu izliyorsunuz? (Yukarıda yapıştırdığınız resimleri aşağıdaki zaman dilimleriyle oklar çizerek eşleştiriniz.) Yanınızda kimler oluyor (yanlızsınız, komşunuz, eşiniz, çocuklarınız v.s....) Zaman dilimlerinin altına yazarak belirtiniz?

Sabah	Öğleden Sonra	Akşam Üstü	Akşam	Gece

Figure C.2 First page of the sensitizing workbook

Televizyon izlerken hangi aktiviteleri de beraberinde yapıyorsunuz? Zarf içerisinde kendiniz için uygun olduğunuz imajları seçerek aşağıdaki boşluğa yapıştırdınız. İmajlarda bulunan aktiviteler dışında televizyon izlerken yaptığınız aktiviteler varsa lütfen yazarak belirtiniz.

Figure C.3 Second page of the sensitizing workbook

Ne şekilde televizyon izlemekten hoşlanıyorsunuz? Zarf içerisinde kendiniz için uygun bulduğunuz imajları seçerek aşağıdaki boşluğa yapıştırınız. Bu pozisyonlar dışında televizyon izlediğiniz pozisyonlar varsa lütfen çiziniz. Bu durumlarda televizyon kumandanızı nerelerde bulunduraktan hoşlanıyorsunuz (elinizde, kucanızda, koltukta, sehpa, yatağınızda v.s...)? Neden?

Figure C.4 Third page of the sensitizing workbook

Televizyonunuzun hangi özelliklerini (televizyonunuzda halihazırda var olan veya sizin olmasını istediğiniz) kontrol edebilmek istersiniz? Hangi durumlarda? Açıklar mısınız?
(Örneğin, geçen alt yazıları okuyamadığımda ekranı büyütebilmek gibi...)

Figure C.5 Fourth page of the sensitizing workbook

Program takip etmek dışında televizyonunuzdan ne şekilde faydalanmak isterdiniz?

☐ Bilgi almak (Hava durumu, Flash haberler, döviz kurları vs...)

☐ Dijital fotoğraf makinenizle çektiğiniz fotoğrafları görüntülemek

☐ Kaydettiğiniz müzikleri dinleyebilmek

☐ Televizyon üzerine kumanda yardımı ile mesaj yazabilmek

☐ Kurulabilen, hatırlatıcı bir alarm olarak

(Lütfen ekleyiniz...)

Figure C.6 Fifth page of the sensitizing workbook

Kumadanızda beğendiğiniz ve beğenmediğiniz özellikleri kumanda üzerinde işaretleyerek açıkla mısınız?

KATILIMCILARIN KUMANDA FOTOĞRAFLARI

Figure C.7 Sixth page of sensitizing workbook

[illegible]

Televizyon kumandanızla yaşadığınız olumsuz bir anınızı anlatır mısınız?

Figure C.8 Last page of the sensitizing workbook

APPENDIX D

LAYOUTS OF THE WORKSHOP EXERCISES

Aşağıdaki televizyon kumandası resimlerini birer insan gibi düşünerek onlara dair sorulan özellikleri cevaplayınız. Dilerseniz onlara isim verebilirsiniz. Zarf içerisindeki televizyonlardan, bu kişilikte bir kumanda ile eşleştireceğinizi ilgili kumanda resimlerinin altında kalan boşluğa yapıştırınız.

				
YAŞI / CİNSİYETİ:				
MESLEĞİ:				
KİŞİLİĞİ:				
NASIL BİR ARABASI VAR?				

Figure D.1 Layout of the exercise *if remote controls were people*

Verilen kumanda örneğinden yararlanarak, kumandanızdaki fonksiyonları kullanım sıklığınızı aşağıdaki kutulara sınıflayınız. (Kumanda fonksiyonları için belirtilen numarayı ilgili kutucuğa yazabilirsiniz.)
Eğer sizin kumandanızda örnekte belirtilen haricinde fonksiyonlar varsa lütfen ekleyiniz.
Kumandanızda olmasa bile olsaydı kullanmayı tercih ederdim dediğiniz fonksiyonlar varsa lütfen belirtiniz.

Sık kullandıklarım	Ara sıra kullandıklarım	Hiç kullanmadıklarım	Olsaydı kullanmak isterdim

1. Hazır bekleme
2. TV modu
3. Harici kaynak (video gibi...)
4. Rakam tuşları
5. Çift rakam
6. Bir önceki programa dönüş (son izlediğiniz iki kanal arasında gidış gelişi sağlar)
7. Kişisel tercih (televizyonunuz üzerindeki kişisel ayarlarınızı kaydedebilirsiniz)
8. Tekli/Çiftli ses modu (orjinal dil yada seslendirme dili)
9. Menü
10. Ses kesme
11. Ses azaltma
12. Ses artırma
13. Program artırma/yukarı tuş
14. Hafıza/resim dondurma
15. Sol tuş
16. Sağ tuş
17. Program azaltma/aşağı tuş
18. Özellik menüsü
19. Programlama menüsü
20. Bilgi alma (hangi kanalı izlediğinizi gösterir)
21. Sayfa tutma (teletexte otomatik sayfa değişimini devre dışı bırakır.)
22. Sayfa güncelleme
23. TV ve teletext görüntüsünü üst üste bindirir
24. Teletext içerik sayfası
25. Saklı bilgi
26. Syfa genişletme
27. Teletext
28. Zaman
29. Ses ayar menüsü
30. Görüntü ayar menüsü

PIP: Aynı ekranda farklı kanalları izleyebilme özelliği. Bu özellik kullandığınızda:

23. PIP değiştirme
24. PIP program yukarı
25. PIP program aşağı
26. PIP Menü

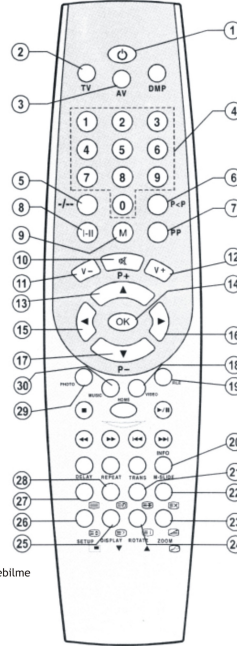


Figure D.2 Layout of the exercise rating the remote control functions according to their usage frequency

APPENDIX E

SAMPLE PAGES FROM THE RESOURCE INTERFACE

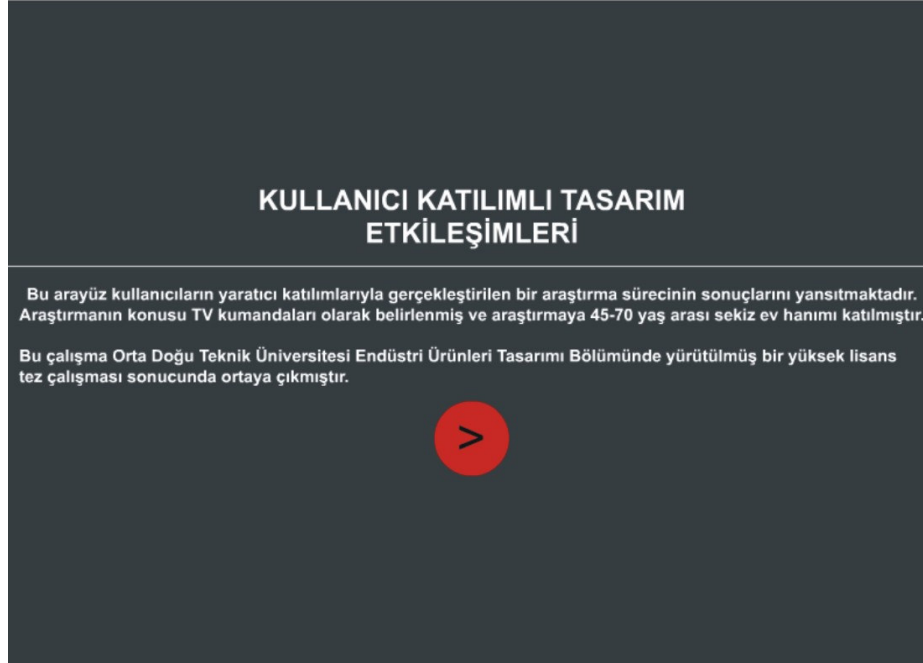


Figure E.1 Introduction page of the resource

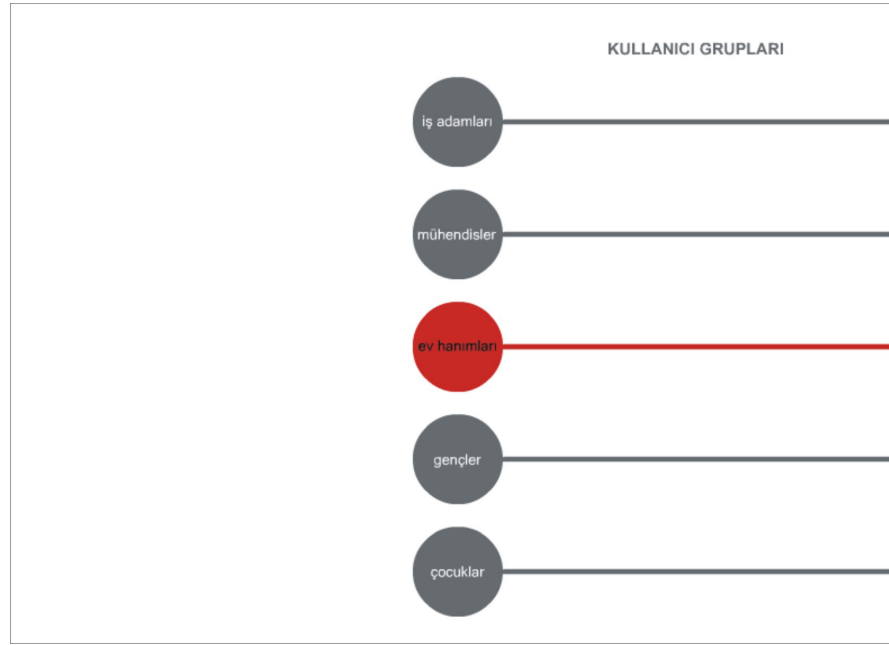


Figure E.2 The resource page showing the possible user groups

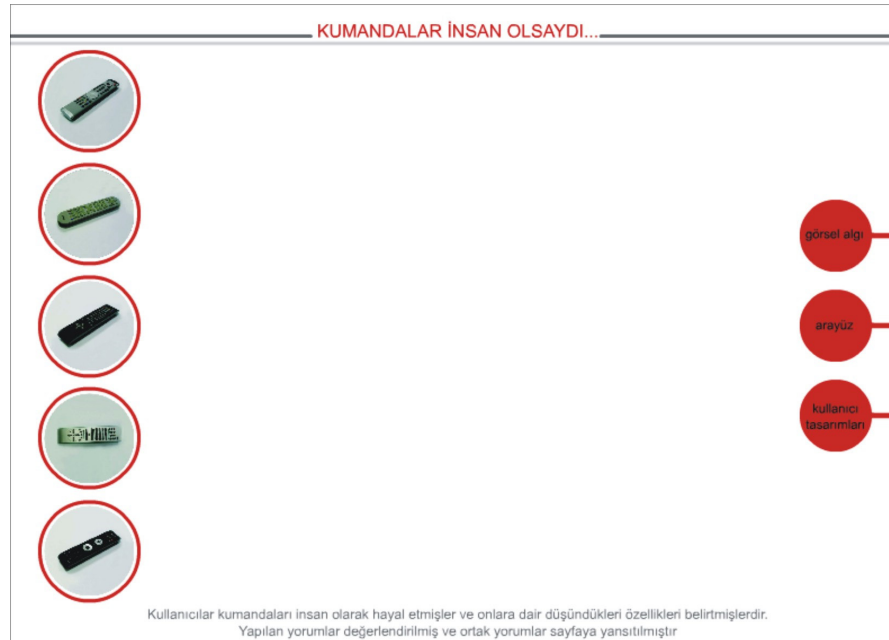


Figure E.3 The initial page of theme *visual perception*

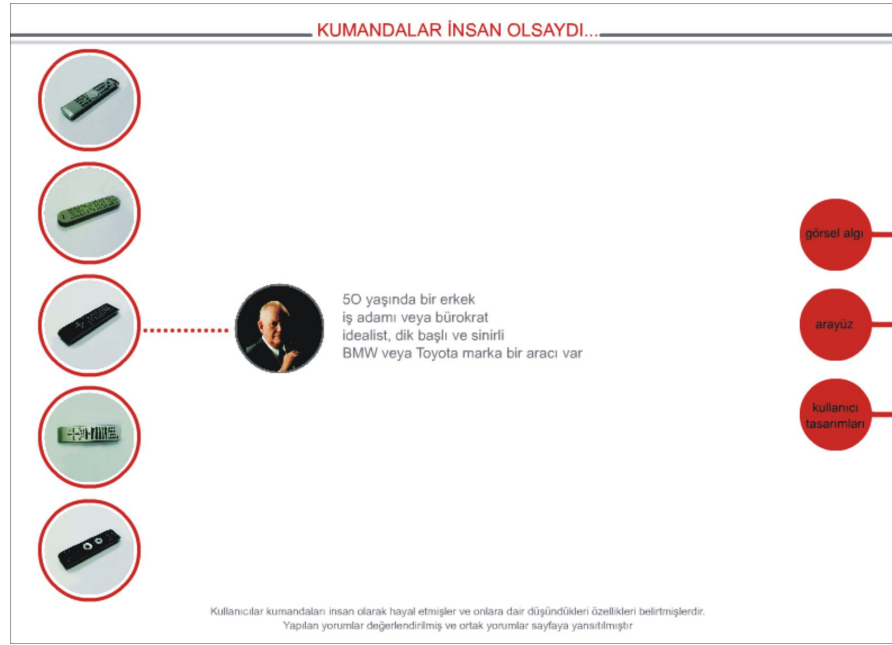


Figure E.4 Sample page from theme *visual perception*

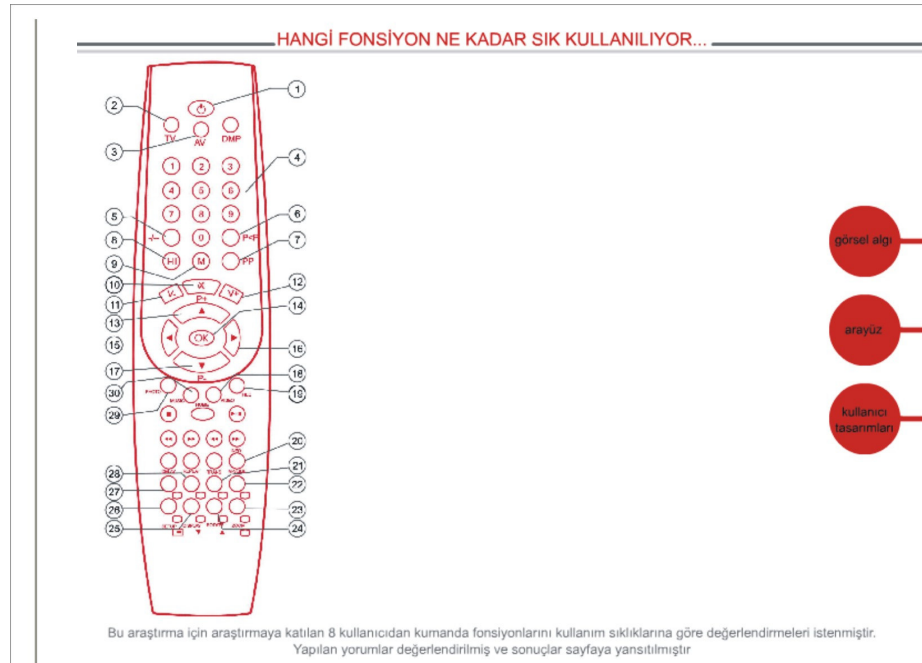


Figure E.5 Initial page of the theme *interface*

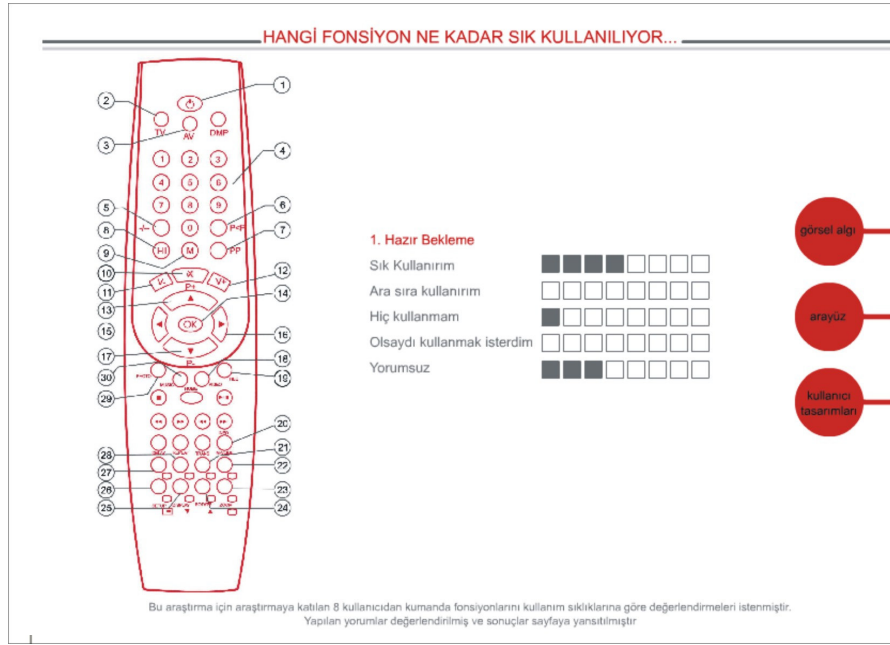


Figure E.6 Sample page from the theme *interface*



Figure E.7 Initial page of the theme *user designs*

KULLANICILAR VE KUMANDA TASARIMLARI...



66 yaşında
Yüksek okul mezunu
Emekli memur
Bilgisayar kullanmıyor
Eşi oğlu gelini ve torunu ile birlikte yaşıyor
Yakını görememe problemi ve diz eklemlerinde ağrılar var
Site içinde, müstakil, mutfak ve salonu ortak, dubleks bir evin alt katında eşi ve kendisi üst katta ise oğlu gelini ve torunu yaşıyor

TV izleme rutinlerim...

☐ Nerede?

☐ Ne yaparken?

☐ Nasıl?

☐ Kullandığım kumandaya dair...

☐ TV'den nasıl faydalanmak isterdim ?

☐ TV kumandası ile neleri kontrol edebilmek isterdim?

Nasıl bir kumanda isterdim?

☐ Çizim

☐ Model

görsel algı

arayüz

kullanıcı tasarımları

Figure E 8 Interim page guiding towards the insights of User C

KULLANICILAR VE KUMANDA TASARIMLARI...

TV izleme rutinlerim...

Nerede?



Sabah
Eşim ve torunumla



Öğlededn sonra
Akşam üstü
Akşam
Eşim, torunum, oğlum ve gelinimle



Gece
Eşimle veya yalnız

görsel algı

arayüz

kullanıcı tasarımları

<

Figure E.9 Page presenting where User C watches TV



Figure E.10 Page presenting the activities User C does while watching TV



Figure E.11 Page presenting the TV watching postures of User C



Figure E.12 Page presenting the problems of User C with her remote control



Figure E.13 Page presenting the remote control related desires of User C



Figure E.14 Page presenting the two-dimensional remote control design of User C



Figure E.15 Page presenting the play-dough model of User C